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CORPORATE OPERATIONS
Providing human resources, infrastructure, communications, information technology, security, and business solutions

SENSORS AND SONAR SYSTEMS
Conducting full-spectrum research, development, prototyping, engineering, integrations, training, testing, evaluation and support

UNDERSEA WARFARE COMBAT SYSTEMS
Developing high-quality products and services that shape the next generation of USW systems

UNDERSEA WARFARE ELECTROMAGNETIC SYSTEMS
Managing full spectrum program for USW communications and electromagnetic systems

PLATFORM AND PAYLOAD INTEGRATION
 Delivering the technical leadership and knowledge base for submarine missile/payload integration and USW launcher systems

UNDERSEA WARFARE MISSION ENGINEERING AND ANALYSIS
Executing the mission analysis, engineering, and intelligence functions

RANGES, ENGINEERING AND ANALYSIS
Delivering undersea test and evaluation capabilities through instrumentation, facilities, engineering, and analysis

UNDERSEA WARFARE WEAPONS, VEHICLES, AND DEFENSIVE SYSTEMS
Providing solutions to the warfighter through technical expertise

DETACHMENTS AND AUTEC
Synopses from the Command’s off-site test and evaluation facilities

FY17 BALANCED SCORECARD
Division metrics from FY17 from customer, financial, employee, and internal perspectives

ECONOMIC IMPACT
Division Newport’s economic impact on southeastern New England

A LOOK AHEAD
How Division Newport will contribute to the Navy After Next
The Naval Undersea Warfare Center Division Newport is pleased to present our 2017 Annual Overview!

Throughout these pages, you will learn about our accomplishments over the past year and see many of the hard-working engineers, scientists, facilities, and business professionals who selflessly support each other and positively impact the Fleet we serve.

Highlights included a visit from Commander, Naval Sea Systems Command, Vice Admiral Thomas Moore who spoke to our workforce about adopting a Culture of Affordability, the need for enhanced cybersecurity and implementing High Velocity Learning (HVL). He witnessed firsthand how Division Newport is leading the way in HVL with some of our emerging projects at our Rapid Innovation Center.

In May, Mary Wohlgemuth departed after five exceptional years as our Technical Director. Our department heads did an outstanding job in their two-month rotations, keeping the Division on course until a new Technical Director is selected.

In August, we hosted our third Advanced Naval Technology Exercise, this time partnering with the Naval Surface Warfare Center Panama City and Fleet operators from the Unmanned Undersea Vehicle Development Squadron One in Keyport.

This year we hired 263 new professionals and 58 interns and we have continued to develop comprehensive training programs for our new hires as well as programs to ensure our workforce leads the way on topics such as cybersecurity and high velocity learning.

We hosted 76 high-level VIP visits and our colleagues earned 42 external awards in a variety of business and technical categories - see them all in our centerfold - which highlights their accomplishments.

Lastly, you will notice throughout the Annual Overview our focus on the NAVSEA “Expand the Advantage” campaign plan while enhancing Newport’s vision of “Undersea Superiority: Today and Tomorrow.”

You are part of an impressive, world-class workforce. We are reminded daily of your unmatched professionalism and enthusiastic can-do spirit in support of each other and the Fleet. Thank you!
Our strategic alignment poster above is displayed throughout our campus to reflect our contribution to higher-level Navy guidance focused through the lens of our Undersea Warfare (USW) mission. To expand our advantage, Division Newport is focusing our workforce on a Wildly Important Goal (WIG) — to be the HOV lane for integrating manned and unmanned systems cross domain by 2020.

Integral to our strategy are People, Process, and Results. Over the last four years, Division Newport has hired 1,053 employees and attrited 625, turning over a large percentage of our workforce. With this turnover comes an increased need for strategic workforce development and high velocity learning. In 2017, we continued efforts to shape our workforce through new professional development, seasoning of journey-level employees, and stewardship of our knowledge base for technical innovation in USW, utilizing our increased National Defense Authorization Act (NDAA) Section 219 authority levels where applicable. We continued our efforts to update our training instruction, implemented a part-time advanced degree training program, increased our collective level of knowledge related to cybersecurity, and strengthened workforce communications. We are utilizing increased contracting flexibilities, such as Other Transactional Authority and authorities made available from the implementation of NDAA Section 233, to optimize the speed and agility in which we contract for products and services. We continuously assess our technical and business processes in an effort to reduce the cost of our products, processes, and day-to-day business. We increased our collaboration with the Fleet, other Warfare Center Divisions and System Commands across the Navy Research and Development Enterprise, as well as other government, industry, and academia partners to meet our commitment for on-time delivery of ships and submarines to the Fleet and to enhance technical innovation for the future.
NAVSEA Commander Briefed Division Newport on Campaign Plan

Vice Adm. Thomas Moore, Commander, NAVSEA, visited Division Newport in January to learn about recent innovations and projects from the technical codes. Following tours of the Towed Array Facility and presentations in the Rapid Innovation Center, Moore spoke to the workforce in Chafee Auditorium about NAVSEA’s recently released Campaign Plan.

Moore referred to his recent All Hands message and encouraged the workforce to read the “NAVSEA Campaign Plan to Expand the Advantage” and give it serious thought.

“We don’t want to maintain maritime superiority, we want to get better,” said Moore. “The technology gap isn’t as big as it used to be. This is what I mean when I say ‘Expand the Advantage.’ Give the warfighter an expanded advantage. I hope that’s something you can connect with.”

Some highlights from Moore’s discussion:

- On-time delivery of ships and submarines. The Navy issued a recent assessment that 355 ships would be needed in order to execute all missions. “This is where we are headed. We need to grow the size of the Navy,” said Moore. “Division Newport plays a big part in that.”

- Culture of Affordability. “It’s not all about saving money. It’s about making every dollar count. In a budget-driven environment, we need to make investments in S&T, education, the workforce,” said Moore. “Look at the products and processes and how can we get more bang for our buck. We do stuff every day that adds no value. It’s stupid stuff. So we need to change the policy. We need to do more of that. You know where those pitfalls are. Bring them to leadership. There are so many things that go on in day-to-day business that we say no to because that’s how we always do things.”

- Cybersecurity. “This is a warfighting imperative. It’s no different from anti-submarine warfare in World War II or missile defense. Our enemies want us to disconnect but our single largest capability is our ability to move data. Our advantage is so significant that no one else can come near us,” said Moore.

- High Velocity Learning (HVL). “HVL is not a fad and it’s not Lean Six Sigma. People are trusted and empowered to share knowledge,” said Moore. “We operate in a complex and demanding environment and we can’t anticipate everything that can go wrong. You guys are on the leading edge of where I want to get to as far as HVL.”

Vice Adm. Moore learned about Division Newport’s current projects in the Rapid Innovation Center.
**Change of Command Ceremony**

Sideboys standing by and music by the Navy Band Northeast set the stage for the change of command ceremony held in March as Capt. Mike Coughlin relieved Capt. Geoffrey deBeauclair as commanding officer of NUWC Division Newport.

"I'm extremely humbled with the honor of closing out my active duty career commanding the Navy's premier organization for research and development, testing, evaluation, and engineering for undersea warfare," said deBeauclair. "The tremendous work of the more than 5,000 talented government employees, contractors, and active duty Sailors is nothing short of eye-watering."

Coughlin, a naval submariner originally from the Chicago, Ill. area, is a 1990 graduate of Northwestern University with a Bachelor of Science degree in chemical engineering. He also holds a master's degree in engineering management from Old Dominion University. He received his commission from the Naval Reserve Officer Training Corps at Northwestern.

Coughlin has served aboard a variety of submarines and commanded the nuclear-powered fast-attack submarine USS Olympia (SSN 771). His shore assignments have included duty on the staff of Commander, Submarine Force, U.S. Pacific Fleet; Office of the Secretary of Defense for Program Analysis and Evaluation; and as deputy commander for Submarine Squadron Three.

"To the women and men of NUWC Division Newport, I am honored, enthusiastic, and humbled to be your commanding officer," said Coughlin. "I am so excited to be joining a truly world-class team of highly dedicated and keenly capable people. I look forward to serving together side by side, supporting each other and supporting the men and women of the world’s best fleet, the United States Navy."

**Fair Winds and Following Seas to Mary Wohlgemuth**

Mary Wohlgemuth, a member of the Senior Executive Service (SES), served as Division Newport’s Technical Director (TD) from January 2012 through May 2017, responsible for the planning and execution of more than 700 technical programs, the management of more than 3,100 civilian employees, and the execution of over $1 billion. Concurrent with her TD position, Wohlgemuth was the Undersea Systems Engineering Deputy Warranting Officer for Technical Authority, where she directed technical oversight and system safety of the Navy’s undersea warfare systems on four submarine classes and multiple surface combatants. She also served as the Naval Sea Systems Command’s Director for Integration and Interoperability.

Wohlgemuth made many significant technical contributions benefiting the Fleet throughout her 33-year career. She was the first woman to serve as TD with responsibilities that included stewarding the Division’s technical capabilities to nurture science, technology, and innovation and executing human capital strategies and the business operations of Division Newport. A hallmark of Wohlgemuth’s career was the ability to excel at holding multiple challenging leadership positions in engineering, science, and management.

After leaving Division Newport, Wohlgemuth was selected for a promotion to Tier III SES at the National Center for Environmental Information at the National Oceanographic and Atmospheric Administration in North Carolina.
In recognition of the Memorial Day holiday, U.S. Sen. Sheldon Whitehouse joined employees at Division Newport on May 26 to honor 32 men who died in service to their country while working at NUWC’s predecessor organizations, the Naval Torpedo Station, Newport; the Naval Underwater Ordnance Station; and the Naval Underwater Weapons Research and Engineering Station.

During a brief morning ceremony following colors, Whitehouse and Capt. Mike Coughlin placed a memorial wreath at a monument inscribed with the names of each employee lost in accidents from 1874 through the late 1960s.

Most of those killed were involved in four incidents. A guncotton fire at the Naval Torpedo Station claimed three lives in 1893. During World War I, 15 men died in two separate explosions in 1918, the first claiming 13 men and the second two. Five men died as a result of a propellant explosion in 1955 at the Naval Underwater Ordnance Station. Others died in individual accidents, including a plane crash.

“For more than a century, Newport has been a hub of pioneering research and development for undersea warfare,” said Whitehouse. “As Memorial Day approaches, it is fitting that we honor the men who lost their lives here while serving their country in pursuit of building the world’s most sophisticated Navy.”

Division Newport’s military detachment participated in Memorial Day ceremony.
A series of tragic events involving collisions on USS John McCain (DDG-56) and USS Fitzgerald (DDG-62) resulted in Navy leadership directing all commands to ensure safe and effective naval operations around the world. To meet this objective, Division Newport’s leadership hosted open forums to discuss a variety of topics that underscore the importance of effective risk management, strong teamwork, and robust communications.

Capt. Mike Coughlin told employees that there would be two steps to the Navy’s review of the ship collisions — the first was the short-term operational pause and the second would be a comprehensive review throughout the Navy.

“We still don’t fundamentally know what the root causes were of these two collisions … It degraded from a bad situation to an extreme situation that eventually led to loss of life, loss of ship situations,” said Coughlin.

“We will ensure that we are taking all possible measures to be safe,” said Acting Technical Director Ron Vien. “We will focus on the fundamentals and operational risk management … and ensure that our teams remain at peak performance.”

“There are many things we do in the course of our duties that could impact the fleet,” Vien added. “Many of the things we do may have an influence, perhaps even causing something like this.”

Leadership also reviewed core values that include procedural compliance, formality, forceful backup (teamwork), level of knowledge (understanding), accountability (ownership), integrity, and a questioning attitude.

“If you had to pick one out, does one resonate with you on a daily basis around here and what we do?” Coughlin asked. “Integrity as a high-functioning team is as important as anything.”

