# Coast Guard, Caribbean Border Interagency Group Seize $30 Million in Cocaine off Puerto Rico

SAN JUAN, Puerto Rico – Coast Guard and Caribbean Border Interagency Group (CBIG) law enforcement authorities seized 2,324 pounds of cocaine, worth an estimated $30 million, following the interdiction of a go-fast vessel off Luquillo, Puerto Rico, Oct. 13 the 7th Coast Guard District said in an Oct. 16 release.

This interdiction is the result of ongoing multi-agency law enforcement efforts in support of Operation Caribbean Guard and the Caribbean Border Interagency Group.

“This successful interdiction is a testament to the crew’s vigilance, dedication to the mission, and quick action, and I couldn’t be prouder,” said Lt. Katherine Ustler, Coast Guard Cutter Donald Horsley commanding officer. “Their efforts, along with support from our partner agencies, directly prevented over a ton of cocaine from reaching the streets of Puerto Rico.”

While on a routine patrol of the area, the crew of the Donald Horsley detected a suspicious go-fast vessel at 1:16 a.m. Oct. 13 transiting without navigational lights and three people onboard, approximately nine nautical miles off the coast of Luquillo.

Coast Guard watchstanders in Sector San Juan alerted CBIG partner agencies of the developing situation, while the Donald Horsley remained in hot pursuit of the go-fast with the assistance of unit’s Over-the-Horizon IV cutter boat.

Upon detecting the Coast Guard's presence, the crew of the go-fast proceeded to attempt to flee the area at high speed with Donald Horsley's cutter boat remaining in hot pursuit. During the pursuit, the Donald Horsley crew observed the suspected smugglers jettison numerous bales of their cargo overboard. Shortly thereafter, the go-fast made landfall near La Pared Beach in Luquillo, where the smugglers fled the area and abandoned the go-fast with the remaining cargo onboard.

Following the pursuit, Donald Horsley combined efforts with responding U.S. Customs and Border Protection Caribbean Air and Marine Branch and Puerto Rico Police Joint Forces of Rapid Action marine units, as well as, Immigration and Customs Enforcement's (ICE) Homeland Security Investigations (HSI) land teams, which located and recovered 47 bales from the water and the abandoned go-fast. A Coast Guard MH-65 Dolphin helicopter and a Coast Guard Auxiliary fixed-wing aircraft also assisted in the search for the jettisoned cargo. The recovered cargo tested positive for cocaine.

The seized contraband is in the custody of ICE-HSI, which is leading the investigation into this case.

Operation Caribbean Guard is a Department of Homeland Security multi-agency law enforcement operation to support ongoing efforts in Puerto Rico and the U.S. Virgin Islands executed under the San Juan Regional Coordinating Mechanism/CBIG.

CBIG unifies efforts between U.S. Customs and Border Protection, the U.S. Coast Guard, U.S. Immigration and Customs Enforcement, the United States Attorney's Office for the District of Puerto Rico, and Puerto Rico Police Joint Forces of Rapid Action, in their common goal of securing the borders of Puerto Rico and the U.S. Virgin Islands against illegal migrant and drug smuggling.

Donald Horsley is a 154-foot fast-response cutter homeported in San Juan, Puerto Rico.

# Legare Returns to Virginia After Rescue Missions Off the East Coast

PORTSMOUTH, Va. — The crew of Coast Guard Cutter Legare returned home to Coast Guard Base Portsmouth Oct. 15 following a 12-week patrol in the North Atlantic, providing search-and-rescue capability and living marine resource protection, the 5th Coast Guard District said in a release.

In more than 12,000 miles of patrolling, the crew supported five search-and-rescue missions, including a disabled and adrift 438-foot liquid asphalt tanker that suffered a catastrophic engine room fire approximately 50 miles off Nantucket. The response to these missions resulted in 40 lives saved and assisted.

They also towed a disable fishing vessel through dense fog over 75 nautical miles and completed over 90 boardings, enforcing federal fishing regulations in America's exclusive economic zone.

"I could not be prouder of this crew and their incredible accomplishments during these days we've been away. I know it is not without sacrifice and certainly the families back home take on a lot of that burden, but rest assured, your sailor is doing their duty and doing it well," said Cmdr. Blake Stockwell, Legare's commanding officer. "The successes from this patrol highlight and remind me why I love going to sea, the sailors that bring the ship to life and serve with devotion and honor the country we love."

