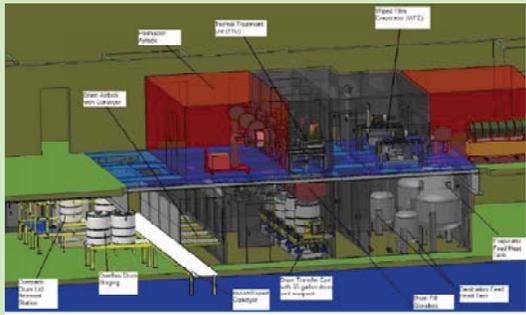


Technology Readiness Assessment Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

²³³Uranium Downblending and Disposition Project

Why DOE-EM Did This Review



Product Packaging System and Interfaces

EM was directed to take ownership of a facility housed in Building 3019 at Oak Ridge that was originally used to extract ²²⁹Th (an isotope used in medical research) from ²³³U. The mission, after takeover by EM, was to downblend the inventory of ²³³U in Building 3019 to mitigate security and safety (especially criticality) concerns and prepare the material for transport and disposal. The project anticipated that the downblended material could be disposed at either WIPP or the Nevada Test Site. This assessment was conducted to coincide with the 30% design review for the “back-end” of the downblending process, thereby allowing observations and issues identified by the assessment team to be included in the project technology maturity plans and/or design review.

What the TRA Team Found

The assessment team identified the following Critical Technology Elements (CTEs) and the associated Technology Readiness Level (TRL):

- Analytical Laboratory (TRL=3)
- Concentration process - Wiped Film Evaporator (TRL=4)
- Product Packaging (TRL=3)
- Offgas Treatment (TRL=2)

The team also identified a significant risk to the project’s mission, which was centered on the uncertainty of the ²³³U concentration in the source material. Downblending the ²³³U may reduce the transuranic (TRU) content of the waste to below 100 nCi/g, which is the minimum TRU content acceptable at WIPP. Waste below this TRU level may be acceptable at the NTS, however, this facility was scheduled to close (year 2010) prior to the blending operations being completed. Thus WIPP was the only foreseeable pathway for disposition of the ²³³U waste disposition, although the produced material may not meet acceptance criteria.

What the TRA Team Recommended

The team made the following recommendations:

- The project (**Analytical Lab**) should develop a detailed sampling and analysis plan to support process control, production schedule, etc.
- The project (**Analytical Lab**) should develop a complete set of data quality objectives that identify requirements for turn-around times, detection limits, precision/accuracy derived from disposal criteria, etc.
- Test the **Wiped Film Evaporator** with simulated waste to provide performance data.
- Test the integrated **Product Packaging** system with granular/powder simulants and with multiple repetitions of transfers (assess solids build-up on surfaces); develop a “tightly specified” acceptance criteria.
- For **Offgas Treatment** the project needs to either demonstrate that the proposed design will capture the fine particles evolved as daughter products from ²²⁰Rn or modify the design (incorporating other CTEs) that ensure capture of these.

To view the full TRA reports, please visit this web site:
<http://www.em.doe.gov/Pages/ExternalTechReviews.aspx>

TRA Summary: August 2011

The objective of a Technology Readiness Assessment (TRA) is to determine the maturity of certain key technologies, identified as Critical Technology Elements (CTEs), using a systematic, metric-based process and to evaluate the readiness of these technologies for insertion into a project design.



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