Demand for extending ship-to-shore (STS) cranes is higher than ever. The prevailing trend to reduce transport costs with new higher and wider container ships is further boosted by the enlargement of the Panama Canal, set for completion in 2015.

The market environment is rapidly changing with many ports and terminals now looking for solutions to handle larger vessels, some with capacities of up to 19,000 TEU. Kalmar is exceptionally well placed to offer the skills, resources and expertise to upgrade the capacity of existing quay side cranes to meet today's performance requirements.

Many terminal operators are finding that upgrades can be a fast and cost-efficient alternative to acquiring new equipment. With STS heightening for example, the time for the crane to be out of operation, in most cases is just six weeks. Additionally, existing crane fleets can also be upgraded to meet the standards of modern environmental, health and safety regulations.

Crane performance can be improved by upgrading or modifying the original specification of the crane. For example, when a component is replaced with improved technology; like replacing a diesel powered system with electric. Kalmar also implements safety and automation upgrades, plus modifications that aim to improve the environmental footprint, such as reduction of fuel consumption, exhaust gases or noise.

Kalmar offers a range of refurbishment and upgrade solutions for all crane brands. Our consultancy and engineering offering includes lifetime analyses, damage surveys and the re-engineering of crane performance. We also undertake repairs on damaged cranes, refurbishment of older or overdue maintained equipment and relocation of equipment.

KALMAR

Kalmar, part of Cargotec, offers the widest range of cargo handling solutions and services to ports, terminals, distribution centers and to heavy industry. Kalmar is the industry forerunner in terminal automation and in energy efficient container handling, with one of the four container movements in the globe being handled by a Kalmar solution. Through its extensive product portfolio, global service network and ability to enable a seamless integration of different terminal solutions, Kalmar improves the efficiency of every move. Read more at: **www.kalmarglobal.com**

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Extending STS cranes

KALMAR

Extending STS cranes

step by step

Kalmar has the know-how and global capability to heighten any brand of STS crane. Typically, the lifting height is increased up to four container heights. When required, the crane's reach can be extended simultaneously. Total cost and delivery time is a fraction of that of a new STS.

With our crane upgrades business centres strategically located in the Netherlands, Spain, Argentina, USA and Malaysia, Kalmar is truly a global player. We are able to deliver our highly specialist services worldwide and also have equipment in-house with the ability to jack up the largest STS cranes, together with tools necessary for horizontal relocations.

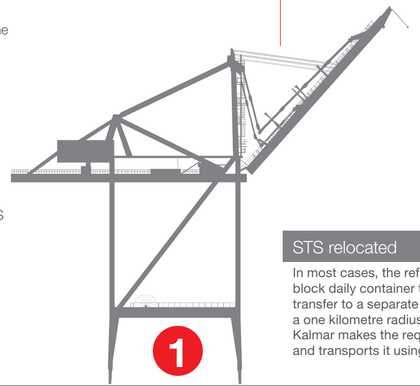
All in all, Kalmar has heightened or extended nearly one hundred STS cranes globally.

Crane lifetime extension

Heightened cranes are normally between five to fifteen years old. The average STS lifetime is around twenty five years, depending on the number of annual lifting moves.

Choosing to extend the lifetime of a crane while heightening it means it's possible ride the investment over a longer time.

Analysing crane loadings determines the weak points where cracks are likely to form, or small cracks may have emerged. Reinforcing these locations can increase STS lifetime by around one to two million moves. A normal STS crane is designed to withstand one to four million moves.



Detailed engineering

Kalmar makes detailed design and engineering calculations of the crane structure. The heavy lifting solutions are defined and fabrication drawings produced. Everything takes place in-house at Kalmar or in close cooperation with our crane engineering partners. Based on the final fabrication drawings and solution to jack up and relocate the crane, local subcontractors are chosen.

STS relocated

In most cases, the refitting of the STS would block daily container terminal operations. Its transfer to a separate work site, normally within a one kilometre radius, is a delicate process. Kalmar makes the required crane modifications and transports it using heavy lifting equipment.

Portal structure reinforced

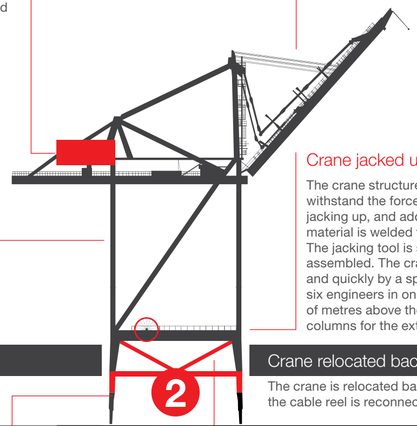
New portal beams, diagonal beams or local strengthening material in the portal structure are added to maintain the right stiffness for comfortable operations and reinforce the structure to withstand increased loads. Elevators and stairs are heightened by as much as the crane, and the cables for the power connection are modified as needed.

Main hoist modified

The hoisting ropes in the main hoist that run in the cable drums atop the crane are replaced to suit the new hoisting height. Sometimes the drums need replacing to allow for an extra length of cable.

Boom lengthening

Where vessels loaded and unloaded get wider, the boom length can be increased. Around a quarter of customers require this. Boom hoisting, trolley travelling and forestays may also need modification.



Crane jacked up

The crane structure is reinforced to withstand the forces exerted during jacking up, and additional supporting material is welded to the jacking points. The jacking tool is shipped to the port and assembled. The crane is jacked up safely and quickly by a specialist crew of up to six engineers in only one day, a couple of metres above the gantry, and four new columns for the extension are installed.

Crane relocated back into operations

The crane is relocated back into operations and the cable reel is reconnected.

PLANNING

Feasibility study

Kalmar analyses the existing STS crane and checks various key issues, such as, stiffness, strength, stability and wheel loads based on the customer's upgrade requirements and onsite inspections.

Budget proposal

A broad outline of the project is defined and the customer receives a budget proposal. If the customer decides to proceed, the budget is allocated.

Detailed engineering

Kalmar, or the customer, defines the technical specification and detailed scope of work for tender documents.

Final proposal and order

Based on the detailed scope and specifications, Kalmar makes a final quotation. In most cases, it includes options, such as, modernisation of the electrical system, extension of the boom length and crane lifetime extension.

Normally it takes over a year from the feasibility study to the final proposal, depending on the customer's internal processes and complexity of the project.

PERFORMANCE UPGRADE

Adding ballast weight

Depending on the crane's stability after the increase of height and boom length, a ballast weight may have to be added to the structure.

Adding gantry wheels

Depending on the wheel loads after the upgrade and allowable quay loads, the number of wheels is sometimes increased to reduce wheel loads.

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Final commissioning and handover

The crane is given extensive testing and commissioning protocol reviews. The fully functional and safe STS is delivered to the customer.

The entire project, including options, is normally completed within six to ten weeks, depending on the total scope and options selected by the customer.