

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 6, 1998

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
**FROM:** J. Kent Fortenberry / Joe Sanders  
**SUBJECT:** SRS Report for Week Ending November 6, 1998

**Revised Fire Scenario for 233-H (Replacement Tritium Facility)** - During discussions related to a recently submitted consolidated Safety Analysis Report (SAR) for Tritium facilities, WSRC explained that a review of fire modeling in 1995 had indicated that the previously assumed fire was not conservative. Subsequent changes in the fire modeling produced a fire with a peak temperature twice that of the previously assumed fire. At this higher temperature, the safety class Seismic Tritium Confinement System (STCS) could no longer be shown to retain its integrity. Fire represents a dominant accident scenario for many DOE special nuclear materials facilities. The site representatives pointed out that the determination that non-conservative fire modeling might under-predict peak temperatures by a factor of two should have resulted in a Potential Inadequacy in the Safety Analysis (PISA) and an Unreviewed Safety Question (USQ). These mechanisms would have provided for formal review by DOE-SR and dissemination to other facilities and sites, if applicable. WSRC stated that since they were in the process of upgrading the facility SAR, and since the changes to the fire scenario represented a change in methodology, there was no need to declare a PISA or a USQ. DOE-SR agrees that this change should have triggered a PISA and a USQ, and so allowed for the type of assessment required for a Justification for Continued Operation (JCO). DOE-SR also agrees that the PISA/USQ process would have allowed this information to be disseminated across the site as well as the complex in order to determine applicability and impact. DOE-SR has issued a letter to WSRC asking for "fire sizing assessments" for each SRS nuclear facility to confirm the adequacy of each facility's safety envelope or to identify required corrective actions. DOE-SR has also requested that WSRC provide the information needed to disseminate this issue to other sites.

**Tank 49 Benzene Generation** - Previous weekly reports (8/14/98 and 10/23/98) described the reduction in the time to reach the composite lower flammability limit (CLFL) in Tank 49 following a loss of ventilation from the current safety basis of 9 days to a conservative prediction of 3 days. This reduced time to reach CLFL was due to a larger than expected decomposition rate of tetraphenylborate (TPB) in the tank. Additional review has concluded that this time to reach CLFL could be as little as 4 hours. Previous plans to credit the ability to install portable ventilators within 12 hours following a loss of ventilation are no longer appropriate. As a result, WSRC has now inerted Tank 49 with nitrogen. The Tank 49 ventilation and inerting system had not been previously operated. This Tank 49 inerting system is similar, but not identical, to the system installed at the ITP Tank 48. WSRC is working to develop the controls that will be implemented to support a Justification for Continued Operation (JCO) for Tank 49. One speculation for the higher than expected benzene generation rate is a reduction in the hydroxide ion concentration  $[\text{OH}^-]$ . The current pH in Tank 49 is about 11.5. However, Tank 49 sampling results for various phenylborates are inconsistent with the expected decomposition of TPB in Tank 49, even at the higher rates. This inconsistency, which may even indicate decomposition of TPB solids, is being assessed. Recall that Tank 48 has a substantial inventory of TPB solids that are not considered subject to catalytic decomposition at current conditions. The site representatives met with DOE-SR to discuss the potential need for testing of various monitoring, alarm, and interlock functions of the never used Tank 49 inerting system, to identify differences between the Tank 48 and Tank 49 ventilation and inerting systems, and the need to review the time to CLFL safety basis for Tank 48.