

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT



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Welcome to the FY15 Annual Overview! This document takes a look back over the last fiscal year at the people, projects, and events that shaped the Naval Undersea Warfare Center (NUWC) Division Newport and set its course for the next fiscal year and beyond.

In addition to focusing on the metrics and technical details of what we accomplished, we are highlighting the workforce who made the year a success.

Three concepts guided us through FY15 and will continue to factor into how we support the Fleet: Innovation, Collaboration, and Workforce Development.

Innovation

FY15 brought exciting new changes for Division Newport as we continue to prepare for the “Navy after next.” Through strategic investments, Division Newport is able to support technical innovation in its state-of-the-art facilities. A big event for us was the opening of the Undersea Warfare (USW) Rapid Innovation Center. This facility has already improved how we work and serves as an open think tank and prototyping environment to support Division Newport programs seeking innovative solutions to the Fleet’s biggest challenges. This workspace and its assets are exciting tools that enable us to develop the products of the future.

Collaboration

Investment in technical initiatives not only supports end-to-end systems capability and the next-generation of USW but it also fosters collaboration across Division Newport and the warfare center enterprise. We recognize the benefits of collaboration and pursue partnerships with industry, academia, and other government laboratories to bring the finest body of expertise to bear on the nation’s undersea warfare needs.

Workforce Development

It was a transformative year for Division Newport as we made a concerted effort to look to the future while maintaining the highest level of support to the Fleet. Division Newport brought on board 337 new employees in FY15. This pipeline of individuals will be mentored by the tremendously talented professionals who started work either in Newport or New London in the 1980s and are now preparing to retire. Transferring that specialized knowledge from one generation to another is a top priority and is being accomplished through focused workforce development initiatives.

As you will see in the following pages, FY15 was a tremendous year at Division Newport!

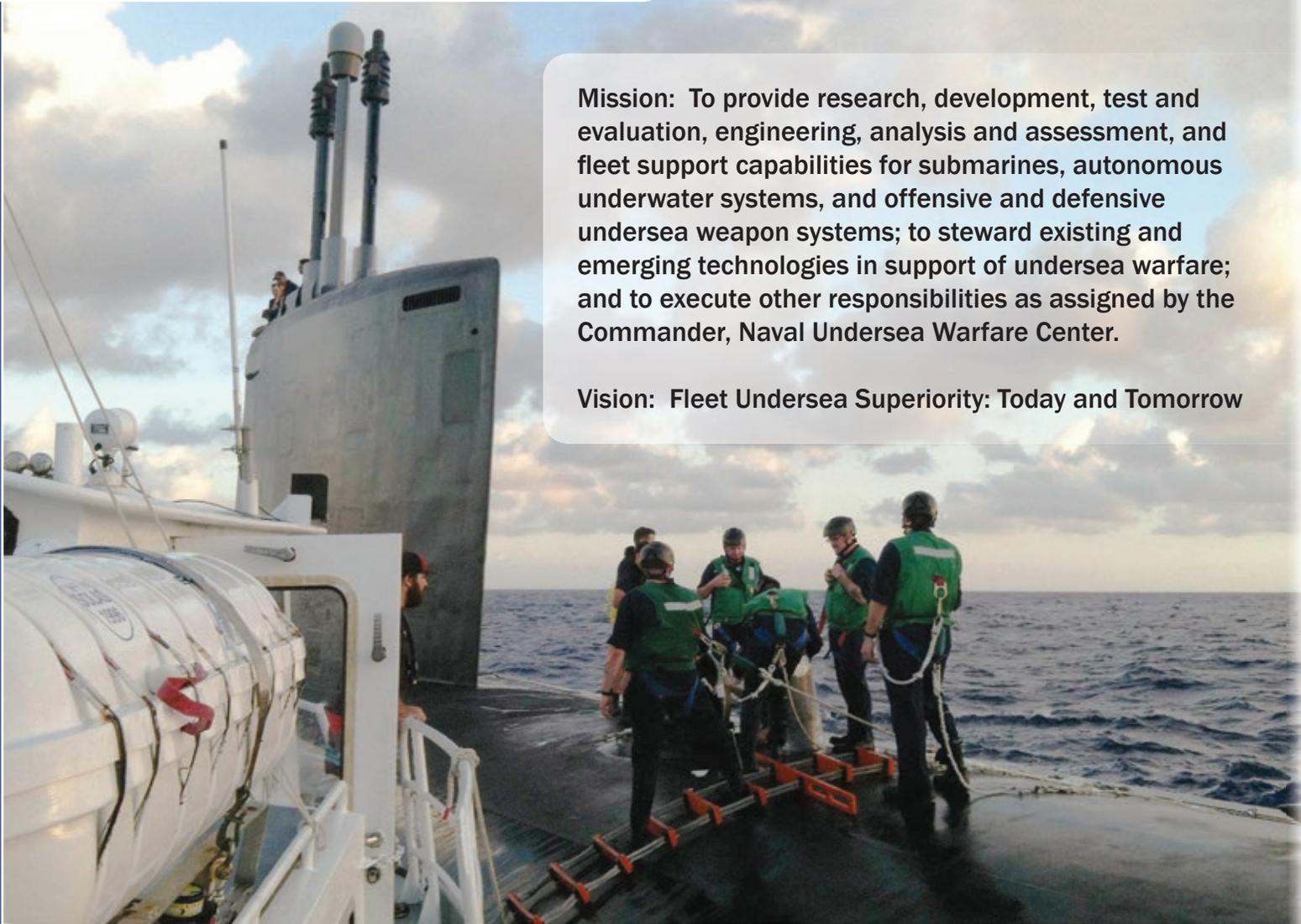


Mary S. Wohlgemuth, SES
Technical Director



Captain Howard S. Goldman
Commanding Officer

COMMAND PROFILE



Mission: To provide research, development, test and evaluation, engineering, analysis and assessment, and fleet support capabilities for submarines, autonomous underwater systems, and offensive and defensive undersea weapon systems; to steward existing and emerging technologies in support of undersea warfare; and to execute other responsibilities as assigned by the Commander, Naval Undersea Warfare Center.

Vision: Fleet Undersea Superiority: Today and Tomorrow

Division Newport provides the technical foundation that enables the conceptualization, research, development, fielding, modernization, and maintenance of systems that ensure our Navy's undersea superiority.

Division Newport is responsible, cradle to grave, for all aspects of the systems under its charter, and is engaged in efforts ranging from participation in fundamental research to the support of evolving operational capabilities in the Fleet. The major thrust of Division Newport's activities is in applied research and system development.

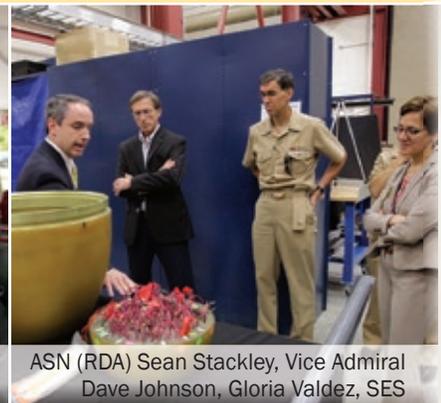
At Division Newport, our "main thing" — the core of our existence — is "Working Together to Deliver the Best Solutions Quickly."



In-water testing



Governor Chafee (RI), Senator Reed (RI),
Congressman Langevin (RI)



ASN (RDA) Sean Stackley, Vice Admiral
Dave Johnson, Gloria Valdez, SES



NUWC Newport - A USW Innovation Hub

The new generation coming into the workforce thinks differently. They collaborate in new ways. It is our role as leaders to embrace this opportunity to set the stage the right way for innovation. The challenge of the demand signal comes in all varieties, from leadership guidance, stakeholder requirements, and fleet needs.

Three key enablers for successful innovation include: facilities for experimentation, design, and testing; processes to guide the flow from concept through development; and a workforce that is educated and knowledgeable to transition this “demand signal” into solutions for undersea dominance.

Innovation is the hub and we are aligned.



Goldman Took Helm of Division Newport

In November 2014, Captain Howard S. Goldman became Commanding Officer of Division Newport.

A naval submariner originally from Baltimore, Md., Goldman is a 1987 graduate of Rice University in Houston, Texas, with a bachelor of science degree in mechanical engineering and a 2004 graduate of the U.S. Naval War College with a master's degree in international security and strategic studies. He served for one year as a national security fellow at Harvard University's Kennedy School for Government and Public Policy. He received his commission from the Naval Reserve Officer Training Unit at Rice University.

Goldman has served aboard a variety of submarines and commanded the nuclear-powered attack submarine USS Toledo (SSN-769). His shore assignments have included duty on the Submarine Tactical Development Staff of the Royal Navy, the staff of Commander Task Force 69 in Naples, Italy, and command of the Naval Submarine Training Center Pacific Pearl Harbor with additional duties as commanding officer, Naval Submarine Training Center Pacific Detachment Guam.

During the Change-of-Command ceremony, Admiral Breckinridge said of Goldman: "This is a great assignment for you. You were born for this job — you have the talent, the drive, and the creative energy."



"Every day I will dedicate 100% of my efforts to make your lives valued and provide the tools and leadership necessary to do your job. I look forward to getting to know you all better."

- Captain Howard S. Goldman



Chief of Naval Operations Visited Division Newport

In January 2015, Division Newport welcomed Chief of Naval Operations (CNO) Adm. Jonathan Greenert, for a technical program briefing and tour of the Towed Array Facility.

In addition to Greenert and his party, Rear Adm. David Johnson, Program Executive Officer, Submarines, and Rear Adm. Joseph Tofalo, Director, Undersea Warfare Division on the Navy Staff, OPNAV N97, attended the briefing and tour.

Greenert was in Newport for events at the Naval War College, including a meeting with the CNO Strategic Studies Group (SSG). The SSG, which reports directly to the CNO, was formed to generate revolutionary naval warfare concepts. The CNO personally selects the director and senior Navy officers and approves assignment of Marine Corps, Coast Guard, and Air Force nominees to serve as CNO Fellows on the SSG. At the completion of each year's efforts, the SSG produces a written report with at least first order analysis and recommendations for executable "next steps."



Vice Chief of Naval Operations Visited Division Newport

Adm. Michelle Howard, Vice Chief of Naval Operations (VCNO), visited Division Newport in April as she helped dedicate the Undersea Warfare Rapid Innovation Center (RIC) and toured the unmanned undersea vehicle (UUV) laboratory.

Adm. Howard visited the state's largest Navy command at the invitation of Division Newport's Technical Director Mary S. Wohlgemuth, Senior Executive Service (SES).

"Adm. Howard is an inspirational leader and role model," said Wohlgemuth. "When I heard she was going to be in Newport, I knew it would be a great opportunity to showcase some of the incredible contributions the NUWC workforce is making to the Navy on a daily basis."

Howard met with young professionals and more experienced personnel that have used the RIC to develop creative pathways and stimulate imaginative approaches to concept and prototype development. The facility is designed to engage, encourage, and enable the next generation of undersea warfare scientists and engineers to foster innovation. Leveraging emerging electronic technology, such as tablets, 3D printers, and virtual world environments that offer scientists and engineers opportunities to develop new concepts and ideas from alternative and traditional perspectives, the RIC is designed to be a communal activity space where teams of employees can apply innovative ideas to solve technical challenges.

"You have empowered yourselves to open your minds," Howard said. "Your accomplishment here demonstrates your dedication to the Navy and the Marine Corps values of honor, courage, and commitment including the courage to question the way things are, and the commitment to overcoming obstacles to create this remarkable space."

Howard was also briefed on Division Newport's work on the Navy's Undersea Rapid Capabilities Initiative and supporting work on Office of Naval Research (ONR) "Speed to Fleet" projects designed to produce near-term mission capabilities. Her briefing examined NUWC's alignment with the Navy's Undersea Domain Roadmap in support of the Commander, Submarine Force's vision.

DelToro Relieved Jabaley at Naval Undersea Warfare Center

Rear Adm. Moises DelToro III relieved Rear Adm. Michael E. Jabaley Jr. as commander of NUWC during a change of command ceremony in July.

Vice Adm. William H. Hilarides, Commander, Naval Sea Systems Command (NAVSEA), was the guest speaker at the ceremony. "Rear Adm. Jabaley has left a significant legacy at NUWC for being in the job for less than a year," said Hilarides. "His ability to support the Navy today, to look forward to the one out in the Fleet five years from now, and into the very far future, really has been superb and is the definition of innovation and exactly what the Navy needs."

A native of South Bend, Ind., DelToro comes to NUWC from a position as the program manager for undersea defensive systems in Washington, DC.

"The Chief of Naval Operations has given us three tenets that frame what we do: warfighting first, operate forward, and be ready," said DelToro in his first address as commander. "NUWC supports all three of these tenets. Divisions Newport and Keyport are two of the many spokes that make up the larger Navy wheel. By conducting full-spectrum research, development, test and evaluation, engineering and fleet support for submarines, autonomous underwater systems, offensive and defensive systems associated with undersea warfare, NUWC is making a difference every day."

"The Chief of Naval Operations has given us three tenets that frame what we do: warfighting first, operate forward, and be ready."

- Rear Admiral Moises DelToro





Deputy Secretary of Defense Robert O. Work

Protocol Team Hosted Record Number of Visitors

As far as special events and visitors to Division Newport, FY15 was one for the record books with more than 1,720 visitors to the Command. The following is a brief rundown of protocol events for the year:

- 81 Very, Very Important Person (VVIP) visits (Flag/SES/Elected or Appointed Distinguished Visitors)
- 92 Distinguished Visitors (O-6/GS-15 or equivalent)
- 18 major events (conferences/awards ceremonies/high-level meetings)



Vice Admiral Connor tours facilities



Rear Admiral Winter



George Drakeley, SES



Congressmen Forbes (VA) and Courtney (CT)

Leadership News

For 10 years, Warfare Center leadership has worked to gain authority for additional Senior Scientist Technical Manager (SSTM) positions within the divisions. Last year's National Defense Authorization Act finally granted the authority and Division Newport gained an additional eight SSTM positions beyond the three positions already held by the Deputy Technical Director/Technical Operations, the Chief Technology Officer, and the USW Electromagnetic Systems Department Head. Qualified positions already competitively selected include the department heads for Sensors and SONAR Systems; USW Combat Systems; Platform and Payload Integration; USW Mission Engineering and Analysis; and USW Weapons, Vehicles, and Defensive Systems. Three additional SSTMs were approved for Deputy Technical Director/Technical Excellence, USW Cyber Defense and Cyber Warfare, and Non-Traditional Sensors and Processing Systems. This is great news for career path planning, especially for those interested in assuming a leadership role and becoming an SSTM in the future. Obtaining these uniquely qualified SSTM positions, approved by the Office of the Deputy Assistant Secretary of the Navy, is a tribute to the work of this command and will allow Division Newport to be more influential and engage at higher Navy levels.

Leadership changes that occurred in FY15 include the selection of Dr. Vittorio Ricci as Chief Technology Officer and Ms. Denise Szelag as Corporate Operations Department Head.

Two New Eateries Opened at Division Newport

In January 2015, a Subway franchise opened on the Division Newport campus and soon after, the Undersea Diner opened its doors.

The restaurants' presence in a central location at Division Newport was a welcome addition for employees.

"This gives employees a chance to go somewhere, get a bite to eat, and engage with other employees to discuss collaboration and innovation." said Donald Aker, Deputy Technical Director.

Captain Howard Goldman was on hand to thank all those who worked diligently to bring these restaurants to the Command, a process that took close to two years.



Cutting the ribbon at the Undersea Diner's grand opening



Subway's daily lunch rush



Subway offers a new spot for collaboration



Demonstrating technology at the RIC

Undersea Warfare Rapid Innovation Center Opened

When the product line codes requested space and technology to do more innovative work, Deputy Technical Director Donald Aker challenged the USW Combat Systems Department (Code 25) and USW Weapons, Vehicles, and Defensive Systems Department (Code 85) with figuring out how to make this happen. The result was the Undersea Warfare Rapid Innovation Center, otherwise known as “The RIC.” The RIC is centrally located for Division Newport personnel with a machine shop onsite for physical prototyping.

In order to provide everything the product line codes wanted while remaining compliant with all information assurance requirements, the team established standard operating procedures, rules of behavior for the space, and a wish list of equipment.

On the wish list were tablets, high-performance computers, wireless system, cameras and imaging equipment, Oculus Rift (virtual reality headset), 3D printer, 3D scanner, neuro headset, Raspberry Pi (a credit card-sized microcontroller), iPads, iPods, iMacs, Android tablets, large touch screens, displays with multi-touch capabilities, wireless intrusion detection system, and various gaming systems. Any future requests for new technology in the space will go through RIC’s Configuration Control Board for approval.

The RIC workspace was a former parts depot whose contents were all moved to the Naval Station and the Facilities Department renovated the space based on concepts developed by Division Newport engineers. The result is a modern, industrial design with exposed duct work and a color palette that resembles a sandbox. All the chairs and tables have wheels on them so the furniture is easy to configure. Whiteboards are on most walls and there are breakout rooms for smaller groups.

