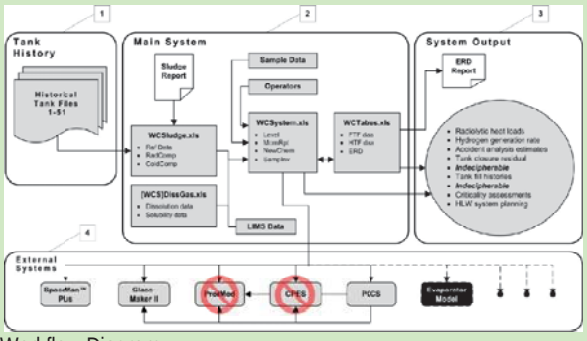
DOE Site:	Savannah River Site/SRS
EM Project:	SRS System Modeling
ETR Report Date:	June 2009

External Technical Review Summary

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

Evaluation of System Level Modeling and Simulation Tools in Support of SRS Liquid Waste Process

Why DOE-EM Did This Review



Workflow Diagram

The objective of the review was to evaluate the current Process Simulation Tools that support the planning basis for Savannah River Site (SRS) Life-cycle Liquid Waste Disposition System Plan. Specifically, the review was to: (1) assess whether the tools yield reasonable estimates; (2) evaluate methods used to model facilities currently in design, construction, planning or operational stages; (3) evaluate methods to improve the rate of system model predictions; and (4) determine if additional tools are needed to guide actual execution of individual processing steps.

What the ETR Team Found

- The current System Plan relies on a collection of software tools to organize and analyze information, and guide the processing of liquid waste. These tools currently provide "reasonable" estimates, but there is a need for an integrated system planning tool.
- The capability of current tools and their integration is limited. This hampers process optimization and mid to long-term planning.
- There is a need to increase system planning flexibility, and turnaround time at which system model predictions are done. There is a need to decouple safety, planning and operations functions.
- There is a need to relate system planning results with cost and impact of potential funding constraints. A further need is to include a waste acceptance tool for Saltstone similar to glass product acceptance.

What the ETR Team Recommended

Short-term (6 to 12 months): (1) Update computer resources (processor, memory and software); (2) Engage software engineers and modeling experts to integrate current tools; (3) Develop approach to calculate propagation of uncertainties through the planning process; (4) Review current QA software design against most recent DOE policy guide lines; (5) Develop an acceptance tool for Saltstone similar to Glass; and (6) Implement spreadsheet best practices to improve data input and integrity.

Mid-term (next 2 years): (1) Determine computing environment for long-term planning needs, including optimization and "what if" scenarios; (2) Implement approach to account for uncertainty analysis, with respect to appropriate constraints (e.g., cost, glass properties, etc.) in system plan; (3) Develop tank inventory database; (4) Implement capability to compare historical model predictions with actual data; and (5) implement integrated models to run timely system planning cases.

Long-term (3 to 4 years): (1) Implement improved planning tools for optimization and decision making; (2) Work with DOE HQ and other program offices to adopt consensus standards for material properties and RAM data across all models; (3) Integrate the tank inventory and "WCS" database; and (4) Develop the capability to ensure assumptions and calculation consistency among Safety, Planning, Operations and Waste Acceptance tools.

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

ETR Summary: September 2011

The purpose of an External Technical Review (ETR) is to reduce technical risk and uncertainty. ETRs provide pertinent information for DOE-EM to assess technical risk associated with projects and develop strategies for reducing the technical risk and to provide technical information needed to support critical project decisions. Technical risk reduction increases the probability of successful implementation of technical scope. In general, ETRs assesses technical bases, technology development, and technical risk identification and handling strategies.