Rear Admiral Moises DelToro Addressed Military and Civilian Workforce

DelToro addressed Division Newport’s military detachment before his All Hands.
Department Heads Filled Acting Technical Director Role

Following the departure of Mary Wohlgemuth as Division Newport’s Technical Director (TD), several of the Command’s department heads took over as Acting TD in two-month rotations. The Command continued to thrive and provide exemplary Fleet support as each new TD took the helm.

David Grande from the Mission Engineering and Analysis Department reiterated the Chief of Naval Operations’ challenge to get faster, and then even faster in delivering improved capability to our Fleet now, not some time in the distant future. “I invite you all to swarm this challenge, bringing innovation forward in our processes to deliver products and capabilities faster to our Fleet,” said Grande. “Each of us plays a pivotal role in our organization’s success and in the many contributions we deliver across the bridge from science and technology to Fleet readiness, keeping our Navy the best in the world.”

Ron Vien from the Sensors and Sonar Systems Department led the Division to the successful execution and conclusion of the Advanced Naval Technology Exercise 2017, a collaborative effort including Division Newport, Naval Surface Warfare Center Panama City Division, Fleet operators, Navy decision-makers, industry, and academia. Vien also stressed his continued focus on “accelerating the pace of capability delivered to our Navy and our implementation of Financial Improvement and Audit Readiness.”

Dr. Brian McKeon from the Undersea Warfare Weapons, Vehicles, and Defensive Systems Department pursued a better understanding of the business side of our organization and continue to pursue new undersea warfare developments, which expand the advantage for our warfighters, enhancing their capabilities. “I am a big believer in strong laboratory, industry, and academia partnerships,” said McKeon.

Marie Bussiere from the Undersea Warfare Combat Systems Department said in her All Hands to the Command: “We are our Nation’s leadership for undersea warfare, the nation’s repository for technical expertise and competency … I will build on my predecessor’s goals and objectives, working as a team to achieve Division Newport’s Strategic Goal. We will be the ‘HOV lane’ for integrating manned and unmanned systems cross domain by 2020.”
Division Newport Employees Selected for Senior Roles

Eric Spigel, Head of the Ranges, Engineering and Analysis Department, was competitively selected for a new senior scientific technical manager (SSTM) position as principal technical manager SSTM for Undersea Warfare (USW) Test and Evaluation (T&E) ranges. In this role, Spigel serves as a primary Navy advisor and subject matter expert on matters pertaining to USW T&E and range research and development. He directs and leads strategy for undersea T&E and range technology transfer into acquisition baselines for the Navy, bridging relations between performers in the undersea T&E range sensor technology base and the system acquisition community.

Christopher DelMastro was selected as Head of the Platform and Payload Integration Department. DelMastro is responsible for leading the department in fulfilling its mission to provide full spectrum life-cycle technical leadership and knowledge base for submarine missile/payload integration and USW launcher systems. With more than 25 years of experience in USW research, development, test and evaluation (RDT&E), including 16 years at Division Newport, DelMastro brings an extensive background in USW RDT&E from advanced concept and prototype development to systems engineering, systems integration, fielding and Fleet support.

Christopher Egan was selected as Director, Undersea Warfare Unmanned Systems and Autonomous Behavior, an SSTM position. In this new role, Egan serves as a primary Navy advisor and subject matter expert on matters pertaining to unmanned undersea vehicles and other unmanned systems autonomy. This position supports Division Newport’s mission by providing the technical consultation and leadership necessary to coordinate the development, application, integration, introduction, and long-term stewardship of innovative USW unmanned systems and autonomous behavior.

Darlene Sullivan was selected as Director, USW Electromagnetic Maneuver Systems, a new SSTM position in the Undersea Warfare Electromagnetic Systems Department. In this position, Sullivan works with the Navy enterprise to assess future mission needs in the area of USW Electromagnetics (EM) and Electromagnetic Maneuver Warfare (EMW) systems and develop technological plans to address those needs. She is responsible for planning and coordinating efforts in USW EM and EMW across Division Newport in alignment with Navy needs.
Educational Outreach Programs Spurred Interest in Science and Engineering

In 2017 Division Newport’s Educational Outreach Program (EOP) had a busy year running science and engineering events with students from regional elementary, middle, and high schools. The EOP was the recipient of the 2017 Personal Excellence Partnership Flagship Award. Personal Excellence Partnership is one of five “flagships” that comprise the Navy’s Community Service program. This particular award honors the best educational partnership program between a Navy command and school or youth service organization.

Having marked its 10th anniversary in 2017, Division Newport’s EOP has provided meaningful hands-on math and science education to thousands of local and regional students. With public school budgets shrinking every year, the demand for supplemental science, technology, engineering and math (STEM) education has increased dramatically. In the past year, more than 5,000 students directly benefitted from Division Newport’s extracurricular STEM activities, all delivered at no cost to the local school districts. The hallmark of the program's success has been its innovative teaching methods, bringing math and science to life by offering lessons that engage students via hands-on, interactive demonstrations. Division Newport’s EOP leadership, staff, and a dedicated team of employee volunteers are making a significant difference in the education of local students and paving the way for future Navy scientists and engineers. The core EOP programs, staffed by over 140 Division Newport personnel in 26 different schools in the region include: Undersea Technology Apprentice Program, MathCounts, SeaPerch, Science Fairs, FIRST Robotics (10 teams), SeaLab and SeaLab Summer, and Newport Community School After School Program.

Partnership Strengthened the Defense and Ocean Technology Sectors

Division Newport and the State of Rhode Island partnered to develop defense commercialization opportunities to help spark innovation at the local level. The goal of this effort is to jointly strengthen the contributions of the defense and ocean technology sectors to the Rhode Island state economy by growing business opportunities for start-ups and small to medium size businesses with capabilities relevant to undersea and naval technologies. In order to fulfill this initiative, an Intergovernmental Personnel Act position was created that provides for the temporary assignment of personnel between the Federal Government and state and local governments, colleges and universities, Indian tribal governments, federally funded research and development centers, and other eligible organizations. In 2017, a Division Newport employee was selected as the Director of Defense Commercialization. As the trusted advisor to the R.I. Department of Commerce on business development strategy for the RI defense economic sector, the Director helped develop strategies for Division Newport to be more agile by giving it better access to startups and non-traditional industries with regional entrepreneurs and directly supports the Long-Range Research and Development Plan.

Main objectives of the IPA include:

- Work with Commerce RI to develop a defense and ocean technology outreach strategy and implementation plan.
- Assist Commerce RI in identifying and attracting Rhode Island businesses and academic institutions that have technology developments or requirements in common with Division Newport.
- Assist Division Newport Technology Partnerships Office to facilitate establishment of relationships between Division Newport and other DOD labs via participation at industrial association events, economic development events and on-site visits.
CHENG Council Brainstormed HVL Opportunities

In June, members of Division Newport’s Chief Engineer (CHENG) Council gathered in the Rapid Innovation Center to examine their primary sources of data and how they could realign efforts and processes to achieve the tenets of High Velocity Learning (HVL). The Council wanted to ensure they were getting the right value out of the things they were doing and possibly implement new processes.

As NAVSEA leaders encouraged accelerated learning, accelerated acquisition, and accelerated prototyping, the CHENG Council analyzed its processes and determined what could be streamlined to support new requirements. The Council determined how they would share their information as well as methods that would allow them to sustain this sharing. They also determined how they would use their knowledge to suggest improvements. In the course of their work, the CHENG Council collected a wide variety of data and had access to the pertinent information that drove decision-making and process changes throughout the Command. They continued to employ their specialized expertise to find the right mechanisms for sharing what they know as well as strategies to sustain their solutions.

Training Event Promoted Diversity in Leadership Across the Warfare Centers

Leaders from across the Navy enterprise came together for the inaugural “Leadership in a Diverse Environment” training event in November, organized by the NAVSEA Warfare Centers and held at the Naval Surface Warfare Center Carderock Division.

The event focused on the challenges and opportunities facing women in leadership, with input welcomed from all, encouraging leadership and potential future leaders to “lean in” and move forward with strategies to hire, train and retain an inclusive workforce that will be even better poised to develop innovative solutions to Navy problems.

Chief of Naval Operations, Adm. John Richardson, keynote speaker of the event, described elements put forth in his Navy Leader Development Framework, said character is as important as competency when assessing and evaluating leaders and leadership potential, and called diversity “fundamental to winning.”

“How do you overcome or mitigate against your bias? Through diversity,” Adm. Richardson said. “It is fundamental to winning. Diversity and collaboration in a team environment are like spotlights shining into all of our blind spots. The diversity of experience, thinking, upbringing – the team approach and inclusion – I try to think of them as flashlights illuminating all of my dark blind spots.”

Division Newport selected 12 employees from a pool of 40 applicants to attend the event. At the event, they were told, “Attendees will be considered Change Agents and as such are expected to return to their respective divisions and apply the tools and best practices they learned to train the workforce by planting the seeds of change.”

With that direction, the group returned to Division Newport inspired by what they heard and developed a plan of action that included briefing leadership, developing a communications plan, planning a book club, and working on more specific projects addressing unconscious bias and personal vision.
NUWC Biologists Teamed with Graphic Arts Department for Navy Exhibit

The New Bedford Whaling Museum launched a major initiative to expand and update Whales Today, its whale ecology and conservation exhibition. The first phase of the expansion incorporated the U.S. Navy’s Stewards of the Sea: Defending Freedom, Protecting the Environment interactive exhibition.

Division Newport marine biologists collaborated with museum curators on a potential Navy exhibit. Curators already had a collection of archived tapes, equipment, and items from Woods Hole Oceanographic Institution (WHOI) and were looking for something new.

In response to the museum’s request, Division Newport helped bring the U.S. Fleet Forces Stewards of the Sea exhibit, which could fit the bill as part of the museum’s exhibit. Division Newport developed an Educational Partnership Agreement for undersea acoustic research that would allow NUWC to provide labor, donate equipment, graphics support, etc.

In September, Division Newport delivered the NUWC panels designed by their in-house graphics department. In addition to the panels, the exhibit featured static displays of a prototype unmanned underwater vehicle as well as hydrophones and acoustic sources donated or loaned by Division Newport.

The opening reception was attended by Commanding Officer Capt. Mike Coughlin, Acting Technical Director Dr. Brian McKeon, and noted WHOI biologist Michael Moore who spoke about the Navy’s exhibit in his opening remarks.

The Stewards of the Sea exhibit remains on display until March 2018. NUWC will continue working with the museum to develop a permanent exhibit featuring rotating research projects of the quarter so there is always fresh material.
Engineering and Diving Support Unit Maintained Fleet Readiness

During 2017, Engineering and Diving Support Unit (EDSU)/In-Service Engineering Agent divers provided towed array engineering dive support to eight separate submarines and logged around 120 hours of bottom time among 34 dives, assisting active-duty Navy divers in mission-critical repairs. Highlights include dives in two foreign countries on deployed platforms, returning them to their missions; discovery of damage that avoided a major Out Of Commission; and on-the-job training to around 50 active-duty Navy divers. Additionally, a diving-specific training brief was developed and given to the Naval Submarine Support Facility divers. EDSU engineers also designed and built a reusable dry can for bringing tools and electrical test equipment through the water column. Their design lasts longer and is more reliable than a dry bag and keeps things completely dry while maintaining the same buoyancy going down and coming up into and out of the ballast tank. This tool has been incorporated into regular use in Groton’s submarine maintenance.