From inception to reality, the RIC took about a year.



Briefing Hackathon rules

Division Newport's First Hackathon was a Huge Success

In October 2014, Division Newport's workforce participated in the center's first Rapid Innovation Center Event (RICE) dubbed "Hacking for Undersea Technical Excellence." Division Newport used the event to inaugurate the new RIC, a workspace designed to encourage innovation and creative thinking.

Thirty-five scientists, technicians, engineers, and mathematicians from across Division Newport's departments and representing a broad spectrum of experience and interests generated ideas in response to four undersea technology challenges: submarine stealth, platform design, payload technology, and sailors' quality of life.

From the dozens of ideas presented by individuals during the forum, five were selected by the group for further team exploration and development. The teams also had access to senior warfare center mentors and active-duty Navy personnel with extensive fleet experience. Over the following two days, the ideas grew into four-minute pitches to the entire group and a panel of evaluators who judged the results on criteria including teamwork, prototyping, creativity, effectiveness, future plans, communication, and whether or not the challenge areas were properly addressed.

The RICE gave participants experience with a new set of innovation tools at Division Newport. While generation of actual, workable and applicable technological solutions to the challenges could be the final result of this hackathon, it was not a necessary result for the event to be judged a success.

The ideas were posted on Division Newport's internal website for further evaluation by the federal workforce using crowdsourcing tools. The number of projects were narrowed and evaluated for real-world potential and possible funding for development.

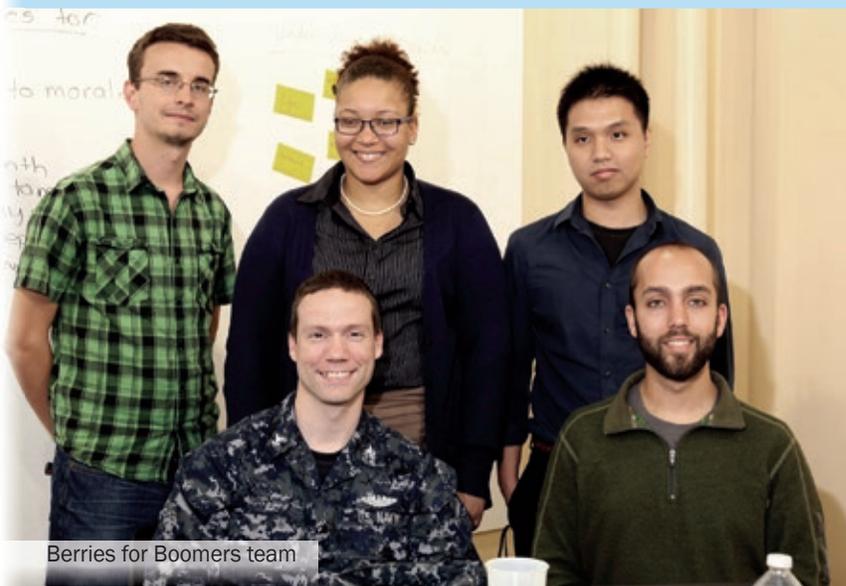
In December 2014, Hacking for Undersea Technical Excellence came to a conclusion with the announcement of the winning team. Forty-seven ideas were narrowed down to five; five teams were narrowed down to two teams.

The first team to present their idea was TORCH —Thermally Operated Refractive Cloaking Halo; their concept is "achieve stealth using a heated tow cable to thermally refract acoustic energy."

The second team presenting was REMORRAS - Robotic Expeditionary Marine Organism Removal Recorder Apparatus Scanner, "a UUV [unmanned underwater vehicle] 'Roomba' that cleans organics from the hull of submarines and detects hull coating defects."

Another idea, known as Berries for Boomers, incorporated hydroponically grown food on submarines. While this idea was not a Hackathon finalist, it has since transitioned to Natick Labs where the first crop of lettuce was produced.

After two short months of idea generation, focused research, and teamwork, the TORCH team was named the winner of Division Newport's first Hackathon.



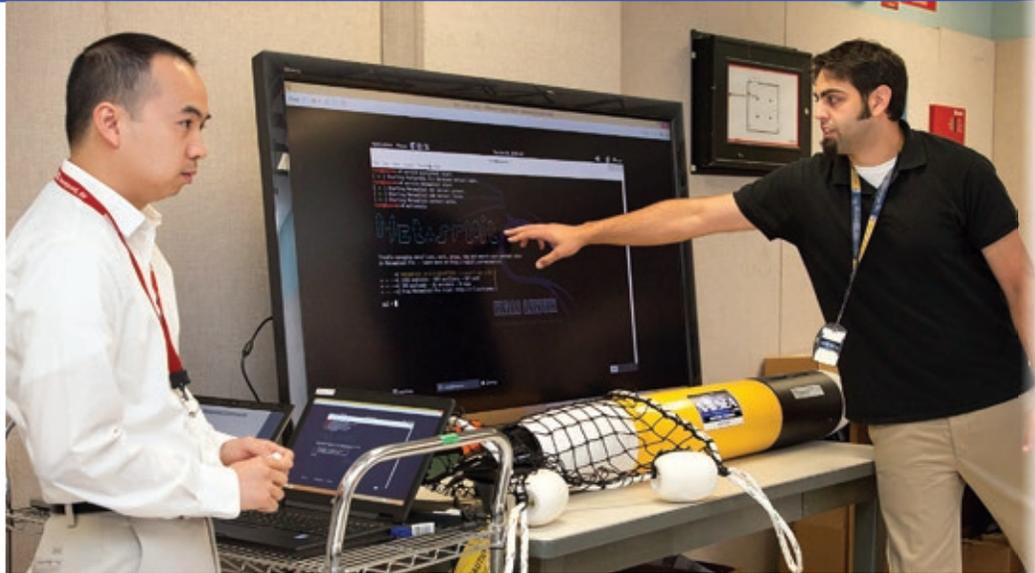
"Both ideas are very innovative," said Technical Director Mary Wohlgenuth, SES. "With REMORRAS, we thought it was closer to engineering and it should be carried forward as a collaboration with other warfare centers and industry partners. That's something we're going to do. This can benefit the shipyards immensely. It's something we can put in place almost immediately."

"This Hackathon is a great idea that Newport started and imitation is the sincerest form of flattery — we have a lot of people interested in what we're doing," said Donald McCormack, Executive Director, Naval Surface and Undersea Warfare Centers. "I watched the videos of all the teams' presentations and shared them with Admiral Hilarides. We need to take these ideas to the shipyards because they need help with innovation. If they are having problems getting ships out, we can help them."

First Cyber Challenge Scored a Hit

Hacking in the sense of Division Newport's Hackathons refers to the activities and events lasting several days in which a large number of people meet to collaborate and innovate. The more traditional definition of hacking is secretly gaining access to a computer system in order to get information or cause damage.

Division Newport scientists and engineers competed in the command's first Cyber Challenge in which they hacked into a UUV in the RIC.



Due to the high level interest, organizers had enough participants for eight teams and four days of competition. All teams received the same challenge, so secrecy involving the challenge details was paramount.

Conceived by Deputy Technical Director Donald Aker, the challenge was to ethically hack into a UUV for what's known as "Red Team Hacking" or "Penetration Hacking."

"Cybersecurity is embedded into all the products we provide to the fleet. With our unmanned vehicles, we have to try to figure out how to protect them from foreign adversaries," said Aker.

Prior to the event, participants were trained on how to use common hacking tools as well as attack methodology techniques. The challenge included a list of objectives to complete, each with a different point value. Each team had access to a UUV as well as laptops with the hacking tools loaded. Team members had 20 hours of independent time before the competition to perform any background research, prepare an attack methodology presentation, and work together as a team to learn the hacking tools.



This effort, facilitated by Code 25 and Code 85, included participants from every department at Division Newport, one team member from Division Keyport, and one team from Naval Surface Warfare Center (NSWC) Division Philadelphia.

Slack Hack Capitalized on Down Time

Division Newport's Slack Hack was modeled after "Google Time" where Google employees spend 20 percent of their time working on any project as long as they account for their time. The Slack Hack allowed Division Newport employees to work on innovative initiatives in their spare time, whether that meant a lunch break, the drive home, coffee breaks, etc.

Signing up for the inaugural Slack Hack were 20 participants that included a diverse mix of generations, departments, and expertise. After participants were briefed on a classified, real-world operational problem, they self-formed teams and began to brainstorm and research ideas. Three of the four teams took an approach that involved area clearing while another team took a weaponized approach.

After five weeks of hacking, the teams had five minutes to present their ideas followed by two minutes of Q&A with the judges. The criteria that the judges used were: operational impact, innovation, business model, and presentation/teamwork. The teams were asked to find solutions that could be prototyped in five years or less. The team known as "Brilliant Bubbles" was named the winner.

Slack Hack organizers and mentors were on hand to support the teams as they made their final pitches to a panel of high-ranking judges that included NUWC Commander Rear Adm. Moises DelToro III; Commanding Officer Captain Howard Goldman; Technical Director Mary Wohlgemuth, SES; Marie Bussiere; and Dr. Vittorio Ricci.

According to Chief Technology Officer Dr. Vittorio Ricci, "Innovation is all about making connections, finding things, and quickly sharing relevant knowledge, experience, and expertise among the working community."

"One benefit of the Slack Hack is that it takes the same general process of a traditional hackathon and stretches it over five weeks. There's more time to do a deep dive but there's also more time to meander and procrastinate," said one of the event organizers. "The great thing about these hacking events is that we're bringing in people from different departments and cross-pollinating mission ideas. It's a great way to try to move NUWC toward game-changing ideas."



ANTX Highlighted Successful Testing of Undersea Constellation Technology

In August, the inaugural Annual Naval Technology Exercise (ANTX) at the Narragansett Bay Shallow Water Test Facility brought together scientists and engineers from Division Newport, SPAWAR Systems Center Pacific (SSC Pacific), and NSWC Carderock for a successful demonstration of Undersea Constellation technology. A UUV docking station built by Division Newport, optical and acoustic communications and a user interface developed by SSC Pacific, and the battery/charging source developed by NSWC Carderock was successfully integrated and tested in the week preceding ANTX. The team collaborated with the goal of transferring power to the Mid-sized Autonomous Reconfigurable Vehicle (MARV) and uploading data from the vehicle to the user interface while docked. Visitors to Division Newport saw technology presentations, a video of the successful testing including underwater footage, as well as the UUV and docking station on display.



SSC Pacific: Acoustic and Optical Communications, Command and Control

SSC Pacific developed technologies related to acoustic and optical data transfer and the multi-vehicle/mission command and control (C2). Specifically, a high-data-rate optical communications technology, low signal-to-noise ratio (SNR) acoustic communications technology, and a prototype C2 network supporting data forwarding, based on the Multi-robot Operator Control Unit (MOCU). MOCU served as a prototype centralized data backbone and commonly accessible “blackboard,” developed and integrated with the MARV and the power transfer systems.

The primary objectives of the MOCU C2 team were to design and implement a distributed and scalable C2 infrastructure for underwater docking stations. As part of this development, the team focused on the graphical user interface and incorporating cloud technologies. In addition to displaying transmitted data from optical and acoustic communications, MOCU can also send commands to the MARV.

NSWC Carderock: Undersea Wireless Energy Transfer

In FY12, NSWC Carderock began an investigation of underwater wireless energy transfer (UnWET). Modeling and simulation, prototype development, and experimentation led to the development of a viable UnWET system in FY15. Scientists used magnetic resonance rather than mechanical coupling, which enables offset and slight misalignment — similar to a cell phone charging pad. This technology can be used on different types of vehicles.

During ANTX testing, once MARV docked, acoustic communications was disabled and an optical communications link was established to report battery status to the control computer and the MARV C2 system. Once verified, wireless power transfer was activated and battery status was monitored and reported via optical communications. The system then charged the battery. Upon completion of charging, the optical system was then used to download a digital file from the MARV simulating an offload of mission data.



Division Newport: Docking Station, UUV, and Testing Support

Engineers in Division Newport’s Platform and Payload Integration Department (Code 40) designed and manufactured a vehicle-agnostic dock for use with the MARV and other UUVs. Ultimately, they want as many types of vehicles to be able to dock as possible. Their first step toward this goal was integrating an alignment feature. The team also incorporated an adjustable tray for the battery coil as well as adjustable joining plates so the UnWET team could make adjustments on the fly. Working with a small budget, the team used 3D printed parts and commercial off-the-shelf parts and no custom-machined components.

In addition to the docking station and the UUVs being tested, Code 85’s ANTX test director coordinated all logistics, testing, and demonstrations among the three centers.

The Engineering and Diving Support Unit provided the in-water rigging of the dock as well as extensive underwater GoPro video of the MARV docking, powering on, and communicating with the pier-side team.

Division Newport leadership envisions ANTX as an annual event to demonstrate the future of Navy technology in action. ANTX provides a lower-risk environment where scientists and engineers can evaluate their technological innovations at the research and development level before their technology has to become militarized and interface at the operational level of the Navy.



Port Security Collaboration with Australia

In September, a team of engineers from the Ranges, Engineering, & Analysis Department (Code 70) joined forces with the Defence Science and Technology Group (DSTG) from Australia to demonstrate the various components that comprise the Waterside Rapid Deployment Security System (WRDSS).

The system combines DSTG's surface sensors and effectors including the Black Kite quadcopter — an aerial unmanned vehicle — with Division Newport's underwater sensors and effectors and the new Crossfire command and control system. The demonstration showed the system's ability to detect and deter threats such as UUVs, small boats, swimmers, and divers. The system has applications at Navy ports and other waterside critical infrastructure locations.



WRDSS team celebrated successful demonstration

The demonstration was a year in the making as the project developed out of the Navy International Projects Office and The Technical Cooperation Panel (TTCP), an international organization that collaborates in defense scientific and technical information exchange and shared research activities for Australia, Canada, New Zealand, the United Kingdom, and the United States.

Black Kite

The Black Kite quadcopter was funded through the TTCP and developed by DSTG along with Royal Melbourne Institute of Technology (RMIT) University. Black Kite will increase response capability by reducing classification time, thereby improving the overall operational effectiveness in a time- and distance-critical situation, such as port protection against asymmetric threats. For the WRDSS demonstration, Black Kite was used for verification and response, camera capability, spotlight, and audible and tone messages.

Crossfire

The command and control software and interface, known as Crossfire, was developed completely in-house and is 100% government owned. This highly automated, detect-to-engage system requires no sonar or radar expertise to operate, an important feature for inexperienced operators. Crossfire integrates sonar, radar, cameras, response assets, and effectors in one unified interface.

The Demonstration

To support the concept of operations, scenarios included various threats in a restricted area of water with WRDSS determining intent and managing the escalation of force. The Engineering and Diving Support Unit acted as potential threats to waterside security — swimmers, open-circuit divers, closed-circuit divers as well as operators of jet skis and small boats. Once potential threats were identified on Crossfire with the use of the various sensors, Black Kite was deployed and its non-lethal response was demonstrated via loudhailer and sirens.

The U.S. Coast Guard has expressed interest in using certain aspects of WRDSS for their Integrated Anti-swimmer System.

NAVSEA Warfare Centers hosted an event for the Defense Science Board at Division Newport in May.



Defense Science Board hosted industry partners



Collaboration under Defense Science Days tent

Community of Practice Established Large-Scale Energy Reduction Efforts

Division Newport took the lead on a vast, collaborative effort to reduce energy usage, reduce costs, reduce the Navy's dependence on fossil fuels, and increase its use of alternative energy sources. The NAVSEA Warfare Center Facilities Community of Practice (COP) was formed in 2003 to allow the thoughtful, informed, organized collaboration of Navy facilities in an effort to share ideas to reduce energy consumption. In the 12 years since its inception, this "dream team" of scientists, engineers, decision-makers, and environmental experts has been putting ideas into practice and sharing lessons learned related to the processes, products, innovation, and communication that will successfully achieve the targeted reductions in the Navy's energy consumption.



Installing energy-saving technology

Monthly meetings allow for the organized presentation of ideas with follow-up collaboration by way of email exchange and taskers. The NAVSEA Warfare Center Facilities COP's ideas, leadership, and expertise resulted in combined energy reductions and significant strides toward meeting the aggressive energy reduction goals set forth by the Secretary of Navy.

With Division Newport taking the helm, the NAVSEA Warfare Center Facilities COP is committed to implementing an energy program that exceeds the goals established by the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, and Executive Orders 13423 and 13514. It is only through the serious commitment of the NAVSEA Warfare Center Facilities COP that these goals can be achieved and the Navy can hope to meet the energy challenge.

In addition to Division Newport's subject matter experts, the COP includes engineers and scientists from the following commands and detachments: Atlantic Undersea Testing and Evaluation Center, NSWC Carderock-Bayview, NSWC Carderock-Dania, NSWC Carderock-Memphis, NSWC Carderock-Philadelphia, NSWC Carderock-West Bethesda, NSWC Corona, NSWC Crane, NSWC Dahlgren, NSWC Indian Head Explosive Ordnance Disposal Technical Division, NUWC Keyport, NSWC Panama City, and NSWC Port Hueneme.

