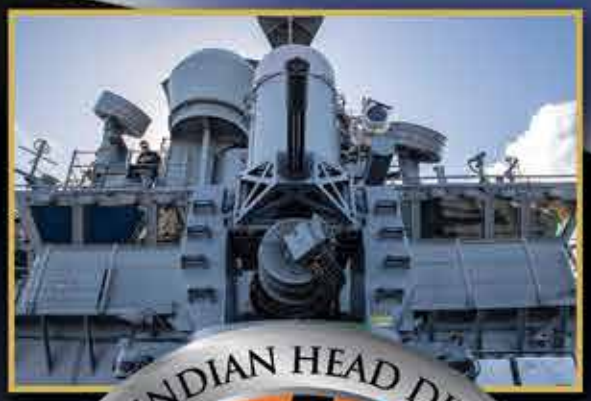
NAVAL SURFACE WARFARE CENTER
INDIAN HEAD DIVISION



NSWC INDIAN HEAD DIVISION
FLY FARTHER ★ HIT HARDER ★ SAVE LIVES

2020
YEAR IN REVIEW

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Command Mission: *To research, develop, test, evaluate, manufacture and provide in-service support of energetics and energetic systems. Provide Soldiers, Marines, Sailors and Airmen with information and technology to detect, locate, access, identify, render safe, recover, exploit and dispose of explosive threats.*

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GLOSSARY

ACIO	Associate Chief Information Officer
AX	Assistant to the Executive Manager for EOD Technology and Training
CAC	Common Access Card
CAD/PAD	Cartridge Actuated Device/Propellant Actuated Device
CBR-D	Chemical, Biological, Radiological Defense
CITE	Centers for Industrial and Technical Excellence
CO	Commanding Officer
Code 107	Property Management Office
COR	Contracting Officer's Representative
CRADA	Cooperative Research and Development Agreement
CREW	Counter Radio-controlled IED Electronic Warfare
CTO	Chief Technology Office
D&I	Diversity and Inclusion
D&I 3M	Diversity and Inclusion Maturity Matrix Model
DoD	Department of Defense
DON	Department of the Navy
DTRA	Defense Threat Reduction Agency
E	Systems Engineering
EEO	Equal Employment Opportunity
EOD	Explosive Ordnance Disposal
ERP	Navy Enterprise Resource Planning
EXU-1	Expeditionary Exploitation Unit 1
G	Systems Integration
HVAC	Heating, Ventilation, and Air Conditioning
IED	Improvised Explosive Device
IHU	Indian Head University
ISEA	In-Service Engineering Agent
IT	Information Technology
JPO	Joint Program Office
M	Energetics Manufacturing
MTAB	Military Technical Acceptance Board
NAVFAC	Naval Facilities Engineering Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply System Command
NEBO	NAVSEA ERP Business Office
NMCI	Navy/Marine Corps Intranet
NSF	Naval Support Facility
NSWC IHD	Naval Surface Warfare Center Indian Head Division
P3	Public-Private Partnerships
PEO IWS	Program Executive Office Integrated Warfare Systems
PHST	Packaging, Handling, Storage and Transportation
R	Research, Development Test and Evaluation Department
RDT&E	Research, Development, Test and Evaluation
SME	Subject Matter Expert
SOP	Standard Operating Procedure
SRM	Sustainment, Restoration, and Modernization
TD	Technical Director

COMMANDER'S ASSESSMENT

As I inevitably yet, reluctantly end my four-year tour with NSWC Indian Head, I wanted to take some time to offer some final reflective thoughts. To begin, I remember my very first Commander's Assessment for our inaugural Year in Review publication. Back in 2017, I ended my assessment, noting that we had overcome many obstacles in that year. I do not believe then, that anyone could have foreseen or imagined the perfect storm of 2020 and what this year would look like for our command, our Navy and our nation. That said, I draw strength in the words of the nation's 36th president, Lyndon B. Johnson, "There are no problems we cannot solve together, and very few we can solve by ourselves." This year we have undoubtedly faced many problems, both inside and outside our fence line and I believe that it is a true testimony that, in the midst of all that has been 2020, we as a team, as a family, and as a command have persevered and overcame. I believe we proverbially touched bottom, but pushed off purposefully and began a new trajectory — one that propels us intentionally forward.

Please do not mistake my words as glossing over the difficulties we faced together as a command and a nation. To the contrary, we need to see and confront our challenges fully and clearly. Undoubtedly, we have witnessed injustices, and our command is a microcosm of the political unrest and racial tensions to which we have borne witness. Add to that the global COVID-19 pandemic and this year is one for the history books. We have been rocked as a nation, shaken as a command and have sought to mete out the root of our issues. Individually and collectively, we have endeavored to remove our blinders, confront our biases, own our shortcomings and earnestly begin and continue the difficult conversations necessary to heal and rebuild. I believe that we are stronger as a command and never more so than when we work together. *There are no problems that we cannot solve together.*

On top of all of that, the necessary shutdown and deliberate restart of our energetics manufacturing operations was a Herculean undertaking. It was front and center in our Energetics Manufacturing Department, but clearly spanned the entirety of our command. Without question, this was our "schwerpunkt" — our main effort. This decisive action was necessary in order to unmask and confront where we, over decades, had unintentionally accumulated undue and untenable risk. In doing so, your undaunted dedication and unrivaled expertise was evident. I believe that our hard-earned progress and precious momentum is affirming. While much hard work remains, we are resolute because our cause is just.

Along with restarting our manufacturing operations, we continued to steadily take back ownership of our infrastructure with willful intent, a move that has allowed us to be more self-reliant in providing our critical needs and have more control and oversight on how we steward the assets with which we have been entrusted. We must and will continue to ensure that we are poised to meet the Navy's and our nation's needs.

Also noteworthy, in June the Secretary of Defense designated the Secretary of the Navy as the DoD Executive Agent for EOD Technology and Training. These new and elevated responsibilities somberly manifest with us. We are uniquely charged to provide decisively advantageous intelligence, information, technologies and capabilities to the joint EOD warfighters, 24/7, 365 days a year, anywhere and everywhere around the globe. In an era of great power competition, this is vastly important as it is EOD technicians that uniquely and critically enable joint force commanders with access, maneuver, protection and intelligence.

Despite a year of maximum telework, physical distancing and uncertainty, one thing has remained unchanged: our command's continued growth. We have onboarded more than 226 new employees. With them, new experiences, insights, perspectives and strengths are brought to bear as we move forward. Growing pains are a part of any successful experience, and together we have struggled well. The adversity and challenges we have faced over the last 12 months are not a shame on us; instead, it has affirmatively defined us in our response. Here and now, at this critical inflection point for our command, we are a stalwart team that has shown time and time again that we are indeed stronger together. *There are no problems that we cannot solve together.*

Our actions today and tomorrow define our future. We are at a critical juncture at the national level as the conversation about who and what we are is in the spotlight. What happens next in the story of Indian Head Division matters immensely. While the Naval Energetics Executive Committee and the DoD's National Energetics Plan assess the current state of our nation's energetics capacity and capabilities, we are clear and present, troop-leading the discussion. Never before have we had more at stake. Notwithstanding, I am clear-eyed. I am "all in" — betting on us, on our command, each and all of you.

By the time our Year in Review is released, I will have been capably and competently relieved by Capt. Correll. Please know that it has been my utter privilege to shoulder our difficult, necessary and important work alongside each of you these past four years. I am truly honored and deeply humbled to have been a part of our team, one with such a storied legacy. You inspire me, and I will expectantly watch with pride as Indian Head Division makes its destiny.

Capt. Scott Kraft
Commanding Officer
Naval Surface Warfare Center
Indian Head Division

STRATEGIC PLAN UPDATES

In 2014, NSWC IHD Technical Director Ashley Johnson challenged command senior leaders with a vision: By 2025, Indian Head will grow 400 work-years stronger by reshaping our industrial complex; capturing research, development, test and evaluation opportunities in energetic systems; and providing reliable, quality and affordable products and services.

Over the past six years, the command has made great strides in realizing those goals. For 2020, the command completed and implemented:

Goal 1: Modernize, restore and/or reshape IHD facilities, utilities and infrastructure to ensure mission achievement and fiscal sustainability.

1.1.1 River Water Fire Suppression System Modernization. The river water distribution system, which provides water supply to the explosive manufacturing area fire suppression systems, has gone beyond its useful life. Frequent piping failures occur, requiring emergency repairs that interrupt scheduled production operations. Substantial progress was achieved in 2020 in support of the replacement of exterior river water distribution piping. Design is in progress, and construction funding ($9.6 million) has been approved for 2022, in support of replacement piping within the Extrusion, Trident and Agile Chemical Plants.

1.1.2 Compressed Air System Modernization. The air compressors and piping distribution system, which provide the compressed air needed for systems operations in the explosive manufacturing areas, have gone beyond their useful life, resulting in the degradation of the quality and quantity of compressed air supplied. Substantial progress was achieved in 2020 in support of upgrading the compressed air plants with $4.5 million in construction funding. Four new electric air compressors were installed and commissioned in May, as well as two new diesel air compressors, totaling more than 15,000 cubic feet per minute of dry air, which improved both reliability and resiliency of the compressed air system.

- **1.1.3 Electrical Distribution System Modernization.** There are approximately 67 miles of overhead electrical distribution lines supporting command operations at Indian Head. Equipment condition and encroachment of trees have negatively impacted electrical service. To improve system reliability, major tree trimming activity was conducted in 2020. Additionally, an electrical distribution privatization study and business case analysis were initiated in 2020 to determine feasibility for a private company to assume responsibility for the maintenance and infrastructure improvements of the distribution lines. This study and analysis will be finalized in 2021.

- **1.1.4 Potable Water Distribution System Modernization.** The potable water distribution system, which provides required fresh water supply to the administrative and manufacturing areas, has gone beyond its useful life. Frequent piping failures have caused emergency repairs, which interrupt scheduled production operations. Military construction funding totaling $55 million for energy resilience and conversation investment was approved to support design and construction activities. Site surveys are complete, design is in progress for completion in 2021, and construction activity is expected to be initiated in 2022.

- **1.1.5 Communications System Modernization.** Significant work continued in 2020 to keep pace with increasing need for telephone, computer, control systems and security systems support. More than 10 buildings had 1,200 new pairs of copper feeders installed, with additional capacity provided for several more buildings. At Stump Neck Annex, a new 200-pair copper feeder was run to the front of the installation to provide additional capacity. Fiber runs were also provided for several buildings, computer systems and the Lenel systems. Building rewiring was completed as part of ongoing construction projects for four other structures as well.

- **1.1.6 Preventive Maintenance Program for Utilities.** Development of a comprehensive NSF Indian Head preventative maintenance program for utilities was initiated in 2020 with significant progress achieved regarding the electrical grid. A basewide electrical study to collect all inventory data and import into the Maximo Inventory Management program is ongoing and expected to be completed next year. The emergency generator program was updated and is now in operation.

1.1.7 Road System Repair and Maintenance. The Indian Head road system consists of approximately 127 miles of paved and unpaved roadways that must continuously handle the safe operation of explosive manufacturing and transporting activities. During 2020, an extensive roadway condition survey was completed for all roadways supporting the manufacturing operations to drive future service requests. Additionally, prioritization coordination meetings led to immediate repairs of significant roadway deficiencies during the year.

1.1.8 Organic HVAC Ducted Split System Maintenance. Maintenance continued in 2020 on HVAC systems within the production, manufacturing and research facilities at the command. Command leadership has also approved the completion of a facility conditions assessment in 2021, which will inventory and complete an engineering assessment of the HVAC equipment assets in support of replacement planning, preventive maintenance plan validation and improvement.

- **1.1.9 Energy Savings Performance Contract (ESPC).** NSWC IHD and NAVFAC partnered in 2020 to support the initiation of an ESPC. The ESPC, which has an estimated opportunity of $50 million to $100 million, will provide needed upgrades to NSWC IHD facilities, utilities and processes to increase resiliency, reliability and efficiency for the long term. Progress in 2020 included statement of work development, acquisition planning, contractor site visits/orientation and contractor proposal evaluations.

- **1.2.1 Explosive Safety Compliance.** The command is improving explosive safety by siting (fully describing hazards associated with an explosive operating building) in accordance with NAVSEA directive OP 5 Volume 1 Ammunition and Explosives Safety Ashore by Dec. 31, 2021, and approved by the DoD Explosives Safety Board. The command has 429 explosive facilities: 290 facilities have a site approval with another 139 facilities waiting to be site approved. Of the 139 explosive facilities that require site approvals, 59 site approvals have been submitted to Naval Ordnance Safety and Security Activity, 31 site approvals are in progress and 49 facilities are awaiting action.

- **1.2.4 Annual Business Viability Assessment.** The command is on the eighth annual financial execution analysis of its industrial, engineering and support complexes. This break-even analysis assesses the annual revenue and costs for each complex to determine the complexes' contribution to the overall command net operating result. Based on this analysis, along with available workload (demand), the assessment team assessed the financial condition and health of each complex to identify measures to improve their financial viability. The team continued to refine the analytics to assess cost and revenue trends. The team also added two new complexes, and performed a deep dive on one complex. Due to a major reorganization of that complex, the deep dive mostly focused on the accuracy of the fixed costs data.

1.2.6 Divest Excess Contaminated Buildings/Equipment. This initiative is the command's five-year-plan to reduce risk regarding environmental impact, explosives safety and cost reduction through footprint reduction. The command spends more than $3 million annually to complete these efforts. The command's manufacturing operations recently went through an operational pause to improve safety. A side benefit of this process was the support of restarting 14 buildings through decontamination/ cleaning of exhaust ventilation systems as well as support for SRM and capital investment programs. From these cleanings, the command generated 141,560 lbs. of scrap metal for recycling.

1.3.5 Project Review, Development and Prioritization. The NSWC IHD Infrastructure Division completed a projects data call for all departments and received investment board approval to complete 62 SRM projects in 2020. Close coordination with NAVFAC achieved a significant improvement in projects execution with a 96% project execution rate for a value of $32 million. The Infrastructure Division also developed and used a new project prioritization methodology for next year's 33-project SRM program.

- **1.3.6 Construction Contracting Authority.** In 2020, the command began using new authorities for construction contracting to speed up repair and maintenance. The command's Contracts Department executed emergent funding efforts in construction facility support. These efforts have allowed the command to conduct tasks such as mold remediation, steam line repairs, lead abatement, and urgent facility maintenance and cleaning related to the COVID-19 pandemic. Many of these efforts have supported immediate contractor mobilization to facilitate repairs necessary to reengage and restart work in affected areas on base.

- **1.3.7 Industrial Complex Internal Maintenance Capability.** The Infrastructure Division provided maintenance services for explosive areas in 2020. Systems supported included grounding, bonding and lightning protection; fire suppression and fire alarm systems; HVAC; and safety showers.

- **1.3.8 NSWC IHD/NAVFAC Interface Review and Improvement.** The Infrastructure Division established a close working relationship with NAVFAC leadership, which resulted in improved project and service ticket execution in 2020. Coordination meetings with the public works officer, deputy public works officer, and directors from the facilities, engineering, acquisition and production divisions, have served to identify the command's priorities for NAVFAC execution. A significant number of M Department facilities' deficiencies were resolved through the prioritization of work service tickets.

Goal 2: Establish Public-Private Partnerships (P3) to enhance energetic materials and systems to support the fleet.

NSWC IHD is actively engaged with private industry partners to enter into P3 under CITE designation and to execute partnership work for those P3 partnerships that have been finalized. To date, the command has entered into five P3 agreements with one new partnership in 2020. There is ongoing discussion regarding possible partnerships with several other ordnance companies.

Goal 3: Develop new products and services across IHD core competencies to support strategic investments and to transition advanced warfighting capabilities.

- **3.1 Conduct market research and analysis of warfighter demand signals to identify new business opportunities.** The team focused on improvements to their digital tools, which included the IHD Market Framework, Business Opportunity Lifecycle Tool and the Market Analysis and Strategy Tool. Chemical, Biological and Radiological Defense was also added to the modules.

- **3.2 Conduct analysis of emerging technology applications to identify new business opportunities.** The effort continues to see successes with over $500,000 for labor in support of small business innovation research; $200,000 in EOD technologies; a new anti-viral face mask project; and three potential new starts with Mistral Inc. in EOD technologies, improved PHST and new warhead development.

Goal 4: Establish IHD as the energetic materials and systems provider of choice to protect the Navy's intellectual capital while expanding delivery of core products and services.

- **4.1.2 Streamline Material and Services Acquisition.** NSWC IHD awarded a $40 million, five-year, multiple award contract to provide the command with hardware from machine shops and electronic fabrication houses. The contract supports the following task areas: production hardware, research and development hardware, inspection services, electronics assembly, additive manufacturing, and advanced machining. This contract will reduce procurement acquisition lead times for critical NSWC IHD programs. Delivery orders will be awarded based on a lowest price technically acceptable basis.

Goal 5: Invigorate interest in energetics to promote new RDT&E investment and the consideration of advanced energetics options within the capabilities development and acquisition process.

- **5.1 Execute a key stakeholder engagement plan.** Objective 5.1 is focused on developing and sustaining the communications necessary to grow the Indian Head science and technology workload. Those goals were met and the objective is now complete. Future efforts are focusing on the new Energetics Futures Integrated Product Team to share (internally and externally) the message of the command's Energetics Renaissance, as well as the command's support to the Office of State Department National Energetics Plan and Naval Energetics Executive Committee.

