

REMTEC 2013 - END OF LIFE DECOMMISSIONING

**Furnaces, Heaters, Boilers, Incinerators –
their decommissioning
and removal**

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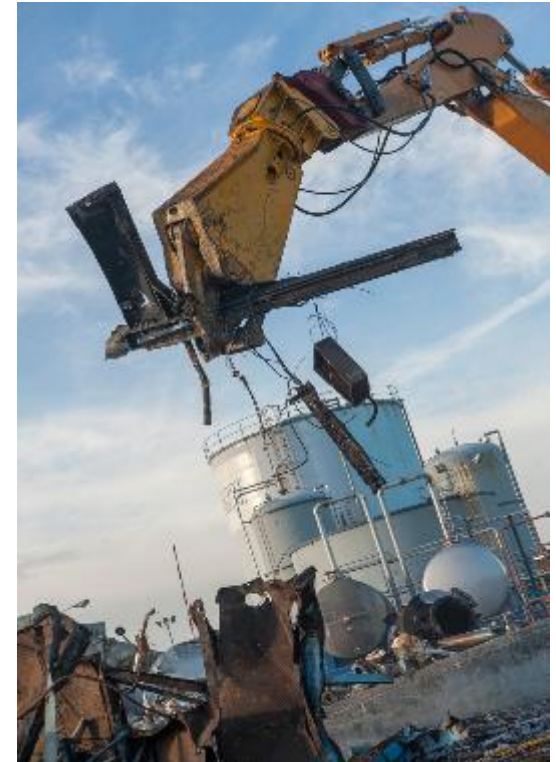
Overview

- At end of life, facilities are routinely cleared for new build or to reduce on-going liabilities.
- In some instances, facilities are moth-balled to give the potential to re-commission at a later date.
- In each instance the remaining contamination issues have to be addressed at some point in time.
- Experience of furnace/heater units that serve large-scale facilities such as refineries and petrochem facilities.
- How these units have been left or handed over.
- Known and potential contamination issues.
- Applying the knowledge and experience.

Euro Dismantling Services Limited (EDS)

- Specialist Decommissioning company:- Dismantling, Asset Recovery, Decontamination, Asbestos Removal, Demolition, Land Remediation
- Originated in Sheffield, UK; the main HQ; started in 1994.
- Focus on industrial facilities; - Oil/Gas, Petrochem. Pharmaceutical, Chemical, Manufacturing, Process Chemicals, Food & Drink, Nuclear
- Operate world-wide for our clients/customers
- Stand-alone operations in Canada and Australasia.

Euro Dismantling Services Limited (EDS)



