

**REMOVING ASH, SLAG  
AND DEPOSITS FROM  
YOUR INDUSTRIAL  
INSTALLATIONS.**

**CUTTING YOUR  
DOWNTIME**



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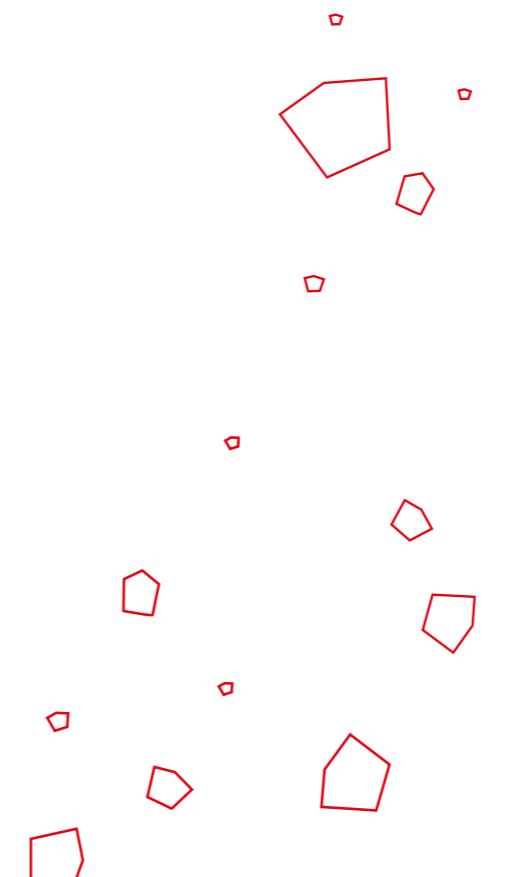
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## FEWER SHUTDOWNS, IMPROVED AVAILABILITY AND ENHANCED SAFETY



Online Cleaning Technologies is recognised market leader in the use of controlled detonative shockwave technology and has started delivering its service in India.

With our proven methods and our deep understanding of the inner-workings of various types of power stations and industrial facilities, the services we offer are truly unrivalled. Our shockwave cleaning solutions remove fouling and other deposits, immediately increasing efficiency and throughput.

OCT is committed to delivering a time- and cost-effective service in the cleaning of boilers, furnaces, silos, precipitators, blocked hoppers and other facilities. Over the past 20 years since OCT was formed we have established a strong reputation and promise complete customer satisfaction at a competitive market price.

### Improving Efficiency

OCT's prime objective is to help improve our customers' efficiency and safety. For more than 20 years OCT has been providing shorter lead times and improving the operational availability for our satisfied customers.

OCT's know-how and experience enables us to assist the customer to reduce costs and increase profit.

OCT is part of a global group that operates across Europe, the United Kingdom, United States of America, Asia, New Zealand and Australia.

Yours sincerely

### MANAGEMENT TEAM

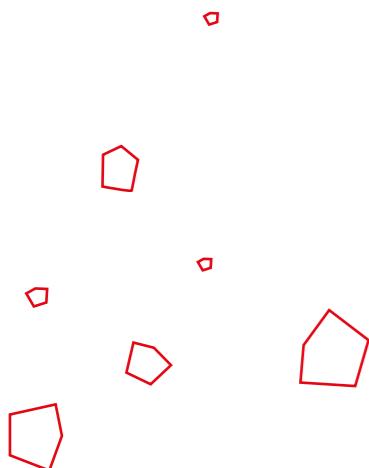


DIRECTOR  
**Fred Wanschers**



DIRECTOR  
**Shilpi Gandhi Khutale**

# WHAT IS ONLINE CLEANING?



When time is money and efficiency is paramount, Online Cleaning can provide essential maintenance without the negative impacts associated with some traditional cleaning methods.

## OCT Solutions

OCT offers "shockwave solutions" using a patented system involving the safe, controlled and expert use of explosives to remove contamination and waste build-up within industrial facilities and power plants. This can be carried out while the plant remains online and fully operational.

## Positive customer feedback

OCT's customers regard us as a committed, service-focused and reliable partner. Our service is available – 24 hours a day, 7 days a week.

More than 70% of all energy-from-waste and power plants in the UK and across Europe use this service. After employing Online Cleaning and our methods which significantly reduce downtime, some customers have reported an increased turnover ranging from €250,000 to €180 million per annum.

## Professional team

OCT workers use their specialist experience to provide the best service possible. All work processes and protocols must meet strict standards for field operations. All workers are individually trained according to the requirements of each task. OCT ensures that safe standard operating procedures are adhered to at all times.

# ENSURING WORKPLACE SAFETY

OCT mission is to ensure workplace safety. Health and welfare are an integral part of doing business in every workplace. Health and safety is the guiding principle for our organisation and our operatives.