Sensors and Sonar System Department Played Key Role in Partnership with Japanese Navy

The Japanese Maritime Self Defense Force achieved a significant milestone in December with the end of a 76-week Regular Overhaul period for ship modernization at Japan Marine United in Yokohama. This event marked the culmination of five years of U.S. Navy efforts in the planning, development, procurement, installation, and training of Baseline 9 AEGIS Combat System with Integrated Air and Missile Defense capability, and upgrading to the latest SQQ-89A(V)15 Anti-Submarine Warfare Combat System with the Multi-Function Towed Array (MFTA). Japan is one of Division Newport’s partner countries and its first partner nation to operate the A(V)15 sonar suite with the MFTA. This also marks the first international AEGIS ship to undergo a major backfit and serves as a pathfinder for all future international Baseline 9 and higher AEGIS Combat System modernizations.
Visitors

Rear Admiral Daryl Caudle

Vice Admiral Dave Johnson

Vice Admiral William Merz

Admiral Phil Davidson

Vice Admiral Joseph Tofalo

Senator Jack Reed (RI)

Admiral Harry Harris
Congressman Rob Wittman (Va.)
Admiral Scott Swift, Commander, U.S. Pacific Fleet
Rear Admiral John Neagley
Senator Sheldon Whitehouse (RI)
Rear Admiral Jesse A. Wilson
Vice Admiral Thomas Moore, Commander, NAVSEA
Congressman Mike Gallagher, Congresswoman Madeleine Bordallo, Congresswoman Colleen Hanabusa
Admiral Scott Swift, Commander, U.S. Pacific Fleet
HACKtheMACHINE participants

Public Hacking Event Addressed Digital Challenges of Warfare Centers, Navy

Division Newport’s role in a hacking event held in September at the Massachusetts Institute of Technology (MIT) already is paying dividends for all the warfare centers — and potentially the Navy.

About a dozen warfare center employees participated in HACKtheMACHINE held by the Naval Postgraduate School (NPS) and MIT’s Computer Science and Artificial Intelligence Laboratory (CSAIL) in Cambridge, Mass. More than 400 people participated in the Boston HACKtheMACHINE event.

Dubbed “Blue Angels for geeks,” HACKtheMACHINE was the third in a series of Navy-sponsored public hacking events addressing digital challenges using actual Navy data and held at technology centers, rather than naval bases.

For the challenge, the teams were given a dataset from the Navy’s Integrated Condition Assessment System — including engine temperatures, oil pressure and other shipboard metrics, some collected electronically and some manually — and were asked to design algorithms to determine actionable data trends.

However, one team of four — which included a Division Newport electrical engineer, a submarine officer, a surface officer, and a recent physics graduate — determined the quality of the data was not consistent or complete enough, and instead set about finding a way to improve data collection that would enable them to use machine learning. The team proposed a tablet-based application for data collection. Ultimately, they wanted to make it easier for the Fleet to collect the correct data. The tool they would potentially develop would help the Fleet input higher quality data.
Rapid Prototyping Projects Took Shape at Division Newport

Rapid prototyping –or the use of 3D computer-aided designs to model scenarios or quickly fabricate physical parts – is just one way Division Newport engineers and scientists deliver solutions to the warfighter. In 2017, several rapid prototyping projects helped the Command maintain its standing as one of the Navy’s top innovators:

- A computer scientist from the Undersea Warfare Electromagnetic Systems Department developed a rapid prototyping project involving a communications decoy for the Marine Corp’s Ship-to-Shore Maneuver Exploration and Experimentation Advanced Naval Technology Exercise (S2ME2 ANTX) in Camp Pendleton. Funding arrived within three months and three months later the prototype was developed. The S2ME2 ANTX featured independent reviewers who gave the project high rankings. The team briefed the Secretary of Navy and two of the Deputy Assistant Secretaries of the Navy (Unmanned Systems and Research, Development, Test and Evaluation). The team was invited to participate in the Steel Knight exercise in December 2017.

- An autonomy researcher in the Sensors and Sonar Systems Department faced challenges integrating his autonomy algorithms into software on existing unmanned underwater vehicles (UUVs) because cost and proprietary issues were prohibitive. He collaborated with a fellow scientist to design and build a UUV with the plan to open source its specifications allowing users to define the requirements for the designers. Next, they teamed up with an unmanned systems working group from the Naval Surface Warfare Center Carderock. Using a Minimum Viable Prototype, the team iteratively improved the vehicle’s design. The “first draft” of their 3D-printed UUV cost $800 in materials. The next step is to integrate the first round of user feedback into the vehicle design.

- The Rocket Propelled Grenade (RPG) of the Sea is a cross-Warfare Center Division effort of a novel ultra-lightweight weapon concept with multiple modular warheads or payloads that will perform missions different from current unmanned underwater vehicles and torpedoes by fielding a low cost asymmetric device that fits into the Navy’s logistics pipeline. The RPG of the Sea is a single-use, man-portable weapon resulting in a high-value tool for a variety of mission uses. A prototyping team consisting of subject matter experts, new professionals and journey-level engineers worked to complete the design of the projectile and launcher components.
Advanced Naval Technology Exercise Provided Venue for Rapid Prototyping, Fleet Engagement

In August, the Advanced Naval Technology Exercise (ANTX) 2017 “Battlespace Preparation in a Contested Environment,” took place at both Division Newport and the Naval Surface Warfare Center Panama City Division, partnering with Fleet operators from Submarine Development Squadron Five from Keyport, Wa., and the Explosive Ordnance Disposal Mobile Unit One in Panama City, Fla.

The multi-site event featured more than 700 attendees observing 50 unmanned systems in action — 11 unmanned aerial vehicles, nine unmanned surface vehicles, 28 unmanned underwater vehicles, and two unmanned ground vehicles.
ANTX featured live exercises of tasks above and below the water including bordering shorelines. Critical goals for this year’s operation included the undetected collection, fusion, and transmission of data, technology enablers that facilitated autonomous operations, and coordination among autonomous platforms and their operators. Division Newport exercises focused on Intelligence, Surveillance, and Reconnaissance, while NSWC Panama City exercises focused on Mine Warfare and Mine Countermeasures.

The ANTX mission is to provide an opportunity for pier-side collaboration among technology developers from industry, academia, and warfare centers, and Navy operators and program offices. Pier-side collaboration creates the high velocity learning environment critical to supporting rapid prototyping of innovative, emerging technologies. The target audience for ANTX is Fleet operators who will one day use these systems, Navy decision-makers who direct acquisition funding, as well as the Navy’s industry and academic partners interested in forming the future partnerships that will speed the research, development, test, and evaluation timeline.

Don McCormack, SES, Executive Director for Naval Surface and Undersea Warfare Centers, said, “Events such as ANTX, with its focus on demonstrations of specific operational-based themes, underscore the value of rapid prototyping efforts. By incorporating warfighters’ needs and focusing on the outcomes, we can make improvements that build on lessons learned and transition these new technologies more quickly than ever before.”
Virtual Submarine Demonstrated to Industry, Academia

Division Newport’s Virtual Submarine, or “VSUB,” is a set of submarine non-propulsion electronic systems including combat control, radio room, periscopes, antennas, sonar, and other systems as well as launchers, weapons, and unmanned vehicles that are connected via a secure campus network. This unique capability allows Division Newport to configure its facilities to emulate any submarine platform in the Fleet. The VSUB is a key enabler in support of test and evaluation, experimentation, integration, lifecycle support, and rapid prototyping of undersea warfare capabilities. Industry and academic institutions throughout the southeastern New England region and beyond are encouraged to use this unique tool for innovation as they partner with the Navy to advance the state of the art for submarine technologies.

Division Newport’s objective is to optimize the systems they are responsible for to support and enhance Fleet mission execution. Partnering with industry and academia is paramount and collaborating on technology development is the next logical step to increase naval capabilities.

Division Newport hosted a tour of VSUB laboratories that featured the use of its newest addition — the Virginia Payload Tube Facility (VPTF). Visitors experienced a Virginia-configured Block III salvo of simulated Tomahawk cruise missiles where the VSUB received mission data and tasking via tactical communications networks from a Fleet node in Norfolk, Va., into the VSUB’s radio room and combat system where operators planned and executed an end-to-end strike of simulated missiles hosted in the VPTF.

“It’s a new paradigm moving forward to get faster and get a longer reach for these platforms,” said Christopher DelMastro, Head of the Platform and Payload Integration Department, when referring to the newly connected VPTF and the opportunities to explore large ocean interface capability.
Video Productions Amplified High Velocity Learning

As warfare centers train their workforce on High Velocity Learning (HVL), several videos have appeared on iNFUSION and Digital Signage featuring NAVSEA leaders communicating what HVL is and why it is important to the workforce. A Division Newport team of writers, graphic designers, illustrators, videographers, and video editors worked with departments and leadership to convey their messages in video form for posting to the center’s Digital Signage, its Facebook page, and YouTube.

Their HVL video was shown throughout NAVSEA to introduce the workforce to HVL concepts and how they can be applied in the Navy. The idea for the video came at a Continuous Process Improvement (CPI) Outbrief when an engineer from the Platform and Payload Integration Department briefed a process improvement event that caught the attention of leadership. A team from the Corporate Communications Division worked with the Platform and Payload Integration Department engineers and the CPI Office to develop a storyboard and script. The result was a four-minute commercial that illustrated how the Fleet and NAVSEA engineers identified a problem, how they worked together to solve the problem, how they shared their results throughout the Fleet, and how they are currently sustaining their solution. That particular example was a well-known problem in the Fleet that had been effectively solved by engineers who unintentionally employed the ‘See, Swarm to solve, Share, and Sustain’ aspect of HVL.

As a follow up to the first HVL video entitled “What is HVL?”, Division Newport released a second HVL video focused on the “Sharing” aspects of HVL. The Corporate Communications team identified Division Newport personnel who employed a variety of methods to share information with the workforce. Featured in the “Sharing” video were Division Newport employees ranging from the Commanding Officer to members of the recently formed Women in Science and Engineering group.

The third video in the series featured Warfare Centers Executive Director Don McCormack explaining how the iNFUSION suite of online tools is a vehicle for HVL.

“By now, you’ve probably heard about high velocity learning and the 4S’s: See, Swarm, Share, and Sustain. At the heart of this is communication and sharing,” McCormack says in the video, which goes on to illustrate how each of the INFUSION platforms can be used to seek out and share information across the NAVSEA enterprise. More than 25,000 people across NAVSEA have joined the internal social network.

In addition to the HVL videos, the team also produced videos on recruiting, mentoring, material management, the Weapons Analysis Facility, the Advanced Naval Technology Exercise, and Research Commons. The Corporate Communications Office along with the graphics and photography teams produced and posted more than 20 videos in the past year to help communicate command initiatives, achievements, events, and special messages.
Sea Mentor Program Provided Unique Fleet, Operational Experience

Division Newport’s Sea Mentor program offered scientists and engineers the unique opportunity to experience at-sea operations — either on a submarine or a surface ship. In 2017, four different test events allowed for personnel to take part in the program.

Engineers from various technical departments participated in torpedo developmental tests, regression testing, wide aperture array calibration, and Weapons Systems Accuracy Trial events while working alongside Sailors who use these systems at sea.

Division Newport also requested to provide rider support on the target platform to support test director and data recording objectives. Recorded data was used to support advanced development efforts in torpedo defense.

In one of the test events, engineers boarded the surface ship USS Lassen in New Orleans, La., for a three-day transit off the coast of Fort Pierce, Fla., where they participated in a two-day torpedo exercise for 10 hours each day.

The sea test experience allowed the engineers to work with a multifaceted team on a coordinated effort. They saw how the systems they developed are used by the Fleet, ship architecture and weaponry, as well as how the Sailors live and work.
In order to teach engineers about the Temporary Alteration, or TEMPALT, process, Division Newport developed a comprehensive training program that hits all aspects of the TEMPALT experience. Hosted by NUWC University, the heart of the training incorporated participation in the Fleet installations that augment submarines with mission equipment.

With few engineers being introduced to a submarine’s waterfront operations, the need was apparent to have experienced engineers write, compile, and provide information to new engineers via a new, comprehensive “Introductory Submarine TEMPALT Installation Process (ISTIP) Training” class. The ISTIP training goes beyond how to compile a TEMPALT; it informs engineers on the realities of TEMPALT work and the pierside experience that goes with it.

