

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 13, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
J. J. McConnell, Deputy Technical Director
FROM: R. T. Davis/ T. D. Burns
SUBJECT: SRS Report for Week Ending February 13, 2004

DWPF Melter Glass Pump: This week, WSRC installed a bubbler-style glass pump in the DWPF melter. By enhancing glass mixing, the pump is expected to improve heat transfer in the melt pool. This, in turn, is expected minimize pressure spikes in the melter and increase the glass melt rate. Both of these effects should serve to increase overall waste throughput— less severe pressure spikes should result in fewer pour interruptions to clean plugged bellows, and an increased melt rate should support faster feeding and pouring.

The JCO supporting use of the glass pump recognizes that the enhanced heat transfer in the melt pool invalidates the analytic correlation between vapor space temperature and waste feed rate. This correlation is used to establish the temperature set point for the Safety Class waste feed interlock that precludes excessive hydrogen concentrations in the downstream melter off-gas system. Absent a revised correlation establishing a new temperature set point, the interlock will not be able to adequately perform its function of limiting the waste feed rate while the glass pump is in use. To protect the feed rate limit while the glass pump is in use, the JCO invokes a compensatory measure allowing operation of only one of two feed pump loops at one time (one pump loop is not capable of exceeding the feed rate limit).

The glass pump was installed as a temporary modification and the associated JCO requires its removal after six months. Continued use will require a formal design change and a corresponding Authorization Basis revision. WSRC will evaluate the performance impacts of the glass pump during the next six months and determine whether overall throughput benefits actually realized warrant a permanent design change.

TCON Project: WSRC efforts to resolve palladium loading issues in the newly designed Thermal Cycling Absorption Process columns continues (site rep weekly, 12/26/03). Cold testing during start-up revealed large void regions in the columns. It is believed that the aluminum foam column internals are impeding proper palladium loading. Parallel resolution paths are being pursued— advanced re-loading using rotation and vibration and removal of the aluminum foam by acid dissolution prior to re-loading. Should removal of the aluminum foam be required, throughput capacity of the columns will be significantly impacted.

Tank Farm Operations: On Tuesday night, a 90 ton crane hit a 480 volt overhead power line while trying to negotiate a sharp turn in the tank farms. Fortunately, no one was injured. Limited nighttime visibility was a primary factor. The area under the damaged line has been isolated and repairs are underway. Corrective actions include restricting future heavy equipment moves to daylight hours, and requiring transport path walk-downs to verify adequacy prior to movements.