# Conference :-
# Heat Rate Efficiency Summit 2023

## Topic :
## Cutting Your Downtime

JASMEET GANDHI & FRED WANSCHERS
OCT India

Council of Enviro Excellence

3RD HEAT RATE EFFICIENCY SUMMIT 2023


online cleaning

CUTTING YOUR DOWNTIME

Jasmeet Gandhi
Fred Wanschers
OCT India

# Online Cleaning: Presentation Outline

online cleaning

1. General Background
2. Company Movie
3. Technology
4. Case Study
5. Client

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# General Background

- More than 15 years operating in European market
- More than 25 years operating in the USA
- Market leader in Shockwave Cleaning (explosives)
- More then 300 Clients around the Globe

***Strong team of Energy experts and Explosives Engineers with multiple year experience. Supported by excellent admin support personnel***

Before an on-line cleaning

After an on-line cleaning

# Fields of Application

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Petro-chemical Industries

Bio-Energy Stations

Black & Brown Coal Power Stations

Peat Fired Power Stations

**Online camera surveillance**
**Process Analysis**
**Risk Management**

Zinc Factories

Waste to Energy Plants

Refineries

**On-line and Off-line Boiler Cleaning**

Process Industries

Melting Works

Pulp & Paper Mills

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Hazardous Waste Plants

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online cleaning

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Hazardous Waste Plants

# Fields of Service

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**On-line and Off-line Boiler Cleaning**

| Linear method | Stickblasting/ OCT Shockpower | CO2/Cardox |
|---|---|---|
| Superheaters<br>Evaporators<br>Economisers<br>Hoppers | Furnace<br>Silos<br>Precips<br>Hoppers | Furnaces<br>Hoppers<br>Scrubbers<br>etc |

**Increased Performance & Safety and minimize shutdown time.**

CUTTING YOUR DOWNTIME

# Online Cleaning: Presentation Outline

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2. **Company Movie**
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# Company Movie

# Online Cleaning: Presentation Outline

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# Technology

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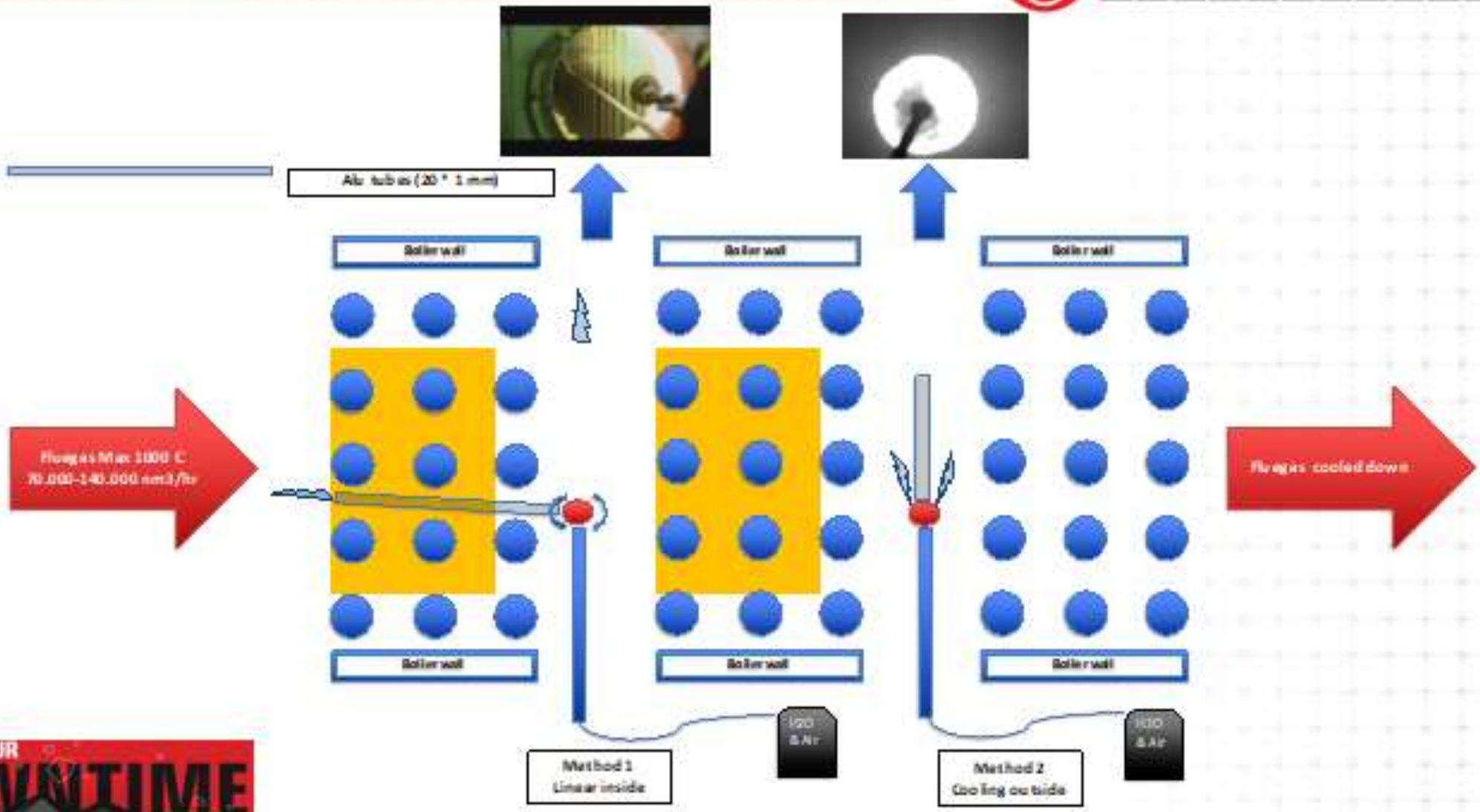


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# Technology

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**Our blasting and camera technology includes a manoeuvrable head to clean and view 360 within the installation**

