



NUCLEAR FUEL SERVICES, INC.

a subsidiary of The Babcock & Wilcox Company

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**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

21G-10-0041
GOV-01-55-04
ACF-10-0066

February 19, 2010

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Subject: 30-Day Written Notification of Event (NRC Event No. 45642)

Reference: Docket No. 70-143: SNM License 124

Gentlemen:

On January 20, 2010, at approximately 2010 hours EST, Nuclear Fuel Services, Inc. (NFS) made a telephone notification to the NRC Operations Center of an event for which 10CFR70.74, Appendix A, (a)(4) requires a 1-hour notification. This letter provides the 30-day written notification of that event.

If you or your staff have any questions, require additional information, or wish to discuss this matter further, please contact me or Mr. Randy Shackelford, Nuclear Criticality Safety Manager, at (423) 743-2504. Please reference our unique document identification number (21G-10-0041) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

David L. Kudsin
President

WRS/smd

Attachment

1E72
NM55

cc: Regional Administrator
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D.L. Kudsin to U.S. NRC
February 19, 2010

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Attachment

30-Day Notification of Reportable Event

(3 pages to follow)

30-Day Notification of Reportable Event

1. The date, time, and exact location of the event

The issue was discovered on January 20, 2010 at approximately 1935 hours (EST). The report of the event was made on January 20, 2010 at approximately 2010 hours (EST). The locations of the associated stored materials are Building 306E and Building 311 in the 300 Complex at the Nuclear Fuel Services, Inc. (NFS) site, located in the town of Erwin, Unicoi County, Tennessee.

2. Radiological or chemical hazards involved, including isotopes, quantities, and chemical and physical form of any material released

There are potential radiological and chemical hazards associated with Uranium Hexafluoride and there are potential chemical hazards associated with Fluorine. There were no materials released.

3. Actual or potential health and safety consequences to the workers, the public, and the environment, including relevant chemical and radiation data for actual personnel exposures to radiation or radioactive materials or hazardous chemicals produced from licensed materials (e.g., level of radiation exposure, concentration of chemicals, and duration of exposure)

There were no actual health and safety consequences to the workers, the public, or the environment. There were also no personnel exposures to radiation, radioactive materials, or hazardous chemicals produced from licensed materials. The potential safety consequences to the workers were those associated with Fluorine gas. These potential safety consequences were low due to the stable condition associated with the materials (i.e., UF₆ in cylinders, cylinders in DOT shipping containers, etc.).

4. **The sequence of occurrences leading to the event, including degradation or failure of structures, systems, equipment, components, and activities of personnel relied on to prevent potential accidents or mitigate their consequences**

Subsequent to the Commercial Development Line (CDL) fire event that occurred in November 2009 (refer to NRC Event Report No. 45497), NFS engineering initiated a detailed investigation to estimate the fluorine gas content and pressure associated with UF₆ cylinders in storage. Using alpha particle radiolysis of UF₆ as the model for fluorine gas generation, a phenomenon supported by literature from the Department of Energy (DOE), NFS engineering estimated that a fraction of the UF₆ cylinders in inventory were pressurized above the working pressure of 200 PSIG; and, a few were estimated to be pressurized above the hydrostatic test pressure of 400 PSIG. This situation presented a potential risk associated with the stored cylinders and in the future handling and processing of the cylinders. NFS took immediate steps to post an exclusion zone around the cylinder storage areas and provide enhanced fire safety support until a thorough hazards analysis could be completed for the pressurized cylinders.

NFS performed a hazards evaluation for the storage of the cylinders. In addition, a team of technical experts (with UF₆-specific knowledge and from other facilities) was assembled to evaluate the storage of cylinders and provide recommendations for future processing of the cylinders. The team concluded that based on an evaluation of storage incident scenarios (Low probability and Low consequence), pressure estimates in cylinders being significantly lower than the burst pressure of the cylinders, the projected burst pressure of valves/fittings being above the maximum cylinder pressure, and the number of high pressure cylinders that have already been eliminated through processing, the current storage situation is stable. The team agreed that initial pressure calculations were conservative; vessel burst pressure calculations are a factor of 5 times above the maximum estimated fluorine pressure. The team also concluded that a catastrophic cylinder failure was not credible. In addition, the team concluded that NFS had taken appropriate measures to 1) post the area, 2) verify operability of smoke detection and sprinkler systems, 3) establish fire patrols, 4) restrict access, and 5) stage dry chemical extinguishers.

5. **The probable cause of the event, including all factors that contributed to the event and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned**

The probable cause of the event was insufficient information related to potential UF₆ cylinder pressurization and presence of fluorine gas within the cylinders prior to the receipt and storage of cylinders at NFS.

No equipment failed or malfunctioned.

6. **Corrective actions taken or planned to prevent occurrence of similar or identical events in the future and the results of any evaluations or assessments**

The issue was entered into NFS' Problem Identification, Resolution, and Correction System (PIRCS) as Problem Identification No. 22949. A root cause evaluation and extent of condition reviews were performed. It was determined that information related to the potential pressurization of UF₆ cylinders and the potential presence of fluorine gas was not adequately communicated to, or within, NFS. As a result of the extent of condition reviews, no similar conditions were discovered. To address the possibility of receiving materials in the future that may have less than adequate material characterization (e.g., new contracts), protocols are being established to address this issue in the contract/proposal stage. Current contracts/materials are currently being reviewed to determine if the existing characterization is adequate.

7. **If the event involved an area or equipment with an approved Integrated Safety Analysis, whether the event was identified and evaluated in the Integrated Safety Analysis**

The event was associated with an area having an approved Integrated Safety Analysis (ISA). Accident sequences associated with pressurized UF₆ cylinders and the presence of fluorine gas were not specifically identified and evaluated in the ISA.

8. **The extent of exposure of individuals to radiation or radioactive materials**

No individuals were exposed to radiation or radioactive materials as a result of this event.