

# BOILER CLEANING AND INSPECTION SERVICES

Boiler cleaning and inspection for the  
power generation industry



# **KRR PROSTREAM:** DEDICATED TO INCREASING PLANT AVAILABILITY AND REDUCING COSTS



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## OUR EXPERTISE

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KRR Prostream has over ten years experience in cleaning industrial boiler systems, giving us a thorough understanding of the issues faced by plant managers and how to resolve them.

KRR Prostream provides the tools for the investigation and analysis of all fouling-related parameters within plants. This enables us to offer cleaning solutions to problems found. Using our expertise we work with you to understand the fouling problems impacting your efficiency and offer technology to mitigate these. These solutions are delivered by highly trained operatives using advanced on-load cleaning technologies and monitoring services.

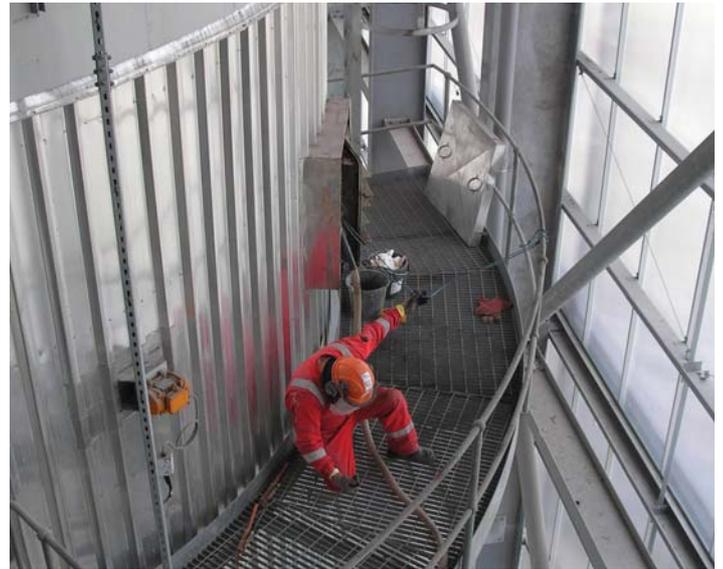
KRR can create customised maintenance programmes for regular cleaning to reduce fouling build-up. We understand the unexpected happens, therefore we also offer an emergency callout service allowing you to get back on-load as soon as possible and with minimal disruption.

To ensure plant shutdowns commence as planned, we are able to undertake a pre-shutdown clean. These remove overhanging fouling to make it safer for those first entering the boiler, while also making inspections easier.

Our aim is to increase the running time of your plant and keep outages to a minimum. This will maximise your income and improve profitability.

### **KRR Prostream can help you:**

-  Increase plant availability
-  Avoid unplanned shutdowns
-  Reduce pressure differentials
-  Control heat transfer
-  Enhance production capacity



## WHAT WE DO

KRR Prostream holds the exclusive license for Bang&Clean® in the UK and the Republic of Ireland, a unique boiler cleaning process, established by Bang&Clean® Technologies AG. We also distribute and service Shock Pulse Generators, developed and manufactured by Swiss company Explosion Power GmbH. These technologies enable you to avoid the financial impact of plant shutdowns and to continue to operate at full capacity.

### **Bang&Clean®**

Bang&Clean® is ideal for removing internal fouling from boilers and furnaces, allowing you to maintain optimal efficiency and prevent unplanned shut downs. The savings when compared to traditional cleaning methods can be significant. Regular maintenance cleans can help keep fouling to a minimum. The technology can also be successfully deployed in pre-shutdown safety cleans.

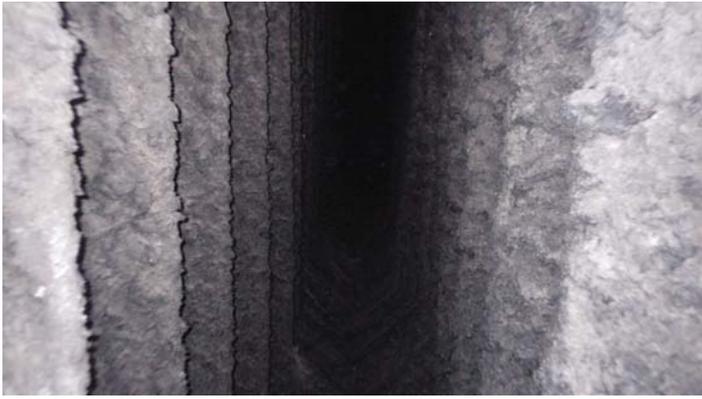
- A lance is introduced into the boiler near the area to be cleaned.
- At the end of the lance a special bag is inflated with explosive gas which is ignited remotely.
- The resulting shock waves cause vibrations in the boiler.
- These vibrations and shock waves dislodge and remove fouling without damage to boiler tubes and infrastructure.
- The plant's ash transport system carries away this fouling for "normal" disposal.