Division Newport is ideally suited for a lead role in the NAVSEA Warfare Center Facilities COP as it is the Navy's principal laboratory for undersea and antisubmarine warfare with over 1.9 million square feet of laboratory and technical office occupancy. It is a multi-site research, development, test and evaluation laboratory with a comprehensive and successful energy reduction plan carried out by an award-winning facilities and environmental staff.

Division Newport shared the details of its Integrated Energy Project, which uses an innovative strategy that employs diverse best practices in a phased and coordinated method based on DoD's spiral development concept. Also, as a result of the execution of two separate Energy Capital Improvement Projects and the award of a Utilities Energy Service Contract in FY13, Division Newport yielded \$13 million in energy savings. Through the NAVSEA Warfare Center Facilities COP, Division Newport's ideas were shared and replicated.

As a result of this collaboration, the commands made a variety of changes and upgrades and achieved significant energy savings. Data showed that energy usage across all facilities is trending downward.



Energy-efficient vehicles make deliveries for Division Newport



Small changes make a big difference in energy savings

Technology Partnerships Office Uncovered New Opportunities

The Technology Partnerships Office (TPO) at Division Newport supports all three of the FY15 Annual Overview's themes of innovation, collaboration, and workforce development. The TPO establishes strategic partnerships in science and technology with other government agencies, non-profit corporations, private industry, and academia to foster development of innovative solutions to undersea warfare challenges. This collaboration has helped expand Division Newport's technological capabilities while developing a more agile workforce.



Using Division Newport-developed technology

Some of the TPO's biggest successes in FY15 included:

- Developing commercialization opportunities to impact the local and regional economy. Newport TechWorks and Commerce RI STEAM Engine initiatives will assist Division Newport in reaching out to new partners. TPO has also created relationships with non-United States public-private partnerships, such as SmartBay and SmartOcean in the Republic of Ireland, that support development and sharing of best practices in technology-based economic development. TPO will seek further engagement with these and similar organizations to advance Division Newport's technology transfer mission.
- Continuing its partnership with the University of Rhode Island through its senior capstone projects. This Education Partnership Agreement (EPA) provided mentors for senior projects and involved Division Newport in joint research projects in corrosion, circuit design, signal processing, and undersea vehicles.
- Under an EPA with Brown University, Division Newport explored common areas of research such as computational fluid dynamics and modeling and simulation.
- A patent license agreement was put in place for a Division Newport-developed remote blood pulse monitor for use on people as well as on animals.
- A Cooperative Research and Development Agreement (CRADA) was established with Woonsocket, RI-company ALFA International Inc. for NUWC XP-1, a high-performance polyurethane developed for protection of marine acoustic and optical equipment first developed in the 1990s by one of Division Newport's scientists.



Working together for Fleet solutions with Rear Admiral Girrier and Admiral Swift



Sea Mentoring Project Sent Scientists Underway

A revitalized project is giving scientists and engineers a rare glimpse into sailors' lives. Administrated out of the Sensors and SONAR Systems Department (Code 15). The Sea Mentoring project provides scientists and engineers with the fundamental aspects of submarine or surface ship undersea warfare combat systems. Scientists and engineers have the opportunity to go to sea with a mentor and experience life at sea to further their understanding of how Division Newport products are used by the warfighter.

The Sea Mentoring project is an adaptation of the former NUWC "Scientist to Sea" project; however, this project focuses less on classroom and lab training and more on the "at-sea" experience between a mentor and one or two mentees. The objective is to reinforce current on-the-job training using fielded tactical systems with mentors who are subject matter experts. This could mean dockside training or an at-sea experience. The Sea Mentoring project is funded through Division Newport's investment program using Section 219 workforce development. Section 219 of the Duncan Hunter National Defense Authorization Act provides a viable avenue of funding for warfare centers to invest in innovative basic and applied research, initiatives that support the transition of technologies into operational use, and development activities that improve the capacity to recruit and retain personnel with needed science and engineering experience.

According to Ann Turley, project principal, this project is important for a number of reasons. "It's important to get as many of our employees to empathize and understand the sailor's dilemma. That's the primary reason. It's also an opportunity for succession training and planning. Employee development offers supervisors an opportunity to include this in an employee's on-the-job training. Young professionals can shadow other people. They can get a test plan and record data."

"This year I communicated with deputy department heads, division heads, supervisors, and project managers across Division Newport to make them aware of the Sea Mentoring project," said Turley. "They can apply for funding by identifying an event (at-sea or dockside), the mentor, and the mentee. This way, the mentees are training people they work with and, in addition to the at-sea experience, the mentee gets on-the-job training."

NUWC University Offered Division Newport-Specific Courses

In FY15, Division Newport revitalized NUWC University, a training program where personnel teach technical skills to both new and seasoned professionals. Program courses are open to all government employees and it is up to the departments to determine if the training is relevant for the employee.

Course topics include Torpedoes 101, Submarines 101, Sonar Fundamentals, Introduction to the Navy Working Capital Fund, Principal Investigator Training, Diffusion of Innovation, and Submarine Combat Systems — each of these courses is taught by personnel in the various codes. In FY16, NUWC University will also offer college-type courses taught over several weeks. These in-depth classes will include homework assignments.

One challenge Human Resources (HR) faced was getting the word out about the courses. HR relied on All Hands announcements, Digital Signage (the command's TV monitors), and Command Updates on the NewPortal, but word of mouth was the best way to generate interest. In fact, feedback is an important component of NUWC University. The command uses the students' feedback forms to shape future classes and to help instructors tailor their content.

Knowledge management is critical to transfer knowledge to the next generation of workers.

Course topics included Torpedoes 101, Sonar Fundamentals, Intro to the Navy Working Capital Fund, Principal Investigator Training, Diffusion of Innovation, and Submarine Combat Systems.



Submarines 101 Gave History, Current State of Sub Force

Submarines 101, taught by Commander Pete Rodgers, is a comprehensive course educating employees on the history of submarines and the submarine force. As part of NUWC University, the course is one of many designed to augment training at Division Newport.

What was originally designed to be a four-hour course soon turned into eight hours of history, anecdotes, and Q&A. The highly engaged audience had plenty of questions for Rodgers as he detailed the submariner's experience throughout the last century. Wearing his navy blue work coveralls, Rodgers demonstrated his encyclopedic knowledge of submarine and military history gained from more than 30 years of reading history books as well as his experiences on the USS Providence, the USS Boise, and the USS Nevada.

This was the first time he taught this course at Division Newport but Rodgers has prior teaching experience at a previous post in Washington, DC.

Rodgers created an inclusive learning environment where the audience felt comfortable asking questions. "I was hoping there would be a lot of questions," said Rodgers. "It's an enjoyable topic that I'm passionate about. I've used NUWC products my whole career. I know they're good and they make submariners more effective at their jobs." Rodgers hopes to teach the course again and recommends the NUWC University program to both new and seasoned professionals at Division Newport.

"Don't just take that diploma and think you're done. There's new stuff coming out all the time," said Rodgers. "You have to be a lifelong student especially because of the technical aspect of what we do. Things change so fast and NUWC University can help with that."

"It's an enjoyable topic that I'm passionate about. I've used NUWC products my whole career. I know they're good and they make submariners more effective at their jobs."

- Commander Pete Rodgers





Poster sessions engaged colleagues



Introductions at the NPN Brown Bag

New Professionals Shared Research and Results at Informative Poster Session

In August, the Strategic Planning Office (Code 00X) hosted its annual New Professionals Poster Session featuring the research and work of 19 Division Newport employees. The posters reflected the results of the Division’s FY15 investment in the New Professional Development Program, an opportunity for new graduates hired within the previous three to four years to compete for internal investment in topic areas of interest to the Division. While some projects were new concepts, others were a continuation of previous research that received follow-on investment.

According to the Internal Investment Program Manager, “NPDPs are a valuable investment that the Division makes in our junior professionals as it provides them with the experience conducting their own research project in an area that they are passionate about. In addition, this poster session provides them the chance to present their results to Division leadership. The experience and exposure they gain provides benefits to both them and the Division.”

Professional Support Network Engaged and Connected the Workforce

In FY15, Division Newport brought on board 337 new employees, including interns and recent college graduates. Joining a command as large and as expansive as Division Newport can be a daunting experience — learning the departments and where all the buildings are located can be a challenge for even a seasoned professional. In an effort to alleviate that anxiety, a group of employees formed the New Professional Network (NPN), an inclusive, informal group with the goal of helping new hires assimilate to Division Newport.

NPN began hosting Brown Bag luncheons in July that gave new professionals an opportunity to meet colleagues and hear from guest speakers on topics such as command organization and career planning.



New professionals took advantage of opportunity to share work



NPN luncheons brought employees together

Invention Enhancement Event Brought Inventors Closer to Patents

Division Newport held an Invention Enhancement Event to increase the quality and quantity of inventions from Division Newport.

With more than 2,000 engineers and scientists at Division Newport working on fleet solutions, there is little time to prepare detailed invention disclosures that can assist the patent attorneys of the Division in producing legally and technically sufficient patent applications. In order to increase the number of innovative ideas that are reported, these events can inform potential inventors of the resources available to assist them with disclosure development, which can be a challenging process.



Working with potential inventors

The event was meant to help people with time constraints get started with their possibly patentable ideas and come up with well-written and technically sufficient disclosures of invention. Improving the quality of invention disclosures will also reduce rework and ease the process.

For the first Invention Enhancement Event, four scientists and engineers presented their invention ideas to a panel of subject matter experts/technologists who provided constructive criticism, thought-provoking questions, and helpful suggestions to help the inventions evolve from an idea to a working and enabled concept. Each presenter had a half hour for their presentations and questions from the experts. When the event was over, the presenters received copies of their feedback as well as information on how to move forward with their ideas.

Torpedoes 101 Course Offered One-of-a-Kind Education

Torpedoes 101 was presented in April to a class of 25 personnel across Division Newport. This course introduced new professionals and journeymen to the basics of torpedo hardware, software, tactics, employment, testing, and analysis.

Developed in 2013 using Section 219 funding, the original Torpedoes 101 course offered a five-day curriculum, tailored to introduce personnel to the basics of torpedo hardware and employment. This year, based on feedback from students, topics were combined and the course was streamlined to four days. While the majority of the course is PowerPoint, it is not static text. The course employs various media – slides, movies, run analysis playback – to keep students engaged and tours were moved to the end of each day, rather than just the final day of class. Tours included the heavyweight (HWT) and lightweight (LWT) automated test equipment labs, the Weapons Analysis Facility, the Propulsion Test Facility, and combat control labs.

There are also annual updates to the training based on changes in the torpedo, modifications to software and hardware, and the normal lineage of a torpedo.

The Systems Assessment Branch (Code 8552) is the core learning ground for torpedoes. A solid career path for a new analyst would be to take the Torpedoes 101 course, a detailed analysis course, and then participate in in-water testing and follow-on data analysis. All new analysts in Code 8552 must take the Torpedoes 101 course: system assessment analysts, analysis tool developers, and database infrastructure personnel. The course is necessary in order to be effective within the branch.

The class is capped at 25 people in order for the tours to be effective. Classes can be attended by personnel from other departments provided there is supervisory approval. The most recent course was attended by students from across the center with a waiting list for future courses.



Torpedoes 101 instructors

COMMAND EVENTS



Testing UUVs
at the Acoustic Tank Facility



STEM Events



Diversity Summit
Speaker on Millennials



Virtual Worlds Demo



Women's Leadership Panel: Karen Burrows, SES;
Deborah Ripley; Valerie Winschel; Anne Davis, SES



Deputy Technical Director
Briefs Workforce



Records Management Briefing
in Collaboration Center



Sea Mentor Participants
Learning the Ropes



Participants in New Professional
Investment Program Poster Session



Getting a Warfighter's
Perspective



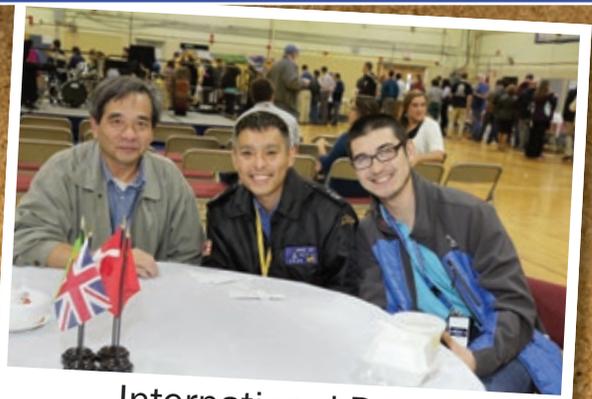
Hackathon Collaboration



2014 Holiday Party



Volunteer Chefs



International Day Celebrates Diversity



Employee Appreciation Day



RIC Open House



Rear Admiral Norton Speaks at Brown Bag



Cyber Challenge Team



Annual Arbor Day
Memorial Tree Planting



Math Club



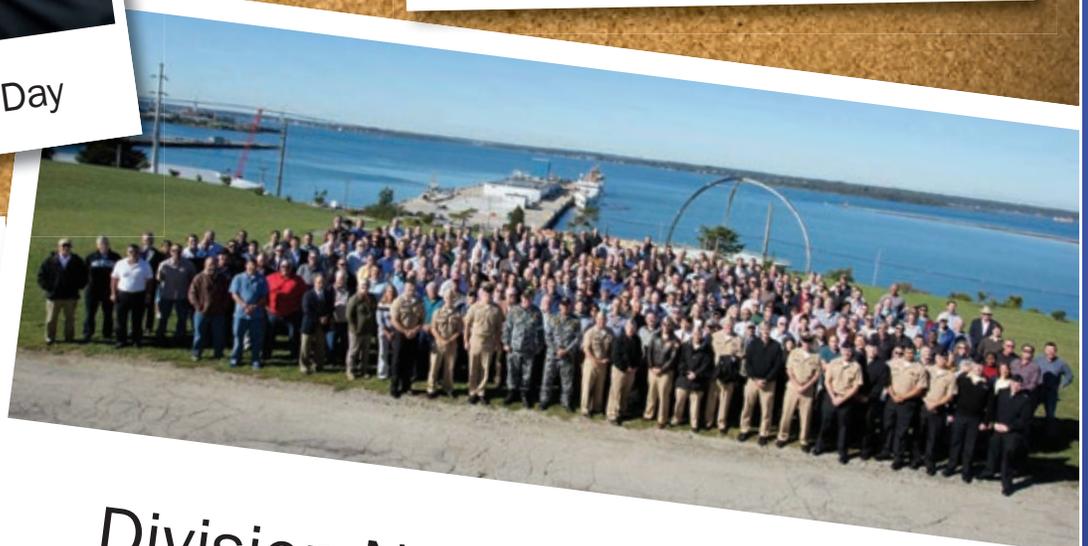
Bring a Child to Work Day



Senior Technologist
Meeting



HR Staff
at Career Fair



Division Newport's Veterans

Lectures Spotlighted Latest Research from NUWC, Industry, Academia



Division Newport continued to offer opportunities for education and collaboration with regular lectures from a variety of sources inside and outside of NUWC. The series included work from researchers who were recipients of Section 219 funding, Independent Laboratory Independent Research or Independent Applied Research funding, or from scientists and engineers in industry or academia as part of the Visiting Scholar or Summer Faculty lecture series. Lecture topics included a wide range of fields — from turbulent boundary layers to piezoelectric crystals. Most lectures were held in the Integrated Display Center and in FY15, the Chief Technology Office (CTO) video recorded many of the lectures and posted them to the CTO site.

Three words — invest, influence, and innovate — define the CTO’s focus. An expansive list of programs and actions overseen by the CTO in each of these areas provide support for NUWC’s scientists today while helping to develop the workforce of the future.

Scientists and engineers shared research in well-attended lecture series

Chief Technology Office Raised the “Stature of Science”

Division Newport’s CTO serves as the leading voice for S&T to external executive decision makers from the military, government, industry, and members of academia. For the Navy After Next, NUWC is the steward for 19 technical capabilities including — sensors and SONAR, launchers, submarine communications, USW combat systems, submarine imaging and electronic warfare, USW weapons, UUVs, undersea platform defense, undersea distributed networked systems, and USW ranges.

In FY15, Dr. Vittorio Ricci took over as Chief Technology Officer where he serves as a member of NUWC’s senior leadership team, responsible for technology matters that shape overall strategy. Ricci maintains and communicates the technical vision that complements the organization’s corporate vision and sets the tone and direction for NUWC’s near- and far-term technology base. In addition, he leads the NUWC S&T Council, ensuring a healthy S&T posture aligned to the organization’s strategic direction. CTO is focused on the importance of S&T at the warfare center level with the goal of “Raising the Stature of Science.” The CTO has established a vision for S&T that is relevant to Navy needs, associated with core technical capabilities, tied to personnel development plans and training, and supported by state-of-the-art science and engineering research and development tools.



