



**DOWNTIME MATTERS
REDUCE IT WITH
ONLINE CLEANING**



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OCT India

Online Cleaning: Presentation Outline



1 **General Background**

2 Company Movie

3 Technology

4 Case Study

5 Client

CUTTING YOUR
DOWNTIME

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 than 300 Clients around the Globe

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

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Before an on-line cleaning



After an on-line cleaning

Fields of Application



Petro-chemical Industries

Bio-Energy Stations

Black & Brown Coal
Power Stations

Peat Fired
Power Stations

**Online camera surveillance
Process Analysis
Risk Management**

Waste to Energy Plants

Zinc Factories

Refineries

Process Industries

Melting Works

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

Pulp & Paper Mills

Hazardous Waste Plants

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Fields of Service



On-line and Off-line Boiler Cleaning

Linear method

Superheaters
Evaporators
Economisers
Hoppers

Stickblasting/ OCT Shockpower

Furnace
Silos
Precips
Hoppers

CO2/Cardox

Furnaces
Hoppers
Scrubbers
etc

Increased Performance & Safety and minimize shutdown time.

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Company Movie



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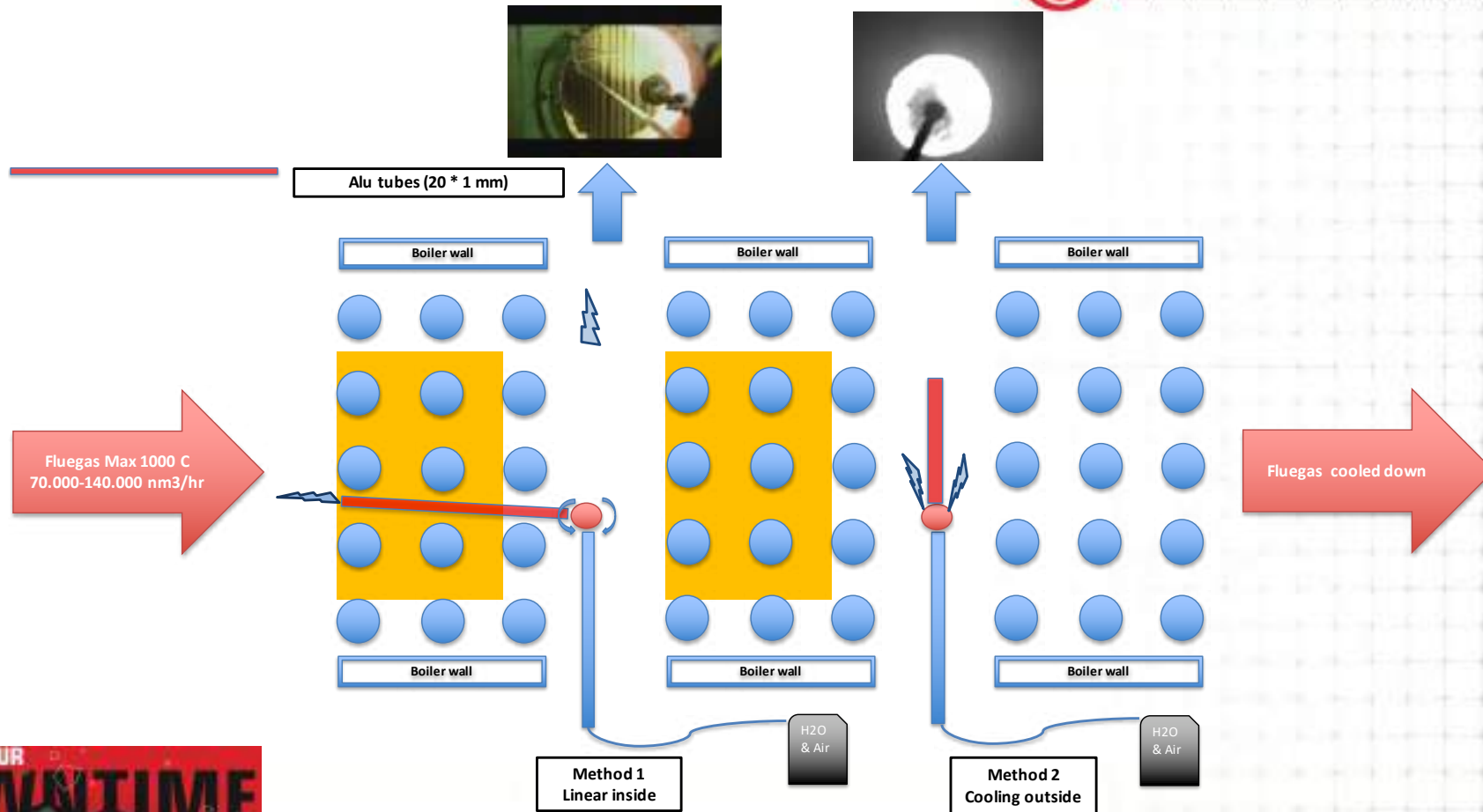
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Technology



