

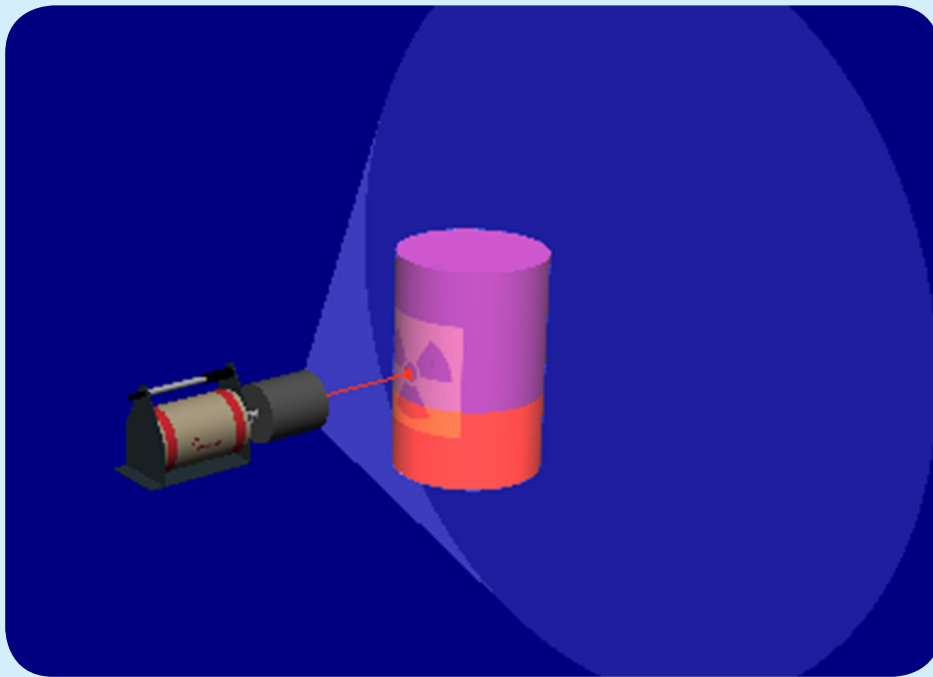
ISOCS In-Situ Gamma Spectroscopy Analysis, for Quality Checking Harwell 200 litre LLW drums

Scope:

This project is to provide Quality Assurance (QA) verification for 200 litre LLW waste drums at Harwell. High Resolution Gamma ray Spectrometry is used, based on the In-Situ Object Counting System (ISOCS) which is an established flexible tool for quantifying the β/γ activity content. This technique is based on computer modelling of the item under interrogation, in order to represent the counting geometry, with no requirement for radioisotope calibration sources. Measurements were performed at the Harwell site in Oxfordshire, UK.

Key Drivers:

RSRL's key requirement is to check the validity of the consignor's declarations for waste contained in 200 litre drums. This is necessary to develop confidence in the consignor's declarations and highlight any characterisation aspects that need further investigation.



This project was conducted from 2009 to 2013 on a campaign basis depending on RSRL's ongoing waste throughput needs.



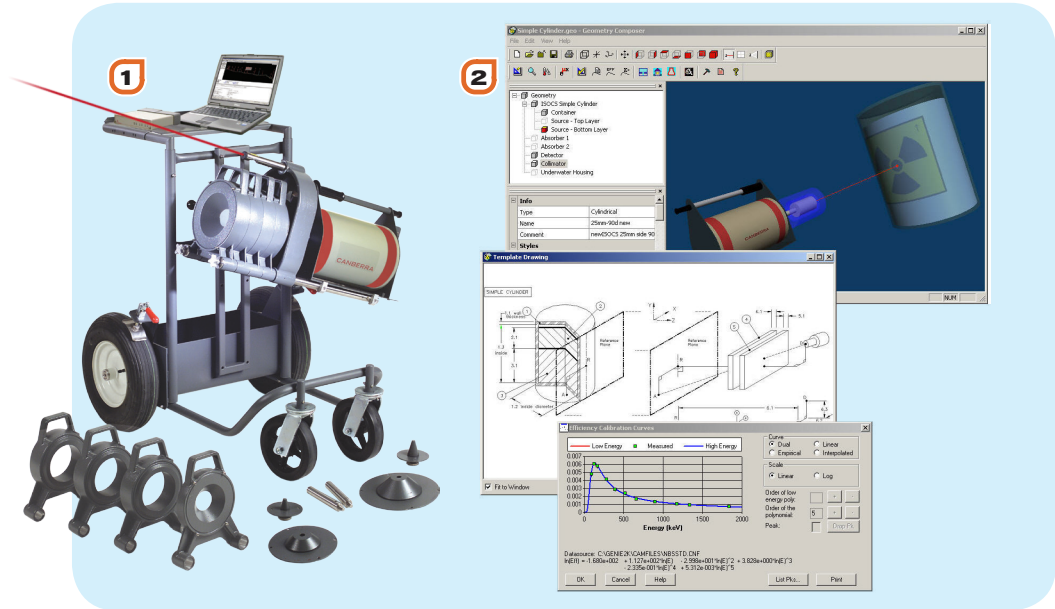
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MIRION
TECHNOLOGIES

Instruments & Techniques Used:

- 1 Instruments:**
 - ISOCS
- 2 Software**
 - ISOCS modelling



CANBERRA Solution:

In order to perform non destructive assay work on site, CANBERRA's solution to RSRL's key drivers included:

- Development of complete step by step procedures
- Provision and mobilisation of ISOCS equipment
- Verifying the system calibrations with actual QC standards
- Performing a non-destructive measurement of the entire item volume to identify the nuclides responsible for the gamma emissions.
- ISOCS modelling of the 200 litre drums to develop the calibrations.
- ISOCS measurements supported by scanning dose-rate measurements to check the homogeneity of the waste.
- Reporting the activity and uncertainty for each identified nuclide.
- To provide Minimum Detectable Activity values for the commonly identified isotopes (and of interest to RSRL), for the items where these are not identified.
- Robust justification and documentation of the assumptions used in the ISOCS modelling.

ACHIEVEMENTS

- The UK measurements team has supported the RSRL team in the verification of LLW waste in 200 litre drums. This is an essential activity which has allowed RSRL to sentence routine LLW arisings to the LLWR repository. The drum measurements have provided valuable externally assessed data for RSRL, contributing to a collective understanding of the radioactive content of the waste in each measured drum supporting RSRL in the completion of waste declaration documentation for LLWR Ltd.