- **5.2 Create, resource and sustain and advanced RDT&E program.** Technology, scouting, forecasting and influencing is ongoing. The Scouting SharePoint site continues to be a repository of technology findings and is used for R, E and M Departments to jumpstart proposal writing. The pandemic stifled efforts to continue the wargaming successes of 2019 but the team is ready to restart in 2021 using lessons learned and following wargames happening across DoD.

- **5.3 Utilize an innovation lab to engage energetics development, external partnerships and develop expertise.** Objective 5.3 was completed in the second year of the command's strategic plan. The Velocity Lab is fully operational. Updates include:
  - Added a deputy innovation officer and hired a new facility support staff member.
  - Continued to execute on a rolling admission basis (applications for funding can be submitted throughout the year).
  - Continued new transitions for external direct work.
  - Collaborated with the College of Southern Maryland Velocity Center in the Town of Indian Head, Maryland.

People Supporting Plan: Ensure Indian Head's workforce is properly informed, aligned, trained, engaged, motivated and rewarded.

- PE.1.2 Building Alliances with the Warfighter: The PE.1.2 team completed planning to build alliances with the warfighter. Those recommendations are:
  - Meet the Warfighter (daytrips)
  - IHD Product/Process Videos
  - Scientist to the Sea Program
  - Workforce/Warfighter Profiles
  - Faces within Spaces

- PE.2 Champion Internal Communications: The PE.2 team wrapped up focus groups with employees and supervisors in January. There were five focus groups conducted in an effort to better understand communications challenges and successes from across the command. The same questions were then used for the M Department focus groups held during the early part of the department's shutdown providing a consistent data set for the command. In August, information prepared by the PE.2 team was also used in the M Department-specific communications plan because many of the communications issues found in M Department are also prevalent in other areas of the command. M Department developed a monthly newsletter for their employees, which is printed and put in breakrooms so those employees who work in the plant have easy access to important command information. The command is also installing digital signage in the M Department breakrooms so employees are able to watch command videos and livestreams, as well as get quick snapshots of command information. PE.2 was put on hold once the pandemic started, but the valuable information the team researched and prepared is being used in the command's efforts to improve the culture at NSWC IHD.

- PE.3.1 Establish a Process to Anticipate Organizational Staffing Needs: The PE.3.1 team determined the NAVSEA Headquarters Workforce Analysis Capabilities Suite is the most appropriate solution for the command's needs. The suite is managed and maintained by NAVSEA HQ. The team maintains contact with the system program manager to continue access, test reports and options for implementation. Once the system has progressed to a level ready for execution, the team will develop an implementation plan.

- PE.3.2 Establish an Efficient and Effective Hiring Process: Process improvements made to the command's recruitment and appointment submission process have reduced hiring timelines by making requirements clearer to managers that has, in turn, improved the quality of the packages received for action. The most recent hiring metrics show the command's average hiring cycle time is 82 days, and both its direct hire and merit promotion hiring (the majority of hiring actions) averages are well under 80 days. The command has also taken over facilitating the employee seating process, working with ACIO/IT Division, the Security Division and the CAC Office to speed up the process to get new hires their NMCI accounts and CACs. The command has completely revamped the process and is working towards the HQ goal of having all employees "seated" within five days of starting.

- PE.3.3 Create a Culture of Inclusion: The PE.3.3 team completed the D&I Maturity Matrix Model (3M) pilot project kicking off in January with 30 members from across the command. The pilot team met in person twice more and switched to Microsoft Teams for the last meeting. Training was developed by the command's D&I Program Manager on the topics of D&I 101; unconscious bias; micro-aggression; generational awareness; race and racial identity; gender; and the D&I 3M path forward. The pilot was a success and provided several recommendations: suggested mandatory D&I training; 20 local developed questions and 10 short answer questions for DEOCS; mandatory exit interviews/data analysis; and starting the "Hello" campaign. Fiscal year 2020 funding for the training was not secured, but the remaining recommendations are going forward.

PE.4.1 Establish Indian Head University: IHU continues to grow in the colleges of Business, General Studies, Leadership and Technical. Updates include finalizing the certification pages, developing the Science & Engineering Rotation Tool and developing the Academic Tuition Assistance Program tool. During 2020, IHU held more than 20 virtual group trainings and 220 course sessions, and had 2,600 enrollments.

Process Supporting Plan: Provide fast, rigorous, repeatable, accurate and safe work systems.

- PR.1 Tech Rigor – See separate technical rigor section for a full update.
- PR.2 Business Rigor's effort for the acquisition pillar hired the command's first Acquisition Pillar Campaign Office Officer in Charge, Lt. Cmdr. Christopher Herrera, through the Navy's Active Duty Operational Support program. The pillar team is focusing on four initiatives:
  - Piloting Technical Acquisition Specialists (TAS) – The pilot program created the position description and hired the first TAS for M Department. The goal is to assist requirement generators to allow technical personnel to focus on technical tasks.
  - Expand – Established a virtual shop store at the command's McAlester detachment and a new Code 107 process, "Team MAC," providing a dedicated team for urgent McAlester material requests that support fleet readiness needs.
  - Bring back ServMart – Joint Base Anacostia-Bolling Base Supply Center is working with our Code 107 personnel to obtain commercial items via various existing contracts from Home Depot, Lowe's, Grainger, etc., with some retailers offering next day free deliveries. If successful, many of our day-to-day needs will be solved with this teaming arrangement. A similar arrangement is being explored with one of the Base Supply Centers in San Antonio for McAlester.
  - Purchase card process improvement – Contracted with FranklinCovey to support the process improvement efforts using The 4 Disciplines of Execution®.

In January, the Acquisition Pillar team met with the newly-hired command's first Acquisition Pillar Campaign Office Officer in Charge, Lt. Cmdr. Christopher Herrera (center right). From left to right: command Business Director Chris Adams, Acquistion Management Specialist Athena Jones, Contracts Department Head Renee Brown, Acquisition Pillar Campaign Director Kent Hibben, Herrera and Contracts Department Deputy Beth Hoover.

STRATEGIC LOCATIONS

Employees*
2,297

Crane, Indiana: 3 civilians
- *Design and construct portable armories*
- *Provide automation for front gates*

Indian Head, Maryland (two sites): 1,850 civilians, 54 military
- *NAVSEA Center of Excellence (CoE) for Energetics*
- *DoD EOD program lead*
- *Expeditionary Exploitation Unit 1 (EXU-1)*

Ogden, Utah: 21 civilians
- *Co-located at Hill Air Force Base*
- *CAD/PAD Air Force Integrated Product Team*

Picatinny, New Jersey: 270 civilians, 1 military
- *Located at Picatinny Arsenal*
- *Joint CoE for Guns and Ammo*
- *Systems Integration (G) Department*

Camp Pendleton, California: 6 civilians
- *Demonstration and Assessment Team*

Norfolk, Virginia: 23 civilians
- *Located at Naval Weapons Station Yorktown*
- *Demonstration and Assessment Team*

Rock Island, Illinois: 5 civilians
- *Quad Cities Cartridge Case Facility*

Louisville, Kentucky: 16 civilians
- *Naval Guns*

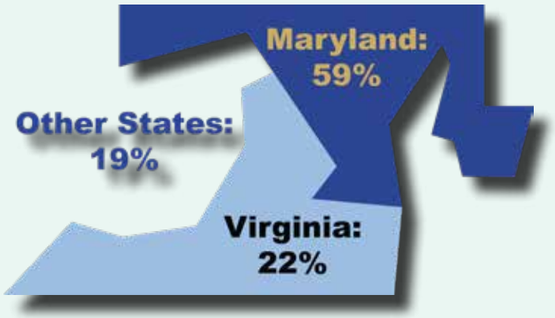
McAlester, Oklahoma: 45 civilians
- *Located at McAlester Army Ammunition Plant*
- *Navy Weapons Division*

NAVSEA
WARFARE CENTERS
Indian Head

** Contractor numbers not included*

ECONOMIC IMPACT

Where We Live



NSWC IHD Total Maryland Payroll

$260 MILLION

FY19 Maryland Contract Dollars

$33.8 MILLION

County-by-County Employee Breakdown (Maryland)

Charles County	**70%**
Saint Mary's	**12%**
Prince George's	**9%**
Calvert	**3%**
Anne Arundel	**3%**
Other	**4%**

COMMAND'S COVID-19 RESPONSE

Command scientist aided in producing hand sanitizer with Blue Dyer Distilling Company in Waldorf, Maryland. Personalized bottles of the hand sanitizer, along with a reusable cloth face covering and a note from NSWC IHD's commanding officer, were given to each department to keep employees safe and healthy when returning to work during the COVID-19 pandemic.

R Department scientists, along with colleagues from the EOD Department and Public Affairs Office, bottled, packaged and dispersed personal care packages to distribute throughout the base and NSWC IHD's other strategic locations.

In 2020, the command was faced with how to continue the mission while ensuring all employees were safely able to complete work in the face of the COVID-19 virus. Employees created more than 2,500 face coverings and several of the command's departments worked together to help produce, package and distribute hand sanitizer and face coverings throughout the spring and summer.

R Department employee Anthony Knott affixes a label to a bottle of hand sanitizer.

EOD Department Technology Assessment Branch employee Elizabeth Orozco and R Department Chemistry Branch employee Stephen Stiles work together to fill bottles of hand sanitizer during the early days of the COVID-19 pandemic.

Employees from across the command created face coverings for their co-workers, cutting, pressing and sewing to create more than 2,500 units for their fellow employees.

In January, the command hosted its second wargaming event. This pilot program incorporated lessons learned in the first wargame pilot from October 2019 — allowing another group of scientists and engineers from multiple NSWC IHD departments to experience wargaming techniques and to develop concepts for technology solutions for future operational needs.

In response to the COVID-19 pandemic, NSWC IHD employees processed multiple fund documents to award an additional $7 million onto an existing contract for procuring more COVID-19 and respiratory panels for the fleet's Next Generation Diagnostic Systems in March. With the number of cases of personnel diagnosed with COVID-19 rising daily, the demand signal drove the need for a higher number of assays to be immediately delivered. The command's CBR-D Division shipped the equipment ahead of schedule to role 2/3 ships such as carriers, large deck amphibious and hospital ships. The CBR-D Division, NSWC IHD Contracts Department, NSWC IHD Comptroller, NAVSEA Comptroller, contractor and program offices worked diligently to ensure successful execution within one day. ◆

In April, personnel from NSWC IHD's CBR-D Division, Virginia Tech and Carilion Healthcare met at the school's corporate research center to test a modification of the Stryker Flyte System used by medical professionals in the treatment of COVID-19 patients. The Stryker Flyte System is a two-part protective ensemble consisting of a reusable helmet with a top-mounted fan paired with a single-use garment comprised of a breathable viral barrier and an integrated face shield known as a Toga. "This command is finding unique ways to adapt our technology and resources to aid in the fight of the COVID-19 pandemic," said TD Ashley Johnson. "It's critical that we continue utilizing these resources and relying on the expertise of our personnel as we continue to adapt to this challenge. I'm proud that we are continuing to think outside of the box in finding ways to support both the community and the fleet in this fight." ◆

NSWC IHD signed a Navy CRADA with Blue Dyer Distilling Company in Waldorf, Maryland, on April 6, allowing the two organizations to combine their efforts to speed up the release of hand sanitizers for those who need it most, namely emergency personnel and first responders. The distillery saw that they could fill an essential niche in their community when they pivoted their operations from the production of spirits to the creation of this much-needed product.

The CRADA allows for Blue Dyer to receive raw materials produced at the command for use at their distillery to produce the hand sanitizer. The agreement was valid for six months, with the potential for further time added based on need. The distillery produced more than 200 gallons of sanitizer, which were delivered to more than 30 state, local and government agencies, including law enforcement personnel and other emergency services.

On July 10, Cmdr. Edgar Britt relieved Cmdr. Matthew Myers as commanding officer of EXU-1 during a change of command ceremony onboard NSF Indian Head. EXU-1 was established in 2006 as a detachment under NSWC IHD. In 2017 the Secretary of the Navy approved the establishment of EXU-1 as an Echelon V command, culminating in a formal establishment as a standalone command in 2018, with Myers serving as its first CO. EXU-1 leads NSWC IHD's mission to collect, process, exploit and analyze improvised and conventional weapons, ordnance and components; and to provide near real-time technical intelligence to tactical commanders, the EOD community, service components, the DoD, national-level intelligence agencies, and allied and partner nations. EXU-1's dedicated professionals are forward deployed in seven foreign countries and one U.S. territory, covering exploitation requirements in the U.S. 5th, 6th and 7th Fleets. Though modern capabilities have evolved since the early days of Operations Enduring Freedom and Iraqi Freedom, the mission remains the same, "Defeat the Device, Attack the Network and Train the Force."

In July, the command received authority to establish the Naval Energetic Systems and Technologies Other Transaction Agreement (OTA), allowing the command to enter into a contract outside Federal Acquisition Regulation with nontraditional defense contractors. The OTA allows NSWC IHD the ability to establish a consortium reachable by anyone within the command and its sponsors for prototyping. As long as the command or partnering agency meets operational requirements, no further competition is needed and can include follow-on, noncompetitive contracts. Several of the technology areas addressed by the OTA include energetics, fuzing safe-and-arm systems, warheads and other technology-specific areas unique to the command. Once the prototype is tested and meets the specific requirements, the government agency can then buy it directly from the customer. ◆

On Sept. 1, the command received Office of the Chief of Naval Operations approval for its name change. On Sept. 21, Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division officially announced its new name, Naval Surface Warfare Center Indian Head Division. The name change reflects not only an alignment with its other warfare center counterparts, but also better represents the broader scope of activities at the command. The command was the only warfare center to include a function in its title, a result of the 2013 merger of then two separate Warfare Center Divisions (Indian Head and EOD Technology). Each of the other nine warfare centers are named only after their geographic location. The command completed the name change on Sept. 27, which included changing its name in official capacities as well as personnel records. The command will continue making updates to internal documents and directives during normal document updates this fiscal year and beyond. ◆

NSWC IHD Graphics Specialist Matthew Getz positions the new command logo in the Video Teleconferencing Center after the command name change.

On Nov. 25, NSWC IHD CO Capt. Scott Kraft and TD Ashley Johnson hosted their last livestream event together that would be Kraft's farewell from the command. In a humorous and often poignant send-off, Johnson shared fond memories of the four years spent working together. A video compilation from employees and departments around the command spoke of Kraft's dedication, kindness and leadership. A visibly moved Kraft was presented with mementos to remember his time serving at NSWC IHD.

On Sept. 17, the command officially announced the signing of a Title 10, United States Code, section 2474, Public-Private Partnership with Global Military Products Inc. Under this 20-year agreement, NSWC IHD and Global Military Products Inc., a subsidiary of Global Ordnance LLC, will jointly develop, qualify and manufacture energetic materials and ordnance systems meeting current and future warfighter needs. Partnership manufacturing activities will be performed in existing industrial plant complexes at the command and will help to sustain key energetics manufacturing capabilities of NSWC IHD while providing safe and effective energetic solutions to the warfighter. NSWC IHD received CITE designation in May 2014 for depot maintenance and military arsenal activities. This designation provides the legal authority for NSWC IHD to enter into P3 agreements for the development, manufacture, test, maintenance, and storage of energetic materials, and ordnance systems. ◆

On Oct. 1, the EOD Department implemented a new organizational structure that will offer greater service, material support and flexibility to the warfighter. The EOD Department mission is to develop and deliver EOD knowledge, tools, equipment and lifecycle support through an expeditionary workforce that exploits technology and information, enhances the technical intelligence process, and provides expertise that meets the needs of the DoD EOD community, combatant commanders and our interagency partners. Three new functional divisions will ensure the department's mission success. ◆

On Dec. 16, Capt. Eric C. Correll (bottom) relieved Capt. Scott H. Kraft (top) as commanding officer of NSWC IHD during a change of command ceremony at the College of Southern Maryland's Velocity Center in Indian Head, Maryland.

Kraft reported as CO in December 2016, and led his workforce to accomplish the command's mission to provide energetic materials and systems research, development, test and evaluation; manufacturing; and systems integration. As CO and deputy executive manager for EOD technology, he championed strategic initiatives to expand the technical mission in support of national security objectives and enhanced the warfighting capabilities, effectiveness and safety of joint EOD warfighters.

The Information Management Division (D1) facilitates the success of DoD EOD technicians by developing EOD procedures and technical information, providing reach-back capability, countering explosive threats and disseminating EOD knowledge to the fleet, field and flight. ◆

The EOD Systems Division (D2) provides targeted subject matter expertise via research, development, prototyping, testing, evaluation, lifecycle logistics and systems engineering support of integrated solutions that meet the needs of the EOD and force protection communities and our interagency partners. The division works seamlessly with the Battle Lab Division to move solutions that are identified as capable of meeting users' needs during Battle Lab evaluations into programs of record, configured items or commercial systems with contractual and logistics support. ◆

The Battle Lab Division (D3) leverages government agencies, industry and academia in the areas of applied research and technology assessment in an adaptable, measurable, and rapid approach to meet urgent needs at home and abroad. The division conducts experimentation, demonstration and assessment of existing and emerging technology in an operational environment; engages EOD, DoD and interagency partners in operational force integration and engagement; and conducts cybersecurity analysis and validation to ensure confidentiality, integrity, and availability of systems, networks and data. ◆

TD Ashley Johnson's Strategic Thinking as a Fundamental Element of Leadership class took part in their final class and graduation on Oct. 16.