Dr. Ricci served as Slack Hack judge

Collaborations with academic institutions and companies play a critical role in fostering a healthy research climate at Division Newport. Recent exchanges with local universities have paved the way for cooperative research projects. CTO investments are designed to shape the workforce to meet future challenges.

Basic and Applied Research Programs Highlighted at Annual Review

Whales, bats, and slugs...What do they have in common and why are they of interest to scientists at Division Newport? They are all part of the research being conducted by the Division through the use of In-house Laboratory Independent Research (ILIR), Independent Applied Research (IAR), and Section 219 programs.



Each year, this research is showcased via presentations, poster sessions, and additional opportunities to discuss ongoing projects with attendees from government, academia, and industry. The Chief Technology Office highlighted research program objectives:

- Provide discretionary financial means to support basic and applied research important or promising in the execution of the participating laboratories assigned missions
- Develop and maintain a cadre of active research scientists who can distill and extend results from worldwide research and apply results to problems of naval interest
- Promote hiring and development of new scientists
- Encourage and support cooperation with universities, private industry, and other Navy and DoD laboratories.

Basic research (6.1) is a systematic study directed toward greater knowledge or understanding of fundamental aspects of phenomena and observable facts without specific applications in mind. Applied research (6.2) is a systematic study to understand the means to meet a recognized and specific need and focus on new technologies that have substantial promise or potential for transition to direct funding within two years, preferably sooner.

Improving submarine superiority is the result of the Division Newport's investments in S&T projects with technical successes realized in programs such as signal processing, transduction, and autonomy. Thanks to a large pool of talented scientists and engineers, Division Newport maintained its healthy portfolio of basic and applied research in FY15.

Industrial Liaison Program Offered Significant Benefits to Division Newport

In order to provide its workforce with the best possible tools to do their job, Division Newport contracted for access to a wide variety of expert academic technical advice. One of those tools is membership in Massachusetts Institute of Technology's (MIT) Industrial Liaison Program (ILP).



According to MIT, the ILP lets its members:

- Monitor emerging innovations in science and technology and explore their potential impacts
- Explore new or best management practices in industry
- Discuss recruiting needs with faculty and meet students
- Seek faculty help to solve specific problems through consulting or research collaboration
- Discuss faculty research projects of interest to Division Newport.



MIT provided technical and organizational support to Division Newport's first Hackathon. As part of the ILP, Division Newport also hosts an MIT lecture series where faculty members give presentations either through videoconferencing or in person. Topics have included "Technologies for the 21st century: Quantum information processing and quantum sensing," "Creating High Velocity Organizations," and "Adaptation in Cyber-Physical Systems."

Working Capital Fund News

As part of the Navy Working Capital Fund (NWCF), Division Newport operates like a customer-driven private business. It must manage costs to provide the best value to its customers and remain fully accountable for the most efficient delivery of products and services. But, unlike a business, Division Newport is not motivated by profit but by staying cost-competitive and saving the Navy money.

Payroll Records Management Pilot Project

The Comptroller department, in collaboration with Division Newport's Records Management Office, conducted a pilot project to implement records management techniques and processes for the department's payroll records. The department successfully demonstrated how the records can be brought into compliance with Navy regulations while at the same time reducing volume and enhancing records organization. The payroll staff cleared more than 84 cubic feet of records, which either had lapsed in its informational value or were not records, reducing the room for error in the payroll records. Records management is a key component in achieving audit readiness and meeting the Financial Improvement and Audit Readiness mandate and the success of the pilot program was an important step for the Division's Records Management program.

Financial Improvement and Audit Readiness

The FY10 National Defense Authorization Act required DoD financial statements to be validated as ready for audit not later than September 30, 2017. Audit readiness was a major thrust of the Division for FY15 and the operational tempo in audit preparation is expected to increase in FY16. Audit readiness impacts most facets of the Division's operations such as asset management, transportation, etc. and supporting efforts such as records management. However, the majority of the effort involves the financial community.

To that end, processes, internal controls, and Corrective Action Plans were reviewed and implemented to meet requirements of the Financial Improvement and Audit Readiness (FIAR) mandate.

Financial audit readiness is critical because it improves the reliability and accuracy of data and decision-making information in operations; produces more effective, transparent business processes; ensures correct allocation of funds and makes better use of resources; and increases public trust and confidence in DoD's use of taxpayer dollars.

Material accountability falls in with the FIAR effort, which has a goal of improving the quality of information related to DoD assets that are critical to the success of its mission. Material ordering has changed over the years and with FIAR, Division Newport is working toward full accountability — from the ordering process to the disposal process.

Travel Improvements

In FY15, the costs of travel and attending conferences remained a focus of the DON and NAVSEA. Travel targets were set by NAVSEA and NUWC headquarters. In response, Division Newport continued to review and update processes to reduce both the amount of travel and the associated costs of each trip. With these measures, in FY15 Division Newport reduced travel costs by 36% from FY10 levels, representing a cost reduction of \$10.4 million in travel expenditures from the FY10 base year. This reduction exceeded Division Newport's goal to sustain a 30% reduction from FY10 levels and this was done without impacting direct support to the fleet and program sponsors.

In an effort to provide the best support to customers, the travel office partners with the other WCs and the NAVSEA Travel Office to share best practices; prepare for audit readiness; and work together to streamline, standardize, and improve processes across the WCs. This effort resulted in the NAVSEA Warfare Center Travel Team winning the Defense Travel Management Office (DTMO) Icon Award as part of the 2014 Excellence in Practice Awards Program and efforts continued in FY15.

Reducing travel costs was just one of many ways Division Newport maximized the value of each dollar of customer tasking executed by operating the most efficiently run organizations; maintaining a world-class, optimally sized workforce; and making cost-conscious investment and outsourcing decisions.



Award-winning Financial Management Team

Automated Funding Document Acceptance Process

Division Newport's Comptroller modernized the funding document acceptance process using SharePoint and InfoPath technology. The new process resulted in a seamless workflow, automatic email notifications, digital signature capability, funding document library, metrics, and a paperless process. The online process replaces a hard copy process, allowing all Division personnel involved to quickly update, review, and sign funding document acceptances. The Budget Office collaborated with the Code 25 business office to develop a tool that would be mutually beneficial to the Comptroller and the product lines. Using this collaborative approach led to a very successful rollout to all departments at Division Newport in FY15. In FY16, all funding documents will be accepted using this tool giving the Comptroller great insight into funding being accepted. The team challenged existing requirements and developed a simple, very low cost solution to a multifaceted process that has resulted in time savings for all involved in the process. In FY16, the team plans to introduce the concept to other warfare centers as a solution to funding document acceptance.

Net Operating Results

One of the major financial metrics Division Newport strives to meet every year is Net Operating Results (NOR), which is the difference between the revenue brought in and the expenses incurred. One of the underlying principles of the NWCF is total cost visibility and full recovery of all costs, including labor, materials, infrastructure, and support. In FY15, Division Newport exceeded budgeted NOR by \$0.4 million. Exceeding its annual NOR budget reduces the stabilized rates that Division Newport charges, which in turn results in customer savings.

NAVSEA Warfare Center Enterprise Data Warehouse Enhancements

Comptroller personnel contributed toward the development of a Purchase Request (PR) workflow model in the Enterprise Data Warehouse (EDW). The PR workflow model provides metrics and visibility for the PR workflow process including data on volume and types of PRs, rejection rates, queue wait times, throughput statistics, approver performance, and trend analysis. Comptroller staff also contributed to various other enhancements of existing EDW reports. These EDW enhancements provided analytical tools for examining and improving the warfare center's business processes and performance.

Professional Development

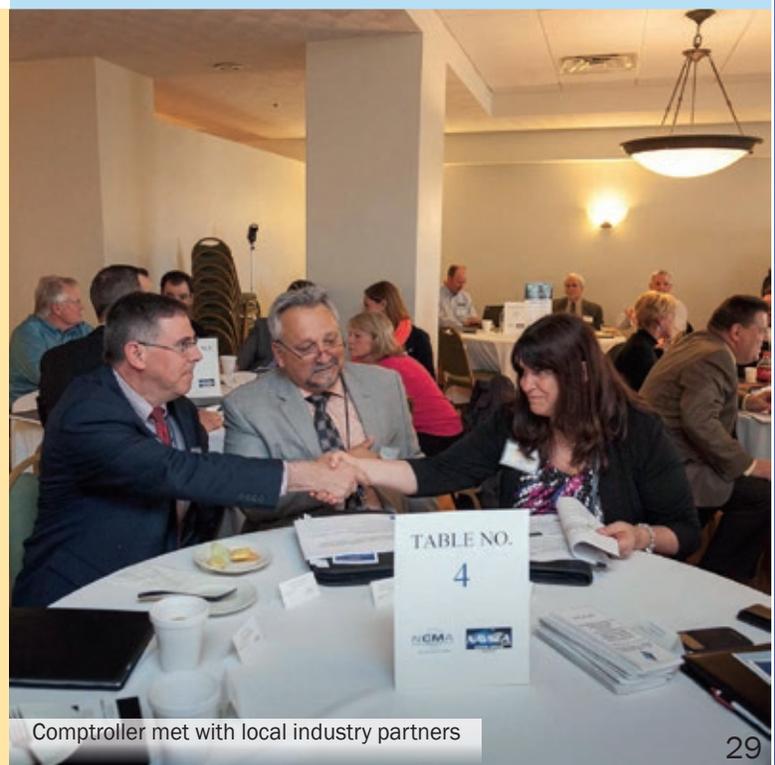
Division Newport remained heavily invested in the professional development of the financial community. In recent years a majority of the financial workforce has voluntarily achieved Certified Defense Financial Manager accreditation through the American Society of Military Comptrollers. In FY15 the financial workforce began training to achieve DoD Financial Management Certification with the goal of having 100% of the workforce certified by the end of FY16.

Reimbursable Orders and Carryover

Division Newport receives funding on reimbursable and direct cite orders. Reimbursable orders are used to fund both in-house and contractor support efforts while direct cite orders can only be used to fund contracts. In FY15, Division Newport received \$674 million in reimbursable orders. A second important measure is the ability to execute orders received. Failure to meet established execution and carryover benchmarks can result in cuts to customers' budgets. Once again in FY15, the Division was successful in meeting carryover target, finishing \$3.5 million below target at \$266.5 million.

Navy Working Capital Fund 101 Course

To further educate the workforce and raise awareness of the NWCF process, the Comptroller developed a "NWCF 101" course for the NUWC University. The four-hour course was well attended by a broad spectrum of the Division's engineers, scientists, managers, and financial staff. Classes will continue into FY16 after a significant waiting list resulted from the first class.



Comptroller met with local industry partners



Contracts personnel participated in team building, morale boosting events

High Marks Earned on Inspection

The NAVSEA Procurement Surveillance Program (PSP) inspection team completed an on-site assessment of the Contracts Department (Code 02) in August. The inspection rated three principal assessment factors: organizational leadership, management controls and internal controls, and regulatory compliance. Code 02 had to demonstrate a systematic approach to adhering to procurement law, regulation, and policy, one that is documented with objective evidence. A primary means of assessing this compliance is through review of official contract file contents. Code 02 received a highly satisfactory rating – the maximum level of performance possible and Division Newport was only the third organization of the 20 assessed organizations to receive a highly satisfactory rating. The PSP also identified a number of best practices at Division Newport that should be considered for employment across the enterprise.

Advocates Made a Difference

The Contracts Department continued to leverage value of technical department acquisition advocates (TDAAs) in developing strong customer relationships. TDAAs have been an integral part of Lean events, periodic contract reviews with leadership, and year-end contract planning. Code 02 also implemented critical milestone agreements with the product line codes to better plan major procurements.

Code 02 continued to leverage value of technical department acquisition advocates (TDAAs) in developing strong customer relationships.



Contracts professional improved the process

Successful Lean Event Conducted

In FY15, Code 02 provided key expertise to a Cross Warfare Center Seaport-E contracts Lean event and process improvement and led two improvement teams. Code 02 documented the future processes and provided training to personnel from all warfare center divisions.

Contracts Personnel Increased Competition

The contracts department held numerous events to increase competition and small business participation including a potential supplier summit in October as well as Virginia Payload Tube Industry Day, Small Business Product Vendor Industry Day, Service Disabled Veteran Owned Small Business/Veteran Owned Small Business Conference, Code 10 Inventory Management/Warehouse Management Pre-Solicitation Conference, and the SeaPort-e Council Meeting.

Courses Provided Essential NUWC-Specific Training

Code 02 conducted 25 training sessions on topics including SUBSAFE, environmental, intellectual property, cost/price analysis, and General Services Administration reverse auction. The training was offered to Code 02 personnel and key personnel from the technical departments. The department also implemented a Friday “Contracts Trivia E-mail” to assess employee understanding of information contained in the previous month’s contracting newsletter. Code 02 dramatically increased the number of training opportunities based on employee requests and department need.

Bar Code Scanner Innovated Tracking, Organization

In FY15, Code 02 employed some tried and true innovation and began transitioning to the use of electronic bar coding for contract files to improve efficiency and accountability. The department completed bar coding of more than 1,700 contract files.



Code 02 innovated with use of bar code scanner

Contests and Theme Days Boosted Morale

In an effort to increase workforce camaraderie, Code 02 raised its game as far as creating a relaxed atmosphere among the contract administrators and negotiators. In FY15 the department engaged in some casual fashion Fridays to maintain a more relaxed working environment. Employees and managers participated in Denim Day, Ugly Shirt Day, Decade Day, and the perennial favorite Halloween costume contest.

According to Code 02’s technical liaison, “September is a tough month for the department with the fiscal year-end crunch. Normally we would be all stressed out but people were laughing when they saw some of these outfits.”

Code 02 has also made an effort to be more involved in activities beyond the normal work day. Their new location allowed them to

participate in Bring a Child to Work Day and their “Deal or No Deal” demonstration of contract negotiations was a big hit for both the kids and the employees who put it together. The department hosted weekly lunchtime Uno competitions, monthly social hours after work, a pumpkin decorating contest, and several Combined Federal Campaign fundraisers.

The department also sponsored a very successful cubicle-decorating contest during the holiday season and implemented an informal employee appreciation practice of providing blank “well done” and “thank you” cards for employees to recognize their co-workers.

Morale underwent a positive shift with the most recent Defense Equal Opportunity Military Institute (DEOMI) Organizational Climate Survey for the department demonstrating positive changes in all 20 assessment factors. In 2015, the contracts department exceeded the Navy rating in 18 of 20 factors. The morale shift was attributed to the proactive efforts of department employees at all levels.



Deal or No Deal demonstration

New Career Development Site Introduced

In FY15, the Human Resources Division introduced its improved Career Path Planning Guide (CPPG), which divides careers at Division Newport into six different paths: scientist/technologist, engineering, program management, line management, business, and technician.

The site provides information for each path and what experience and skills are needed to advance to the next level. The site will also help employees determine gaps in their experience and point them to what they need to do depending on the path.

To help employees achieve their professional goals, Division Newport offers formal training, education, mentoring, rotational assignments, and special projects to provide the experience and knowledge necessary to do their jobs effectively and move ahead in their careers.



New professionals get briefed on new career site

Continuous Process Improvement Saved Money, Solved Problems

Division Newport's Continuous Process Improvement (CPI) events from FY15 were estimated to save more than \$16 million in total (over their three-year window of FY15, FY16, and FY17). Regular CPI Outbriefs provided Division Newport personnel with an opportunity to share their solutions and learn from each other. The following is just a sample of Division Newport's top CPI events for FY15:

- Code 10 developed and implemented a web-based system to track and document the support provided to its nine detachments. This level of oversight ensures that detachments are being provided the agreed-upon level of support from both their host and parent commands. As a result, Division Newport's checklist, which includes areas such as PII, safety, and EEO, was adopted by the Inspector General as a tool for inspecting other Warfare Centers.
- Engineers in the Sensors and SONAR Systems Department (Code 15) developed a filtration system that allows the re-use of ISOPAR, a petroleum product used to achieve towed array buoyancy requirements. Code 15 will turn a recurring cost of \$240K per year into a savings of \$192K per year. The Code 15 team hit the CPI trifecta with a reduction in cost, a reduction in the disposal of chemical waste, and a reduction in vulnerability to supply disruptions.
- Following a bid of \$222K to upgrade computer-based training for the Surface Warfare Officers School (SWOS), computer scientists in the USW Combat Systems Department (Code 25) found a better solution that accomplished the task for \$2,500 while providing comprehensive student tracking data. The cost avoidance of more than \$200K was re-invested into the program and Code 25 will continue to provide additional enhancements to SWOS computer-based training.
- The Ranges, Engineering, and Analysis Department (Code 70) avoided \$7.8 million in remediation costs to resolve an environmental compliance issue at its Undersea Warfare Shallow Water Training Range in Jacksonville, Fla. A CPI analysis of the layout, installation, and contract modifications resulted in a new plan that cost \$1.17 million. Code 70's plan not only cost less but reduced the number of nodes in the water, established new cable routes, and modified locations to meet all environmental regulations.
- To avoid significant costs and disruption in fleet service caused by a power outage in its Weapons Analysis Facility, the USW Weapons, Vehicles, and Defensive Systems Department (Code 85) invested in a power supply system to protect more than 400 workstations as well as multiple servers, simulators, and supercomputers. Over three years, the new system is expected to save \$1.5 million in repair and replacement costs as well as provide seamless fleet support.



