Coal Flow Information System KOFIS
Power Plant Neurath, RWE Power AG
**Constant Coal Quality for Lignite Burning**

In order to obtain a consistently high efficiency while keeping emissions at a minimum during the burning of lignite in power plants, the quality of the coal should be constant.

The coal flow information system KOFIS provides information about the quality of the fuel and, in doing so, renders an optimized operation of the power plant.

The Neurath power plant of RWE Power AG is supplied with lignite by the open-pit mines at Garzweiler and Hambach. The lignite shows heavy fluctuations in its chemical composition. Today, the coal flow information system KOFIS ensures constant coal quality at these locations.

What KOFIS does is to provide complete tracking of batches from the time they are dumped in the power plant bunker all the way to the single boiler coal bunkers. This has made it possible to create the database needed to inspect the coal quality with an overall accuracy of at least 90% and to automatically adjust the boiler operation to the coal quality in question.

In order to offset the fluctuations by means of selective blending, each arriving batch is assigned quality parameters obtained from online analyses and upstream systems. The lignite batches are then dumped based on a dumping system that takes into account their different qualities and leads to the first blending of the lignite.
Fully Automatic Stockpile Scanning

In order to determine the amount being dumped as well as its exact location within the stockpile, the stockpile is scanned fully automatically after each discharge of a coal train. A system counting axles recognizes the arrival of a train from the bunker tracks and automatically causes a scanner car to move. This involves a laser scanner, whose rotating scanning head measures the stockpile in one level, being moved along the coal bunker in a car. The data obtained that way is remitted via WLAN to a productive server, which uses it to calculate a 3D model of the coal stockpile.

The ditch bunkers are drained by three bucket wheel excavators. Their exact locations along the ditch bunker are determined by sensors on the excavators. In order to determine the point of engagement of the bucket wheel in the stockpile model, a capacitive gradient sensor captures the inclination of the projecting arm, an absolute-value encoder captures the speed and a volume scanner captures the extraction flow.

After being extracted, the lignite is moved through a crushing plant to an intermediate bunker, whose volume level is measured by eight ultrasonic sensors. The sensors are connected via profibus to KT97 compact controls of the AC31 Series 90, which provide the flawless link between complex sensor technology and communication of the controls via standard logs and components. From these controls, binary messages are captured that will be available as statuses in the central operator station of the power plant control system. Further diagnosis and visualization of the facility are available as web-based applications.
**Constant Quality**

After the intermediate bunker, additional conveyor belts transport the lignite to the boiler coal bunkers. During the entire process, the productive server calculates the load on the conveyor belts as well as the contents of the bunkers and displays them. Quality values based on mathematical models can be used to adjust process parameters to optimally burn the lignite being fed.