Command employees (left to right) James Young, Samantha Gray, Christina Spencer and Carl Brothers participate in a group discussion during TD Ashley Johnson's Strategic Thinking as a Fundamental Element of Leadership class. The stated purpose of the course is to build a cadre of strategic thinkers at the command who can link the national or defense strategy to the kinds of capabilities NSWC IHD brings to that table to address complex problems that do not have fully scientific or analytical answers, but which energetics and energetic material systems can help solve.

The Project Management Pillar team worked closely with project managers and managers across the command to ensure all projects have data inputted into the Project Execution Tool (PET). They are also rolling out the Project Management Health Assessment. The health assessment serves as a checklist at each project phase of execution. Project managers will update their health assessment record each month when they update their PET records. The pillar team will validate approximately three health assessment records each month. This equates to a minimum of 60% of the projects each fiscal year. The validated results will be rolled into the command's technical rigor performance metrics. ◆

In March, the Safety Pillar team conducted an Enterprise Safety Applications Management System (ESAMS) rapid improvement event to streamline the ESAMS process, improving the way deficiencies are corrected and allowing operational supervisors to focus on deficiencies that affect the mission. In 2020, the SOP guidelines were revised and expanded to include all departments, not just M Department as in the past. Training for the new SOP guidelines will be developed and provided in 2021. ◆

Capt. Scott Kraft, AX team members and the MTAB meet off-site to bid farewell to Maj. Aaron Foist, the U.S. Army MTAB member.

The NSWC IHD hazard analysis instruction was updated to better reflect higher level guidance. The Safety Pillar team coordinated review of the instruction with their departments. The team also began developing multiple online tools to support Indian Head's efficiency during maximum telework status. The Safety Pillar team continues to work towards a new configuration management process for safety documents for tooling drawings, building site diagrams, site spill plans, hazard analyses and safety review committees. ◆

The Systems Engineering Pillar team developed and released the command-wide Systems Engineering Policy Instruction. The team also developed and released a command-wide personnel qualification standard for Technical Data Package Proficiency. Through the Systems Engineering Pillar, the Energetics Futures Integrated Product Team was formed in October. This cross functional team will help coordinate and manage Indian Head's involvement in two very high visibility efforts moving forward. ◆

The Quality Pillar team has developed and implemented a Total Workforce Management Services-based Quality Basic and Customer Care Training guide. This training is intended for all personnel as a one-time training to understand why quality is important, what the IHD's Quality Management System is and how the system is tied to International Standard for Quality Management Systems (ISO 9001:2015). An action tracking tool for corrective and preventive action tracking was purchased and will be rolled out with training in 2021. ◆

The Naval Innovative Science and Engineering (NISE) program, administered through the CTO, continues to provide significant and essential value to NSWC IHD, allowing the command to perform innovative basic and applied research, transition technologies into operational use, and develop its workforce to improve our ability to recruit and retain highly skilled scientists and engineers. NISE/Section 219 work focused on increasing the performance of weapons, and ultimately platforms, by developing materials and equipment that both extends the range of weapons and increases their lethality. ◆

Safety Office Unsung Heroes (left to right): Roderick Spruill, Rachel Hardin, Anthony Brown, Larry Kijek, Robert Collins, Stuart Richman and David Carpenter. Not pictured: Chris Mikus

Development, integration and testing of a Safe and Arm (S&A) module were key highlights for RPG of the Sea, a joint project of NSWC IHD, NSWC Carderock and NUWC Newport in 2020. The testing series included NUWC Newport Water Tunnel flow measurements for the S&A Flow Sensor, open water tank testing to characterize impact accelerations and a demonstration of the complete fire chain with an inert warhead at NSWC Crane's Lake Glendora Test Facility. ◆

The Safety Pillar team built upon the system architecture from fiscal year 2019 and began the detailed system design of a platform and weapons agnostic S&A system for use in current unmanned aerial vehicles with current explosives. ◆

The CTO implemented a full-time Science and Technology Information Officer to focus on the technical release of data, documents and intellectual property. ◆

The JPO processed an average of 8,000 fleet requisitions and 200 funding documents, and managed more than 400 contracting actions. ◆

In 2020, there were several key milestones in Navy and CAD/PAD history; notably FY20 was the first fiscal year in naval aviation history without any Navy and Marine Corps fatalities. ◆

2020 was an active year for aircraft ejections, incidents and mishaps that CAD/PAD products supported successfully with four incidents reported involving nine aviators and nine aircraft. ◆

Ordnance Assurance and Safety Office personnel participated in numerous M Department Restart focus group efforts, with the Safety Office co-leading the Transportation focus group. Although the M Department restart efforts were front and center for the Safety Office, the office never lost sight of other critical support required to meet the NSWC IHD mission. The Safety Office continued to support organizations and operations, including the COVID-19 Crisis Action Team and Quad Cities Cartridge Case Facility start-up. ◆

The Safety Office launched the Great Safety Catch Campaign. These awards are a proactive rather than reactive way to bolster the command's safety program. The Safety Office received and approved more than 45 nominations for the Great Safety Catch Award. ◆

The Safety Stand Down 2020 theme was "Better Together," with an emphasis on teamwork. Due to COVID-19 restrictions, the annual all hands was not possible. Instead, Crystal Keys-Mason, David Carpenter and several other members of the Safety Team, narrated a video discussing important occupational safety and health (OSH) and explosive safety topics. ◆

Collaborating with NAVSUP Fleet Logistics Center Norfolk, the Safety Office coordinated over 500 hazmat and chemical locker assessments with the support of the command's department hazmat coordinators working group, completing a 100% locker assessment. ◆

The command's Picatinny Detachment Explosives Safety Officer Gary Best completed all 10 explosive safety self-assessment programs. He also reviewed and approved one SOP and participated in three explosive SOP validations. Picatinny's environmental compliance program underwent an inspection by the U.S. Army Picatinny Arsenal Environmental Performance Assessment System. U.S. Army Picatinny Arsenal is the detachment's host command. ◆

During the COVID-19 pandemic, the Code AX team met for a social-distanced team lunch.

The Safety Office reviewed approximately 83 SOPs, five ballistic test plans and one engineering procedure. Other services included providing assistance to develop several SOPs for the Infrastructure Division; attending over 40 pre-construction meetings; processing more than 300 hazmat Authorized Use List requests; conducting facility OSH and explosive safety inspections; and issuing over 920 safety work permits to identified hazards and mitigations. ◆

The Environmental Program underwent an inspection in June; the annual Maryland Department Environment inspection focused on the Resource Conservation and Recovering Act requirements. There were no findings. ◆

The Radiation Safety team was responsible for "100% accounted for" inventory of ionizing radiation-producing machines and sources. Using new technologies, they continued to provide radiation safety training to personnel during the pandemic. ◆

The department's Demonstration and Assessment Team (DAT) participated in an Unmanned Logistics Support – Air Joint Capability Technology Demonstration program, which conducted three integrated flight tests of TRV-80, TRV-150, Gilo Industries SkyFalcon and Malloy TRV-400 vehicles. The vehicles were tested at various locations, including Aberdeen Proving Grounds, Maryland; Harford Airport, Maryland; and the United Kingdom. The tests were in preparation for the Year 2 Technical Demonstration in August at Fort A.P. Hill, Virginia.

In 2020, the EOD Department DAT continued to support Naval Information Warfare Center Pacific with their modular autonomous robotics systems (MARS) project. MARS is a low-cost autonomous amphibious platform with an open architecture that can be leveraged by multiple developers to produce the needed algorithms for a heterogeneous multi-mission autonomous swarm of amphibious vehicles. It is an amphibious capability that removes the warfighter from high-risk first wave amphibious operations; increases speed to minimize vulnerability; and reduces cost, risk and time of manned beach assaults.

Members of EOD Department's Test and Evaluation Branch participated in exercise Arctic Edge 20 held in Juneau, Alaska, from Feb. 24 to March 3. Participation in the exercise was to assess an underwater remotely operated vehicle's (ROV) ability to accurately position and fire an EOD disrupter against targets in arctic conditions. ◆

The Technical Support Center team processed more than 4,000 requests for information (RFI), with an average of 288 per month. Inquiries included RFIs on IEDs; U.S. and foreign explosive ordnance; EOD equipment; CREW equipment; tactics, techniques and procedures development; and requests for NSWC IHD products. ◆

Test and Evaluation Branch employees conducted testing on commercial off-the-shelf chemical containment bags to evaluate their use as an improved method of containing leaking chemical munitions and improvised chemical devices. The purpose of this testing was to determine how well the bags met requirements established by joint EOD users statement of need. ◆

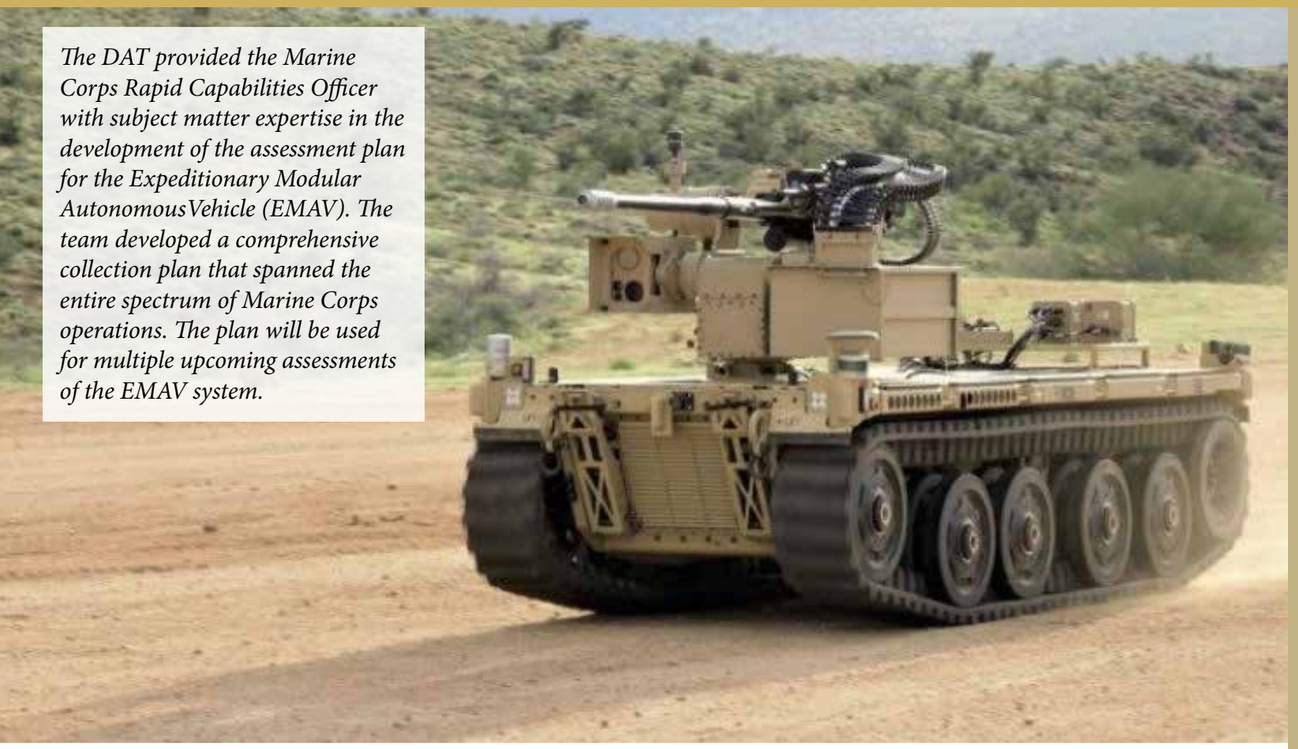
The EOD Department DAT, in support of the Office of Naval Research Information, Cyber and Spectrum Superiority program, provided venue/exercise coordination and acted as the independent assessor. The team provided SMEs, government and military liaisons, and venue coordinators during demonstrations and assessments. During March, the team provided the proper venue, radio frequency and GPS denial environment to both demonstrate and assess the capabilities in multiple emerging communication technologies. The goal of the project is to bring leading edge technology to the warfighter, with the end state of developing a handheld-sized device for warfighter usage supporting signal collections and adversarial positioning in all operational environments.

From January to June, the department's Electronics Exploitation Team completed firing energy discharge testing on two U.S. programs in support of EOD render safe procedure development. The team prepared target devices to assist in determining the success or failure of the EOD render safe procedure. In addition, the team completed electrical arming and firing evaluation of two foreign weapon systems. ◆

The Technical Support Branch and the FBI's Weapons of Mass Destruction Directorate are in active collaboration with both joint EOD and public safety bomb squads to build partnerships with funding sources and development partners. To date, this collaboration has yielded a partnership with the FBI research and prototyping IED defeat program and DTRA by providing EOD SMEs to help facilitate testing and tool prototyping. This collaboration has yielded procedures and equipment that will better prepare military and civilian bomb technicians to render safe explosive hazards at home and abroad. ◆

The department's universal test set/single laptop solution (SLS)/CREW team completed four engineering change proposals for the SLS program between January and June. The team incorporated the Panasonic CF-31 Mark 6 laptop into the current SLS baseline. In March and April, the team applied semi-annual security updates to the SLS baseline. It also completed multiple software updates associated with these proposals. In June, the team supported a version update for an Australian Department of Defense customer. ◆

EOD Department's International Program Office hosted 13 foreign visits to Stump Neck Annex from Australia, Canada, the Netherlands and the United Kingdom. ◆



The DAT provided the Marine Corps Rapid Capabilities Officer with subject matter expertise in the development of the assessment plan for the Expeditionary Modular Autonomous Vehicle (EMAV). The team developed a comprehensive collection plan that spanned the entire spectrum of Marine Corps operations. The plan will be used for multiple upcoming assessments of the EMAV system.

The EOD Department COR team managed 37 contracts in support of the department and joint EOD services with total obligated funding of $25.2 million from January to June and a total ceiling of $1.4 billion. The COR team supported the Anti-Terrorism and Force Protection Team, DAT multi-award contract, EXU-1 command and the NAVSEA enterprise-wide IT services contract. Additionally, the COR team supported the Expeditionary Missions Program Office on multiple contract vehicles ensuring mission success. The team also worked on follow-on contracts to be awarded in fiscal years 2020 and 2021 for technical services and management support. The follow-on contracts include supporting the FBI for the Mark 1 Robotics Shop, FLIR Systems Inc. identiFINDER, Mark 2 Talon Robotic Shop and a new contract in support of the U.S. Navy's Flexible Cyber-Secure Radio. ◆

The department's Foreign Military Sales Office executed 14 major shipments of automated EOD publications to eight partner nations. ◆

EOD Department's International Program Office processed and coordinated 13 foreign disclosure requests through the Deputy Director for EOD Technology and the MTAB. ◆

The Information Management Division produced nearly 400 advanced issue publications supporting the EOD warfighter, all while maintaining strict COVID-19 guidelines. ◆

The Acquisition and Technology Division fielded 224 SEEKERe handheld explosive and drug detection systems to 111 ships. ◆

EOD Department's Logistics Division provided critical shipping support for 26 foreign military sales cases. This involved the kitting and shipment in excess of 3,000 pieces of equipment to 12 countries. ◆

Forty-two FBI special agent bomb technicians took part in a two-day Man Transportable Robotic System Mark 1 training event at the Stump Neck Annex. Technicians in the Logistics Division and the Robotics Branch provided instruction and guidance for the operation and basic maintenance of the PackBot. The training was conducted by a corps of expert EOD robot technicians: Jimmy Brown, RIT Taylor, Nathan Massie and Warren Tibbs. The consensus from all who participated was that the PackBot units were going to be a major value-added to their repertoire of response mechanisms in the field. The training events for the FBI are under a robot loan memorandum of agreement and support agreement, with the overarching goal of providing robots to all 56 FBI field offices and training bomb tech operators at each field office. ◆

The department's DAT supported assessment of the Known Distance Automated Scoring with accuracy testing for the Marine Corps Training and Education Command and Marine Corps Systems Command-sponsored project that examined four automated scoring systems to replace current rifle range target systems. Objectives of the end-user evaluation were to identify annual rifle qualification time savings compared to the current method, identify range facility improvements required to support the systems, and determine maintenance sustainment costs. The three phases of execution included accuracy tests, controlled relay and course of fire evaluations.

Supporting the command-directed "Fenceline to Fenceline" assessment of all operations, maintenance and sustainment materials, the EOD Department Material Management Team conducted in-depth evaluations of its receiving, quality assurance, kitting, repair and shipping workspaces. The team was able to evaluate the mission effectiveness of materials from Underwater, Robotics, CREW, joint service EOD, Explosive Detection Equipment, Magnetometer and NAVSUP programs to determine their demand, availability and cost-effectiveness of warehousing. This effort resulted in approximately 8,050 items turned over to Defense Logistics Agency Disposition Services for reutilization where applicable. The team was also able to collect and sort over 22,700 pounds of scrap metal for recycling. ◆

In January, E Department project manager and engineer Jean Nelson (pictured right and second row, middle in the group picture) supported J.C. Parks Elementary School's Celebration of Science, Technology, Engineering, Arts and Math (STEAM). More than 300 students and guardians engaged in learning and hands-on activities for STEAM. Nelson demonstrated the EOD robot and its functions while discussing the different technologies needed to design a robot. She encouraged the students to enroll in as many science and math courses as they can so that they could become one of NSWC IHD's future robotic engineers.

