

Case note

ABB drives bring smooth, precise control to overhead crane



ABB industrial drives crane control program enhance health and safety at Carinox.

Carinox, owner of a hot strip mill in Belgium, has improved the safety and reliability of eight electric overhead travelling cranes using ABB industrial drives with crane control program.

The cranes are used in the grinding of mill rolls which are suspended and moved above the factory floor. The existing crane installations used old technology such as slip-ring motors and Carinox needed to upgrade its crane control systems to improve health and safety at the plant.

A crane control system was needed that could accurately control the movement of the hoist without endangering the lives of the crane operator and factory floor personnel.

The system needs to handle movement of the crane whether it is loaded or empty.

ABB industrial drives feature the patented direct torque control (DTC) motor control platform which plays a critical role in bringing the performance levels, inherent safety and protection functions needed for a crane application.

DTC allows accurate control of speed and torque with or without pulse encoder feedback from the motor shaft. However, at Carinox, for additional safety on hoist drives, an encoder is used on the shaft to measure real speed rather than relying totally on the motor model.

DTC is designed for constant torque applications such as that of overhead cranes, where a load is suspended and the torque must always remain the same – from zero speed to maximum. The drives have an excellent torque response which is vital to the control of the load. With a suspended load, if the torque is not controlled, the load will swing, with the danger of causing damage through uncontrolled impacts. Similar challenges arise when stopping the crane.

Another key feature of the ABB solution is its crane control program which uses DTC to deliver enhanced operational safety and provides accurate slow speed control with high torque levels. It eliminates the need for an external PLC and incorporates all the functions commonly required for hoist, trolley and long travel motions in industrial cranes.

Solved problem

- Accurately control the movement of the hoist without endangering the lives of the crane operator and factory floor personnel

Solution

- ABB industrial drives along with ABB's custom-designed crane control program

Benefits

- Cranes are controlled precisely and predictably, improving safety
- Smooth crane operation reduces maintenance costs, resulting in an accurate and soft control which avoids erratic movements of the load
- Mechanical wear is reduced
- Flexible crane control program for adapting old start/stop and reference logic to new platform
- Easy to use with ready made parameters which are dedicated for use with cranes



Hoist motors use incremental encoders for accurate position feedback.



One of several 200 kW ABB industrial drives used by Carinox.

For more information please contact:

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