



# Eaton delivers turnkey communication solution improving safety for Russian mine shaft sinking system

**Location:**

Ust-Jaiwa mine, Russia

**Challenge:**

Safety and operational performance in a difficult climate

**Solution:**

Comprehensive solution designed to integrate functionality into one system

**Results:**

Turnkey communications solution for mine shaft sinking system designed for superior safety

*“To put it simply, we drill holes into the Earth, our workers are down there and we do not take any risk on safety. That’s why we chose Eaton; its solutions are in the highest explosion protection class out there.”*

*Frank Otten, vice president, international projects, Deilmann Haniel*

**Background**

As sinking depths continue to increase, the construction and lining of mine shafts to access new areas of mineral deposits pose an enormous challenge for clients, project engineers and contractors. The new Ust-Jaiwa mine, located in the Berezniki/Solikamsk area of Russia, about 200 km north of Perm on the west side of the Ural range, is just one of these examples. Once built, it will mine approximately 10 million tons of ore per year, complementing what is produced by the five other existing Uralkali mines in that area.

In 2004, Uralkali won the tender for the development of the Ust-Yayvinsky block and obtained a mining license. The reserves of the block comprise approximately 1.3 billion tons of sylvinitic ore, which will provide 30 to 35 years of steady operation of the mine. In December 2011, Uralkali signed a contract with general contractor Deilmann Haniel for construction of the shafts for the Ust-Yayvinsky mine.

The construction of the surface complex at the Ust-Jaiwa block began in 2015.



Powering Business Worldwide



Deilmann Haniel plans to complete the construction of shafts in 2017 and produce its first ore in 2020. The new mine will have two shafts: a 465-meter deep shaft with skip winding (for hoisting the ore) and a shaft with cage winding (for hoisting and descending workers and loads). The mined ore will be processed at the Berezniki-3 plant, where a 6.3 km cable-belt conveyer will transport it.

It was imperative that the different required systems integrate well with one another and that the supplier could manage the various solutions for one holistic system.

“We worked with Eaton because of its team’s dedication to safety and its ability to provide one turnkey solution for the project,” said Frank Otten, vice president, international projects, Deilmann Haniel. “To put it simply, we drill holes into the Earth, and there could be gas in these holes that could cause an explosion. Our workers are down there and we do not take any risk on safety. That’s why we chose Eaton; its solutions are in the highest explosion protection class out there.”

## Challenge

General contractor Deilmann Haniel required an integrated shaft signaling system that included wireless and wired communication, automation for water pumping, material gripper and hydraulics for the shaft sinking platform, and a gas monitoring system for the sinking level at a mine in Ust-Jaiwa, Russia. This mine will increase production to enable Uralkali to replace the depleting ore reserves of the Berezniki-2 mine (2 million tons of KCl per annum) and increase the Berezniki-3 capacity by 0.5 million tons of KCl per annum.

Deilmann Haniel put particular emphasis upon equipment selection and arrangement, focusing on suppliers that were able to offer superior safety and operational performance for deep shaft sinking in a difficult climate. Eaton stood out as a supplier that could provide one turnkey solution for the entire project.

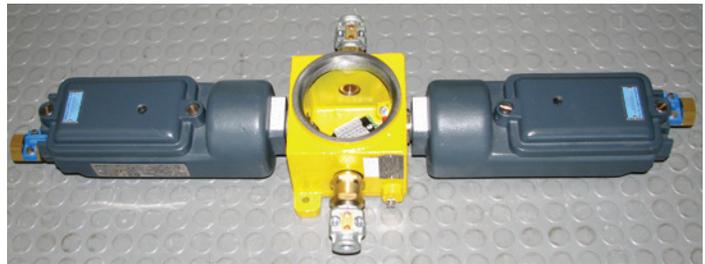
## Solution

Eaton’s Crouse-Hinds series FBT signaling and communication system, MR90 wireless communication, Z51 automation and gas monitoring systems provided a holistic solution for the project.

The Eaton signaling and communication solution is able to integrate all the functionality required by the shaft sinking company into one system.

## Results

Eaton delivers a turnkey solution that fits the customer’s requirements and meets the time schedule from the end user. This was achieved because of the close cooperation among the Eaton project engineering team, all the customer’s subcontractors and the end user.



Intrinsically safe power supplies



Mounting the main cubicle for wireless communication

## Complete solution

Project planning and documentation development

- Intrinsically safe shaft signaling system including safety circuit – ZM51
- Wireless shaft communication – MR90
- Loudspeaker system – L111
- Telephone system – iVT3
- Automation for hydraulic for shaft sinking platform – ZM51
- Gas monitoring for sinking level – ZM51
- PLC programming
- System test at Siemens Tecberg factory in Haiger

All systems are preinstalled and pretested by the winder supplier to reduce onsite installation and commissioning costs.



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