Vision & Foresight

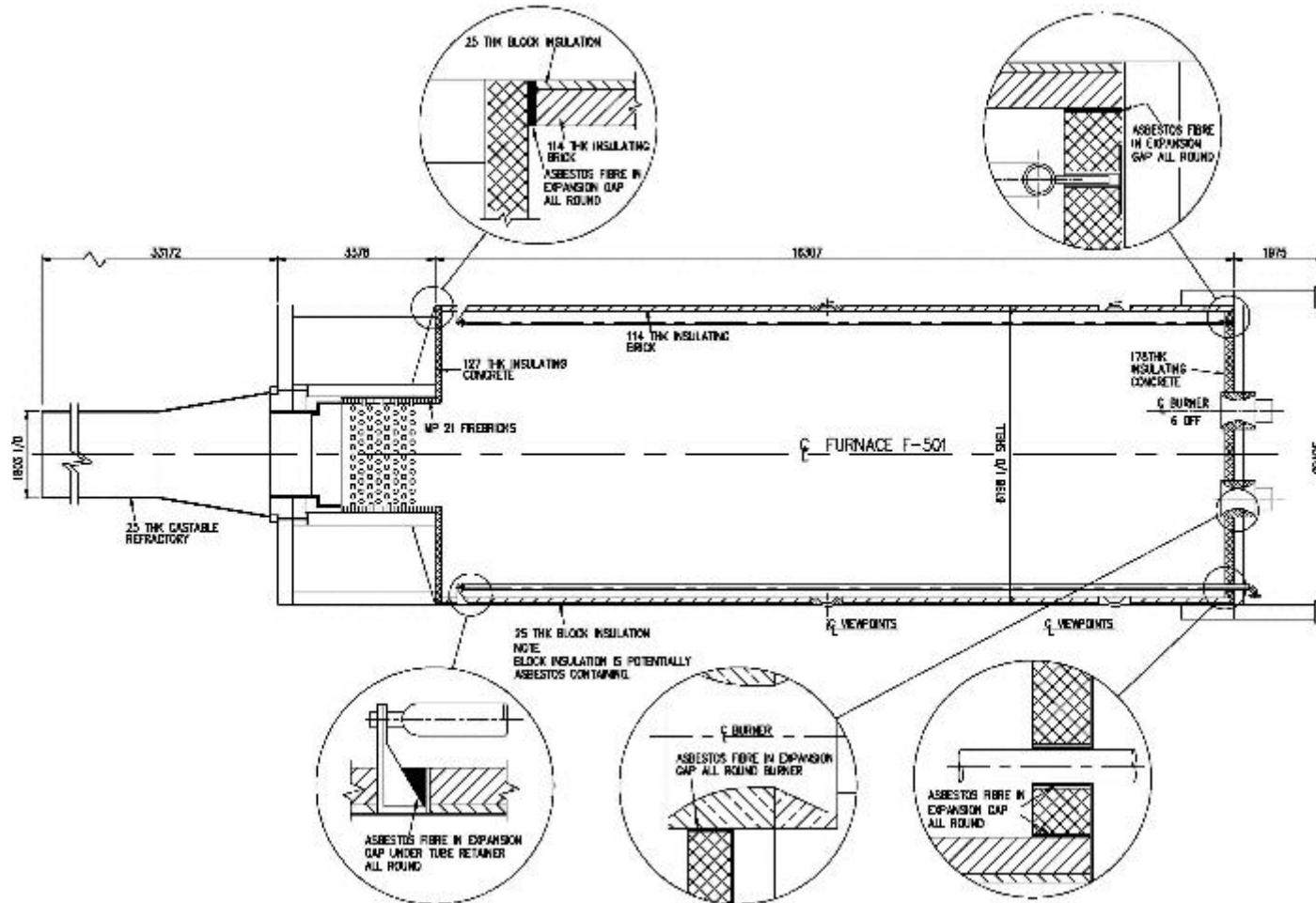
- UK is the first country to seriously de-industrialise
- Clear-out of older industries
- Land values and the shortage of land
- Competitive world markets
- Decommissioning Industry is well developed in UK
- Strong export opportunities

Hot Boxes

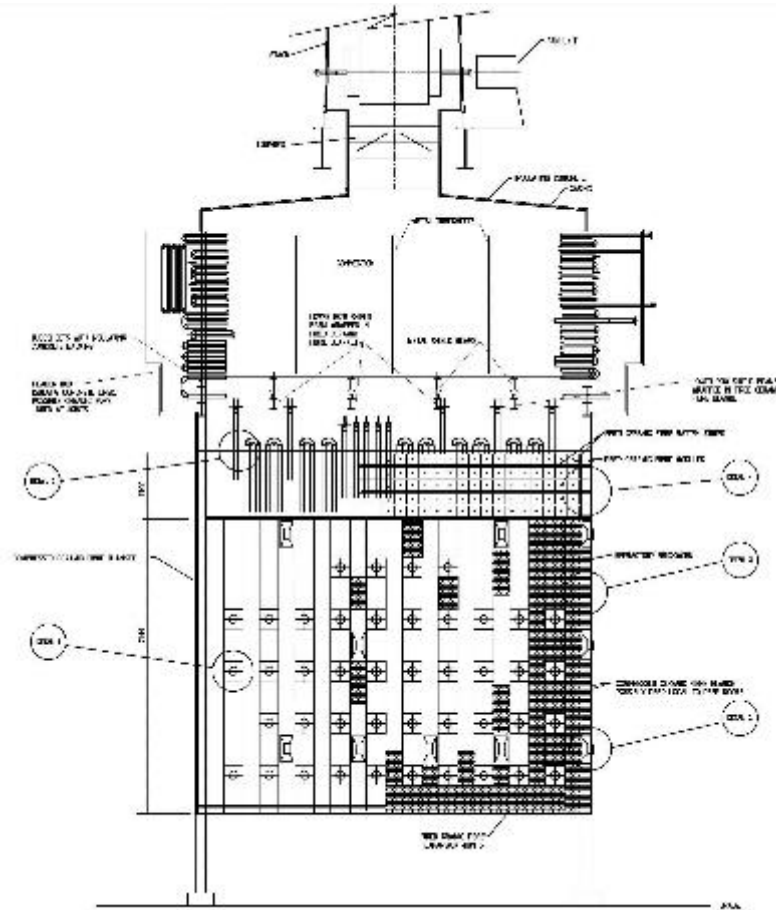
- Boilers, Heaters, Furnaces, Incinerators
- Square, Rectangular, Round
- Outer steel structural frame
- Refractory-lined: hanging, twigging, self-standing
- Stack, flues, ductwork
- Burn the fuel, create the heat, apply the heat, recover the heat



