Optimized Soot Blowing Management
SR::BCM

Application

During the operation of a coal-fired steam generator, the ash content of the coal leads to fouling of the heating surfaces and thus to a deterioration of the boiler efficiency. For the power generation from coal to take place as efficiently as possible, the fouling needs to be removed from time to time. As the cleaning procedure itself entails costs (soot blowing fluid and erosion of heating surfaces, among other things), an optimal cleaning of heating surfaces can only be achieved by means of a software optimizer like the boiler cleaning management system SR::BCM.

Benefit of the system

The system provides the maximum benefit when it controls the existing soot blowing systems fully automatically (closed-loop operation). When the system has identified a specific cleaning step to be necessary, SR::BCM generates a request that is interpreted by the DCS as the start signal of the respective sequence of steps.

The integrated boiler diagnosis provides the operating engineer with additional information on the current operation.

The long-term storage of data enables the analysis of the operating data over longer periods of time.

The most important advantages of SR::BCM at a glance:

- Fully automatic operation of the cleaning systems of the steam generator
- Automatic reaction to changed boundary conditions like e.g. fouling behavior of different coal types
- Easy adjustment of the cleaning strategy by the user
- Flexible optimization goals (efficiency, reheat spray flow, time between overhauls, etc.)
- Continuous development on the basis of operating experiences
- Additional benefit owing to integrated analysis tools
- Integration of third-party systems (sensor- or camera-based) possible

Properties of SR::BCM

SR::BCM uses performance values to determine the current status of the steam generator in detail on the basis of this information. Additional, not directly measurable information is provided by using a detailed thermodynamic model of the steam generator. The most important examples of such information are the fouling of each individual heating surface as well as the flue gas temperatures in the steam generator.
The soot blowing is optimized taking into account the current operating parameters. Typically, the following operating parameters represent the basic information that is evaluated for optimizing the soot blowing:

- Fouling of each individual heating surface
- Flue gas temperature at the end of the furnace
- Flue gas temperature downstream of the economizer
- Spray flow in the reheater (if available)

Besides these thermodynamically relevant parameters, further plant-specific boundary conditions are considered in addition. For instance, SR::BCM autonomously detects an increase in the basic fouling of individual heating surfaces and automatically adjusts the soot blowing strategy to this new boundary condition.

The optimization of the cleaning strategy considering the many influencing factors is effected by a fuzzy algorithm. For the specific optimization task, this technology has the essential advantage that the partially contradictory influencing factors are adequately considered.

Integration of third-party systems

If the steam generator is equipped with a separate system for the detailed analysis of the fouling condition of the evaporator heating surface e.g. by means of heat flow sensors or infrared cameras, this additional information can be integrated into the superordinate optimization of the cleaning strategy by SR::BCM as well.

Analysis tool for the continuous optimization

The optimization of the steam generator cleaning is a continuous task. In particular, the analysis of the soot blower operation in the past provides important information here. Besides the data analysis in diagrams and the easy export of the data to MS Excel, SR::BCM also supports this in the form of reports from statistical evaluations.