

# Coast Guard Cutter Active Returns Home After Seizing \$87 Million Worth of Cocaine

PORT ANGELES, Wash. – The Coast Guard Cutter Active returned home Oct. 12 following a 50-day counterdrug deployment to the Eastern Pacific Ocean.

The 75-member crew aboard Active conducted multiple law enforcement boardings in international waters off the coasts of Central and South America. The cutter interdicted three suspected smuggling vessels, disrupting the movement of 5,794 pounds of illicit narcotics valued at more than \$87 million.

An Air Station Port Angeles aircrew and a MH-65 Dolphin helicopter embarked aboard Active for the majority of the patrol. The aircrew aided in the interdiction of suspected narcotics traffickers. Two members of the Chilean Navy also deployed aboard Active during the patrol.

Coast Guard cutters operate under the tactical control of 11th Coast Guard District in support of Joint Interagency Task Force-South while conducting counterdrug operations in the Eastern Pacific Ocean. The U.S Coast Guard partners with other nations through bilateral agreements to conduct interdictions in foreign and international waters.

Active is a 210-foot medium-endurance cutter commissioned in 1966 and homeported in Port Angeles. Active's crew routinely operate from the Straits of Juan de Fuca down to the waters off Central America. Active conducts nine of the Coast Guard's 11 statutory missions, including search and rescue, drug interdiction, fisheries enforcement and homeland security.

---

# Coast Guard Continues Hurricane Michael Response

MOBILE, Ala. – Coast Guard crews continued response efforts along the path of Hurricane Michael, the U.S. Coast Guard Hurricane Michael Response Information Center said in an Oct. 11 release.

As of 6:30 p.m. on Oct. 11, Coast Guard crews had rescued approximately 40 people and assisted 232.

Coast Guard shallow-water response teams have been conducting search-and-rescue efforts and removing debris from the roadways to ensure emergency services are able to access the roads. The shallow-water response teams helped assist 142 nursing home patients to a bus that transferred them to a safe haven at a Pensacola hospital.

Coast Guard Port Evaluation Assessment Teams are assessing damage caused by the hurricane and have been actively engaged with port partners to ensure reopening of Pensacola and Panama City waterways.

Coast Guard pollution responders are evaluating waterfront facilities, sunken, damaged or capsized vessels and conducting overflights to ensure mitigation of hazards to the maritime environment.

---

# Navy Innovators Reveal Revolutionary Research to Counter Emerging Threats

DAHLGREN, Va. – Navy inventors are confident that their latest research in quantum physics, artificial intelligence, and cyber security – to name a few – will ultimately impact U.S. military and homeland security efforts. The innovations and their potential military applications were introduced and explained by the researchers at a recent event, Naval Surface Warfare Center Dahlgren Division (NSWCDD) announced Oct. 12.

In all, principal investigators presented 20 research projects with the titles of their discoveries ranging from “Cyber Security for the Internet of Things” and “Electrochemical Destruction of Bulk Chemical Warfare Agents” to the “Dynamical Non-Locality Induced Effect in Quantum Interference.”

Navy technical managers, engineers and scientists networked with representatives from academia, industry, transition partners, and other key stakeholders to see and hear more about these new innovations at the In-house Laboratory Independent Research (ILIR) and Independent Applied Research (IAR) End of Year Review at the University of Mary Washington Dahlgren Campus, Sept. 25.

Funded by the Office of Naval Research (ONR), the ILIR and IAR program fosters fundamental and applied research at the Navy Warfare Centers to counter emerging threats by connecting technological needs with current and emerging capabilities.

The NSWCDD principal investigators identified challenges, objectives, accomplishments and future benefits while answering questions and briefing the ILIR and IAR projects they’ve been working on over the past year.

“The program helps to ensure a next generation of technically competent scientists by supporting masters and doctoral dissertation research, and research in the areas that are essential to our future mission,” said Dr. Jeff Solka, NSWCCD ILIR/IAR program director. “Our ILIR and IAR process is a means to develop the next generation of Navy scientists and engineers capable of addressing key warfighter challenges to ensure the Navy maintains a leading edge in science for national defense.”

