

At sea solutions

Innovation is the watchword for equipment designers purveying a new generation of floating crane solutions to port executives, as Mike King discovers

Floating crane solutions have been a key part of handling operations in Europe's congested northern ports and on major waterways such as the Mississippi River for decades.

Usually perceived as a supplement to landside bulk cargo operations or an aid to transshipment direct to barge, the traditional deployment of floating cranes to handle low value bulk cargoes has not been conducive to the development of new designs or technologies because stevedoring rates have not justified vast expenditure on customised solutions.

Yet the rapid growth in global seaborne trade has left many terminals cramped and congested, while higher freight rates (and demurrage charges) have ramped up the pressure on loading speeds. Given that in most parts of the world it takes a lot less time and money to mount a crane on a barge or pontoon than it does to complete the permissions required for a landside development, a new market for a fast capacity fix has emerged.

Much of the older generation of floating cranes were introduced in the 1950s and 1960s to replace infrastructure destroyed in the Second World War, so an older generation of equipment is also now due to be replaced.

The development of new technology, initially used in the offshore oil and gas sector, is also now opening up new markets for floating solutions in dry cargo markets.

Some equipment suppliers are now selling new generation floating transshipment options to the container sector, for example. And the challenge of exporting coal from countries with draft limitations has prompted the development of large new floating transshipment terminals, quite often equipped with buffer storage, to cope with offshore ship-to-ship handling.

According to Mario Terenzio, executive director of Logmarin Advisors, the economic reasoning for using a modern floating crane solution is quite simple. "The bigger the vessel that can be received, the lesser the unit freight cost of the container or bulk material," he says.

"In the case of containers markets, the trend is to build larger and larger vessels. The floating container crane provides users with the hedge needed to make their operation more competitive and profitable by way of enabling them to break into larger shipment size markets to which they have no access, whilst reducing the freight disadvantage against nearby competitors."

Italy's Coeclerici Logistics, where Mr Terenzio made his name, has been a key innovator in the development of new floating solutions, most memorably setting up a sophisticated Venezuelan coal export operation first planned in the late 1990s.

As part of a consortium of bulk interests, Canadian shipowner CSL International was another floating terminal pioneer, taking its self-unloader services a step further with the development of a transshipment platform to load capesize vessels with coal direct from barges off the coast of Indonesia.

Others have since picked up the baton, most notably mobile harbour crane specialist Gottwald.

Since launching the Gottwald Floating Crane in 2004, the company has supplied 12 barge-mounted units for bulk stevedoring operations.

Gottwald has cleverly found a way round many of the drawbacks associated with building bespoke floating crane units. Multi-unit production processes have been used to keep a lid on prices without sacrificing the mobile harbour crane (MHC) technology options customers are familiar with.

"We have kind-of reinvented the use of floating cranes and tapped a promising market," says a spokesman. "Thanks to their autonomy, low specific investment costs and short delivery lead-times, there is a multitude of possibilities opening up for Gottwald Floating Cranes, especially in terms of ever increasing vessel size and competition as well as high quay costs or high costs for appropriate quay infrastructures."

The new barge-mounted units use the same standardised concept and assembly process as the company's rail or rubber tyre-mounted MHCs. The basic diesel-electric crane models are manufactured according to uniform design principles using common parts. Then the crane is adapted for waterway operations and mounted on a customised barge supplied according to customer preference.

All at sea: Rietlanden's Gottwald floating crane discharges coal at Amsterdam



"Operators profit from all the benefits of a proven crane series: series components that ensure short delivery lead-times, a high degree of reliability and long-term spare parts availability," says the spokesman.

Gottwald's breakthrough order came in 2004 from St James Stevedoring, a mid-stream operator on the Mississippi River.

The Mississippi had been known for its antiquated floating craneage prior to the St James order. Such has been the impact of Gottwald on the market – and rival stevedores admit privately that they cannot compete on service – that St James has been able to expand. A further two units were delivered in 2006 and 2007 and the company has also now formed a stevedoring joint venture with a subsidiary of grain giant Archer Daniels Midland, which brings to the table two additional units. This gives St James and its partners use of five of the 12 floating cranes Gottwald has sold thus far.

