

Grab solutions



Peter Klein, Gottwald Port Technology, Germany, and John Fitzgerald, ABP Grimsby & Immingham, UK, examine how innovations in mobile harbour cranes are benefiting ports.

Two Gottwald HMK 260 EG mobile harbour cranes at Immingham Dock.

Mobile harbour cranes have not only proved to be reliable over decades of use, but have also developed from being a niche product to being a preferred choice. This has been seen at multi-purpose terminals, where they feature as versatile cargo handling machines and make a valuable contribution to developing a port's infrastructure. Their greatest assets, i.e. their mobility, versatility, flexibility and comparatively low capital outlay, are evident when a range of cargo types is handled, e.g. containers, bulk materials and project cargo.

Where the proportion of bulk materials handled amounts to approximately 60 - 80% of all goods, it is worth considering whether it is more efficient to use a conventional

two-rope crane or the four-rope grab variant. If the proportion of bulk goods exceeds 80%, Gottwald recommends using four-rope grab cranes with a higher classification, in conjunction with a mechanical grab rather than a motor grab. On the one hand, this leads to an increase in tonnage shifted. On the other hand, it means that the crane is ideally suited to the tough working conditions of uninterrupted bulk handling.

It was for this reason that Gottwald modified its two-rope mobile harbour cranes by strengthening the steel constructions to meet the requirements of a higher crane classification. In addition, these cranes are equipped with a second hoist and, where required, a second slewing gear.

Finally, for the four-rope grab versions, Gottwald has modified the roller bearing slew ring and rope pulley assemblies.

All in all, modern mobile harbour cranes are now very well suited to the tough operating conditions of uninterrupted professional bulk handling and are a realistic alternative to purpose-built equipment. This is because of the low capital outlay, the ease with which lifting attachments can be changed, the ability to move quickly from one quay to another, and the relatively high resale value. With handling rates of up to 1500 tph, there are 100 four-rope grab Gottwald cranes in use worldwide. Over 90 of these are EG cranes, with some achieving up to 1500 tph.

On track for more productivity

Where quays are particularly narrow, and possibly also equipped with rails and conveyor belts, portal harbour cranes work well. In this field, Gottwald offers the HSK portal harbour crane, featuring assemblies and components from the established HMK mobile harbour crane series. Only the rail-mounted portal is adapted to meet the specific conditions in existence on the quay, such as the track width, loadings and the clear height to allow traffic to pass below.

For ports that need to be able to use a rail-mounted crane on several quays, and even those without rails, Gottwald has developed a travelling gear arrangement that allows rail-mounted cranes to be moved from quay to quay. Stabiliser pads attached to the portal enable crane operations to take place on quays without rails.

In recent months, HSK portal harbour cranes have been supplied to Russia, China and France. Two of them began commercial operation in China in the spring of last year while two HSK 260 EG cranes were inaugurated at the Port of Bordeaux in November last year. Furthermore, four HSK 170 EG cranes were commissioned at a Russian Black Sea port in the autumn. A glance at the project schedule shows that HSK portal harbour cranes are also of interest for other ports, either as replacements for older rail-mounted machines with lower lifting capacities or as new equipment at those new quays that prefer to use portal cranes.

Humber International Terminal

Gottwald's mobile harbour cranes provide lifting capacities of up to 120 t, radii of up to 56 m and handling rates of up to 1500 tph. The company has already supplied mobile harbour cranes to both large and small ports in over 70 countries worldwide, where they are now engaged in many types of cargo handling. In addition, they are used in special-purpose terminals including large-scale bulk handling operations. One of the many customers who have recently invested heavily in mobile harbour cranes is the Humber



HMK 280 EG discharging coal for power generators at the Humber International Terminal, UK.

International Terminal, Immingham, UK.

Located close to main industrial centres such as Leeds, Manchester and Sheffield, for the last three years ABP's Grimsby & Immingham Port has been the busiest port complex in the whole of the UK in terms of tonnage. It handles a variety of cargo, including chemicals, petroleum products and bulk materials, as well as containers, steel, timber and project cargo. The majority of its bulk handling comprises coal and iron ore, which are transported via a new rail terminal to the power plants and industrial enterprises further inland.

