

A call for innovative, integrated ports



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Maersk one week, China Shipping the next, and then CMA CGM: it feels as though we hear about an apparently unending succession of new orders for ever larger containerships, with increasing frequency, all adding to the world's container fleet.

The container handling industry, and the ports sector more broadly, is facing what many believe looks set to be a prolonged glut in capacity. And these 'mega' container vessels – 18,000 TEU and larger – are placing unprecedented peaks in demand on container handling infrastructure. Indeed, even some major ports in the US struggle to handle vessels of up to 14,000 TEU.

However, decision-makers have a unique opportunity to meet this step-change in capacity, while at the same time fulfilling safety requirements and meeting a more exacting environmental regulatory framework – all in a fiercely competitive market place.

The answer: innovative automation and electrification technologies that can be integrated with one another to improve safety, maximise operational efficiency, and minimise environmental impact.

Innovative thinking

Never before has the ports sector had access to the variety of innovative technologies that it does today. Automation and electrification – two key ways the port industry is already taking steps to expand capacity, reduce its environmental footprint and make operations safer – are two areas where operators have the opportunity to further realise considerable efficiency gains.

The introduction of new automation and electrification technologies can be achieved in a manageable cost structure

that reduces operational costs and improves profitability for the long-term.

We need to ensure that there is a free-flowing dialogue between port operators, shipping lines and equipment manufacturers to ensure that technologies are developed which match, and indeed surpass, the capacity challenges the industry faces. In this way, we can be sure that the sector has the best chance of meeting the needs of its customers, as well as fulfilling its safety and environmental commitments.

The Cavotec approach

Cavotec has worked closely with a variety of partners in the shipping industry – OEMs, port authorities, shipping lines and industry bodies – for many years.

Our focus on research and development has delivered a series of technologies that have helped ports and shipping lines expand capacity, improve safety and reduce environmental impact – and continue to do so. We review a selection of these systems here.

Alternative Maritime Power

Cavotec's Alternative Maritime Power (AMP) shore power systems enable the connection of vessels to shore side power supply, rather than using ships' diesel generators, thereby reducing emissions and improving air quality in and around ports.

First adopted in Sweden in 1985, AMP is now in use at a large number of ports in North America, Europe and Asia, as well as on growing number of containerships in specially converted containers, ('AMPTainer'). Cavotec's range of AMP systems includes medium and low voltage ship and shore-based, and mobile units.

Automatic Plug-in System

One of Cavotec's most recent innovations, our Automatic Plug-in System (APS), automates the connection of cranes, ships and other mobile equipment to the power grid using cable reels. The process promises to make an important contribution to many ports and terminals in terms of safety, environmental performance and operational efficiency.

APS is the first cable connection system that allows cranes fitted with cable reels to automatically connect to an electrical power source. Alternative technologies continue to rely on infrastructure-intensive conductor bars to supply electrical power. The technology has been ordered for a number of applications in Europe and the Far East.

For e-RTGs using APS, the automated connection and disconnection takes around 30 seconds. This compares to between 10 to 20 minutes needed for manual connection and disconnection, involving one to two workers, depending on anchoring systems and terminal safety procedures.

MoorMaster automated mooring

MoorMaster™ is a vacuum-based automated mooring technology that eliminates the need for conventional mooring lines. Remote controlled vacuum pads recessed in, or mounted on the quayside or pontoons, moor and release vessels in seconds. One person operates the system, via a hand-held radio remote control unit, either on shore or onboard a ship.

MoorMaster is in use at a growing number of sites worldwide, including bulk and container handling, Ro/Ro, ferry and lock applications. Cavotec has also been commissioned to work on projects



to develop ATEX (explosion proof) approved MoorMaster systems for use at LNG berths. To date, the technology has conducted more than 100,000 mooring operations.

By removing mooring lines from the mooring process altogether, MoorMaster is far safer than conventional mooring. And because mooring with MoorMaster takes a matter of seconds, compared to up to an hour with standard mooring practices, it generates substantial efficiency gains: increased cargo output, more ship calls, and improved tug, pilot shore personnel and ship crew utilisation.

In some cases, the technology also creates infrastructure savings because MoorMaster units only require the parallel side of a ship to moor, so ships can overhang the berth, if necessary. This negates the need for quay extensions or the construction of dolphins.

We have combined AMP, APS, MoorMaster and our other technologies to create our 'E3' Gate concept. E3 stands for environment, ergonomics and efficiency. By looking at ports' needs, and the challenges they face, with an overarching rather than piecemeal approach, we feel that ports will maximise their chances of realising the safety, productivity and environmental gains they need to in order to compete in the global marketplace.

Radio remote control

Cavotec has also developed radio remote control (RRC) systems for use with quay cranes such as automated stacking cranes (ASC) and rail mounted gantry (RMG) cranes during maintenance allowing operators to continue to conduct operations safely from the yard.

RRC systems can also be integrated into automated guided vehicles (AGVs) to enable them to be moved by an operator positioned a safe distance from the equipment.

Electric vehicles

The port industry is steadily adopting electric vehicles (EV) in a number of areas. Whether for their entire vehicle fleets, or specifically for AGVs, Cavotec is supporting the integration of these technologies with power connectors and other charging components that can be integrated into port infrastructure.

Conclusion

Innovative technologies, and the fresh thinking needed to implement and further improve them, are likely to be key ways for the industry to tackle the demands put on ports by the emergence of mega container ships. The adoption of these technologies in a coherent and integrated way will also ensure the industry meets its safety and environmental obligations today and in the years ahead.

About the author

Yann holds a degree in Business Administration from the École Supérieure de Commerce de Grenoble, France. Before joining Cavotec in 2007, where he served as Middle East Aviation Division Manager until 2010, Yann was a Business Development and Key Account Manager at Nexans, France and European Market Manager at Alcatel France.

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, maritime, airports, mining, tunnelling and general industry sectors.

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