

October 30, 2009  
REL:09:048



U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Director, Office of Nuclear Material Safety  
and Safeguards  
11555 Rockville Pike  
One White Flint North  
Rockville, MD 20852

Gentlemen:

**Subject: Thirty-Day Follow-up Report to October 1, 2009 Incident Reported Under 10 CFR 70.50(b)(2); NRC Event No. 45407; AREVA NP Inc. Richland Facility; License No. SNM-1227, Docket No. 70-1257**

On October 2, 2009, the AREVA NP Inc. (hereafter called AREVA) Richland facility reported an incident involving damage to primary and final (secondary) High Efficiency Particulate Absorber (HEPA) filters in a radiological process off-gas system. The initial report was made in accordance with the reporting criteria in 10 CFR 70.50(b)(2) relative to safety equipment that is disabled or failed to function as designed. This 30-day follow-up report is being submitted in accordance with 10 CFR 70.50(c)(2).

Caller Identification

This incident was reported to the NRC Operations Center by Robert E. Link, Manager of Environmental, Health, Safety and Licensing on October 2, 2009 at 1330 hours. A follow-up courtesy call was also made to the State of Washington Department of Health Air Emissions Office.

Date, Time and Exact Location of Event

This reportable condition was discovered at approximately 1330 hours on October 1, 2009. The reportable condition (i.e., damaged primary and final HEPA filters) was observed in the off-gas treatment system of the Richland site's Solid Waste Uranium Recovery (SWUR) incinerator located within the Specialty Fuels (SF) Building.

Event Description

The discovery of the damaged HEPA filters in the SWUR off-gas system occurred at 1330 hours on October 1, 2009 as part of a follow-up investigation of a high temperature event that had occurred in the off-gas system on September 27, 2009. The incinerator had been shut down on September 25<sup>th</sup> and was fully cooled (<100°F) when on September 27<sup>th</sup> Air Balance personnel arrived to perform Dioctyl Sebacate (DOS) efficiency testing of the south bank final HEPA filters within the SWUR off-gas system. Primary (upstream) south bank HEPAs were removed from the system in preparation for DOS smoke testing of the final south bank HEPAs, during which time the off-gas flow was being routed through the parallel north bank primary and final HEPAs.

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At approximately noon while exhaust flow was still through the north bank HEPAs, wisps of smoke were observed coming from a flange downstream of the packed column air reheater, an exhaust system component located immediately upstream of the primary HEPAs and immediately downstream of the packed column scrubber. (With the incinerator in a fully cooled mode, water is not supplied to this scrubber.) Noting an elevated (414°F) temperature at the packed column scrubber, the operator initiated water flow to the scrubber column. This action quickly brought down the temperature within the packed column scrubber, the apparent location of the high temperature event.

Based on the observed events, Air Balance personnel had reinstalled the primary HEPAs in the south bank and terminated preparations for DOS efficiency testing. Exhaust flow, however, was maintained exclusively within the north bank.

Approximately two hours later, based on reports of smoke puffs being observed from the SWUR exhaust stack, personnel reexamined the off-gas system and noted wisps of smoke emanating from the north HEPA bank and elevated HEPA plenum surface temperatures. The north HEPA bank was isolated and the south HEPA bank placed online. Temperature monitoring of the north HEPA plenum was initiated and continued as temperatures declined. By 1600 hours, plenum door temperatures for the primary and final HEPA plenums were 126°F and 166°F, respectively. Periodic temperature monitoring continued over the next eight hours.

Over the ensuing days (September 28 through October 1), the incinerator and its off-gas system were progressively inspected, beginning with the incinerator itself, the Venturi scrubber immediately upstream of the packed column scrubber, and the bottom (upstream) end of the packed column scrubber. Opening of the north HEPA banks occurred on October 1 at 1330 hours. Inspection of the primary and final HEPAs, initially in-place at that time and again after removal on the next day, precipitated the 10 CFR 70.50 notification to the NRC. The bottom filter of the two parallel primary HEPAs showed localized damage; damage to the lower of the two parallel final HEPAs was extensive.