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Technology



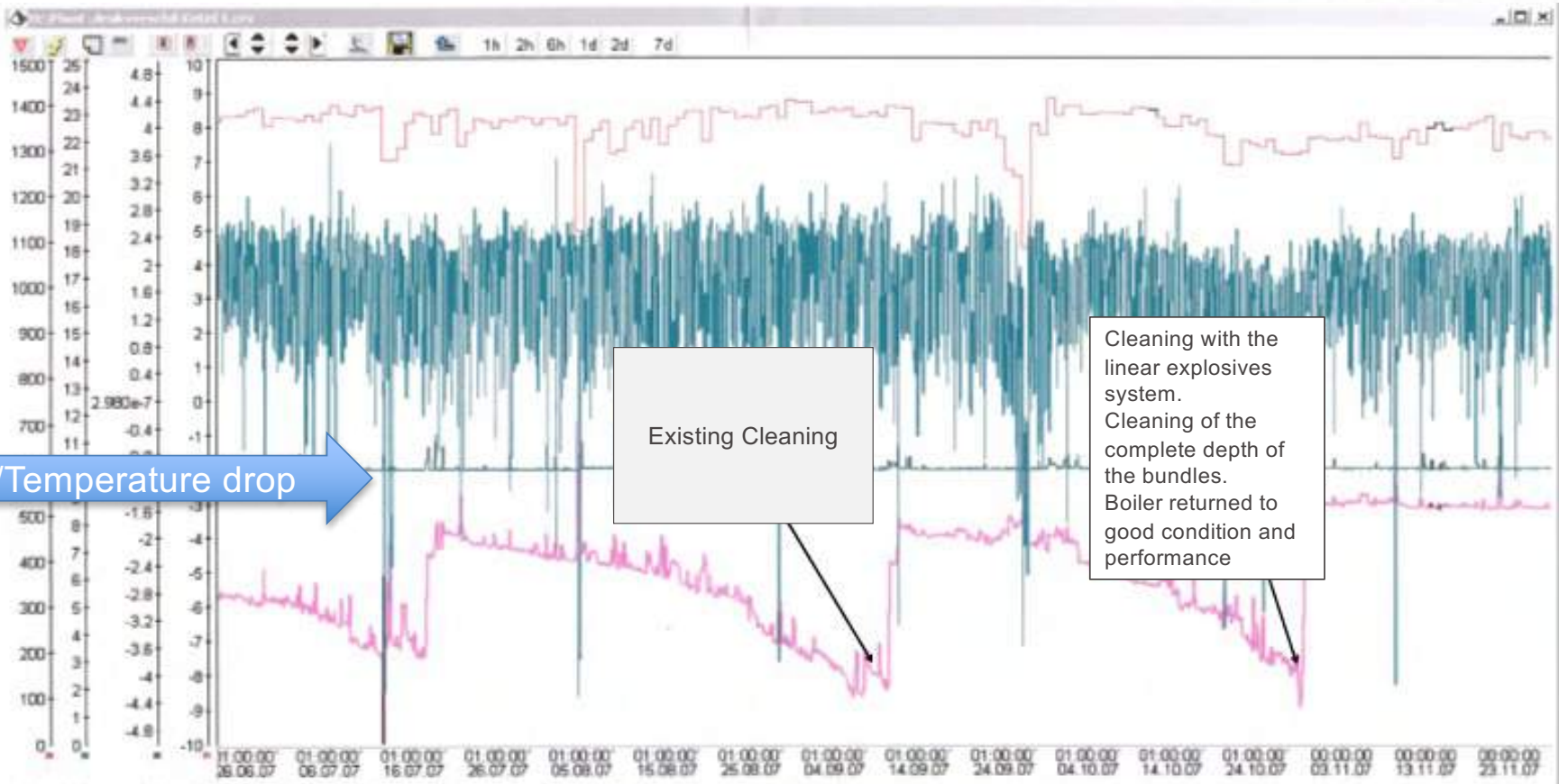
Our blasting and camera technology includes a manoeuvrable head to clean and view 360 within the installation