## Systems, staff and procedures

All members of engineering staff are issued with the latest PPE equipment and are highly experienced in the operation of our technologies. Our process is fully incorporated into a Safe System of Work, audited and reported both internally and externally by Lloyds Register.

## Proven technology

The technologies we use are proven and safe, with hundreds of thousands of safe applications worldwide. The applications are varied, but the process is always captured within the SSOW procedures, whatever situation they are being applied in.

## Accreditation

OCT is annually audited by external companies, including Achilles and Notified Bodies.

Our H&S & SSOW procedures aim to:

- » ENCOURAGE STRONG LEADERSHIP IN CHAMPIONING THE IMPORTANCE OF, AND A COMMON-SENSE APPROACH TO, HEALTH AND SAFETY IN THE WORKPLACE
- » FOCUS ON THE CORE AIMS OF HEALTH AND SAFETY
- » ALWAYS AIM FOR ZERO INCIDENTS TO WORKERS AND EQUIPMENT
- » ENCOURAGE A STRONG "NEAR MISS" REPORTING CULTURE
- » INVESTIGATE FULLY INTO WORK-RELATED ACCIDENTS AND ILL HEALTH
- » REINFORCE THE PROMOTION OF WORKER INVOLVEMENT AND CONSULTATION
- » TARGET KEY HEALTH AND SAFETY ISSUES
- » CARRY OUT ROOT CAUSE INVESTIGATIONS INTO WORK-RELATED ACCIDENTS AND ILL-HEALTH



“  
**SERVICE AND RESPONSE  
TIME WERE ABOVE AND  
BEYOND WHAT WE  
WOULD EXPECT FROM  
ANY CONTRACTOR ”**

## PRIMARY FIELDS OF OPERATION

-  Power plants including black coal, brown coal and peat
-  Biomass power plants
-  Energy-from-waste power plants
-  Pulp and paper mills
-  Process Industry
-  Melting installations e.g. Zinc, Manganese and Cement kilns

## BENEFITS AND OUTCOMES

- » EXTENDED RUN CYCLES
- » REDUCED UNPROGRAMMED DOWNTIME
- » ENHANCED SAFETY
- » CLEANING OF FOULLED SUPERHEATERS, EVAPORATORS AND ECONOMISERS
- » REMOVAL OF CLINKER/ASH BUILD-UP
- » ONLINE CLEANING OF BLOCKED HOPPERS OR BRIDGES IN ESP'S, SILOS, ABSORBERS, TUNNELS, DUCTS ETC.
- » SAFETY CLEAN OF FURNACES AND EMPTY PASSES PRIOR TO A SHUTDOWN

# SOLUTIONS FOR YOUR PLANT



## SHOCKWAVE CLEANING IN INDUSTRIAL FACILITIES

Individual cleaning methods and solutions to address site-specific problems using highly qualified personnel, skilled in a wide range of techniques:

- » PATENTED LINEAR CLEANING
- » STANDARD STICK BLASTING
- » CO<sub>2</sub> – COMPRESSED GAS
- » HIGH DEFINITION HIGH TEMPERATURE CAMERA
- » REAL TIME MONITORING DASHBOARD

## PATENTED LINEAR CLEANING

- » Higher velocity shockwave for more effective clean
- » Improves energy efficiency from boiler operations
- » Reduces work health and safety risks by replacing existing or traditional manual cleaning operations with new technology
- » Removes fouling and waste build-up to improve process flow volumes

By correctly introducing the explosive into the affected area and detonating the charge in a controlled manner, contamination is safely and efficiently removed. This can be achieved while the facility continues to operate online.

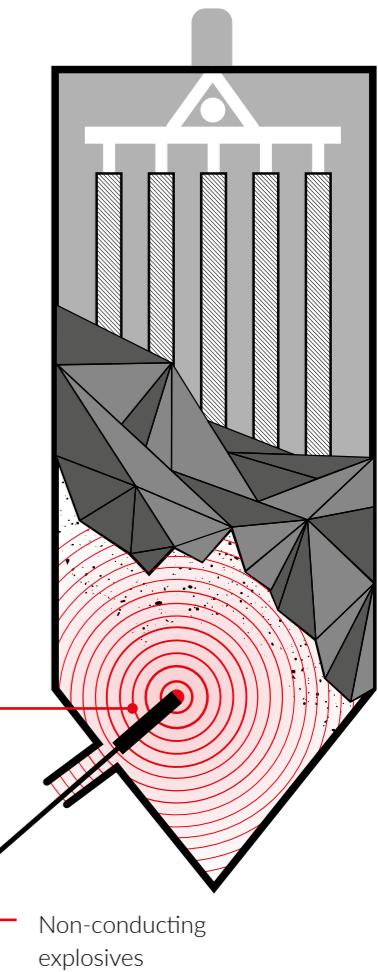
This method offers guaranteed results, unlike any other service available, largely because of the velocity of shockwaves administered.