Many of the projects presented at the ILIR and IAR event have the potential to result in Cooperative Research and Development Agreements. This legal agreement provides a means for NSWCCD and a private sector partner to cooperatively conduct research and development in a given technical area and share in the technical results.

“We have three strategic thrusts for ILIR and IAR programs,” Solka said, in reference to the programs at NSWCCD. “We provide funding for science, engineering, mathematics and statistics students to complete their graduate studies. New researchers can develop their own science and technology projects and portfolios. In addition, world-class researchers have the ability to develop revolutionary ideas.”

For example, world-class principal investigators Scott Spence and associate investigator Dr. Dan Parks developed a revolutionary idea for their quantum physics project, titled, “Dynamical Non-Locality Induced Effect in Quantum Interference.” The potential military applications of their research include anti-tamper cybersecurity, invisible security fences and highly sensitive vibrometer technologies.

“Dynamic non-locality is more robust than kinematic non-locality,” said Spence, pointing out that dynamical non-locality will provide an enabling technology for future quantum devices.

Principal investigator Dr. Joseph Hunt's work – "Synthesis and Characterization of Carbon Nanotube-Metal Organic Framework Composites" – could be used to develop new electromagnetic materials with enhanced, tunable properties with applications in electromagnetic offense and defense, and electric weapons in addition to chemical, biological and radiological protection.

"The Metal Organic Framework nanotube composites could be transitioned to a variety of operational areas in which thin layers of material with high electromagnetic lossiness is desired," said Hunt. "The other permittivity and potential electronic properties could be used in electric weapons or directed energy projects."

Hunt's project – performed to produce composites with enhanced properties by combining carbon nanotube and reticular chemistry – advance the state of the art by exploring how the material properties of Metal Organic Framework are affected by the incorporation of increasing amounts of carbon nanotubes.

"This work enables future weapon systems by providing control over the electromagnetic properties of the material as well as providing the improved conductivity necessary for sensors and other electronic systems utilized by the Navy and Department of Defense."

Principal investigator Kimberly Zeitz – an NSWCDD scientist and Ph.D. student at Virginia Tech – presented a new security technique in her project, "Cyber Security for the Internet of Things," that has the potential to protect data from sensor devices utilized for wartime communications.

Zeitz focused on limiting the time attackers may conduct reconnaissance on low-powered embedded system devices while considering the challenges such as resource and performance constraints. Low-powered, low-resource devices cannot use traditional security methods.

“This Micro Moving Target IPv6 Defense obscures communications of these devices through address rotation,” said Zeitz, regarding her research at NSWCDD, which is closely linked to ongoing research conducted within the Virginia Tech Information Technology Security Lab.

“Past and ongoing research includes a Moving Target IPv6 Defense and its applications in enhancing network security,” said Zeitz. “This security technique can be catered for use with different applications on different embedded devices. The ability to select the hashing algorithm used allows it to be adapted for a best fit and also to stay current as new has algorithms are developed.”

Dr. Elizabeth Haro’s research on data visualization support resulted in a tool that will be transitioned to the Aegis Readiness and Training Center for use in in training Sailors. Her research project – “Data Visualization Support for Creation of a Numerical Table: Effects on Training and Performance” – can result in novel visualization techniques, including 3D visualizations to optimize delivery and utilization for the human users.

An incorrectly developed ship doctrine can lead to catastrophic events. Currently, the system includes a tabular display of completed doctrine statements on the Aegis Display System and the doctrine comparison capability in 2D. There is no graphical representation to aid the warfighter in the development of doctrine.

“This technology is a visual-based doctrine system that could enable the ability for centralized Fleet level doctrine creation and tactics in real time,” said Haro, the team lead for the NSWCDD Human Systems Integration Science and Technology Team. “It can reduce Sailor workload by minimizing the required sectors that a warfighter must monitor for each ship based on the global coverage area of the fleet doctrine.”