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



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Technology

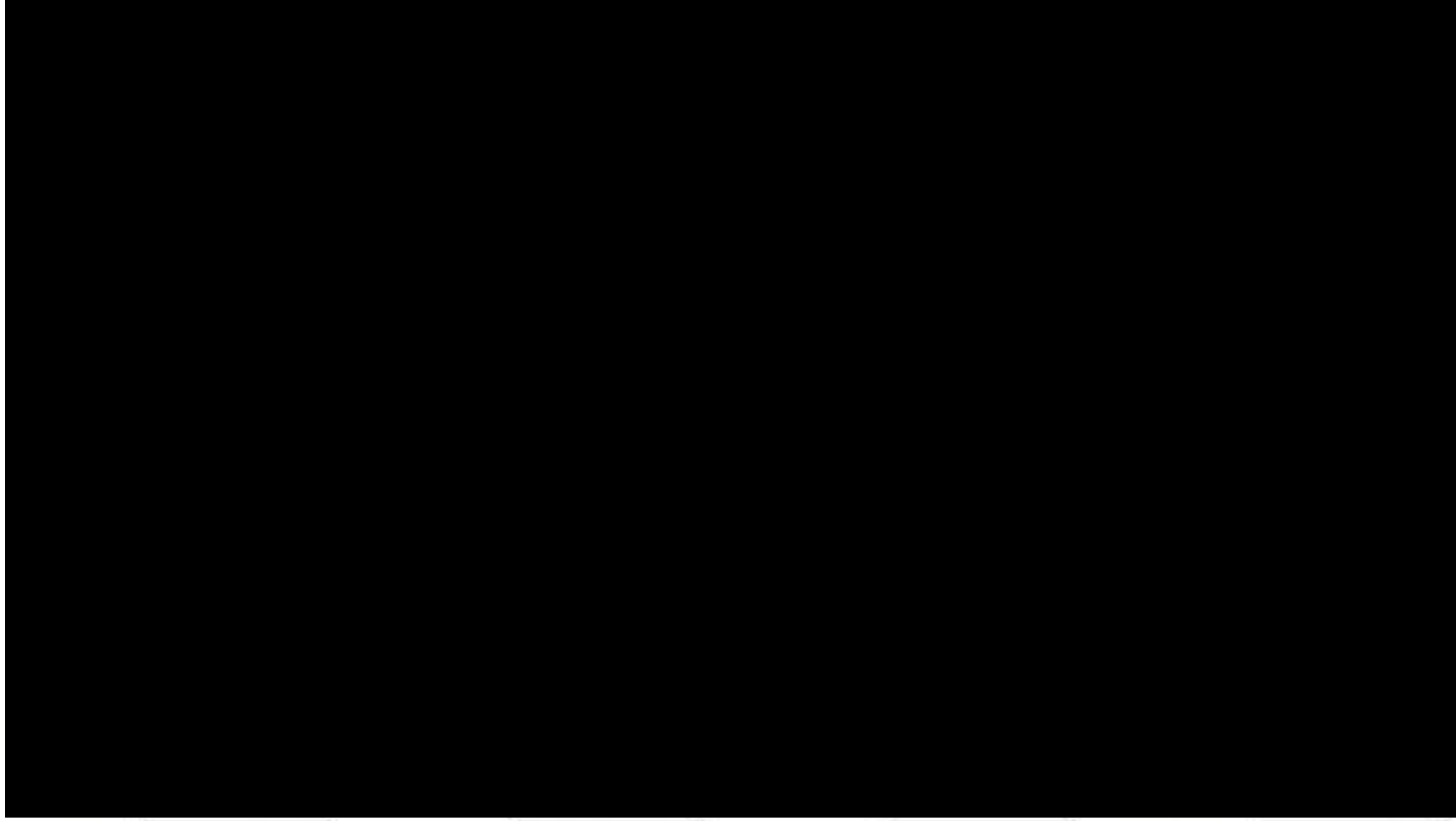


Pressure/Temperature drop

Existing Cleaning

Cleaning with the linear explosives system.
Cleaning of the complete depth of the bundles.
Boiler returned to good condition and performance

Camera inspection



Camera inspection



Technology



Manual System(5-6 m from one side)