Subject matter experts from Division Newport provide the in-person TEMPALT training, which includes TEMPALT design requirement, Technical Data Package preparation, and the roles and responsibilities of the Alteration Installation Team and testing personnel. The training includes two days of presentations and one day at a submarine base or shipyard.

Working with the Fleet is essential for engineers to understand how new systems are developed, installed, and operated. The at-sea environment is very different from that of a laboratory. Submarines are complex. During upkeep and shipyard periods, coordinating a TEMPALT installation with other installations, shipboard training, drills, and maintenance is always challenging.

The course teaches the students to work with Ship Design Managers, TEMPALT Program Managers, and an array of Technical Warrant Holders in presenting their system designs, and to follow up on all NAVSEA technical concerns.
Presentation Described Benefits of Mindfulness

In July, a Lunch and Learn session introduced mindfulness and its ability to improve job performance, reduce stress, improve sleep, and benefit interpersonal relationships. The brief referred to research on the proven effects of a regular mindfulness practice. The goal was to provide a definition of mindfulness and to gauge interest in pursuing “mindfulness@work” as a community at Division Newport.

Companies such as Google and Aetna, which employ engineers and scientists amid a culture of innovation, have made organized mindfulness programs available to their employees; the result is decreased levels of stress and decreased health care costs.

Because federal employees tend to be long-term employees, mindfulness practice can improve retention rates in the workforce as well as improve organizational climate. Mindfulness has been at the forefront of corporate industry for the last four or five years and the Marines have a significant mindfulness program that aides their decision making.

Individual benefits include improved problem solving skills, confidence, and the ability to accept and process criticism. Mindfulness may also boost the immune system. These individual benefits carry over to work life with the bonus of increased job satisfaction, performance, creativity, and productivity.

While mindfulness is not about achieving a static goal and there are no metrics, as a facility focused on research, there has been some interest in studying a test group of volunteers practicing daily mindfulness for a period of time to record changes in blood pressure, heart rate, cognitive physiological data such as electroencephalogram (brainwaves), task-based eye-tracking, and galvanic skin response as a result of consistent mindfulness practice.
Research Commons Consolidated Library Resources Across Warfare Centers

To transition its traditional library to the digital age, the technical library staff at Division Newport created the Corporate Research and Information Center (CRIC) and re-established itself as the preeminent source for researchers. An important part of the CRIC is an online platform known as Research Commons, a dynamic web portal for accessing digital library subscriptions while also bringing together information and research tools from across the Command, Navy, and Department of Defense in one central location. Research Commons includes the Digital Repository, an online full-text repository intended to facilitate the collection, preservation, and dissemination of unclassified scientific and technical material produced by the Command. Together, the Research Commons and Digital Repository allow users to access the complete unclassified scientific and technical output of the Command from their desk.

In support of NAVSEA’s One Team initiative, Research Commons allows Warfare Center libraries to share the costs of subscriptions, share resources, and streamline processes.

Division Newport is also standing up a Warfare Center Library and Research Community of Practice to increase collaboration, discuss common warfare center library and research issues, and share lessons learned.

Research Commons Digital Repository: Content by Type

- Books & Chapters
- Conference Publications
- Conference Posters
- Conference Presentations
- Journal Articles
- Patents
- Portal News/Newsletters
- Reports
- Theses

Employees Participated in URI’s Capstone Design Program

Division Newport employees participated in the University of Rhode Island’s (URI) Mechanical Engineering Capstone Design Program for the first time by working with students on a project called Universal Payload Gripper System. The Capstone project aims to provide the U.S. Navy with a means of carrying payloads of various shapes and sizes through the use of a pliable material or mechanical system that can conform to any shape.

To get a fresh perspective on how to achieve the goal of a Universal Payload Gripper System, four URI seniors explored the art of the possible for payload retention. The students toured Division Newport’s Virginia-class Payload Tube Facility to better understand the scale of the likely payloads, and to discuss the project goals with subject matter experts. As the project moved forward, the student team provided status reports and held meetings to ask questions, share results, and get feedback.

Since the start of the project, the team developed more than 100 concepts and used Quality Function Deployment techniques to down select to the two most promising concepts. These concepts were used to create preliminary designs that included component design, material selection, and stress analysis, as well as a 3D printed scale model. Future efforts will focus on the refinement a preliminary design and a critical design review.
Command Events
Bring a Child to Work Day Entertained and Informed

Division Newport’s annual Bring a Child to Work Day in April brought in almost 400 students during their school vacation week to see what Division Newport’s scientists, engineers, technicians, and business professionals do to support the Navy. Departments offered fun, interactive, and informative presentations to give the kids an idea of the science, engineering, technology, and business that keeps Division Newport running. Presentations included Lasers at Work, Name That Sound, Chemistry Lab experiments, exploring the inside of a whale, Virtual Worlds, and appearing in movie posters courtesy of the graphics department, among others.
Informal Work Group Helped Integrate New Employees

A group of employees known as the New Professional Network (NPN) continued its efforts to help new hires acclimate to Division Newport. The NPN held several events throughout 2017 to provide new employees with a variety of opportunities to meet, socialize, and learn about different aspects of the Command.

In August, the NPN organized its Annual Ice Cream Social in the Collaboration Center as employees came to beat the heat with ice cream, and create their own sundaes. In December, the NPN organized a Hot Cocoa and Holiday Cookie Contest with prizes awarded for first and second place.

On Wednesdays, NPN Hangouts were held at the Rapid Innovation Center (RIC) and were open to all NUWC professionals. Employees brought their lunch to the RIC and socialized with new people and friends over their lunch break. There were also video games along with RIC technology available for everyone to use.

The NPN also hosted two events outside of Division Newport. At Halloween they went to Six Flags New England for haunted houses and Fright Fest as well as a trip to Roger Williams Park and Zoo for the Jack-O-Lantern Spectacular.

The NPN also organized technical tours to provide new employees with some greater detail about some of the projects underway at the Command.
Joint Capability Technology Demonstrations Team of the Year
AWESUM (Advanced Weapons Enhanced by Submarine UAS Against Mobile targets):
Peter Harrigan, John Frasier, Scott Sideleau, Grant Miller, Cari Hodge

The Technical Cooperation Program Achievement Award
Maritime Systems Group Technical Panel 9 Anti-Submarine Warfare Systems and Technology Large Array Signal Processing Project Team:
Sally Sutherland, James Casalegno, Dr. Ivars Kirsteins

Black Engineer of the Year Awards
Professional and Academia Awards
Dr. William Martin, Jr. (Professional Achievement)

CNO Environmental Awards
Ice Exercise 2016 Environmental Planning Team:
Michael Geremia, Karin Dolan

DON Meritorious Civilian Service Award
Douglas P. Hembdtt

DON Meritorious Civilian Service Award
Jeffrey R. Milburn

DON Meritorious Civilian Service Award
Thomas Wohlgemuth

DON Meritorious Civilian Service Award
Drew C. Keane

DON Meritorious Civilian Service Award
Dr. Gregory Jones

DON Meritorious Civilian Service Award
Bruce Imre Incze

DON Meritorious Civilian Service Award
Kevin M. Cronin

DON Meritorious Civilian Service Award
Raymond St. Amand

DON Superior Civilian Service Award
Neil Dubois

DON Superior Civilian Service Award
Mary S. Wohlgemuth

Dr. Delores M. Etter Top Scientists and Engineers for the Year Awards,
Emergent Investigator
Dr. Christin T. Murphy

Dr. Delores M. Etter Top Scientists and Engineers for the Year Awards, Top Scientist
Paul V. Cavallaro

Dr. Delores M. Etter Top Scientists and Engineers for the Year Awards, Top Scientist
Dr. Thomas Ramotowski

Hispanic Engineer National Achievement Award
Vima Manfredo

National Defense Industrial Association Bronze Medal
Dr. Evangelos H. Giannopoulos

National Defense Industrial Association Bronze Medal
Edward Rishmany

NAVSEA Chief Information Officer Rowan Award for Excellence and Initiative
Rebecca Chhim
NAVSEA Commander’s Award for Innovation / SECNAV Innovation Awards
Denise Crimmins, S2ME2 Task Force Team

NAVSEA Commander’s Award for Innovation / SECNAV Innovation Awards
Stephen O’Grady (Innovation Catalyst)

NAVSEA Commander’s Award for Innovation / SECNAV Innovation Awards
William J. Jones (Data Analytics)

NAVSEA Commander’s Award for Innovation / SECNAV Innovation Awards
Disruptive Technology Lab BAAM Optionally Manned Demonstrator (Outside of the Box)

NAVSEA Engineer, Scientist, and Technical Authority of the Year Awards
Advanced Weapons Enhanced by Submarine UAS against Mobile Targets (AWESUM) Unmanned Aerial System/Tactical Data Link Team:

NAVSEA Engineer, Scientist, and Technical Authority of the Year Awards
DGO-1 Coating Test Team: Dr. Thomas Ramotowski, Adam Duszkiewicz, Martin Leff, Matthew Rice, Dr. Wayne Tucker

NAVSEA Engineer, Scientist, and Technical Authority of the Year Awards
Denise Crimmins

Providence Business News “Business Women Awards”
Dr. Theresa A. Baus (Industry Leader)

Federal Computer Week Rising Star Awards
Christopher Crogan

Technology Rising Star Award
Dr. Erin Gauch

NAVSEA Warfare Centers Award
iNFUSION Team: Mark Dalton, Dr. Lonnie Parker, Ashley E. Tingstad, Brian K. Amaral, Michelle L. Bones, Dr. Erin Gauch (Knowledge Sharing)

NAVSEA Warfare Centers Award
Annual Naval Technology Exercise Team: Dr. Brian McKeon, Thomas Fulton, John W. Hughes, Joseph Murphy, Dr. Peter Hardro, Michael Ansay, Tracy Warila (Innovation)

NAVSEA Warfare Centers Award
Industrial Service Enterprise Team: Donald Arsenault, Donald E. Cressman, David T. Curran, Dennis G. Estacio, George F. Ferreira, Kevin P. Garrett, Steven J. Godin, Stephen C. Harris, Martin T. Hong, Kenneth A. Medeiros, Anthony S. Poirier, Donald J. Rioux, Scott R. Swart, Steven P. Tobiaz, Daniel J. Vadeboncoeur, Andrew C. Wehner (Technical Support Services)

NAVSEA Warfare Centers Award
Shipalt Install Guide Team: James L. Madden, Joseph M. Roberts, Jon S. Merrill (Collaboration Award)

NAVSEA Warfare Centers Award
Period End Close Team: Sandra Richardson (Collaboration Award)

Technology All-Star Award
Darlene Cooper

Technology All-Star Award
Esther Thatcher

Modern Day Technology Leader
Dr. Lonnie Parker
Our People

The XO

ANTX group provided support for CNMOC’s Gulf of Mexico demonstration

Ride your bike to work day

Cross-Warfare Center meeting

University of Rhode Island President Dooley tours Division Newport

Celebrating Cyber Day

Eclipse image taken by Division Newport engineer
Green Belt class

Easter shenanigans

Dodge ball champs

WISE group shoots HVL video

New Engineering & Diving Support Unit divers

Division Newport trade show display
Comptroller Made Progress Toward Successful Financial Improvement and Audit Readiness (FIAR)

In late 2017, the DoD began a full financial audit to examine the accuracy of financial information and to determine whether the warfare center can account for its assets; the DoD made it a top priority to correct all deficiencies identified in the audits. Division Newport's Comptroller Department has been preparing for this audit for more than a year with vigorous equipment and inventory management and a transformation of its business culture. In the past year, the department has made great strides in educating Division Newport’s workforce on the operational changes required for a successful audit. Throughout 2017, the Comptroller department tested audit readiness for a number of areas including leave and fringe adjustment, transportation of people, financial statement compilation and reporting, service cost center, and contract vendor pay. The department will continue to develop metrics for operational processes that will sustain audit readiness.

