

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 22, 1999

MEMORANDUM FOR: G. W. Cunningham, Technical Director
FROM: J. Kent Fortenberry
SUBJECT: SRS Report for Week Ending January 22, 1999

H-Canyon Transfer of HEU Solution to Outside Facilities - One of the new controls recently added to highly-enriched uranium (HEU) solution storage tanks is a minimum nitric acid concentration of 0.5M to prevent uranium precipitation that might result from the buildup of di-butyl phosphate, a decomposition product of tri-butyl phosphate (see 5/29/98 weekly report). The transfer of HEU solution to an outside storage tank in December was recently determined to have violated this 0.5M acidity limit.

When the 0.5M acidity control was implemented, acid was added to applicable outside facility storage tanks to establish a >0.5M acid heel. This baseline, combined with ensuring transfers from H-Canyon to be >0.5M acid and quarterly samples and analyses of the storage tanks, were relied on to meet the >0.5M acid requirement. However, two tanks not previously considered HEU storage tanks were put into service for that purpose in December. Preparations to utilize these tanks included the introduction of flushwater to verify operability of tank instrumentation. When the transfer of HEU solution to these two newly designated storage tanks began, one tank was empty but the second tank contained the flushwater. Although facility operations were aware of the flushwater, the dilution of acid concentration was not considered. The fact that the resulting tank acid concentration was less than 0.5M was determined this week upon performing the quarterly sample and analysis.

WSRC will add nitric acid to re-establish a >0.5M acidity. Initial discussion indicated that there were no plans to add a verification of the acidity of target tanks prior to transfers, as this was now not necessary since adequate acidity had been established in all tanks. Comments were provided to both WSRC and DOE to consider adding such a verification to prevent future, unanticipated recurrences.

The 0.5M HNO₃ requirement is based on a di-butyl phosphate concentration of about 86 ppm, at 0°C, and for a uranium concentration of 12 gm-U/liter. The material involved in this event was at about 1.2 gm-U/liter, less than 10 ppm di-butyl phosphate, and at a temperature closer to 20°C.

DOE-SR Identification of Technical Staffing Needs - Although the recently issued DOE-SR Critical Technical Staffing Management Plan concludes that its workforce is "a well-trained, capable technical workforce and has no critical gaps in its ability to oversee the safe operations of the site," the plan did identify a limited number of staff qualified in the Technical Expert area (see 1/8/99 weekly report). In response to this technical capability need, DOE-SR has announced plans to pursue "critical hires" for seven scientific/engineering positions in 1999. The areas of technical expertise identified for these positions include Natural Phenomena, Criticality Safety, and Material Accountability and Control.