The velocity of the shockwaves administered by this method sets us apart from the competition as our Patented Linear system produces a shockwave at a velocity of around 1000 - 8000 metres/second - greater than anything offered by our competitors.

Operating conditions encountered include dirty and difficult-to-access sites, possible extreme density of the contamination, and extremely high temperatures, which can be upwards of 1600°C.

OCT works online as shutting down the plant can lead to unnecessary thermal cycling of the plant. This can have a negative material and financial cost e.g. tiles and refractory thermal cycling, bag filter blinding, let alone the operational financial losses.

**Principal:**  
Online Cleaning of an  
ESP or Silo in duty





## STANDARD STICK BLASTING

OCT can undertake safety cleans as soon as the boiler is taken out of operation. This is to remove large slag deposits from the furnace; ensuring maintenance personnel are able to safely access the facility.

## HIGH DEFINITION HIGH TEMPERATURE CAMERA

At industrial sites where heat is generated and inspection of facilities by conventional means is not possible, OCT is able to offer options for visual inspection while the boiler / plant remain in operation.

Our High Definition camera can withstand temperatures up to 1200°C and can be used for inspecting plant equipment e.g. rapping and shower wash systems, furnace refractory and tiles, all while the plant remains in full operation.



## AVOID THE HEADACHE OF COSTLY SHUTDOWNS AND REPAIRS WITH HD CAMERA INSPECTIONS

Regular furnace inspections are essential for identifying issues and highlighting problems like refractory damage or missing tiles, which can lead to costly unplanned stoppages and repairs. The scope for inspection in power plants and industrial installations is often restricted due to limited access and visibility while plants are in full operation, however these limitations can be overcome using Online Cleaning Technologies' services.

Longer runtimes can lead to extra stress on the planet. Refractory damage in the furnace means corrosive flue gases can attack membrane walls, thin the boiler tubes and lead to catastrophic leaks which result in costly unplanned stoppages, potentially lasting for days while repairs are carried out.

But furnace inspections and careful monitoring is a proven way of identifying stressed areas so issues can be dealt with before they cause major and costly problems.

Online Cleaning's High Definition, High Temperature camera is like nothing else used in this industry.

The specialised camera is heat-resistant to temperatures up to 1,500°C and allows us to easily inspect and record every part

Missing Refactory Tile



of the installation while it is still online. It offers highly detailed imagery of the condition of refractory and tiles and allows us to assess furnace slagging prior to outages.

The camera can be used to visually inspect elements within the facility to ensure they are working correctly, can be used to visually demonstrate the effectiveness of OCT's cleaning solutions, and the HD Camera can also be used to inform preventative maintenance planning, as well as for inspections during longer running periods.

For our customers these inspections are an invaluable element acting as a preventative maintenance regime which helps to maintain plant efficiency and availability.

In addition to regular camera inspections, many of our customers benefit from our Online Real-Time Monitoring Dashboard to track and analyse plant performance in real time. As it is based online, the

dashboard can be accessed remotely to track and analyse general plant performance and allows those who have access to spot anomalies and potential issues before they cause serious problems. The tool can also be used by clients to monitor general performance on a regular basis.

The Monitoring Dashboard enables guaranteed, proactive maintenance and helps inform Online Cleaning and the client as to the best course of action regarding cleaning programs, while improving overall productivity and efficiency of the plant or facility.

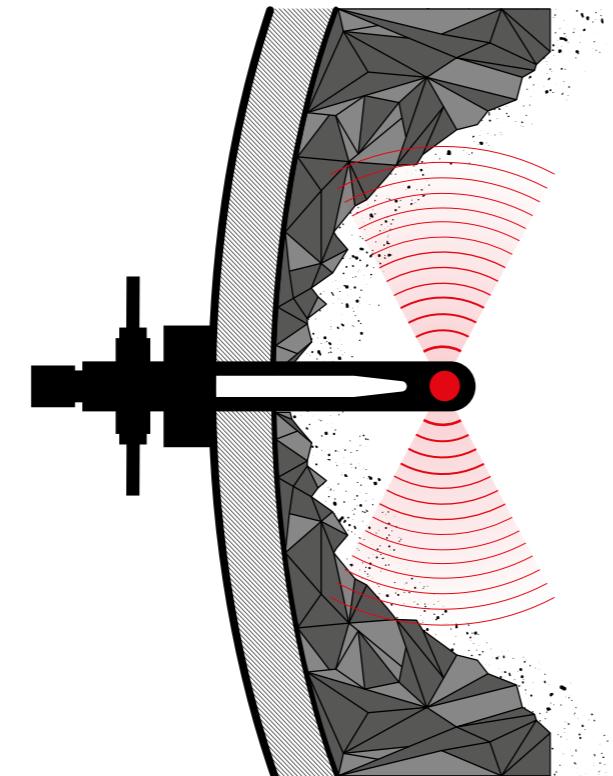
Using this tool, cleaning can be more effectively targeted and will be "condition based", meaning that we only clean when, and where, necessary resulting in reduced costs and increased profit.

