

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 30, 2010

TO: T. J. Dwyer, Technical Director
FROM: M. T. Sautman and D. L. Burnfield, Site Representatives
SUBJECT: Savannah River Site Weekly Report for Week Ending July 30, 2010

Solid Waste Management Facility (SWMF): In 1974, workers placed a 55-gallon drum of transuranic waste containing plutonium-238 in a culvert. SWMF workers removed this drum from the culvert and overpacked it in 2008. Weeks later, real-time radiography detected ~13 gallons of liquid inside the original drum and in the annulus between the drum and the overpack. After workers moved a 55-gallon drum of transuranic waste off a pallet in Pad 16 this week, liquid began to “gush” from the bottom of the carbon steel overpack. Many gallons of liquid, possibly all 13 gallons, leaked from the overpack and drained down the sloped pad towards a sump. Pad 16 is a 160’ X 60’ concrete pad with a heavy duty polyvinylchloride-coated polyester fabric weather enclosure on top of it.

Workers immediately evacuated Pad 16. Two teams of workers entered Pad 16 later that night to take contamination surveys (wet smears up to 50 million dpm α), check the pH (8), place some absorbent material in front of the sump, and pour fixative near the drum (although the surface was wet). They left because the as-found contamination levels greatly exceeded their Radiation Work Permit suspension guides. Over the next few days, workers placed air monitors next to the exterior doors, barricaded the Pad, and taped plastic sheeting around the bottom edge of the weather enclosure’s walls to reduce water intrusion. Because the weather enclosure is not air tight (it has 7 unfiltered vents and other openings) and the Pu-238 would become extremely mobile once it dried, workers later installed 6 filtered air blowers on the wall near the sump to reduce the spread of contamination. Foggers were used to fix the contamination, but their effectiveness was likely small due to the very large enclosure volume, the limited number of foggers, and equipment breakdowns. Three days later, workers in plastic suits reentered the facility and manually applied fixatives along the sloped drain path. Workers also inserted a wand through a hole in the enclosure and sprayed fixative around the drum. Upcoming recovery activities include applying fixative to the entire liquid drain path and overpacking the breached overpack and 55-gallon drum. To date, no contamination has been detected outside the weather enclosure.

While no workers have been contaminated so far, they were not dressed adequately during the initial two entries for the contamination present (i.e., one pair of anti-contamination clothing and a respirator for first entry, two pair and powered air purifying respirator for the second). This prevented the facility from performing meaningful mitigation while the contamination was still wet and less dispersible. Rather days were spent tracking down equipment, training SWMF workers, and borrowing trained workers from the canyons. When the site rep asked SWMF personnel in June 2005 whether it was shortsighted not to maintain trained personnel and supplied air equipment for an emergency, the response was that the Fire Department would be used. However, in this instance, the Fire Department was not informed of the event until the next afternoon. Since the breach did not occur outside, it was not technically an emergency, but this was also not a normal decontamination activity inside a concrete nuclear facility with filtered ventilation either. The initial perspective of facility management was that the spill was stabilized although little more than closing the tent doors had occurred and the facility is not remotely airtight. Luckily, high winds did not cause the enclosure’s fabric to flap and “pump” out contamination through the vents and other holes. Recovery actions did not begin in earnest until a senior SRNS manager arrived at SWMF about 26 hours after the spill. Since then, recovery planning and execution has been a high priority.

Electrical Storm: A thunderstorm caused a false stack alarm at H-Canyon and damaged safety-related equipment at the Defense Waste Processing Facility. While a Remain Indoors was in affect for H-Area, a Tank 48 Limiting Condition for Operation action (due to loss of power and instrument air) to take a field reading was missed.