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 18,000 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 a week. 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, i.e 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 has the know-how and global capability to heighten any brand of STS cranes. 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 required for a new STS.

Extending STS cranes step by step

- Kalmar has the know-how and global capability to heighten any brand of STS cranes 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.

### Performance

Changing 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.

Choosing to extend the lifetime of a crane while heightening means it’s possible to ride the investment over a longer time. Adding ballast weight increases the crane’s reach. The strengthening is normally added to the structure.

Extending crane’s reach can be achieved with minimal disruption to operations. The crane is relocated back into operations 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.

- The crane is relocated back into operations and the cables are reconnected.

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### Planning

1. **Feasibility study**
   - Kalmar analyses the customer’s requirements and checks feasibility, such as, modernisation of the crane, extension or local strengthening material in the existing STS crane, and transport of the crane to the customer.

2. **Budget proposal**
   - A broad outline of the expected budget and scope of work for tendering.

3. **Detailed engineering**
   - Kalmar makes detailed design and engineering calculations of the crane structure. The heavy lifting solutions are defined and fabrication drawings produced. Kalmar takes place of the customer’s STS crane partner. New portal beams, diagonal beams and columns are added to maintain the integrity of the portal structure.

4. **Final proposal and order**
   - Based on the detailed engineering drawings, Kalmar makes a final proposal. The proposal includes options, such as, modernisation of the electrical system, extension of the hoisting height and crane lifetime extension.

### Upgrade

5. **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.

6. **Adding gantry wheels**
   - Depending on the wheel loads after the upgrade and additional span loads, the number of wheels is sometimes increased to reduce wheel loads.

### Main host modified

The hoisting space in the main hoist that cut in the cable drum step in the crane is replaced to the new installation. The drum riding height is increased to allow for all extra length of the cable.

### Boom lengthening

Where vessels loaded and unloaded in the crane’s reach will be increased. Around a quarter of the customer’s require this. Boom riding height, which affects the container load, may also need modification.