Two Successful Lean Events Tackled Travel Processes

Personnel in the Comptroller Department set out to improve two travel-related processes in an effort to save time and money. Working with the Continuous Process Improvement office, a team of representatives from the Travel Comp Office, supervisors, financial managers, travelers, financial systems, and human resources professionals examined the Travel Compensation Review and Approval process. Division Newport had experienced an increase in travel and an associated backlog of travel compensation claims. Delayed claims impact the traveler and result in problematic late charges to programs. Division Newport travelers, financial managers, and supervisor identified the need for process improvement so the team focused on reviewing the process of submitting, reviewing, and approving travel comp claims. Their goal was to increase awareness and knowledge of the requirements and to streamline the process. While no major deficiencies were identified, several supplemental documents were developed to increase awareness and educate workforce. The supplemental documents (Traveler Do's and Don'ts, Supervisor Do's and Don'ts, Myth/Facts ) are currently in the final review stage, and will be posted on the command's intranet once approved for release. Additionally, a centralized phone number was set up for the travel office.
Improvements Resulted in More Productive, More Efficient Contracts Department

Independent reviewers analyzed every major contract and a statistically significant sample of all other contracts and determined that the contracts workforce improved the quality of their work over the past year. The reviewers were looking at corrective actions and opportunities for improvement and 32% of all contracts had no findings — a positive trend from previous years’ performance. Of those contracts with errors, the number went from 3.5 errors per contract to less than 2. Branch heads within the department recognized those employees with impeccable files and low or no errors.

Formal Training Program

In FY17 the Contracts Department training branch established a detailed checklist and a quality assurance program to bring new employees up to speed. The training program was so successful that it could take a new contracts employee with no knowledge of government contracts to being able to negotiate a major case — $150K or more — in a two-year timeframe. This comprehensive and effective training allowed the workforce to be given high levels of responsibility in a short amount of time, thereby reducing the length of time that contracts are processed.

The intent of the training branch is to train new entrants to the contracts career field, with little to no experience, to get them to work independently within a three- to four-year timeframe. This involves incremental trainings, learning and working modification on actions increasing in complexity all the way to major contract actions.

The primary focus is to train individuals by leveraging their areas of strength and increasing their responsibilities and workload accordingly over time. Having a branch head as the primary point of contact until they have proven themselves in one particular area benefits the entire department as the branch head can gauge progress and identify areas of improvement.

Positive Culture Boosted Work Force

The Contracts Department continued its dedication to a positive work environment with themed outfits, after-work socials, potluck lunches, and a system of acknowledging superior work with thank-you notes. The collective positive attitude contributed to the department’s overall uptick in performance for 2017.

In FY17, Division Newport’s Contracts Department:

- Obligated $667 million
- Executed 2,898 actions
- Improved process flow by 6%

Morale boosting Super Hero Day showed cohesive team.
EEO Hosted RI Secretary of State During National Hispanic Heritage Month

The Equal Employment Opportunity Office invited Rhode Island Secretary of State Nellie M. Gorbea to share her experiences as a minority and working woman during a presentation for National Hispanic Heritage Month in Chafee Auditorium. Gorbea, who is the first Hispanic elected to state office in 2015, took questions from Division Newport employees during her presentation and Capt. Mike Coughlin presented Gorbea with a book about Division Newport after the event.

Infrastructure/Facilities Improvement Plan Executed Across Campus

Numerous outdoor construction projects were completed across the Division Newport campus over the past few years, from more than $1.6M in road repaving efforts, the Building 1258 addition, and a new 527T prefabricated production facility, to various sidewalk, stairwell, and utility repairs. Road repaving efforts were capped by a $541K project along Fulton and Bushnell streets in 2017. A new gate will be constructed throughout 2018 and will provide a restroom, improved protection from the elements for gate guards, improved stand off distance, and improved lighting.

Corporate Business Office Rolled Out High Velocity Learning Initiatives

In support of NAVSEA’s focus on High Velocity Learning (HVL), Division Newport’s Corporate Business Office set out to spread the word by training the workforce on the basic applications of HVL’s “S4”: See, Swarm/solve, Share, and Sustain. The Continuous Process Improvement (CPI) staff held a series of “train the trainer” events to educate managers who could then educate their employees. CPI staff also assisted the Records Management Community of Practice to help them apply HVL concepts to their work as well as the Chief Engineer Council.

Train the Trainer introduced HVL to the command.
Purchase Requisition Centralization Streamlined Processes

Feedback from workforce surveys prompted a process change for purchase requisitions. The newly formed Property Management Division tasked a centralized group of purchasing professionals to remove this burden from the departments, allowing them to refocus their efforts on other Fleet-related tasking. A team of department representatives along with the Property Management Division developed a plan of action to get to an improved future state with common processes, defined roles and responsibilities, and clearly defined policies.

Cybersecurity and Information Technology Teams Made ANTX a Secure Success

The Cybersecurity Branch played a large role in making the Advanced Naval Technology Exercise (ANTX) a success in 2017. They developed and deployed the Information Assurance Concept of Operations as well as the security for the communications paths connecting the three locations. They also provided WiFi registration and Intrusion Detection Scanning before and during the event.

The Information Technology Operations team ensured the cross-site connectivity during the event, which was so critical to the success of ANTX, allowing data transfer during the in-water exercises conducted simultaneously at Newport and Panama City.

The Information Management Customer Services team installed a new public address system at the pier, which was critical to announce launches and other pertinent information throughout the event.
Engineers Developed Instrumented Tow Cable for In-Situ Real-Time Ocean Temperature

Sonar systems and associated components are a key element in sustaining undersea superiority, a primary objective of Division Newport. The performance of these systems is directly dependent on accurate real-time ocean temperature measurements. Seeking improved fidelity relative to operating environments for deployed sonar systems, Division Newport engineers conducted in-water tests of the Instrumented Tow Cable (ITC) to determine effectiveness of the system. Tests showed that the ITC provided curtains of in-situ temperature data, with a significant improvement in spatial and temporal resolution over expendable bathythermographs and naval oceanographic predictions, particularly of the upper water column where most of the ocean’s temperature variability is found. The ITC system requires only one commercial-grade fiber and is adaptable to any cable including those towed, moored, or tethered. The tests conducted using the ITC system at Division Newport’s Seneca Lake detachment showed promising results. Multiple organizations including the National Oceanic and Atmospheric Administration have expressed interest in collaborating in future tests and demonstrations as they look to help transition the technology and sustain undersea superiority.

New Engineering Design Resulted in Significant Cost Savings

A team of Towed Array Handling Systems In-Service Engineers developed a replacement data box for a towed array handling system that can be used on all active U.S. submarines. Called the Reconfigurable Data Box (RDB), the unit tracks towed array deployment length and outputs sensor signals to the system’s control unit. The original data box was designed in the 1970s and uses many proprietary and obsolete components. The new design uses state-of-the-art, commercial-off-the-shelf components to produce a more reliable unit at a lower cost. The unit can also be reconfigured to be used on any current U.S. submarine, replacing four separate designs.

A multidisciplinary team of engineers developed a concept for the new data box, created the detailed technical design, and built a prototype. The total cost of the prototype box was around $11K. With this new data box developed in house, the team could continue to use the legacy data box or switch to the RDB.

By using the RDB, the Navy could improve reliability, have shorter lead times to get data boxes to the Fleet, have a box that would be compatible across fleet platforms, and eliminate sole source procurement issues.

After preparing a business case analysis, a Continuous Process Improvement team determined that over a three-year period, the Navy could avoid $352K in costs if they used the RDBs rather than buying new data boxes and refurbishing existing data boxes.
Four-Legged Assistants Supported Sensor Project

To develop algorithms that can automatically recognize human and animal activities, scientists from the Sensors and Sonar Systems Department collected seismic and video data from a linear sensor testbed on the Perimeter Trail of the Division Newport campus.

Simultaneous collection of seismic and video data from the testbed was conducted in two separate test events. In one event, data was taken on the Perimeter Trail with the help of Gemini, a Labrador Retriever who works as a service dog for one the command’s antiterrorism/force protection officers. Gemini helped provide data for a collection of smaller animal signatures.

In a second event, Monty and Red, horses from the Newport Equestrian Academy, participated in the project by performing a series of activities to provide a data set of larger animal signatures. As part of the test, Monty and Red performed four different actions: stomping, walking, trotting, and loitering. They performed the tests with and without a rider.

The data collected will help differentiate human from animal activities. Ultimately, this data will improve the ability of linear sensors to detect abnormal behaviors near the boundaries of military installations.

Animal activities are the primary source of alarms for seismic systems. When a variety of video data is collected in the same area, it allows observers to distinguish between animal and human activity.

Process Improvement Event Improved Test Procedures

A Helmholtz coil can be used to generate a nearly uniform magnetic field along their center axis at a location between the two rings. In the Sensors and Sonar System Department, they are used to simulate Earth’s magnetic field at various geographic locations around the globe to calibrate magnetic heading sensors used in towed array sonar.

When testing Helmholtz coils, technicians at the Naval Array Technical Support Center must monitor the test 100% of the time because physical adjustments must be performed manually; the sensor reprogramming for calibration must be done manually as well.

Engineers set out to improve this time-intensive process so they applied Continuous Process Improvement methods to reach their solution.

With the goal of reducing test time and operator error, they upgraded the software and hardware. They rewrote software features to streamline Helmholtz coil operation and automate test results. For the hardware component, they designed prototypes to automate heading sensor motion during the Helmholtz coil test, which reduced the need for operator interaction. Finally, they wrote new documentation and work instructions for the hardware and software upgrades. Over a three-year time period their solution will avoid more than $200K in costs.
Cross-Department Team Streamlined New Cyber Compliance Framework

When the Department of Defense implemented Risk Management Framework (RMF), the number of validations required for a system’s compliance with cybersecurity requirements increased from 400 to more than 1,900. This change added significant time to get performance specifications to systems engineers and increased the amount of time for a system to obtain an Authority to Operate. These delays could mean the Navy may not get the systems they need in a timely manner, which inhibits Fleet readiness. A team of engineers and scientists from the Undersea Warfare Combat Systems Department and the Corporate Operations Department got together to solve this problem and they came up with the RMF Tailoring Tool. This online tool automatically bypasses duplicate questions and populates fields for the user, significantly reducing the time to compile performance specifications from hours/days to about five minutes.

The RMF Tailoring Tool team recognized the importance of establishing cybersecurity design requirements upfront, while minimizing compliance “checking” at the end. Their tool establishes an early cybersecurity controls selection process that is repeatable, common, streamlined, and clear to the user. Their tool also addresses unique threats and is customizable as new threats emerge.

The success of this project will be felt throughout the NAVSEA enterprise as the tool is adapted for other commands and system types.

Department Personnel Experimented with Unmanned Systems Command and Control

Engineers and scientists from the Undersea Warfare Combat Systems Department participated in unmanned systems demonstrations in 2017 as a follow on to technology development and demonstration in the U.S. Marine Corps Ship-to-Shore Maneuver Exploration and Experimentation (S2ME2) event at Camp Pendleton in April. The demonstrations for Bold Alligator were conducted in October at Camp Lejeune. L-3 OceanServer, the vendor for Iver UUVs, was a significant partner in the NUWC events, providing support personnel and resources. Division Newport supported three technology demonstration areas featuring the deployment of Iver UUVs from a SeaMob unmanned surface vehicle, rapid response shallow water hydrographic survey with Iver UUVs, and command and control of Iver UUVs using line-of-sight and over-the-horizon options with a common unmanned systems controller. Nearly all of the functional objectives targeted in test design and embedded in the operational events were successfully completed.
Engineers Improved Decision-Making With Tactical Cloud Analytics

The Undersea Warfare Combat Systems Department led a Strategic Capabilities Office joint project known as Tactical Cloud Reference Implementation (TCRI). This effort funded by the Strategic Capabilities Office included the Office of Naval Research, Communications-Electronics Research, Development and Engineering Center-Intelligence and Information Warfare Directorate, Air Force Life Cycle Management Center (Special Programs Division), and Defense Threat Reduction Agency — all focused on providing an end-to-end ecosystem for ingesting, processing, accessing, and analyzing data from multiple sources.

