

Increased STS productivity with dual hoist automation

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Automation can increase the overall productivity of a quay crane and raise almost all drivers to a high production level.

For dual hoist cranes, this is even more true. The theoretical advantage of a dual hoist crane over a single hoist crane is substantial, but in everyday operation those fantastic numbers have been difficult to achieve. Due to the complexity of the dual hoist system, operation has often been slow. The difficult landings and pickups in combination with complex crane handling easily make the seconds slip away. With a production rate that may be close to that of a single hoist crane, the extra investment cost can hardly be justified.

Automation is clearly the solution to the problem. As the world leader in crane automation, ABB has an extensive range of automation features that boost berth productivity.

For a number of projects, ABB has delivered sway and position control as well as Automatic Skew control – all of these able to handle two head blocks simultaneously.

With ABB's drive and automation, dual hoist cranes delivered to Busan, Korea have managed to reach a productivity of 60 containers/hour, a truly outstanding number. More boxes/hour results in shorter berthing times for the ship and a potential to increase profit and cash flow for the terminal operator.

Trolley speed

There are some areas where the potential timesavings are large. One factor that is easy to forget is the utilization of the maximum speed of the cranes. Today, the cranes get faster with higher speeds and shorter ramp times. However, this also requires more from the operator; since the crane might feel jerky and precision driving is difficult.

The result is that many times, new cranes are operated at a lower speed than they are designed for. With ABB's automation, the crane

will be operated at its maximum performance, thus making sure that optimum productivity is achieved. The trolley speeds alone may cut the trolley travel time with up to 30 per cent.

Skew control

The complexity of the dual hoist and the head blocks with their separation cylinders requires some extra thought. Because of the dynamic connection between the systems, a change at one end may affect another part in an undesired way.

There are also time delays in the system, which makes operators overcompensate. With automatic skew control, the skew positioning is continuously taken care of.

Vehicle Alignment System

As mentioned above, adjusting the skew and the separation of the cylinders can be very time consuming. With ABB's Vehicle Alignment System, VAS, the vehicles are guided to the correct positions. When halted, the final positions are measured and the skew, separation and trolley reference are adjusted accordingly.

Unloading time from ship to quay can be shortened by as much as 30–40 per cent when using automation compared to manual driving.

Safety aspects

In addition, the Vehicle Alignment System gives a possibility to move the flagman from the exposed position underneath the crane. With supervision from the crane operator, the automatic cycle can continue and perform a fully automatic set down or pick up. This minimizes the need for unwanted stops or decelerations, and saves even more seconds each cycle.

Simulator training

Operating the new Dual Hoist cranes requires training. Even for an experienced operator, there are many new functions and controls to get used to.

When TSI Deltaport in Vancouver recently received their three new dual hoist cranes, a well-planned training schedule was implemented.

The first part of the training was conducted in a CS800 Crane Simulator, which is equipped with a Dual Hoist crane and all its related controls. In the CS800, the operators could experience how to load and unload a ship with a dual hoist crane and train to use all features of the new cranes.

The setup with the simulator made it possible to decrease on-crane training and hence free time for the extensive testing of the cranes while still keeping the short delivery time from order to start of operation.



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ABOUT THE COMPANY

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