



Boiler and Furnace Fouling

THE PROBLEM

Boiler tube bundles that are heavily fouled will compromise your generating capacity due to poor heat exchange and/or high pressure drop. With extreme fouling, your plant may need to be taken offline.

Change of fuel, especially to biomass, can exacerbate fouling problems, and installed equipment such as rappers or soot blowers may not be up to the task of keeping the gas path free and ensuring good heat transfer. Ash deposits and fouling (e.g. "eye brows") around the burners in coal power plants can create health and safety issues during shut down and maintenance. Combined Cycle Gas turbine boilers suffer from rust deposits on the finned tube bundles. This is exacerbated by repeated start ups and shut downs.

THE SOLUTION

KRR ProStream can quickly and effectively clean boilers with Pressure Wave Technology (PWT). PWT is offered in two formats. KRR Mobile PWT (Bang&Clean®) can be deployed at short notice and is ideal for lower cleaning frequencies. KRR Fixed PWT is suitable for sites where a high frequency of detonations is required. These are created according to a pre-calculated schedule by a series of units that are affixed permanently to the boiler/furnace. When used online, both systems offer an impressive array of benefits:

- No shut down – plant availability is maintained
- No start up/shut down fuel bills
- No extra ash disposal costs
- No expensive manual cleaning costs
- No odour release – bunker remains under negative pressure
- No start up curves
- Waste inputs are unaffected
- No waste diversion
- Generation is unaffected
- Overall plant efficiency is improved
- H&S risks associated with shut down are avoided

Additionally, KRR Mobile PWT (Bang&Clean®) can also be employed to save time and money during shut downs:

- Reduced manual cleaning requirements
- Done during cooling cycle – no waiting time
- Ash disposed of through normal ash transport system
- Ensures safe access for operator and contractors
- Removes risk of using abseilers
- Avoids delays caused by reliance on manual methods
- An effective precursor to manual cleaning

TURN OVER TO SEE HOW IT WORKS



HOW IT WORKS

KRR Mobile PWT (Bang&Clean®)

Mobile PWT can be applied while boilers are running, removing the need for costly plant shut downs. Alternatively, the process can be applied during shut down. In order to target mobile PWT and improve shut down planning, the KRR View high temperature camera system allows the operator to pinpoint problem areas and assess the need for intervention.

- A lance is introduced into the boiler near the area to be cleaned
- At the end of the lance a balloon is inflated with an explosive gas mixture
- The mixture is ignited via a remote ignition
- The resulting shock waves cause vibrations in the boiler
- These vibrations and shock waves dislodge the fouling without damage to tubes or infrastructure

KRR Fixed PWT

Fixed PWT units, developed by Swiss engineering company Explosion Power GmbH, often replace existing rappers or soot blowers in situations where experience has shown that regular detonations are required to keep surfaces clean.

- Fixed PWT units are fully automated, generating pressure waves by means of a controlled explosion of combustible gases. They are ideal for increasing the period between maintenance outages and the overall efficiency of the power plant.
- Detonation frequency varies from 15 minutes to several days depending on the level of fouling. KRR Fixed PWT replaces other cleaning systems such as rappers or soot blowers, removing the associated high running costs and providing increased cleaning efficiency.

Applicable sectors:

- Energy from Waste
- Energy from Biomass
- Power Stations
- Pulp and Paper
- Combined Cycle Gas Turbine Stations
- Cement

Deployment sites:

- Furnaces
- Radiation Parts
- Evaporators
- Superheaters
- Economisers
- Air Pollution Systems
- APC Silos
- Finned Tube Heat Exchangers
- Electrostatic Precipitators



Above: Superheater tubes before and after cleaning with KRR Mobile PWT. **Below:** Examples of both fixed and mobile PWT equipment.



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