Collaboration Between Small Companies Demonstrates Port Security Technology At Port Hueneme

A team from Ion, SpotterRF, and Marine Arresting Technologies employ a UAV to autonomously deploy a line that successfully slowed the Navy target boat at the entrance to the Port of Hueneme during ANTX Coastal Trident 2021. ION / Dave Gentile
The Advanced Naval Technology Exercise – Coastal Trident 2021 Open House is taking place this week at the NavalX Fathomwerx Laboratory at the Port of Hueneme to examine innovative solutions for port and maritime security. Fathomwerx is a partner-run facility with the Naval Surface Warfare Center Port Hueneme Division (NSWC PHD), the Port of Hueneme, Economic Development Collaborative and Matter Labs.

According to NSWC PHD's Brendan Applegate, the director for the exercise, Coastal Trident is an operational research program conducted to advance the state of the art in countering threats to port and maritime security and the global operations of naval forces. "ANTX-Coastal Trident is not just a Navy exercise, but rather a 'whole of government' effort to bring together involve non-DoD federal, state and local government partners, as well as academia and industry to respond to maritime security threats and incidents in port and coastal waters," he said. "Coastal Trident combines scenario-based training, technical demonstration, field experimentation, and exercise activities, and involves the participation of more than 150 public and private sector organizations."

Hybrid Event

Although teams will be conducting demonstrations throughout the week, the “kick-off” virtual event conducted via Zoom on Sept. 22 provided an overview of the Coastal Trident program and featured presentations by the operational stakeholders.

Participants representing stakeholders from Naval Surface Warfare Center, Naval Facilities Engineering and Research, Office of the Chief of Naval Operations, Department of Homeland Security and Naval Agility provided perspectives on the science and technology (S&T), research and development (R&D) and warfighter communities to communicate the “pull” from the warfighter, provide guidance and alignment for organizations, companies and academia seeking to develop and transition their technical solutions.

The Sept. 23 sessions in-person “open house” at the Fathomwerx facility focused on engagement between operational and technical stakeholders, with presentations on some of the project demonstrations conducted at the Port of Hueneme and at Fathomwerx. Solution providers also had an opportunity to follow up on the technical needs shared during the first day, and to propose solutions and discuss collaborations for future ANTX-Coastal Trident projects.

Applegate said many of the small companies participating in Coastal Trident do not have an adequate understanding of the Navy and its operational requirements or who would best benefit from their technologies.

“We have an environment where we can get a lot of organizations together to look at the technologies from a number of different perspectives, so there are more paths to success,” he said.” We can introduce our participants to all the different parties, the companies that are developing the technology, people who are going to use it, the program offices that are going to help acquire it, and the people that are going to be part of the logistics and sustainment pipeline. So, the goal is to bring all those people together

in some form or another throughout the process.”

Coastal Trident takes advantage of the facilities and capabilities of NSWC PHD and Ventura TechBridge to support high-velocity learning and accelerate development, evaluation and identification of technology implementation to support naval forces with in-service engineering, maintenance and supportability; sensor data fusion, maritime communications and decision support; multi-spectral sensing, augmented (AR) and virtual reality (VR) and digital engineering; and unmanned systems (UxS) applications and countermeasures.

This year, the exercise is examining the operational and technical capabilities of port and maritime security organizations to counter asymmetric threats to the U.S. Marine Transportation Systems (MTS) and its associated personnel, operations, and critical infrastructure.

A number of teams have been working on their projects for many months, and may continue to leverage the knowledge and experience gained as a result of working together during ANTX.

“This event is the culmination of a lot of effort, but it’s just a part of the picture. We’ve been conducting experiments since May. We have 55 different projects, with about 850 people from 160 different organizations, that are part of the program this year,” Applegate said.

Team Entangles Target

In one scenario at the Port of Hueneme, for example, a team employed asmall unmanned vessel as a force multiplier to provide an initial response to a threat.

“The goal of our team is to detect and engage a high-speed leisure craft entering a security zone ‘on the plane’ without damage to the vessel or occupants,” said Matthew Searle, chief technology officer Marine Arresting Technologies (MAT) of Tarpon Springs, Florida. Our objective is to determine

tactics, techniques and procedures for the use of unmanned platforms to deploy non-kinetic effectors, including launch and recovery procedures, the ability to maneuver and deploy payload, and to investigate if speed and stability of the platform is practical in a port environment."

Working with MAT is SpotterRF of Provo, Utah, which is using its small radar to track targets and pass information to the command and control (C2) hub provided by Houston-based ION, which is demonstrating effective data fusion and tracking and intercepts of fast-moving targets.

In the actual demonstration at the entrance to the Port of Hueneme, the target – a Navy High-Speed Maneuvering Surface Target (HSMST) boat – was detected by the SpotterRF radar, queuing the ION C2 system, which directed the launch of the Theiss UAV and autonomously sent it to deploy the MAT drogue line ahead of the HSMST, which entangled the boat's propulsion and slowed it, effectively allowing time for security personnel to respond, and preventing or disrupting the intrusion.

The demonstration took place during intermittent thick fog at the harbor entrance. The radar was not only able to track the boat, but also differentiate between the drone, sea birds, floating objects in the water and pedestrians on the shore, and track them all continuously.

For the demonstration, MAT fitted the UAV with a composite canister with a command-initiated life jacket air flask to inflate an airbag that discharges the arresting line in front of the vessel. The UAV can be recovered and the system reloaded for subsequent missions.

According to Ken Gardner, SpotterRF business development manager, the SpotterRF C550 perimeter surveillance radar has a range of about 1.5 kilometers, weighs 3.5 pounds and is about the size of a laptop computer (although the company has larger

and smaller models), and multiple sensors can work together to cover larger areas. It can be set up or taken down in minutes, and is powered by regular 117-volt AC current or a small 24-hour battery.

Dave Gentle from ION said the input from the radar was fed into the C2 system which uses ION’s Marlin platform technology to plan and execute the missions for the UAV to autonomously deploy the arresting line and return.

SpotterRF CEO Frank Cristophersen said the ANTX provided a valuable opportunity to bring together a team to collaborate and demonstrate a creative technology solution, with the Navy providing targets, instrumentation and observers from the warfare centers and other organizations that otherwise would not be available to the individual companies.