

Problematic Waste IPT

Problematic Waste Management Case Study

Treatment and Disposal of ILW Desiccant



Waste description

Desiccant was used within gas dryers at all Magnox reactor sites, during the operational period, to control the moisture content of reactor gas in order to prevent corrosion of the reactor components. This had resulted in a population of waste consisting of legacy drums of desiccant from several Magnox Ltd sites. The desiccant was highly tritiated and declared as Intermediate Level Waste (ILW) in the UK Radioactive Waste Inventory (UKRWI).

Why the waste was problematic

The desiccant was highly tritiated (100GBq) and was also C-14 contaminated. Although the waste had a low contact dose rate and no shielding was required for its storage, tritium levels were too high to allow incineration.

In addition, there was a risk that the waste in the drums would not be as declared, and would include items other than the desiccant (for example gloves, vacuum bags etc.). The drums therefore required characterisation and repackaging prior to disposal.



Berkeley desiccant granules

Solution

Through the LLW Repository Ltd combustible framework, Tradebe Inutec was contracted to sort, segregate and treat the waste at their Winfrith facility. The waste was hand sorted to remove additional items from the desiccant. The desiccant was then washed to remove the tritium. This reduced the tritium activity to levels consistent with the Waste Acceptance Criteria (WAC) for incineration. The activity of C-14 and Cl-36 were also significantly reduced by the washing process.

After washing, the desiccant and wash water were sampled to determine the amount of activity which had been removed by washing. The sampling also determined that the washed desiccant was suitable for incineration.

Tradebe Fawley carried out the incineration of the waste. Sufficient tritium and chlorine was driven off the washed desiccant to allow the secondary waste (ash) to be disposed of to an appropriately permitted landfill.

The washing effluent was managed through the existing effluent treatment and discharge route at the Winfrith site.

Any issues?

The waste was found to contain significant quantities of other materials (not exclusively desiccant). However, this risk had been recognised at an early phase of the project and therefore mitigation (sorting of the waste) was in place.