Legare is a multimission 270-foot medium-endurance cutter.

Missions include search and rescue, maritime law enforcement, marine environmental protection, homeland security, and national defense operations.

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# Wärtsilä Opens the World's First International Maritime Cyber Centre of Excellence

SINGAPORE – The technology group Wärtsilä opened an International Maritime Cyber Centre of Excellence (IMCCE) Oct. 16 in Singapore, the company said in a release. The IMCCE consists of a Maritime Cyber Emergency Response Team (MCERT) and a cyber academy.

The IMCCE is a world's first industry solution for the marine industry, founded by Wärtsilä together with its strategic partner in cyber security, Templar Executives. The IMCCE will provide a focal point for the industry to help drive the cyber awareness and response to cyber incidents.

"Cyber is such a critical topic to all players in marine. Taking stewardship in something as important as this, shows that Wärtsilä is committed to transform and digitalize the marine industry. This is the next step in our Smart Marine vision and supports our Oceanic Awakening and Sea20 initiatives," says Marco Ryan, chief digital officer at Wärtsilä.

"There are three main drivers for the maritime industry to collaborate in improving our cyber resiliency: the vast attack surface that the maritime industry offers to cyber criminals; the inclusion of maritime into the critical national

infrastructure of nation states and the pending cyber security regulation by the International Maritime Organization in 2021," said Mark Milford, vice president, Cyber Security at Wärtsilä.

The MCERT is an international cyber intelligence and incident support platform enhancing cyber resilience for the entire maritime ecosystem. It provides international intelligence feeds, advice and support, including real-time assistance to members on cyber attacks and incidents, and a Cyber Security Reporting Portal (CSRP) for its members. The MCERT operates from the Wärtsilä Acceleration Centre facilities launched today in Singapore.

"It's not a coincidence that the IMCCE is based in Singapore – it's a country that is forward-leaning in cyber development and a very important location in the maritime ecosystem. Despite its home base, the MCERT is available for the entire maritime sector around the world, from single vessels to large shipping and tankers to ports, port authorities and suppliers," Milford said.

The MCERT is based on a membership model and for those who want to lead the cyber agenda in the industry, it offers an Advisory Board membership. The Advisory Board will comprise of key stakeholders from the Maritime ecosystem in the areas of shipping, oil and gas, ports and cruise ships.

The Cyber Academy's courses will cover a range of relevant topics, from cyber security coaching for senior management to cyber awareness for all organizational levels within the maritime industry.

"In the face of growing Cyber threats and increasing regulatory pressures it is up to us in the Maritime sector to act now; the IMCCE incorporating the Maritime Cyber Emergency Response Team and the Cyber Academy for Maritime is an exciting opportunity for us all, from the smallest to the

largest providers within the Maritime ecosystem, to work together to protect, influence and enable the future of our industry," said Andrew Fitzmaurice, CEO at Templar Executives.

"The IMCCE is a totally new business model that supports our customers in their industry transformation, whilst demonstrating a step change in clock speed for the company about how we turn an idea into a tangible Cyber as-as Service solution," Ryan said.

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# Fabrication Begins on Future USS Bougainville

PASCAGOULA, Miss. – Fabrication has been started for the future amphibious assault ship USS Bougainville (LHA 8) at Huntington Ingalls Industries' (HII) shipyard in Pascagoula, Mississippi, Naval Sea Systems Command said in an Oct. 16 release.

The start of fabrication signifies the shipyard is ready for sustained production after a successful production readiness review. LHA 8 is the second ship named in honor of the Bougainville Island campaign in World War II and is scheduled to be delivered in 2024.

"Expeditionary warfare and power projection ashore is advancing at a historic pace – starting on this unique ship is a proud day for our Navy, Marine Corps and industry partners," said James F. Geurts, assistant secretary of the Navy (Research, Development and Acquisition). "Bougainville represents the next generation of amphibious capabilities and is a key component to meet the demands of the National Defense Strategy. The ability to both support Joint Strike Fighter and

put Marines ashore will ensure that the Amphibious fleet remains agile and capable of expeditionary warfare well into the 21st century."