#### Safety Significance of the Event

This event occurred with the incinerator in the out-of-service mode and was of low safety significance relative to both environmental and worker safety.

The highest calculated stack concentration was  $2.5E-13$   $\mu\text{Ci}/\text{ml}$ , with a projected concentration of approximately  $8E-19$   $\mu\text{Ci}/\text{ml}$  at the boundary of the restricted area (orders of magnitude less than the 10 CFR 20 Appendix B Table 2 equivalent concentrations for air based upon ICRP 66 and 68 models for Type S uranium compounds). The total calculated activity of low enriched uranium released was approximately  $3E-3$   $\mu\text{Ci}$ . Thus, the potential dose to a member of the public and the effect on the environment were essentially negligible. Room air samples coincident with this event were within normal levels; thus, the risk to onsite personnel was also negligible. No external conditions affected the event.

Simultaneous failure of both primary and final HEPAs in the SWUR off-gas system was analyzed in the Integrated Safety Analysis and was found not to constitute either an intermediate or high consequent event.

This incident did not result in the activation of the site's emergency response organization or result in a declared emergency event. No press release was made or is planned. In addition

to NRC notification, a courtesy notification was made to the pertinent Washington State Department of Health office.

#### Incident Response Actions

Operators and Air Balance personnel responded appropriately to terminate and mitigate the consequences of this event. Operators isolated the location of the high temperatures and acted quickly to initiate scrubber water flow to the affected component. Conservative proactive action by Air Balance to restore the south HEPA bank to full capability (reinstallation of primary HEPAs) resulted in that component being available to receive exhaust air diverted from the north bank when high temperatures subsequently occurred in that component. Involvement of plant Health and Safety Technicians and proper and conservative utilization of respiratory protection appropriately controlled worker exposures.

#### Incident Cause

The event has been entered into the site's corrective action program and is currently under investigation. The apparent initial source of the high temperature event is the packed column scrubber and the immediately downstream air reheater. Safe access to disassemble and fully examine these components is awaiting construction of a permanent access platform. That project is underway with projected completion by mid-November.

Pending full access to the scrubber/reheater components, the preliminary opinion of the investigation team is that the event was initiated by combustible polypropylene material from the mist eliminator packing in the downstream end of the packed column being pulled into the reheater, catching fire upon contacting the heating elements, and then dropping back down into the packed column where it ignited the remaining mist eliminator and combustible packing material within the column. Hot air and burning debris from this initiating site caused the subsequent, albeit delayed, damage to the downstream HEPA filters, as previously described.

#### Corrective Actions to Prevent Recurrence

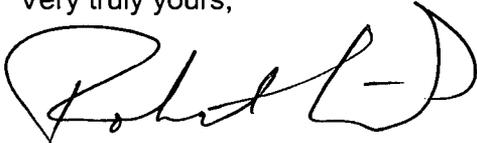
Potential corrective actions identified on a preliminary basis include:

- Replacement of the packed column packing material and mist eliminator with non-combustible materials
- Adding an interlock to deenergize the packed column air reheater whenever there is no water in the scrubber system
- Modify the auto response to high HEPA inlet temperatures to shut down the incinerator induced draft (ID) fan, deenergize the shutdown exhauster fan, and shut down the air reheater

These corrective actions may be modified and/or supplemented based on completion of the full investigation of the off-gas system components. The incinerator will remain down until the investigation is complete and appropriate corrective actions have occurred. This includes cleanup of contamination within portions of the offgas treatment system impacted by this event.

If you have questions about this incident or AREVA's investigation and corrective actions, please feel free to contact me at (509) 375-8409.

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert E. Link". The signature is fluid and cursive, with a large initial "R" and "L".

Robert E. Link, Manager  
Environmental, Health, Safety & Licensing

/mah

cc: Daniel W. Rich, Branch Chief  
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