Boiler width < 12 m → Manual system
Boiler width > 12 m → Semi Automatic

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# Technology

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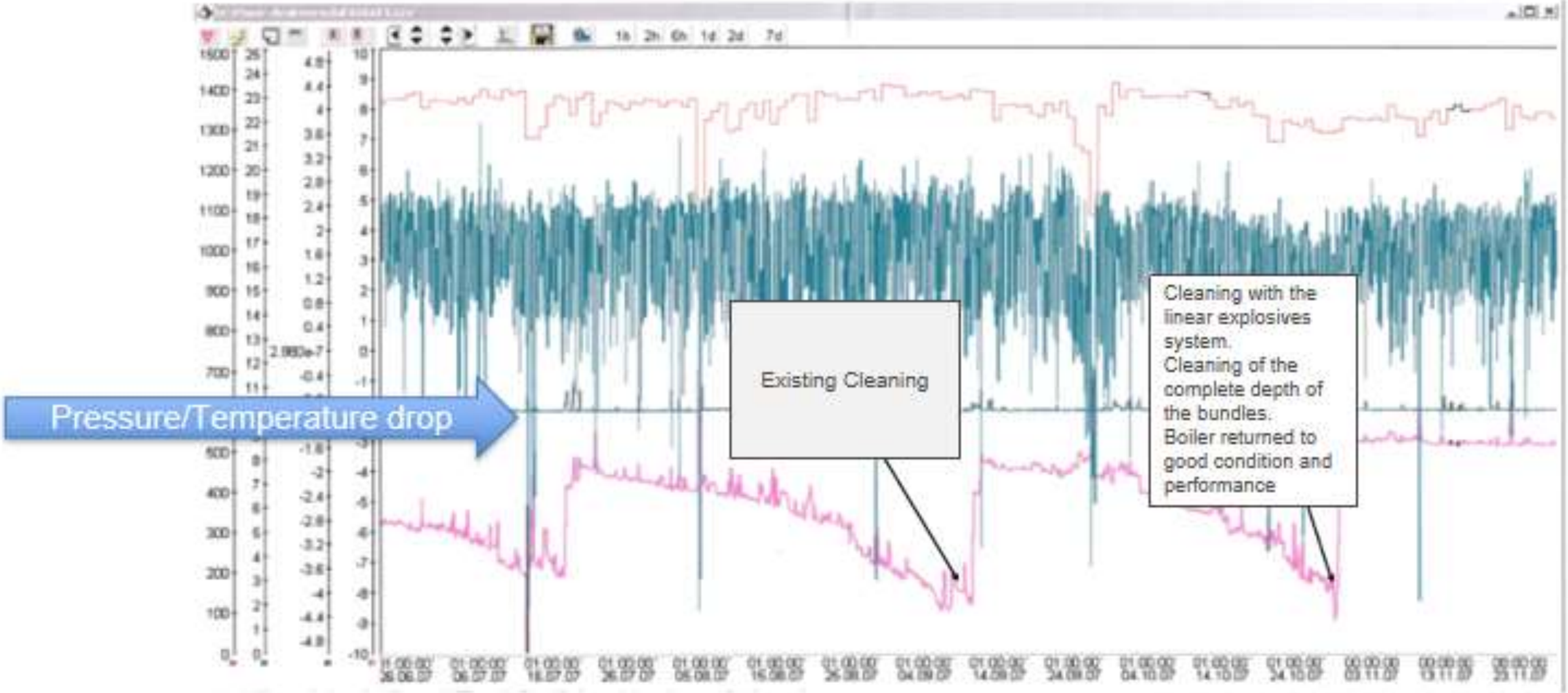

# Camera inspection

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# Technology

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## Manual System(5-6 m from one side)

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# Technology

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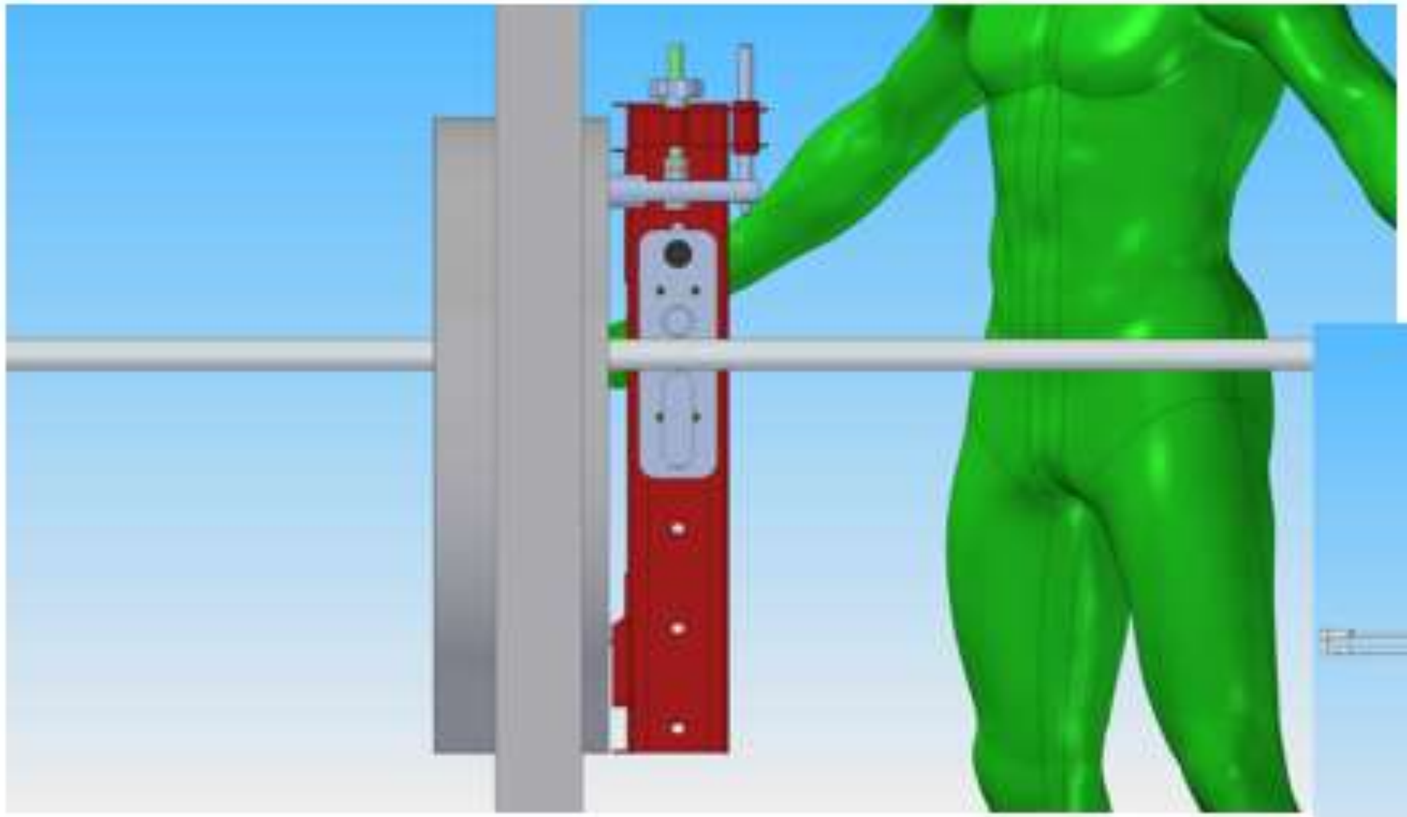
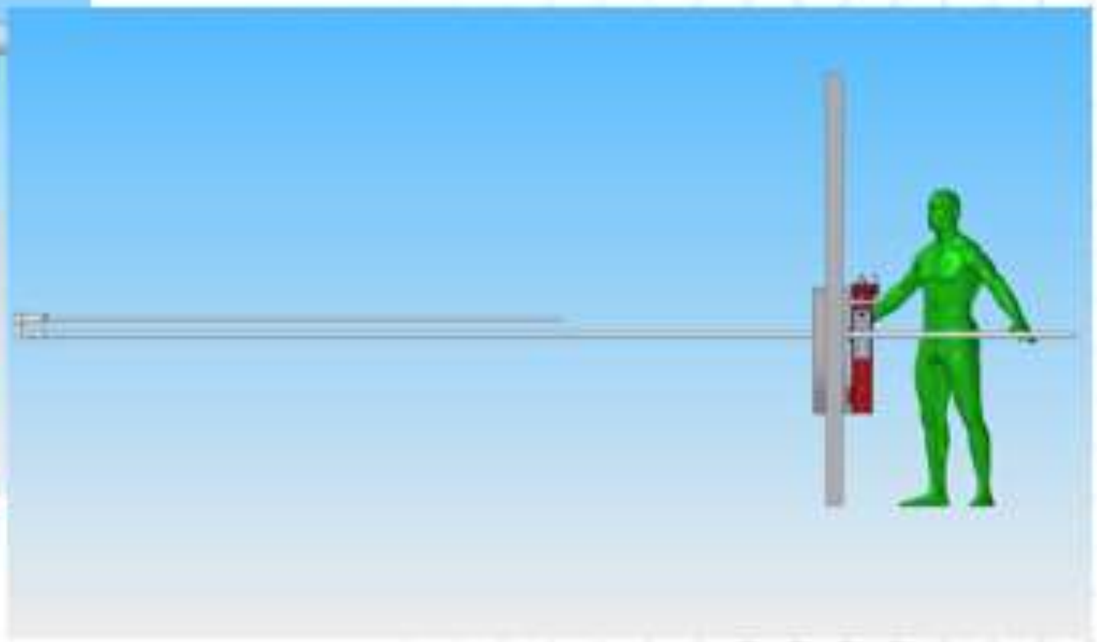
## Enhanced Manual System(7-8 m from one side)