The LHA Replacement Program, also known as USS America (LHA 6) class, replaces the original five Tarawa-class LHAs, all of which have been decommissioned. The America class is designed to accommodate the Marine Corps' future Air Combat Element including F-35B joint strike fighter and MV-22 Osprey, with additional aviation maintenance capability and increased fuel capacities. It will also provide additional cargo stowage capacities and enable a broader, more flexible command and control capability.

LHA 8 will be the first Flight I ship and will reincorporate a well deck to increase operational flexibility. Bougainville will incorporate the Enterprise Air Surveillance Radar volume air search radar in lieu of the AN/SPS-48G air search radar on America and Tripoli.

"We are excited to commence fabrication on the third ship of the America class," said Tom Rivers, Amphibious Warfare program manager for Program Executive Office Ships. "We look forward to achieving future production milestones as we work to deliver this versatile and capable warship to the fleet."

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# Alert Returns Home Following Counterdrug Patrol

ASTORIA, Ore. – U.S. Coast Guard Cutter Alert returned home Oct. 13 following a 50-day counterdrug patrol to the Eastern Pacific Ocean, the Coast Guard Pacific Area said in an Oct. 15 release.

The 75-member crew aboard Alert conducted multiple law enforcement boardings in international waters off the coasts of Central and South America. The cutter interdicted a suspected smuggling vessel and seized approximately 1,300 pounds of cocaine worth an estimated $17 million wholesale.

Coast Guard cutters operate under the tactical control of 11th Coast Guard District in support of Joint Interagency Task Force-South (JIATF-S) 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.

“The Coast Guard Cutter Alert crew once again exceeded all expectations during this diverse patrol,” said Cmdr. Tobias Reid, Alert’s commanding officer. “They represented the Coast Guard in exceptional style during LA Fleet Week 2018, made great strides in preparing for our major annual training evaluation, and successfully stopped suspected drug smugglers from transporting cocaine into our country.”

Commissioned in 1969, Alert is one of 14 remaining 210-foot Reliance-class medium endurance cutters built for the Coast Guard. Alert’s crew routinely operate from the Straits of Juan de Fuca down to the waters off South America.

Alert conducts nine of the Coast Guard’s 11 statutory missions, including search and rescue, drug interdiction, fisheries enforcement and homeland security.

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# Cutter Heriberto Hernandez

# Repatriates 12 Dominican Migrants

SAN JUAN, Puerto Rico – The crew of the Coast Guard Cutter Heriberto Hernandez repatriated 12 Dominicans and returned two Haitians to Dominican authorities Oct. 14, following the interdiction of a migrant vessel Oct. 11 in waters just off Mona Island, Puerto Rico, the 7th Coast Guard District said in a release.

The interdiction is the result of ongoing efforts in support of Operation Unified Resolve, Operation Caribbean Guard and the Caribbean Border Interagency Group (CBIG).

Two of the interdicted male migrants are Dominican nationals, who are facing potential federal criminal immigration charges in Puerto Rico for attempted illegal re-entry into the United States.

“The outstanding work by the Coast Guard and our interagency partners focused on humanitarian efforts and preventing loss of life at sea,” said Lt. Cmdr. Rafael Battle, U.S. Coast Guard Heriberto Hernandez commanding officer. “The Mona Passage is a volatile waterway with heavy seas. Transiting on dangerously overloaded and unseaworthy vessels poses large risk to anyone making the journey from the Dominican Republic to Puerto Rico. Fortunately, we discovered and saved 16 people before they encountered other potential dangers.”

During a routine patrol of the Mona Passage on the night of Oct. 11, the crew of a Coast Guard HC-144 Ocean Sentry maritime patrol aircraft detected a grossly overloaded 25-foot migrant boat transiting without navigational lights, approximately 10 nautical miles north of Mona Island, Puerto Rico. Coast Guard watchstanders in Sector San Juan diverted Heriberto Hernandez to interdict the vessel. The crew of

Heriberto Hernandez arrived on scene, stopped the boat and safely embarked all 16 migrants: 14 Dominican nationals, 10 men and four women, and two Haitian men.

Once aboard a Coast Guard cutter, all migrants receive food, water, shelter and basic medical attention.

