Cavotec's shore power innovation hits new highs

Luciano Corbetta, *group market unit manager, Ports & Maritime, Cavotec, Milan, Italy*

With the global ports industry taking substantive steps to operate more sustainably and cost-effectively, leading shore power expert with the Cavotec engineering group, Luciano Corbetta, describes how shore power, or 'cold ironing' systems are increasingly being adopted, and adapted for port authorities, shipping lines and ship owners.

"We're increasingly adapting our alternative maritime power (AMP) systems, be they on shore, ship-based, fixed or mobile, low or medium voltage, for all types of customers," says Corbetta.

Working closely with engineering partners, shipping lines and port authorities, Cavotec has developed shore power technologies since the 1980s. The group designs and manufactures a variety of shore power systems with varying voltages, including ship-based units, land-based vault systems and mobile units. Shore power systems enable ships in port to switch off their engines and connect to shore-side electrical power supply, thus reducing emissions in ports and surrounding communities.

"Shore power is increasingly seen as an effective way to operate more sustainably, and as fuel prices rise, also a way to reduce costs in the long-term," says Corbetta.

Indeed, in many countries, the ports industry is being left with little choice but to introduce shore power systems. It is operating in an increasingly demanding legislative framework when it comes to emissions, both nationally and internationally.

Increasing adoption of new systems

In California for example, by 2014, all ships calling at the state's ports must be fitted with shore power connection systems. And by 2020, 80 percent of the power used by docked ships will have to come from shore power.[i]

Today, there are more than 400 Cavotec AMP units installed, or currently being installed on ships; while ports such as Los Angeles, Long Beach, Oakland, Prince Rupert, and Tacoma in North America, as well as Antwerp, Goteborg, Stockholm and other ports across Europe use the technology.

The majority of Cavotec's existing AMP systems are installed at container or bulk handling applications, and passenger ferry and cruise ship berths. Cavotec's shore power interface equipment primarily consists of cable management systems and connectors installed in or on the quayside, or on board ships that connect grid-generated electrical power from shore to ship.

A world-first for shore power

Cavotec is constantly innovating and adapting its shore power systems. During the summer, the group announced a uniquely innovative project that will integrate AMP with its automated mooring technology MoorMaster™ into a single system at two passenger ferry berths in Norway. The units will be installed at the Lavik and Oppedal passenger ferry berths, in the Norwegian fjords, and used by another world first: a fully battery powered, catamaran-hulled ferry, run by Norwegian ferry operator Norled. The system will first moor and then connect the ferry to electrical power to charge its batteries.

"These are the first systems anywhere in the world that integrate automated mooring and automated AMP. This demonstrates our capacity for innovation, and our ability to offer integrated systems that maximise efficiency gains

A Cavotec AMP cable management system at the Port of Ystad, Sweden.

and environmental performance," says Sofus Gedde-Dahl, managing director of Cavotec Norway.

The 80 metre long vessel will have capacity for around 120 cars and 360 passengers, and will make 17 crossings of the Sogne Fjord daily. It is scheduled to enter service in 2015.

The MoorMaster™ units will be operated by Cavotec hand-held radio remote controls by the ship's captain from the bridge of the vessel. The mooring system will signal to the AMP unit when the ship is secure, and sensors will then guide the AMP connector to a hatch in the side of the vessel, connect to the ship's battery and start charging.

By using MoorMaster™ the ferry's propeller system can be switched off for nine minutes during each 10 minute boarding process, giving more than

A ship-board AMP system at the Port of Long Beach, USA.

One of two Cavotec Alternative Maritime Power (AMP) units that recently went into service at the Port of Rotterdam.

sufficient time to connect to the Cavotec AMP system and charge the on-board batteries.

With around 6,000 port calls made annually on the Lavik-Oppedal route, the air quality improvement and fuel cost savings compared to using conventional mooring and power systems is considerable. At present, the diesel-powered ferry that operates on this route needs to run its engines to hold the vessel in position on the berth, thereby generating emissions, increasing fuel costs, and causing noise pollution.

MoorMaster™ is a vacuum-based system that eliminates the need for conventional mooring lines. Remote controlled vacuum pads recessed in, or mounted on the quayside, moor and release vessels in seconds.

Airport know-how takes flight in the ports sector

In another example of the extent to which shore power systems are being innovated, Cavotec is currently delivering a large number of 'easy lift' access covers and shore power outlet connection boxes for four separate container terminals at several ports in California and other locations worldwide.

The Port of Los Angeles, one of the largest ports in the US, already uses AMP at several berths, and has a Cavotec AMP Mobile unit that can be deployed as required throughout the cruise terminal.

Cavotec's 'easy lift' access covers are safer for personnel to operate than many existing alternatives. This product is an example of the effective cross-implementation of technology between Cavotec market units as these systems were first developed for use at airports and other aviation-related applications.

The units avoid operator stress and injury by reducing lift weights to a minimum. They are built into the quayside to enable vessels to connect to grid-generated electrical power quickly and easily.

The economic case for shore power

While shore power is frequently championed as an effective way for the ports industry to reduce its environmental impact, the economic case for shore power has, in the past at least, tended to be less clear. Rising fuel prices are however, creating conditions where the economic benefits of shore power are becoming increasingly apparent.

"Willingness to reduce fuel costs are making shore power an increasingly attractive option on a cost basis, not simply an environmental one," explains Corbetta.

Looking forward

Given the degree to which shore power systems are adapting to new levels of technical sophistication demanded by customers, it seems that shore power is set to continue to deliver the operational and environmental gains that ports and shipping lines are seeking to make.

References

[i]The Electric Generation, 'Electrification Moves to the Seas', Rémi Paccou, September 25, 2013.

About the author

Luciano Corbetta is Cavotec's group market unit manager, ports & maritime. He holds an MSc in mechanical engineering from Politecnico di Milano. He has worked as a mechanical engineer at TTR Srl. and as a sales manager at Brevetti Stendalto SpA. Corbetta has been responsible for the development of advanced maritime power supply solutions, and has been involved in a large number of high voltage shore-to-ship projects. He is also actively involved in the ongoing standardisation process of shore power equipment.

About the organisation

Cavotec is a global engineering group that manufactures power transmission, distribution and control technologies that form the link between fixed and mobile equipment in the ports and maritime, airports, mining and tunnelling and general industry sectors. In addition to AMP and MoorMaster™, Cavotec's range of technologies for the ports sector includes Panzerbelt cable protection systems, crane controllers, marine propulsion slip rings, power chains and connectors, radio remote controls and motorised and spring driven cable reels.

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