

## Beach Panel and Controls uses Fiber Optics to Secure Ships for Trips into Dangerous Waters



Any time the armed forces of the United States go into action anywhere in the world, much more than meets the eye – or the evening newscast – is involved. Behind the scenes a long logistical trail stretches back from the battle or disaster to supply bases in the U.S. Most of those supplies travel by sea on ships under the Military Sealift Command, or MSC. During a war, more than 95 percent of all equipment and supplies is carried by sea going vessels. This fleet includes more than 120 government owned ships, along with others that are chartered as needed. Without this vital supply chain, the U.S. military would grind to a halt.

The task of getting supplies where needed is today being done on more secure vessels. Through a contract with MSC, Beach Panel & Controls Inc. (BPC) of Chesapeake, Va. put state-of-the-art technology to work, providing the ships

better access control and perimeter security. The company was able to do so, in part, thanks to fiber optic modules from Weed Instrument Co.

Don Mannon, BPC engineering manager for the project, notes that the access-control perimeter security system developed by the company for the MSC depends upon fiber for communications. What happens if that fiber breaks? “The Weed self-healing ring module can give us an indication of where the break has occurred,” he says.

He notes that Weed’s products have this capability, giving BPC an advantage. In addition to the self-healing ring functionality, BPC selected Weed’s products in part because of the small package size. Mannon estimates that the use of Weed technology reduced space requirements by half compared to other solutions, a significant savings. That was a particular advantage given where the systems go.

“Anytime you’re doing something on board a ship and you can make it more compact, generally speaking that’s a plus. The people who are operating the vessels and the crew tend to appreciate that,” he explains.

Like any other enterprise, the Military Sealift Command would like to do more with less. Like government agencies everywhere, MSC would also like to enhance the security of its assets. MSC, however, faces some unique problems and conditions. For one thing, the Washington, D.C.-based MSC sends its ships into some troubled waters, increasing both the need for security and the risk of encountering a problem. Civilians crew those ships, with some military personnel present for specific and specialized tasks.

The traditional way to protect a ship in port from intruders is to use armed guards, a manpower intensive approach given the many doors, hatchways, and hiding spaces on a vessel. MSC wanted a smarter way to increase security. So the Military Sealift Command asked for bids on an automated system that would lock down points of entry while recording video and other information. The system would provide a way to monitor the situation from a central location and do a quick assessment of potential threats. These improvements, MSC specified, had to be done without adding personnel and be highly reliable despite a harsh environment.

Beach Panel & Controls bid for the job, going up against 15 or 20 other companies. The privately held firm won the contract, in large part because of the superiority of its solution. That was partly a consequence of component choices, such as the decision to use Weed and other products that offered the right capabilities in suitably sized packages. “One of the reasons our bid was chosen was because of some of the advantages of the way we put the system together brought us,” says Mannon.

With the BPC solution, crew members can monitor selected locations simultaneously. The fully-integrated system has multiple touch screens that combine real-time video surveillance, alarms at points of entry, hull perimeter lighting and audible warning systems, along with recording a complete alarm history.

BPC selected Modicon PLCs for their system controllers, with multiple communication lines placed along different routes and redundant power supplies. In this way, the chance of any single point of failure causing problems was lessened.

BPC went with a Weed-enabled fiber optic ring with redundancy because of its reliability. The fiber optic approach also gave a much higher bandwidth than possible with copper wire. Furthermore, fiber also prevented EMI or RFI noise generated on the ship from interfering with the network or vice versa, something difficult to guarantee with copper.

To take advantage of all of these benefits, the system uses a Weed EOTec 2000 fiber optic modem operating in a self-healing redundant ring topology. If a single break cuts the line in two, signals and data are automatically routed around the break.

In addition to reliability, Mannon notes another benefit of the Weed-powered fiber approach. “We reduced by probably 60 to 70 percent the weight of the wire that would have been installed otherwise.”

For ocean going cargo vessels, that weight reduction translates into either more cargo, less fuel consumption, or a combination of both. Also, a lighter ship will ride higher in the water, which could be crucial in navigating certain harbors or situations.

Since winning the contract, BPC has completed and delivered more than 100 systems. The company is currently constructing a slightly modified version of the system for use on a half dozen additional vessels. Mannon reports the customer is pleased, not the least because of the way Beach

Panel & Controls integrated various elements into one smoothly functioning and highly reliable automated security system.

As for the future, the system or something like it might someday be used in commercial vessels as a way to meet the requirements of the International Ship and Port Facility Security Code. As a bonus to the increased security, the fiber optic, camera, sensor and Weed products can be used to monitor areas difficult for crew members to get to, such as tanks in the bowels of a ship. “We’ll put an infrared illuminator down there and it’s like daylight, even though the lights are out,” says Mannon.