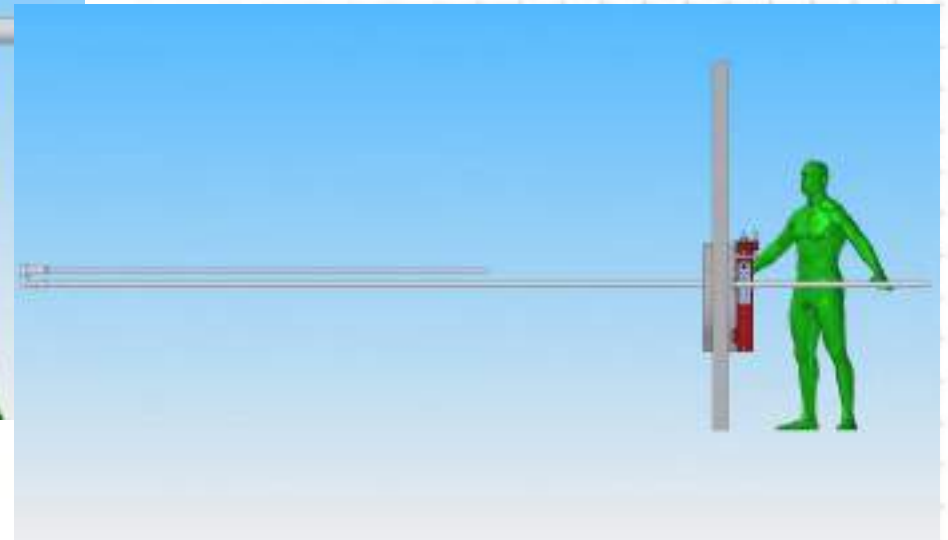
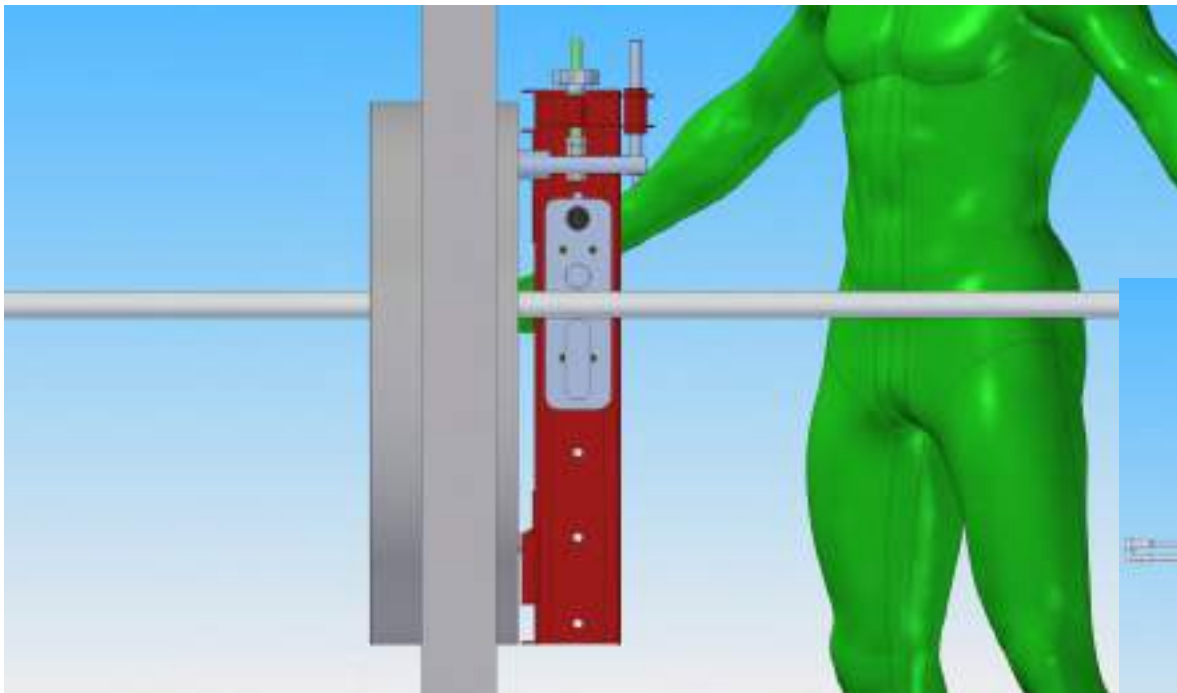
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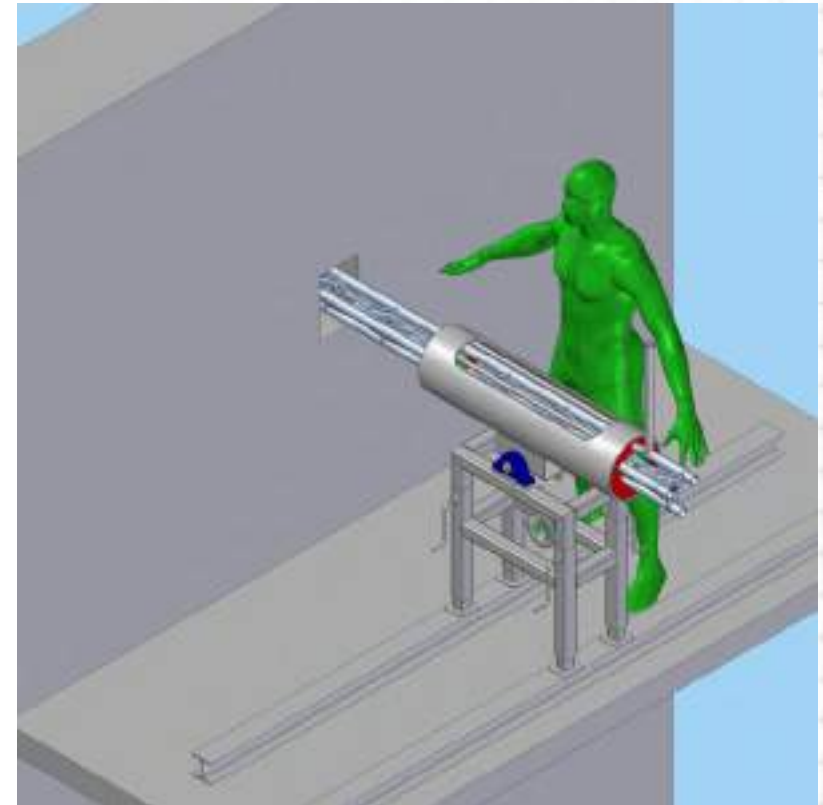
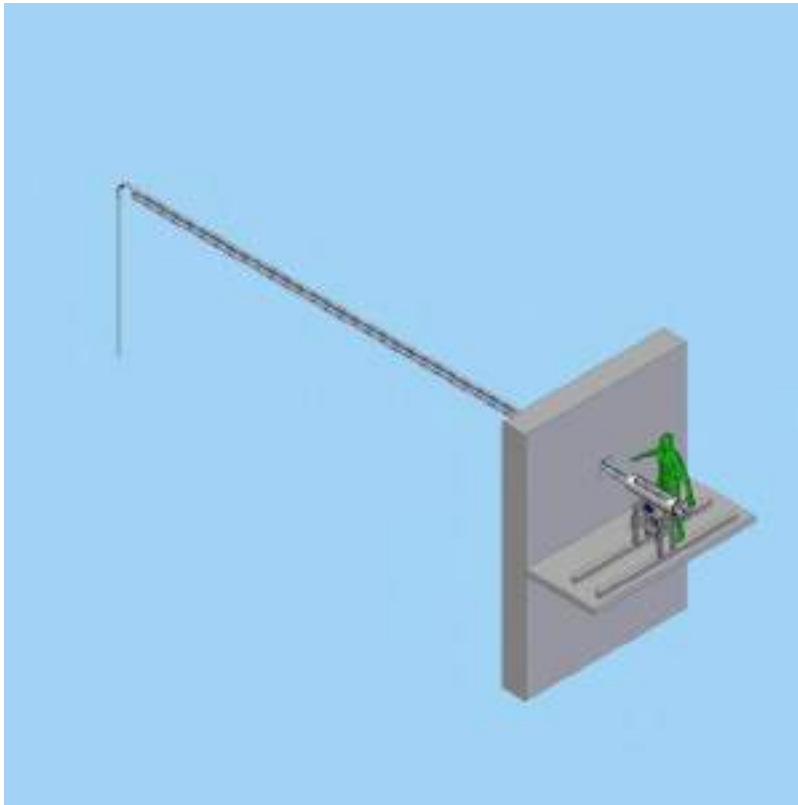
Technology



