Secure connections in the brown coal region

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R&M splice closures in brown coal surface mining.

An impressive backdrop. When approaching the surface mining of Garzweiler on the old Bundesstrasse 1, one plunges into a territory where apparently the titans are working. In the foreground, bucket-wheel excavators the size of dinosaurs are digging into the soil. In the background giant power plants are steaming. R&M is the partner for secure data and telecommunications in the heart of the West German brown coal region.

To drive into the surface mining zone is only possible with an off-road vehicle. Quickly one is faced with meter-high brown coal beds devoured by the teeth of the enormous bucket-wheel excavators. No. 288 is the largest excavator in the world. Its height almost matches the height of the Cathedral in Cologne. Its bucket-wheel is as high as a seven-floor building.

Fuel for generations

Eight of these gigantic machines haul 30 to 40 million tons of brown coal annually from the earth in the mining area of Garzweiler I – fuel for the adjacent power plants that supply the urban area around Cologne and Dusseldorf with electricity. In the region west of Cologne, within a surface area of 2,500 square kilometers there are 55 million tons of brown coal from 12 to 20 million years old, which have been mined since the 18th century. This energy potential corresponds to the crude oil deposit of Iran and Irak.

Kilometer-long conveyor belt systems pass through the entire surface mine and transport tailings and coal to the storage sites and power plants. Alongside the conveyor tracks run the energy and control cables for the excavators. The cables meet in the control room from which RWE Power employees control the coal mining.

Behind the scenes
High-tech communication

The surface mining, appearing outwardly very gigantic and sluggish, emerges here as a very complex and dynamic computer-controlled process with up-to-date data and telecommunications cabling. In the future, the bucket-wheel excavators will be remote controlled via GPS signals and the conveyor technology will be automatically updated. Heavy fiber-optic cables are used for the data transmission to the units.

RWE Power has relied on the R&M know-how and solutions for years. Due to the extreme loads in surface mining, the robustness of all connection technologies has top priority.

Cabling must be flexible, robust and future proof

The operator selected connection module systems of the VS modular type for the telephone connections in the surface mine, a system that stands out by virtue of its reliability and flexibility (wire cross-section of up to 2.5 mm, double contacts). The data network in the control room was set up with the Cat. 6 R&Mfreenet STAR products. In the connected halls and work spaces, products of the SplashLine series are used because splash protection according to IP54 protection class is required for the connection technique.

Due to the fact that in the control centers many computers are needed in the smallest of spaces, the connection technique was carried out via connection points. RWE Power attached importance to friendly service and downstream compatible RJ11 capability. Besides, with the R&M solution there are sufficient reserves available for the introduction of future protocols on demand. R&M splice closures and Venus small distributors are used for cabling in the conveyor technology. Their use was in particular advocated thanks to their easy access in harsh working conditions as well as easy installation.

Brown coal, the only national primary energy source, is competitive with oil, coal and gas imports and will be around for generations to come. Therefore, the mining region of Garzweiler II will become operational next year. At the moment, the necessary infrastructure is being developed. RWE Power trusts R&M as one of the main suppliers for telephone and data connection technique for this project. Proven and tested products and collaboration – also for Garzweiler II.

Coal extraction is not done in one's Sunday best.

The biggest excavator in the world at work…

Garzweiler I and II
Germany's largest brown coal resource area with a total surface of 56-square kilometers extends from the Rhenish Grevenbroich in the Neuss Township to expressway A44. In 2002 just under 38 million tons of brown coal were mined. In order to maintain the present output level, the Garzweiler II mine to the west will become operational next year. In this 48-square kilometer coal resource area, which extends almost to Erkelenz, there are an additional 1.3 billion tons of brown coal available for exploration.

RWE Power
RWE Power AG is one of Europe's largest electricity producers. 18,000 employees work at the one-hundred-percent subsidiary of the RWE energy group and produce annual sales of approximately three billion Euros. This makes RWE Power one of the central pillars of the Rhenish energy giant.

R&M products used
RWE Power relies on a multitude of R&M components for telephony and data systems as well as conveyor technology:
– VS modular distribution systems for telephone connections
– R&Mfreenet STAR Cat. 6 in the data network, RJ11 compatible
– Connection components with SplashLine for IP54 protection class
– Splice closures and Venus small distributors for conveyor technique
– LWL UniRacks in 19-inch distribution installations