Aerospace engineer Annmarie Shahan (right) joined her twin sister, Lt. Rachael Young, on a tiger cruise during the USS Abraham Lincoln's (CVN 72) final week of deployment at the end of January. "I got to talk to some of the pilots that were around in their Ready Rooms. We talked about CAD/PAD and how NSWC IHD supports them in their mission," Shahan said. "They were a little unfamiliar with this topic, thankfully, because these individuals had never had to eject from their aircraft. I think it was something they were still grateful for even though they didn't quite understand how it worked." Shahan said she learned a lot during the cruise, "It was all definitely worthwhile; and I have a greater respect and appreciation for our Sailors, and the work that NSWC IHD does to support their needs."

In March, CAD/PAD Fleet Support Team/Mishap Investigation Support Team Lead Nick Schombs discussed CAD/PAD technology with students during the annual History, Industry, Technology and Science Expo at St. Charles High School in Waldorf, Maryland.

The department's Energetics Systems Division, Systems Safety Branch reorganized in March to form the new Systems Safety Division. The division consists of three branches: Surface, Maritime and Marine Air-Ground Task Force Systems Safety. ◆

In April, at NASA's Neil A. Armstrong Flight Research Center (NASA Armstrong), E Department's JPO drafted and completed a Memorandum of Understanding (MOU) in support of the NASA Armstrong F-18 Aircraft and their Acquisitions and Logistics Branches. ◆

In May, the NASA Lyndon B. Johnson Space Center in Houston, Texas, along with the JPO and the Acquisitions and Logistics Branches, drafted and completed an MoU in support of both their Martin WB-57F Canberra tactical bomber and the Northrop T-38N Talon aircraft. ◆

Engineering authority for the F-35 CAD/PAD items was transferred from Lockheed Martin and BAE Systems to NSWC IHD. The command will work with the Joint Strike Fighter Program Office Escape System Lead Engineer to work on all technical changes in CAD/PAD sustainment engineering and their associated processes in maintaining the F-35 aircraft platform. NSWC IHD will also take a more active role in the ordnance assessment program, service life extensions, overall engineering changes as well as aircraft mishaps, engineering investigations and in-service discrepancy reports. ◆

CAD/PAD supported Naval Air Systems Command's (NAVAIR) Precision Strike Weapons Program Office with flight testing for two weeks in October at the Calspan Flight Research Facility in Niagara Falls, New York. The advanced aerial refueling store (AARS) is undergoing operational flight testing and will be deployed to the fleet aboard Boeing's carrier-based MQ-25 unmanned aircraft system to extend combat range of deployed F-18 and F-35. The AARS/MQ-25 marriage is being developed and tested in partnership with DoD contractors, including Science Applications International Corporation, Coherent Technical Services Inc., L3 Technologies and Boeing. Calspan provided a Gulfstream modified to carry an instrumented AARS-7 in-flight refueling pod and a modified Learjet 25 chase aircraft fitted with an in-flight refueling probe. E Department's Acquisition and Ordnance Assessment Branches supported logistics for the MD66 CADs used to sever and jettison the refueling hose in the event of an in-flight emergency. The In-Service Engineering Branch supported the arming and de-arming operations for the guillotine pre- and post-test flights daily.

Throughout 2020, E Department's Technology Development Branch supported the U.S. Army Kitting and Modification Team by preparing the technical data packages necessary to support acquisition and sustainment of the Apache Attack Helicopter (AH-64D/E) Underwater Emergency EgressSystem (UEES). The UEES is to be incorporated in all United Kingdom Ministry of Defence AH-64E and selected U.S. Army AH-64D/E squadrons operating in a littoral environment. The UEES reduces the underwater blast acoustic pressures to survivable levels. ◆

The Ordnance Assessment and Logistics Branch and the Technology Development Branch worked closely with NAVAIR's Specialized and Proven Aircraft Program Office on the F-5F and F-5N US16J seat upgrades. To date, seats for Naval Air Stations Fallon and Key West are complete, while Marine Corps Air Station Yuma seats were worked on as well. ◆

The Hybrid Product Support Integration (HPSI) team met prior to COVID-19 max telework at the CAD/PAD JPO to collaborate on an effort to map out, record and identify roadblocks in delivering a cartridge kit for the F-35B aircraft. The HPSI team is a comprehensive team of CAD/PAD sustainment experts from the command; Naval Support Activity Mechanicsburg, Pennsylvania; and the prime contractor, Lockheed Martin. The team executed a request received from Lockheed Martin for an F-35 cartridge kit in support of Marine Corps squadron VMFA-501 in Beaufort, South Carolina. The request required using existing systems and resources and incorporating them into the F-35 Global Asset Management process. The HPSI team delivered a cartridge kit to Marine Fighter Attack Squadron (VMFA)-501, identified roadblocks as well as opportunities for future development, and established the process for deliveries within the continental U.S. over the course of the four-day operation. The team also conducted live fire test for outside the continental U.S. deliveries. ◆

During Engineers Week in February, nine G Department employees shared STEM experiences and opportunities to more than 100 girls from local high schools as a part of Picatinny Arsenal's annual Introduce a Girl to Engineering event. Students asked questions on what drove interests in STEM careers, what to consider when deciding career paths and what STEM professionals do to support the warfighters. G Department also provided a special guest to speak with the students at the event — Lt. Joyce Kim from the U.S. Naval Academy New York/New Jersey Field Admissions office. Honored guests from the local chamber of commerce and state legislature also attended the event.

In January, G Department employees came together to celebrate their love for food and football with a Super Bowl LIV potluck meal and chili cook-off. The department enjoyed the food and fun, with Deena Zawisha reigning supreme as the chili cook-off champion.

In February, G Department close-in weapon system (CIWS)/SeaRAM ISEA members John Stansberry and Ian Weller completed installation of the SeaRAM system on USS Roosevelt (DDG 80). The system was installed ahead of schedule and on budget, ensuring the Roosevelt was able to conduct sea trials with this system as scheduled. This represents a significant upgrade in capability for this ship as well, with the Roosevelt now included in the six DDG hulls that have a SeaRAM system installed. ◆

In October, CIWS ISEA personnel attended a customer-sponsored Technical Management Team meeting in Tucson, Arizona, hosted by CIWS design agent Raytheon Corporation. This event gave Self Defense Systems Division personnel the opportunity to work with design agent personnel to improve the system use in the future and ensure that upgrades are able to be deployed and maintained. ◆

With max telework during the COVID-19 pandemic, G Department began a Wednesday Wins program in April to virtually connect to one another. Branches hosted after work virtual get-togethers, or designated a time to participate in virtual well checks. Despite the separation from their co-workers, employees were able to connect in a new way, learn more about each other and support each other through the worst of the pandemic. The department was able to celebrate news of babies and graduates, chuckle about new office settings and "co-workers," highlight volunteers making masks or helping at a shelter, and share some fun facts about the hobbies employees enjoy outside of work. ◆

G Department employees Alex Del Rosario, Jonathon Leonard and Starr Piazza participated in the command's inaugural D&I 3M Pilot Team from February to July. Race, protests, sexual orientation, gender identity/expression and ageism were just some of the hard topics the D&I 3M Pilot Team addressed during its term. The team conducted a five-month deep dive into these topics to help develop the proper way to roll out new initiatives across the command. (Pictured is Alex Del Rosario.)

Medium Caliber Guns Branch (G34) Mark 110 ISEA engineer Frank LoPresti and technician Forrest Malnar received the Coast Guard Meritorious Team Commendation, signed by Capt. T.D. Vance, commanding officer of the U.S. Coast Guard Cutter James (WMSL 754), for their critical contributions to the execution of the Combat System Ship's Qualification Trial. The commendation is dated Oct. 15 and the two received a digital version of the letter on Nov. 24. ◆

G Department Guns Division Cyber Team members Alan "Drew" Andrews (left) and Tarik Khudairi (right) continued to step up to the plate on-site to fill urgent requests. The two provided guidance and conducted installation testing in support of weapon installations. As cybersecurity lead, Khudairi provided key technical support to PEO IWS 11 for the Mark 38, including system overview, shipboard physical and environmental security, scanning and patching with final completion and authorization to operate signed by then-NAVSEA Commander Vice Adm. Moore in April for the Mark 38 machine gun system.

G Department's Guns Division submitted a technical proposal and, as a result, received over $9 million for a Mark 110 engineering mount delivered in June. This new equipment capability will enable the division to rapidly support the fleet for casualty reports and provide a newer larger capability to support the warfighter for in-service engineering.

Mark 46 technician Matt Mascolo stands aboard USS Anchorage (LPD 23) while the ship was docked at Naval Air Station Point Mugu in San Diego, May 20. While aboard Anchorage, Mascolo helped with craning the ship's turrets off of the ship and onto maintenance stands for general maintenance.

G Department celebrated diversity and the differences in those that support the command's mission in 2020. Mark 45 Technician Team Lead Jeremy McVicker (right) is a proud Cherokee and Blackfoot, while major caliber acquisition engineer Karla Rodriguez (left) is proud of her Puerto Rican heritage.

ISEA Montgomery Cox, seen here aboard USS Anchorage (LPD 23), was a crucial SME to the Mark 46's structural test fire, working with fellow ISEA SMEs to install and test gun mounts aboard USS Zumwalt (DDG 1000).

PHST Center representatives provided assistance to the Board of Inspection and Survey (INSURV) Inspection Team during an INSURV inspection onboard USS Boxer (LHD 4) at Naval Base San Diego, Jan. 29-30. Fourteen material handling equipment (MHE) units were inspected. Twenty-seven MHE findings, including four safety-related findings were noted and incorporated into the ship's maintenance program. An additional 11 MHE units were in non-operable repair status and not inspected. ◆

On July 15, the Ammunition Engineering Support Branch (G22) Mobile Ammunition Evaluation and Reconditioning Unit (MAERU) Team departed for Pearl Harbor to inventory and assess 2T/2E/0T COG ammunition. The team consists of Bill Jurkowski, Rod Wiggins and Cameron Swett. The team has inspected 49,420 samples of 2T/0T COG ammo from Naval Magazine Pearl Harbor's Lualualei and West Loch sites. Naval Munitions Command Pacific East Asian Division, Detachment Pearl Harbor has provided outstanding support. MAERU's involvement in ammunition inventory management keeps the Navy's procurement and maintenance plans accurate with real time information. ◆

Pictured left to right: Brandon Chew (G22), Tommy Singer (G22), Chief David Riggs and Chief Michael Whisenant (both from G4).

On Sept. 24, Navy Gun Range 647 personnel successfully completed the Mark 7 link test at the CIWS facility. Northrop Grumman, manufacturer of the Mark 7 link, funds the Navy to test the links as part of the acceptance process for the Army. The alternate non-live fire Mark 7 link test procedure provides substantial cost savings to the government and mitigates risk to test personnel when compared to the previous live fire test procedure used for Mark 7 link acceptance testing. The test called for two separate lots of links to be tested. Both lots successfully uploaded 100 rounds and downloaded 92 spent cases and eight dummy rounds simulating a live fire test event. Personnel from both G22 (Range 647) and G42 (OEM Support Team) worked together to support the effort. ◆

The R Department bid farewell to its department head in January. Dr. Joel Carney left the command after 18 years. Research and Development Division director Dr. Heather Hayden was promoted to R Department head in July.

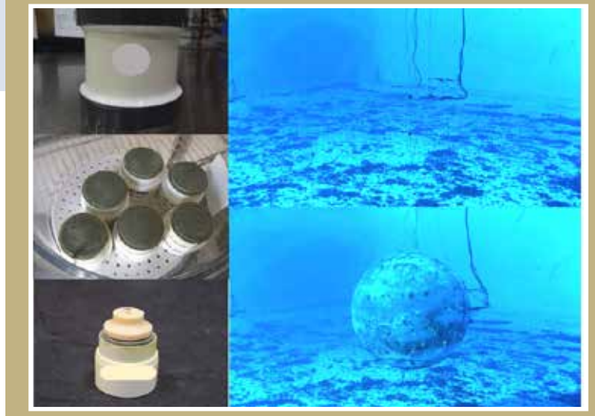
R Department employee Ryan Hibbard and EOD Department employee Laura Tinsley work together to fill bottles of hand sanitizer during the early days of the COVID-19 pandemic. R and EOD Departments worked together on the hand sanitizer project.

Scientists and engineers from R Department's Research and Technology Division led two programs that explored the use of extended range mortar ammunition (ERMA) propellants in 60 mm and 81 mm mortar systems to provide extended range and increased ballistic performance. Live-fire testing was conducted using the ERMA propellants at Yuma Proving Grounds in Arizona, and the pressure-time data obtained demonstrated favorable interaction between the experimental ERMA propellants and the igniters used. Performance increases observed are expected to be applicable and useful to other sized mortar systems and translatable to large, medium and small caliber ammunition systems across the services.

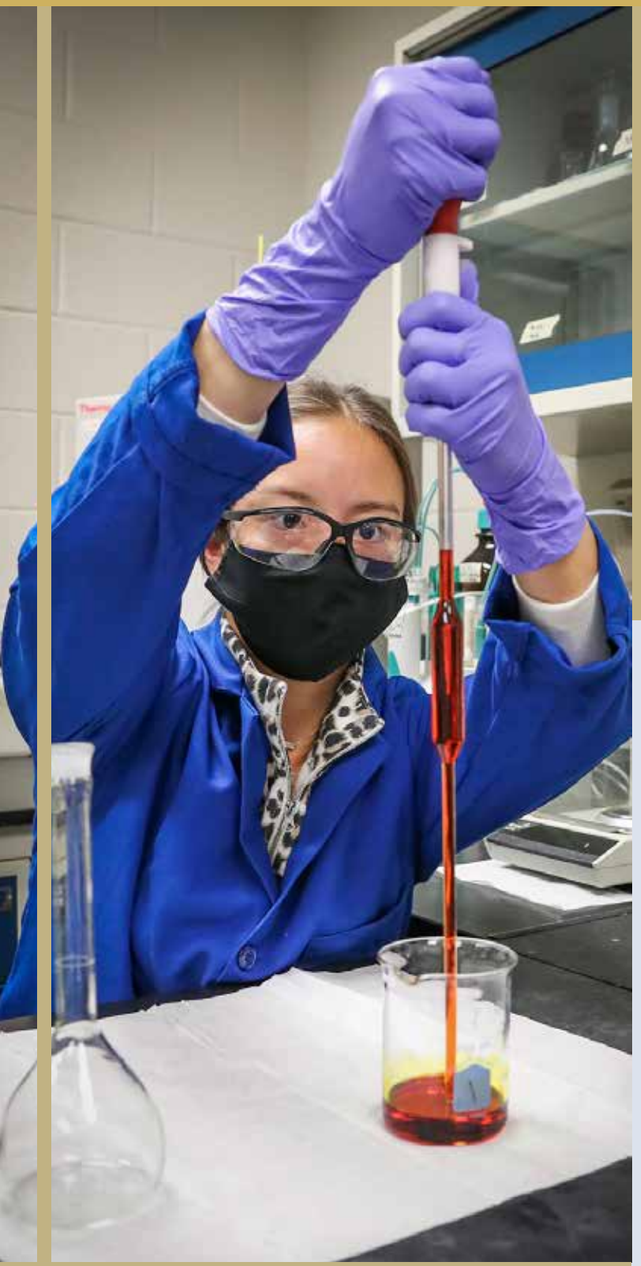
The department's CBR-D Waterfront Fleet Support Team conducted comprehensive readiness assist visits (RAV). The purpose of the RAV is threefold: Assess all CBR equipment and systems; train shipboard personnel in operation and maintenance; and inventory and issue the chemical and biological warfare agent consumables. COVID-19 restrictions for travel and ship visits resulted in the development and implementation of a modified RAV process that allowed delivery of mission-critical CBR supplies and support while minimizing exposure of support personnel at periodic points of the year from the heightened pandemic spread. Over 50 Navy and Coast Guard ships were provided direct or modified support throughout the first nine months of the pandemic. ◆

While the command was under maximum telework conditions, CBR-D Division's Waterfront Fleet Support Team ensured that warehouse operations continued with new, innovative methods to solve issues created by COVID-19 restrictions. One such effort was the receipt and delivery of over 1,500 Next Generation Diagnostic Systems and related supplies with an approximate value of $7.5 million. This effort resulted in the team being awarded the Michael J. Carl 2020 Chemical and Biological Defense Most Accomplished and Responsive to the Fleet Award. ◆

The Non-Destructive Evaluation Branch had their open facility radiographic operation approved by the Radiological Affairs Support Office for large motor testing. This high speed radiography (X-ray image capture during a ballistic firing event) capability will provide an important tool for failure investigations to watch at approximately 2,000 frames per second what is happening inside a rocket motor during a ballistic event. A trailer-mounted system was assembled that can be towed to the test site, set up in about four hours and provide approximately 12 seconds of video with a 12-inch window. This capability could be deployed to other areas of the command for immediate hazard determination. ◆



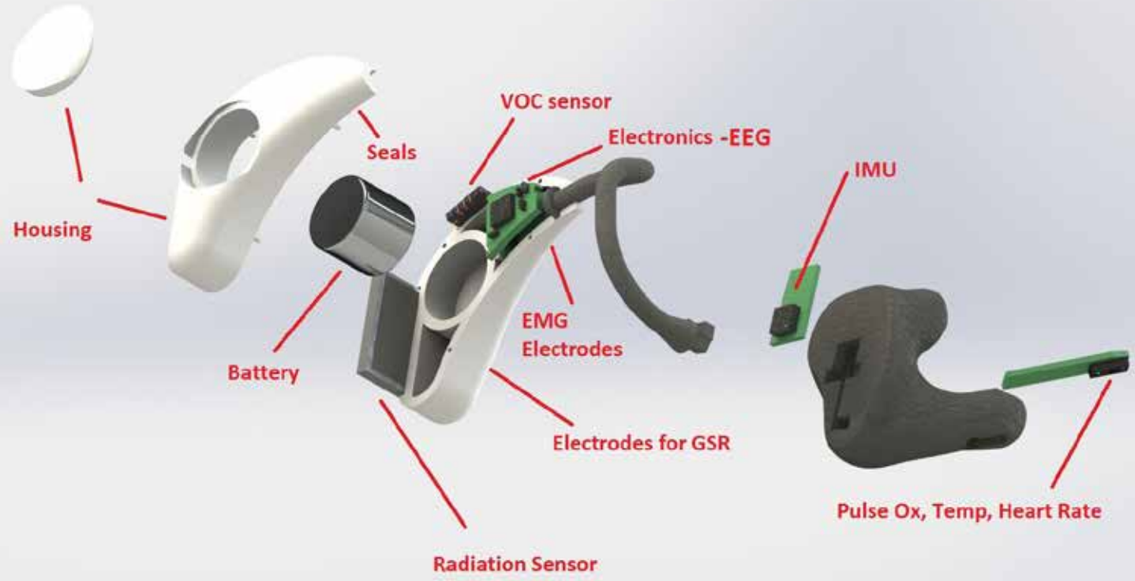
Engineers and scientists in R Department's Chemistry Branch and M Department's Explosive Engineering and Development Branch formulated, scaled and manufactured both cast-cure and pressed explosive test articles for underwater performance testing at NSWC Carderock. The experimental explosives developed were detonated in an underwater test pond to determine shock and bubble performance at the smaller scale. Formulators continue to build on this work with the goal of developing and qualifying the Navy's next generation high performance underwater explosive.



