

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 13, 2003

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
J. J. McConnell, Deputy Technical Director  
**FROM:** R. T. Davis/ T. D. Burns  
**SUBJECT:** SRS Report for Week Ending June 13, 2003

**Tank 30 Flammability Controls:** For all high level waste tanks under non-seismic conditions, the time required to go from 25% to 100% of the composite lower flammability limit (CLFL) must remain greater than 7 days per the recently implemented Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs). Calculation of the time-to-CLFL has three primary inputs– the hydrogen generation rate of waste in a given tank, the nitrate and nitrite concentration in the waste available for hydrogen scavenging, and the tank vapor space. The current methodology outlined in the DSA for computing the time-to-CLFL requires periodic sampling for nitrate and nitrite concentrations, allows only the vapor space above the level of the tank's High Liquid Level Conductivity Probe (HLLCP) to be credited (regardless of the actual liquid level in the tank), and assumes the ventilation system is inoperable.

On Thursday, sample results of Tank 30 waste revealed a sharp drop in nitrate and nitrite concentrations, and subsequent time-to-CLFL calculations (using only the vapor space above the HLLCP) indicated that 100% CLFL could be reached in only 4 days. This represented a violation of TSR 5.6.2.27 *Flammability Control Program*, and per the DSA a response plan was initiated. The response plan prohibits all waste transfers into and out of Tank 30, restricts flush water additions, and increases surveillance of the ventilation system to assure its operation. The time-to-CLFL calculated using the actual liquid level in the tank is greater than 15 days. Therefore, the path forward for exiting the response plan will be to lower the HLLCP (thereby increasing the creditable vapor space) to re-establish an adequate time-to-CLFL. Additional issues that need to be addressed are the corrosion control impacts of the drop in nitrate and nitrite concentration, and the adequacy of the current nitrate/nitrite sampling periodicity.

**Locomotive Derailment:** Last Saturday, a site locomotive derailed at a switch while transporting a railcar containing transuranic waste. Only the front set of wheels derailed. The locomotive and the railcar remained upright. No release of contamination or personnel injury occurred. In response to the event, WSRC decoupled the waste car from the locomotive and moved it to a safe location (it was subsequently delivered to the burial grounds). The locomotive was pulled back on the track and the track and switch were repaired and tested.

In July 2002, a similar derailment of the same locomotive occurred in K-Area. Investigation of that event indicated that a switch rail point failure was likely the cause of the derailment. Corrective actions included inspection of switches and review of the site track inspection program. Initial examination of the switch associated with the most recent derailment does not indicate a similar failure mode. An outside contractor (Rail Sciences Inc.) will assist WSRC in investigating the cause and appropriate corrective actions for this event.

**H-Canyon:** In May, WSRC implemented a revised safety basis at the H-Canyon facility. Several criticality controls were modified as a part of this revision. During performance of a sump flush, an operator failed to comply with a procedure and violated a single criticality defense. The procedure required verification of adequate acid in a head tank prior to transfer to the sump receipt tank. In this case, the operator did not verify acid level in the head tank prior to transferring to the sump receipt tank. This procedure was revised as part of the safety basis revision. Operator training was performed on the overall safety basis change; however, specific training on procedural changes appears to have been inadequate. As a part of the corrective actions for this event, the first line supervisors will review revised procedures with operators prior to execution in the field.