### **Shock Pulse Generators (SPGs)**

Shock Pulse Generators (SPGs) set a new bench mark in boiler cleaning and are installed to provide a permanent cleaning solution in boilers, particularly in economisers, evaporators, empty passes and superheaters. They replace other cleaning systems, such as soot blowers, rappers, shot ball and shower cleaning. SPG units are flanged to the outside of the boiler and are fully automated. Shock pulses can be activated from 15 minute intervals to every 24 hours depending on the level of fouling. We can also monitor the units remotely to ensure optimum performance.

Advantages compared to traditional cleaning systems:

- Superior cleaning effect with no tube washing as with soot blowers.
- Have a smaller footprint than sootblowers.
- Provide constant cleaning to prevent unplanned outages due to severe fouling.
- By constantly keeping surfaces inside the boiler clean they maximise heat transfer for higher boiler efficiency.



Before cleaning



After cleaning

## INSPECTION AND CLEANING

### High Temperature Video Cameras (HTVCs)

Our camera system allows us to look inside the boiler whilst the plant is on-load. Our near infrared cameras have various functions enabling them to operate at temperatures of up to 1200°C. Using our camera system has the following benefits including:

- Areas of fouling can be identified to pinpoint where cleaning is required.
- A reduction in intervention costs if the footage shows no fouling.
- A before and after comparison of the effectiveness of applying Bang&Clean®.

### HPCO<sub>2</sub> (High Pressure CO<sub>2</sub>)

HPCO<sub>2</sub> is ideal for removing blockages and unwanted deposits in hoppers, silos and ash pits. It is quick to deploy and is effective on a range of materials including ash, lime, Air Pollution Control residues and large items of combustible material. By using CO<sub>2</sub> which is inert, it is safely deployed in combustible environments to dislodge blockages and deposits. The technology involved is well established and is used worldwide. Some unique advantages are:

- Can be used in combustible atmospheres.
- Precise targeting of locations where fouling frequently reoccurs.
- Fractures fouling into small grain sizes that can be removed easily.



# REAL RESULTS

KRR Prostream delivers genuine performance improvements in any plant that is reliant on the efficient operation of furnaces and boilers on a continuous 24 hours, 365 days a year basis.



Image courtesy of Lakeside Energy from Waste Ltd



Image courtesy of RWE Great Yarmouth Power Station

## OUR SECTORS

Whenever you encounter excessive fouling and compromised performance, KRR Prostream has the tools and experience to diagnose the cause and provide effective solutions, restoring your operations to maximum capacity. We can assist in all of the following areas:

### Energy from Waste (EfW)

With waste forming a growing part of the UK's energy mix, there is an ever increasing number of EfW plants processing millions of tonnes of waste annually. These plants often have issues with fouling due to the complex nature of the waste fuel.

### Energy from Biomass (EfB)

Plants burning virgin and waste wood fuel also have a similar problem with fouling so these facilities often need regular cleaning. KRR ProStream offers Bang&Clean® technology services as well as Shock Pulse Generators – both of which keep the boilers clean giving solutions for the different problems arising.

### Heat Recovery Steam Generators (HRSGs)

Bang&Clean® has proven to be ideal at removing rust and sulphur build up within HRSGs. The shockwaves penetrate into the finned tubes to provide a more efficient and effective clean compared to other methods. As the cleaning depth is more extensive, this technology also results in a much faster clean which significantly reduces outage periods. Bang&Clean® is ideal for use on the cooler heat exchangers which have higher rates of fouling.



Image courtesy of FCC Environment Greatmoor

## OUR ETHOS

KRR Prostream is committed to reducing our environmental impact and improving our sustainability.

When furnaces and boiler systems are performing optimally, then their emissions and internal energy requirements are both reduced. We help our clients to follow best environmental practice, either for the purpose of regulatory compliance or as a component of their corporate social responsibility. We are equally proactive when it comes to monitoring and reducing the environmental impact of our own operations. KRR is involved in local youth charities by providing financial support and education about our technology. Our head office in Loseley Park, Surrey, is supplied with energy by solar panels installed on our buildings.

We use sustainable sources of energy to heat and cool our facilities. We also coordinate a waste recycling scheme in Loseley Park. This enables companies to sort and dispose of their waste responsibly.

Our commitment to the environment and implementing sustainable policies is an integral aspect of our operations.

## Health and safety is a guiding principle for our organisation and our operatives.

When our teams are on site we leave nothing to chance to ensure the safety of both personnel and plant. All of our staff are equipped with the latest PPE equipment and are highly experienced in the operation of our technologies. We have rigorous Standard Operating Procedures and detailed reporting processes. We are also fully insured for all our cleaning and inspection activities.



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