

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 2, 2011

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 September 2, 2011

Nuclear Safety: SRNS invited two atmospheric dispersion model developers and a meteorologist to review the collection and use of SRS-specific meteorological data in accident dose calculations. The subject matter experts compared the distribution of Pasquill-Gifford stability classes determined with SRS meteorology data to those determined by using National Weather Service (NWS at Columbia airport) and Plant Vogtle data. The NWS data indicated that the most stable classes (F and G) were present more than ten times as often as SRS data was indicating. The SMEs believe that SRS was not correctly adjusting their wind turbulence data taken at night when wind speeds are often low. Furthermore, the SRS wind turbulence data reflected not only thermal turbulence (i.e., buoyancy), but also mechanical turbulence resulting from surface roughness and plume meander. The atmospheric dispersion model used at SRS (MACCS2) requires data that only reflects thermal turbulence. The stability class bias caused dose calculations to assume more dispersion occurred during 95th percentile weather than actually occurred and thus underestimated the resulting calculated dose. Furthermore, the dose calculations using SRS meteorological data effectively double counted the impact of surface roughness. The net impact is that doses calculated using current SRS meteorological data were underreported by approximately a factor of 2.4 compared to those using NWS data. The SMEs concluded that SRS can continue to use the sigma-theta method if the turbulence data is fully adjusted per EPA-454/R-99-005. The site reps believe that it would help if DOE-STD-3009 was revised to clarify the expectations for implementing current Nuclear Regulatory Commission and Environmental Protection Agency standards.

Responding to DOE comments, SRNS withdrew their positive Unreviewed Safety Question (USQ) for the Solid Waste Management Facility. DOE and SRNS believe the above issue represents a different analysis method and thus the USQ process is not applicable. In the short term, SRNS plans to calculate doses with SRS meteorological data without crediting surface roughness since those results are fairly close to those calculated with NWS data that credit surface roughness. Longer term, the SRS meteorological data will be adjusted per EPA guidance and doses recalculated. SRNS is also having the SMEs review the issues in the Board's recent tritium letter.

HB-Line: SRNS previously restricted receipts of nuclear material at HB-Line because they might not be able to maintain the credited room exhaust flow path during large fires (see 8/5/2011 report). This week, DOE approved a Justification for Continued Operations (JCO) allowing operations to continue until April 30, 2012 or until SRNS can correct the room exhaust flow path. The JCO was required because projected doses to the collocated worker during a postulated accident approached 100 rem TED.

H-Canyon: After failing a functional test, SRNS realized they had operated the second uranium cycle six times using three incorrect temperature setpoints that were criticality controls. While the new setpoints were correctly entered into the process control module as a temporary modification, they were not saved to the configuration database when the changes were made permanent. As a result, the software passed earlier functional tests, but the setpoints reverted to the previous values when the system was rebooted in April. A review of operational data indicates that actual conditions in those six runs would not have triggered any of these setpoints.