

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 12, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: J. S. Contardi/M.T. Sautman, SRS Site Representatives
SUBJECT: SRS Report for Week Ending August 12, 2005

Savannah River National Laboratory: After performing an acid digestion of a 0.5 gram sample, contamination was found on a worker's shoe while exiting from a radiological buffer area. A followup survey of the lab found 40,000 dpm/100cm² on the floor. Although the personnel contamination was low, 1500 dpm α , the digestion sample was from the 800 series underground tanks in F-Area and had a high specific activity ($> 10^9$ dpm α per gram, $> 10^8$ dpm β/γ per gram). Given the high specific activity of this material, the laboratory may be better served by performing these operations in a glovebox rather than using a radiological hood. In addition, several deficiencies were noted with the response of radiological personnel to the contamination event.

Radiological Work Planning: In FB-Line, a worker received ~250 mrem to his hand while stabilizing americium (Am) oxide in a grout matrix. The measured dose rate of 25 R/hr on contact exceeded the radiological work permit suspension guideline of 3 R/hr on contact. The high purity Am oxide (~50 Ci) was legacy material retrieved from the Multi-Purpose Processing Facility in F-Canyon. The primary cause of the event was an inadequate hazard analysis although less than adequate radiological surveys contributed to the exposure. The site contractor is evaluating the event and developing a path forward to safely remove the stabilized material from the glovebox.

Building 232-H: The site reps walked down Building 232-H, a former tritium extraction and purification facility, that should be completely deactivated by this fall. Only limited ventilation will be provided during the next several decades while residual tritium is allowed to decay. At the site reps' suggestion, facility personnel agreed to review the lessons learned at Building 247-F, where significant mold growth required extensive mitigation during decommissioning.

Plutonium Uptake: As discussed previously (Site Rep weekly 6/17/05), a routine bioassay from an operator at the Solid Waste Management Facility was positive for Pu-239 and Pu-238. Following an exhaustive investigation, neither the source nor the time of the uptake could be definitively determined. The assigned dose was determined to be 636 mrem.

Tank 5: In 2001, ~four gallons of waste leaked into the annulus from 15 leak sites before the waste was lowered below the leak sites. In order to remove the current 11" of salt cake, tank 5 will be filled above 14 of these leak sites (105 - 110") with tank 7 supernate and inhibited water to allow the contents to be mixed for up to 240 hours before transferring the waste out. The primary driver for this fill height is that operating the submersible mixer pumps at a lower level is expected to result in a waste temperature increase that would require the pump speed to be lowered. In order to mitigate the expected leaks, the flow rate and temperature of air pumped into the annulus will be raised to increase the rate of evaporation. The annulus level will be verified shiftly with video cameras or the annulus bubbler. The annulus jet suction is 1" off the floor and could be used if more than 380 gallons leaked. Before the waste level is increased, all equipment will be staged and/or have its operability verified and required procedures will be approved.