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Case Study

Fuel for the Power Plant – 16 Coal Feeders with Arched Plate Conveyors

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With the conversion of 16 arched plate conveyors, Aumund Fördertechnik contributed to the improvement of the operating procedures at the RWE power plant in Neurath, Germany.

In August 2012 after investing 2.6 billion Euro, RWE Power AG put the two additional lignite power block units F and G into operation at the Neurath power station. Each of these blocks features a performance of 1100 MW and works according to the principle of improved systems technology, BoA.

The two new lignite fired blocks F and G at RWE Power’s Neurath power plant (Pictures: © RWE Power)

At the Grevenbroich-Neurath power plant, the first block unit was put into operation in 1972. Up to 1976 two more 300-megawatt-block units and two 600-megawatt-block units were put into operation in total. The power plant uses lignite from the open pit mines at Garzweiler and Hambach (both in Germany) to produce the electricity base load demanded by private households and industry. With more than 4200 MW, the seven block units of the Neurath plant cover more than ten percent of the installed output by RWE Power owned power plants.

Initially installed Conveyors failed

The coal feeders for the coal mills of the block units F and G delivered by a competitor in 2012 did not work satisfactorily and caused high costs for downtime and maintenance. Each of the two boilers is fed by eight coal feeders.Due to the structural situation and the high costs for new machines, Aumund was contracted to improve the existing pan conveyors that were only two years old. The casings of the machines were conserved as far as possible and received additional re-inforcements.On the outside sections of the machines drive motor, gear unit and bearings were re-used. On the inside, however, all components including the drive shafts were replaced by parts of Aumund’s BPB 250 line. In carrying out the contract, Aumund undertook construction, production and installation supervision. The existing cleaning conveyors were converted from three strand to two strand conveyors. The drive units remained, but their positions were optimised during the retrofit, while the drive- and tensioning stations were renewed.Two years after the initial start of operation Aumund engineers conducted an inspection together with the customer. They noticed, that the existing pan conveyors with round link chains of a third-party manufacturer were heavily worn. Besides, they displayed substantial mechanical defects and did not fulfill the customer’s demands concerning pressure tightness.

Keeping the Power Plant on Steam

During a rotational downtime of the plant, the existing conveyors were retrofitted by Aumund specialists partially while the furnace kept working. Thus, a general overhaul could be executed with the heavily worn conveyors while avoiding a simultaneous boiler downtime, which would have been necessary under the given circumstances in the medium term.For the retrofit, RWE selected light pan conveyors with an average performance of 150 t/h and even 200 t/h at peak times. While designing the new machines into the existing casings, some constructional tricks became necessary to achieve the demanded conveying performance. Aumund decided upon welded pan conveyors, which had to be adapted very individually for the connection to the hopper.

Aumund arched plate conveyors replace the coal feeders at RWE’s Neurath power plant. (Picture: © AUMUND Fördertechnik GmbH)

The Aumund conveyors with a standard width of 200 to 300 mm had to be built into the extremely cramped construction space. Simultaneously, with an adaption and a complete exchange of the former material feed, the conveyors were equipped with a new surface. Due to the limited space available between material

feed, side plate and rollers on one side and the outer edge of the casing - pressure tight up to one bar - on the other side, a special construction had to be realised. Due to the negative pressure loading of the coal mills, special attention was paid to improve the tightness of the entire casing to avoid the leaking of air.The arising material loads underneath the bunker chutes were brought under control by installing a baffle beam. With an increased board height, the feedback conveyor had to be lowered. Besides, a smaller sprocket wheel was used.In addition, the pan conveyors were equipped with AU6052 chains. With its significantly higher safety they allow for a notably higher service life. New flights between the chain strands, the lowering of the tensioning axis and the installation of a new sprocket wheel completed the retrofit.