

### Overview

The Atomic Weapons Authority (AWE) has a significant amount of drummed Intermediate Level Waste (ILW) stored at its Aldermaston site. A Solid ILW Treatment Facility has been proposed to process this waste to a passively safe condition, whilst also meeting NDA RWMD (formally Nirex) conditions for long-term storage. The selected process is one of supercompaction, loading the compacted 'pucks' to a NDA RWMD approved container and then grouting ahead of interim storage on site. Initial trials demonstrated that feed drum volumes reductions of at least 5:1 can be achieved.

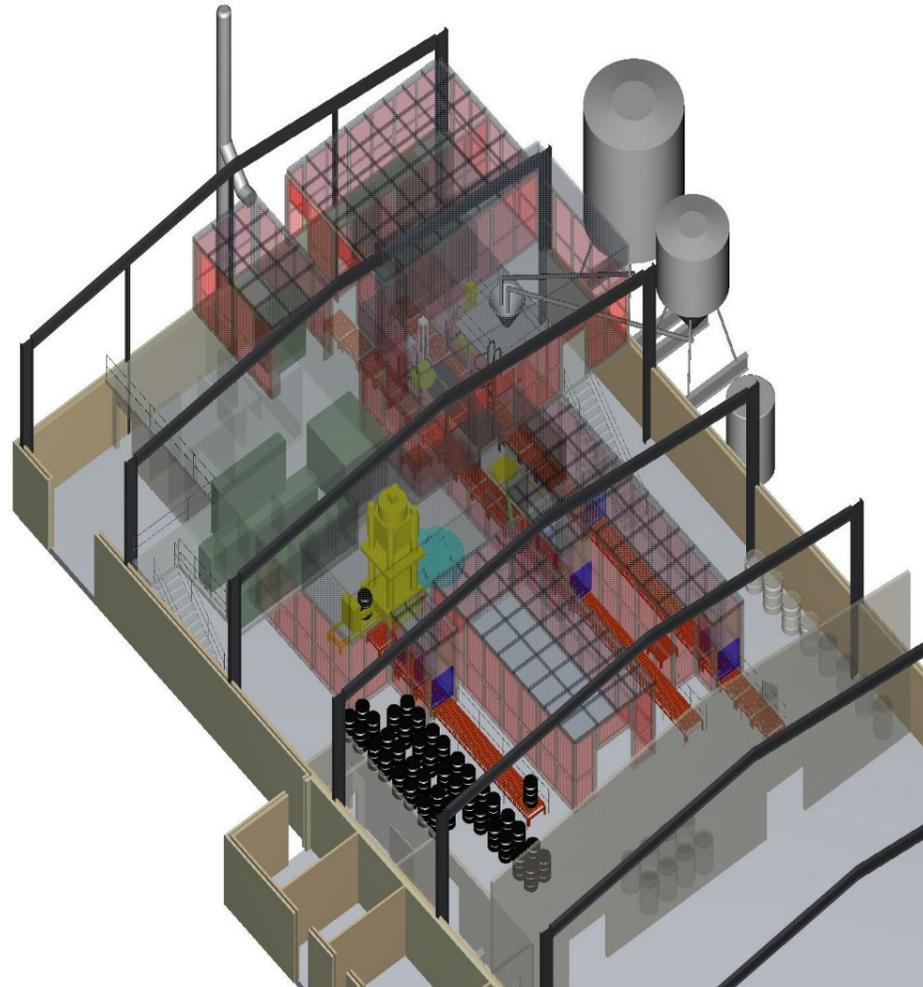
### Scope of Service Supplied

Nuclear Technologies were contracted by AWE to provide a number of services in support of the Solid ILW project including;

- Engineering Management
- Provision of project support staff
- NDA RWMD Letter of Compliance Submissions
- Criticality Assessments of Process and the Stored Packages
- Grout annulus performance assessment
- Store Re-Stack Management

### Contract Brief

AWE intended that 200 litre drums of PCUM ILW were supercompacted to reduce the drum volumes and that a number of the resulting 'pucks' were loaded into a 500 litre NDA RWMD approved drum. The 'pucks' would then be encapsulated using a cementitious grout prior to disposal. AWE were required to demonstrate that the waste packages will comply with all the performance requirements specified by the NDA generic waste packaging specifications.



### Grout Annulus

The integrity of the waste package was dependent on a number of package design features including grout annulus. It was therefore necessary to accurately determine the performance of the grout annulus. A programme of experimental work was undertaken by Nuclear Technologies to determine:

- The key grout product evaluation data required for designing the waste packaging process and for inclusion on the Letter of Compliance submission;
- The grout annulus performance with respect to the integrity of the 500 litre drum.

The experimental programme was based on 2 off 200 litre mixes of 3:1 PFA/OPC grout. The mixes provided preset grout data and a range of grout test samples to enable key empirical data to be determined including:

- The suitability of selected, commercially available cement powders for grout annulus production including grout flow and workability data;
- Product evaluation data on grout samples over a 90 day period.
- Testing of grout samples to demonstrate grout annulus performance e.g. chloride penetration.

### Value derived for the customer

Significant savings in legacy waste costs are predicted, greater storage capacity is possible without recourse to construction of new stores. Nuclear Technologies have provided suitably qualified and experience personnel resource to assist AWE to internally manage such a capital project requiring considerable specialist knowledge.