CPI Outbriefs provided forum for idea sharing

Completed Successful CSI and Command-Wide Secret Inventory

Division Newport passed a Cyber Security Inspection conducted in March with an overall score of 79 (acceptable). The average technical score for Division Newport's three networks was an 83, which is a rating of excellent. Several areas actually had such a good score that the lead inspector commented that she had not seen that before in a technical area.

The Technical Information Library also successfully executed command-wide Secret Inventory using the Base Inventory Tracking System (BITS) tool. BITS is a centrally managed online inventory tool that tracks all classified administrative material. BITS ensures users can track all of their material using one tool. NSWC Carderock is replicating the way Division Newport does things.

CRIC Team Built New and Improved Web Site for S&T Community

In FY15, the Corporate Research and Information Center (CRIC) put the finishing touches on a dynamic, intuitive, and user-friendly web site for the Science and Technology (S&T) community.

The CRIC team built a web site that highlights its shift to digital resources, spotlights new arrivals of books and subscriptions, and promotes published works by Division Newport researchers.

This new web site has filled an S&T need by revamping its subscriptions and on-demand services to better assist researchers and can be accessed outside of NUWC.

Similar to the Naval Research Laboratory, Division Newport is a research, development, test, and evaluation center. To remain a leader in that area, the Command needs PhDs researching basic science and publishing their findings. The CRIC and its new web site can offer the S&T community publishing assistance by helping them through the peer-review process. Most importantly, the CRIC has a huge number of specifications and standards — their largest subscription service — and can get on-demand access to additional standards as needed.

FY16 plans include establishing an Executive Reading Club where Division Newport leaders can recommend books or articles that have helped them.



CRIC team continued improvements to library



Researchers built their unique herring pen

Biologists Provided Essential Data for Navy Study

Biologists from the Environmental Branch researched the effects of sonar on river herring as part of a U.S. Fleet Forces data gap study. Addressing these knowledge gaps is essential for the Navy to meet environmental requirements set by Federal law.

Most fish cannot hear sound at the frequencies used in Navy testing, but river herring most likely can and the Navy needs to understand the potential effects. River herring are considered a “species of concern,” which means there are concerns regarding status and threats to population and habitat. The Navy remains interested in addressing gaps in data for the potential effects of sonar on the particular family of fish known as Clupeids. River herring could become an endangered or threatened species in the near future. Any deleterious effects on them may affect an ecosystem as they are considered forage fish for a variety of mammals and other fish species and an important part of the food chain. The team began their tests on the herring last summer when they collected juvenile herring as they made their way out to sea. They also collected adult herring as they were returning up river to spawn.

The team observed the fish behavior as they were exposed to sound and then followed up with internal and external examinations looking for indications of injury. The goal of the study was to determine if and how the river herring are potentially affected by Navy sonar. The team’s findings addressed a data gap that supports environmental assessments for the Navy that are governed and required by Federal law.

Students Learned the Thought Behind the Process

In the summer, the staff from Division Newport’s award-winning Educational Outreach Program hosted 75 high school students as part of the Undersea Technology Apprentice Program (UTAP). The students formed teams to build a SeaPerch vehicle that they operated in a series of competitions.

Building the vehicle in a team environment involved numerous processes, job assignments, and iterations until the teams achieved their best final product. For this UTAP session, the Continuous Process Improvement team arrived to show the students how to improve their processes and their final products. The simulated process the students involved a catapult-like device and its ability to deliver accurate readings for their “customers.” Over the course of four days (and just one hour a day), the teams improved the way they worked together and ultimately improved the performance of their catapults and their SeaPerch vehicles by applying their newfound CPI skills.



Head of CPI Office demonstrated catapult



New professional at work in the Advanced Concepts in Electronic Systems lab

Submarine Bottom Sounder Functionality Restored

Sensors and SONAR Systems Department (Code 15) engineers restored critical submarine bottom-sounding functionality by providing technical assistance and repair parts for an essential power amplifier. The Code 15 team then assisted in dockside testing to verify operational performance.

Team Completed Successful End-to-End Testing for Large Vertical Array

Code 15, in collaboration with industry, academia, and NSWC Carderock, performed installation and end-to-end testing of the USS Maryland (SSBN 726) Large Vertical Array (LVA) at the Norfolk Naval Shipyard. The SSBN LVA installation posed several unique challenges that were successfully overcome.

Supporting the Submarine Fleet

The Advanced Rapid COTS Insertion (ARCI) program fielded several software updates across Technology Insertion (TI) 10 and TI12 platforms providing numerous system enhancements and improved reliability. Although these updates were generated and verified in-plant on limited TI10/12 hardware, system certifications were conducted on board the submarine in several locations including Groton, Kings Bay, and Pearl Harbor. Boats affected included 688/688is, SSGNs and VA Class Block I/II platforms. This was accomplished while conducting System Design Certification Testing of TI14 and conducting the planning and Initial Design Reviews for TI16.



Scientist participated in first Hackathon

Subject Matter Experts Shared Career Experiences

In an effort to transfer knowledge from the seasoned workforce to its new professionals, Code 15 hosted “Leadership Series” presentations. These talks provided personnel with the opportunity to meet leaders from all levels of the organization. The talks were designed to share key experiences or qualifications that helped the presenters advance in their careers. In addition, they provided a forum for sharing ideas, answering questions, networking, and potentially establishing mentoring relationships to prepare today’s workforce for future leadership presentations.

SONAR Analysis Studies Supported Navy Decision Making

The SONAR Analysis Facility continued to provide rigorous physics-based modeling of SONAR equipment, functions, and tactical usage for major program offices in the support of requirements decisions, design trade studies for performance/affordability, and fleet maintenance decision making. Analysis products from the department included performance predictions that supported Code 60’s dynamic tactical analysis of Virginia Payload Module (Block V), a technical report that documented array design principles, analysis to support hull array maintenance and replacement criteria, and various other performance analysis efforts that supported Large Diameter UUV specification development, Digital Acoustic Communications at-sea testing, and Large Vertical Array at-sea testing and analysis.



Supporting the fleet



Multi-code collaboration

Modernization Effort Continued for Surface Ship USW Systems

As an undersea warfare center, Division Newport is often associated with submarines; but the command has a significant role in the development, testing and installation of Surface Ship USW systems for DDG-51, LCS and DDG-1000 platforms. Division Newport has key roles in the areas of software/hardware testing, towed array design, and variable depth SONAR in-service engineering support. In FY15, engineers for surface ships were instrumental in advancing the modernization efforts for towed arrays. By using the spiral development approach inspired by the submarine program’s Advanced Processing Build process, surface ships use an Advanced Capability Build process to implement improvements to the AN/SQQ-89 A(V)15 program. Division Newport engineers also prepared for integrated testing of the LCS ASW Mission Package at the Division and on the platform and served as subject matter experts providing technical oversight for testing the AN/SQQ-90 USW system for DDG-1000.

Latest Technology Improved Life Cycle Support

Using 3D printing technology, Code 15 engineers prototyped an improved split-nut design for outboard SONAR array cables to improve life cycle support. The new prototype is a proposed replacement for a Navy brass coupling nut that is currently in the fleet and is corroding in-situ. The corrosion is severe enough that there is concern that the coupling nut may fail during a removal/replacement evolution. The split-nut design allows for replacement of a failed coupling nut without removal of other array components.



Summer picnic



Towed Array Facility



Scientists deployed cost saving learning management system solution to the Fleet

Modernizing the SSBN - Tactical Control System Upgrade

In July, PMS 425-sponsored temporary alteration (TEMPALT) 361.01 was approved by NAVSEA. This TEMPALT provides the Ballistic Missile Submarine (SSBN) fleet with modernized AN/BYG-1 APB-11 Tactical Control System (TCS) functionality. These capabilities are provided as an interim upgrade in advance of the planned SSBN major combat systems modernization commencing in FY17. This TEMPALT is installed by the USW Combat Systems Department (Code 25) personnel from Division Newport and also from the department's detachment in Bangor, Washington and onsite office in King's Bay, Georgia. At the end of calendar year 2015, 11 of the 13 planned installations had been completed. Kudos were received from the commanding officer of the USS Wyoming (SSBN 742) on the TCS upgrade.

Joint Capability Technology Demonstration Completed

In September 2015, the Advanced Weapons Enhanced by Submarine Unmanned Aerial Systems against Mobile Targets (AWESUM) Joint Capability Technology Demonstration (JCTD) successfully completed an operational demonstration from a submarine platform consisting of six vignettes involving multiple sea and air assets. The integrated end-to-end

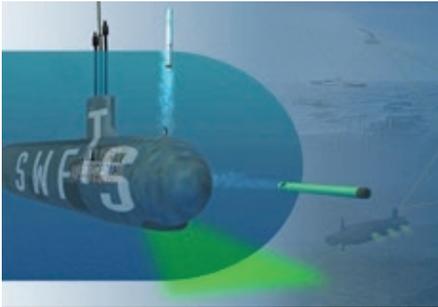


system onboard the submarine was fully operated by the crew and demonstrated the use of an unmanned aerial vehicle. Latency and various message types were tested and performed well within the required parameters to accomplish objectives. An independent assessment was conducted with the following summary: "The AWESUM system is rated highly in virtually every category." AWESUM integrates not only the unmanned aerial vehicle, its canister and launcher, but also communications and command and control functionality to provide an end-to-end system capability for the warfighter.

The Future is Now – Defining the Architecture for the Next Generation Submarine Combat System

The NAVSEA Program Executive Office Submarines (PEO SUB-S) and the Combat and Weapons Control System Program Office (PMS 425) are developing the Common Infrastructure Services (CIS) subsystem as a new independent subsystem within the Submarine Warfare Federated Tactical System (SWFTS). The intent is to pull all the common infrastructure components and services into a cohesive architecture and issue standards and interfaces for use of these services to the various subsystems that currently reside on the Tactical Local Area Network (TACLAN). This facilitates the ability of those subsystems to redirect efforts that are currently being used to provide infrastructure support toward development and upgrading of

tactical applications directly supporting the Fleet users. Code 25's engineering support includes generation of the CIS Concept of Operations document and the Performance Specification.

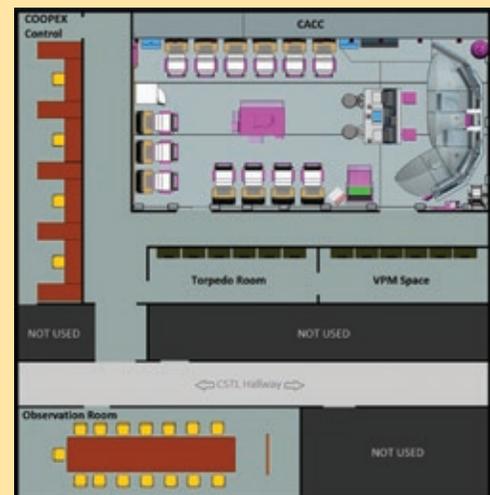


Bridging Major Acquisition Programs – Consolidated Afloat Network and Enterprise Services Virginia-class Block IV Design

Code 25 is the primary design agent for the Tactical Networks Program Office's (PEO C4I PMW160) submarine Consolidated Afloat Network and Enterprise Services (CANES) program. The department also provides technical leadership for platform and combat systems engineering and test and evaluation for the Virginia-class program led by PEO SUB PMS 450. The CANES program of record (POR) is planned as a Government Furnished Equipment (GFE) system for new construction Virginia-class submarines starting with Block IV. The initial CANES design for Virginia-class submarines drove many shipboard changes, which translated into schedule risks jeopardizing the on-time delivery of Block IV Virginia-class hulls as well as impacting planned budgets. The Code 25 CANES and Virginia-class engineering teams collaborated to define the CANES to minimize impacts to the platform, allowing the CANES POR to be installed on both new construction Virginia platforms as well as backfit platforms.

Virginia Payload Module Concept of Operations Exercise – Warfighter, Government and Industry Collaboration

In order to help address USW Strike mission challenges presented by development and integration of the Virginia Payload Module (VPM) on new Virginia-class submarines, the Code 25 VPM team planned and conducted a VPM Strike Concept of Operations Exercise (COOPEX) in June 2015. The goal of the COOPEX was to evaluate improvements to both the combat system and strike operational procedures, and to determine ways to further increase operator effectiveness and efficiency in concert with platform requirements. Code 25 led the COOPEX and, with support from the Platform and Payload Integration Department (Code 40) and industry partners, developed, assembled, and integrated a prototype combat system and mockups of the ship's operational spaces (Command and Control Center, Torpedo Room, and VPM Equipment Space) in Division Newport's USW Collaborative Analysis and Fleet Experimentation (CAFE) facility. The prototype system combined modified tactical components, simulation, and data collection equipment. In addition, there was significant warfighter participation in the event. The results of this event support the ongoing continuum of operational exercises aimed at optimizing VPM requirements and design.

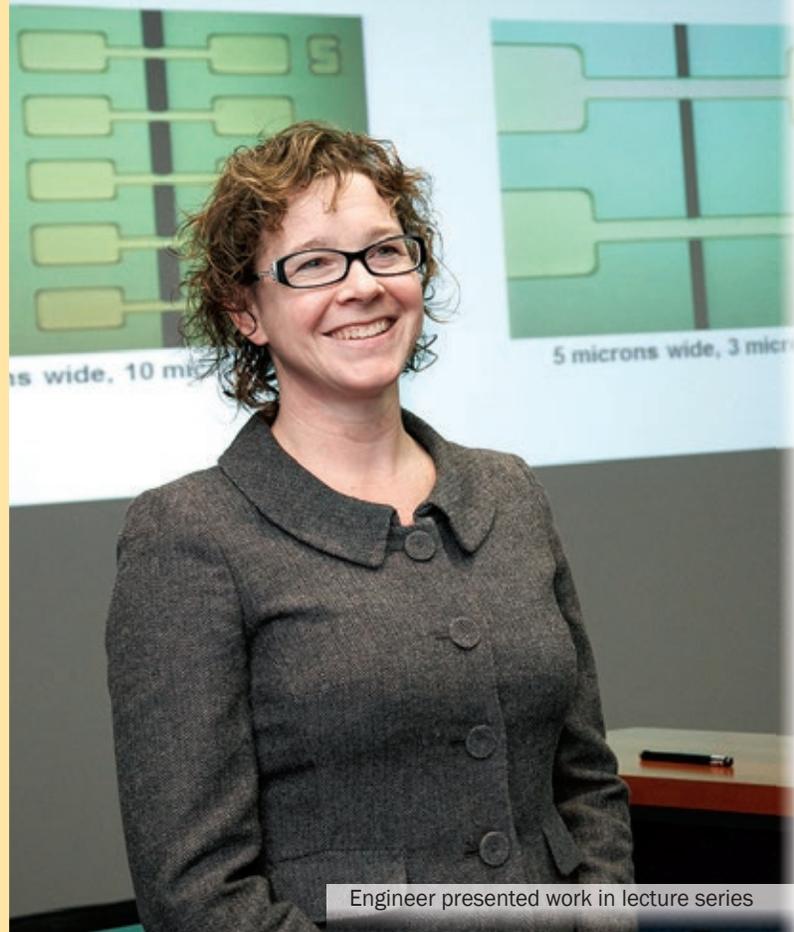


Layout of Code 25's Collaborative Analysis and Fleet Experimentation (CAFE) facility, as used for VPM Strike COOPEX

Contributions to Navy's Undersea Warfare Dominance

During FY15, engineers, scientists, technicians, and analysts developed essential technology initiatives for the Navy including:

- Representatives from Code 34, along with industry, performed benchmark testing of the video performance of a Virginia-class imaging system. Mast-level and end-to-end testing was performed for both the Mast Technology Insertion and the Low Profile Mast configurations. Signal-to-noise ratio and modulation transfer function measurements were also performed.
- Personnel participated in hydrodynamic tow tank testing of the prototype mast fairings for the Affordable Modular Panoramic Photonics Mast Future Naval Capability at the facilities located at the U.S. Naval Academy in Annapolis, Md.
- Engineers took delivery of a hyper-hemispherical optical dome. The project was led by Code 34 engineers who developed the dome as a broadband headwindow for a prototype submarine panoramic periscope system.
- Engineers participated in a technical review for the maturation of spinel manufacturing process for broadband windows.



Engineer presented work in lecture series

In-Service Engineering Agent Supported Fleet Readiness

- Personnel assisted with the upgrade and transition of cryptologic devices that will be needed to support an upcoming milestone in the Embedded National Tactical Receiver broadcast.
- Personnel provided hands-on imaging system technical training to shipyard personnel at the Periscope National Maintenance Facility. The shipyard training was developed over the last two years to increase the skill level and proficiency of periscope on-site representatives, regional repair center shop personnel, and the waterfront intermediate maintenance activity personnel.