# Technology > 12 m

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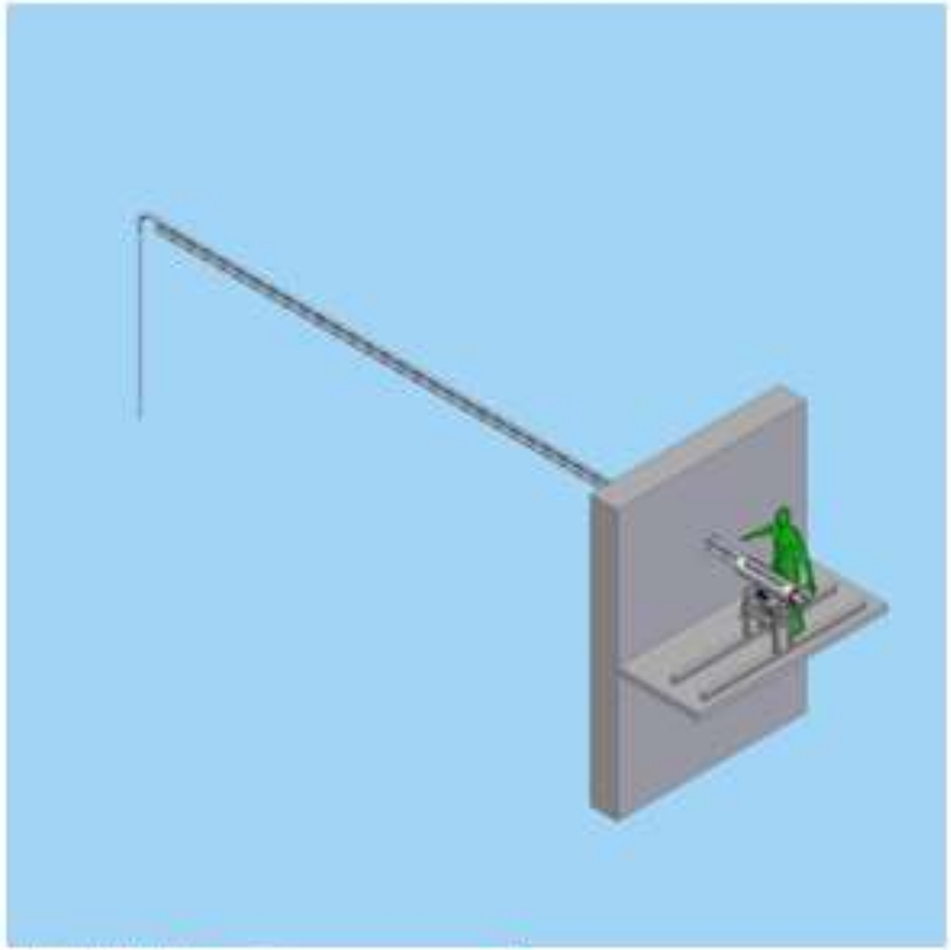