Fleet needs are heavily influenced by data and the ability to handle and analyze it. As a tailorable data and analytic infrastructure toolbox platform, TCRI works tactically to provide the means to store, access, analyze, and distribute with technologies that can scale to massive amounts of data. TCRI provides the means to host data from various sources in a common environment as well as the tools to extract meaning from and enrich data on a massive scale, including correlation of data from multiple domains. TCRI supports data assimilation, analysis, presentation, distribution capabilities, even in the absence of robust connectivity to resources ashore. TCRI services work across multiple target environments.

TCRI is part of the larger picture known as the Data Focused Naval Tactical Cloud (DF-NTC), which incorporates big data technologies and advanced analytics to improve naval operational intelligence and tactical warfighting decision-making. The software developed by TCRI adds automation to operational intelligence across echelons supporting Anti-Submarine Warfare, Integrated Air and Missile Defense, and Expeditionary Warfare missions across multiple levels of war (e.g., operational, tactical). DF-NTC allows for unprecedented access to data; users can extract deeper insights by exploiting that data in innovative ways. The warfighter can apply these new insights to improve naval warfare operational and tactical decision making.

Team Modernized SSBN With Common Infrastructure Services

Program Executive Office, Submarines (PEO SUB) oversees and facilitates execution of system-level integration and testing, as well as platform-level systems engineering and integration, to ensure commonality of process, integrated functionality, improved reliability, and the most efficient use of resources across the Naval Sea Systems Command enterprise. This effort requires coordination with more than 20 program offices and commercial organizations to ensure the Submarine Warfare Federated Tactical System (SWFTS) System of Systems (SoS) Architecture and associated periodic Technology Insertions and Advanced Processor Builds are effective.

The Combat Systems Integration Office, part of Team Submarine, requested that the Common Infrastructure Services (CIS) Team, comprised of personnel from the Undersea Warfare Combat Systems Department as well as the Sensors and Sonar Systems Department, conduct a full-system engineering review and assessment of the combat system to develop an independent CIS subsystem.

The CIS team provided major contributions in the areas of practical application of SoS systems engineering principles, promotion of robust systems engineering principles throughout the SWFTS enterprise, as well as effective systems engineering process development in order to lay the groundwork for the enterprise to achieve significant cost savings, while reducing the time to evaluate and field new mission capabilities, and increasing overall SoS performance.

The CIS subsystem was installed on the first SSBN modernization platform in September 2017 due largely to the extensive research, systems engineering, and acquisition engineering efforts by the CIS team. Their support of the acquisition engineering product cycle for the newly defined SWFTS CIS subsystem ensured the system was properly specified, designed, and tested to meet the Fleet delivery milestones.
Department Performance Solid in FY17

2017 was a successful year for the Undersea Warfare (USW) Electromagnetic Systems Department. More than $200 million was accepted for the execution of work across the department’s technical programs with approximately $120 million of this budget contracted to local industry. The department also welcomed 20 engineers and scientists while maintaining attrition at the same rate as previous years.

Department Combined Imaging and Electronic Warfare In-Service Engineering Agents

In 2017, the department combined the Imaging and Electronic Warfare In-Service Engineering Agents (ISEA) into a single program, allowing for reorganization and efficiencies that will set the stage for improved Fleet support. Direct support to the Fleet continued to be a major element of the work the department provided, with 15 periscopes repaired, responses to 217 Hotline calls, and 449 Casualty Reports closed.

Test and Evaluation Efforts Proved Successful

Common Submarine Radio Room (CSRR) engineers issued eight test reports for test events conducted in Land-Based Submarine Radio Room, and issued 40 Environmental Qualification Test (EQT) plans/reports/white papers as part of the EQT plan for CSRR.

Department engineers completed RADAR Cross Section testing of the Multi-function Modular Mast (MMM) Antenna in Augmented Configuration using the department’s Compact Range Chamber.

Engineers developed a phased test plan and executed server-based RADAR Narrowband system integration and testing at the Lockheed Martin facility. The test event, led by Division Newport, evaluated signal processing and system classification and identification performance capability prior to fielding on submarines.
Department Continued Support of Legacy, Next Generation EW Systems

The department successfully completed an AN/BLQ-10 Next Generation Architecture system Critical Design Review and system integration through software build three of five. Following a program redirect, department personnel developed an AN/BLQ-10 Technology Insertion 2020 specification and acquisition documentation under significant time constraints. Additionally, the AN/BLQ-10 ISEA completed annual Specific Emitter Identification certification, which is essential for the submarine force’s continued contribution to national databases; it certifies both the fidelity of the AN/BLQ-10 system as well as the organizations authorized to perform collections for the Specific Emitter Identification Analysis and Production Center.

Department Support to the Fleet

In support of NAVAIR PMA290E Division Newport’s Electromagnetic Warfare (EW) Advanced Technology Development (ATD) personnel supported the Netted Sensors 17 Fleet Experiment at the Naval Air Station, Patuxent River, Md. Department scientists and engineers delivered, integrated, tested, and successfully demonstrated an Intelligence, Surveillance and Reconnaissance capability for the Fleet Modular Autonomous Unmanned Vehicle at the Pacific Missile Range Facility, and participated in several real-time demonstrations of Third Party Targeting during Vigilant Hammer II.

During FY17, department personnel managed the In-Service Engineering efforts for 16 Radiant Valkyrie Light and 20 Mission Configurable Mast systems that provided enhanced capabilities to the Fleet. The department also led a payload development effort for an Unmanned Aerial System Common Communications Mast whose design will transition to a Program of Record. Our Special Projects teams continued to develop, deliver, and support systems used every day by frontline deployed submarines. Efforts included Temporary Alteration (TEMPALT) maintenance/development, planning and coordination with all stakeholders (Navy Labs, Type Commanders, Sponsors, Squadrons, ships’ force), physical system installation and testing, wardroom and operator training, cybersecurity maintenance/certification for Approval to Operate (ATO) obtainment, and Casualty Report (CASREP) support, as well as continued support of the systems throughout the deployment cycle.

Department Contributed to Navy’s Submarine Communications

In support of Extremely High Frequency (EHF) Satellite Communication (SATCOM) Systems, SATCOM Systems team members completed updating the Advanced EHF terminals Key Management Infrastructure procedures Quick Reference Guide. For recurring work at the Submarine EHF SATCOM Integration Facility (SESIF) and Submarine High Data Rate (SubHDR) National Maintenance Center (NMC), the SESIF was inducted into the department’s Quality Management System (QMS) with a perfect score. The SubHDR NMC was already in this department’s QMS and was the gold standard for its establishment. Under this QMS, the NMC and SESIF met all quality objectives for FY17, consisting of 52 ready-for-issue masts; configured, completed Pre-installation Test & Check-Out, tested, and delivered 13 Navy Multiband Terminals, 17 Operator Interface Units, and 9 Red Interface Processors.
Mark 19 Air Turbine Pump Muffler Redesigned

The Platform and Payload Integration Department completed the redesign and qualification of an integral muffler for the Mark 19 air turbine pump (ATP). The redesigned muffler allows the legacy Mark 19 ATP from the Ohio class to fit within the arrangement of the defensive weapon system on the Columbia class, minimizing both development cost of the launching system and impact to the overall ship design. The effort leveraged the Department’s previous experience in developing a low-cost, integral muffler for the Mark 21 ATP. The redesigned muffler was designed in accordance with the Department’s rigorous systems engineering process to meet modern technical requirements and maximize producibility while maintaining the performance of the Mark 19 ATP. A prototype muffler was manufactured and subjected to qualification testing including simulated torpedo launches in the Department’s Submarine Launcher System Test Facility. The development was completed early and within budget. The first production muffler will be delivered for eventual shipboard installation in the mid-2020s.

Successful Mark 21 Air Turbine Pump Startup Testing Completed

In April, the Platform and Payload Integration Department collaborated with the Combined Weapons Integrated Test Team and Electric Boat Corporation for the successful completion of Mark 21 Air Turbine Pump (ATP) startup testing on Pre-Commissioning Unit Colorado. Data from testing indicated satisfactory performance of both installed Mark 21 ATPs and their associated air firing valves. This testing constitutes the initial installed operational testing of these specific units. Division Newport serves as the Technical Direction Agent and In-Service Engineering Agent for the Mark 21 ATP under the sponsorship of the Virginia Class Program Office and NAVSEA 05.
Virginia-Class Shipyard Test Procedure Process Improved

The Platform and Payload Integration Department supported Portsmouth Naval Shipyard's (PNSY) evaluation of the use of Laser Tracker technology in place of traditional optical measurement systems for the completion of Torpedo Tube and Ejection System clearance and alignment measurements. Department personnel collaborated with PNSY to complete both optics- and laser-based measurements of launcher shutter and muzzle door clearances on the U.S.S. New Hampshire. The incorporation of laser measurement methodologies into the Virginia-class Launcher System Test Procedures utilized at public shipyards will greatly reduce the man-hours required to execute the subject testing while providing higher precision. This task was sponsored by the Virginia-class Program Office and completed in collaboration with PNSY and Submarine Maintenance Engineering, Planning and Procurement Activity.

Explosion Research Assisted in Protecting Marine Mammals

All Federal agencies are required to conduct analyses of potential environmental consequences of their activities and take appropriate measures to avoid/mitigate adverse effects. In collaboration with the Corporate Operations; Undersea Warfare Engineering and Analysis; and Ranges, Engineering, and Analysis departments, the Platform and Payload Integration Department took the modeling lead in a cross-department team of researchers that numerically investigated the effects of underwater explosions (UNDEX) on marine mammals, as might be encountered in scenarios such as coastal construction activities, underwater demolition, or military operations. Mortality and serious injury from blast exposure have been documented in a number of species, including common dolphins and humpback whales. Lung injury is related to stretching (strain) of lung tissue that occurs in response to UNDEX in the same manner as would a free-standing spherical air bubble exposed to uniform step changes in pressure; the presence of surrounding marine mammal tissue (blubber, bone, and muscle) has no influence on the transmission of the UNDEX shock wave energy to the lung; and the internal structure of the lung itself has no effect on oscillation. Today, many of these assumptions can be improved upon by using modern modeling techniques not available several decades ago. As part of a broad three-year effort, the team employed modern technology—the Navy's Dynamic System Mechanics Advanced Simulation fluid-structure interaction code—to simulate the multidisciplinary phenomena of UNDEX detonation, UNDEX shock wave and bubble pulse propagation through the water, pressure pulse transmission through marine mammal tissue, and, ultimately, the dynamic response of the air contained within the marine mammal lungs to these stimuli. The intended investigation results include improved and scientifically defensible understanding of risk to marine mammals posed by UNDEX.

Engineer Assisted in Puerto Rico Recovery Efforts

A mechanical engineer working in the Payload and Platform Integration Department took a leave of absence to fulfill his duties as an Army reservist. While at Division Newport, he works on Capsules Support Equipment for the Tomahawk program but in October he traveled to Puerto Rico to help repair power lines following Hurricane Maria. Working with the U.S. Army Corps of Engineers, for two months he served as a liaison between the soldiers restoring 15 kilometers of power lines and the command center in San Juan. When he arrived in Puerto Rico, the island was at 15-20% power; when he left it was at 60%.

The Underwater Explosion team in Nova Scotia.

Thumbs up for Department Picnic.
Analysis of Alternatives Completed for Advanced Lightweight Torpedo

In 2017, the Mission Engineering and Analysis Department directed the Analysis of Alternatives (AoA) for an Advanced Lightweight Torpedo (ALWT). The AoA was initiated last year because prior studies had established a need for an AntiSubmarine Warfare lightweight torpedo with improved capabilities against even the most well protected submarine targets.

