

# Integrated pump package is a step change for the industry

The MarFlex NQZR is not a new pump, rather it takes advantage of existing technologies to house all measuring and control systems in a single unit which can then be remotely monitored by satellite

Twenty years ago MarFlex introduced its electric drive deepwell cargo pump with an oil lubricated shaft. At the time it was seen as a spectacular innovation; now it is a market standard. The newly launched MarFlex NQZR, an all-in-one electric cargo pump package, which can be monitored and maintained via satellite, is destined to follow a similar path, says MarFlex owner, Paul van Beveren.

Mr van Beveren has been incubating his idea of creating a fully integrated electric deepwell pump for both cargo and ballast duties for the last three years. The first step was to acquire and fully integrate the electrical specialist, Snijders Elektrotechniek, into MarFlex's parent company, Global Pump Investment.

MarFlex and Snijders had been working together on the open market for some time but Mr van Beveren wanted to bring Snijders

in-house before sharing his plans. The purchase was made two years ago, and while Snijders is still working in wider industry, it is now exclusively designing, producing and installing the control systems for MarFlex pumps.

Together, the two companies have developed two innovations on the electrical and control side. "First, we have created a unit that enables a cargo pump to be remotely accessed by satellite. This means we can take over the whole management of a system, wherever a vessel happens to be, and check for failures, as well as the status of alarms, parameters and settings.

"We can make an accurate diagnosis and take remedial action quickly, and often without the time and expense of sending an engineer half way around the world to fix a problem. Recently we dispatched an engineer from the Netherlands to Central America to carry out a 15 minute re-adjustment of settings on board a new tanker, sailing with a new crew. By the time the engineer's flights and accommodation were factored in, the owner faced a €10,000-€15,000 bill. For the shipowner, remote access will help bring down the total cost of a system and for us it means we can offer a more efficient service network."

The technology is programmed in such



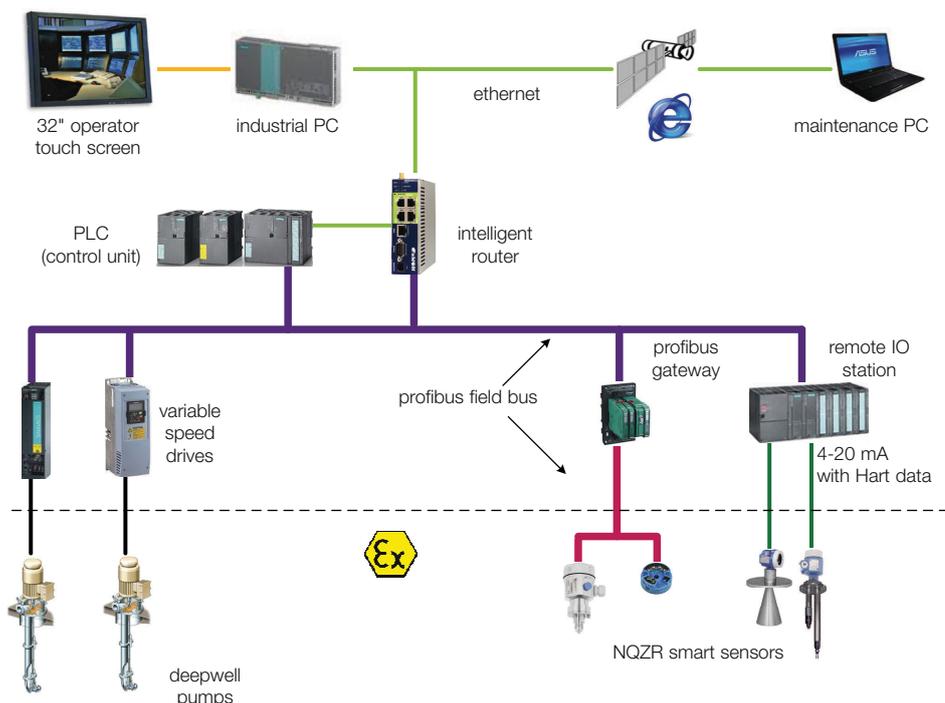
Paul van Beveren: "For our company there is only one focus, and that is electric driven pumps are the future of our industry"

a way that the exchange of information is based on kilobytes, so it is very limited, especially when compared with the costs of typical exchanges taking place between ship and shore. "Also, it is not an open line," says Mr van Beveren. "Communications and access only takes place when requested by the captain, and he can also shut this down at any time."

