



SMART Clean

Optimized On-load Cleaning of Steam Generators in Industrial Boilers, Waste Incinerators and Biomass Plants

Situation

The combustion of refuse-derived (RDF) and fossil fuels is characterized by continually changing fuel properties. In order to ensure an optimal plant efficiency, the use of a demand-oriented, on-load cleaning system is a must. The complexity of the process presents a significant challenge to optimizing operations.

Excessively frequent cleaning with the aid of sootblowers will produce additional costs through potential erosion, increased steam consumption, and elevated maintenance requirements of the cleaning systems.

Too long cleaning intervals will reduce the heat transfer, thereby affecting the steam generation and therefore, the boiler efficiency. This can result in substantial power losses or even in the worst case, obstruction of the flue gas path which may force the operator to shut down the plant.

The most advantageous solution lies in the use of a powerful computing system to monitor and optimize all cleaning activities since an optimum result is difficult to achieve via a manual or interval-controlled cleaning process alone.

Our Solution

The SMART Clean system for steam generators in industrial boilers, waste incinerators and biomass plants optimizes the performance of all cleaning devices such as water cannons, Shower-Clean systems, sootblowers, rapping devices and explosion generators on an individual basis. The useful effect of these cleaning operations is continuously calculated and recorded. Cleaning devices are controlled on the basis of the resulting data so as to obtain an optimum boiler output.

The system is based on proprietary purpose-developed, computing software and relies on a process model tailored to suit the given application which employs on-line measurements of the steam generating process to optimize cleaning activities.





SMART Clean System for Steam Generators in Industrial Boilers, Waste Incinerators and Biomass Plants

Operating Principle

The SMART Clean system for steam generators in industrial boilers, waste incinerators and biomass plants relies on existing process variables (steam, water and flue gas measurements) to monitor the effectiveness of cleaning operations. Further Clyde Bergemann diagnostic equipment such as, SMART Flux Sensors can likewise be used in this context.

For a targeted analysis, each boiler is divided up into separate sections such as, the combustion system (including the grate) and the convective part. Each boiler section in turn, comprises of specific "cleaning zones", which are areas that can be cleaned by means of a cleaning system.

The system optimizes boiler cleaning activities by a mathematical process carried out after each cleaning operation, linking the results of the process model with data from the preceding cleaning operations. In doing so, it takes into account the effect of each cleaning operation in terms of the rise in heat absorption and hence, its impact on the effectiveness of the boiler. When a cleaning operation is started, the permitted min./max. interval between two successive cleaning cycles is duly considered.

🔴 Your Benefits

- Straightforward, demand-driven cleaning of industrial boilers, waste incineration and biomass boilers
- Increased efficiency through improved heat absorption of heating surfaces
- Minimization of heat exchanger loads
- Adaption of on-load cleaning cycles to match changes in the fuel properties
- Boiler operating cost savings
- Reduced consumption of cleaning media (water and steam)
- Avoidance of shutdowns
- Easy integration into the existing infrastructure
- Reduced wear (erosion) of equipment



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