U.S. Navy Relies on Osprey Video's Rugged Decoders to Modernize Top Deck Video Monitoring on its Destroyers

A large and pivotal organization of the U.S. Navy, the Naval Sea Systems Command (NAVSEA) takes care of all the material needs for the Navy's entire sea fleet. This effort encompasses a wide range of responsibilities, from managing surface ships and submarines to ensuring the operational readiness of various sea-based vessels. Within NAVSEA, there are approximately 10 warfare centers, each devoted to a specific aspect of naval operations.

One of those warfare centers — located in Port Hueneme, California — is dedicated to maintaining digital systems for destroyers, with one particular division focused on video distribution and surveillance systems. This division's primary mission is to ensure that any video input can be viewed seamlessly throughout the vessel, a capability that is crucial for maintaining safety and security during naval operations.

Challenge

In recent years, IP-based systems have overtaken analog in video surveillance technology. This shift presented significant challenges for NAVSEA, particularly in selecting and implementing surveillance cameras for Arleigh Burke-class destroyers. The existing analog infrastructure on these ships was becoming less and less compatible with modern digital cameras, creating a technological gap that NAVSEA needed to address.

"As the camera world has gone almost entirely digital, we faced challenges with older destroyers that still use analog infrastructure," said Robert Aviles, lead electronics technician for NAVSEA's Naval Surface Warfare Center in Port Hueneme. "It became difficult to find replacement analog surveillance cameras that met the Navy's ruggedness standards for topside use."

The main purpose of the surveillance cameras is for safety and security "topside" (on the outdoor part of the ship). More specifically, they monitor missile launches and flight deck operations. It's a requirement for the Navy to observe and record those activities. No less important is the need to surveille what's going on in the region around the ship. For example, cameras onboard a Navy destroyer deployed in the Red Sea observed and recorded a ship that was carrying weapons it shouldn't be carrying. Data from those cameras went back to the Navy for evaluation.

Beyond the ability to integrate modern digital cameras with legacy systems, NAVSEA's primary requirements for a new solution were support for RTSP video protocol, ruggedness to withstand harsh maritime conditions, and a temperature tolerance of up to 60°C/140°F.

Solution

NAVSEA turned to Osprey Video's Talon UHD-SCD Rugged video decoder, which converts IP video to SDI while meeting rigorous military specifications.

The deployment involves more than 50 Osprey Video decoders across multiple ships. Each decoder takes IP signals from a Bosch MIC IP starlight 7100i IP camera and converts them into digital signals compatible with the ship's existing infrastructure. The cameras are mounted topside, while the decoders are housed below deck in interface boxes, wherein the temperature can reach 130 F.

"Decoders that go strictly from RTSP to SDI are few and far between, and when you do find one, it doesn't meet the temperature requirement. One of the biggest selling points for us was the temperature range that the Talon Rugged decoder could withstand," Aviles said.

The signal flow begins with the Bosch IP camera capturing video and outputting it as an RTSP stream. The Osprey Video decoder ingests this stream and converts it to SDI. The SDI signal travels through existing coaxial cables to an AJA video converter, which transforms it into RGB sync on green to interface with the ship's three-color RGB coaxial cable system. Ultimately, the converted signal appears on any number of monitors and combat consoles.

"Osprey Video developers went out of their way to fast-track RTSP support within the decoder so it could handle RTSP streams for us. You don't get that level of cooperation and customization from just anyone," Aviles said.

"We make a point of staying flexible so we can give our customers exactly what they need," said Osprey Video's Scott Whitcomb. "We'd been planning to add RTSP support to our Talon Rugged decoder for surveillance applications sometime in the next few months — and eventually roll it out in all of our commercially available off-the-shelf boxes so everyone can benefit. But when NAVSEA said RTSP was a priority for them, it became our priority too. Thanks to NAVSEA providing the camera for testing, we completed the feature upgrade in about a month — well ahead of our original schedule."

NAVSEA is in the process of implementing this setup across 30 Arleigh Burke-class destroyers over five years. Each camera requires one decoder, and the deployment varies slightly depending on the ship. There are 20 Flight I ships with two cameras each and 10 Flight II ships with four cameras each.

Results

Osprey Video's Talon UHD-SCD Rugged decoders have made it possible for NAVSEA to meet its goal, which was to be able to view digital video in an analog world.

"Now we can choose any digital camera that fits the form and function we want, knowing that the video will be converted reliably so that it's visible anywhere on the ship," Aviles said. "At the same time, we know that those products are going to be available for some time to come, which protects our investment."

The Osprey Video encoder ensures that NAVSEA has many more camera choices than it had before, which increases flexibility in video system design and implementation.

Future

The next phase of collaboration between NAVSEA and Osprey Video is already in the works for some of the newer ships. Whereas now the Talon unit is decoding right away inside the interface box before sending SDI to the distribution rack, in the next round, NAVSEA will install the Talon in the rack itself, sending digital signals all the way to the rack before conversion. Converting to analog only at the final stage will make for a cleaner solution.

Overall, Osprey Video has ensured the Navy can bridge the gap between analog and digital worlds.