

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 26, 2000

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
**FROM:** C. H. Keilers / R. T. Davis  
**SUBJECT:** SRS Report for Week Ending May 26, 2000

**FB-Line:** This week, certified weld inspectors completed visual inspections of all the existing bagless transfer cans. No weld anomalies were identified in the several hundred cans inspected. During the last two weeks, FB-Line has been performing cold runs of the bagless transfer system, including welding cans. The DOE readiness assessment is expected to begin on June 6.

During the last 3 weeks, FB-Line has had 3 occurrences involving airborne monitoring systems. Two involved improper valve positioning, leading to reduced monitoring and incorrectly posted spaces. In one case, an annual calibration was missed. In another, a remote low-flow alarm failed, leading to a need to check all similar alarms in the facility. The need for improved maintenance, coordination, and training has been recognized and is being addressed by facility management. (3.a)

**F-Canyon:** Second Pu Cycle had 2 occurrences in the last week that were primarily due to operator error but were also facilitated by the distributed control system (DCS). In one case, a DCS operator was increasing solvent temperature using steam. He was observing the monitor and intended to increase steam flow slowly by pressing the slow "slew" key. He inadvertently pressed the fast slew key several times instead. The valve design permitted a rapid increase in steam to the solvent heat exchanger. He quickly recognized his error but was unable to stop the solvent temperature from reaching the DCS interlock set-point, resulting in cycle shutdown.

In the second case, maintenance personnel were performing a post-installation test on a neutron monitor circuit by injecting a false high count rate test signal. The DCS automatically responded by flushing the bank to reduce the count rate. This resulted in about 15 gallons overflowing a tank into the sump. The DCS functioned as design but provided no indication of interlock activation to the operator. Earlier, the operator and supervisor had acknowledged a high count rate alarm but failed to recognize the DCS interlock function. Additional factors are (a) previous procedural requirements to by-pass the neutron monitors were deleted in a revision and (b) the facility could have manually isolated flow to the automatic valves, since the cycle was shutdown. F-Canyon is preparing a recovery plan for both these occurrences. (3.a)

**Safety-Related Instrumentation and Control Systems:** Last week, a site representative accompanied DOE-SR and WSRC personnel on a vendor review for safety-related Instrumentation and Control (I&C) systems. Two vendors were visited that have qualified programmable logic solvers for application in safety systems in accordance with Instrument Society of America (ISA) standard S84.01, *Application of Safety Instrumented Systems for the Process Industries*. These systems, along with appropriately designed sensors and final elements (e.g., shutdown valves), appear to be appropriate for safety-significant I&C systems. WSRC has adopted the ISA standard and will use it for all new system designs. For existing systems, the WSRC nuclear materials stabilization division is developing a path forward to identify cost effective improvements consistent with this standard. The site representatives believe it would be prudent to develop similar backfit plans across the site and at other DOE defense nuclear facilities. (1.a)