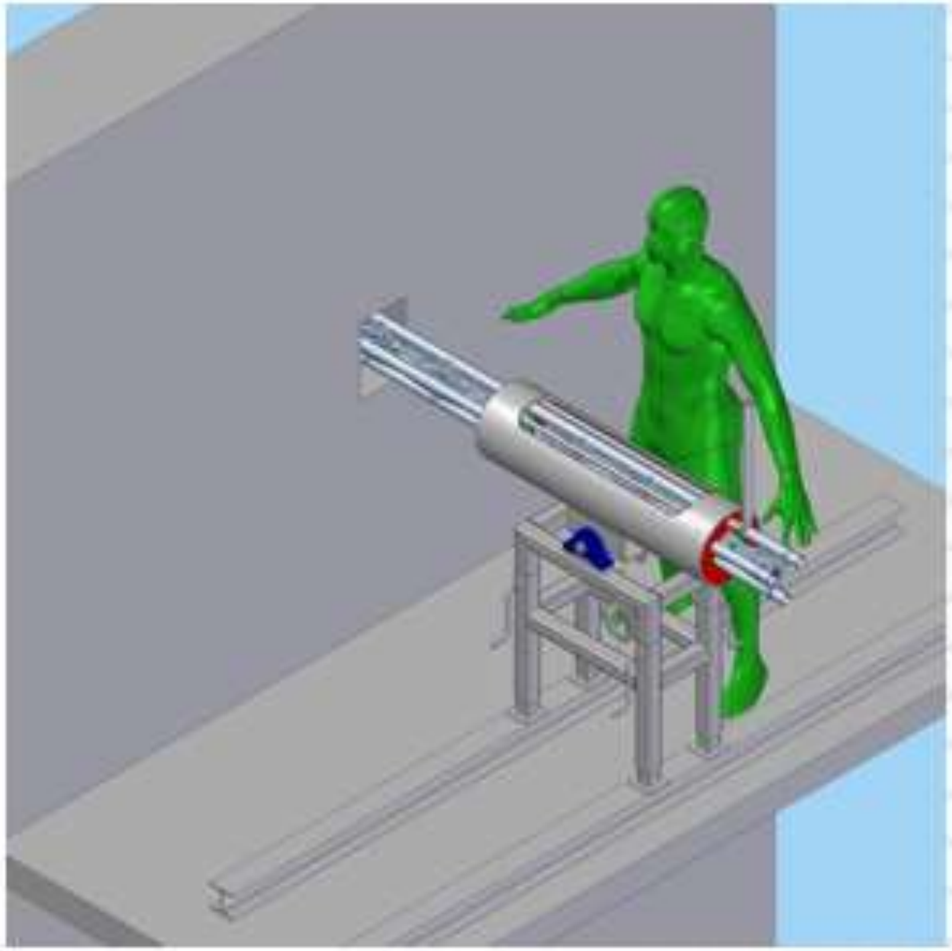

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# Technology > 12 m

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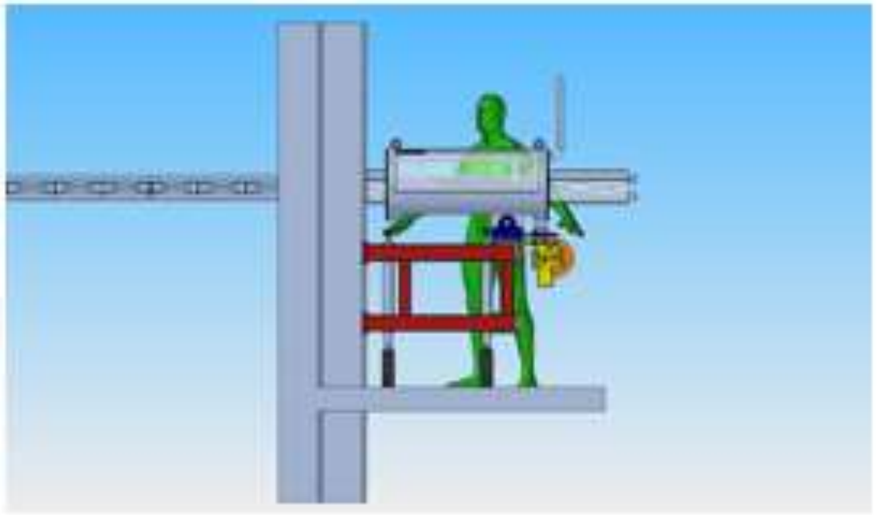

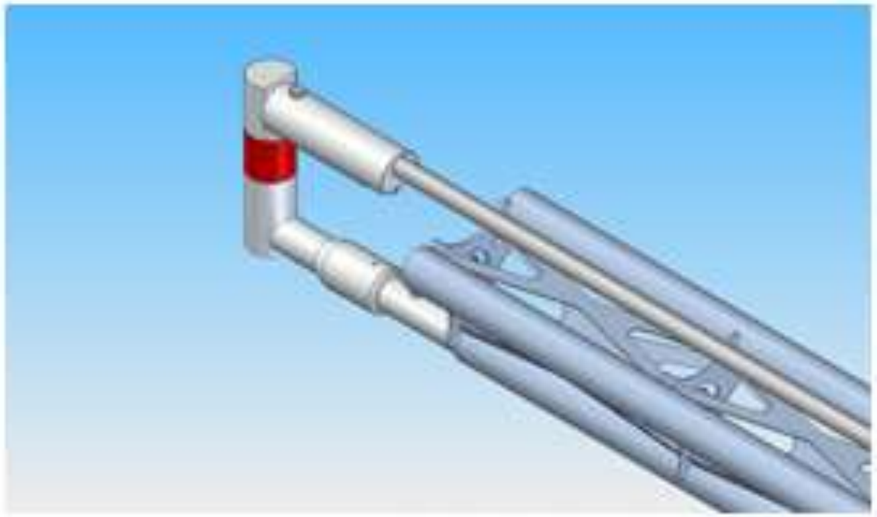

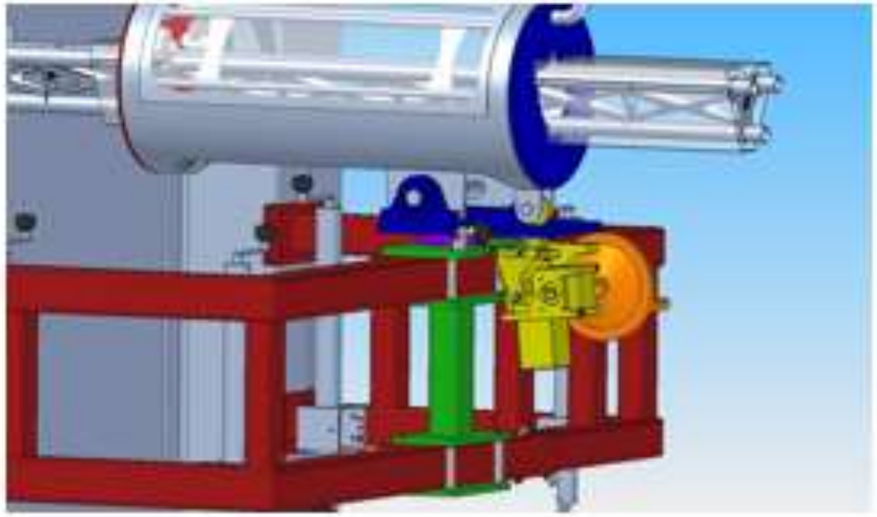

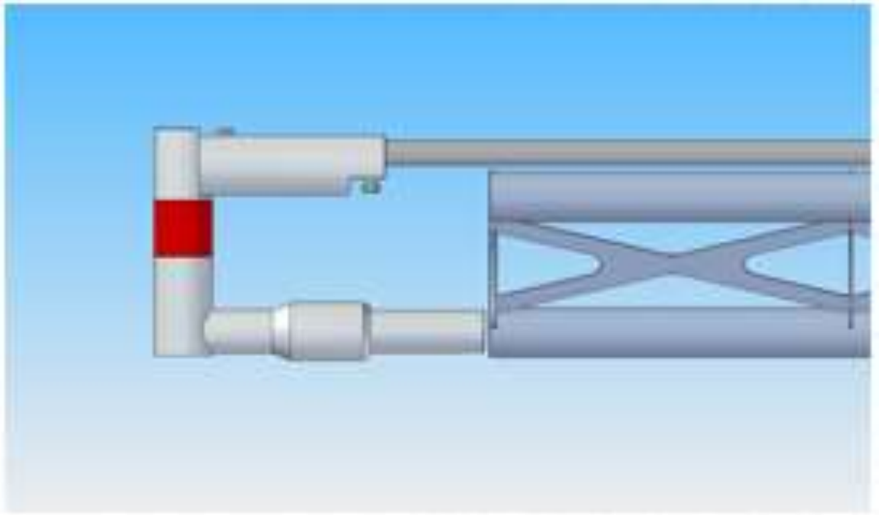

# Technology > 12 m

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# Equipment & Storage on-site.

