

Industry: Maritime

Customer case study



Servicing ships around the world through the mGuard Secure Cloud

Highlights

- De Nora wanted to support its Hyde GUARDIAN® ballast systems on ships around the world
- However, the ships' remote locations and electromagnetic properties made this difficult
- By using the FL mGuard and mGuard Secure Cloud service, De Nora employees can patch directly into a vessel's Ballast Water Management System (BWMS) Control System, thereby bypassing the complications of distance and limited cellular connectivity
- The latest generation of the Hyde GUARDIAN BWMS now has built-in remote access and saves customers and De Nora the delays and expense of flying technicians out to ships

Customer profile

De Nora is the water treatment technology partner of choice to the maritime community, offering ballast water solutions for all flow rates and vessel types. The Hyde GUARDIAN®-US Ballast Water Management System (BWMS) and the De Nora BALPURE® BWMS, both approved by the U.S. Coast Guard, can be found on many types of ships: general cargo carriers, ro-ro vessels and ferries, cruise ships, container ships, OSVS and tugs, LPG and LNG carriers, oil and chemical tankers, bulk carriers, modus, heavy lifts, or drill ships.



Challenge: Supporting ships around the world

Because of the mobile nature of its industry, De Nora cannot always dispatch a technician quickly. Vincent Page, Global Product Manager–Services, said, “Ships are mobile. They’re not just static facilities parked on land somewhere. Ships are constantly roving the oceans and moving around the planet. To perform service activities, there’s a significant amount of logistics involved—moving personnel from port to port, country to country, and getting them to catch up and liaise with the vessels. This is difficult, and even more so when international travel restrictions are in place due to the global pandemic situation.” He said, “The ability to be digitally present at



Figure 1: Ballast systems are installed deep in the hull of the vessel. The Faraday Effect makes it difficult for electromagnetic fields to penetrate in this area, so cellular communication is not always possible.

“If you have Internet access, we’re there and can immediately bring the brains to the problem.”

Vincent Page, Global Product Manager–Services

any time, any place, as long as the vessel has an Internet connection, is absolutely beneficial to us.”

A ship’s remote location is not the only service challenge. “Because we are in the maritime sector, our systems are typically installed way down deep in the hull of the vessel. Thinking back to your science training, the notion of a Faraday cage is that

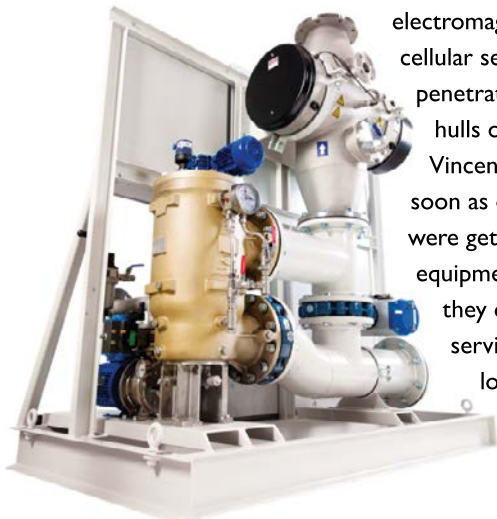


Figure 2: The Hyde GUARDIAN-US is a U.S. Coast Guard-approved Ballast Water Management System (BWMS).

electromagnetic fields, such as cellular service, can’t easily penetrate down into the hulls of these vessels,” Vincent explained. “So, as soon as our service engineers were getting down to the equipment on the vessel, they quickly lost cellular service and were no longer accessible to us for support. This made it difficult to use applications like text messages, phone calls, or video chat.”

Solution: Industrial router with flexibility

Vincent explored different integrated router options before specifying the FL mGuard series and mGuard Secure Cloud (mSC) service from Phoenix Contact. The mGuard device is an industrial router with integrated firewall and VPN. The mSC is a free, web-based service that allows FL mGuard users to communicate securely with and support industrial equipment over the Internet.

When comparing it with a competitive product on the market, Vincent found the mGuard was more robust. “The competitor’s product was plastic, and some of the apps didn’t seem well put together. My gut was steering me toward Phoenix Contact, because the mGuard appeared to be a more industrial-ready solution,” he said.

He also liked the mGuard’s built-in secondary and tertiary functions, such as a DMZ port and NAT routing capabilities.

From retrofitting to complete integration

The first mGuard installation for remote access on a Hyde GUARDIAN BWMS involved retrofitting three large Articulated Tug Barges (ATB) operating in the Gulf and East Coast of the U.S.