For more information on how OCT can help you maintain optimal efficiency and avoid unplanned stops contact us today.



## CO<sub>2</sub> - COMPRESSED GAS METHOD

The compressed gas method ensures the removal of build-up and constricting deposits or clinkers, as well as the proactive reduction of accumulative waste. The explosive impact is highly precise, effective and reliable. The system uses compressed carbon dioxide (CO<sub>2</sub>), otherwise known as carbonic acid. The precision of this method allows OCT to measure the sensitivity of the plant and the composition of the build-up, ensuring no damage is caused to the installation.



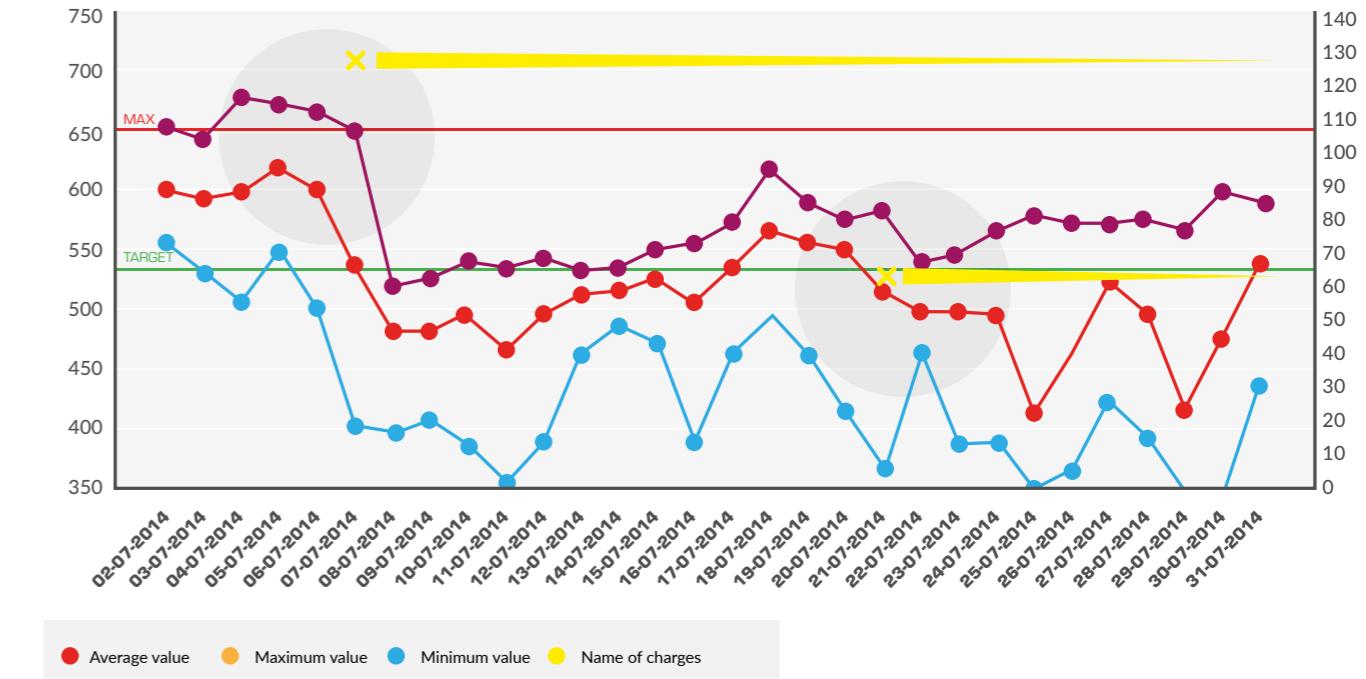
### Principal:

Compressed gas  
cleaning method



## REAL-TIME MONITORING DASHBOARD

OCT can also provide online monitoring and analyzing solutions within performance guaranteed contracts. These contracts can guarantee run times up to two years under certain guaranteed process parameters. With our Monitoring Dashboard OCT can offer "condition based" cleaning; only cleaning when necessary resulting in reduced client costs.