Chemical and Materials Analysis Branch chemist Meghan Griffiths transfers Otto Fuel II from a beaker into a volumetric flask for sample preparation by dilution.

Ron Roller of R Department's Radiological Mobile Survey and Remediation Team conducts survey training onboard USS Lassen (DDG 82).

Dissection and Machining Branch hazards testing technician Dick Jones prepares test samples on the Explosives Research Laboratory's impact machine. Hazards testing supports production, ordnance assessment and research programs. The data allows engineers and researchers to verify the relative sensitivity of their energetics when compared to defined standards.



The CBR-D Laboratory Sciences Branch leads an ear-wearable device (EWD) program for the DTRA. Dr. Prabha Dwivedi brought the program to Indian Head during wave three of the CBR-D transfer of function from NSWC Dahlgren. The EWD is a collaboration between NSWC IHD, Arizona State University and Naval Health Research Center. The objective of the project is to develop a wearable device with control and analysis software to detect the onset of adverse autonomic biochemical responses indicative of a warfighter's health state and to provide remote warfighter readiness, well-being and performance assessment capabilities.

The Radiological Mobile Survey and Remediation Branch team supported U.S. naval ships' fallout radiological controls resulting from the power plant explosion at the Fukushima Dai-Ichi Nuclear Power Plant in the Fukushima Prefecture of Japan. Support was provided in the complete remediation for USS McCampbell's (DDG 85) main propulsion exhaust uptakes in Yokosuka, Japan. Support was also provided for USS Lassen (DDG 82) in Mayport, Florida, and USS Preble (DDG 88) in San Diego with module cooling fans removal. ◆

The CBR Detection Branch's Enhanced Maritime Biological Detection program continued to move forward despite the challenges of COVID-19. The program completed the engineering, manufacturing and development phase; entered the low rate production phase; and is on track to award the full rate production contract in 2021. Despite the challenges, the team completed all required logistics, provisioning, military standard testing, live agent testing, the operational assessment and the operational test. The operational testing was wrapped up in November onboard USS McFaul (DDG 76) in Norfolk. ◆

The GQM missile slug is launched from the starboard rail.

In June, TD Ashley Johnson reassigned four of the M Department's experienced and knowledgeable senior engineers. The group of SMEs including Bill McConnell, Wayne Thomas, Ray Geckle and Dave Clark, was intended to be a key piece of the M Department knowledge management strategy, to mentor and train junior personnel on critical operations and processes. ◆

After reviewing the results of the Operational Restart Readiness Review Board (RRB) and the focus groups, it became clear many newer front-line employees felt insufficiently prepared for their tasks. Johnson felt it was vital to deploy the Code M Restart Task Force made up of senior engineers to the front lines to serve as a "Well of Wisdom" (WoW) for those less experienced personnel. ◆

The WoW members focused on multiple mission-critical projects, assisting with RRB action item closures associated with these projects, as well as responding to technical questions. They assisted with identifying infrastructure repair needs, driving repairs to completion, and developing SOPs. The team continues to build bridges between the engineering and operations personnel so M Department can work together and achieve mission success. ◆

In September, NSWC Executive Director Dr. Brett Seidle (right) visited CAD/PAD Manufacturing Operations. During the visit, explosive operators demonstrated disassembling M25A1 Thrusters, which remove the canopy on the Air Force T-38 and F-5 aircraft in the event of an emergency. M Department employee Rita Wallace (left), a participant in the NAVSEA Next Generation Leadership Program, speaks with her assigned mentor, Dr. Seidle, during the tour.

M Department employees Gerard Heard Jr. and John Shumpert participate in new eTrack training, overseen by M21 employee and Forklift Training Course instructor Floyd Proctor, Sept. 2. eTrack is a new cargo restraint system designed to better secure items during transportation moves.

The department's CAD/PAD division delivered 28,887 CADs and 1,287 PADs in 2020. ◆

In October, two GQM missile slugs were successfully launched from the AML-4K3 launcher at White Sands Missile Range, New Mexico. This was a cross-command collaboration with personnel from M, R, E and EOD Departments. This effort supported NAVAIR's Aerial Targets Program, Northrop Grumman Space Systems and NSWC Port Hueneme in their tests for a new launcher. ◆

A team of M Department employees supported the 100% inspection of all explosive transport vehicles to ensure corrective actions were in place to keep the vehicles in service. M Department collaborated with the Safety Department and the Transportation Focus Group to redesign and manufacture a new cargo restraint system: eTrack. With the implementation of eTrack, all cargo is strapped down using ratchet straps and prevented from moving in any direction. ◆

In November, the department's Controls and Tooling Design Branch purchased a laser engraver to digitally engrave parts on-site. Having the ability to engrave products in-house will greatly decrease project lead times and will also be a significant cost savings. ◆

M Department senior technologist Ray Geckle receives a retirement flag and letter during a gathering at NSWC IHD, Dec. 11, commemorating his retirement from the command. Geckle was first hired on at NSWC IHD in 1982 as a chemical engineer and held numerous leadership roles including director of the Ordnance Assurance and Safety Office, director of the CAD/PAD Manufacturing Division and head of M Department during his tenure onboard NSWC IHD. During his career he received numerous commendations, including the Joe L. Browning Award for Managerial Excellence in 1990.

M Department employees Albert Wright and Zander Royston researched, collaborated with the Safety Division and procured hand-held laser jet printers to replace previous stenciling procedures. Working with the printer manufacturer to meet safety requirements for the facility and governing station instructions, Royston and Wright implemented the hand-held printer usage decreasing the time to create stencils and complete a packaging lot from 45 man-hours to five. ◆

The Mark 90 Propellant Grain Production Team formed a task force to resume operations to support completion of two grain lots in March and November as part of the graceful shutdown. ◆

Since January, Receipt Inspection processed over 275 orders, supported 68 programs, viewed and processed over 310,000 parts, and rejected approximately 40 parts or orders. ◆

M DEPARTMENT RESTART

M Department employees Matthew Knott, Bobby Dame, Chris Bruce, and Jason Carpenter participate in new supplemental NSWC IHD forklift training and proficiency demonstrations, Sept. 1.

On Jan. 29, NSWC IHD CO Capt. Scott Kraft and TD Ashley Johnson jointly ordered the command's M Department suspend all operations. This decision was based on several factors that, when considered in their collective, indicated the M department's overall operational risk had increased to unacceptable levels. Throughout the year, the M Department actively assessed and adjusted all operations to ensure operational safety and other processes allow the efficient delivery of quality products. ◆

M Department operations were categorized into 38 operational areas, each requiring a comprehensive command-level board review of team-assessed manufacturing readiness. The reviews ensured lessons-learned from past performance findings (technical reviews, audits, surveys, and prior issues or events) were sufficiently implemented. An analysis to ensure appropriate rigor and corrective actions was applied across 10 categories: personnel proficiency, supervision and leadership, infrastructure, ordnance inventory control, quality control, documentation control, tooling and equipment, safety, programmatic controls, and other factors that impact effectiveness. ◆

The category assessment was supplemented by 10 focus groups with cross-command participation that provided an independent assessment for each operational area. Following each RRB, Class I actions were addressed prior to resuming operations. Class II actions, which often represent best practices but not critical to resuming operations, continue to be implemented.

Additionally, nine command cross-departmental "Big Rock" teams were established to look at longer-term improvements. Solutions pursued include ways to make the process for arms, ammunition and explosives keys less burdensome; information technology improvements in the plant; ensuring external facilities and infrastructure organizations are held accountable; and improvements in training tools and knowledge management. The command established a one-time approval process throughout the operational pause to ensure urgent fleet needs would continue to be addressed. Kraft and Johnson provided approval for these critical needs based on the ability to sufficiently mitigate safety, quality and efficiency risks (in that order). These one-time approvals included:

- Mark 90 Propellant Grains: Clear the plant (graceful shutdown) and complete Lots 4 and 5 delivery
- CAD/PAD, Otto Fuel, COVID-19 filters and Mark 12 deliveries to the fleet and other agencies
- Evolved Sea Sparrow Missile Mark 134 rocket motors for collaborative aging study with NSWC Dahlgren
- JAU-8 Initiators assembly/delivery (supports aircrew escape systems)
- M25A1 Thrusters (supports aircrew escape systems)
- Mark 85 Rocket-Assisted Take-Off: Igniter Engineering Investigation and Rocket Motor Production/Deliveries
- Mark 70 Booster Rework
- CKU-7 Catapult Propellant Mix and Cast (Assembly previously approved for re-start; supports aircrew escape systems)
- PBXIH-136 Explosive Qualification Mix

Some widespread improvements resulting from the operational pause include:

- Transportation:
  - Trucks were inspected and repaired.
  - Corrective actions, including installation of an eTrack cargo restraint system, have resulted from a comprehensive hazard analysis of the command's transportation program.
  - Operating carts were repaired and preventative maintenance program for M Department's handling equipment were established to keep the command's carts in appropriate condition going forward.
- Infrastructure: The Infrastructure Division and NAVFAC validated structural integrity along with continuing to make overdue building repairs; rectified gaps in periodic infrastructure test programs; cleaned ventilation systems; and performed analyses to develop periodic maintenance intervals.
- Personnel Proficiency:
  - Development of desk guides and training materials for operations.
  - Implementation of hands-on demonstration of skills with inert items (e.g., transportation, handling, forklift, rocket catapults, eTrack, weigh-out and mixing operations).
  - Renewed focus on succession planning and skills development.
  - Establishment of a "Well of Wisdom" team of senior technologists to aid in mentoring of junior personnel.
- Processes: Ordnance inventory control policy has been drafted to include roles and responsibilities; evaluate ways to improve the timeliness of SOPs and other reviews; implement new policies for quality control; improve configuration management of tooling and equipment drawings.
- Culture Improvements:
  - Implemented a monthly M Department "GaMe Plan" newsletter to better share information with personnel.
  - M Department management participated in "Leading at the Speed of Trust" training.
  - Leadership policy implemented to improve accountability, transparency, communication and visibility in the plant.

NSWC Indian Head Division
GAME PLAN
M Department Newsletter
Week of September 28
Issue 4

LEADERSHIP CORNER
Mike Thornton, Acting Department Head
Marci Moses, Deputy Department Head
Updates from the MROC
Restarted Operations - Twenty-eight of the 38 operational areas have been authorized to resume operations. Since the second edition of the GaMe Plan, the following additional operational areas have been authorized for restart:
- **M11/M13:** CAD/PAD common RRB, primers, impulse cartridge, thrusters, initiators, catapults operations, fire extinguisher, igniters, delay cartridges (includes cutters), PDRM
- **M12/M13:** M1 motor load operations (through packout)
- **M21:** Lining/painting, machining, molding powder production, washout, meltcast/steamout
- **M22:** RAM mixer
- **10 areas are continuing to work class I actions**

COMMAND NAME CHANGE
Effective immediately, our command name has changed
From: NAVSURFWARCENIHEODTECHDIV
To our new name: NAVSURFWARCEN IH DIV
Effective immediately, the new Plain Language Address Directory (PLAD) addresses are:
NAVSURFWARCEN INDIAN HEAD MD
NAVSURFWARCEN DET PICATINNY NJ
NAVSURFWARCEN DET MCALESTER OK

INCIDENTS AND INVESTIGATIONS
This section highlights investigations of unexpected events within the department. More information will be made available upon completion of the investigation.
- On August 12, tooling was damaged during operations at Building 730
- On September 8, burning of filters resulted in an event a the Strauss Avenue Thermal Treatment Point

NEED TO KNOW
Safety Shoe Information:
- Employees **must** provide a phone number and POC before arriving at the Shoe Truck.
- Employees will now select an appointment time when submitting the purchase request worksheet.
- If there are delays of more than 20 minutes or if the shoe truck has been canceled, employees will be contacted via the telephone number they provided.
- Go to **www.safetyshoes.com** if you have a special request for shoes that are not regularly carried on the shoe truck.
- For a full list of shoes that are regularly carried on the shoe truck, please contact Jennifer Clevenstine or Ebony Williams at 301-744-4792.

TEMPORARY DEFERRAL OF PAYROLL TAXES
- What is happening?
Effective pay period ending September 12, 2020, DFAS will temporarily defer your 6.2% OASDI tax withholding if your wages, subject to OASDI, are less than $4,000 in any given pay period.
- Who does this affect?
Any employee making less than $4,000 (taxable wages) per paycheck.
- What will happen to your paycheck?
The amount you normally see withheld on your LES would accumulate between Sept-Dec 2022 and MUST be paid back next year. ***You will see reduced pay from Jan-Apr 2021 equal to any increase in pay from Sept-Dec 2020.***
- What should you do?
You should set aside this extra money now and prepare to use the savings to make up for the difference next year.
- Can you opt out?
NO
As more information becomes available, it will be posted on: https://www.dfas.mil/taxes/Social-Security-Deferral/

Safety Office Promotes Awareness and Encourages Constructive Criticism with Great Catch Campaign
Courtesy of Ordnance Assurance and Safety Office
The Safety Office established the Great Catch Campaign as a way to recognize NSWC IHD employees who are doing things the right and safe way, or who made contributions toward advancing or improving the Environmental Occupational Safety and Health and Explosives Safety programs.
Any employee can nominate their co-worker for a Great Catch Award. An employee whose nomination is approved will receive a Silver Award. Employees can collect five Silver Awards to redeem them for a Gold Safety Catch Award Certificate. The Gold Safety Award Certificate equates to on hour of excused absence to be scheduled between the employee and their supervisor.
Contact Crystal Keyes-Mason at georgette.keys@navy.mil or 301-744-2568 for more information.

Rita Wallace, M13, a participant in the NAVSEA Next Generation Leadership Program, speaks with her assigned mentor, NSWC Executive Director Dr. Brett Seidle, during a CAD/PAD tour September 16.

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M Department implemented a monthly M Department "GaMe Plan" newsletter to better share information with the Department's personnel.

- Organization: Established departmental liaison positions to improve coordination with Facilities, Procurements and Human Resources; M Department vacancies are also being filled. M Department is actively evaluating organizational construct to ensure mission area focus is properly aligned. ◆

CORPORATE OPERATIONS DEPARTMENT

In March, the Staffing and Classification Branch put a process in place to allow two new hires to participate remotely in new employee orientation. That process was developed into a more robust, remote onboarding orientation for all new hires due to the command's full-time telework posture. Human Resources (HR) onboarded 164 new hires remotely in 2020. At the onset of maximum telework, the Labor and Employee Relations Branch worked to ensure all employees' telework eligibility codes were correct and adding in telework agreements as necessary. The branch achieved 99% of telework agreements in place by the end of 2020.

The Infrastructure Division completed a projects data call for all departments and received investment board approval to complete 62 SRM projects. Significant improvement in projects execution was achieved by NAVFAC through close coordination with NSWC IHD. A 96% project execution rate was obtained on a total program value of $32 million. Additionally, a new project prioritization methodology was developed to rate and rank all projects submitted for the 2021 SRM program.

The Workforce Development Branch hosted 25 virtual training sessions through IHU. The HR Planning, Policy and Analysis Branch continued with planned reorganizations, including the EXU-1 civilian stand-up. They also worked behind the scenes in support of the command's name change. ◆

The Records Management Team continued a three-year project to inventory and create a complete index of the engineering gun drawings from the command's G Department. The team completed Phase 1, which was to inventory all the drawings to obtain a complete list of the holdings archived. In November, the Records Management Team began Phase 2 of the project. ◆

The Corporate Communications Division published 26 editions of the biweekly newsletter "The Loop," including several special editions honoring the command's graduates, honorary awards and unsung heroes during the COVID-19 pandemic. The division supported numerous command initiatives including the M Department Restart, the EEO/DI Hello and Table Talk campaigns, and the command's name change process, along with multiple VIP visits and award presentations. The division produced a series of podcasts to share the mission and information about several command initiatives and departments. The pandemic accelerated the division's livestream rollout, producing 15 livestreams featuring command and department leadership. ◆

Analytics manager Aida Torres, teamed up with the Leadership Southern Maryland non-profit agency, in the rollout of Leadership Southern MarylandEmerging Leaders Program (LEAP), a new junior leadership program developed to strengthen skills in early to mid-career employees in Southern Maryland. Two Indian Head employees, Maile Bowen with the EOD Department Explosive Detection Equipment Branch and Phillip Melton with the E Department Ordnance Electronics Engineering Branch, graduated from the program on Oct. 23. TD Ashley Johnson (top left) provides advice and guidance to the first LEAP cohort. Also pictured in the group is LEAP co-founder Aida Torres (first row left).