---

# **SPY-6 Radar Tracks Ballistic Missile Through Intercept and Multiple, Simultaneous Targets**

TEWKSBURY, Mass. – Raytheon Co.’s AN/SPY-6(V) radar continues to demonstrate its integrated air and missile defense capability through exceptional performance against multiple targets, the company said in an Oct. 10 release.

The radar detected, acquired and tracked multiple targets from the U.S. Navy’s Pacific Missile Range Facility, Kauai, Hawaii. Capitalizing on two unrelated exercises conducted nearby in mid-September, SPY-6(V) not only tracked multiple threats simultaneously, but also a ballistic missile through intercept, for the first time.

Raytheon’s SPY-6 continues successful testing at the U.S. Navy’s Pacific Missile Range Facility.

“AN/SPY-6(V) continues to impress through consistent performance against complex, surrogate threats,” said U.S. Navy Captain Seiko Okano, major program manager for Above Water Sensors, Program Executive Office, Integrated Warfare Systems. “With production now underway, we’re progressing – with confidence – toward delivery of this exceptional, game-changing radar, which will transform our naval capabilities for decades to come.”

The SPY-6(V) program has met all milestones, ahead of or on schedule, since its inception in January 2014. The radar has amassed a track record of performance, demonstrating its

multimission capabilities against an array of single and multiple simultaneous targets throughout the Navy's extensive testing program and against various targets of opportunity. Now in production at Raytheon's advanced Radar Development Facility, AN/SPY-6(V) remains on schedule for delivery to the first DDG 51 Flight III, the future USS Jack H. Lucas, in 2019.

AN/SPY-6(V) provides greater range, increased accuracy, greater resistance to environmental and man-made electronic clutter, higher reliability and sustainability than currently deployed radars. The radar's demonstrated sensitivity provides greater coverage for early and accurate detection which optimizes the effectiveness of the Navy's most advanced weapons, including all variants of Standard Missile-3 and Standard Missile-6.

---

## **Coast Guard Conducting Search and Rescue After Hurricane Michael**

MOBILE, Ala. – The Coast Guard is conducting search-and-rescue operations throughout areas affected by Hurricane Michael, the U.S. Coast Guard Hurricane Michael Response Center in Mobile, Alabama, said in an Oct. 11 release.

As of 9 a.m. on Oct. 11, Coast Guard crews have rescued approximately 17 people and assisted six. Currently, the Coast Guard has nine aircraft and three shallow-water response teams conducting rescues.

Nine people were rescued by Coast Guard aircrews after they

became trapped in a bathroom when a roof collapsed in Panama City, Florida, on the afternoon of Oct. 10.

“We have multiple aviation and ground assets focused on saving lives,” said Cmdr. Jason Franz, Sector Mobile incident commander for Hurricane Michael. “We’re working closely with Customs and Border Protection aircrews to help with our search and rescue operations.

“Our pollution and damage assessment teams have begun evaluating major areas of pollution and damage to our waterways, and we’ve partnered with the Army Corps of Engineers and other port partners to begin the process of re-establishing our ports to ensure we have commerce flowing as soon as possible,” he said.

---

## **NAVSEA Approves First Additive Manufactured Metal Component for Shipboard Use**

WASHINGTON – Naval Sea Systems Command (NAVSEA) has approved the first metal part created by additive manufacturing (AM) for shipboard installation, the command said in an Oct. 11 release.

A prototype drain strainer orifice (DSO) assembly will be installed on USS Harry S. Truman (CVN 75) in fiscal 2019 for a one-year test and evaluation trial. The DSO assembly is a steam system component that permits drainage/removal of water from a steam line while in use.

Huntington Ingalls Industries Newport News Shipbuilding builds

Navy aircraft carriers and proposed installing the prototype on an aircraft carrier for test and evaluation.

“This install marks a significant advancement in the Navy’s ability to make parts on demand and combine NAVSEA’s strategic goal of on-time delivery of ships and submarines while maintaining a culture of affordability,” said Rear Adm. Lorin Selby, NAVSEA chief engineer and deputy commander for Ship Design, Integration, and Naval Engineering. “By targeting CVN 75, this allows us to get test results faster, so – if successful – we can identify additional uses of additive manufacturing for the fleet.”