## INNOVATIVE ONLINE CLEANING OF INCINERATION PLANTS WITH LINEAR TECHNOLOGY

OCT's Patented WIFI-controlled Linear technology can clean all areas within your industrial facility. Boilers up to 20 metres wide can be effectively cleaned using up to 10 metre lances. A 360° rotating head on the end of the lance enables a precisely controlled clean. Using our High Definition, High Temperature camera, OCT records the whole process, including the results, and this offers dramatic 'before and after' images which clearly demonstrates the effectiveness of our methods.

OCT's 20 years of explosive expertise sets the standard!

Before Online Cleaning



After Online Cleaning



## ONLINE CLEANING OF PRECIPITATORS (ESP'S)

ESP blocked or short-circuited?  
Considering what action to take?

Plant shutdowns using traditional cleaning methods can incur significant costs both in terms of time and profitability.

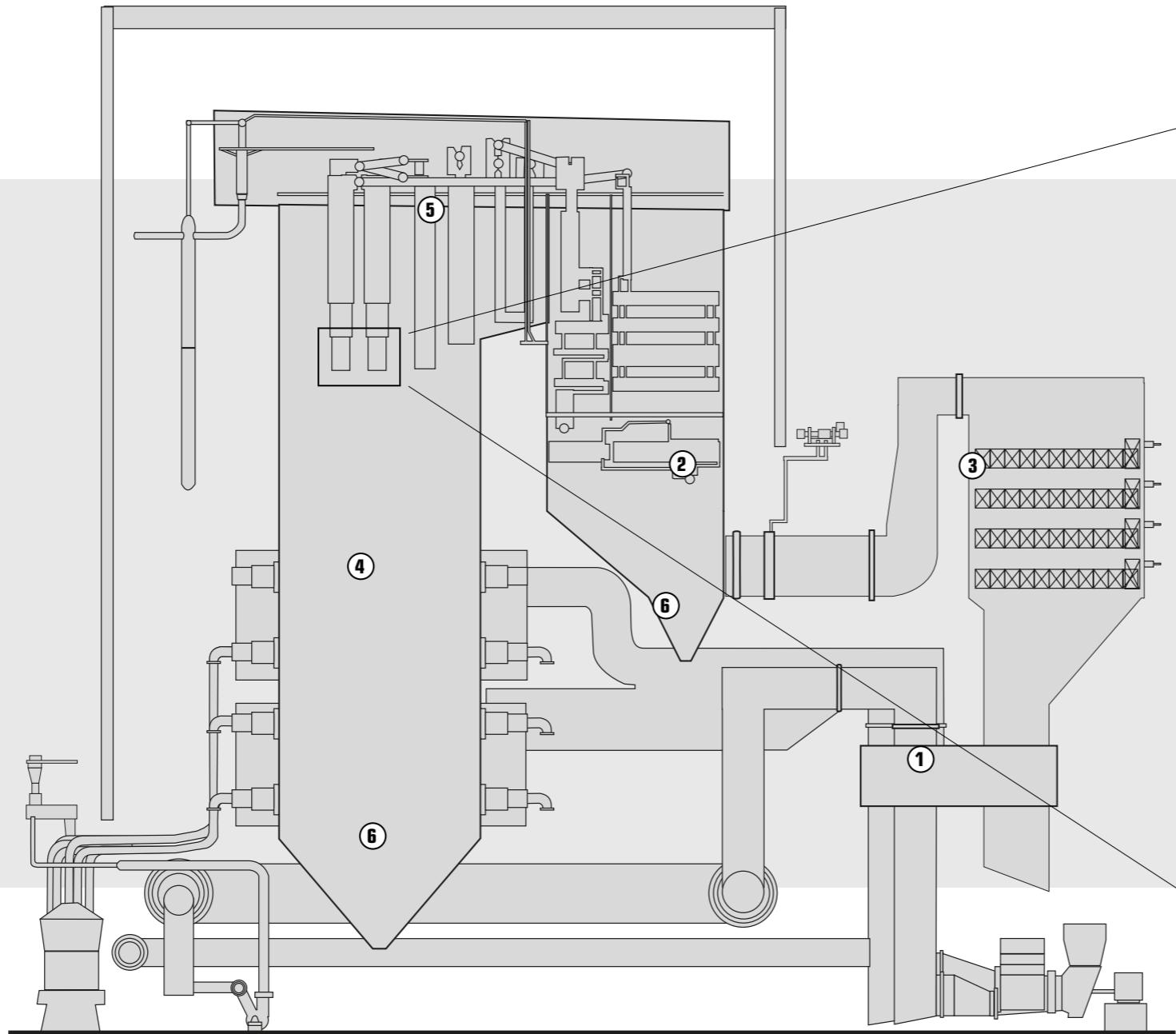
Online explosive cleaning is an EFFICIENT and INNOVATIVE alternative to maintain production online, and therefore increase overall turnover.

