

Case note

Waste handling crane uses anti-sway control program to avoid collision risk



Using anti-sway control within the narrow bunker reduces collision damage.

ARN bv is a leading waste handling and recycling company, with a waste to energy plant at Nijmegen in the Netherlands. The plant takes in about 640,000 metric tons of household and light industrial waste a year and produces around 160,000 mega watt hours (MWh) of electricity that is distributed to the public supply grid. It also produces around 700 tera joules (TJ) of energy, which is supplied to a neighboring sewage treatment plant.

The plant has four electric overhead travelling (EOT) cranes: three to transport waste from a bunker to the furnace and one to transport slag following the incineration process. Each crane grab can lift 4.5 metric tons of waste in one lift.

Demand for reduced maintenance and better crane control

The low voltage AC drives used on the EOT cranes were coming to the end of their life cycle. Spare parts for the drives were increasingly difficult to source and there was a need to reduce maintenance and service.

A better crane control was also needed to give more accurate positioning of the grab. The entrance to the waste bunker is narrow and as the 5.5 metric ton grab moves towards it, collisions between the grab and the concrete sidewalls can occur, potentially damaging the bunker or the grab itself.

Downtime kept to a minimum

Two cranes were each retrofitted with two ABB industrial drives using ABB's anti-sway control program. Existing squirrel cage motors, brake resistors, switches, cabling, PLC and other parts of the control systems were retained. This reduced installation cost, as well as minimized downtime. The cranes use three 15 kilowatt (kW) motors, one on the long travel movement and two powering the trolley movement. The drives are fitted with sine filters, allowing reuse of the existing 150 meter long cables used to connect the drives in the electrical room to the crane motors.

Cost-effective anti-sway control

Using the ABB industrial drives with anti-sway control means that even coarse handling of the controls by the crane driver results in minimal grab swing, while better control of the crane results in reduced maintenance costs.

ARN bv is saving \$14,136 (10,000 euros) in maintenance costs a year by using ABB industrial drives with anti-sway crane control. This saving results from reduced collisions with the bunker and through savings on servicing costs compared to the previous system provider. The anti-sway control program, built-in to the drives as an option, gives maximum cost-effectiveness since no additional hardware is needed. Stan Vos, electrical manager of ARN, says: "ABB is able to offer the anti-sway function integrated in the drives, which was the most cost-effective solution."

Two cranes were retrofitted in stages to meet ARN's tight deadline. The other two cranes are planned to be retrofitted with the same solution in the near future.

Stan Vos continues: "The retrofits were done in close cooperation between ARN and ABB. They were executed during normal maintenance stops of the plant. We managed to have the cranes running again during the available time frame and they are operating reliably now. We consider ABB as a reliable drive supplier, as well as a partner for maintaining our plant."

Challenges

- Existing low voltage AC drives approaching the end of their life cycle
- Need to reduce maintenance cost
- Better maintenance and service needed
- Damage caused to bunker and grab through load swing

Solution

- AC drives replaced with ABB industrial drives with anti-sway control program
- Sensorless anti-sway control used for long travel and trolley movements
- Existing motors, cabling and brake resistors reused
- Sine filters allowed reuse of long cabling

Benefits

- Reduced maintenance cost by \$14,136 (10,000 euros) per year
- Cost-effective anti-sway solution due to built-in control program in the drive
- Less damage to bunker walls and grab due to reduced load swinging
- Minimized downtime since retrofit was done during normal maintenance stops and only the drives were replaced



The compact ACS800-01 drives with built-in anti-sway control program installed in the cabinet.

For more information contact your local ABB representative or visit:

www.abb.com/drives

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