The test articles passed functional and environmental testing, which included material, welding, shock, vibration, hydrostatic, and operational steam, and will continue to be evaluated while installed within a low temperature and low-pressure saturated steam system. After the test and evaluation period, the prototype assembly will be removed for analysis and inspection.

While the Navy has been using additive manufacturing technology for several years, the use of it for metal parts for naval systems is a newer concept and this prototype assembly design, production, and first article testing used traditional mechanical testing to identify requirements and acceptance criteria. Final requirements are still under review.

“Specifications will establish a path for NAVSEA and industry to follow when designing, manufacturing and installing AM components shipboard and will streamline the approval process,” said Dr. Justin Rettaliata, technical warrant holder for Additive Manufacturing. “NAVSEA has several efforts underway to develop specifications and standards for more commonly used additive manufacturing processes.”

---

# **MARAD Issues RFP for Vessel Construction Manager to Deliver New Training Vessel**

WASHINGTON – The Maritime Administration (MARAD) released a request for proposal (RFP) to solicit for a Vessel Construction Manager (VCM) to deliver a new class of training ship, referred to as the National Security Multi-Mission Vessel (NSMV), MARAD said in an Oct. 11 release.

The VCM selected by MARAD will contract with a qualified shipyard to ensure that commercial best practices are utilized in delivering the NSMV on time and on budget.

“A new multi-mission vessel built by an American shipyard will not only create new jobs but help train the next generation of American mariners and contribute to disaster relief,” said U.S. Secretary of Transportation Elaine L. Chao.

The 2017 National Defense Authorization Act directed MARAD to “provide for an entity other than the Maritime Administration to contract for the construction of the NSMV.” This procurement process leverages existing marketplace expertise, targeting companies experienced in the production of innovative U.S.-built ships.

“The U.S. shipbuilding and repair industry is vital to the economic strength and security of our nation,” said Maritime Administrator Mark H. Buzby, “and this project will demonstrate that American shipbuilding remains the global standard of excellence.”

The NSMV will help to sustain world-class, U.S. maritime

training operations at the state maritime academies by equipping young American mariners with a modern and adaptable training platform. The NSMV will feature numerous instructional spaces, eight classrooms, a full training bridge, labs, and an auditorium. It will have space for up to 600 cadets to train in a first-rate maritime academic environment at sea.

In addition to serving as an educational platform, the NSMV will also be available to support federal government efforts in response to national and international disasters, such as hurricanes and earthquakes. In this role, the NSMV will be equipped to support major federal relief and response efforts, providing hospital facilities, a helicopter landing pad, and berthing for up to 1,000 first responders and recovery workers. The NSMV's roll-on/roll-off ramp and a crane to facilitate container storage capabilities will also enable it to provide critical supplies to damaged port facilities.

The economic benefit of this coastwise-endorsed training vessel extends beyond academics – and the replacement of the nation's aging "training ship" fleet – to the thousands of men and women in the shipbuilding and repair industry. These skilled workers at U.S. shipyards and repair facilities add billions to the economy annually, reflecting the best of American maritime engineering and ingenuity. The first NSMV is expected to be delivered to MARAD in 2022.

---

## **Navy Secretary Names Two Littoral Combat Ships**

WASHINGTON – Navy Secretary Richard V. Spencer has announced

the names of two future littoral combat ships (LCSs), the secretary's public affairs office announced in two Oct. 9 releases. The Freedom-variant LCS 29 will be named USS Beloit and the Independence variant LCS 32 will be named USS Santa Barbara.

The future USS Beloit (LCS 29) is named in honor of Beloit, Wisconsin, and is the first ship to bear the name.

"The city and citizens of Beloit have been a steadfast supporter of the Navy and Marine Corps," Spencer said. "From building engines for Freedom-variant LCSs to manufacturing components for the Ford-class aircraft carriers, the contributions of Beloit citizens make our Navy stronger, more capable and more lethal. I am proud to name the next ship in honor of the city and citizens of Beloit."