From a global perspective, it has been consistently demonstrated that facilities which utilise online explosive cleaning of ESP's on a continual basis, avoid the need for regular shutdowns. Hence it is evidence-based that explosive cleaning during full production is the most economical solution.

## COAL FIRED POWER STATION

53.5% of India's  
Capacity is Coal Fired

1. Airheater
2. Economizer
3. SCR
4. Furnace
5. Superheaters, Re-heater
6. Hoppers



## FURNACE CLEANING

Online Cleaning of the Platten Superheater  
(600 MW Boiler)



Before

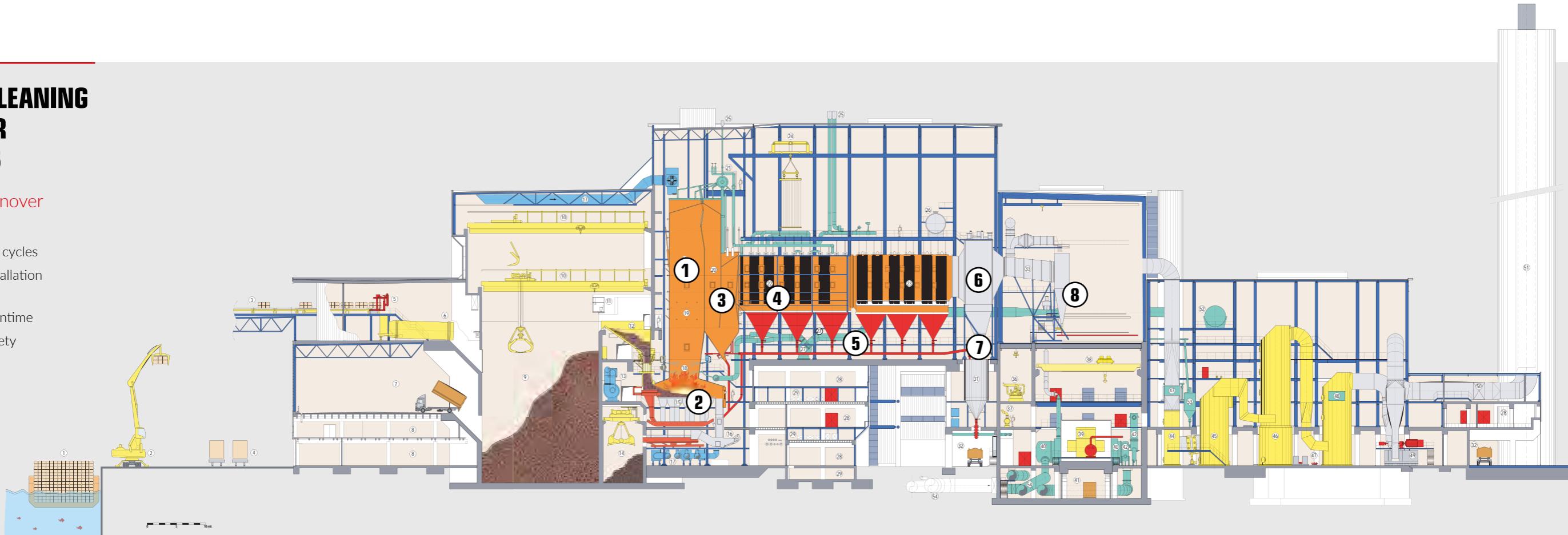


After

# ONLINE CLEANING OF POWER STATIONS

Increased turnover  
achieved via:

- » Extending run cycles
- » Increasing installation performance
- » Reducing downtime
- » Enhancing safety



**1** Online cleaning of slag build-up on walls, burners and panels. Offline safety cleaning of sintered slag

**2** Online unblocking of slag-discharge systems

**3** Online cleaning of membrane walls and panels. Unblocking of hoppers

**4** Online cleaning of convection bundles e.g. superheaters, evaporators and economisers. Also Offline as pre-outage clean

**5** Online and offline unblocking of all types of hoppers

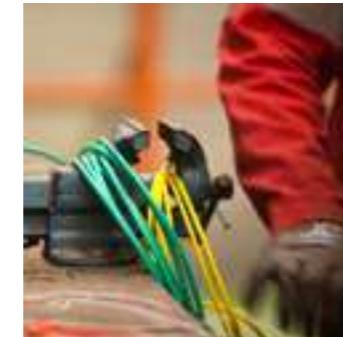
**6** Online and Offline Cleaning of Absorbers etc

**7** Online and Offline Unblocking of Hoppers in Baghouse Filters etc

**8** Online and Offline Cleaning of Electrical Precips, Cyclones, Catalysts etc

# THE BENEFITS OF ONLINE CLEANING

- » INCREASED OPERATIONAL AVAILABILITY >95%
- » GUARANTEEABLE EXTENDED RUNNING PERIODS OF UP TO TWO YEARS
- » REDUCTION IN UNPLANNED SHUTDOWNS
- » INCREASED REVENUE FROM PLANT THROUGHPUT/OUTPUT
- » OUTAGES OPTIMISED FROM PRE-SHUTDOWN CLEANS



## INCREASED TURNOVER THROUGH REDUCED DOWNTIME

Explosive cleaning is the innovative and efficient solution to increase plant availability and turnover.