The ACIO and IT Division rapidly provided new and improved IT services and support, such as large scale remote secure access for NMCI and RDT&E network users, desktop video teleconferencing, and livestreaming services for leadership. IT procurement support for the command included the processing of 467 IT Procurement Requests (ITPR) and approval of 829 ITPRs and 2,465 ITPR line items in ERP. Customer services also processed 1,895 NMCI S&T and RDT&E tickets, and submitted 7,130 NMCI move, add or change requests in support of approximately 3,000 unclassified and classified NMCI users. The Cybersecurity Branch raised NSWC IHD's system authorization percentage from 18.5% to 74.5 %, and achieved Authority to Operate for two additional core network packages. ◆

The Personnel Security Team reviewed and processed 370 new hire packets and reviewed 580 investigations. The Industrial Security Team reviewed and signed 50 classified contracts and approved more than 200 CACs for contractors working on classified contracts. Information Security maintained classified mailing and courier operations throughout the command's maximum telework status with 100% accountability of classified material. The Physical Security Team completed more than 400 AA&E surveys, 75 non-AA&E surveys and surveys for accreditations on five new open storage spaces; assisted with the M Department Big Rock projects; completed the AA&E key and lock rotations for the command; and conducted more than 55 AA&E screenings to establish an additional Lenel workstation for the command. ◆

CORPORATE OPERATIONS DEPARTMENT

In February and October, the Continuous Process Improvement Office offered a 40-hour Green Belt training at Indian Head. Trained Green Belts serve as CPI consultants and advocates for change within their respective organizations. As part of a team challenge during the February 2020 Green Belt training, Ron Snider (left) of the CAD/PAD In-Service Engineering Branch launches a ball to test the shot accuracy of the team's "statapult." Code 106 employee Jacquline Clancy and CO Capt. Scott Kraft look on with hopes of a winning shot.

(Left to right) Navy Regional Maintenance Center Executive Director Stephanie Douglas, NAVSEA Executive Director James Smerchansky, NSWC IHD Combined Federal Campaign (CFC) Coordinator Janice Hedges (Code 107 Purchasing Requisitions) and NAVSEA Commander Vice Adm. Bill Galinis display the command's CFC 2020 Fundraising Goal of $193,177 during the CFC Kickoff Ceremony at NAVSEA Headquarters at the Washington Navy Yard, Oct. 8.

From March to October, under the direction of the CO, the Corporate Business Office led the effort to facilitate the command's name change from NSWC IHD Explosive Ordnance Disposal Technology Division to NSWC IHD Division. ◆

The Purchasing Requisition Branch processed 24,097 material and service lines, totaling $608,182,681; the branch also processed 521 Virtual Shop Store transactions totaling more than $445,987. The Code 107 Supply Branch completed 100% of the 2020 Operations, Maintenance and Sustainment (OM&S) Inventory with 21 warehouses and 16, 315 line items of OM&S. The General Equipment (GE) Branch completed 100% of the 2020 GE Inventory with 941 locations and 8,889 GE assets. Code 107 successfully transitioned all command detachments for total centralization and Naval Sea Logistics Center warehouse control. Code 107 assisted in the completion of Phase III of CBR-D conversion to the command. ◆

At the end of September, Code 107 welcomed Giovanni Perez as its new director. ◆

In January, the EEO, D&I team established five foundational training courses on D&I 101: unconscious bias, micro-aggression, generational awareness, and race and racial identity to begin a dialogue and understanding of the value of a diverse and inclusive work environment. In February, the EEO, D&I Office achieved 50% in credentialed expertise in strategic D&I management, which resulted in the command's Strategic Plan D&I initiative to complete the D&I 3M. The EEO, D&I team conducted a successful pilot program to address any areas of concern during two-day pilot training sessions held February, March and June. NSWC IHD maintained representation and supplied D&I expertise on the 2019-2020 NAVSEA Enterprise inaugural

In February, the EEO, Diversity and Inclusion Council (EDIC) held its kickoff meeting for the 2020-21 term. EDIC coordinated and executed several projects in 2020, including conducting a virtual 2020 walkabout survey and supporting other ongoing initiatives.

Inclusion and Engagement Council. As part of the M Department Restart Culture Assessment Team, the D&I team developed workplace culture questions and participated in the restart process category with two technical interviews. In February, the D&I team kicked off the new term of EDIC that included representation from all departments on the command. In March, the EEO team developed an anti-harassment program instruction, process and implementation plan that tracks and maintains compliance with DoD, DON and NAVSEA guidance on program requirements. In April, the EEO team developed and executed a large, multi-year sign language interpreter contract to meet the needs of our deaf and hearing-impaired workforce. The EEO team successfully provided for the reasonable accommodation of 88% of requests. The EEO team was able to close 78% of EEO complaints (total EEO complaints including ones carried over by previous years and ones filed in 2020) filed against the command by withdrawal, settlement or with a no discrimination judgement. ◆

In July, Lisa Griffith became the command's first Director of Culture. From August to September, Griffith developed a culture framework and an approach to design an inclusive culture of desired values and norms that will reflect the command tenets. In October, she established the command Culture Working Group. From October to November, Griffith and the working group developed and defined organization values, desired behaviors and norms that will embody the NSWC IHD culture. From November to December, they developed the culture continuous learning program. ◆

CONTRACTS DEPARTMENT

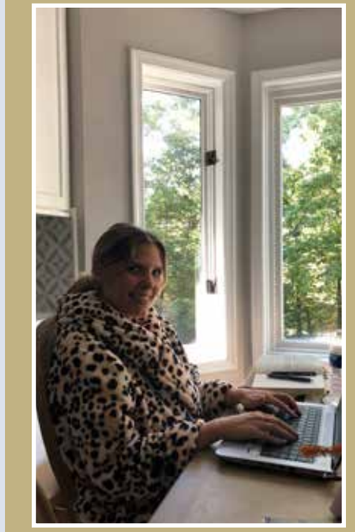
The last week of September — the end of the fiscal year — is when the Contracts Department comes together and cheers on their teammates to get all expiring funds obligated. The department refers to it as "eat week." In a typical year, the department would gather daily in the break room for breakfast, lunch and desserts; each day boasting a spirit day theme. Although the department couldn't gather in the breakroom this year, they gathered on Microsoft Teams and hosted virtual "spirit days." It was a fun team-builder and a great way to boost morale and bring the department together to close out fiscal year 2020.

In spite of the COVID-19 pandemic and maximum telework, the Contracts Department had a very successful year. Throughout these challenges, the department found ways to stay connected and motivated, proving the command is always stronger together. ◆

In March, Assistant Secretary of the Navy for Research, Development and Acquisition James Geurts issued a memo on the imperativeness of support for the industrial base, to sustain and leverage existing and future capabilities to ensure continued efforts through the Navy. This effort included the command's contractors and Navy personnel being able to continue work to support the fleet and our contractor base in the face of the COVID-19 pandemic. The department's Contracting Division A team expedited a $74 million Indefinite Delivery Indefinite Quantity contract for the Mark 419 Mod 1 multi-function fuzes and the Mark 92 Mod 1 blind loaded and plugged Navy 5-inch all-up round projectile. The first order was issued for $37 million, which allowed Northrop Grumman to get orders into their suppliers, prior to the end of their closing period. ◆

The department's tri-annual Procurement Surveillance Plan (PSP) was conducted July 27-Aug. 7, using a hybrid approach of on-site and virtual reviews and interviews. This was the first ever hybrid PSP experience for NAVSEA and the department. The Contracts Department achieved an overall PSP inspection rating of highly satisfactory. There were three principal assessment factors that determined the department's overall rating of highly satisfactory:

- Organizational Leadership, in which the department received a highly satisfactory.
- Management and Internal controls, in which the department received a highly satisfactory
- Regulatory Compliance, in which the department received a satisfactory.



Even within a maximum telework environment, the Contracts Department continued to work together as a team, ensuring all aspects of operations continued and the warfighter remained fully supported throughout 2020. In early spring, Contracts executed a critical role in expediting contract modifications that resulted in the fielding of an advanced COVID-19 test capability valued at approximately $7.5 million across the Navy during the height of the global COVID-19 pandemic. The team from the Comptroller Department, Contracts Department, Property Management and CBR-D Divisions received a special act award for their extraordinary efforts.

The Contracts Department came up with a virtual video idea that inspired their team — and the rest of the command — to stay positive, continue to work hard and procure for the warfighters.

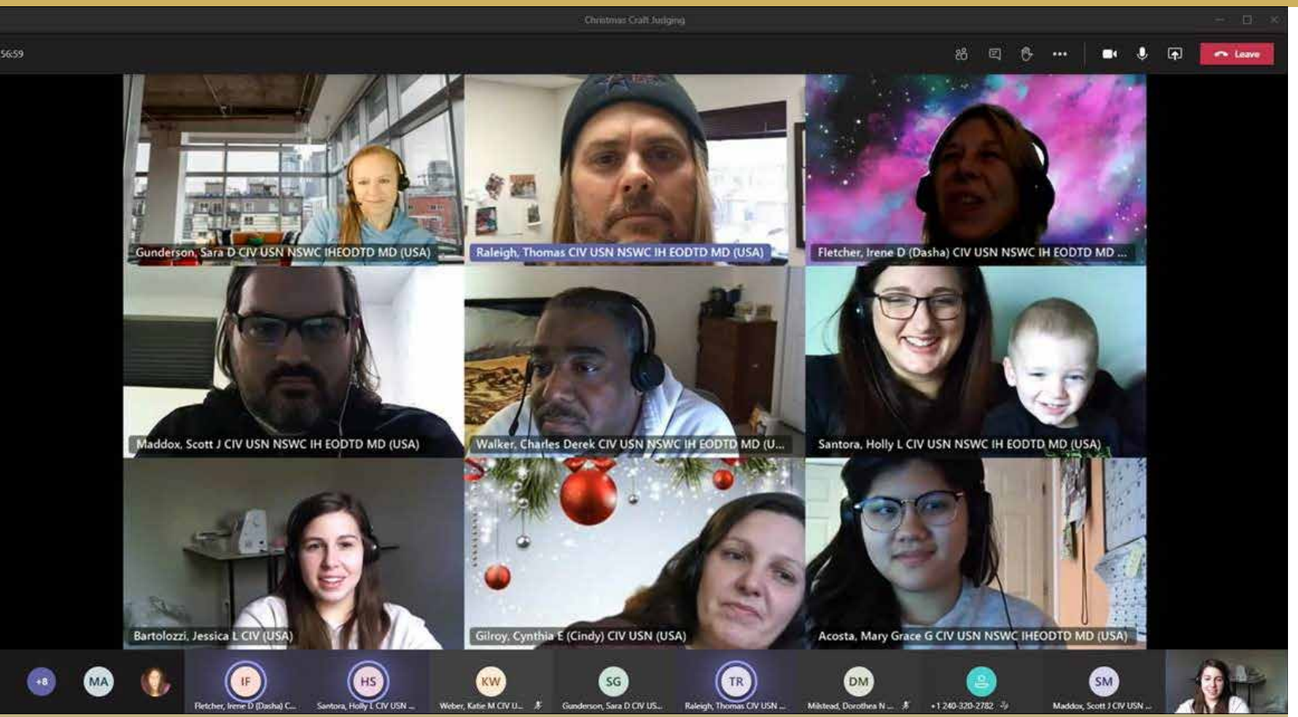
The PSP team highlighted 31 strengths, 12 promising practices, 10 best practices, zero significant findings, three deficiencies, 17 weaknesses and 26 watch items. Although this is the third PSP in a row where the Contracts Department received a highly satisfactory rating, this one meant a little more to the team as it was conducted over a period of time with many unknowns. ◆

The COR Certification Manager for the COR program, Mary Sandy, continued her outreach and training and has not missed a beat. All COR quarterly meetings and refresher training have continued remotely via conference line. ◆

The Purchase Card (PCard) Program had many successes while in remote status and since March 1, 630 PCard purchases totaling $15 million have been executed. The PCard Agency Program Coordinator office continues to play a vital role in assisting Code 107 with PCard transactions. ◆

The Contracts Department closed out the year with 1,751 completed actions and with a total obligated amount of $537,156,421.53 for fiscal year 2020. ◆

COMPTROLLER DEPARTMENT



There were many firsts for 2020 and this was the first time Comptroller would successfully close out a fiscal year 100% remote.

Comptroller accountant Scott Maddox, along with the rest of the Comptroller Department transitioned to telework in March.

The Comptroller Department maintained its normal high level of performance, supporting business as usual requirements in addition to several new business requirements. With new circumstances arising in 2020, namely the manufacturing suspension of operations and the COVID-19 pandemic, many new financial impacts and reporting requirements resulted. The Comptroller Department continued to deliver and serve the command with every new requirement. ◆

As the command moved to Health Protection Condition Charlie and a maximum telework environment, the Comptroller Department hit the ground running. The primary concern was to ensure all NSWC IHD employees were paid. The Payroll Office began planning for worst case scenarios to ensure all employees continued to be paid. It is also mission-essential to ensure employees can travel in support of the warfighter and this was maintained through the travel office in the Employee Services Division. Vendors continued to be paid through the Accounting Division, and the Comptroller Department maintained the ability to accept incoming funding and send outgoing funding through the Budget Division. ◆

In addition to the mission essential requirements, many new financial requirements resulted from the pandemic. The Comptroller Department generally requires a process implementation to provide the ability to report the financial impacts of any one event. Throughout 2020, in addition to business as usual, Comptroller monitored the impacts of suspension of operations, the impacts of COVID-19, as well as telework metrics for the command. ◆

The Funds Management Team maintained a consistent workload throughout 2020. The COVID-19 pandemic did not reduce funding workload and the team was able to manage all capabilities through the maximum telework environment. The Incoming Funding Team accepted 4,457 documents totaling $685 million, which included $607 million of reimbursable funding and $78 million of direct cite funding. The Fund Document Closure Team closed 2,175 documents, of which 47% of the 2,175 documents were scheduled to cancel at the end of the year. The Fund Document Closure Team also took part in a project where they returned $2.3 million to help reduce carryover. The Funds Management Team supports sending outgoing funding documents in support of the command's mission. Indian Head processed $114 million of outgoing funding in 2020. The Funds Management Team supported an emergency COVID-19 request with quick turnaround to support the fleet. The team's rapid response to secure funding provided the ability to deliver equipment and lifesaving capability to the fleet. The Funds Management Team was recognized by NAVSEA executive leadership for their "One Team" efforts. ◆

The Comptroller Department collaborated with partners in the technical departments and Customer Advocate Office and were able to transform stabilized rates over three fiscal year cycles. Comptroller implemented a manufacturing wage grade rate in the fiscal year 2019 stabilized rate structure. The rate is important to the plant labor portion of partner estimates, and allows the Comptroller Department to successfully to capture production work and positively affect investment in the command's infrastructure, facility usage fees and test services. ◆

Comptroller employee Roy Higgins teleworking inside and outside.

Thanks to the detailed analysis and outstanding efforts of the Warfare Center Budget Team, the Warfare Centers were able to reduce the financial impact of the coronavirus pandemic from $9 million to only $5.3 million. ◆

The Accounting Team set out with a goal in 2020 to clean up aged unbilled accounts receivable. After research and coordination with the NEBO, Accounting noted this would require a joint effort between the Accounting and Funds Management Teams. The Accounting Team was able to clear $6.6 million of the $8.6 million aged unbilled accounts receivable. The efforts have allowed the Accounting Team to understand the root cause and document the process. As a result, the initiative will reduce future occurrences, supporting audit preparedness. ◆

COMPTROLLER DEPARTMENT

Comptroller Department employees Bonnie Lee and Sara Gunderson (pictured below) sewed face coverings for command personnel.

"I was able to produce around 500 masks directly for the base and another 500 for the community," said Bonnie Lee. "When not working on the Navy's supply, I worked both independently and with a local volunteer group, Southern Mask Makers. At the beginning of Operation Spartan Helmet, it was an around-the-clock effort to produce the masks and fulfill my duties with Comptroller. No matter how tired I was I knew the rest of the team was working just as hard. It was an honor to be part of the team!"