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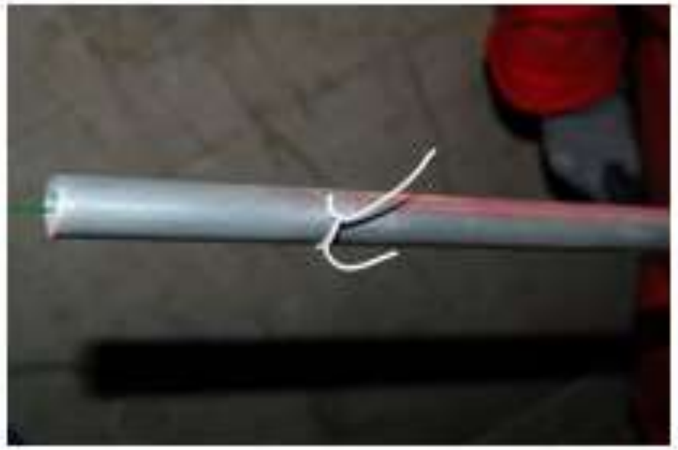

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# Online Cleaning: Presentation Outline

1. General Background
2. Company Movie
3. Technology
4. **Case Study**
5. Client

# Study 8 * 200MW

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## Installation Arrangement:

- 8 Boilers 200 MW each
- Brown/lignite coal
- Running time max 90 days
- Loosing output after 4-5 weeks

| period | MW |
|---|---|
| 1 | 220 |
| 2 | 220 |
| 3 | 217 |
| 4 | 215 |
| 5 | 212 |
| 6 | 210 |

## Problem areas:

- 1st path, Platen SH(Heat loss)
- 2nd path, Superheater(Heat loss)
- ECO, dP increasing
- ESP, Inlet, gas dividing plates blocking

CUTTING YOUR DOWNTIME

# Study 8 * 200MW

online cleaning

Online Cleaning
**Your partner in explosive cleaning**

| | Unit | Manual | Online |
|---|---|---|---|
| Output | MWyr | 15.113.920 | 15.417.600 |
| Scheduled stops per line | x/yr | 3,9 | 3,0 |
| E output/hr | MWh | 215,7 | 220,0 |
| Amount of boilers | | 8 | 8 |
| Unreliability | % | 6% | 5% |
| $/MW | 50 | $ 687.509,893 | $ 714.572,188 |
| Extra Income per year | | | $ 27.062.295 |
| Duration of scheduled stop | days | 3 | 3 |
| Cost Man Clean | $ 180.000,00 | $ 5.618.836 | $ 4.238.073 |
| interval between man cleaning | week | 13,3 | 17,7 |
| nec.cleaning days man cleaning | days | 1 | 1 |
| Cost Online Cleaning | $ 11.500 | | $ 3.827.208 |
| interval between online cleaning | weeks | | 5 |
| nec. Online cleaning days | days | | 4 |
| Initial costs | $/yr | $ - | $ 500.000,00 |
| Wacc | | 9,5% | |

| System | Manual | Online |
|---|---|---|
| Higher performance | 0,0% | 2,0% |

**Financial evaluation: Fred Wanschers**

**Start situation:** 3,9 times manual <> 3 times manual(with Online Cleaning)
# Online Cleaning every 5 weeks 4 days cleaning. Results in 3 times manual
# Increase of efficiency 3,8 %
# Due to an better and stable performance the reliability will increase with 1%(assumption based on worldwide experience)

**To be filled in**

**$ 150.918.603**

| Year | wacc | Manual Cash in | Cash Out | Netto CF | Online Cash in | Cash Out | Netto CF | |
|---|---|---|---|---|---|---|---|---|
| 0 | 1 | | | € 0 | | $ 500.000,00 | € 500.000- | € 500.000- |
| 1 | 0,9132 | $ 687.509.893 | $ 5.618.836 | $ 622.731.559 | $ 714.572.188 | $ 8.565.273 | $ 644.755.174 | $ 21.523.615 |
| 2 | 0,8340 | $ 687.509.893 | $ 5.618.836 | $ 568.704.6[illegible] | $ 714.572.188 | $ 8.565.273 | $ 588.817.510 | $ 41.836.505 |
| 3 | 0,7617 | $ 687.509.893 | $ 5.618.836 | $ 519.[illegible] | $ 714.572.188 | $ 8.565.273 | $ 537.732.886 | $ 60.004.441 |
| 4 | 0,6956 | $ 687.509.893 | $ 5.618.836 | $ [illegible]890 | $ 714.572.188 | $ 8.565.273 | $ 491.080.261 | $ 76.778.812 |
| 5 | 0,6352 | $ 687.509.893 | $ 5.618.836 | $ 433.156.064 | $ 714.572.188 | $ 8.565.273 | $ 448.475.124 | $ 92.097.873 |
| 6 | 0,5801 | $ 687.509.893 | $ 5.618.836 | $ 395.576.314 | $ 714.572.188 | $ 8.565.273 | $ 409.566.324 | $ 106.087.882 |
| 7 | 0,5298 | $ 687.509.893 | $ 5.618.836 | $ 361.256.908 | $ 714.572.188 | $ 8.565.273 | $ 374.033.172 | $ 118.864.147 |
| 8 | 0,4838 | $ 687.509.893 | $ 5.618.836 | $ 329.914.985 | $ 714.572.188 | $ 8.565.273 | $ 341.582.806 | $ 130.531.968 |
| 9 | 0,4418 | $ 687.509.893 | $ 5.618.836 | $ 301.292.223 | $ 714.572.188 | $ 8.565.273 | $ 311.947.768 | $ 141.187.512 |
| 10 | 0,4035 | $ [illegible] | $ 5.618.836 | $ 275.152.715 | $ 714.572.188 | $ 8.565.273 | $ 284.883.806 | $ 150.918.603 |
| **Total CF** | | | **$ 56.188.364** | **$ 4.281.456.229** | **$ 7.145.721.880** | **$ 86.152.727** | **$ 4.432.374.832** | |
| **Difference in Cont. Cash Flow** | **$ 150.918.603** | | | | | | | |

# Study 8 * 200MW

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Cleaning Scope:

- 1st path > 20-30 Shockwaves
- 2nd path > 40-50 Shockwaves
- ECO > 10 Shockwaves
- ESP > 8 Shockwaves (Non- conductive technology)

Cleaning interval every 4 weeks 1,5 Day per boiler.

