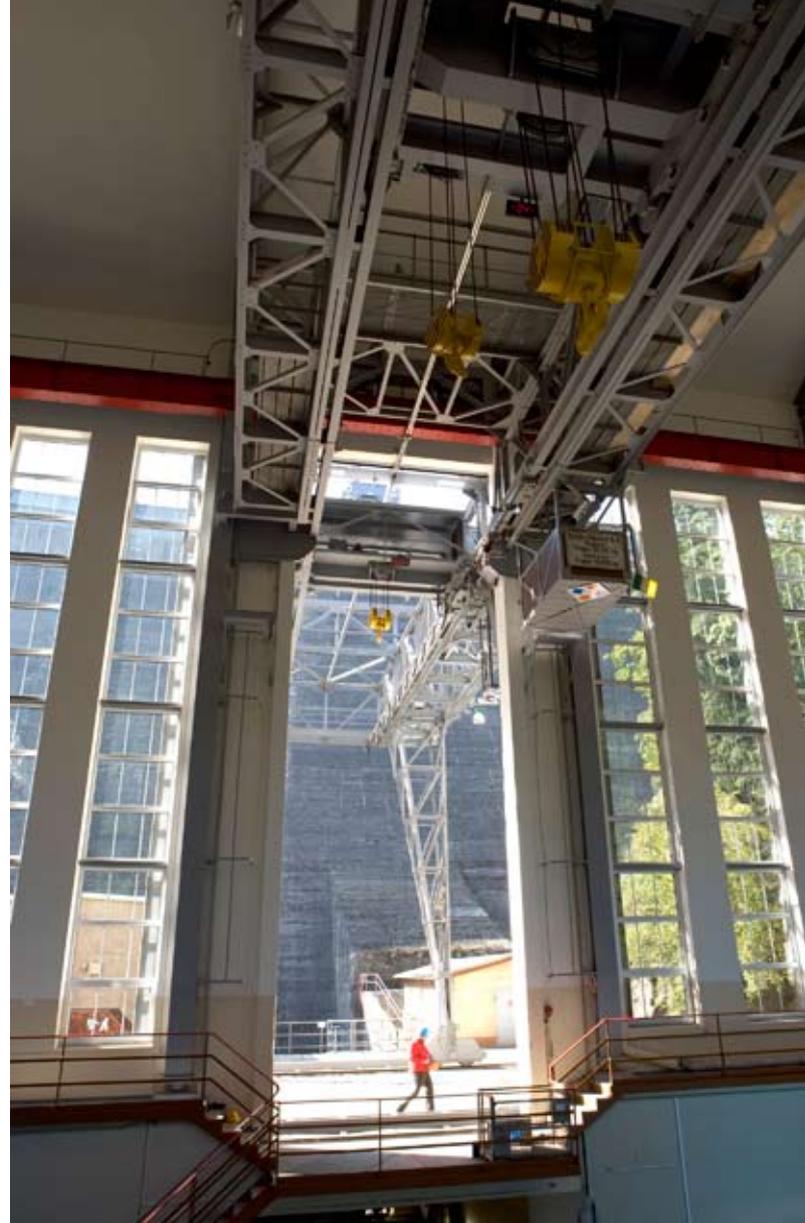


# Crane modernization reduced maintenance and increased user-friendliness

A case study from Emotron





*The modernization of the cranes at the Bleiloch pumped storage power plant resulted in reduced maintenance and increased user-friendliness. Two bridge cranes in the engine room can be connected with a portal crane on the throttle valve forecourt. This enables loads of up to 100 tonnes to be transported.*

**The cranes at the Bleiloch pumped storage power plant in Germany have undergone a comprehensive modernization after 75 years of operation. The project, carried out by Emotron and the crane manufacturer Saalfelder Hebezeugbau, involved also the renewal of the electrical equipment in the crane units and the installation of an electric control system. The result is reduced maintenance and improved user-friendliness.**

#### **Cranes modernized after 75 years**

The Bleiloch Dam is the largest artificial area of water in Germany. The upper reaches of the Saale in Thüringen were dammed back in 1932. Since then, power has been generated here in a pumped storage power plant. The peak output of the two pumped storage units is 80 megawatts. The plant is run by the Swedish power company Vattenfall.

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*Cover photo: The cranes at the Bleiloch power plant were modernized and are now controlled by Emotron VFX variable speed drives.*

The plant's cranes have now undergone a comprehensive modernization after 75 years of operation. The project, carried out by the crane manufacturer Saalfelder Hebezeugbau GmbH and Emotron, also involved the complete renewal of the electrical equipment in the crane units and the creation of a user-friendly and easily maintained electrical control system.

A number of objectives were set for the modernization. One of them was increased functional and operational reliability. Another one was improvement in the tracking controls for the bridge travel drives. Low-maintenance operation for at least another 25 years was one request, as was of course the compliance with safety regulations.

#### **Bridge and portal cranes transport 100 tonnes**

The pumped storage power plant has two 100/25-tonne bridge cranes and a 25-tonne portal crane used to move machines and equipment in the engine room and on the neighbouring throttle valve forecourt. The local conditions are almost Alpine: the plant can only be reached by means of a funicular railway or on foot. The funicular

railway, which connects the forecourt with the access road to the power plant, can transport loads of up to 45 tonnes.

