



Global Nuclear Fuel

A Joint Venture of GE, Toshiba, & Hitachi

Global Nuclear Fuel – Americas, LLC
Castle Hayne Rd., Wilmington, NC 28401

November 2, 2010

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Subject: 30-day Report of Event – UO₂ Furnace Loss of Geometry

References: 1) NRC License SNM-1097, Docket 70-1113
2) GNF-A Event Report 46305, 10/3/10

Dear Sir or Madam:

In accordance with 10CFR70.50(c)(2), the Global Nuclear Fuel – Americas L.L.C. (GNF-A) facility in Wilmington, North Carolina hereby submits the required written report for the October 3, 2010 notification (Reference 2) involving a loss of a criticality safety control in the Fuel Manufacturing Operation sintering furnace process area.

The applicable information required by 10CFR70.50(c)(1) was submitted by facsimile on October 3, 2010, and is included as an attachment to this letter.

Additional information is provided as follows:

Event Details and Safety Significance

At approximately 1240 on October 1, 2010 an operator received a pusher overload alarm on the Line #3 UO₂ furnace. At approximately 1330 on October 2, 2010 it was discovered that boats of fuel pellets had become stacked. The stacked boat condition was discovered after two pellet boats were removed from the entrance of the furnace. With these pellet boats removed, the stacked pellet boats were observed and notifications were made per internal procedures.

The furnace was shutdown to perform a full investigation, and the as-found condition indicated that while there were a total of 22 pellet boats (approximately 330 kg net weight) in the furnace at the time of the jam, 5 pellet boats (approximately 75 kg net weight) were involved in the actual furnace jam condition, which resulted in the loss of geometry control. Approximately 15 kg of UO₂ pellets were found outside the limits of the pellet boats.

An investigation determined that the jam condition was a result of pellet boat misalignment inside the pre-heat section of the furnace. The cause of the pellet boat misalignment was determined to be a misaligned charge pusher. The misaligned charge pusher allowed a pellet boat to strike the entrance doorframe and become misaligned on top of a pellet boat skid. The investigation team was able to recreate the scenario where a pellet boat is misaligned as a result of striking the doorframe, thereby allowing misaligned pellet boats to enter the main furnace tunnel.

The sintering furnace process has independent controls on geometry, which limit the process to a single layer of boats; and moderation, which prevent water and other forms of moderator from entering the process. In this event, the geometry control was compromised; however the moderation control remained intact. The stacked boat condition has been analyzed as a process upset condition and is demonstrated safe in a documented safety analysis.

While this discovery did not result in an unsafe condition, it was reported pursuant to the requirements of 10CFR70 Appendix A(b)(1) within 24 hours.

Immediate Corrective Actions

- Automated furnace boat stoking system was shutdown following overpressure alarm condition. Completed October 1, 2010.
- Verified all main and crossover pushers to be aligned and functioning properly. Completed October 4, 2010
- All furnace boats and skids were inspected according to procedure to ensure acceptable condition. Completed October 7, 2010.
- Line 3 sintering furnace was placed in cool down mode (shutdown). Cool down initiated October 4, 2010. Completed October 19, 2010.
- After providing temporary compensatory measures to prevent moderator (water) intrusion into the furnace, Line 3 furnace was disassembled and geometry control was restored. Completed October 20, 2010.

Probable Cause of Event

Probable cause of the event was attributed to a misaligned charge pusher system that allowed a loaded boat to turn and jam inside the furnace.

A root cause investigation determined that stoking system maintenance procedures lacked sufficient detail on how to verify alignment (inadequate preventive maintenance).

Near-term Corrective Actions Taken

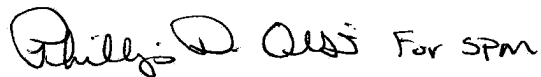
- All other similar sintering furnaces in operation were inspected for a similar potential condition. The charge pushing mechanism was verified to be functioning properly on the other operating furnaces. Completed October 29, 2010.
- Implement periodic pusher alignment verification by Area Engineer until improved verification and preventive maintenance measures are implemented. Scheduled completion November 5, 2010.

Long-term (Preventive) Corrective Actions

- Evaluate integrated safety (ISA) documentation and item relied on for safety (IROFS) determination for revision or augmentation. Scheduled completion – December 31, 2010
- Implement improved verification and preventive maintenance measures on furnace pusher systems. Scheduled completion – February 11, 2011.

If additional information is needed regarding this report, please contact me on (910) 819-5950.

Sincerely,

 For SPM

S.P. Murray, Manager
Licensing and Liabilities

Attachment

cc: SPM 10-049
NRC Region II Administrator, Atlanta, GA
M.T. Adams, HQ Washington, DC
M.L. Thomas, Region II, Atlanta, GA

Attachment – Event Description

At approximately 1330 on October 2, 2010 it was discovered that boats of fuel pellets had become stacked in a UO₂ sintering furnace located in the GNF-A Fuel Manufacturing Operation. The furnace had been shutdown due to an apparent boat jam, which was detected by an overload sensor on the equipment that pushes boats into the furnace. This sensor is designated as an IROFS in the ISA Summary. The stacked boat condition was discovered after process engineering removed two boats of fuel from the entrance of the furnace as part of the boat jam investigation. With these boats removed the stacked boats could be clearly seen and proper notifications were made to management.

The sintering furnace process has independent controls on geometry, which limit the process to a single layer of boats, and moderation, which prevent water and other forms of moderator from entering the process. In this event the geometry control was compromised however the moderation control remained intact. The stacked boat condition has been analyzed as a process upset condition and is demonstrated safe in a documented safety analysis.

The IROFS that were intended to detect a misalignment of boats functioned properly during the event as the misalignment was detected. The IROFS mitigated the severity of the boat jam and the furnace operation was shutdown due to the misalignment. This event did not result in an unsafe condition, however the declared IROFS did not prevent the loss of geometry and resulted in a failure to meet performance requirements.

As a result, this event is being reported pursuant to 10CFR70 Appendix A (b)(1).

Scott Murray
Manager, Licensing & Liabilities
10/3/2010, 1300 PM