Outlines of Hot Boxes



Outlines of Hot Boxes



Views of Hotboxes



Views of Hotboxes



Views of Hotboxes



Contamination Issues?

We have a wide experience:-

- Asbestos
- Refractory Ceramic Fibre (RCF)
- 'Furnace Residues'
- NORMs



Where are these and to what extent?

These also have to be coupled with the deconstruction/demolition hazards.

Different people have different views and perspectives.

Inspiration- Breaking the Enigma Code



Inspiration- Breaking the Enigma Code

John Herivel, 1940

“ We were always concentrating on the encoded messages, and always totally without any glimmer of progress”

Dream:-

A picture of a German Enigma operator early in the morning, the wretched operator is woken to set the new key of the day on his machine. By laziness, tiredness or panic, he chooses the new day's settings as the letters already in the machine's window from the day before.

It was possible to work out how this error could be detected.
Subsequent messages could be decoded.

What Does this Mean?

- An understanding of human nature rather than what should happen.
- Apply this to contamination issues at the site.
- Apply this to the past site arrangements.
- Apply this to the current site arrangements.



When the Site was operational

- Production may have been paramount?
- Shorten the shutdown, get back up and running?
- Worry about it later.
- Not my issue, someone else's.
- Out of spec goes to the mistakes tank
- Problem solving.

Often, when you first walk around a site, you get a good feel for how it operated.

You get an even better idea when it is demolished and cleared. This also gives an in-sight into the remediation needs.

When the Site was Closed or Moth-balled

- Rapidly losing interest
- It will never get re-started
- I'll be long-gone
- It's got no hope of being re-commissioned



Current Site Status

Operational Site

- Side show compared to production
- Common goal to the end point

Closed Site

- Slower priorities
- Land re-use
- Handed to a consultancy?
- What is the fee basis?



Asbestos Contamination Issues

- Often been re-lagged
- Bad strip? – Look in the corners
- Full enclosure? – hot works inside a confined space?
- Sectionalise?
- Amount of twigging?
- How clean is the refractory behind?
- Asbestos Stripping is a high-risk activity
- Different countries have different standards
- What is practical?
- Risk Profile

HTI Asbestos Removal with Demolition



Refractory Ceramic Fibre (RCF) Contamination Issues

- Conversion to crystalline silica (cristobalite)?
- Exposed RCF/Protected RCF
- The RCF/refractory themselves?
- How was the refractory installed
- Risk Profile
- Convert dusts to pastes?

RCF, Refractory and Twigging



Removal of Exposed RCF



Removal of Protected RCF



Removal of Protected RCF(2)



'Furnace Residues'

What could there possibly be?

Depends how it was operating and what was being burnt.

- Vanadium Pentoxide
- Heavy Metals
- PAHs
- Dioxins/Furans
- Acidity?
- Sulphur compounds
- Chlorides

Furnace Residues a)



Furnace Residues b)



Furnace Residues c)



Furnace Residues

- Acidic conditions; - deterioration over time
- Corrosive conditions; - chloride and sulphurous attack
- Ash pits
- Leaching to ground below
- Everywhere through system; - stack, ductwork, flues
- Waste disposal by burning through the system



Naturally Occurring Radioactive Materials (NORMs)

- Some crude petroleum feedstocks
- Some forms of refractory
- Precipitators
- Water abstractions
- Known sources have usually been removed, but trefoils often remain.
- Scrap metal nightmare scenarios



Reminder for Remediation

- Think of the operators.
- Whatever has gone through the system will invariably have been spilt as well.
- The process wastes as a result of the process
- The structure has effectively surcharged the ground-mass;
- what is currently trapped in the ground can now become more mobile.