OCT provides an individually tailored cleaning programme for each customer that is specifically adapted to the needs and requirements of management.

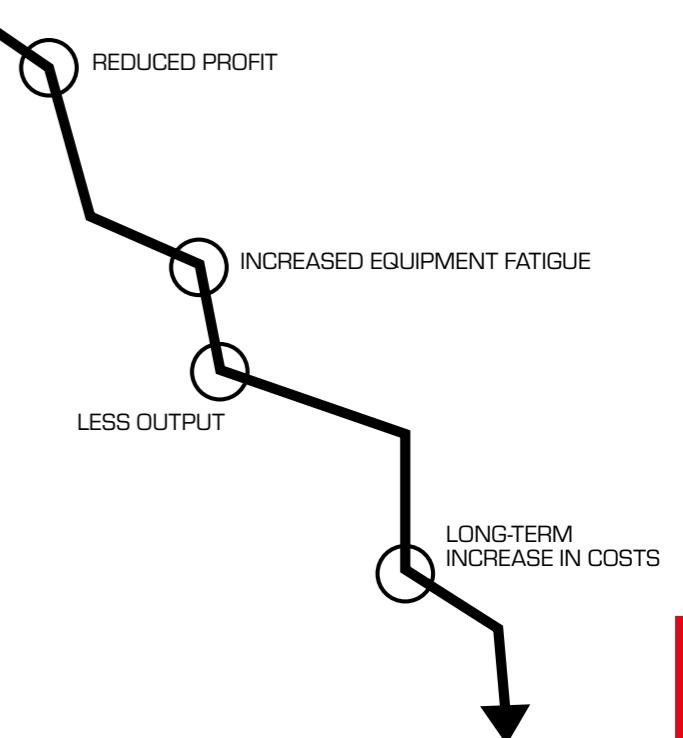
OCT's 24/7 stand-by service is available to assist in the event of unplanned or critical stop situations. This service is based on demand, expectation and mobilisation time frames.

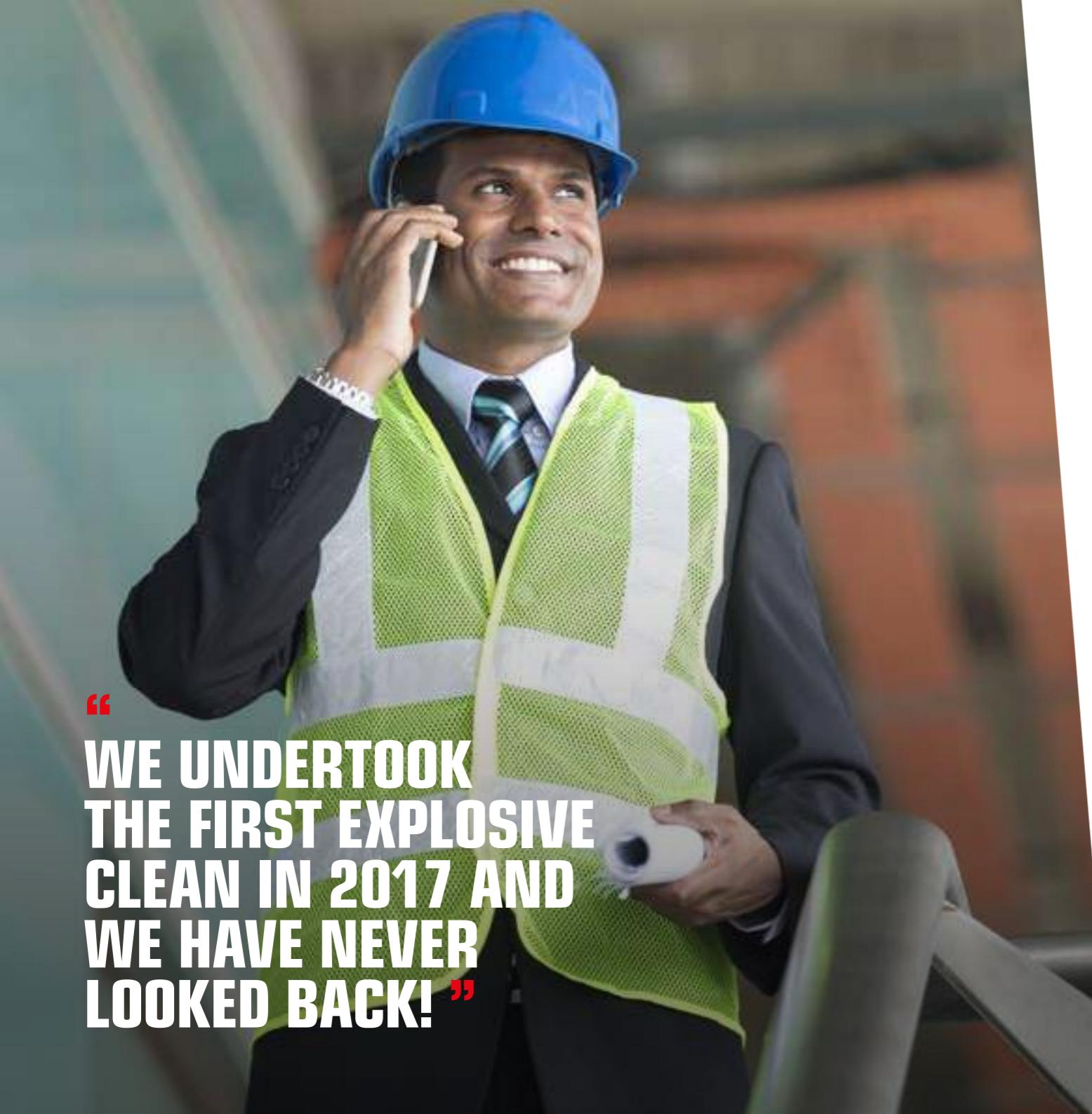
OCT's equipment and consumables can be housed on site, ready for use.