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

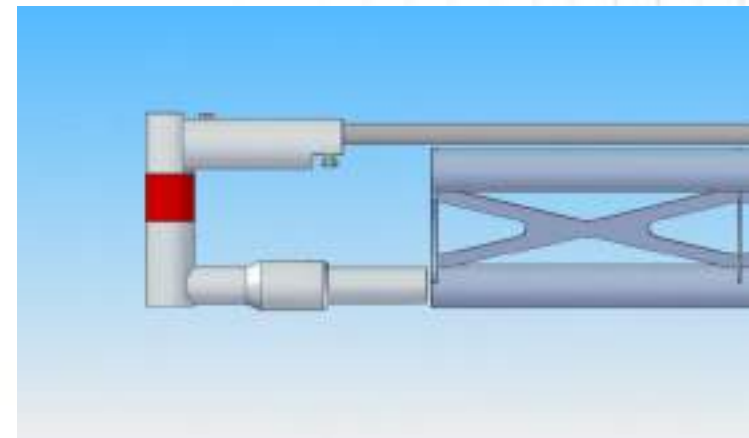
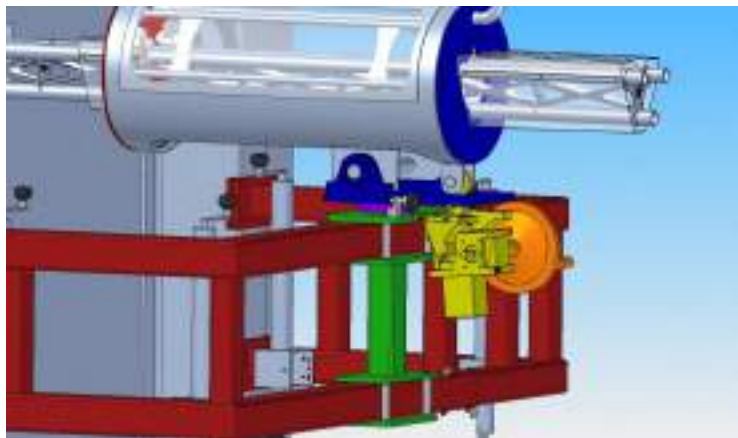
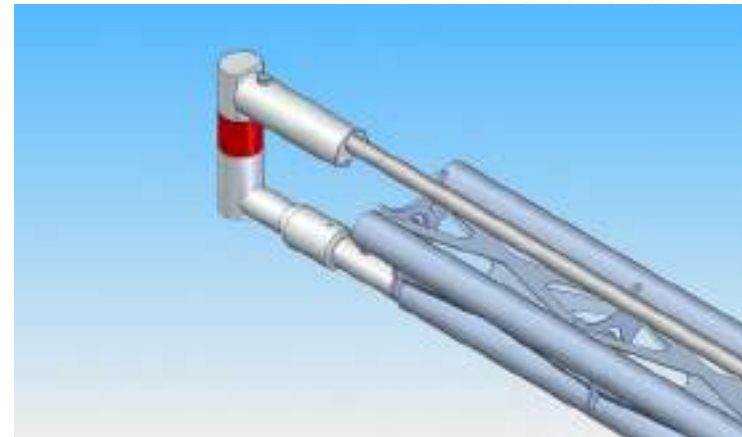
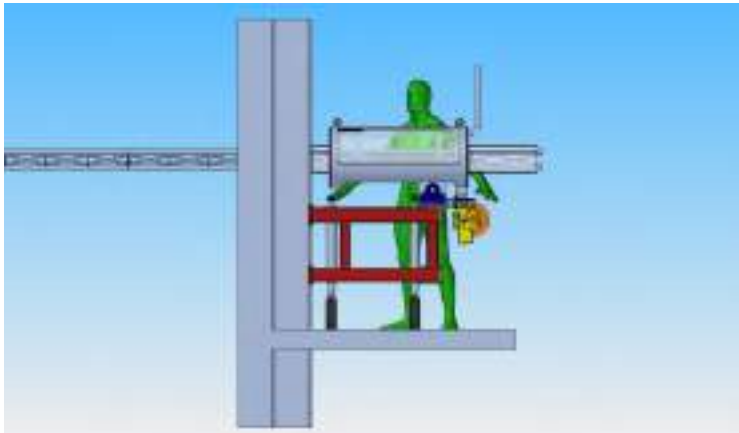


Technology > 12 m



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Technology > 12 m



Technology > 12 m



Equipment & Storage on-site.



