

**Organisation for Economic Co-operation and Development - Nuclear Energy Agency  
Workshop on Radiological Characterisation for Decommissioning  
Studsvik, Tuesday 17th (12:00) – Thursday 19th (13:00) April 2012**

## **ABSTRACT**

### **Characterisation of metal in support of decommissioning a Reactor Site**

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Calder Hall, located on the Sellafield Site in the North West of England, was the world's first commercial nuclear power station. It safely produced electricity for the national grid for 47 years before finally closing down in 2003. Since then, decommissioning activities have been taking place in order to reduce the hazard posed by the aged structures.

In preparation for the removal of the 16 heat exchanger structures at Calder Hall, a phase of decommissioning work has been initiated which involves the removal of over 6000te of pipework and structural steelwork surrounding the heat exchangers.

To support the decommissioning and optimised waste routing of the metal, a programme of characterisation has been executed by the Sellafield Ltd Facility Characterisation team. The strategy sought to maximise the quantity of metal for unrestricted release from the site. In order to achieve this, there were numerous challenges which required investigative work and technical justifications to underpin the waste sentencing decisions. These included:

- Depth profiling of metal to determine whether material in close proximity to the reactor was activated.
- Coupon sampling of pipework to determine bulk activity concentrations of tritium.
- Activity assessment of high radiation reactor gas pipework through modelling to avoid dose to sample team.
- Sampling of paint coating structural steelwork to quantify activity concentrations resulting from an accumulation of over 50 years of atmospheric deposition.
- Dose assessments on painted metal that underpinned the justification to release it from the site with minimal decontamination, despite trace levels of activity within the paint.

Despite the challenges, comprehensive characterisation has enabled in excess of 90% to be sentenced as Radioactive Substances Act (RSA) '93 exempt material with no or limited treatment, enabling huge safety, environmental and cost savings to be realised.