“The way ATBs operate, and the unique methodology employed by our BWMS to meet the needs of these vessels were first-of-its-kind within the industry,” Vincent said. “We had some initial

system complications related to flow rates and valve sequencing, and it was my responsibility to tackle those issues and achieve customer satisfaction. As corrective action involved deep monitoring of system process data and deployment of software updates, I thought this would be a prime opportunity to retrofit the installation with remote access technology

Operator interface terminals (OIT) displays or human machine interfaces (HMIs) on the Hyde Guardian BWMS are connected to the mGuard, so that the crew members in the barge control house can see what the systems are doing. Vincent said, “I’m tunneling in right to that location as well, so I can see what they see precisely when they see it. That’s really the beauty of remote access. It immediately bridges the gap between operator and expert, and enables them to work efficiently in tandem, right when it’s needed the most. And, since, of course, security is crucial to the vessel’s operations, there’s a push button integrated directly to the operator’s BWMS Remote Panel to enable or break the remote connection. We’re there when you need us, and gone when you don’t.”

Since the retrofits were successful, “We went ahead and pulled the trigger on the whole remote access thing, and now have integrated the mGuard as a standard component within all of our gen-three control panels,” Vincent stated. The gen-three is the standard control panel for the new United States Coast Guard-approved Hyde GUARDIAN-US BWMS.

He said that De Nora also performs optional retrofitting for their previous generation of the Hyde GUARDIAN BWMS as well. For example, they recently sold a three-piece retrofit GUARDIAN remote access package with three RS2000 mGuard units to a government police force in Europe. “They use patrol vessels for



Figure 3: De Nora has made the FL mGuard a standard part of its BWMS. With remote access coupled with their DLAU data analytics solution, De Nora ensures actual functional protection for the environment and the satisfaction and trust of our customer base.



Figure 4: Operator interface terminals (OIT) displays or human machine interfaces (HMI) on the Hyde Guardian BWMS are connected to the mGuard, so that the crew members in the barge control house can see what the systems are doing.

their coast and up the rivers. We retrofitted three of their Hyde GUARDIAN Gold units with the mGuard RS2000, so that we have that type of support ready there, too. It's all about preparedness."

By making remote access fast and easy, the mGuard cuts down on delays, travel expenses, and general unnecessary expenditures. In addition to savings, utilization of remote access technology has also helped establish new lines of direct profitability.

DE NORA VIA™ is the trade name by which De Nora implements services such as remote access, data analytics, and IoT, among other modern industrial technologies. Vincent

explained, "We want to keep our units running as smoothly as possible during their full lifespan, so we've developed aftermarket Technology and Support services for the maritime BWMS sector similar to those achieved by OnStar for vehicles. Remote access, coupled with our DLAU data analytics solution for proactive system performance monitoring, creates an elegant technology symbiosis for ensuring we achieve the two things that matter most: actual functional protection for the environment and the satisfaction and trust of our customer base."

Results: Remote access built in

"There's a difference between ad hoc remote access or remote support and actual, formal design integration. We also use other remote support applications like GoToAssist or Team Viewer to support customers, but with the mGuard application, we can officially say, 'Our product has remote access built directly within it,'" Vincent said.

"We no longer have to fly a warm body out to meet you. If you have Internet access, we're there and can immediately bring the brains to the problem," he concluded.

Remoting in to solve real-world problems

DE NORA VIA's remote access service is not theoretical.

They are putting it into practice. Vincent described a few cases where he remoted into the system to fix a problem while a ship was at sea.

A cargo ship, moving hundreds of thousands, or maybe millions, of dollars in goods, contacted the service team about a valve that was registering as not being fully open. Because of this issue, the ship was experiencing process alarms on their BWMS, which inadvertently were interrupting the vessel's vital ballast operations for cargo exchange—a costly problem.

He explained, "When I remoted in, I immediately saw the problem and realized the valve's analog position feedback was 1% less than that needed to be considered Opened by the system's software. Because our remote access is not a mimic, but an actual VPN connection to the BWMS network, I pulled up our programming software here on my local computer and went online with the as-running BWMS PLC logic. I went right into the code, found the piece of logic blocked by the 1% valve feedback error, and immediately got them back to smooth cargo transfer."

"Because of these successes, customers have come back to us for repeat orders, directly saying in their purchase order that they chose us over competitors because they were so impressed with the degree of support and dedication that we demonstrated," Vincent stated. "They trust us because of the infrastructure that we have in place to support them. And one of the main assets that we utilized in that process was remote access technology with the Phoenix Contact mGuard."