Indian Head's Financial Improvement and Audit Remediation (FIAR) team, in coordination with Warfare Center Headquarters, performed internal testing for operating materials and supplies process and general equipment process to ensure that the command has effective internal controls in place to prepare for upcoming audits. The team's focus is on improving existing controls and making sure IHD remains diligent in strengthening its processes, documentation and internal controls to be in line with acceptable audit practices and standardized processes. The FIAR team will begin to focus efforts on implementing corrective action plans based on results from internal testing. ◆

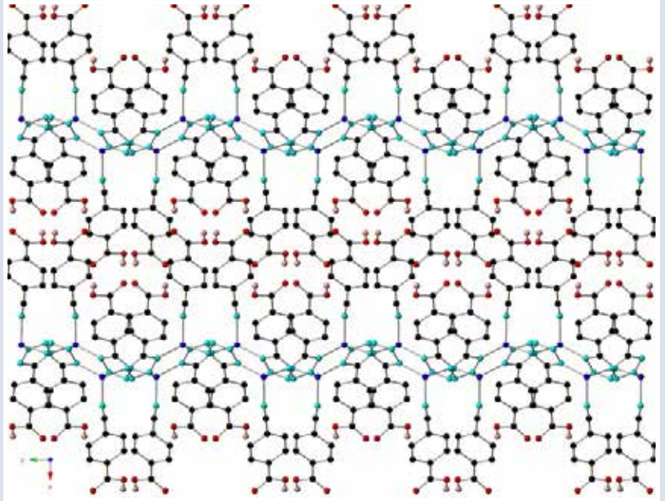
The State Department's Special Issuance Agency approved the command's request to become a Passport Acceptance Facility. The travel office will serve all service members and employees who need official passports, including no-fee passports and visas for outside the continental U.S. official travel. The command's previous passport agent moved with EXU-1, leaving a gap in service for the command's travelers. Comptroller employee agents will participate in training and begin accepting applications in 2021. ◆

Comptroller supported the transition of the Indian Head Unit Identification Code (UIC) to the newly established EXU-1 civilian UIC. The transition was a combined effort that crossed many teams, including HR, Comptroller, EXU-1, NEBO, Defense Finance Accounting Service, command leadership, NAVSEA HQ and Code 107. The unified efforts continue to exemplify the "One Team" approach to business success. ◆

Employees in the Comptroller Department took time and skill to assist in the command's OSH. OSH was the command's effort to ensure that all employees had proper protective equipment to continue to work safely. Bonnie Lee and Sara Gunderson sewed face coverings for command personnel. ◆

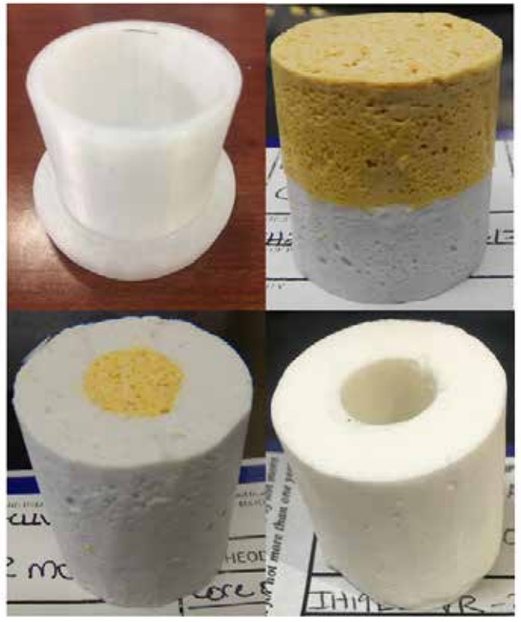
Comptroller employee Austin Garruba was selected as Travel Team Lead and Tyler Iverson was selected as Accounting Officer. ◆

INNOVATION AND PATENTS



A team of scientists from R Department's Research and Technology Division, along with professors from Georgetown and The George Washington Universities, are leading a project with the goal of synthesizing novel energetic materials through the formation of coordinating polymers. A successful outcome of the project may provide a far-reaching impact on the strength and capability of naval weapon systems.

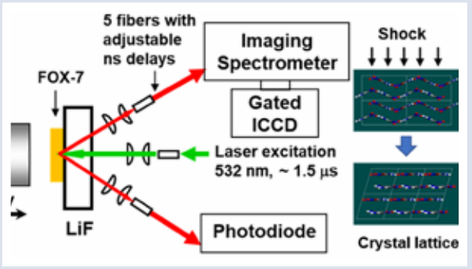
Appropriately titled "Novel Routes for the Synthesis of Energetic Coordination Polymers," the project will not only increase naval weapon systems' lethality and efficiency, but also maintain lifesaving sensitivities that come with energetics materials. According to the project's principal investigator Dr. Andrew Kerr, the chemistry components his group of experts work with aim at both stabilizing reactive materials and increasing the post-decomposition of those gaseous products for increased performance. This goal is achieved by incorporating both tetrazole and azide ligands with copper metal centers. The stabilization is a direct result of the metal to ligand binding and often results in the final structure adopting one, two, or three-dimensional frameworks containing nano to angstrom scale pores. Coordinating polymers could yield materials that are tunable and stable, providing scientists with a route to high performing explosives. They may also yield efficient burning fuels while maintaining lifesaving sensitivities of the energetic materials.



The command's engineers and scientist in the R Department Chemistry Branch used resonant acoustic mixing in place of traditional vertical mixing in order to manufacture monolithic propellant grains with a chemical formulation gradient. The test data from these grains will feed into ballistic models which can help predict gun propellant performance. These models will be used as tools to guide the development of chemically and geometrically complex gun propellant grains using advanced manufacturing techniques that can significantly improve overall performance.

The Customer Advocate Office finalized one CITE partnership agreement signed Sept. 17 with an estimated value of $80 million over the 20-year agreement period, along with 16 Work for Private Parties Agreements with a total value of $1.8 million. The office also executed and finalized 23 CRADAs, resulting in approximately $3.7 million of funding for research. ◆

The R Department Physics and Engineering Branch published a paper titled "Structural Transformation and Chemical Stability of a Shock-Compressed Insensitive High Explosive Single Crystal: Time-Resolved Raman Spectroscopy" in The Journal of Physical Chemistry (August 2020). The paper resulted from a collaboration between scientists from NSWC IHD and Washington State University. This work aimed to identify governing processes of shock insensitivity of energetic crystal of FOX-7. In-situ Raman spectroscopy experiments revealed several shock-induced molecular and crystalline changes attributed to increased stability. The shock results in conjunction with static compression studies provide the first experimental insight into the molecular-level response of a shock-compressed IHE single crystal and open up significant new opportunities for theoretical studies and synthesis of energetics with balanced insensitivity and performance.



Scientists from R Department's Chemistry and Materials Science Branches successfully applied "mix-in-syringe" as a mixing method in additive manufacturing operations. The benefit of mixing in the final container, rather than in a transfer vessel include: no loss of solvent, reduced likelihood of mass loss when mixed in final container/reservoir, potential to reduce the occurrence of air entrapment, and reduced likelihood of feedstock drying. This accomplishment and milestone will enable a definitive evaluation of additive manufacturing as a supplemental technology to conventional energetics manufacturing techniques. ◆

The R Department Dissection and Machining Branch machining team began work on a wax prototype in preparation to core a propellant sample out of a HAWK rocket motor coin. The project was in support of lot acceptance testing for a foreign military customer. The team completed the the project after five months of continuous work. ◆

The R Department Detonation and Combustion Branch's Counter-Improvised Threat Team developed analytical methods designed to characterize the reaction effects of a lengthy list of toxic gas forming precursor materials. This gas forming reaction effort is sponsored by the Department of Homeland Security and serves to inform the national security community of potential vulnerabilities. The team also worked with the EOD Department to develop a safe means of evaluating a novel explosive desensitizing agent,

The CBR Detection Branch Information Systems group was successful in adding Navy-wide tasking for Chemical, Biological, Radiological and Nuclear (CBRN) warning, reporting and hazard-modeling for ships and fleet command centers across the Navy. This was the culmination of more than one year of work with the fleet and with doctrine, training, and meteorological and oceanographic SMEs. The effort resulted in a new section in the Navy-wide operational task Common Maritime Picture (CMP) that defines a new component to the CMP called the Common CBRN Picture, which incorporates products from the Joint Warning and Reporting Network and the Joint Effects Model, two programs led by R22 scientists. The CBRN additions to the CMP will form the backbone of the Navy's CBRN warning and reporting and hazard modeling requirement.

Silent Spring, in an effort to advance to large scale production runs. This evaluation effort included safely manufacturing and handling particularly dangerous homemade explosives of tactical relevance. ◆

Patents in 2020

U.S. Patent Number 10,458,770. **Inflatable tool for plasma generation and shaped charge stand-off**

Christopher Wilhelm, Samuel Emery, Paul Giannuzzi, Daniel McCarthy and Lesley Wilhelm

An EOD tool has an inflated state and a deflated, collapsed state. In the inflated state, the EOD tool includes a central longitudinal axis and a radially outer portion. The radially outer portion contains an inflation composition. The radially outer portion includes an opening for admitting the inflation composition into the radially outer portion, an exterior wall and an interior wall that defines a through opening centered on the central longitudinal axis.

U.S. Patent Number 10,508,892. **Distributed fuze architecture for highly reliable submunitions**

Daniel Pines, Corey Cochran, Kevin Hendershot, John Kunstmann, John Frederick and David Reinaldo Gonzalez

A submunition delivery device including a master electronics module; a submunition module operatively connected to the master electronics module and including a plurality of submunition banks separated by bulkheads.

U.S. Patent Number 10,539,404. **Blast containment system for trash cans**

Edward A. Lustig, Eric Gahagan, John W. Monico, Jr., Paul C. Perricone, William Qualls, Michael Agens, Daniel C. Jones, John Winslow, Michael Murray Sr., Kimberly Peranich, Lee Foltz, Jesse Stuart Moran, Christopher Wilhelm, Lesley Wilhelm and John Wilkinson

A blast containment system for trash cans includes a liquid-impervious flexible bag having a sealed bottom positioned at a base of a trash can, and an unsealed top positioned and retained at a top periphery of the trash can.

U.S. Patent Number 10,571,212. **Lodged projectile removal charge**

David Rivera Marchand, Angel Diaz, Daniel McCarthy, Michael G. Craft, Walter Hubbard and Nicholas Shaker

A process that uses a lodged projectile removal charge apparatus to remove a projectile jammed in a cannon's gun tube.

U.S. Patent Number 10,599,182. **Docking station apparatus**

Juan C. Roman-Sanchez, Andrew Czop, Carlos Ramos Garcia and Michael DelSignore

A docking station apparatus for a portable electronic device such as a laptop computer. The apparatus includes a base section having electronic circuitry, electrical wiring and at least one battery compartment.

U.S. Patent Number 10,605,682. **Microelectromechanical systems (MEMS) unpowered pressure sensor**

Daniel Louis Jean, Scott Rauscher, Andrew Jen and Muhammad Khan

A MEMS unpowered pressure sensor device including a substrate, a flexible membrane operatively connected to the substrate, and a cantilever beam operatively connected to the substrate and suspended over the flexible membrane. The flexible membrane is configured to deform towards the cantilever beam upon pressure applied such that the deformed flexible membrane makes contact with the cantilever beam.

U.S. Patent Number 10,676,445. **Synthesis of aminopyrimidine-based energetic materials**

Christopher Wilhelm, Farhad Forohar and Denisse Soto

A new azido compound, 5-amino-6-chloro-2, 4-diazido-pyrimidine, and a process for synthesizing.

U.S. Patent Number 10,683,735. **Particulate-filled adaptive capsule charge**

Daniel McCarthy, Lee Foltz, Angel Diaz and David Rivera Marchand

A shaped charge includes a casing with a liner disposed therein. The liner has two spaced-apart and nested walls with each wall having an identical ogive shape. An explosive material fills a portion of the casing up to one of the walls. A loose particulate material is disposed between the walls. A blasting cap is coupled to a first axial end of the casing adjacent to the explosive material, and a sealing cap is coupled to a second axial end of the casing.

U.S. Patent Number 10,690,459. **Detonation-wave-shaping fuze booster**

Mary H. Sherlock, Brian A Cole, Kyle M. Beckett, Joshua E. Felts, Forrest R. Svingala, Reid M. McKeown and Harold W. Sandusky

A fuze booster includes a first explosive charge having a cavity with an annular portion of the first explosive charge encircling a first axial portion of the cavity and a semi-annular portion partially encircling a second axial portion of the cavity.

U.S. Patent Number 10,704,881. **Remotely actuated multi-use modular explosive ordnance disposal rocket dearmer**

Lee Foltz and Dan McCarthy

A novel dearmer enables EOD technicians to propel dearmer projectiles using conventional electric .50-caliber blank cartridges or conventional non-electric 12-gauge blank cartridges.

U.S. Patent Number 10,727,765. **MEMS friction drive linear motor**

Daniel Louis Jean, Ezra Chen, Troy Caruso and Andrew Jen

The friction driven linear motor includes a slide element with a portion with a pair of parallel straight sides.

U.S. Patent Number 10,731,958. **Monolithic fragmentation casing with tunnel pattern**

Kevin Genson

A fragmentation casing is defined by a monolithic tube having a solid radial wall and a pattern of tunnels defined in the solid radial wall.

U.S. Patent Number 10,739,112. **Impulse dampening system for emergency egress**

Philip Alan Renn, Edward Aloysius Cudahy IV and Michael Kaige Qin

An impulse dampening system reduces peak pressure and impulse acoustic pressures of an acoustic wave to a level that permits initiation of an emergency egress system by personnel in a submerged/flooded cockpit following landing or crashing into water.

U.S. Patent Number 10,746,520. **Thermomechanical active hazard mitigation capsule**

Ian A. Hall and Edward A. Russo

A thermomechanical safety device includes a body and a capsule valve mounted in the body. A volume of auto-ignition material is disposed in the capsule valve, which is moveable between a rest position and a firing position. A spring engages the capsule valve and the body, and biases the capsule valve towards the rest position. A temperature sensitive actuator engages the capsule valve and the body. The temperature sensitive actuator moves the capsule valve between the rest position and the firing position in response to a change in temperature. The temperature to cause the temperature sensitive actuator to move the capsule valve between the rest position and the firing position is less than the ignition temperature of the auto-ignition material.

U.S. Patent Number 10,753,712. **Extraction system for underground threats**

Lee Foltz, George Torres, Jim Wade, Dan McCarthy, Mike Sharp, Lonnie Frericks, Mike Shattuck, Dennis Askin and Angel Diaz

A system for extracting threats buried underground includes a housing, a shaped charge coupled to the housing at one end, and an explosive projectile disposed in the housing and spaced-apart from the shaped charge.

CO Capt. Scott Kraft (left) receives a plaque from Rear Adm. Ver Hage at the EOD Technology and Training Program Board at NAVSEA Headquarters, Sept. 11. On the plaque, there are coins from all of the joint EOD communities, as well as the Naval School EOD and the former Naval EODTECHDIV. The plaque reads: "Presented to CAPT Scott Kraft USN Deputy Manager for EOD Technology Dec 2016 – Dec 2020 By the Joint EOD T&T Program 'Thank you for your dedicated service to the EOD Community and the continuous pursuit of excellence for the Joint EOD T&T Program'"

Lt. Thomas Cowhey (right), a platoon leader with EXU-1, received the Rear Admiral Draper L. Kauffman Leadership Award on Sept. 29. Kauffman organized the first U.S. Navy demolition teams in 1943 and is widely regarded as one of the forefathers of EOD. The annual award is presented to an EOD officer who serves in a platoon or company commander position. Cowhey excelled as EXU-1 Platoon 5 Commander and twice deployed as Commander, Task Group 75.9. His actions allowed for the collection, processing, exploitation and dissemination of technical intelligence reports of conventional and improvised weapon systems, electronic components, documents/media and unmanned systems.

On March 4, former Under Secretary of Defense for Research and Engineering Dr. Michael D. Griffin (right) presented NSWC IHD Engineering Department Chief Engineer Frank Tse with a Distinguished Service Award during the 2019 Science and Technology International Award Ceremony at the Pentagon.

In spite of the COVID-19 pandemic, the command took time to celebrate its valuable employees through the annual Honorary Awards celebration in April with a special edition of its internal newsletter, The Loop. The awards are presented to individuals and teams who have made significant contributions to the command, the warfighter, the community and our nation.

Robert B. Dashiell Award for Excellence:
Kevin L. Phelps

Dr. George W. Patterson Award for Outstanding Accomplishment:
Edward G. Tersine

Joe L. Browning Award for Managerial Excellence:
Danielle N. Zimmerman

Admiral Harold R. Stark Award for Innovation:
Distributed Fuze Architecture for Highly Reliable Submunitions Patent Team: Daniel C. Pines, Kevin R. Cochran, John E. Hendershot and John F. Kunstmann

A.J. Perk Outstanding Operator/Technician of the Year:
Duane T. Adams and Cale C. Williams

Captain H.E. Lackey Award for Community Service:
Robert M. Moss

Continuous Process Improvement Award:
IHU Development Team: Angie L. Amen, Susan M. Tanner, Tara S. Landis and Lekisha T. Hodges

Equal Employment Opportunity and Diversity Award:
Diana O. Bragunier

Internal Customer Service Award:
Lynn J. Elmwood, Peter J. Cusack and Ronald R. Castillo

Lance Corporal T.J. Honeycutt Award for Forward Deployed Service:
Lacey L. Flagler

Excellence in Project Management Award:
Michael J. Allison

Excellence in Quality Execution Award:
Milton L. Reese and Melina M. Andino

Excellence in Systems Engineering Award:
Caroline A. Wiley

Excellence in Safety Execution Award:
Grounding, Bonding, and Lightning Protection Program Team: Ahmed Z. Al Shawi, David C. Carpenter, Bryan S. Danner, Lawrence A. Kijek, Wendell R. Lee, Joseph H. Rogerson, Joseph V. Sferrella, David A. Tomlinson and Gary M. Wood

Excellence in Business Operations Award:
Terri L. Willett

Roger M. Smith Team Award:
JCREW Software Support Activity Team: Jon A. Madejski, James P. Aquino, Shane D. Hanna, Peter C. Reinert, Jaime J. Camacho-Rosa, Kevin S. Ludwig, Julie A. Bowler, Polly H. Cheung, Cynthia L. Bass, Yolanda Torres, Kazi H. Islam, Thomas B. Higdon, David A. Christie, Kelly L. Swann, Kent Eldredge, Robert W. Hales, Cody R. Krikstan, Raymond S. Bean, Angelina L.C. Vargas, Jessica D. Scalfaro, Darlene M. Gragan, Susan L. Gaylor, Tiffany R. Johnson, Rebecca A. Maddox, Susan M. Simpson, Nicole A. Coleman, Jodi L. Fields, Marlene L. Ridgell, Brandi L. Sorzano, Christina E. Simpson, Krystal D. Murphy, Sharon G. Cooper and Michelle Y. Reeves

The Spirit of Indian Head Award – The Rising Star:
Ryan J. Kelly

The Spirit of Indian Head Award – The Emerging Legend:
Lawrence A. Kijek

The Spirit of Indian Head Award – The Legend:
Frank C. Tse

Tech. Sgt. Tim Donnan, (center left) is congratulated by Commander, Air Force Installation and Mission Support Center Maj. Gen Tom Wilcox (far right), during Wilcox's visit to NSWC IHD, Nov. 5. Wilcox visited the command to recognize the Air Force Civil Engineer Center's Joint EOD Technology Division on their recent nomination for a Gears of Government Award. Also pictured are Chief Master Sgt. Edwin V. Ludwigsen (far left) and Maj. Patrick Kucera (center right).