A sixth crane was bought by another Mississippi operator in the shape of Associated Terminals, whose managers happily admit drawing inspiration from the success of St James' deployment of Gottwald barge-mounted units.

Other orders for Gottwald have come from Amsterdam bulk stevedore Rietlanden and operators in Brazil and Indonesia, the latter order for use in the open sea.

According to the spokesman, the barge-mounted concept could also be applied to non-bulk operations, much as a mobile harbour crane might switch between cargoes simply by changing the crane's attachment. "We have had enquiries, but so far they have all been sold for handling bulk, mainly for coal," he explains. "But there's no reason why they couldn't be used for containers – it would make sense for various reasons because they could support landside cranes."

Liebherr, Gottwald's main rival in the mobile harbour crane field, has also been competing for orders from



Water baby: Liebherr is now looking to supply turnkey floating crane solutions

Mississippi midstream operators and is understood to be developing a floating crane concept which utilises its mobile harbour crane technology, although the company would not comment on its progress.

However, Liebherr's crane division, which already supplies cranes to be mounted on floating piers, has extended its supply of equipment by marketing a new mobile floating terminal concept designed by Logmarin Advisors for handling bulk cargoes or containers.

Although no turnkey deliveries have been made so far, at least one order is understood to be close to completion with two more self-propelled units at the design stage.

The mobile terminal, which can be deployed on waterways and in the open sea, uses heavy-duty four rope ship cranes mounted on barges or platforms and can be fitted with buffer storage for up to 200 teu capacity. For container handling, boxes are stowed fore and aft to provide balance and to optimise both the crane cycle time – by minimising the spreader slewing motion for container positioning – and deck cargo capacity.

To ensure adequate stability and longitudinal trim, large ballast capacity tanks are also fitted as are wing tanks and high power pumps to keep the pontoon and the crane within the acceptable heeling operational limit.

Spokesperson Mhairi Fischer says the solution can be applied to "bulk, multi-purpose and container handling in sheltered waters, including rivers and shallow draughts".

Capacity options are varied, ranging from 18,000 tonnes per day to 25,000 tonnes when a loading arm is deployed and a larger pontoon is used. "Under open sea conditions, grab operation up to 45 tonnes at 38 m with double girder cranes is possible, or up to 45 tonnes up to maximum jib length of 32 m," she adds. "Or we can do 35 tonnes at 36 m with slewing four-rope grab cranes or 30 tonnes at 28 m. With ex-centre platform the outreach can also be extended by up to 10 m."

But will deploying one of the new generation of floating crane solutions actually pay its way?

"As far as the return on the investment, there isn't a standard rule," says Logmarin's Mr Terenzio. "The structuring of the contract can be done in any way to suit the requirements of the end users and shippers."

"As a rule of thumb, the greater the advantages arising from the utilisation of the floating crane in accrued savings, the shorter the payback period." **PS**

A viable container solution?

Mario Terenzio, formerly of CoeClerici Logistics, remains one of the stalwarts of the floating crane handling sector with a string of successes in the bulk market. Now plying his trade as chief executive of Genoa-based Logmarin Advisors, he is now examining the potential of the container sector.

He identifies deep-sea ports with inland waterway transport connections such as Hong Kong, Shanghai, Constanza and Europe's northern range terminals as potential customers.

"In each case the floating crane could be berthed on the sea side of the container vessel moored alongside the shore terminal, to enhance terminal productivity, to mitigate container terminal congestion, or to tranship containers between the mother vessel and the feeders which

distribute the containers to inland terminals through inland waterways," he tells *Port Strategy*.

He also sees ports affected by restrictions on draught, lock dimension, beam or LOA which prevent them receiving the modern fleet of container vessels as potential buyers. "In India, Indonesia, China, the USA and the UK there are many of these terminals," he says. "The floating crane can be deployed for mid stream transhipment operation between larger container vessels and feeder ships."

However, using the Logmarin/Liebherr design for handling containers does have its limitations, admits Mr Terenzio. "Due to the operational issues associated with the transhipment of the containers, such as the necessary accuracy of positioning the



Digital day: Logmarin's floating terminal design for containers

spreader above the containers and the container positioning itself, this kind of operation has to be carried out in relative sheltered area with maximum waves height up to one metre and winds of no more than about 50 km/h," he says.