FY15 Saw Major Milestones

- Engineers supported the Multi Intelligence Sensor Development Preliminary Design Review.
- Engineers successfully conducted Common Submarine Radio Room Preliminary Design Review for Virginia-class submarines.
- Personnel conducted Critical Design Review for the Rotational Module redesign.
- Engineers completed AN/BRR-6 Lean Six Sigma Antenna/Amplifier Improvements Preliminary Design Review.
- Personnel conducted SSBN Common Submarine Radio Room Anti-Access/Area Denial System Design Verification Test Readiness Review.



Engineers shared latest research at a poster session



New professional spotlighted for research



Testing racked systems

Test and Evaluation Efforts Continued

- Prototypes of the Advanced Buoyant Cable Antenna underwent at-sea test and evaluation aboard the Research Vessel Tiburon in October. The prototypes were evaluated side-by-side with the legacy buoyant cable antenna.
- A 120-hour software longevity test for the AN/BVY-1 (V)4 Integrated Submarine Imaging System Virginia configuration was completed in November.
- Personnel successfully conducted a data collection exercise using the Mast Test Vehicle off the coast of Gould Island.
- Very High Frequency (VHF) Environmental Qualification Test connector samples, which are part of the VHF/Radar Absorbing Structure portion of the Photonics Mast, completed hydrostatic pressure testing.



Unique test facilities

- Personnel conducted radar cross section measurements of the AN/BVY-1 Integrated Submarine Imaging System Augmented System mast in Division Newport's anechoic chamber and conducted Prototype Photonics mast testing at NUWC's Fisher's Island antenna test facility.
- Engineers successfully conducted the Integrated Submarine Imaging System (ISIS), System Operability Verification Test on a Virginia-class platform receiving both the ISIS Augmented System together and an Electromagnetic Interference upgraded Mast Technology Insertion mast.

Department Personnel Received Numerous Accolades in FY15

- A Code 3413 Principal Investigator was acknowledged for support of antenna efforts performed on the USS Albany (SSN 753).
- The PMS435 Imaging Excellence Award was presented to Code 34's team for the Development and Testing of the Integrated Submarine Imaging System Augmented System Low Profile Masts. The team developed the performance specifications, provided continuous technical guidance, reviewed and approved technical documentation and procedures, and adjudicated technical issues throughout the development and fabrication stages of the project.
- The PMS435 Electronic Warfare Excellence Award was presented for Code 34's outstanding performance provided to Commander, Submarine Force, U.S. Pacific Fleet in the development, installation, and maintenance of several special temporary alteration systems.
- The PMS435 Runner-Up Electronic Warfare Excellence Award was presented for Code 34's lead role in the "BPS-XX RADAR" effort.
- The PMS435 Runner-Up Imaging Excellence Award was presented for innovation and leadership to the Technical Project Manager for the Submarine Imaging In-Service Engineering Agent and manager of the National Periscope Repair Facility.



Summer picnic



Department new hires



Continuous Process Improvement event



Virginia Payload Tube Facility Opened for Business

After the installation of the Multiple All-Up-Round Canister (MAC) in February 2015, Platform and Payload Integration Department (Code 40) engineers continued to work with Electric Boat (EB) to complete systems installation, piping, and electrical work on the Virginia Payload Tube Facility (VPTF). This included working with Code 25 to install electronics in the control room to work toward completion of virtual submarine connectivity.

The VPTF team also completed an installation of All-Up-Round Simulators (AURS) and AUR ballast cans into the MAC cells, which allowed additional facility certification testing and completion of a major milestone.

In September, Code 40 hosted its first outside entity when the crew of a VPT-equipped submarine came for a week to learn the controls. The crew included five torpedomen, six fire control technicians, and one combat systems officer. As they went through a series of hands-on operational training, it was the first time the crew got to touch actual fleet assets — most of the crew was recently out of submarine school. They trained from 8 a.m. to 9 p.m. every day for a week and, by the end of their training, they felt comfortable working with the systems.

The training was also a success for Code 40, which received a lot of positive feedback. For the VPTF team, it was their first time using all the equipment as well, and they were able to continue their close connection with the fleet. The experience helped the Code 40 personnel become training facilitators as they learned the crew's procedures, their manner of communication, and how they go about accomplishing their tasks. This will help when other crews come to the VPTF for training.

Soon after the submarine crew left, EB wrapped up all of their testing and Code 40 officially took ownership of the VPTF. The goals for the VPTF staff are, first and foremost, solving fleet issues, becoming good training facilitators, and understanding future improvements.

The VPTF continues to be inundated by industry as Code 40 hosts multiple tours each week.



Engineers assisted with installation

VPTF Team's Problem Solving Avoided Significant Costs

Virginia-class Block III VPT (AURS) and All-Up-Round Grade B Ballast Cans (AURBb) are six inches shorter than the 688 and Virginia-class Block I and II simulators and ballast cans. These are carryover simulators and ballast cans from the SSGN program.

When the VPT simulator or ballast can is positioned to be uprighted in a Mk 34 shipping skid, the upper flange of the simulator rests on top of the forward support cradle instead of extending beyond it. Because of this interference, lip seals cannot be installed.

The shipyards have always used Mk 34 shipping skids to upright simulators for 688-class and Virginia-class Blocks I and II. The fleet uses a shipping skid for Mk 34 or Mk 30 or a Mk 23 tilt fixture to upright simulators, ballast cans, or missiles. While the Mk 30 or the Mk 23 skids will work to upright a Virginia Payload Tube simulator, there are none available to supply the shipyards.

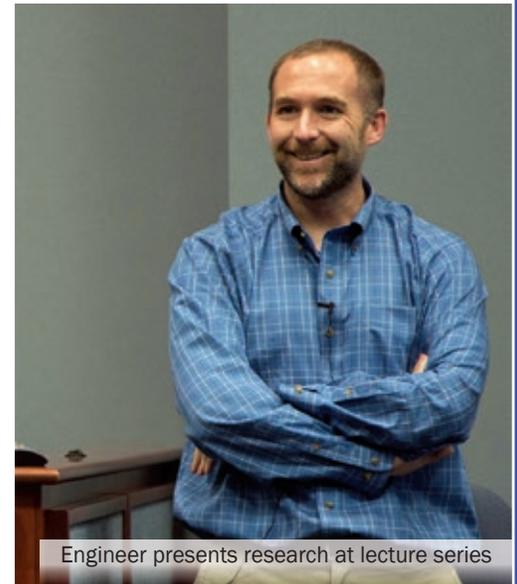
To solve this problem, Code 40 engineers designed, built, tested, and approved adapter plates that can be bolted to the Mk 34 shipping skid that will relocate the position of the Mk 26 uprighting fixture by six inches. The cost for this fix is \$12,600 for the first two sets, with a four-week lead time. One set (two adapter plates) is needed for each Mk 34 shipping skid.

Code 40 engineers generated a draft drawing of the adapter plates and a set of prototype adapter plates were built. The prototype adapter plates were tested and they successfully relocated the position of the Mk 26 uprighting fixture.

Minor updates to the drawing were made and the drawing was formally released. Next, procedures were generated and supplied to the shipyards and the fleet to install the adapter plates. Building the adapters plates avoided at least \$77,400 in costs and the total time to solution was also greatly reduced when compared to the standard procurement process.

Scientists Conducted First-of-its-Kind Implosion Studies

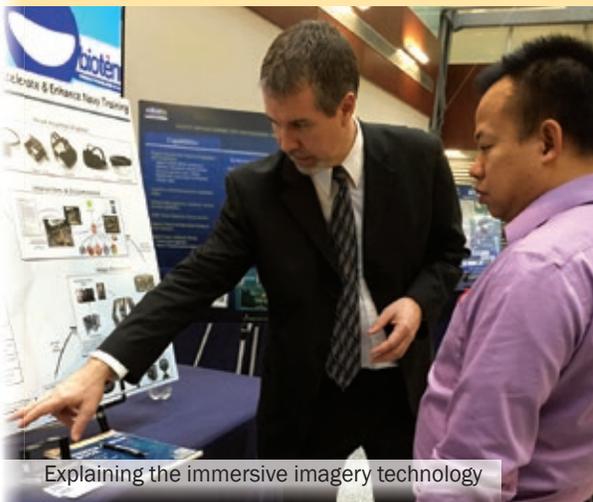
In a multi-code collaboration with academia, scientists from Code 40 and Code 70 continued implosion studies as part of an overarching Office of Naval Research (ONR)-funded research project. The original study, funded under a Future Naval Capabilities program, explored the basic physics of implosion events in free field environments. Code 40 scientists established a follow-on study, in collaboration with the University of Rhode Island, to investigate the physics of implosions occurring within confining environments. This extension of the original research focused on the mechanics of an implosion of a tube that occurs within an outer cylinder that is closed on both ends. In the collaboration, the University of Rhode Island developed unique test facilities to conduct the experiments, and Division Newport employed advanced computational methods to simulate the experiments. The initial part of the study investigated the collapse of cylinders located in the center of the confining tube to develop a fundamental understanding of the effects of the confining environment. The work was subsequently extended to explore the effects of (1) longitudinal offsets (implosion located toward one end of the outer tube), and (2) initial air bubble (how would the presence of an initial air volume influence the collapse). This research presented another opportunity to apply real-world physics to investigate the mechanics of an implosion of cylindrical tubes occurring within a closed outer tube.



Engineer presents research at lecture series

Immersive Imagery Technology Enhanced Training Capabilities

Code 40's involvement in Temporary Alteration development and crew training for the Virginia Payload Tube Facility led to the use of immersive imagery for capturing detailed photographs in a 360-degree view. When considering a casualty scenario with a spatial issue, analysts wondered how a sailor would be able to operate under certain conditions and what obstructions may prevent reaching a component. Drawings and computer-aided design would not be helpful for this scenario. A Code 40 mechanical engineer leveraged his immersive imagery equipment and experience and photographed the room in question. The end result was a detailed 360-degree image that allowed the customers to put themselves in the room and get a better sense of space. The resolution was so good that users could read the serial numbers on the equipment. The RIC was essential in providing the necessary tools to accomplish these immersive imagery projects. A convergence of technology makes immersive imaging possible: digital photography, advances in processing power, manipulation of digital images, and advances in mobile devices, which offer a means of disseminating the imagery. There are also more display devices such as virtual reality headsets and other tools that lend themselves to the use of immersive imagery. Although not yet integrated into training, immersive imagery will soon be used for familiarity with spaces, training, and reference purposes.



Explaining the immersive imagery technology

CNO's Rapid Innovation Cell Visited for Mini-Hack

As part of CNO's Rapid Innovation Cell (CRIC) tour of the northeast, a two-hour rapid innovation session — or "mini-hackathon" — took place in the RIC. The CNO tour, which made stops in Groton, Newport, and Boston, included visits with the Naval War College, the Coast Guard Academy, Massachusetts Institute of Technology, and Commander Submarine Development Squadron 12.

The USW Mission Engineering and Analysis Department (Code 60) was the event's facilitator and NUWC's liaison to CRIC. The objective was to create an opportunity for collaboration and idea sharing among CRIC members and Division Newport analysts, engineers, and scientists.



CRIC mini-hackathon event

This mini-hackathon revisited ideas from Division Newport's first Hackathon that resulted in five ideas being moved forward. The other 40+ ideas were still on the whiteboards on the RIC walls and, for this event, three were selected for the participants to vote for and ultimately pursue one idea to incubate. The 30 engineers, scientists, officers, and enlisted personnel involved in this mini-hackathon were divided into groups and presented with three themes based on those technologies, and all the groups pursued ideas related to one common theme.

While the CRIC was visiting the area, the goal was to bring them to Division Newport for a few hours for idea incubation and the result helped to evolve the work from the previous Hackathon.



Downselecting ideas



Knowledge sharing of Field Team experiences

Cost Analysis Provided Insight

Code 60 led the cost analysis effort for a constrained Analysis of Alternatives (AoA) to determine the required capabilities for a proposed newly developed, lower-cost expendable mine neutralization system. Cost analysis and engineering is an area identified for future growth with Code 60, opening up new avenues to help acquisition programs and resource sponsors establish new programs. After two employees completed the Naval Postgraduate School's Master's program in Cost Engineering, this AoA cost analysis provided the first opportunity for this new capability to be showcased by NUWC.

Despite a very tight schedule, this effort adhered to NAVSEA cost estimating processes to the maximum extent practicable, including estimates for RDT&E and procurement costs for the five alternatives selected for analysis. The AoA Cost IPT was led by a lead cost analyst in Code 60, who was supported by a working group composed of NSWC Panama City, Division Newport, and Johns Hopkins University-Applied Physics Laboratory (JHU-APL) subject matter experts and cost experts. The cost team worked with NAVSEA O5C to obtain consultation, data resources, review of the methodologies, and assumptions and modeling approaches used in developing the cost estimates. The acquisition cost estimates were supplied to JHU-APL, which added operational effectiveness modeling results and merged system engineering studies conducted by both Division Newport and NSWC Panama City (supported by Dahlgren and Indian Head) to produce the final report for delivery to the program office and the prospective resource sponsor.

Code 60 continues to identify cost analysis and estimation tasks, with a specific focus on contributing to formal acquisition studies related to the undersea domain, as well as submarine systems.

Fleet Battle School Inspired Gaming Community



A recent resurgence in wargaming prompted engineers from Code 60 and NUWC headquarters to develop new tools to address complex naval problems outside of what traditional warfare analysis tools provide.

Deputy Secretary of Defense Robert Work, in his memo on wargaming and innovation, wrote, “When done right, wargames spur innovation and provide a mechanism for addressing emerging challenges, exploiting new technologies, and shaping the future security environment.”

When trying to learn how systems and ships interact, wargaming allows participants to play out a scenario before actually doing it. By “gaming” a scenario first, participants gain more insight. This technique is employed in tactical development efforts at SUBDEVRON 12 using the Low Fidelity Tactical Simulation, which evolved from commercial historical wargaming techniques.

For the last two years, Fleet Battle School, a computer wargame representing naval warfare, has been in development.

The multiplayer wargame allows for players to play through scenarios against one another as a way to understand the roles and “major muscle movements” in naval warfare at the regional level. It is intended for use in naval education to help service members understand decisions and risks in naval warfare, in concept development to experiment with new concepts or strategies, and to explore how the introduction of new technologies changes the mechanics of naval warfare. The game is being developed for Windows, Android, iOS, Mac, and Linux.

Using the resources of the RIC allowed the team to quickly respond to this opportunity from the CNO’s Rapid Innovation Cell. The availability of a range of computing devices, including tablets, and the ability to install early versions of the game on a network enabled them to conduct development and evaluation on this game, which they would not have been able to support without this facility.

While most Navy wargames are events that bring people together to share their knowledge of naval warfare, historically, a war game is a tool to enable players to think deeply about warfighting.

Fleet Battle School offers high-tactical, low-operational-level game play. It focuses not on what individual ships or aircraft do tactically, but how units representing multiple ships and aircraft are employed. It is about orchestrating units together and sequencing their movements and use of firepower to achieve an objective. Much like storyboarding, it is sequencing how they do it and how to react to the inevitable breakdown in the original plan – when you start taking hits or have to figure out how to reload when out of ammunition.

Other goals for Fleet Battle School include generating interest, providing insight, serving as a knowledge enhancer, and providing a concept-development tool. For senior-level people, Fleet Battle School can help prepare for broader war games.

As noted by Secretary of the Navy Ray Mabus, “Wargaming is an invaluable method used to assess new ideas, question existing practices, stimulate innovation, and develop new operational concepts in a risk-friendly environment.”



Fleet Battle School developed game at the RIC



Wargaming club meets locally

Personnel Facilitated Technology and Exchange Meeting

On two separate events occurring in March and September, the Scientific and Technical Intelligence Liaison Office (STILO) (Code 60X) coordinated a technology and capability exchange meeting between Code 15 and the Undersea Sensors (TAC-51) Division as well as Code 85 and the Emerging Technologies Team of the Farragut Technical Analysis Center, Office of Naval Intelligence. Code 15 representatives presented topics related to acoustic sensor design and performance prediction for U.S. platforms. The Farragut representatives presented the latest intelligence assessments for foreign undersea sensors and systems. Code 85 representatives presented topics on the latest U.S. autonomous underwater vehicle (AUV) platforms and integrated systems and capabilities as well as energy and power developments for AUV propulsion and systems while the TAC-51 Farragut representatives presented topics regarding worldwide emerging technologies and foreign AUV developments. The objective of this and future exchanges is to increase the two-way collaboration among analysts and engineers with like roles and disciplines at the two organizations. In addition to coordinating future exchanges among Code 15, Code 85, and TAC-51, the STILO office is planning similar exchanges with other Division Newport and Farragut Analysis Center departments.

