

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 13, 1998

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
**FROM:** J. Kent Fortenberry / Joe Sanders  
**SUBJECT:** SRS Report for Week Ending February 13, 1998

**Tritium Extraction Facility (TEF) Geotechnical Investigation Status** - The two-phased TEF geotechnical investigation was described in the weekly report from 1/16/98. During Phase I, sixteen deep seismic piezocone penetration tests (SCPT) were performed. One SCPT (SCPT #9) met the "soft zone" criteria (<15 tons per square foot tip resistance over a thickness of at least two feet). During Phase II, five standard penetration test borings were conducted. Boring #3, purposefully located next to SCPT #9, did not indicate a soft zone. However, a "rod drop" (the rod sinking under its own weight, indicative of softer material) was experienced at Boring #2. As a result, four additional SCPTs were pushed to estimate the extent of this soft zone around Boring #2. Only one met the soft zone criteria. The final report, due in late March, will evaluate the adequacy of the underlying soil and whether additional geotechnical work is merited.

**Dispersion/Dose Model for Tritium** - WSRC was considering using a more realistic dispersion/dose model, UFOTRI, for evaluating tritium releases to support completion of the Consolidated Tritium Facilities SAR. This week, WSRC decided to continue using MACCS because there were concerns that validating UFOTRI may prove difficult and could impact the scheduled SAR completion date. However, the results from UFOTRI may still be reported in the SAR. The UFOTRI code provided about a 60% reduction in offsite dose from tritium releases as compared to the MACCS code currently being used by the site for general radionuclide dispersion/dose modeling. The primary reason(s) for the reduction are being investigated. Like MACCS, the UFOTRI code performs a Monte Carlo simulation of the Gaussian Plume model using representative atmospheric data. Unlike MACCS, UFOTRI differentiates between tritium gas and tritiated water vapor when calculating transport and deposition characteristics. Furthermore, UFOTRI models uptake, organic binding and re-emission of tritium from soil and vegetation. UFOTRI may replace MACCS in the future for use in the APT and TEF projects.

**TRU Waste Drum Venting** - About 600 of the 3800 drums that have been vented/purged to date had initial hydrogen concentrations greater than 4%. Previous weekly reports noted that two TRU waste drums had reestablished flammable gas concentrations a few days after being purged and vented. WSRC has now sampled about forty of the drums with initial hydrogen concentrations between 4% and 53% to assess whether hydrogen concentrations are being reestablished. The time elapsed since these drums were purged/vented ranged from 87 to 326 days. All samples show less than 2% hydrogen. WSRC intends to resume drum venting next week. Drums measuring greater than 4% hydrogen will be segregated and subjected to additional limitations on movement following the purge/vent operation. WSRC will continue to sample purged/vented drums to provide more information on hydrogen buildup and subsequent diffusion.