Ramey Sector Border Patrol Agents in Puerto Rico received custody of the two migrants facing prosecution, while the Heriberto Hernandez later rendezvoused with a Dominican Republic navy vessel and transferred custody of the remaining migrants to Dominican authorities.

The Coast Guard's efforts under Operation Unified Resolve contribute to the interagency results being achieved locally under Operation Caribbean Guard, which coordinates efforts between the Coast Guard, its Department of Homeland Security, Commonwealth and Territorial law enforcement partners, who are working diligently to deter, detect and disrupt illicit maritime trafficking to Puerto Rico and the U.S. Virgin Islands.

CBIG unifies efforts between U.S. Customs and Border Protection, the U.S. Coast Guard, U.S. Immigration and Customs Enforcement, the United States Attorney's Office for the District of Puerto Rico, and Puerto Rico Police Joint Forces of Rapid Action, in their common goal of securing the borders of Puerto Rico and the U.S. Virgin Islands against illegal migrant and drug smuggling.

The Heriberto Hernandez is a 154-foot fast-response cutter homeported in San Juan.

# Navy Birthday Ball Marks 243 Years of Service Above Self

WASHINGTON – Hundreds of Washington-area Navy personnel and their guests celebrated 243 years of "honor, courage and commitment" at the U.S. Navy Birthday Ball Oct. 13 at the Ronald Reagan Building, hosted by Navy League national headquarters.

The event featured a performance by the U.S. Navy band and remarks from Chief of Naval Operations (CNO) Adm. John M. Richardson and Tammie Jo Shults, a former naval aviator and now a commercial pilot, who gave a riveting account of the teamwork, training and "steel-caliber nerves" that helped bring Southwest Airlines Flight 1380 in for a safe landing April 17 after the plane suffered a catastrophic engine failure at 32,000 feet.

The CNO and his wife, Dana, and Shults and her husband Dean, joined Navy League National President Alan Kaplan and his wife, Marnie, in the official party for the evening, along with Master Chief Petty Officer of the Navy Russell Smith and his wife, Amy, and Undersecretary of the Navy Thomas Modly and his wife, Robyn.

The remarks and dinner in the Reagan Building's cavernous atrium were followed by the ceremonial cake-cutting with Richardson and Smith being joined the youngest and oldest Sailors in attendance, toasts to each of the sea services and "those in harm's way," and dancing in the adjacent ballroom with music from DJ Chad.

Rear Adm. Brent Scott, chief of chaplains of the Navy, offered the invocation.
"From the core of our soul, help us find faith in something bigger than ourselves, where toughness of spirit and strength

of character emerge to carry us, alongside our families, through the storms that head our way," he said.

During his introductory remarks, Kaplan noted, "Our organization is honored to host the 243rd Navy Birthday Ball. … It takes a special person to become a Sailor. Sailors are not born, they are forged. Tonight, it is our honor to thank you, your spouses and your families for the sacrifice, dedication and for all your service. … You will always be our organization's North Star, lighting our way and inspiring us with your lifelong journey, forged by the sea," echoing the event's theme.

Richardson opened his remarks with a few words of thanks to the Navy League, noting, "The Navy League really has taken this to whole other level. What a great night to come together and remember what the Navy means to our nation."

He also asked that those in attendance remember those who would be marking the Navy birthday from the far corners of the globe, where they were conducting the business of protecting the nation's interests.

"It is a maritime era, this is a maritime century, a maritime economy, … and the stakes for us have never been higher," he said. "While we are here enjoying this wonderful meal in tremendous comfort, even luxury, it always is helpful to think about those 65,000 Sailors who are deployed on about 95 ships, protecting our security."

That is at the very heart of the notion of "forged by the sea," Richardson said.
"They are out there deterring bad behavior, deterring those who would want to take us on, building alliances and partnerships, responding to crises," he said, be it by providing hurricane relief in the Carolinas, assisting with drug interdiction efforts in the Caribbean and Eastern Pacific, participating in the Trident Juncture exercise with

NATO allies in Northern Europe or Valiant Shield in the Pacific, or operating in the Mediterranean: “an increasingly hot part of the world. … We do our job by being forward, by being at sea and we are at sea tonight.”