Ranges, Engineering, and Analysis Department Supported Naval Oceanographic Office

Low frequency receiver calibration was performed on Naval Oceanographic Office (NAVOCEANO) Environmental Acoustic Recording System (EARS) hydrophones. NAVOCEANO's EARS systems were developed as recording systems capable of being moored for long-term ambient recording. These systems are deployed and retrieved several times per year. Seneca Lake provides pre- and post-calibrations to ensure recorded data accuracy.



Engineering and Diving Support Unit Collaborated with Industry

The Engineering and Diving Support Unit (EDSU) lent their expertise to a barrier installation at Naval Station Norfolk in Virginia. As a follow-up to a previous installation of Halo Maritime Defense System's mobile barrier at Stillwater Basin in Newport, EDSU was asked to contribute their diving and engineering skills to test the barrier in another location.

EDSU initially became involved in this project when the Combating Terrorism Technical Support Office (CTTSO) wanted to deploy a section of the gate in Newport. Following the successful installation of the barrier in Newport, CTTSO funded EDSU to go to Naval Station Norfolk to install a 400-foot section of the Halo barrier.

To provide additional testing data, EDSU compiles underwater still photography and video of the barrier to document the growth of biologic material and to determine how it holds up to hurricanes and winter conditions. Norfolk's high winds and heavy sea state will provide a good measure of the barrier's durability.

Despite the availability of divers in the Norfolk area, CTTSO continues to use Division Newport's EDSU for their technical expertise and familiarity with the barrier system. The divers have a proven track record of problem-solving in the water. While a contractor installs the mooring and handles any crane and barge activity, EDSU is the go-to team for all in-water installation and maintenance.

In addition to these types of projects, EDSU continues to provide logistical, swimmer, and diver support to Division Newport's R&D projects as well as emergent, last-minute jobs from the fleet.



Division Newport's EDSU is utilized for their technical expertise and familiarity with the barrier system. The divers have a proven track record of problem-solving in the water.

Test Support of NAVAIR'S Airborne Low Frequency Sonar Program

Acceptance testing was conducted on Airborne Low Frequency Sonar (ALFS) systems destined for the U.S. and Australian navies. Acoustic and mechanical performance was evaluated covering all operational scenarios and an elevated platform suspended by the Seneca Lake facility's 200-ton crane was used to simulate helicopter hovering operations. This testing was conducted to evaluate the real-world operation of the ALFS system without costly flight hours.

Significant Progress Made on New Training Range

During FY15, the Undersea Warfare Training Range (USWTR) transitioned from the design/engineering phase to the production representative phase of the program.

The event that marked this transition was the critical design review (CDR), which was held in March. The Technical Review Board administering this CDR was comprised of senior representatives and technical authorities from most of the NAVAIR competencies plus the PMA 205 program manager and the NAVSEA Undersea Range Technical Warrant Holder.

The USWTR CDR report stated: "Of note, CDR was held on schedule; exactly one year after the preliminary design review and entry criteria was met. No action item is considered a critical finding that would be expected to have far reaching consequences in the program. The development demonstrated excellent teamwork among the contractor, NUWC Newport, NUWC Keyport, and the NAVAIR team."

USWTR is planned to be an instrumented shallow water area capable of surface and subsurface platform tracking located off the coast of Jacksonville, Fla. Installation will be accomplished in two phases totaling 500 square nautical miles with initial operating capability planned for FY19 and full operating capability planned for FY23.

Marine Mammals Monitored on Navy Ranges

The Marine Mammal Monitoring (M3R) program provided passive acoustic tools for the detection, classification, localization, and density estimation of marine mammals. M3R systems are currently operating at Atlantic Undersea Test and Evaluation Center (AUTEK), Southern California Offshore Range (SCORE) and Pacific Missile Range Facility (PMRF).

In FY15, the M3R program was involved with two major efforts to investigate the effect of mid-frequency sonar on cetaceans. The Behavioral Response Study (BRS), featuring controlled playback experiments, was conducted in the vicinity of SCORE and the opportunistic study, during which tags are deployed on animals prior to operations, occurred at AUTEK, SCORE, and PMRF. The two projects

are complementary: the BRS provides detailed information on the reactions of a small number of animals to sound in a controlled environment while the opportunistic study provides a population-level view of the way groups of beaked whales respond to actual Navy exercises. The BRS is a collaborative effort with the University of St. Andrews, Woods Hole Oceanographic Institution, Bahamas Marine Mammal Research Organisation, Cornell University, Space and Naval Warfare Systems Command (SPAWAR), National Oceanic and Atmospheric Administration, and the North Atlantic Treaty Organization Undersea Research Center, whereas the opportunistic study is being conducted solely by the M3R group.

M3R was also involved with several projects investigating methods to estimate the density of marine mammals using passive acoustics. One of these programs, the National Oceanographic Partnership Program-funded Density Estimation for Cetaceans from passive acoustic fixed sensors is being conducted in collaboration with the University of St. Andrews, SPAWAR, Woods Hole Oceanographic Institution, and Oregon State University.

M3R has worked with local observers at each site to conduct species verification and tagging studies. During these tests M3R uses its software to find animals on range and then vectors boats out to the animals. The observers then identify the animals present and obtain photo IDs, skin samples, and/or tag the animals, depending on the particular exercise. These studies help document the long-term health of marine mammal populations, evaluating fecundity, predator-prey relationships, immigration, and emigration.

The M3R program also managed contracts supporting research teams in the field at AUTEK, SCORE, and PMRF. In addition the program is overseeing the contract for development of a new GPS-equipped marine mammal tag for use on smaller cetaceans such as beaked whales by Alaska Sea Life Center.



Collaboration Events Moved UUV Technology Forward

In May, NAVSEA Warfare Centers hosted an event for the Defense Science Board (DSB) at Division Newport. This event supported a targeted visit from the Unmanned Undersea Systems (UUS) task force of the DSB. As part of the agenda for the visit, the USW Weapons, Vehicles, and Defensive Systems Department (Code 85) set up a tent with displays and hardware of UUS technologies and concepts from Division Newport, Division Keyport, NSWC Panama City, NSWC Carderock, and industry participants. Division Newport employees were able to see the displays for limited hours on both days. The displays featured some internal investment research, some research from program offices, and some advanced concepts. In addition to UUV industry leaders Lockheed Martin, Raytheon, Bluefin, and Hydroid, there were representatives from NSWC Carderock and the University of Rhode Island.

As reflected in the DSB and Naval Studies Board (NSB) reviews as well as other past combined efforts, warfare centers fully embraced an unmanned vehicle coordination initiative and took the next step in this area by sponsoring the first Unmanned Vehicle and Autonomous Systems (UVAS) Working Group kick-off meeting in June. Warfare Centers presented concepts, business model considerations, and a framework for defining the future UVAS vision and capabilities through experimentation and incremental fielding initiatives. These constructs and recommendations were presented during the UUV fact-finding tour.

NUWC recognized unmanned systems as a “game changer” in the rapidly evolving global technological environment and has played a key role in this technology by creating breakthrough warfighting concepts even before the DoN formally announced its “2013 Objectives and Beyond” regarding the need to proliferate unmanned systems.



Division Newport, Division Keyport Explored Opportunities for Collaboration

In March, personnel from Division Keyport leadership joined counterparts and the general workforce at Division Newport for a presentation of their capabilities, tour of the facilities, and collaboration meetings to continue the dialogue on how the two warfare centers can complement each other.

Initiated by Dr. Brian McKeon, Code 85 department head, the goal of the event was to continue to improve communication, establish relationships between the two activities, and identify targets of opportunity for additional collaboration. The face-to-face meeting stemmed from bi-weekly telcons between the centers focused on addressing issues, removing barriers, and improving communication, as well as a visit to Keyport last fall to discuss the newly reorganized Code 85.

The agenda included briefs that were open to Division Newport personnel interested in collaborating with Division Keyport. While the Keyport-Newport torpedo relationship goes way back, this visit sparked collaboration in other areas. Division Keyport is known for providing in-service engineering support, logistics, and test and evaluation services. In the case of UUVs, Division Keyport has good contacts with the Commander, Submarine Development Squadron Five (DEVRON 5) and Division Newport can capitalize on their expertise.

The collaboration started with smaller projects and eventually will lead to larger, multi-center efforts.



Divisions Keyport and Newport met to collaborate on new ideas

Scanning Electron Microscope Upgraded Division Newport's Research Capabilities

A scanning electron microscope (SEM) produces images by scanning specimens/samples with a focused beam of electrons that interact with atoms in the sample, which produce signals that contain information about the sample's surface topography and composition.

As part of the Capital Improvement Program, Division Newport acquired a new, state-of-the-art SEM that has been up and running since February 2015. Division Newport had an SEM that was purchased in the 1990s and was out of date. The maintenance costs were high, the performance was degrading, and only used parts were available.

What is available now is the latest in SEM technology. The instrument purchased from TESCAN, a "MIRA XMU," features variable pressure, a Schottky Field Emission electron source, a fully integrated Oxford Instruments Energy Dispersive Spectrometer (EDS), and an extra-large specimen chamber. The field emission source provides nanoscopic feature resolution at low voltage. This limits the depth of penetration of the electron beam providing a more accurate picture of surface morphology. It also has a motorized navigation system. Users can "point and click" to where they want to scan and a presets feature allows users to walk away from the machine and get back to their previous location — a significant time saver. The EDS provides real-time elemental information. Besides analyzing morphology, users can determine which elements are present and how much of that element is present.

Current research being performed on Division Newport's SEM includes scanning of whale and seal whiskers for possible use in UUV sensing as well as morphology and element composition for both research and fleet support. The SEM has also been used to investigate the size, shape, and elemental composition of battery and fuel cell materials for power and energy research. Fleet specimens have also been analyzed for corrosion, fractures, and elemental composition.

TOPSIDE C2 Leveraged Open-Source Technology for Improved Situational Awareness

With Office of Naval Research funding, a Code 85 team developed a powerful data fusion, mission planning, and piloting station known as TOPSIDE C2. This plug-in-driven, Java-based software is built on NASA WorldWind, which is an open-source 3D visualization system similar to Google Earth. TOPSIDE C2 provides fusion and visualization on a unified time axis of all available information, including assets' positions, environmental measurements, and weather — including ocean model forecasts with ocean currents. Additional sockets are available for compatible mission planning modules and compatible data fusion models. TOPSIDE C2 provides an intuitive graphical user interface, permitting planners to run real-time acoustic and environmental models, mission parameters and plans.

TOPSIDE C2 is a flexible software suite that can be used for many projects. The architecture can be reconfigured easily to rapidly prototype new sensors, data feeds, and assets. The software was also designed for distributed collaboration and scales easily to support more operators as needed.

DETACHMENTS/ON-SITE OFFICES



- WEST PALM BEACH, FL**
- FEO NORFOLK, VA**
- MANASSAS, VA**
- BANGOR, WA**
- SAN DIEGO, CA**
- SYLMAR, CA**
- MAYPORT, FL**
- KINGS BAY, GA**
- WILLIAMSBURG, VA**
- KEYPORT, WA**



- CATEGORY 1 DETACHMENT**
- CATEGORY 2 DETACHMENT**
- ON-SITE OFFICE**
- MISCELLANEOUS SITE**

Andros Island Test Facility Served as Helicopter Test Site

Throughout FY15, the Atlantic Underwater Test and Evaluation Center (AUTEC) on Andros Island in the Bahamas conducted a series of four integrated Helicopter Maritime Strike/Helicopter Sea Combat Final Battle Problems as part of the overall Helicopter Advanced Readiness Program. The shallow-water operations were followed by operations on both the AUTEC Minefield and Shallow Water Range and the deep-water range. Participating units also performed snag and tow events, among other testing during the exercise for a total of six events.

Other AUTEC highlights included:

- The Information Operations Test and Evaluation at AUTEC investment project designed, procured, and is installing threat/target representative capabilities to support test and evaluation of information operations systems for signal intercept and evaluation. The project is operating within schedule and budget and is currently undergoing assembly and integration testing. Site preparations for installation at AUTEC are ongoing with Final Acceptance and Operational Testing scheduled for 2016.
- Code 70 initiated acquisition planning for the follow-on AUTEC Maintenance and Operations contract, which has an FY19 expected award. The department led a series of major stakeholder events, published a Request for Information package, and conducted its first Industry Day event.

Detachment Aides NSWC Crane Assessment and Testing

Seneca Lake Facility provided support to NSWC Crane with the initial assessment and static launch of a decoy launch system. Information gained from two successful launches at the Seneca Lake Facility resulted in a recommendation for at-sea testing in summer of 2015. Because of its unique bottom features and narrow beam test accuracy, Dodge Pond was selected by General Dynamics Electric Boat to test multiple configurations of a submarine bottom sonar assembly. Results of these tests will impact costly reconfiguration decisions for the submarine.

Field Engineering Office Home to Successful Navy Diagnostic Testing Program

Division Newport's Detachment Field Engineering Office (FEO) Norfolk is home to the Navy's Miniature Microminiature/Module Test and Repair Program. This highly successful program includes what is known as "Gold Disk" diagnostic test routines used by technicians throughout the DoD on-site circuit card repair. There are currently more than 7,000 Gold Disk test routines but as a result of budget cuts, there are not enough developers. Throughout FY15, FEO Norfolk engineers got to work certifying additional commands to develop Gold Disks. As a result of their efforts, this vital program will remain afloat while providing targeted diagnostic testing for the fleet. Since the program began in FY96, the repair cost avoidance for the Navy is \$679.49 million.

INDUSTRY DAYS



Meeting with Industry Partners



Small Business Showcase



Browsing New Products



Southeastern New England Defense Industry Alliance Hosted Defense Innovation Days

FY 15 BALANCED SCORECARD

Trend Data -

Balanced Scorecard Measures



Red -

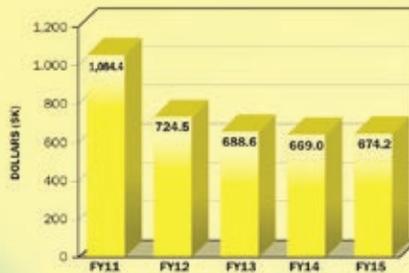
Signifies Measure Needs Attention

Yellow -

Signifies Significant Progress Toward Goal

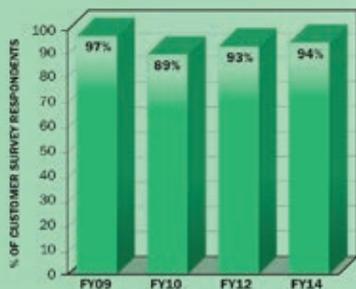
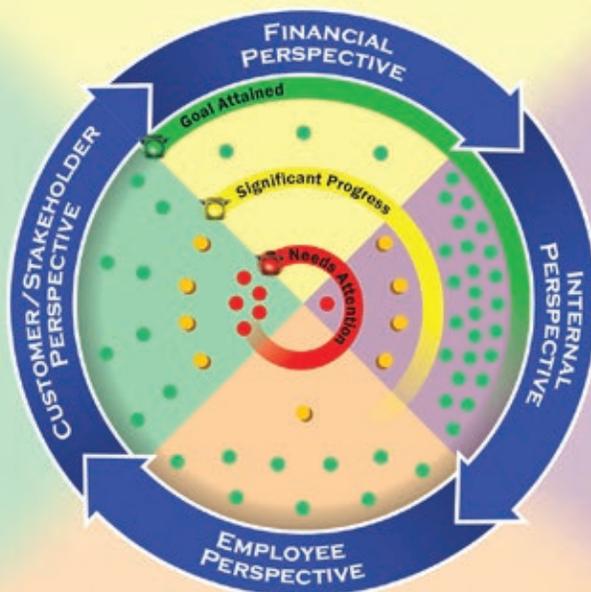
Green -

Signifies Goal Attained



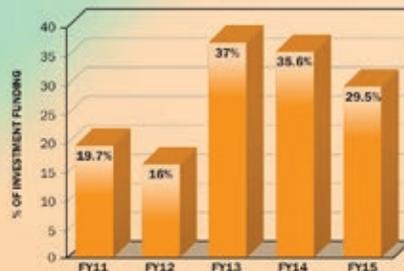
ACTUAL \$ DIRECT NEW ORDERS

- Target: \$685K
- Results within performance parameters.



CUSTOMER SURVEY OVERALL SATISFACTION

- Target: 90%
- Division Newport results exceeded overall WC satisfaction rate of 91%.
- Next survey will be in FY16.



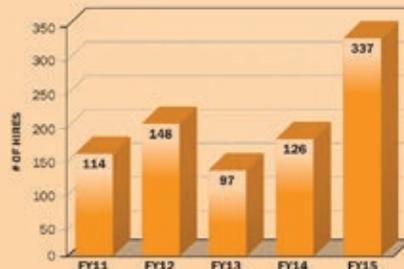
PERCENT INVESTMENT ALLOCATED TO NEW PROFESSIONAL DEVELOPMENT

- Target: 15-25%
- Performance exceeded the target.