When OCT cleans a facility or plant prior to a shutdown, there is a reduction in offline manual cleaning, thus saving the customer time and money. In addition to the enhanced safety features of this cleaning method, the removal of ash during the cool-down phase is beneficial, as it is not treated as chemical or hazardous waste.

## PERFORMANCE OUTCOMES

OCT's online cleaning service is provided to more than 70% of all energy-from-waste and power plants in UK and Europe. Depending on the size of the plant, some of OCT customers achieve increased turnover ranging from €250,000 up to €180 million per annum. The majority of this additional turnover is a result of higher availability and increased performance while the installation is operational.





**“WE UNDERTOOK  
THE FIRST EXPLOSIVE  
CLEAN IN 2017 AND  
WE HAVE NEVER  
LOOKED BACK! ”**

## OCT WILL INCREASE EFFICIENCY THROUGH PLANT-OPTIMISATION

OCT promises FEWER SHUTDOWNS, IMPROVED AVAILABILITY AND ENHANCED SAFETY.

OCT is committed to the supply of a product/service, which in every way will satisfy our customer needs via:

- » Realistic cost and performance
- » Positive outcomes that fulfil expectations
- » A strong commitment to safety and security

## SAFETY

OCT performs safety cleans prior to the boiler shutdown, cleaning out dangerous clinker and build-up in order to minimise risk. In the past, the use of traditional cleaning methods has resulted in several accidents.

Using OCT for safety cleans, these traumatic incidents/accidents can be avoided and the area can be safely entered.

## ENVIRONMENT

Higher emissions and additional (indirect) costs primarily occur during plant shutdown / start up. Longer operational availability reduces the number of shutdowns and is therefore more beneficial from an environmental perspective.

## TECHNIQUE

Shutdowns lead to increased stress on the plant, primarily caused by rapidly decreasing temperatures – from 1000°C to more ambient conditions. This may result in thermo-shock, which can lead to negative financial and material effects, e.g. refractory damage within the furnace.

## EXPERIENCE AND KNOWLEDGE

Although the OCT was founded in 2002 our history in industrial cleaning, through our European partners, stretches back to the 1950s.

As modern power generation technologies emerged, including the energy-from-waste sector, a new speciality cleaning method needed to be developed.

Towards the end of the nineties, as a complement to the conventional industrial cleaning methods, detonative cleaning was added to our range of services.

In the years that followed the Global Group became the market leader in cleaning energy-from-waste boilers. Recommendations were given to clients regarding adapting the boilers for OCT as well as advice on optimising existing cleaning systems.

## CONTINUITY AND LONG-TERM VISION

The positive aspects of OCT's beginnings remain evident. For instance, personal contact is maintained and encouraged, staff turnover is low and the loyalty of, and to, customers remains high. Overall, mutual interests are of utmost importance and long-term benefits for customers are a high priority.

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## CUSTOMERS

Details for a contact person at a similar installation can be provided on request.



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## MANAGEMENT

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