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Study 8 * 200MW



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

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Study 8 * 200MW



Online Cleaning Your partner in explosive cleaning								
	Unit	Manual	Online	System	Manual	Online		
Output	MWyr	15.113.920	15.417.600	Higher performance	0,0%	2,0%		
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					
Extra Income per year			\$ 27.062.295					
Duration of scheduled stop	days	3	3					
Cost Man Clean	\$	180.000,00	\$ 5.618.836					
Interval between man cleaning	week	13,3	17,7					
nec. cleaning days man cleaning	days	1	1					
Cost Online Cleaning	\$	11.500	\$ 3.827.200					
Interval between online cleaning	weeks		5					
nec. Online cleaning days	days		4					
Initial costs	\$/yr		\$ 500.000,00					
Wacc			9,5%					
				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	\$ 644.765.174	\$ 21.523.615
2	0,8340	\$ 687.509.893	\$ 5.618.836	\$ 568.704.620	\$ 714.572.188	\$ 8.565.273	\$ 588.817.510	\$ 41.636.505
3	0,7617	\$ 687.509.893	\$ 5.618.836	\$ 519.550.784	\$ 714.572.188	\$ 8.565.273	\$ 537.732.886	\$ 60.004.441
4	0,6956	\$ 687.509.893	\$ 5.618.836	\$ 470.500.890	\$ 714.572.188	\$ 8.565.273	\$ 491.080.261	\$ 76.778.812
5	0,6352	\$ 687.509.893	\$ 5.618.836	\$ 423.156.064	\$ 714.572.188	\$ 8.565.273	\$ 448.475.124	\$ 92.097.873
6	0,5801	\$ 687.509.893	\$ 5.618.836	\$ 379.576.314	\$ 714.572.188	\$ 8.565.273	\$ 409.566.324	\$ 106.087.882
7	0,5298	\$ 687.509.893	\$ 5.618.836	\$ 341.256.908	\$ 714.572.188	\$ 8.565.273	\$ 374.033.172	\$ 118.864.147
8	0,4838	\$ 687.509.893	\$ 5.618.836	\$ 309.914.985	\$ 714.572.188	\$ 8.565.273	\$ 341.582.806	\$ 130.531.968
9	0,4418	\$ 687.509.893	\$ 5.618.836	\$ 281.292.223	\$ 714.572.188	\$ 8.565.273	\$ 311.847.768	\$ 141.187.512
10	0,4035	\$ 687.509.893	\$ 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						

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 a better and stable performance the reliability will increase with 1% (assumption based on worldwide experience)

Study 8 * 200MW



Cleaning Scope:

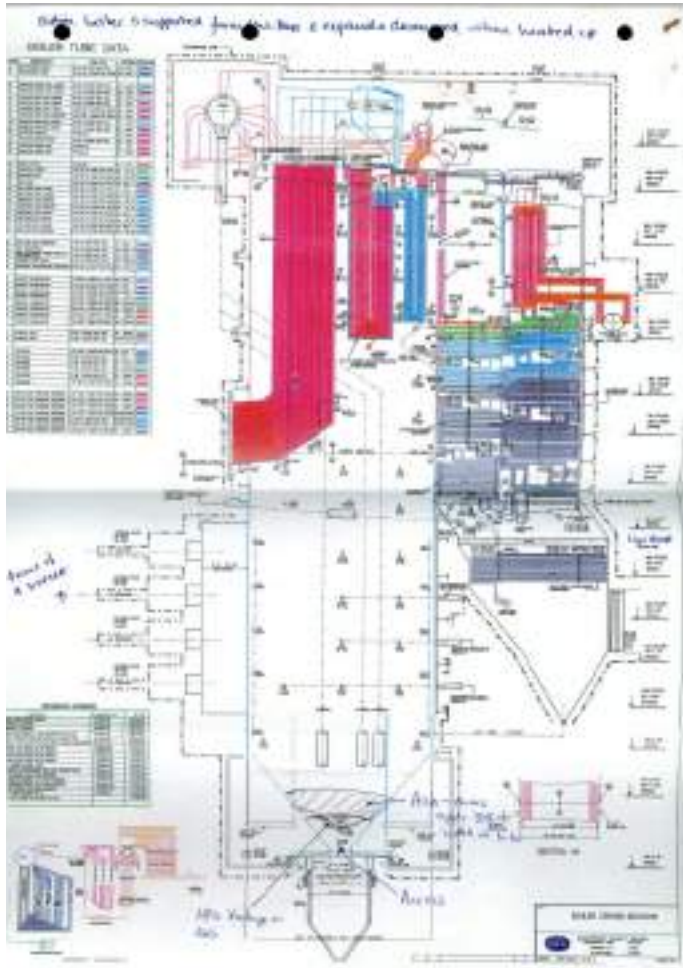
- 1st path > 20-30 Shockwaves
- 2nd path > 40-50 Shockwaves
- ECO > 10 Shockwaves
- ESP > 8 Shockwaves (Non- conductive technology)

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



Blockage and "Clinker" trophy at Dora Creek, NSW



ESP(Precips) Hoppers.

