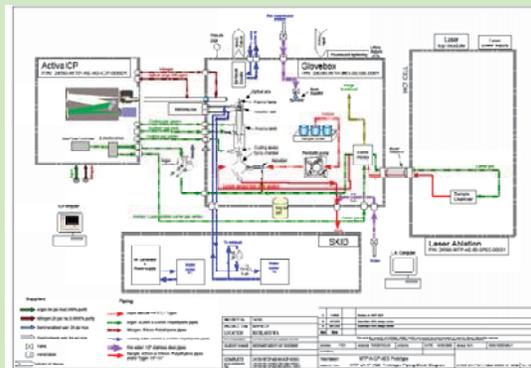


Technology Readiness Assessment Summary

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

Waste Treatment and Immobilization Plant (WTP) Analytical Laboratory, Balance of Facilities and LAW Waste Vitrification Facilities

Why DOE-EM Did This Review



Schematic of Laser Ablation Analytical Subsystem

DOE is constructing a Waste Treatment and Immobilization Plant (WTP) at Hanford to treat the site's tank wastes. The WTP is composed of several facilities including an Analytical Laboratory (LAB), Balances of Facilities (BOF) operations, and Low-Activity Waste (LAW) Vitrification Facility. The purpose of this assessment was to identify the critical technology elements (CTEs) in the abovementioned facilities (LAB, BOF, and LAW) and determine if these are sufficiently mature to be incorporated into the final WTP design, which normally requires a Technology Readiness Level of 6.

What the TRA Team Found

The assessment team identified the following CTEs, along with each element's Technology Readiness Level (TRL) for the LAB, BOF and LAW facilities:

- Two LAB systems were CTEs:
 1. Autosampling System (TRL=6), and
 2. Laser ablation analysis system: LA-ICP-AES/LA-ICP-MS (TRL=5)

- No BOF systems were CTEs
- Five LAW systems were CTEs:
 1. LAW Melter Feed Process System (TRL=6),
 2. LAW Melter System (TRL=6),
 3. LAW Offgas and Vent systems: LOP/LVP (TRL=6),
 4. LAW Container Sealing Subsystem (TRL=5), and
 5. LAW Decontamination Subsystem (TRL=4)

The team concluded that the CTEs are "sufficiently mature to continue to advance the final design."

What the TRA Team Recommended

The assessment team recommended the following:

- Testing the LAB's Laser Ablation Atomic Emission Spectrometry subsystem using actual waste samples to demonstrate the achievable detection limits and turnaround times.
- Testing the LAW's container inert filling, flange cleaning, inspection, and lidding/delidding system in a simulated remote environment to verify the equipment performs as required.
- Integrating testing of the LAW's container decontamination and smear testing systems in a simulated remote environment to verify the equipment performs as required and can achieve the specified decontamination levels. This testing should be supplemented with laboratory-scale testing to define the operational parameters for the CO₂ decontamination system.
- Identify and qualify a LAW melter bubbler design using material other than high nickel MA 758 alloy to mitigate the risk associated with the availability of this alloy.

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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