## Results:

1. Runtime > 150 days
2. Boiler output constant 200 MW

# Case Study: Clinker Blockage

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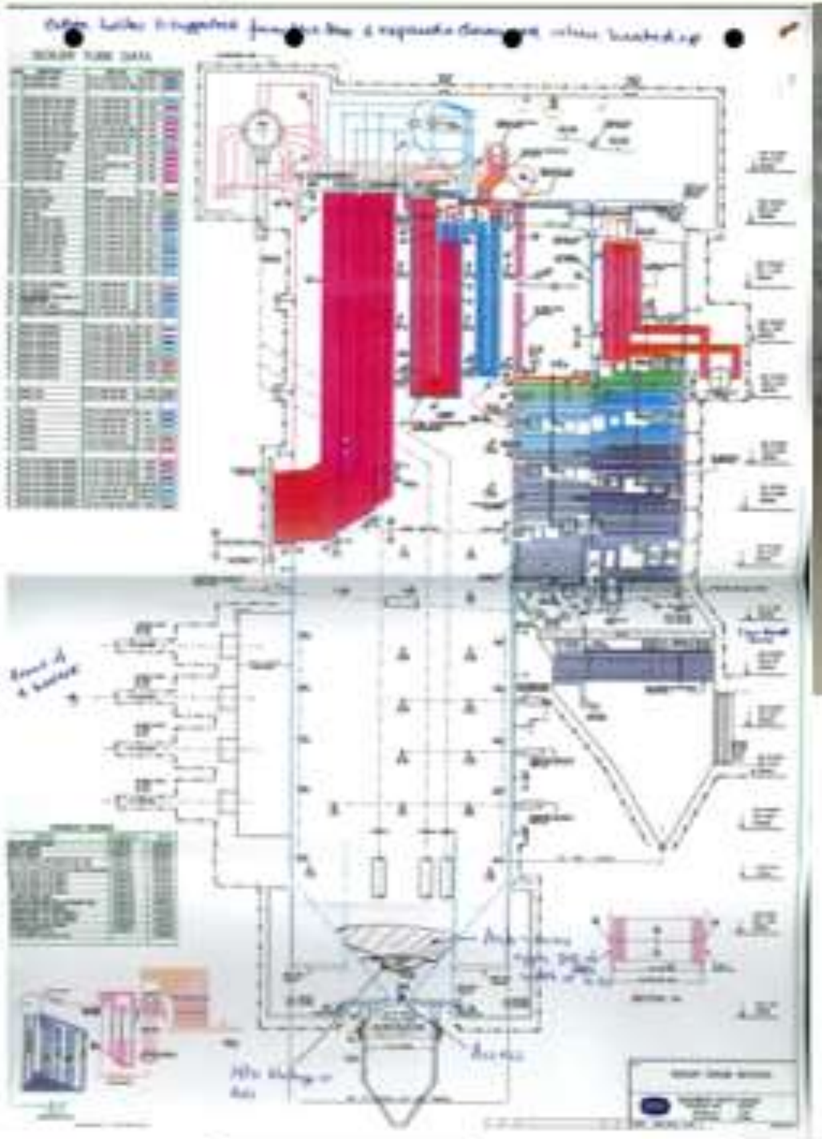

Blockage and "Clinker" trophy at Dora Creek. NSW

# ESP(Precips) Hoppers.

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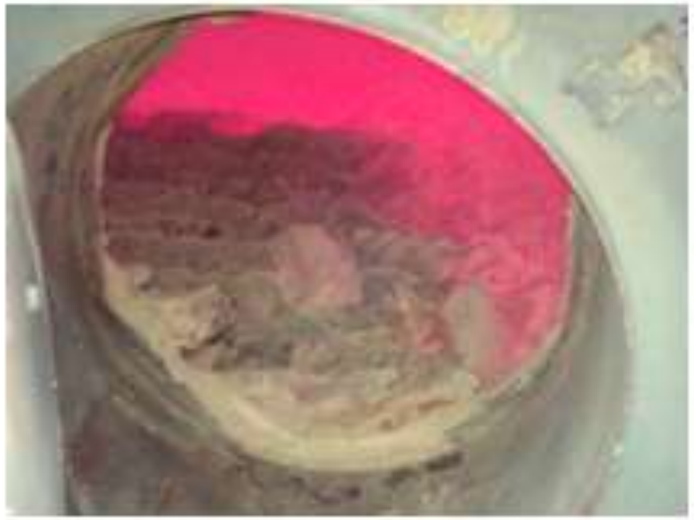
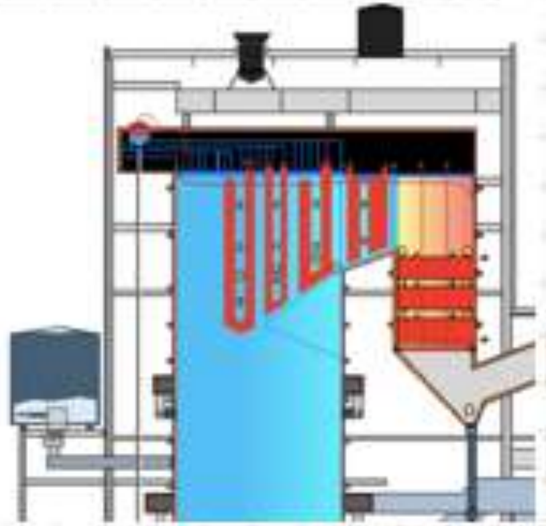
17 of 25 ESP hoppers blocked after startup

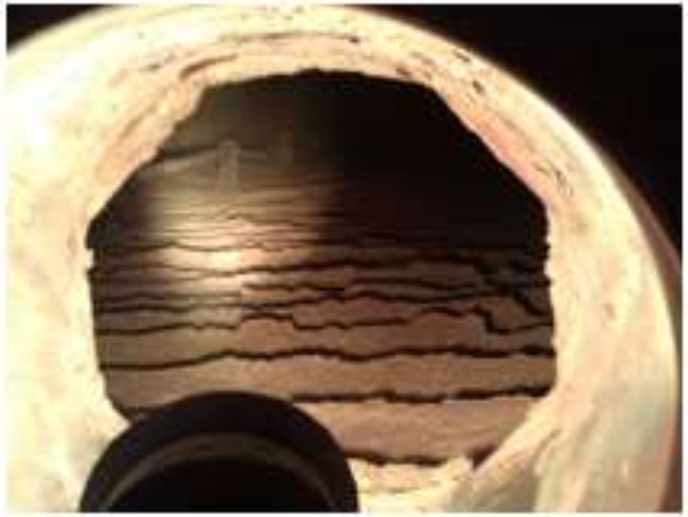
600 MW Coal

# Coal Case Study (sootblower failure)

online cleaning







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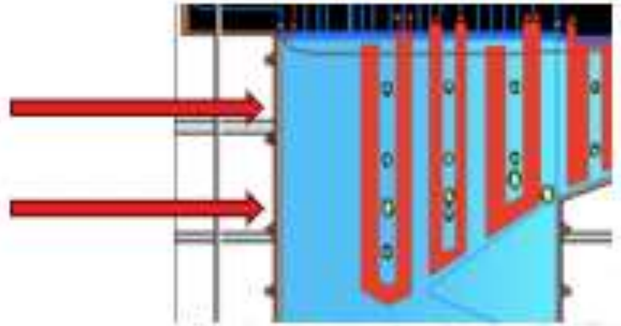
## 660 MW 100% converted Coal > Biomass