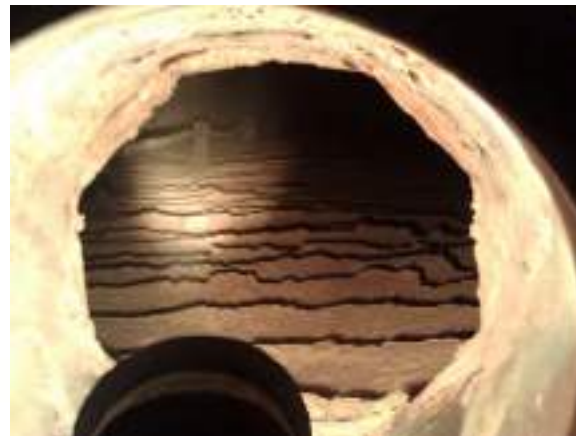
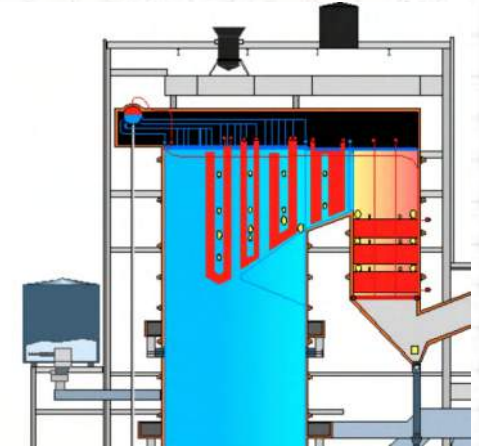
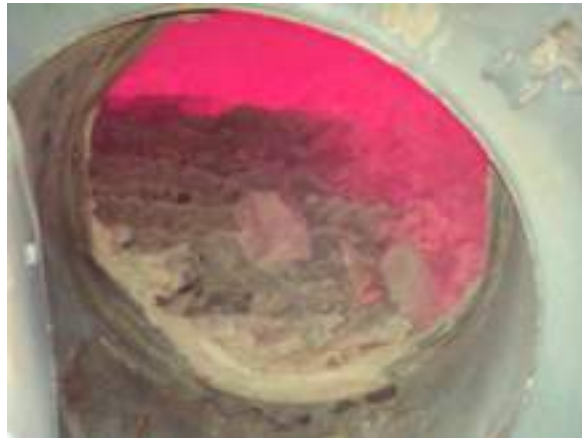


17 of 25 ESP hoppers
blocked after startup

600 MW Coal



Coal Case Study (sootblower failure)



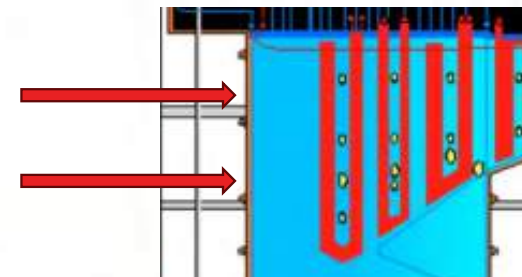
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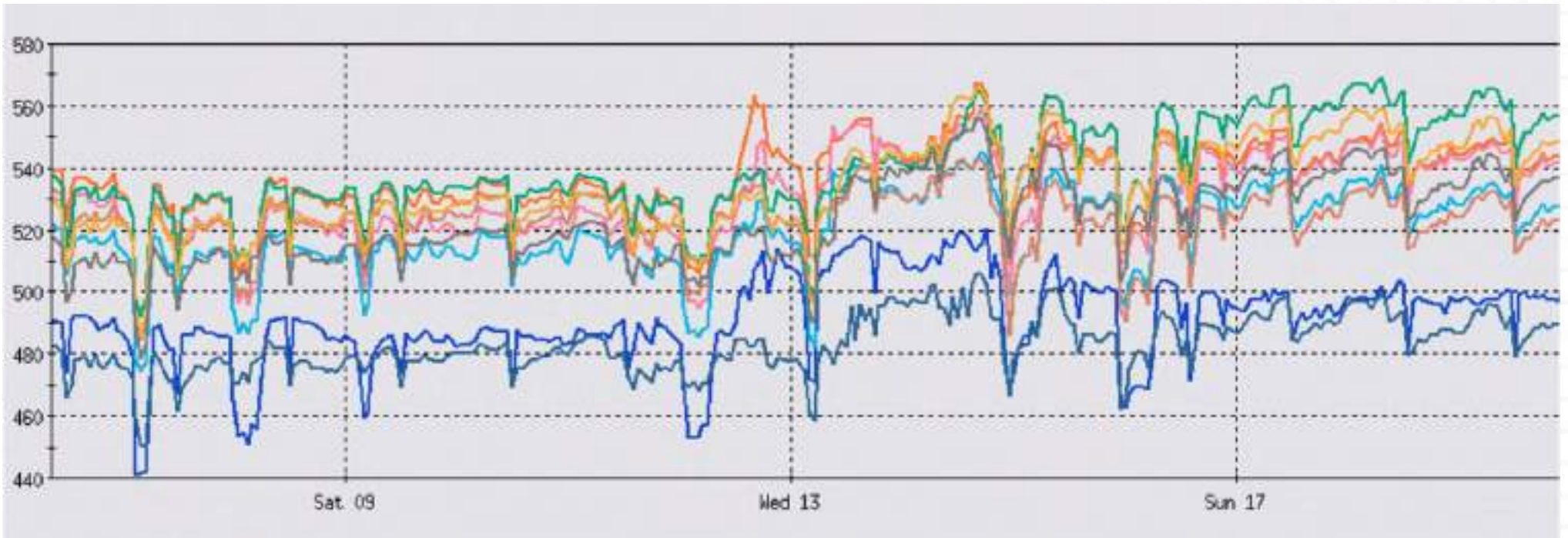
660 MW 100% converted
Coal > Biomass

SH Platten Online
Cleaning



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Safety Cleaning: prior to a Shut Down.



online cleaning



Safety Cleaning: Burner Eye Brows



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Current Clients



Europe

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

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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.

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.



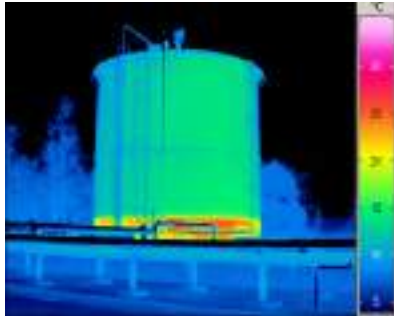
I thank you for your attention and hospitality.