This terminal, which currently has a berthing face of up to 300 m, but will be extended to 520 m in the second phase, was purpose-built as a multi-function terminal and welcomed its first vessel on 10 June 2000. With 14 m draught alongside, the terminal is well placed to discharge coal from lightened Cape vessels. A lorry shuttle transfers the coal to the stockyard, where it is distributed to the power generators further inland via a new rail-head that was opened in 2002. The new terminal enables

board-to-board transhipment for other destinations in the UK and Europe and offers a range of value-added services including screening, washing, blending and bagging of solid fuels.

As part of Associated British Ports Grimsby & Immingham, the terminal was considerably expanded in 2000. In this process, ABP decided from the outset to purchase three 100 t HMK 280 EG mobile harbour cranes made by Gottwald. The three cranes are operated at the coal terminal in conjunction with three mobile hoppers and guarantee cargo handling rates of over 5 million tpa.

HMK 280 EG

The HMK 280 EG is a four-rope grab crane weighing a total of 360 DWT. It has a working radius of 11 - 50 m and a maximum lifting capacity of 100 t. As with all the larger mobile harbour cranes, the HMK 280 EG is powered by a diesel-electric generator with an engine output of 720 kW at 1500 rpm. The hoisting speed for a full grab (32 t) is 60 m/min, the maximum slewing speed is 1.35 rpm. Of the six axles, two are driven and five can be steered. The crane's propping base is 12 x 11.5 m and its turning radius is approximately 7 m (inner radius) and approximately 16 m (outer radius).

Positive results

Humber International Terminal ordered a further six HMK 260 EGs (three in 2002 and three last year) when its operations expanded. While the HMK 280 EGs used for coal handling work were adapted specifically for Immingham and formed the basis for the later and more powerful HMK 330 EG model, the six new HMK 260 EG cranes are a completely new generation of crane. The three cranes commissioned in 2002 were the first of their kind to go into commercial operation anywhere in the world.

HMK 260 EG

The HMK 260 EG cranes, which ABP uses mainly for handling scrap, fertilisers, animal feed stuffs, biomass cargoes and ferro alloys, have a number of special features.



*Two Gottwald HSK 360 EG portal harbour cranes
at the Port of Qinhuangdao, China.*

The crane's fuel tank can be refilled during operation, for example, and the hoists are located at the rear of the superstructure, enabling the size of the counterweight to be reduced. As a result, the hoists are no longer located below the tower and are more easily accessible for servicing from above and from the side. The same applies to the room housing the diesel generator train. In addition, the hydraulic unit is an upright design, which makes it easier to lift it out for repair work. The chassis of the HMK 260 EG has been designed to allow a sixth axle to be fitted when axle loadings for the quay are restricted.

As with the HMK 280 EG, the HMK 260 EG is a four-rope grab crane with a total weight of 300 t. It has a working radius of 10 - 44 m and a maximum lifting capacity of 100 t in heavy-load operation. A diesel-electric generator also powers

this crane, and the engine has an output of 701 kW at 1500 rpm. The hoisting speed for a full grab (32 t) is 60 m/min, the maximum slewing speed is 1.6 rpm. The crane steers through all five axles, of which two are driven. Its propping base is 12.5 x 12 m and its turning radius is approximately 5.6 m (inner radius) and approximately 14.5 m (outer radius).

