

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 20, 2002

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 December 20, 2002

HLW Safety Basis Upgrade: On Friday DOE-SR issued their Safety Evaluation Report approving the new HLW Documented Safety Analysis (site rep weekly 6/28/02).

Tank 40 Hydrogen Release: In late-November, Tank 40 experienced a rapid, and unexpected, release of trapped hydrogen gas after completion of a short slurry pump run supporting post-maintenance testing (site rep weekly 11/22/02). In response, WSRC opened a New Information investigation to identify the cause and potential impacts of this phenomena.

With the exception of this recent anomaly, site operational experience has indicated that release of trapped gas requires energetic agitation with slurry pumps and that gas release ceases once slurry pumps are stopped. This empirical data was obtained from experience with either unwashed sludge or washed sludge that had not built up a significant inventory of trapped gas due to relatively frequent agitation. The Tank 40 material, which exhibited the anomalous trapped gas release behavior, was washed sludge that had been undisturbed for an extended period of time due to the current DWPF outage. WSRC believes that sludge washing likely decreases the amount of energy necessary to evolve trapped gas and suspects that this phenomena may have been masked previously because the time required to completely evolve the small trapped gas inventories from washed sludge was shorter than slurry pump run durations. Review of previous operational data with washed sludge is on-going to validate these hypotheses.

Regarding potential safety basis impacts, WSRC concluded that operations remained within the approved safety envelope and that a positive USQ did not exist. The quiescent time program credited in the safety basis requires that trapped gas be periodically evolved such that an instantaneous release of all trapped hydrogen to a tank head-space and subsequent radiolytic generation would not result in 100% of the lower-flammable limit (LFL) concentration being reached in less than 9 days. Since the periodicity of trapped gas evolution controls are based on an assumption of instantaneous release, the unexpected release behavior in Tank 40 remained bounded and the existing controls were adequate to ensure that 100% LFL would not be reached in less than 9 days. However, based on operational prudence considerations, the periodicity of trapped gas evolutions in sludge washing tanks will be increased to minimize the potential transient hydrogen concentrations in tank head-spaces.

FB-Line Deinventory Acceleration: Deinventory of FB-Line is a key activity in the overall plan for deactivation of F-Canyon. The baseline plan was to complete DOE-STD-3013 packaging of plutonium metal and oxide by December 2005 and to deinventory the facility by September 2006. Recently, DOE-SR requested WSRC to include 3013 packaging of composites materials received from Rocky Flats (approximately 200 to 250 cans). WSRC has developed a preliminary schedule to include this scope and to accelerate completion of 3013 packaging by 12 months to December 2004. To achieve this acceleration, WSRC will adjust facility resources early next year to operate welding activities 24 hours, 5 days a week. This includes bagless transfer can operations in January and outer can operations in April. In addition, WSRC plans to support furnace stabilization activities 24 hours, 6 days a week. Additional facility operators will be required to support this schedule once outer can welding operations begin. WSRC believes that these changes along with appropriate support activity adjustments will support the additional scope and accelerate completion of packaging by 12 months.