An AoA is a requirement of U.S. military acquisition policy ensuring that multiple feasible alternatives are analyzed prior to making costly investment decisions. The AoA establishes and benchmarks metrics for cost, schedule, performance, and risk depending on military “needs” derived from the Joint Capabilities Integration Development System process. AoAs are intended to move acquisition away from employing a single source to the exploration of multiple alternatives so agencies have a basis for funding the best possible projects in a rational, defensible manner considering risk and uncertainty.

The ALWT weapon system is to be deployed on fixed wing aircraft, rotary wing aircraft, and surface ships. Engineering efforts identified alternative functional solutions with potential to achieve the needed capability. The ALWT AoA evaluated and compared each of these alternatives in terms of those operational advantages, disadvantages, costs, and risks. It identified a preferred path forward to develop this capability and the AoA’s sub-studies will form a knowledge base for writing effective requirements.

Currently, OPNAV N96 has developed a briefing for higher level decision-makers based on the study and is moving ahead with funding for a program. Programmatic and planning work in support of that program will begin in FY18.

Modeling and Simulation Team Supported Operational Testing for the Columbia Class

As Columbia Class SSBN construction begins with missile tube deliveries to Electric Boat starting in 2017 and SSBN 826 delivery to the Government in 2027, the Mission Engineering and Analysis Department has been a vital contributor in platform-level mission analysis. This team is completing its second COLUMBIA Early Operational Assessment (EOA) in spring 2018. EOA Operational Test (OT-B1) provides an early design maturity assessment using Survivability Modeling and Simulation (M&S); subsystem design, integration, and sustainment data; development schedules; and Fleet fielded subsystem performance to identify potential risks to Commander, Operational and Test and Evaluation Force’s and Columbia Class Program offce’s (PMS397) successful completion of Initial Operational Test and Evaluation (IOT&E) in 2029. The Undersea Warfare Mission Engineering and Analysis is providing data and analyses to support assessment of the Columbia class submarine. OT-B1 improvement efforts were a collaborative two-year effort that involved developing a new weapons model by the Undersea Warfare Weapons, Vehicles, and Defensive Systems Department and the creation of detailed performance predictions by the Sensors and Sonar Systems Department. OT-B1 results will be assessed and used by PMS397 as well as Navy and Pentagon stakeholders to determine the suitability of future testing plans and capability of Columbia’s current design to successfully complete its mission. The use of robust and accepted M&S is integral to completing IOT&E and ensuring SSBN 826 will commence its first strategic deterrent patrol in 2030.
Office of Naval Research Workshop Held in Rapid Innovation Center

The first of a series of Office of Naval Research (ONR)/Tactical Submarine Evolution Plan (TSEP) Alignment workshops to identify technologies needed to support future USW needs, was conducted in July in the Rapid Innovation Center (RIC). ONR is sponsoring the workshop series in response to the OPNAV97 TSEP initiative. The series highlights where future technology maturation is required for late-block Virginia-class evolutions and subsequent new submarine-class designs.

The workshop utilized narrative wargaming techniques in a collaborative environment, allowing teams to evaluate and make tactical decisions on a future undersea mission. Bringing together warfighters, technologists, engineers, and analysts, the specific objective of the workshop was to identify key areas for technology investment in support of future USW and submarine design. Each team brainstormed potential courses of action for three different tactical situations. Discussion was seeded with the relevant technology, and team members considered how future technology would be employed to conduct the missions assigned to the team in each situation. Through this, the teams identified which technologies were most helpful, but also how well each technology would have to perform to succeed in the future mission.

Department engineers designed the workshop to dig into specific questions about how technology could be used on future missions. A member of Division Newport’s military detachment structured the various scenarios considered by the teams to set the context and challenges for players. The project was sponsored by ONR, Ship Systems and Engineering Research Division.

Scientific and Technical Intelligence Liaison Office Informed Command

As a “one-stop shop” for all of Division Newport’s intelligence needs, the Scientific and Technical Intelligence Liaison Office (STILO) Office sponsored and presented five popular intelligence briefs under the aegis of the Command’s Knowledge Management Forum series, as well as six periodic Leadership Intelligence Updates for Division Newport’s senior leadership. In August, the China Sea Power Forum, the CNO’s premier intelligence briefing on the subject, was briefed to an all hands forum. Other services provided by the STILO Office in 2017 included coordinating more than 100 technical intelligence requests, providing three STILO outreach briefings for the product lines, reviewing several technical publications and security classification guides, and organizing nine groups of tours, briefs, and presentations for visiting members of the intelligence community. In 2017, the office added another analyst to assist in providing a two-way interface between the Division’s science and engineering workforce and the intelligence community.
Undersea Warfare Training Range Project Moved Forward

The Ranges, Engineering, and Analysis Department successfully completed the installation and testing of the production representative segment of the Undersea Warfare Training Range (USWTR) Increment I Program. Once operational, USWTR will begin its incorporation into the Naval Air Station at Jacksonville, Fla., Fleet Area Control and Surveillance Facility and will be renamed the Jacksonville Shallow Water Training Range (JSWTR). Future USWTR Increments are planned for the Southern California Offshore Range and the Pacific Missile Range Facility.

The primary mission of the JSWTR is to support Fleet readiness through training and tactical development of submarine, surface ship, and aircraft undersea warfare capabilities. Secondary missions include training in shallow water and regional conflict operations. Timely and accurate feedback of training performance to exercise participants and the ability to rapidly reconstruct the training event contribute significantly to the quality of this complex training. These capabilities may only be realized through the use of an instrumented, at-sea training range.

At present, the only operational instrumented range supporting fleet training on the East Coast is the Atlantic Undersea Test and Evaluation Center (AUTEC), Andros Island, Bahamas. AUTEC is a deep water environment, requiring that results be extrapolated to apply to the critically different conditions of shallow water. Speculation and interpretation are required to evaluate crew and equipment performance, reducing the veracity of the feedback. JSWTR will provide a training environment that is consistent with real-world threat situations, where training exercises can be conducted under safe and controlled conditions, and with critically important real-time feedback that eliminates the need for iterative method training events to validate and confirm results.

FY17 accomplishments included integration of production representative equipment at the Cable Termination Facility, Naval Station Mayport, Fla.; deployment of 70 miles of trunk cable; installation of two undersea junction boxes and a string of three acoustic tracking nodes; and functional and performance assessment of the full installation.

Shipboard Electronic Systems Evaluation Facility Opened in Rota, Spain

In September, the U.S. Navy’s first permanent Shipboard Electronics Systems Evaluation Facility (SESEF) site was officially opened in Rota, Spain. This Division Newport tenant activity site of Naval Station Rota, Spain, is the only SESEF site in Europe that will service the Commander Sixth Fleet Forward Deployed Naval Forces. Rear Admiral Daniel Dwyer, Chief of Staff/Deputy Chief of Staff for Strategy, Resources and Plans, U.S. Naval Forces Europe-Africa and U.S. Navy 6th Fleet presided over the ribbon-cutting ceremony on-site.

SESEFs are land-based test sites established to facilitate testing and evaluation of ship’s electromagnetic transmitting and receiving equipment, having primary customers of the U.S. Navy, U.S. Coast Guard, and Military Sealift Command.

Along with Division Newport employees, this site was established through the efforts of many U.S. Navy organizations such as Office of the Chief of Naval Operations, NAVSEA 05H (SESEF program manager), C6F, Commander, Naval Surface Forces Atlantic, Commander, Naval Expeditionary Task Force Europe and Africa, Space and Naval Warfare Systems Command, Forward Deployed Regional Maintenance Center Detachment Rota and Naval Station Rota, and members from other organizations such as the U.S. Embassy in Madrid and the Spanish Navy.
Industrial Collaboration Improved Rapid Prototyping Capability

The Ranges, Engineering, and Analysis Department was instrumental in forming the Warfare Center Industrial Service Enterprise (WISE) whose immediate goal is developing trusted relationships among the Warfare Centers; long-term goals include expanding capabilities for rapid response and developing a cadre of subject matter experts.

As part of the WISE initiatives, a NAVSEA, cross-Warfare Center team developed a web site where technical points of contact can connect with each other to transfer work, materials, and equipment. The Proposal Opportunity Web site (POW) was created with three channels of collaboration: machine shop, environmental testing, and additive manufacturing and can be expanded to include other collaboration opportunities.

The POW is ideally suited for the work flow of machine shops, which is cyclical and often has long contract lead times. The POW ameliorates these issues by creating a network. Instead of having 10 discrete machine shops operating independently of each other, the POW follows NAVSEA’s One Team approach by facilitating the sharing of workload, resources, and funding vehicles.

Roadmap Set Path for Range Capabilities

In 2016, ASN (RDA)/RDT&E requested that the Ranges, Engineering, and Analysis Department develop a Navy Undersea Warfare (USW) Ranges Capability Roadmap to provide understanding, awareness, and visibility of USW range capabilities. The Roadmap will be used to create a strategy to sustain and enhance existing capabilities to meet test and evaluation (T&E) and Fleet training needs.

In 2017, the roadmap team created a comprehensive brochure, “Undersea Warfare Range Capabilities Overview,” to bring awareness of all their capabilities to range users, operators, and resource sponsors. For the first time, stakeholders can view the capabilities at all facilities and USW ranges in one document.

In September, the second Navy Undersea Warfare Range Capabilities Roadmap Summit was held at the Naval Surface Warfare Center Carderock. More than 70 attendees included resource sponsors, range developers, operators, and users throughout the T&E and training communities. Representatives from major acquisition program offices in the Naval Sea Systems and Naval Air Systems Commands (NAVAIR), representatives from the Major Range and Test Facility Base, Strategic Systems Programs, and most warfare centers attended. The Summit provided understanding, awareness, and visibility of range capabilities across organizational and programmatic lanes and, most importantly, identified collaborative opportunities for capability sustainment and development.
Innovative Naval Prototype Project Featured Multi-Center Collaboration

The Forward Deployed Energy and Communications Outpost (FDECO) project is an Office of Naval Research (ONR) Innovative Naval Prototype that is developing and demonstrating an undersea expeditionary infrastructure system that will autonomously provide energy, data exfiltration and communications services to manned and UUVs. Division Newport teamed with Naval Surface Warfare Center (NSWC) Carderock, NSWC Philadelphia and SPAWAR Systems Center Pacific (SSCPAC), industry, and academic partners on this project. Over the past year, Division Newport fabricated and integrated FDECO UUV payload sections and successfully tested them with a REMUS 600 UUV in the laboratory and at SSCPAC in San Diego, Calif.

Successful Integration Testing Completed in Narragansett Bay

In support of the Program Executive Office for Littoral Combat Ship Mission Modules Program Office, the AN/SLQ-61 Light Weight Tow project completed the design, fabrication, and hardware-software integration of the Engineering Development Model-2; and in December 2017 successfully completed integration testing at the Narragansett Bay Test Facility. The system is planned for Developmental Testing at-sea in 2018. The Light Weight Tow will be the primary torpedo defense system for both variants of the Littoral Combat Ship.

Speed-to-Fleet Project Completed Successful Demonstration

The Fleet Modular Autonomous Undersea Vehicle Intelligence Surveillance Reconnaissance and Electronic Warfare Speed-to-Fleet project was a collaborative initiative that developed a system in 21 months using the state-of-the-art technology in the areas of unmanned underwater vehicles (UUV), intelligence, surveillance, and reconnaissance-electronic warfare payload, autonomy, non-traditional navigation, command & control, and homing/docking. The effort culminated in September 2017 with the successful in-water demonstration of a multi-mission vehicle, operated within the context of a larger demonstration that highlighted utility to the warfighter.
FDECO team completed demonstration Fuel Cell Powered Vehicle Tested Successfully at ANTX

Driven by the ever increasing demand for energy sources that will enhance mission capability, Division Newport has been researching fuel cell technologies as replacements for batteries. This past year saw the demonstration of a rapid prototype, low-temperature, proton exchange membrane fuel cell (PEMFC) that utilizes hydrogen gas as a fuel. During the 2017 Advanced Naval Technology Exercise (ANTX), Division Newport and an industry partner successfully demonstrated a fuel cell-powered micro-unmanned undersea vehicle. Division Newport designed and built the PEMFC-based energy section exercised at ANTX.

