

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 8, 2011

TO: T. J. Dwyer, Technical Director
FROM: D. L. Burnfield, Site Representative
SUBJECT: Savannah River Site Weekly Report for Week Ending April 8, 2011

HB-Line: Operators aligned the fans in Phase 1 of HB-line so that the next shift could perform a vibration test. For the Phase 1 glove box exhaust fans, normally one fan is running while the other fan is in standby. In this case, the operators aligned the fans so that the #1 fan was in standby and the #2 fan was running. Approximately two hours later, the operators noticed the indicator for the Phase I glove box exhaust fans specified both the #1 fan and the # 2 fan were operating simultaneously. The operators examined the glove box exhaust fans and found that the #1 fan had restarted without operator action. The operators shut down the # 1 fan, which resulted in a safety significant interlock activating

The activation of the interlock shutdown both the fans that supply air to the entire building as well as the fans that provide exhaust ventilation for the rooms which contain the glove boxes.

The operators immediately restarted glove box exhaust #1 fan. The appropriate exhaust fan for the room started automatically. By design, operators must manually restart the building supply fans, which they did. It was then recognized that the damper for the #2 glovebox exhaust fan was closed while the fan was operating, so they turned it off.

The room exhaust fans were then placed in the normal operating condition, with the #1 fan off and the #2 fan running, to allow start up of the building supply fans. The operators started the building supply fans and an interlock activated shutting down the supply fans. They attempted to restart the building supply fans again and when the required vacuum could not be maintained, the shift operations manager directed the supply fans be shut down.

The electrical and/or mechanical faults that contributed to this series of system failures have yet to be determined. The site continues to trouble shoot the system.

HEPA Filter In-Service Leak Test: The lead engineer for F/H Lab building 772-1 cell exhaust fan reported that the cell exhaust HEPA filters are only in-service leak tested when they replace the filters. He stated that this replacement occurs on a five-year cycle. The Savannah River Site Engineering Standard Number 15888, *HEPA Filter Requirements*, states:

“The schedule for these tests is normally provided in the facility Technical Safety Requirements (TSR) documents. For testable filters not listed in TSR, the time period shall be a maximum 18 months unless specified differently by the design authority.”

Thus, with the approval of the design authority, the five year replacement cycle was permitted by SRS directives because the design authority had approved the periodicity. However, the national consensus standard that applies to safety related systems, ASME N511-2007, *In-Service Testing of Nuclear Air Treatment, Heating, Ventilating, and Air-Conditioning Systems*, requires the in-service HEPA testing of HEPA filters at least every 2 years. Further, the DOE Nuclear Air Cleaning Handbook (DOE-HDBK-1169) prescribes an annual in-service leak testing frequency for all DOE HEPAs whether they are safety related or not. The site rep walked down the system in question, and will pursue why the site has requirements that seem to be at odds with the standards.