To bring costs down further, MarFlex is looking into integrating the cost of satellite communications within its total package to owners. The company is in negotiations with a European based communications concern to see how its router could mesh with onboard pump systems.

The other part of the new offering is the MarFlex NQZR pump system itself, which incorporates all the elements required for cargo monitoring and measurement, such as temperatures, pressures and level gauges. Mr van Beveren is keen to stress that the company has not re-invented the cargo pump but harnessed the best of what is available in one unit. At the development stage MarFlex also signed an exclusive agreement with Swiss sensor specialist Endress + Hauser. "That company has advised us on sensors and measurement points, both in the cargo pump and in the cargo tank."

Typically, when a cargo system is ordered one company will deliver the pump system and others will deliver the various monitoring



A MarFlex NQZR package can be monitored and maintained via satellite

systems. “We believe an integrated package is both logical and safer, and offers the benefits of predictive maintenance. For shipyards our package means that they deal with only one turnkey supplier.”

So how is the MarFlex NQZR configured on board? In the cargo control room is the NQZR control panel, a single 812mm (32in) touch screen, which surveys and controls all MarFlex electric deepwell pumps on a ship, including those used for ballast, as well as cargo and ballast water conditions. There is no need for the user to switch between different screens.

Monitoring is made possible via two multi core cables which attach the NQZR touch screen to an on deck junction box. From this one centralised point all field cables connect to the measuring equipment. The sensors for cargo temperature and tank pressure are already integrated in the pump itself but all sensors are connected to the explosion-proof junction box. From there tank and process data pass through the barrier cabinets and converter cabinets to the NQZR touch screen.

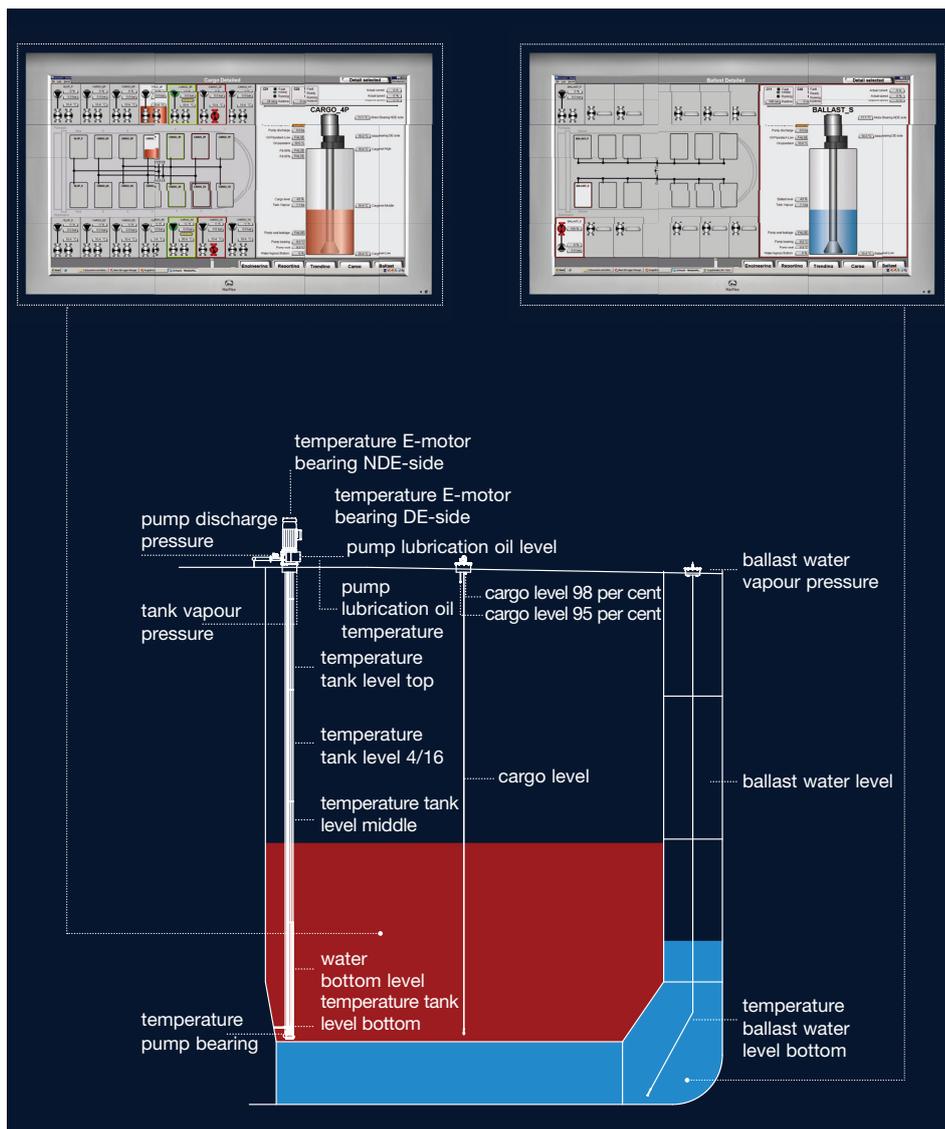
Using the cargo overview window it is possible to start one of the deepwell pumps and simultaneously monitor the cargo temperature. A detailed cargo view window shows not just vital pumping information but all cargo sensor readings. The ballast overview screen works in essentially the same way, handling a ship's ballast pumps.

