

Saltstone Facility Analyses

**M. R. Yeung, J. E. McAllister Jr., J. A. Fishel, D. K. Allison, E. A. Henley,
T. C. Campbell, H. Hutchins, S. P. Graham, S. Chow, K. A. Harris,**

A.G. Mohiuddin, G. E. Dorfler, S. M. Lonchar

URS Safety Management Solutions

2131 S. Centennial Ave

Aiken, SC 29803

john.mcallister@wsms.com

Abstract

Modifications to the Savannah River Site (SRS) Saltstone Production Facility (SPF) are being implemented and include the installation of Salt Solution Receipt Tanks (SSRT), construction of new Salt Disposition Units (SDUs), and changing the function of the Waste Concentrate Tank (WCT). A broad overview of the facility is presented and the locations of the various analyses for the SSRTs, SDU, and WCT are shown. The analyses in the presentation are chosen to show the diversity of the accident scenarios that should be considered to demonstrate safety in a large complex facility. Transient thermal analyses were completed to demonstrate that the SSRT heat up rate was acceptably low after design changes were implemented. A second class of safety analyses is the ventilation/flammability studies that were completed for the SSRTs and WCT. Significant efforts were completed in a third class of analyses to determine the CLFL characteristics of the headspace in the SDU 2. A minimum-time grout pour schedule with ventilation of the headspace to fill the SDU was developed to maintain the headspace above the grout below a CLFL value of 60%. This parametric study varied the ventilation schedule, the temperature inside the SDU, the concentration of Isopar[®] L, and a minimum daily grout pour size. Additionally, a dose consequence calculation for an explosion event in the SDU 2 headspace was completed. Last, the technique for determining the source term of the salt-solution volume-equivalent of aerosols in the vapor space of SDUs due to splashing from operational pours is presented.