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21G-09-0052
GOV-01-55-04
ACF-09-0087
April 2, 2009

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

Subject: 30-Day Written Notification of Event (NRC Event No. 44887)

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

Gentlemen:

On March 3, 2009, at approximately 1522 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, (b)(2) requires a 24-hour notification. This letter provides the 30-day written notification of that event.

Attachment 1 contains sensitive information and is marked as "Official Use Only," and is not suitable for public release. A redacted version of this submittal suitable for public disclosure is being provided as Attachment 2.

If you or your staff have any questions, require additional information, or wish to discuss this matter further, please contact me or Ms. Jennifer Wheeler, Licensing and Integrated Safety Analysis Manager, at (423) 735-5429. Please reference our unique document identification number (21G-09-0052) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

B. Marie Moore
Director of Safety and Regulatory

EAS/pdj
Attachments

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Contains Circumvention of Statute
Information. Nuclear Regulatory
Commission approval required prior to
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Attachment 2

Redacted Version

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 event occurred on March 3, 2009, at approximately 1024 hours (EST). The report of the event was made on March 3, 2009 at approximately 1522 hours (EST). The event occurred in Area F of Building 302 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 were no radiological or chemical hazards associated with the event. Specific information concerning the materials typically located in the related areas is as follows:

Isotopes	93 wt.% ²³⁵ U
Quantities	Classified
Chemical Form	Classified
Physical Form	Classified

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 workers, the public, or the environment. There were also no personnel exposures to radiation, radioactive materials, or hazardous chemicals produced from licensed materials.

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

Area F is part of the solvent extraction uranium recovery process. The solvent extraction process removes usable uranium and strips out impurities from the solution. An organic solvent and nitric acid are used as part of this process. Colum-0F13 is a strip column which has organic solvent flowing into the bottom and usable uranium/nitric acid entering from the top. After passing down through the solvent, the nitric acid exits Column-0F13 from the bottom, into feed Column-0G04. Column-0G04 then feeds into evaporator Column-0G05. If solvent were to enter Column-0G05 and begin reacting with the heated nitric acid while the system was closed (i.e., no vent relief) then a potential overpressurization or "red oil" accident could occur. The scenario assumes that the reaction continues (self-heating) even though the heaters are shut off.

IROFS FAF-19 consists of flow switch FS-0F13, located in Column-0F13, which is interlocked to PUMPMT-0F19. [REDACTED]

[REDACTED] If flow switch FS-0F13 senses loss of Column 0F13 interface, PUMPMT-0F19 shuts off which stops flow into Column 0G04 and thus into Column-0G05.

[REDACTED] The regularly scheduled [REDACTED] Test was performed on March 3, 2009, and the purpose of the test is to demonstrate that the flow switch will fall when interface is lost and thus will shut off PUMPMT-0F13. The test failed because the flow switch did not fall, so the pump did not stop (PIRCS Problem #17584). Though there are defense in depth factors such as procedural requirements for operators to verify that no solvent is present in feed Column-0G04 prior to operation of evaporator Column-0G05, it was determined that IROFS FAF-19 was degraded and that the performance criteria of 10CFR70.61 were not met.

IROFS FAG-12 is an open vent that is credited as an additional control that is in place to prevent overpressurization due to self-heating. However IROFS FAF-19 is also required to be available in order to meet the performance criteria.

Previous [REDACTED] testing of the flow switch in January 2009 identified a potential problem with the flow switch sticking. As follow-up to that occurrence, the area process engineer reduced the [REDACTED] testing frequency from semi-annual to its current frequency of monthly in order to provide better indication if a problem was developing. Area F is currently in a safe condition and is operating under revised IROFS.

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 system design uses a safety control flow switch to shut off the pump and discontinue flow under certain conditions. The level control switch uses a pressure to current transducer and when pressure is lost, the level control sensor will shut off the pump. The flow switch that failed is a LINC Level Control Switch Model # L471-24-05. The safety control is the interlock from the flow switch that shuts off the pump. The interlock prevents organic solvent and nitric acid from reaching evaporator Column-0G05.

Prior to performing the [REDACTED] Test, both the pump and level control switch were running under normal conditions. The level control switch would send a pressure signal to a pressure to current transducer. The transducer would convert the signal to a current signal allowing the pump to continue to operate. During the [REDACTED] test, the interface was manually brought down [REDACTED] while the system was operating. As the interface steadily drops, the level switch should steadily fall as well. Once the interface drops down to a certain point, the level control switch should completely fall and lose its pressure thus causing the transducer to have no pressure signal and shutting off the pump. However, during the [REDACTED] test the level control switch did not fall thus allowing the pump to continue to function. The failure was caused either by material build up under the level control switch or by a faulty switch.

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 level control switch and pump were tagged out of service upon failure of the [REDACTED] test. The system was unable to be repaired by replacing the old level control switch with a new

[REDACTED]

level control switch because one was not available. A new level control switch has been ordered. A procedure modification was made to require operations to inspect level in feed Column-0G04 every thirty minutes. The new procedural modifications removed the level control switch and pump [REDACTED] until the new level control switch can be installed and evaluated over a period of time.

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) in which an accidental overpressurization is determined to be highly unlikely through the application of IROFS. The accident sequence associated with this report was 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.

[REDACTED]