The NQZR system settings can be accessed via the engineering overview screen. Here, such parameters as cargo measurement units and time zones can be adjusted. All reports on cargo conditions and maintenance can be found in the reporting overview screen. In the trending overview screen all measured data are presented in an analytical way using graphics and tables.

The system log always shows its three most recent alarm notifications on screen, while a complete summary can be viewed in the detailed overview. Any alarm will be shown immediately with deviating readings in red. An alert is sent to a nearby palmtop computer or personal digital assistant on deck, loaded with sophisticated software for monitoring and maintenance.

A text message or e-mail can also be sent to onshore recipients. Both onboard and onshore, NQZR allows for real time monitoring in a web browser via a secured connection. In this way crew and owner can quickly diagnose the situation. After any performance degradation, MarFlex can predict failure moments and plan maintenance to prevent maintenance stops.

Mr van Beveren believes the enhanced level of monitoring anticipates future class requirements for rotating equipment. “It is a



NQZR sensor readings: a touch screen offers complete oversight of operations

little strange that critical rotating equipment is operating in a hazardous environment on a chemical or product tanker but nothing is measured. Pumps are working in a high temperature environment where there are oils and other flammable products.

“We can easily foresee requirements for monitoring bearings in electric motors, cargo pumps and cargo heads. With our system, we can predict if a critical situation is looming, and if a component strays out of its normal range an alarm is sounded.”

A key concern for any shipowner installing a cargo pump system is how it will relate to the ballast pumps – and in particular the new requirement to install ballast water treatment plant. “We have ballast water pumps with a pressure head of 2.5-3 bar and appreciate that those pumps will need to be able to handle increased pressures when ballast water treatment systems are installed.

“We are working on this in cooperation with treatment plant manufacturers. As the ballast water treatment system issue is still

not fully settled, we have to take a wait-and-see approach before we commit ourselves in a particular direction.”

Although the MarFlex NQZR is available as a total package today, Mr van Beveren accepts that different companies have different appetites for new products and also that some might prefer to incorporate some, but not all, of the facets of the system. Mr van Beveren says that the pumps can be customised to requirements; in a model test facility at MarFlex's plant in Holland owners can see the NQZR in action.

Wireless operation of the pumps is technically possible but is the next frontier. Having launched electrically driven deepwell cargo pumps with oil lubricated shafts on a sceptical market two decades ago, Mr van Beveren knows that patience is required as the industry gets to know a product, and he has not placed a timetable for the widespread uptake of MarFlex NQZR. “For our company, there is only one focus, and that is electric driven pumps are the future of our industry.” **TST**