Fred Wanschers
Director
Online Cleaning India

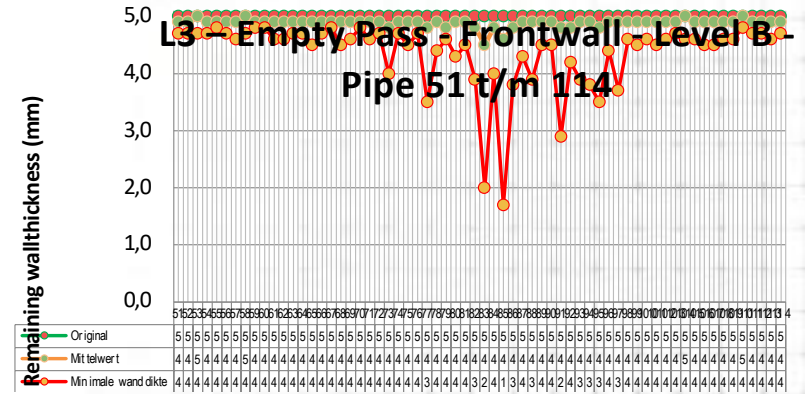
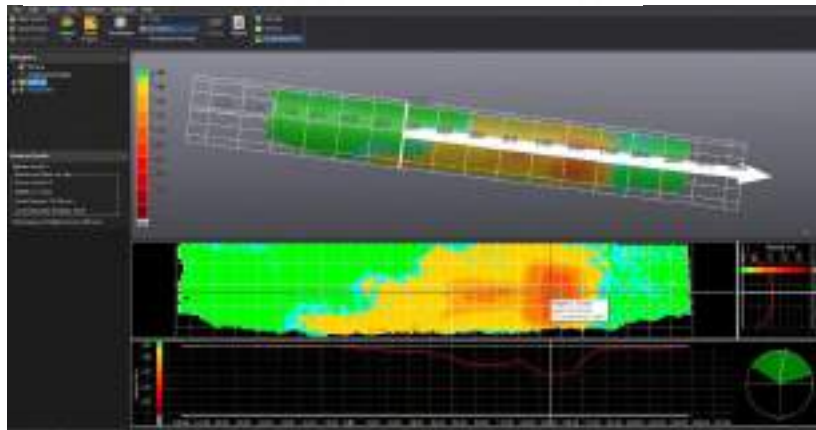
fred@onlinecleaning.co.in
fred.wanschers@onlinecleaning.com



Other Technologies



INDUSTRIAL
Ingenieur ohne Grenzen



Scanner



Technical Data

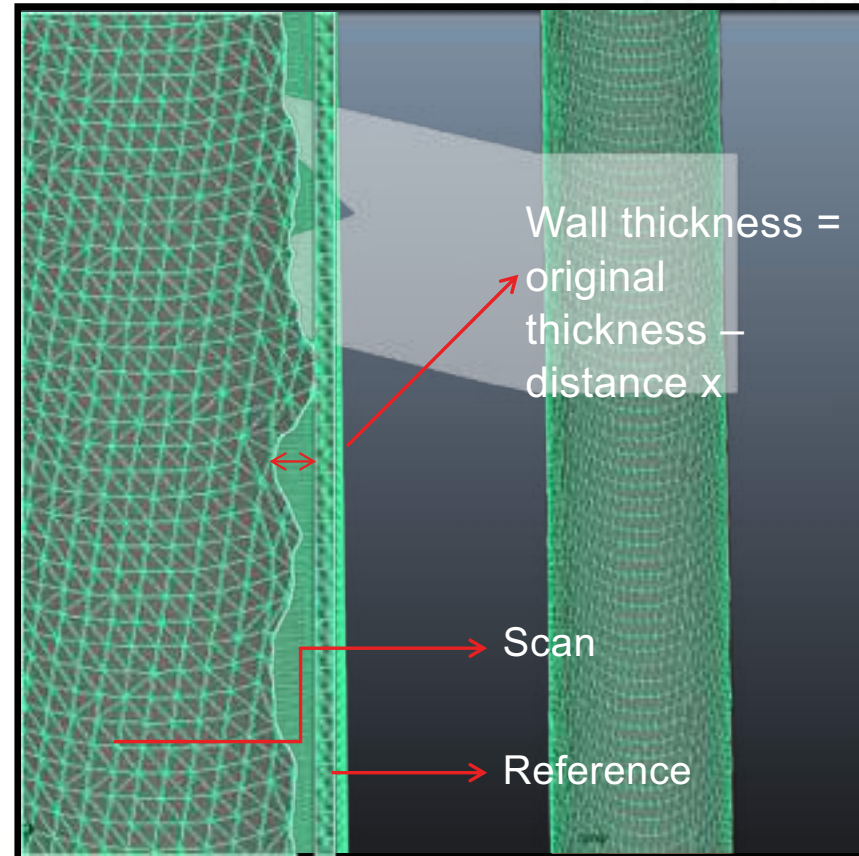
- **Messrate** 550.000 Measurements/s
- **Accuracy:** 0,1 mm
- **Resolution:** 0,1 mm
- **Distance to object:** 400 mm
- **Scan-area:** 380 x 380 mm



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





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