USS Beloit will be constructed by Lockheed Martin with Marinette Marine in Marinette, Wisconsin. This ship will be 387 feet long, have a beam length of 57.4 feet and travel at speeds in excess of 40 knots.

The future USS Santa Barbara (LCS 32) is named in honor of Santa Barbara, California, and is the third ship to bear the name.

"I am pleased to name the next Independence variant LCS after the city of Santa Barbara," Spencer said. "This city's innovative workforce and longstanding support of our Navy and Marine Corps team, whether active duty, reserve force, civilian or Veterans, the support from this community strengthens our Navy and nation."

The future USS Santa Barbara will be built by Austal USA in Mobile, Alabama. This ship will be 421 feet long with a beam length of 103.7 feet and be capable of operating at speeds in excess of 40 knots.

The Navy has accepted delivery of 16 LCSs. Including the

recent contract modifications, a total of 32 LCSs have been procured with 10 ships under construction (LCS 15, 17, 19-26).

---

## **Coast Guard Rescues 10 from Disabled Cargo Ship**

PORTSMOUTH, Va. – The Coast Guard Cutter Confidence rescued 10 crew members, who had been stranded on a disabled cargo ship for almost 20 days, Oct. 8 approximately 1,380 miles southeast of Bermuda, the 5th Coast Guard District said in an Oct. 5 release.

“We were conducting a law enforcement patrol near Puerto Rico when we were assigned to assist the crew of the motor vessel Alta,” said Cmdr. Travis Emge, the commanding officer of the Confidence. “We traveled over 1,300 nautical miles to get to the disabled ship ahead of Hurricane Leslie’s forecasted track and brought the 10 crew members aboard. We are all proud of our part in this coordinated Coast Guard response to rescue this crew.”

The Coast Guard was notified Sept. 30 that the 250-foot Tanzanian-flagged cargo ship, Alta, became disabled Sept. 19, while transiting from Greece to Haiti, and was unable to make repairs. The crew reported that they had enough food for two days and water for 15 days, and that there were no injuries or immediate medical concerns.

An aircrew on an HC-130 Hercules airplane from Coast Guard Air Station Elizabeth City, North Carolina, dropped about a week’s worth of food to the crew Oct. 2, helping sustain the men until help could arrive.

The Confidence is taking the 10 men to Puerto Rico and is scheduled to arrive there Oct. 12.

The Coast Guard's Fifth District command center has been working to coordinate with the ship owner for a commercial tug to tow the vessel to shore.

---

# **Aerojet Rocketdyne Successfully Tests Hypersonic DMRJ Engine**

NASA LANGLEY RESEARCH CENTER, HAMPTON, Va. – Aerojet Rocketdyne has successfully tested a new dual-mode ramjet/scramjet (DMRJ) engine, the company announced in an Oct. 8 release.

When combined with a gas turbine engine as part of a turbine-based combined-cycle propulsion (TBCC) system, this engine may provide the capability to propel a vehicle from a standstill into the hypersonic flight regime of Mach 5 or higher and back again.

“Developing hypersonic capabilities has recently been cited by Department of Defense officials as the ‘highest technical priority’ for our nation,” said Eileen Drake, Aerojet Rocketdyne president and CEO. “Aerojet Rocketdyne is well positioned to support this call to action as we have been developing hypersonic propulsion technologies for more than 30 years.

“Our scramjet engine powered the record-setting test flights of the X-51A WaveRider, and we have accelerated our development efforts since then. That progress, when combined

with the advances we've made in additive manufacturing has enabled this next generation of hypersonic propulsion systems," she said.

The series of tests was conducted as part of an ongoing collaboration with the Defense Advanced Research Projects Agency, NASA and the U.S. Air Force to develop hypersonic propulsion technologies. These tests also helped validate an advanced analytical tool set developed by Aerojet Rocketdyne that enables precise simulation of complex DMRJ flow fields across a broad scale of applications.