

Packaging of Trawsfynydd Active Waste Vaults

(Interim stage)

Summary of Assessment Report

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Background

British Nuclear Group Project Services acting on behalf of Magnox North, has sought Interim stage endorsement of waste packages produced as a result of packaging and conditioning solid waste to be retrieved from the Active Waste Vaults at Trawsfynydd Decommissioning Site.

This document summarises the results of the assessment carried out by NDA Radioactive Waste Management Directorate in response to the submitted proposals. The assessment has been carried-out as part of the Letter of Compliance process, whereby NDA examines the disposability of the proposed waste packages by assessment against ILW packaging standards and specifications and the Phased Geological Repository Concept (PGRC). Further information on the Letter of Compliance process is available elsewhere¹.

Scope of the Proposals

Solid intermediate level waste has been produced during operation of the twin Magnox reactors at Trawsfynydd Power Station. The waste corresponds to waste streams 9G22, 9G25, 9G26 and 9G27 in the 2004 National Radioactive Waste Inventory.

The solid ILW consists predominantly of redundant metallic equipment and materials stored in canisters and drums as well as large steel items such as plates, sheets, fuel machine components. The waste comprises a mixture of activated components retrieved from the reactor with the possibility of light contamination and contaminated wastes from pond operations and includes both low level waste and intermediate level waste (LLW and ILW). Work is in progress to characterise the materials, enabling LLW to be retrieved and packaged for disposal to the National Low Level Waste Repository, and ILW to be segregated for future packaging. It is the ILW component that is the subject of this assessment.

The radionuclide inventory is relatively low and would be towards the bottom of that expected in intermediate level waste. The estimated number of waste packages is also low as the waste could be packaged into 9 standard 3m³ Boxes. The volume of waste is an insignificant fraction of the ILW scheduled for disposal in the PGRC and accounts for <0.02% of the total reference volume.

Packaging proposals

The packaging process considered is based on a number of discrete and dependent stages. Initially the waste would be subject to sorting and characterisation and packed into a 3m³ Box in a pre-determined arrangement. Cement grout would be added, to immobilise the waste and produce a package that would be suitable for disposal. The 3m³ Box waste container is

¹ Guide to the NDA Radioactive Waste Management Directorate Letter of Compliance Process, NDA Document WPS/650, June 2006.

manufactured from stainless steel and would be compliant with NDA waste packaging standards.

This proposal would be similar to that proposed for other solid ILW at Trawsfynydd Decommissioning Site, which has been subject to endorsement and where an operational facility has been used to package the waste. However, due to the current location and temporary storage arrangements it has been judged that it is not possible to transfer the Active Vault Wastes to the existing plant. Hence the packaging of Active Vault Wastes would be undertaken using local arrangements and that this process should be subject to separate assessment and endorsement.

The waste would be fully encapsulated using a cement grout based on 3:1 mixture of pulverised fuel ash and ordinary portland cement (PFA/OPC). After setting of the encapsulation grout a final capping grout would be added before the package is lidded.

Completed packages would be transferred into a concrete shielded overpack for continued storage in the new ILW store to await transport to a final disposal facility.

Assessment of Disposability

The acceptability of the proposed packages has been assessed against criteria established within the PGRC and associated Generic Waste Package Specification (GWPS).

The Assessment is based upon the inventory data supplied by Project Services for the solid wastes. It has been noted that the definition of a fully accurate inventory is not possible until the characterisation of the wastes has been completed and all data collected.

The proposed waste packages examined herein are consistent with the requirements of intermediate level waste packaging standards and the process has been judged to follow established practice by waste producers for the packaging of solid wastes. Analogues of the proposed wasteform are available and the associated development work assessed by NDA Radioactive Waste Management Directorate provides confidence that adequate waste package performance could be produced by cement encapsulation of these wastes.

In summary, the Assessment has concluded that a Disposability Safety Case ultimately could be made for packages containing solid ILW retrieved from the Active Waste Vaults at Trawsfynydd Decommissioning Site, and that the proposals for the packaging of these wastes can be endorsed at the Interim stage. During the course of the assessment, areas requiring additional work to progress the proposals beyond the Interim stage were identified, and these are summarised below.

Requirements for further development work

The assessment by NDA Radioactive Waste Management Directorate has been based upon the development work performed by Project Services and Magnox North. At the future Final stage, it is required that all the information required to demonstrate disposability should be available and confirmation should be provided that the waste packages manufactured in the as-built plant will be compliant with the PGRC. Hence it should be agreed and demonstrated through the following:

- demonstration of satisfactory grout infiltration of the waste;
- finalisation of proposals for waste packaging, recorded in a product specification;
- confirmation of arrangements for the storage and monitoring of completed waste packages;
- finalisation of proposals for producing waste package records.

Conclusion

The assessment of the proposals has concluded that packages containing solid ILW retrieved from the Active Waste Vaults at Trawsfynydd Decommissioning Site are expected to be consistent with disposal under the PGRC and can be endorsed at the Interim stage.