Unmanned Vehicle Project Moved Forward

The Relative Autonomous Navigation on Range (RANR) project, funded by the Test Resource Management Center Test and Evaluation/Science & Technology Program, utilized Division Newport’s Midsized Autonomous Research Vehicle outfitted with RANR capability to autonomously and accurately maintain desired positions while sharing water space with submarines and engaging in maneuvers and data collection efforts in Navy ranges. A number of successful demonstrations were conducted throughout the year at the Atlantic Undersea Test and Evaluation Center where the vehicle reliably maintained close proximity to submarines during operations while engaging in maneuvers. These demonstrations built confidence for future efforts where submarines and UUVs can safely share water space during operations.

Torpedo Support Included New Capabilities and Upgrades

As design agent and support activity for Torpedo Test Systems, Division Newport developed and maintained support and test equipment used by the U.S. and its foreign allies. During the course of FY17, new systems were developed to either introduce new capabilities or address obsolescence. An example of these activities is the Mark 695 Mod 1 Torpedo Systems Test Set. It is the baseline system for the new lightweight torpedo (Mark 54), but has recently been upgraded to test the older Mark 46 eliminating obsolescence associated with that suite of test equipment and reducing test systems footprints at maintenance facilities (one test set does both systems). Division Newport also introduced these systems to the Fleet and trained the maintenance crews.

Modeling and Simulation Project Added Realism to Submarine Testing

The Environmental Centric Weapons Analysis Facility provided the architecture and framework for the next generation of Modeling and Simulation (M&S) Systems. This system introduced advances in M&S to create more realistic at-sea environments to test submarine systems. During FY17, capability was brought online to test the next generation of torpedo systems currently in development as a real-time, hardware-in-the-loop system. In addition, the first totally digital instantiation of the system was developed and interfaced with other simulators at Division Newport to perform critical warfare type analysis.
Dodge Pond Facility Provided Contained Testing Area

The Dodge Pond Acoustic Test Facility in Niantic, Conn., provides Division Newport with an open-water test and evaluation site for all transducers, arrays, domes, baffles, towed line arrays, and underwater electroacoustic devices. In 2017, the facility was used for the majority of the Undersea Warfare Training Range (USWTR) phase 1 production acoustic testing. Approximately 115 of the USWTR sensors designated for open-water acoustic testing were evaluated at Dodge Pond. Personnel continually accommodated deviations in the manufacturer's planned production schedule to keep the program on schedule. Unit-to-unit matching is essential to production evaluation so it was imperative that the Dodge Pond acoustic measurements maintain a high level of methodological consistency. This goal was achieved and all units were found to be within the specified tolerance. This information is now being used to improve test processes in preparation for phase 2 production testing. The Dodge Pond Acoustic Test Facility played a crucial and unique role in moving the USWTR program from production testing to system installation.

Upstate New York Facility Offered Unique Test Capabilities

The Navy established the Seneca Lake Sonar Test Facility in Dresden, NY, as an underwater test facility for evaluating active and passive acoustic devices from a single element to a full sonar system. All sonar and acoustic testing is conducted by highly qualified acoustic testing professionals on systems and equipment of all sizes. It is the only Navy facility with a 220-ton crane capacity capable of lifting full-scale submarine and surface ship array fixtures and sonar domes. In 2017, the facility provided test support to the Defense Advanced Research Projects Agency-sponsored Hydra System. Tests of the variable buoyancy system and communication system of the prototype were completed. Throughout FY17, Seneca Lake continued to support acceptance testing of NAVAIR's Airborne Low Frequency Sonar (ALFS) system — all newly delivered ALFS systems go through complete acoustic and mechanical evaluation prior to delivery to the Fleet. The facility also supported certification testing for a NAVAIR sonobuoy; information obtained will be used as justification for the official buoy certification and deployment to the Fleet.
The North Atlantic Treaty Organization (NATO) Forces Sensor and Weapons Accuracy Check Site (FORACS) is a multi-national project with eight member nations: Canada, Denmark, Germany, Greece, Italy, Norway, the United Kingdom, and the United States. The mission of NATO FORACS is to measure the bearing, range, heading, and sensor positional errors onboard surface ships, submarines, and helicopters. The NATO FORACS AUTEC (NFA) sensor data acquisition and analysis capabilities are designed to acquire, process, and provide data deliverables in standard NATO as well as Commander, Naval Sea Systems Command formats.

Over the course of the past year, NFA saw an increase in ship testing from a recent historical annual average of less than eight to 11 in 2017, with this increase expected to remain in future years.

NFA has played a major role in ensuring that all four of the project’s locations (the three test ranges and the NATO FORACS Office at NATO headquarters in Brussels, Belgium) are suitably prepared.

In October 2016, Hurricane Matthew impacted areas of AUTEC resulting in damage to some facilities. Hurricane Matthew made landfall at AUTEC as a Category 3 storm. During the peak of the storm, winds reached 130 miles per hour, making Hurricane Matthew the strongest storm to impact AUTEC since the 1960s. In anticipation of the storm, AUTEC proactively executed the evacuation plan to ensure safety of the employees.

Following the impact of Hurricane Matthew, the resulting damage necessitated the initiation of many building repair and roofing projects. Hurricane recovery work will continue into FY18 with anticipated completion in FY19.
All Hands audience

Top-notch team of engineers

Provisioning Center of Excellence community

Lecture Series provided workforce an opportunity to share their research
Promoting NAVSEA’s monthly publication Soundings.

Virtual map team.

TEMALT Group.

Working with Naval Academy students in Chem Lab.

NAVSEA’s Leadership Program Graduation.

Working on Continuous Process Improvement.
Ride your bike to work day
Meeting concentration
War college demonstration
Command photographer
Ice Cream social
55
Divers on a recovery job
Pizza party
Yoga
War college demonstration
Meeting concentration
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<tr>
<th><strong>Financial Perspective</strong></th>
<th><strong>Internal Perspective</strong></th>
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<tbody>
<tr>
<td>Sustain Business Excellence in WCF Management</td>
<td>Target</td>
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<tr>
<td>Actual $ Direct (New Orders) ($M)</td>
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<tr>
<td>Total Direct Workyears</td>
<td>2417</td>
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<tr>
<td>% of Employees Attaining Initial Financial Management Certification within the Required Timeframe</td>
<td>100%</td>
</tr>
<tr>
<td>% of Employees Maintaining Financial Certification within the Required Timeframe</td>
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<th><strong>Customer/Stakeholder Perspective</strong></th>
<th><strong>Employee Perspective</strong></th>
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<td>Ensure Regulatory Compliance</td>
<td>Target</td>
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<td>Information Assurance Vulnerability Management (IAVM)</td>
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<td>Environmental Spills</td>
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<td>Security Violations</td>
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<td>Electronic Spills</td>
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<td>Ensure Strategic Awareness and Communications</td>
<td>% Available Mission Critical Field Team Positions Filled</td>
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<td>Execute Technical Commitments as Promised</td>
<td>Customer Survey Overall Satisfaction Rating</td>
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<th><strong>Target</strong></th>
<th><strong>Results</strong></th>
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<td>Ensure Continuous Improvement</td>
<td>FY17 CPI Executive Planning Session Execution ($K)</td>
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<td>FY15 CPI Event Validations ($K)</td>
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<td>Meet Commercial Acquisition Objectives</td>
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<td>% Single Bid Contracts</td>
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<td>% of Contract Obligated Funds Awarded to Small Business</td>
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<td>Foster Innovation and Collaboration</td>
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</tr>
<tr>
<td>Number of New Partnership Agreements Established</td>
<td>55</td>
<td>126</td>
</tr>
<tr>
<td>Optimize Internal Investment Portfolio</td>
<td>% Division Overhead Allocated to Internal Investment Program</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Employee Perspective</strong></th>
<th><strong>Target</strong></th>
<th><strong>Results</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruit and Retain High Caliber Workforce</td>
<td>End Strength</td>
<td>3219</td>
</tr>
<tr>
<td>Planned Attrition</td>
<td>172</td>
<td>179</td>
</tr>
<tr>
<td>External Hires</td>
<td>263</td>
<td>242</td>
</tr>
<tr>
<td>Retention Rate: 5+ Years</td>
<td>90%</td>
<td>87%</td>
</tr>
<tr>
<td>External Awards Participation</td>
<td>7%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Employees with Advanced Degrees (Total Workforce)</td>
<td>30% Masters; 6% PhDs</td>
<td>32%</td>
</tr>
<tr>
<td>Scientists and Engineers with Advanced Degrees</td>
<td>37% Masters; 7% PhDs</td>
<td>28%</td>
</tr>
<tr>
<td>Train and Mentor Workforce in Mission-Critical Competencies</td>
<td>% Investment allocated to New Professionals</td>
<td>15%</td>
</tr>
<tr>
<td>% of Employees that are non-compliant with DAWIA Field Certifications</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>% of Employees that are non-compliant with DAWIA Continuous Learning Points</td>
<td>0%</td>
<td>6%</td>
</tr>
</tbody>
</table>
These measures represent a small sample of Division Newport’s performance measurements.

- Target: $0.0
  - Results within performance parameters.

- Target: $792.8K
  - Results within performance parameters.

- Target: 75%
  - Results exceeded the target.

- Target: 100%
  - Results met performance parameters.

- Target: 90%
  - Results exceeded the target.

- Target: $14,000
  - Results exceeded the target.

- Target: 8%
  - Results met performance parameters.

- Target: 40%
  - Results met performance parameters.

- Target: 75%
  - Results exceeded the target.

- Target: 40%
  - Results within performance parameters.

- Target: 7%
  - Results exceeded the target.

- Target: 263
  - Results within performance parameters.
Salve Regina University Released Report on Division Newport’s Regional Economic Impact

During a press conference in May at Salve Regina University in Newport, Rhode Island, students of the university’s “Introduction to Econometrics” class unveiled a report on the economic impact of NUWC Division Newport on the state of Rhode Island. The report stated, “The direct spending of NUWC leads to the creation of jobs and income generated throughout the Aquidneck Island community as well as the state of Rhode Island. NUWC’s expenditures, through contractors and employees’ salaries, extend into local communities and the state through day-to-day spending, resulting in further jobs and incomes being created.”

Among the highlights of the student study’s findings were that Division Newport:

- Generated an estimated 32,243 jobs in Rhode Island after applying all ripple effects of spending using direct and indirect effects; this amounts to 5.8% of total jobs in Rhode Island.
- Created approximately $708.6M in income for Rhode Island.
- NUWC created $801M in total value added to Rhode Island.
- Provided 3,135 high paying jobs with an average salary of $103,186.
- A total of 2,490 of NUWC’s employees hold at least a bachelor’s level degree; of these 2,490 employees, 993 (40%) hold advanced level degrees.
- Average employee age is 47.
- The total economic impact NUWC has on Rhode Island including visitors is $825M.

2,980
Division Personnel Reside In:
(Actual as of 9/30/17)

*Includes all detachments
To effectively operate in a dynamic environment, Division Newport must remain agile and flexible while providing innovative solutions for our customers. The command’s focus throughout 2018 will continue to emphasize the Strategic Guidance, which aligns Division Newport goals and objectives with higher-level Navy guidance. Our diverse team of world-class professionals will continue to optimize the speed, agility, and rigor of our technical and business processes to ensure Fleet readiness today and innovate for generation systems tomorrow. We will continue to make progress against the Navy’s Design for Maintaining Maritime Superiority and NAVSEA’s Campaign Plan to Expand the Advantage focused through the lens of our Undersea Warfare vision — Undersea Superiority Today and Tomorrow.

With increasing demand signals for our undersea warfare 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.