The experiences at sea, being far forward on deployment, “are the experiences that forge us together to be much tougher, more capable versions of ourselves, inspiring us to levels of performance that even we didn’t think that we could do on our own,” Richardson said.

And he introduced Shults as “someone who embodies all of that. She is one of us, she is a naval aviator,” he said. “Drawing on her extensive naval and civilian flight training, Captain Shults and her team remained calm under extraordinary pressure and circumstances. She piloted her damaged aircraft and nearly 150 passengers onboard to safety in performing an emergency landing in Philadelphia.

“Being a captain means something, and you set the tone. And amid the toughest circumstances, she kept her cool. … We celebrate the Navy spirit embodied in Tammie Jo Shults. She did not give up her aircraft, and we do not give up the ship.”

Had either the Air Force and Army obliged, Shults might not have become “one of us,” as the CNO noted. Growing up in New Mexico, “you don’t see many ships there,” she joked, but the jets from nearby Holloman Air Force Base “drew my attention.”

Her desire to become an aviator, however, was rebuffed by the Air Force and the Army. So while the Navy was not her first choice, it did give her what the services would not: an opportunity.
“In March of 1985, I checked into AOCS (Aviation Officers Candidate School Class 16-85) in Pensacola, Florida. I got my head shaved, and I stared doing push-ups like everyone else. I loved it. I had found my people,” she said.

Shults entered the Navy at a fortuitous time, as more doors

were being opened to women for roles that traditionally had been male-only, something that would come later – many years, in some cases – for other service branches. She went on to become one of the Navy's first female F/A-18 Hornet fighter pilots.

"The Navy itself is too noble, with a mission too big, to cater to personal prejudice," she said. "The Navy was moving on, from the best armada of men to the best armada.

"The experiences that we have in the Navy we could have nowhere else," she continued. "For me, carrier landings and A-7 night bombing stand out as the challenges that groomed more than my skills. They forged a new set of steel-caliber nerves for me. As an instructor pilot, I wasn't allowed to teach guns like my peers. … I was sent to teach OCF [out of control flight] instead. This constant rehearsal of departing controlled flight and even a spiral served me well on April 17, when my Boeing wanted to depart flight."

Shults paused at the midpoint of her remarks as the harrowing audio of the air traffic control recordings that chronicled the battle to bring Flight 1380 in for a landing was played back for the audience, who then gave her a standing ovation when the tape concluded.

Twenty minutes into the flight from New York to Dallas, the 737's left engine failed over Pennsylvania, damaging the wing and the hydraulic and fuel lines, and sending debris into the fuselage that caused a rapid depressurization of the cabin. One passenger was partially sucked out of the plane.
"Everything was fine, until it wasn't," Shults said.

She was quick to credit her fellow crew for their teamwork in helping bring the flight back from the brink of disaster to a safe conclusion.

"A wise man once said, 'It is amazing what you can accomplish when you don't care who gets the credit.' I was blessed to be

part of an incredible team that day," she said.
While the flight crew battled to keep the plane in the air, the cabin crew assisted the passengers with their oxygen masks and assured them that "we were not going down. We were going into Philly," Shults said. "A destination gave hope. It changed the atmosphere immediately."

One passenger, Jennifer Riordan, died as a result of the accident, despite the heroic efforts of several passengers to first pull her back into the plane and then give her cardiopulmonary resuscitation. And though the plane landed safely, "and we returned 148 people to their loved ones that day," the fact that one passenger was not still weighs heavy on herself and the crew, Shults said.
"There is a time to weep and a time to laugh," she said. "A time to mourn and a time to dance. That day I understood those words."

Going forward, Shults urged those in attendance to, come what may, keep blazing a trail.
"It is my hope that when you get your head down deep into the details, or grow tired of your grueling schedule, or become weary of trying to balance saving the free world and still making it home in time for a family dinner, please do not let this one fact elude you: The ripples of your obedience in serving your country, a cause greater than yourself, it changes the very posture of the world we live in," she said.

"You certainly changed my world, by opening your ranks, allowing women to fly in the military. The Navy blazed this trail. … Your birthday quest? … I implore you to lead on. You know who you are, and where you are going. You set a good course. Please continue. Lead on."

# 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, NSWCDD 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 NSWCDD 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 NSWCDD. “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.”