The bridge cranes of the engine room can be mechanically connected with the portal crane. The trolley can then move from the bridge crane over to the portal crane on a piece of rail attached to the building. To do this, gaps in the rails of 20 millimetres must be overcome. The solution enables loads weighing up to 100 tonnes to be transported between the forecourt and the engine room.

### **Variable speed drives optimize operation**

The modernization process was based on a standard developed by Saalfelder Hebezeugbau GmbH for the flexible replacement of hosting equipment in wind power stations. This made it possible to plan and deliver quickly. The electrical equipment for the engine room crane units and the portal crane was installed separately. In order for the portal crane to also be fully functional in winter, a temperature-based rail heating system was installed.

Emotron VFX variable speed drives are used to control the hoist motors of the cranes. The result is optimized



*The IP54 enclosure allowed the variable speed drives to be installed on the crane bridges and the winch. This reduced installation costs.*

operation and high efficiency thanks to direct torque control. With the application of a nominal load of 110 per cent it was possible to achieve a ratio of almost 1:1 between current and torque.

### **Low installation cost with IP54**

As the Emotron VFX variable speed drives have a high protection class (IP54), they are protected against dust and spray water. They could therefore be installed outside the equipment cabinets on the crane bridge and on the trolley. To use IP54 crane equipment is not common in crane design, but it brings significant savings potential.

“Costs are reduced since smaller equipment cabinets can be installed for the crane control,” says Lothar Sendzik, crane manager of Emotron and the one to develop the solution together with Uwe Bergmann, project engineer at Saalfelder Hebezeugbau. “In addition, it eliminates the need for traditional solutions that demand the design and cabling of numerous coupling relays, or a PLC.”



*The Emotron electronic flange control ensures fully synchronized travelling. The auto tune function of the crane control system means no PC is needed. Parameters and settings are clearly displayed.*

Functions such as travel, hoist, deviation monitoring and speed are controlled via a crane I/O option board in the variable speed drive, one for each crane motion.

### **Operators benefit from easier handling**

The modernization also brought improved user-friendliness in handling the cranes. A HBC radio-controlled system was installed for remote control. A transmitter in the engine room remote control can be used to operate the two bridge cranes, either separately or in tandem. If a trolley moves from the overhead crane to the portal crane, technical control is taken over by the portal crane’s remote control. To assist the operator, the selection or release of the transmitter is indicated on an illuminated panel.

Complicated transport procedures by the engine room cranes can be controlled from the crane cockpit. A user-friendly and easily maintained electrical control unit was designed to facilitate the operators’ work.

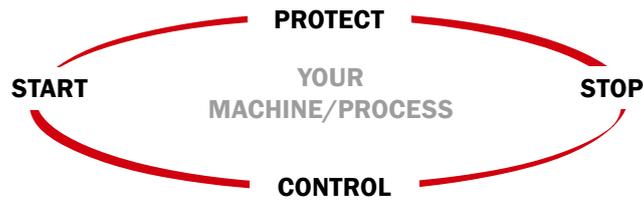
### **Reduced wear on wheels and rails**

The Emotron electronic flange control was installed for the control of the bridge travel drives of the engine room cranes. The previous control through mechanical flange contact led to a high level of wear and high maintenance costs.

“Thanks to the Emotron electronic flange control the wheels are fully synchronized and the crane travels on the rails without any sideways contact of the flanges,” says Lothar Sendzik. “The mechanical stress is minimized and maintenance costs are reduced. The ready-to-install system meant it was not necessary to replace the crane wheels and the crane rails.”

An Emotron crane control system is used for the configuration. An auto tune function senses the system and automatically sets the required values. No PC is needed and the system is easy to install and use. Parameters and settings are clearly displayed in the process units of the operator’s choice.

# A dedicated product portfolio



Emotron's product portfolio meets all levels of need for machines and processes driven by electrical motors. You will always find the optimum solution for your specific situation. When choosing Emotron, you will also benefit from cost-efficient installation and commissioning through built-in functionality that is

otherwise provided by additional equipment. You will also find intuitive user and process interfaces with the possibility of communicating critical parameters to other parts of your process, using analogue, digital, serial or fieldbus communication.



## PROTECT

### Emotron Shaft Power Monitors

when you wish to protect your application from over- and underload situations

## START • PROTECT • STOP



### Emotron Softstarters

when you wish to protect your application from over- and underload situations, as well as to optimize the start and stop sequences of your application

## START • PROTECT • CONTROL • STOP



### Emotron Variable Speed Drives Emotron Compact Drives

when you wish to protect your application from over- and underload situations, optimize the start and stop sequences of your application, as well as be in full control of your process values – flow, pressure, speed, torque, etc.



## Dedicated drive

Emotron focuses on solutions for starting, protecting, controlling and stopping machines and processes driven by electric motors. Our drive is to create measurable benefits for our customers and their customers to achieve their and our business goals, thus creating a win-win relationship for all parties involved with Emotron.

We have been developing our product portfolio during over 30 years towards carefully selected applications.

As a result we have built up specialist competence and can therefore offer our customers the optimum solution for their specific application needs.

Emotron is a Swedish company with manufacturing and development resources in Helsingborg, Sweden and in Bladel, the Netherlands. We have sales and service organisations in Sweden, Benelux and Germany, offices in China and Latin America, as well as a global network of distributors and service partners.



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