In June, Research and Development Division senior interior ballistic engineer Edward Tersine received the Dr. Delores M. Etter Award for Top Scientists and Engineers for 2019. Tersine was recognized for providing critical insight as the Navy Gun Propulsion subject matter expert in representing Navy interests in the Extended Range Cannon Artillery II program.

NSWC IHD employees were recognized in December with 2019 NAVSEA Human Resources Community Awards.

- NAVSEA Human Resources Community Rising Star Award: Brandy Stickel
- NAVSEA Human Resources Community Collaboration Award: Christine Farrell, Lindsay Longshore, Lori McFarland, Lauren Moreland, Diana Murray, Lisa Robey, Jill Ryan, Brandy Stickel, Sebastiane Toney and Lauren Trilli ◆

Personnel from the command's G Department were recognized in December with fiscal year 2020 2nd and 3rd Quarter PEO IWS Excellence Awards for their efforts in helping the fleet stay up and running. The PEO IWS Excellence Awards are presented twice a year and acknowledge individuals, teams and organizations that have made significant contributions to PEO IWS.

- SeaRAM Elevation Drive Gear Assembly Implementation Team: Charles Grass, Richard McDonough, Timothy Morris, Jeffrey Niedert, David Reid, John Stansberry, James Vaughn and Nicholas Wilkowski
- Mark 38 ISEAs: William Carroccia and Sean MacDonald
- Mark 38 ISEA Team: James Holle, Kevin MacCheyne, Sean MacDonald, Steve Maher, Stephanie Peacock, Sean Stafford and Joshua Su ◆

The Air Force Civil Engineer Center's Joint EOD Technology Division at NSWC IHD was recognized as the Air Force Material Command's nominee for a 2020 Gears of Government Award in November. The team is responsible for testing and publishing joint service EOD procedures, and conducts RDT&E for emergent equipment technologies and concepts to support joint force EOD technicians. The Gears of Government Awards program recognizes individuals and teams across the federal workforce whose dedication supports exceptional delivery of key outcomes for the American people, specifically: Mission Results, Customer Service and Accountable Stewardship. ◆

On Dec. 15, EXU-1 personnel were recognized with the Navy Unit Commendation from the Secretary of the Navy. "I'm incredibly proud of the EXU-1 team and thankful for the recognition that this award provides to the command," EXU-1 CO Cmdr. Edgar Britt said. "We are a small unit and our people work hard in a challenging mission with high tempo and limited resources. For years, our team has provided an outsized contribution to the fleet and joint force and this award is an acknowledgement of that. We gratefully accept and will drive on towards new challenges." ◆

In December, NSWC IHD Emergency Management Division Director Matthew Konschak (right) was recognized with the Navy Meritorious Civilian Service Award. The award is the third highest Navy civilian award and presented to DON employees for meritorious service or contributions resulting in high value or benefits for the Navy or the Marine Corps. Konschak was commended for his active leadership role in the command's response to mitigate the impact of the COVID-19 pandemic.

NSWC IHD CO Capt. Scott Kraft (left) presents EXU-1 CO Cmdr. Edgar Britt with the Navy Unit Commendation, Dec. 15, at EXU-1's headquarters aboard NSF Indian Head. Also pictured are Command Master Chief Jose Bryant (center), EXU-1's Civilian Director Alan Tompkins (center-right), and EXU-1's Executive Officer Lt. Cmdr. Jon Maurus (right).

In a monthly series from January to early March, employees from across the command gathered at the NSF Indian Head Mix House, as representatives from the command's Acquisition Pillar Campaign, Infrastructure Division and IT Division presented to three packed houses as part of a "lunch-and-learn" series. Leadership from the respective groups outlined their duties and responsibilities, explained current projects and fielded questions from the audience.

In an effort to provide the workforce with more access to top leadership and events around the command, a three-part podcast series kicked off in January featuring leadership from the various departments and divisions to provide insight into relevant topics such as NMCI, infrastructure and acquisitions. The podcasts allowed the workforce who were unable to attend the lunch and learn events to learn more about these topics.

In April, NSWC IHD CO Capt. Scott Kraft and TD Ashley Johnson began a biweekly livestream to share views and tackle tough questions from the senior leadership perspective. The livestream has allowed the command to connect virtually. In conjunction with the livestream, an Ask Me Anything channel was created, allowing employees to interact and ask questions directly.

In February, the command hosted a Joint Asymmetric Industrial Warfare Institute (JAIWI) demonstration at the Blossom Point Research Facility in Welcome, Maryland. The JAIWI is a combined effort across DoD, whose active members include NSWC IHD, NSWC Carderock, NSWC Crane, NSWC Keyport, NUWC Newport and Naval X, the DON's "super-connector" focused on scaling non-traditional agility methods across the DON workforce.

Comptroller Department employee Bonnie Lee was instrumental in the command's Operation Spartan Helmet. "When COVID-19 proved to be an imminent threat, we all were concerned. Each of us wondered how to respond to this threat. First responders and our military never once took a step back, but in their fight many began to fall. Resources were scarce and time was of the essence. I had boxes of fabric scraps, ribbon, elastic and other notions from decades of sewing. I started making masks for my family and friends almost immediately as a way to limit our vulnerability. Then people I didn't know began to come to my door. One early morning knock truly demonstrated to me the need, as a visibly alarmed women feared going to her essential job with no PPE [personal protective equipment]. Her eyes teared up as I gave everything I had made at the time to her for her and her co-workers to use. The struggle, the fear was real and was not going away quickly. I reached out to my supervisor that morning and asked about providing reusable face coverings to our department and to the base. She put me in touch with Janet Virgin, the command's protocol officer.

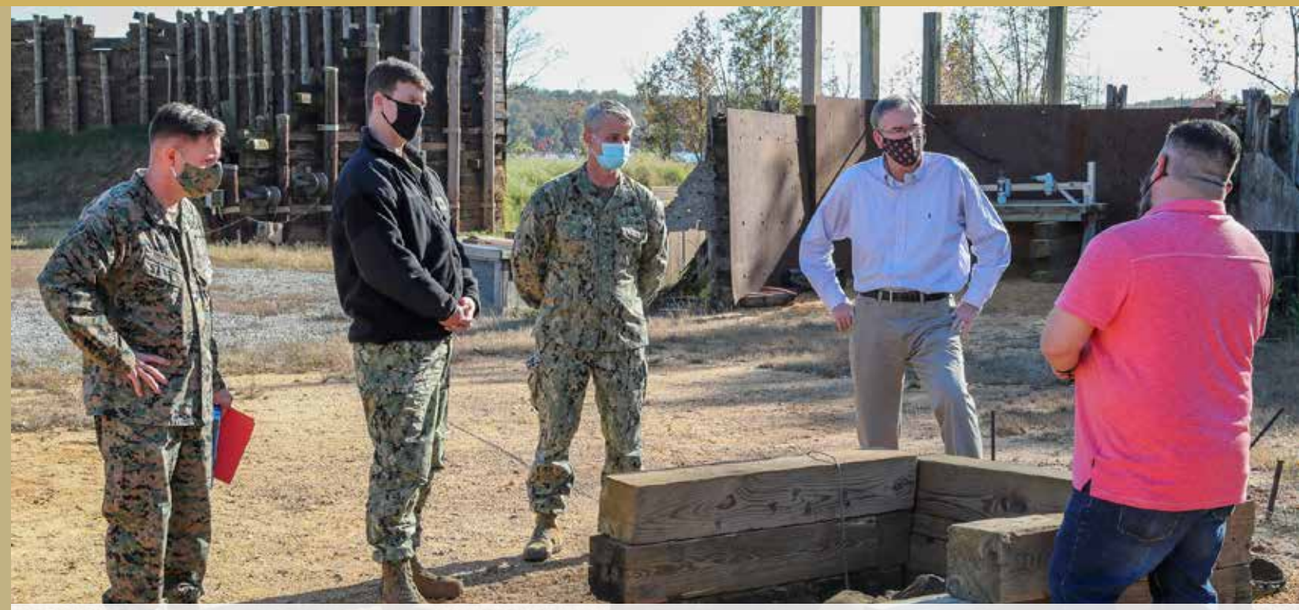
A few emails and a couple of phone calls later, Operation Spartan Helmet was underway. We quickly banded together, thought outside the box, and used our collective resources and skills to provide effective PPE to protect those that work to protect us all. Who could have imagined that a sewing machine would be a vital weapon against an enemy 'foreign or domestic'! The hours were long, the team was fantastic and the work was rewarding. I felt a sense of pride as TD Ashley Johnson displayed our masks on the Leadership Livestream, with one of my designs making it to his final two choices. To be able to do something to contribute to the fight was gratifying and demonstrated that civilian or military, we are all warfighters and are much stronger together."

An EXU-1 deploying team member conducts scene documentation during one of the final certification events in late October at NSWC IHD. The Final Evaluation Period is the culmination of six months of training for EXU-1 personnel certifying them as ready to accomplish their critical mission in expeditionary technical intelligence operations.

In October, EXU-1 completed six months of intensive training and concluded their Final Evaluation Period to certify them as ready to accomplish their critical mission in expeditionary technical intelligence operations. As the Navy's preeminent authority in the technical and forensic exploitation of advanced weapons and other systems, EXU-1's work is critical in helping put the clues together to figure out who is responsible for an ordnance, and providing valuable data to advise what the bigger picture could mean for joint force countermeasures or national level attribution supporting diplomatic actions. ◆

An exploitation specialist assigned to EXU-1 takes photographs of captured enemy weapons during a site exploitation training scenario at NSWC IHD prior to deployment, Oct. 23.

In February, the command hosted the EOD Technology and Training Program Board. February also brought a final visit from Donald McCormack, executive director for NAVSEA Warfare Centers, as part of his farewell tour across the nation's Warfare Centers before his retirement. McCormack retired in April following 35 years of federal service.



Ordnance Development Team Lead Joe Rothenberger explains to (right to left) Deputy Assistant Secretary of the Navy (Air/Ground Programs) William Taylor, CO Capt. Scott Kraft, NAVSEA Warfare Centers Commander Rear Adm. Kevin Byrne and Marine Corps Maj. Joseph Hockett, protocols for developing, validating and verifying render safe and disposal procedures for EOD technicians, Nov. 3. The visit provided Byrne and Taylor an overview of the joint EOD program and highlighted MTAB, EXU-1 and EOD Department components in the program.

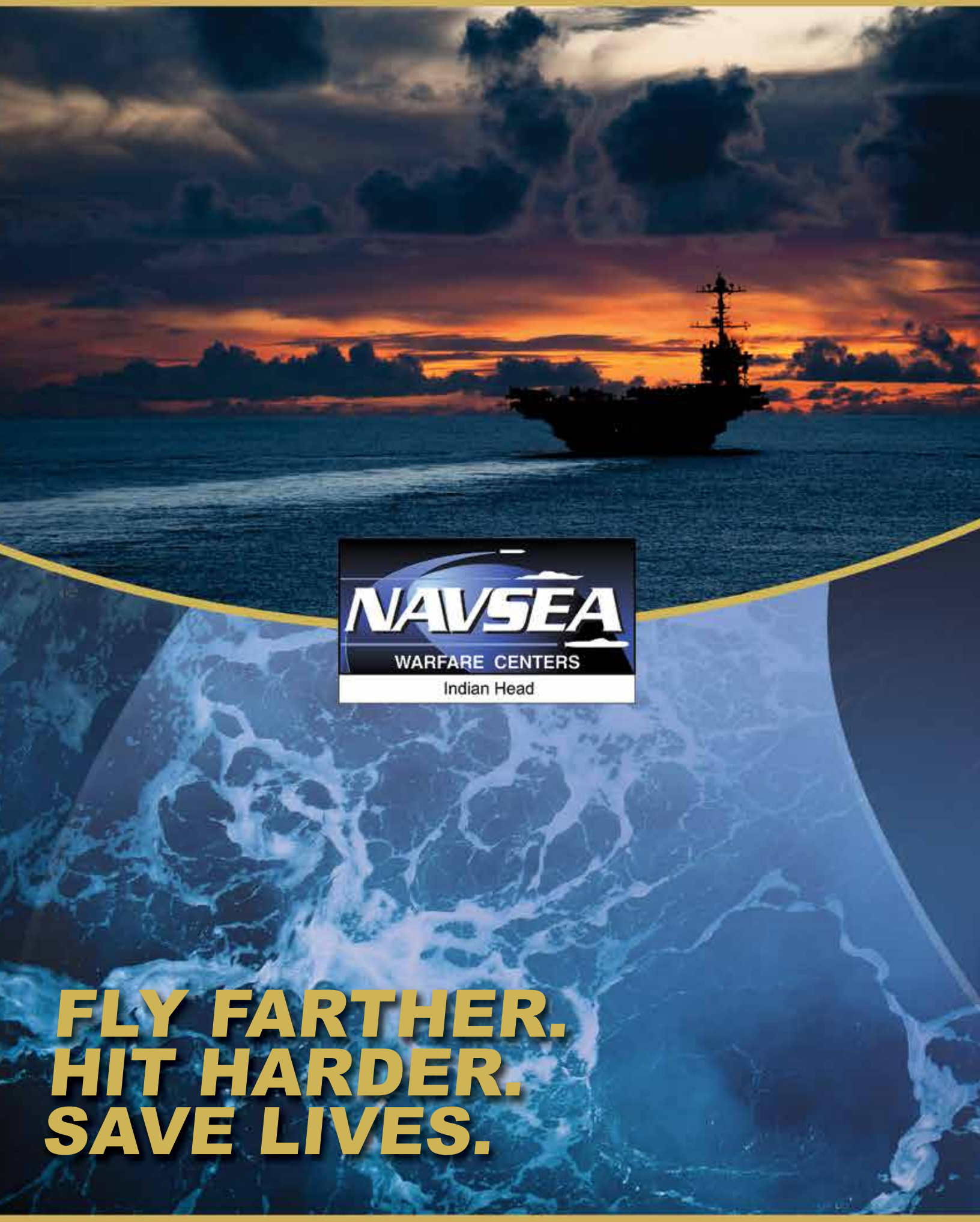
NAVSEA Warfare Centers Executive Director Dr. Brett Seidle visits the primer assembly operation during his tour of CAD/PAD operations, Sept. 16. Pictured are M Department employees Sandy Matthews-Green, Lenora Nathan and Linda Hawkins.

Visits and events took on an entirely new meaning in 2020 with the command and most of the DoD in a max telework environment. The year began strong with a visit from DTRA in January to discuss its global power competition posture, to highlight current and future programs, and to provide a tour of some of the command's key laboratories. DTRA Senior Executive Stephen Dowling and several colleagues were briefed on some of the command's current joint DTRA and IHD programs as well as the command's new CBR-D capabilities and toured several facilities and laboratories, including one building where the majority of DTRA-funded research is conducted. ◆

Strategic Warfighting Innovation Cell Director Capt. Nicholas Dienna visited visited in February to learn more about the command's innovation efforts and opportunities for collaboration. ◆

Joe Martin, Executive Director of Supply Chain Management, Assistant Secretary of the Navy (Research, Development and Acquisition), visited the command in December. As the Deputy Assistant Secretary of the Navy lead for the Naval Energetics Executive Committee Line of Effort 2: Infrastructure Sustainment /Supply Chain Fragility, Martin came onboard to learn more about the command's organic energetics capability. ◆

In October, Commander, Air Force Installation and Mission Support Center Maj. Gen. Tom Wilcox visited the command to present the Gears of Government Award nomination to the Air Force Civil Engineer Center's Joint EOD Technology Division at NSWC IHD. The Joint EOD Technology Division was recognized in 2020 as the Air Force Material Command's nominee for a 2020 Gears of Government Award. Pictured from left to right: Master Sgt. Bradley Taylor, Tech. Sgt. Nevin Umble, Tech. Sgt. Michael Stuenzi, Maj. Patrick Kucera, Master Sgt. Noah Cheney and Master Sgt. Colby Nokes.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