## SH Platten Online Cleaning



CUTTING YOUR DOWNTIME

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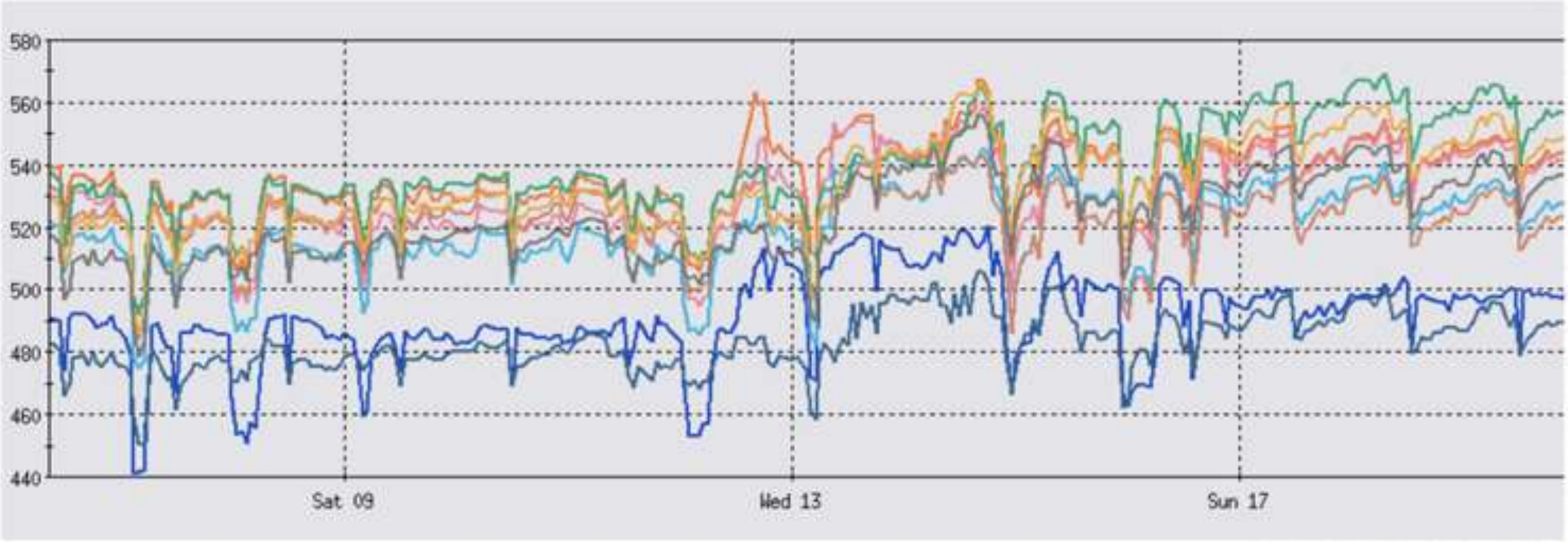

# Safety Cleaning: prior to a Shut Down.

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# Safety Cleaning: Burner Eye Brows

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# Online Cleaning: Presentation Outline

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## Current Clients

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### Europe

- RWE
- Vattenfall
- EON/Uniper
- Veolia
- Drax
- Sita/Suez
- Electrabel
- Nyrstar
- GDF Suez
- Engie
- EPR
- Viridor
- UPM
- Etc

### Australia

- Eraring, Dora Creek, NSW
- Nyrstar Hobart, TAS
- BHP
- South32 Temco, Bell Bay, Tas
- Visy Pulp&Paper Mill, Tumut NSW
- Engie, Hazelwood Power Station, Morwell Vic
- Nyrstar Port Pirie
- Australian Paper
- Etc.

More information about other countries like US, South Africa etc. but also installation type and contact details is available on request.

CUTTING YOUR DOWNTIME

## Online Cleaning Options

- **Preventive Options:**
  - Improve performance, more stable operation
  - Minimise shutdowns due to fouling.
  - Lower erosion/corrosion rates
  - Reduced downtime during shutdowns (scheduled & unscheduled)

- **Corrective Options:**
  - Safety Cleaning. Cleaning for safe entry. Faster Access > Faster Repair
  - Hopper blockages
  - Othes issues incl. Baghouse, ESP, Screens, Silos etc.

- **Pre shutdown options**(during cool down time):
  - Improved Safety
  - Reduced shutdown time.

I thank you for your attention and hospitality.

Fred Wanschers
Director
Online Cleaning India

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# Coal(Black, Brown & Peat) Case Study

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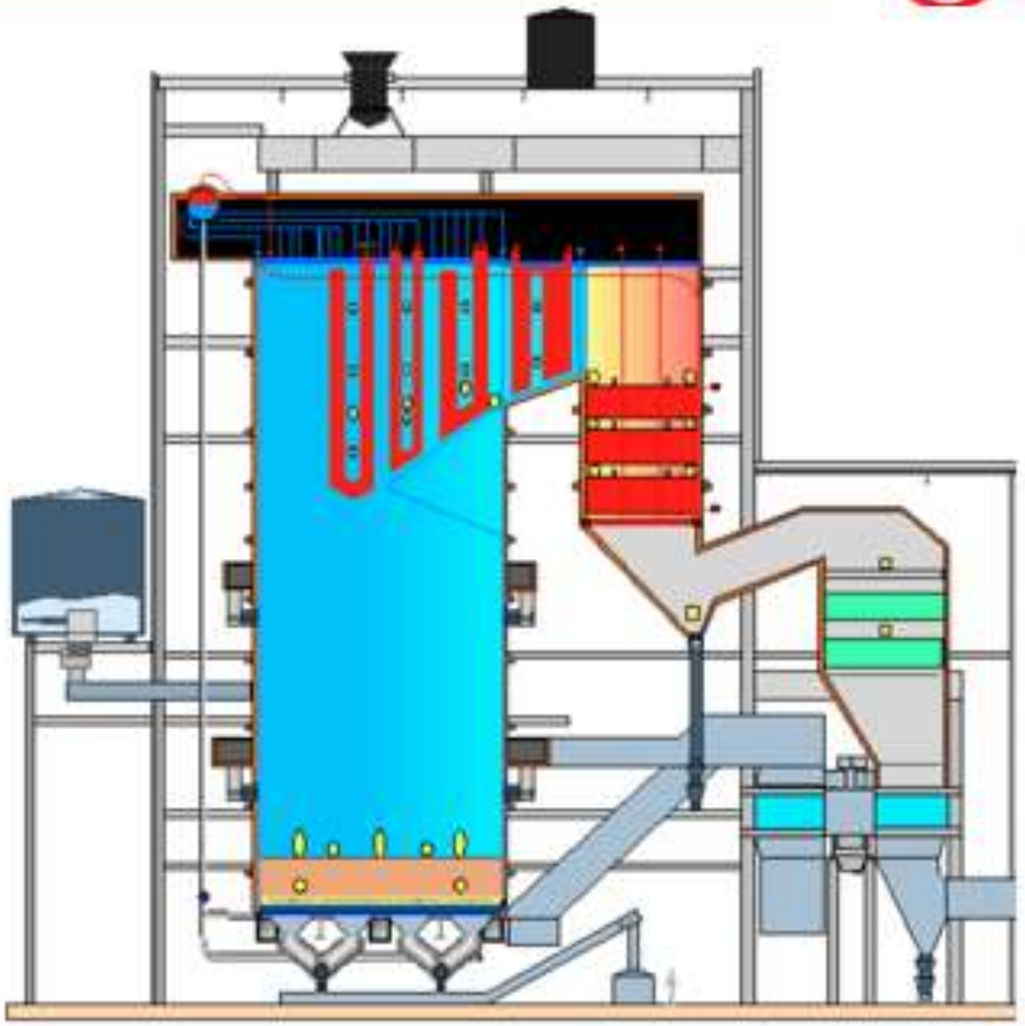