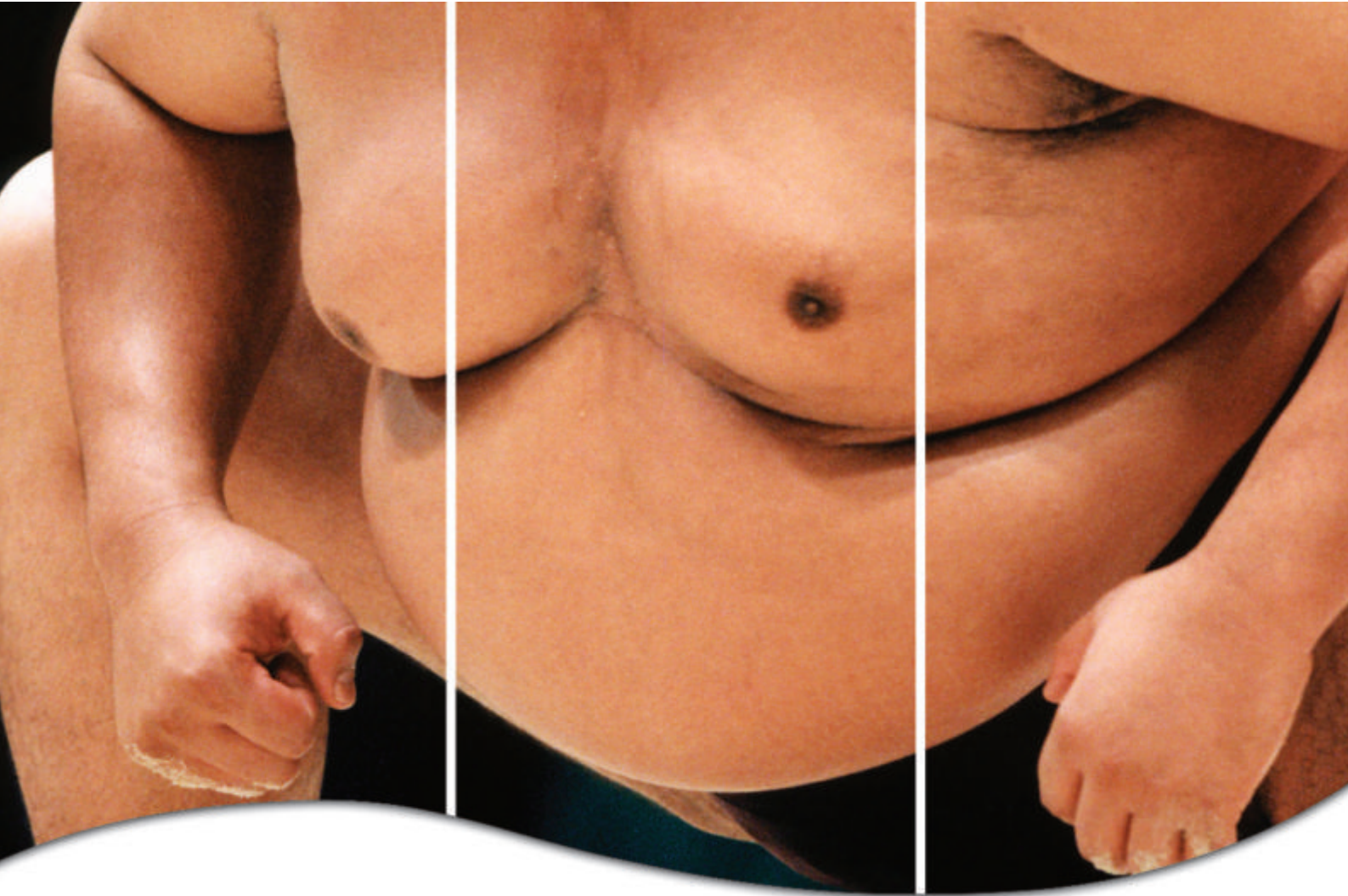
Diesel-electric drive

A common feature of all of the larger Gottwald mobile harbour cranes is the diesel-electric drive concept. All of these cranes can be equipped from the outset with a cable reel for connecting up an external power source or, if required, retrofitted for full electric drive. Both the fully electric and diesel-electric versions guarantee optimum availability, economical operation and service-friendly design.

Conclusion

Gottwald has recognised that the market requires a four-rope grab solution for mobile harbour cranes and is keen to put them to optimum use. In ABP Grimsby & Immingham the company found a customer that relies on four-rope grab technology to meet its requirements with a view to the Humber International Terminal expansion. The terminal has placed its confidence in three HMK 280 EG cranes, giving it a capacity of 5 million tpa, a crucial part of ABP's commitment to supplying the power stations with uninterrupted coal deliveries.

The expansion of the dry bulk terminal, coupled with the customer's excellent experience with mobile harbour cranes, have encouraged the company to rely on the same technology for its other handling operations. ■



Up to 1,500 tonnes per hour

With over 850 cranes already sold, Gottwald Port Technology stands unchallenged as the heavy-weight champion in the field of state-of-the-art Mobile Harbour Cranes – which also makes us the most reliable weight-lifter in professional bulk handling. Gottwald's four-rope grab cranes are a force to be reckoned with when it comes to bulk handling. With capacities of up to 1,500 tonnes an hour, these gentle giants



move coal, ores, agribulk, gravel or scrap rapidly and cost-effectively. Bulk-handlers such as ABT, CBM, ABP Immingham, Port Autonome de Bordeaux and Port of Qinhuangdao make full use of these performance levels on a daily basis.

If you want to move more in professional bulk handling, it's time to make a move in our direction. Contact Gottwald Port Technology.

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