DAWIA CONTINUOUS LEARNING POINTS COMPLIANCE

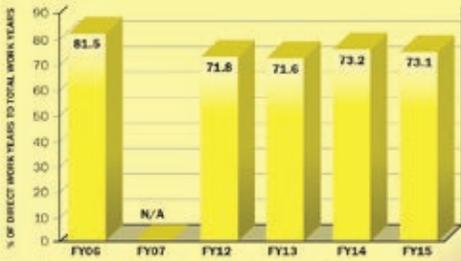
- Division Newport target: 90%
- Performance exceeded the target.



ACCESSIONS - EXTERNAL HIRES

- Target: 344
- Results within performance parameters.





PERCENT OF DIRECT WORKYEARS

- Target: 75%
- Results within performance parameters.



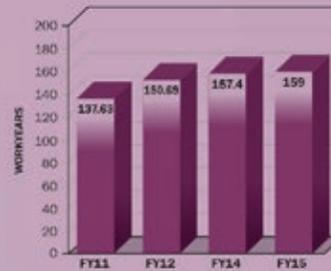
CONTINUOUS IMPROVEMENT - FY15 EXECUTION

- Target: \$15,000
- Performance exceeded the target.



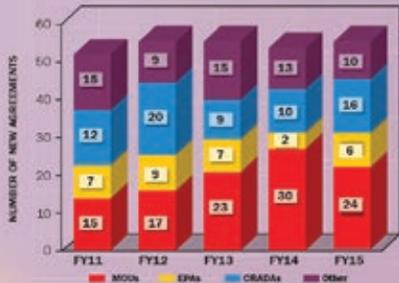
PERCENT RDT&E FUNDING

- Target: 35%
- Performance exceeded the target.



S&T DIRECT WORKYEARS

- Target: 150
- Performance exceeded the target.



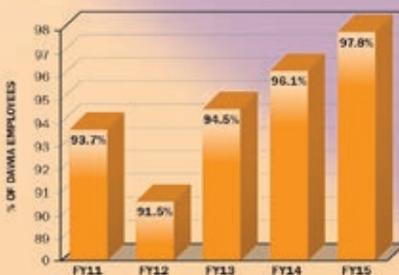
STRATEGIC PARTNERSHIPS- NEW AGREEMENTS

- Target: 55
- Performance exceeded the target.



NUMBER OF PATENT APPLICATIONS FILED

- Target: 35
- Results within performance parameters.



DAWIA CAREER FIELD CERTIFICATION

- Target: 100%
- Results within performance parameters.



PERCENT OF OBLIGATED DOLLARS AWARDED TO SMALL BUSINESS

- Target: 35%
- Performance exceeded the target.



FY15 BALANCED SCORECARD

The Balanced Scorecard (BSC) is a Strategic Management process used to assess business and technical performance. The BSC provides a framework that translates Division strategy into operational objectives and aligns the Division's strategy across four perspectives.

OBJECTIVES	MEASURES	TARGET	RESULTS
Financial Perspective			
Sustain Business Excellence in Working Capital Fund Management	Actual \$ Direct (New Orders) (\$M)	\$685.0	\$674.2
	Total Direct Workyears	2083.0	2108.0
Customer/Stakeholder Perspective			
Execute Technical Commitments as Promised	Technical Feedback Report (TFBR) Average Response Time received in quarter (days)	0-21 = green; > 35 = red	21.8 ^①
	Average Response Time (days)	0-21 = green; > 35 = red	27.6 ^②
	TFBR Delinquency Average (end of quarter)	0	62 ^③
^① High due to closure of aging TFBRs ^② High due to closure of aging TFBRs ^③ Some TFBRs require extended engineering and numerous changes, increasing the length of time required to achieve closure			
Ensure Regulatory Compliance	Federal Information Security Management Act Certification and Accreditation	0.0	0.0
	Electronic Spills (YTD)	0	>0 ^④
	Security Violations (YTD)	0	>0 ^⑤
	ISO 14001 Certification	1.0	1.0
^④ The Division is dedicated to educating the workforce and implementing controls to prevent electronic spills ^⑤ The Division is dedicated to educating the workforce and implementing controls to prevent security violations			
Ensure Strategic Awareness and Communications	% Available Field Team Positions Filled	100%	83.0% ^⑥
	% of Mission Critical Field Team Positions with Full Pipeline	100%	100%
^⑥ 5 of 6 candidates submitted for these external positions were selected.			
Internal Perspective			
Meet Commercial Acquisition Objectives	% Competitive Contracts	75%	85%
	% Single Bid Contracts	</= 25%	15%
	% of Contract Obligated Funds Awarded to Small Business	35.0%	39.1%
Meet Organizational Performance Review Objectives	Number of Incomplete Managers Internal Controls (MIC) Corrective Action Plans	0	0
	% MIC Internal Reviews Conducted	66.0%	57.0% ^⑦
^⑦ Review schedule has been adjusted, expect to achieve 100% in FY16 - Goal is to achieve 100% compliance over 3 year span.			
Steward Technical Capabilities	% RDT&E Current FY Authorized Funding	35.0%	38.0%
	S&T Direct Workyears	150	159.0
	% of Total S&T Workyears	8.0%	7.5%
	Refereed Open Literature Publications	60	59
	Number of S&T Transitions	Baseline Year	10.0
	Patent Applications Filed	35	32
	% of Externally Co-Authored Publications	10.0%	17.7%

OBJECTIVES

MEASURES

TARGET

RESULTS

Internal Perspective *Cont.*

Foster Innovation and Collaboration	Number of Visiting/Exchange S&Es	18	18
	Number of Active Partnership Agreements	151	197
	Number of New Partnership Agreements Established	55	56
	Number of Distinct Strategic Partners	123	135
Optimize Internal Investment Portfolio	%Total Investment Addressing Far Term Challenges	60.0%	66.1%
Ensure Continuous Improvement	FY15 CPI Executive Planning Session Execution (\$K)	\$ 15,000.00	\$ 16,275.00
	% Change in Electric Consumption	-3.0%	-0.2% [Ⓢ]
	% Change in Steam Consumption	-3.0%	-5.7%
	Office Occupancy Rate	90.0%	82.7%

[Ⓢ] Significant decreases in prior years limit ability to achieve additional savings; will continue to look for opportunities to reduce energy costs.

Employee Perspective

Recruit and Retain High Caliber Workforce	End Strength	2754	2938
	New Hires	344	337
	Retention Rate: 5+ Years	90.4%	88.8%
	External Awards Nomination Participation	7.0%	6.1% [Ⓢ]

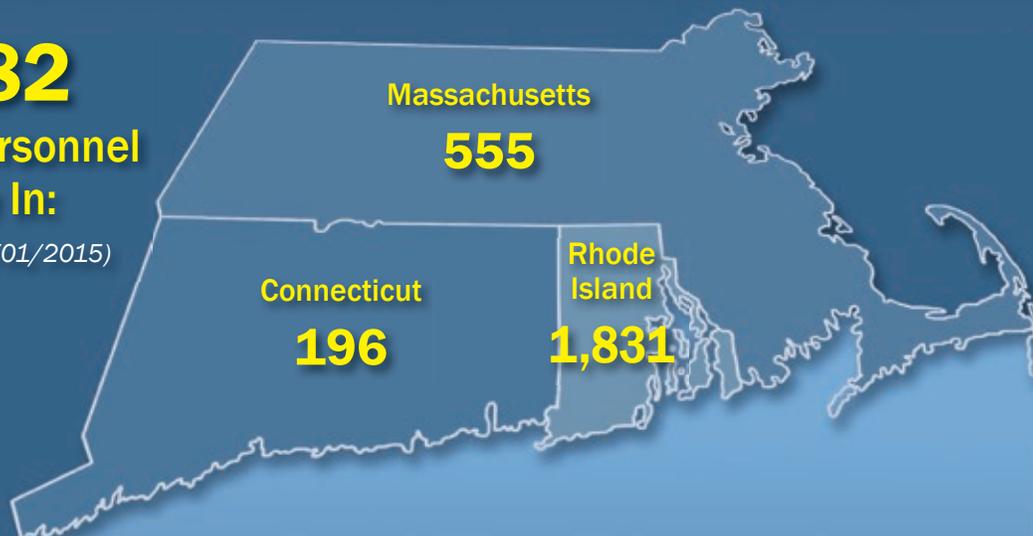
[Ⓢ] Division committed to nominating employees for external awards. Additional emphasis will be provided to ensure target is met for FY16

Train and Mentor Workforce in Mission-Critical Competencies	% Investment allocated to New Professionals	15-25%	29.5%
	% of DAWIA Career Field Certifications	100.0%	97.8%
	DAWIA Continuous Learning Points Certification	90.0%	91.1%

EMPLOYMENT IMPACT ON SOUTHERN NEW ENGLAND

2,582
Division Personnel
Reside In:

(Actual as of 10/01/2015)



Total Employment by Classification	Civ Serv Employment	Contract Work-Years	Est Overall Employment
Engineering/Science	2,320	682	3,002
Professional Administrative	420	696	1,116
Technical Support	159	715	874
Administrative/Clerical	59	200	259
Wage Grade/Other	2	99	101
Total	2,938*	2,392	5,352

*Includes all detachments

DIVISION NEWPORT AWARD WINNERS

NAVSEA Excellence Awards: Ohio Replacement Ship Specification Team, Michael J. Gregory, Stephanie M. Fuller, Robert A. Alperstein, NSWCCD Philadelphia, Mathew R. Waleski, Eric R. Tanner, John E. Weaver, Robert L. Cascella, Azael C. Gonzalez, Ashley N. Edwards, Marcus A. Burrell, Paul I. Herman, Scott B. Bernhard, Nasim Iqbal, Lizabeth M. Wasilewski, Dennis E. Freeman, Richard D. Lantz

SECDEF Medal for the Global War on Terrorism: David E. Jardot

SECNAV Energy and Water Management Awards Supported Command: Naval Undersea Warfare Center Division Newport (Blue Level)

ASME Fluids Engineering Award: Dr. Promode Bandyopadhyay

Defense Acquisition Workforce Development Award, Gold Award - Large Organization: Naval Undersea Warfare Center, Division Newport Human Capital Department

DoN Superior Civilian Service Award: William J. Blackburn Jr.

DoN Haismaier Memorial Award: Alan T. McHale

DoN Meritorious Civilian Service Award: Brian E. Raffensperger

DoN Meritorious Civilian Service Award: David E. Jardot

DoN Meritorious Civilian Service Award: Joan E. Turner

Blanche Witte Memorial Foundation Award: Andrew Nagelhout

Copernicus Awards: Patrick K. Kelley

DoN Chief Information Officer Awards/ Cyberspace and IT Person of the Year: Jacob Sylvia

DoN Meritorious Civilian Service Award: Guy Borges

DoN Meritorious Civilian Service Award: Thomas Diamantini

National Defense Industrial Association Captain George W. Ringenberg Award: Dr. Gregory B. Jones

DoN Meritorious Civilian Service Award: Denise M. Crimmins

Institute of Electrical and Electronics Engineers Professionalism/Technical Achievement/Literary Awards (Harry Diamond Award): Stephen C. Butler

CNO Environmental Awards, Environmental Planning category: Hawaii Southern California Training and Testing (HSTT) Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) Team, Amy Farak and Peter Houlton

DoN Meritorious Civilian Service Award: John W. Kennedy, Jr

Dr. Delores M. Etter Top Scientists and Engineers for the Year Awards: Harold C. Robinson

NAVSEA Excellence Awards: Pressurized Rescue Module Latching System Field Change Team Member: Scott Osterman

NAVSEA Excellence Awards: Warfare Center Enterprise Data Warehouse Kevin O'Connor Newport Team Member

NAVSEA Excellence Awards: Warfare Center Multi-Platform Mission Package Innovation Cell Newport Team Members: Pierre Corriveau, Raymond Harnois, Travis McCune

NAVSEA Excellence Awards: Long Range Strike Weapon Payload Launcher Team

NAVSEA Excellence Awards: Mine Hunting Unmanned Surface Vessel Team

DoN Superior Civilian Service Award: Dr. Pierre J. Corriveau

NAVSEA Warfare Center Awards: Anti-Submarine Warfare Advanced Development Model Mission Package Team

Commander's Award for Innovation: SSBN Tactical Control System Upgrade Team, Brian Alexander, Francis Alsop, Timothy Conrad, Allen Gifford, Peter Grumbles, Patrick Kelley, Daniel Kennedy, Jean Kirwin, Ronan Lacey, Keith Marshall, Daniel Moniz, Fernando Pereira, Christopher Plezia, Robert Rankin, David Robertson, John Rountree, Jeffrey Spooner, Peter Welsh

Commander's Award for Innovation: Hacking for Undersea Technical Excellence Team –CDR Charles H. Maher, George McNamara, Raymond Rowland, Steve O'Grady, Steven Masterson, Timothy Nolan, Rebecca Chhim, Dr. Pierre Corriveau

Commander's Award for Innovation: Naval Array Technical Support Center, Hose De-Kinking Solution – Louis Sansone, Darren Blier, Michael Vartanian

DoN Meritorious Civilian Service Award: Kenneth A. Lester

DoN Meritorious Civilian Service Award: Gary Weiss

DoN Meritorious Civilian Service Award: David Toth

DoN Meritorious Civilian Service Award: Erik Chaum

DoN Superior Civilian Service Award: Donald O. Olson

National Defense Industrial Association Bronze Medal: Christopher Egan

National Defense Industrial Association Bronze Medal: Patrick Kelley

National Safety Council Rising Stars of Safety: Marcus Davis

Submarine Imaging Excellence Awards: Donald Higgins

Submarine Imaging Excellence Awards: ISIS Augmented System Low Profile Mast Team, Matthew Ahlberg, Darrell Fournier, Shawn Goode, Monica Hallisey, William LeBlanc, Carl Lindstrom, Warren McAuliffe, Aaron Pasteris, Brian Rosemark, Jonathan Welch, John Wilson, Dr. Robert LaFreniere

Technology Rising Stars: Maria Diaz Masterson

Hispanic Engineer National Achievement Awards Conference Professional Achievement Level 1: Maria Diaz Masterson

DoN Meritorious Civilian Service Award: Steven K. Aguiar

DoN Meritorious Civilian Service Award: James M. Bardine, Jr.

NAVSEA Warfare Center Awards: The Terahertz (THz) Imaging Team - Innovation, Dr. Patric K. Lockhart

NAVSEA Warfare Center Awards: Anti-Submarine Warfare Advanced Development Model Mission Package Team

NAVSEA Warfare Center Awards: Towed Array Science and Technology-Innovation, Dr. Kimberly M. Cipolla

NAVSEA Warfare Center Awards: Undersea Warfare Rapid Innovation Center Team – Innovation, Steven J. Masterson, Rebecca I. Chhim, Raymond J. Rowland, Matthew C. Puterio, Roy Correia, Timothy D. Nolan

NAVSEA Warfare Center Awards: Unmanned System Command and Control Development and Integration Team - Transformation, Dr. Michael Incze, Scott Sideleau

NAVSEA Warfare Center Awards: Multi-Platform Mission Package Innovation Cell Team – Collaboration, Pierre J. Corriveau, Travis A. McCune

SECNAV Safety Excellence Award in Safety

Integration in Acquisition: Virginia Class Submarine Integrated System Safety Team, Susan Bender, Marcus Davis, Darlene Cory

System Safety Society Awards Manager of the Year: Karen J. Cooper

A LOOK AHEAD

The command's focus throughout 2016 will continue to emphasize our Strategic Guidance, which aligns Division Newport with higher level Navy guidance, including the CNO's recent "A Design for Maintaining Maritime Superiority," NAVSEA's Strategic Business Plan, and the Warfare Centers Strategic Business Plan.

Division Newport will continue to meet Commander, NAVSEA's focus areas for FY16 as follows:

1. Execution Excellence in all we do – the fundamentals of Cost, Schedule, Quality, and Technical Excellence.
2. Ensuring Compliance with requirements and regulations – including Environmental, Safety, Personnel Programs, Contracting Discipline.
3. Actively seeking and identifying ways to help the Navy spend less money – particularly eliminating waste and excess costs and being judicious in spending the government's money as if it were our own personal money.
4. Proactively weaving cybersecurity awareness and compliance in our programs, products, and work culture.

Technical Authority within the undersea domain will continue to be instituted across command technical departments. Maintaining Technical Authority is critical because it represents the fundamental responsibility to establish, monitor, and approve technical standards, tools, and processes and ensure that the Fleet's ships and systems are safe and reliable.

Division Newport leadership will continue to champion three focus areas in 2016 in accordance with its Strategic Guidance, as follows:

1. People – unlocking the innovative potential of our people while maintaining balance with business regulations and cybersecurity.
2. Technical and Business Readiness – ensuring technical and business excellence to meet all tasking commitments and stewardship responsibilities.
3. Next Generation USW – addressing future USW emerging capabilities by advancing early, innovative, integrated solutions.

With increasing demand signals for our USW products and services, Division Newport is well-positioned to ensure our sustained relevance in the undersea domain. Our strength lies in our commitment to innovation, workforce development, and affordability, which combine to ensure our continued technical excellence and leading role in supporting the technical and operational excellence of the U.S. Navy.