# Other Technologies

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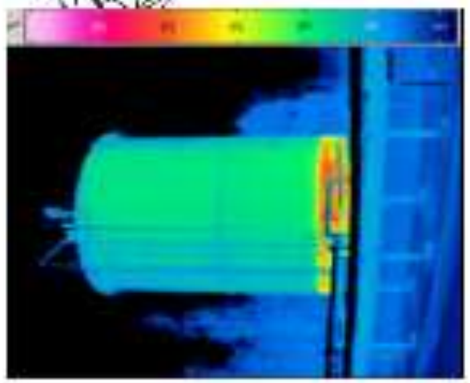
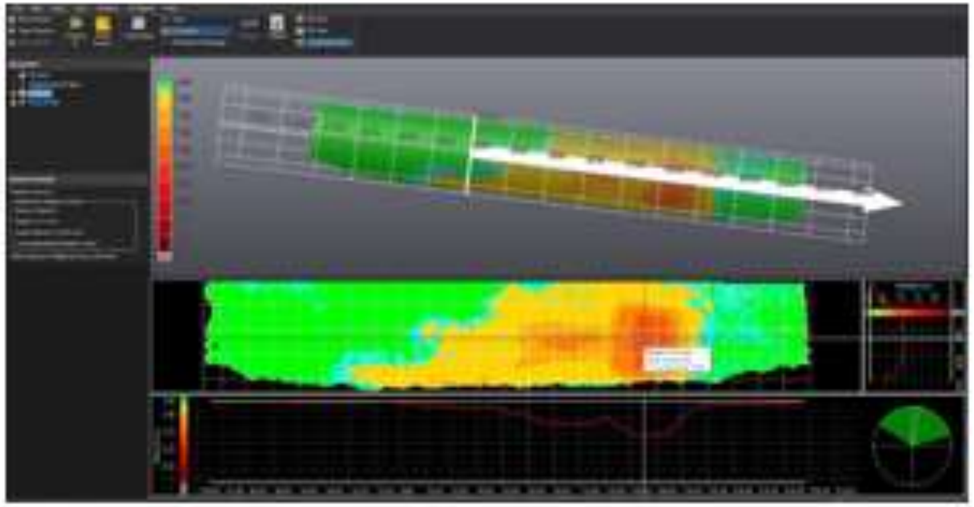
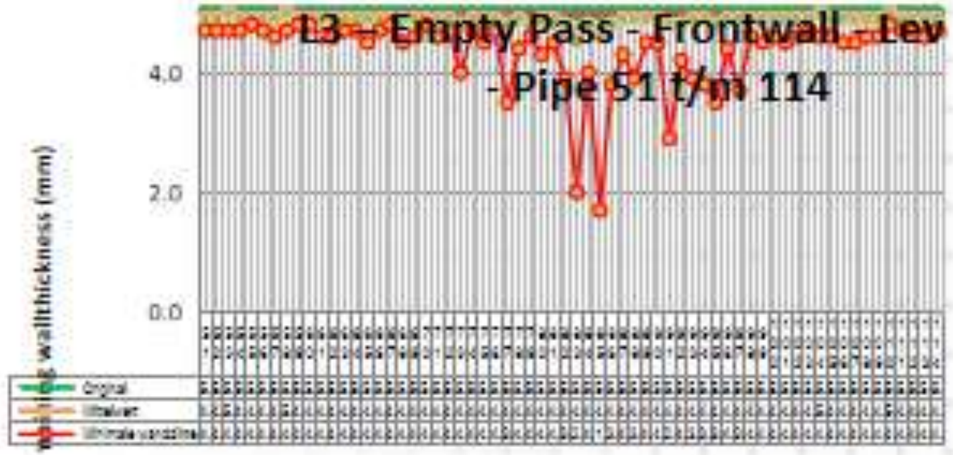


3D INDUSTRIAL






# Scanner

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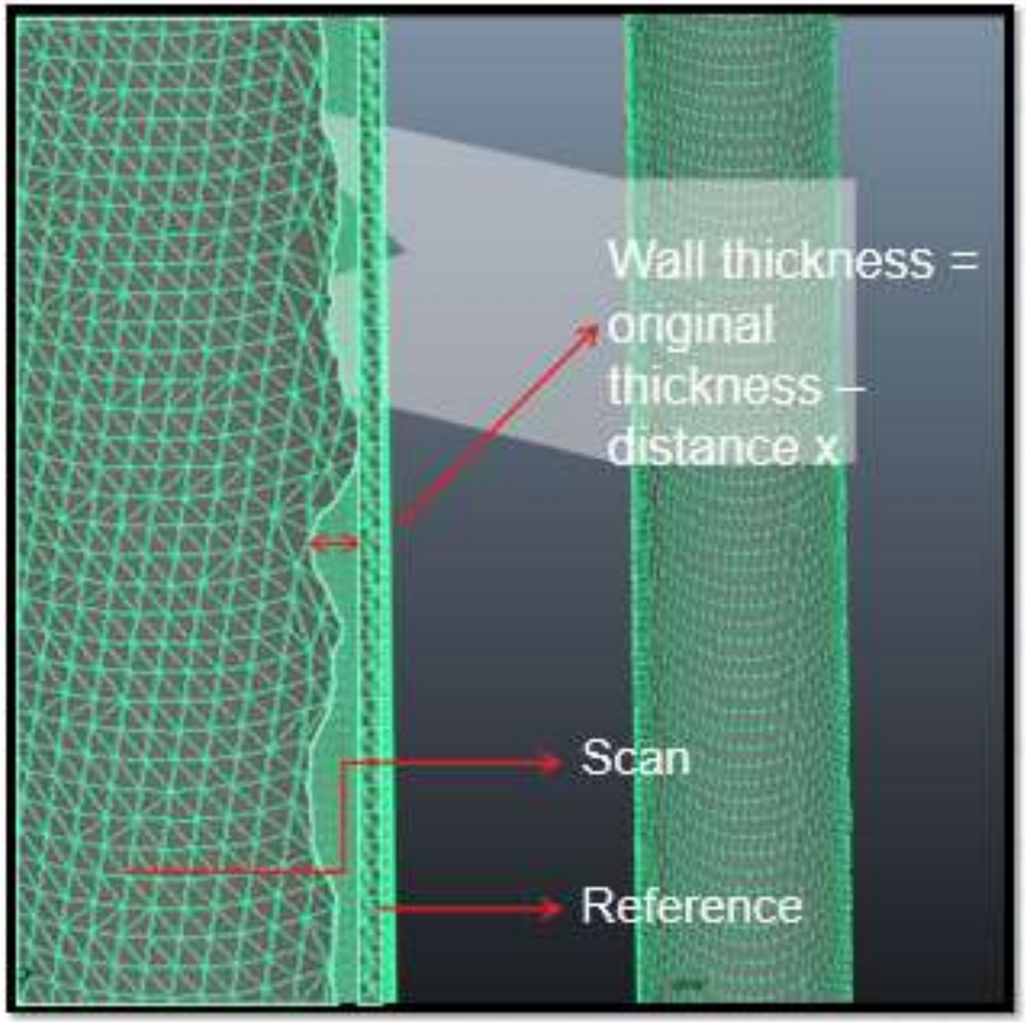
## Technical Data

- **Messrate** 550.000 Measurments/s
- **Accuracy:** 0,1 mm
- **Resolution:** 0,1 mm
- **Distance to object:** 400 mm
- **Scan-area:** 380 x 380 mm

# The 3D WearScan concept

- Scanning of a pipe
- Next step compare the scan with a virtual copy of the original pipe
- At the end calculation of the remaining wall-thickness



# Equipment & Storage on-site.

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Thanking You
on Behalf of!
cee
Council of Enviro Excellence