Online quality control of a coal blending yard

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ABSTRACT
Knowledge of fuel qualities is of ultimate importance for the efficiency of chemical plants or power stations. Although most blending yards are equipped with automatic samplers and the derived samples are processed in the laboratory the quality variation of the blended product may be still strong. This is caused by several reasons. First of all the process of sampling, crushing, dividing and analysis is time consuming. Results are available only with a delay of 2 to 24 hours. During this time blending is operated without knowledge of main parameters. Conveyors with high throughput require expensive sampling systems which are able to handle samples which are representative. Frequency of sampling needs also be high in order to be representative. This results in high maintenance costs and also downtime of the sampling system. Online analysis of bulk materials has matured over time and today it can supplement but not replace laboratory analysis. As an example, J&C Bachmann has realized a coal quality monitoring system on the coal supply of a south african coal processing plant. The plant consumes ~42 Mio tons of coal per year. The blending yard consists of 2 sets of 3 heaps where coal of 8 different mines is blended according to the factory’s requirement. From there, the blended coal is fed to the factory on 2 different belts. In 2010 the plant installed a TEXAS X-ray fluorescence analyzer as a trial. It was tested under different conditions at several belts before the customer decided to install 6 TEXAS analyzers on the feed belts to the stackers and 2 more analyzers at the reclaimer belts. All analyzers are installed directly on the belt but not on a substream. During the test period also blending strategies were developed in close cooperation between customer and J&C Bachmann. The use of the analyzers in conjunction with the blending model has proven that the variation of the reclaimed coal quality was decreased significantly which results in increased process performance and strong cost savings.