



**Global Nuclear Fuel**

A Joint Venture of GE, Toshiba, & Hitachi

**Global Nuclear Fuel**

**Scott P. Murray**

Manager, Facility Licensing

3901 Castle Hayne Road  
P.O. Box 780  
Wilmington, NC 28402  
USA

T (910) 819-5950  
F (910) 362-5950  
scott.murray@ge.com

SPM 12-030

June 29, 2012

US Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

Subject: Reply to Notice of Violation

References: 1) SNM-1097, Docket 70-1113  
2) NRC Inspection Report No. 70-1113/2012-002 and Notice of Violation, 4/30/12  
3) GNF-A Extension Request, S.P. Murray to M. Sykes, 5/18/12  
4) NRC Approval of Request for Extension, M. Sykes to S.P. Murray, 5/25/12

Dear Mr. Sykes:

Enclosed with this letter is Global Nuclear Fuel – Americas, LLC's (GNF-A) response to the Notice of Violations described in Reference 2.

Attachment 1 provides GNF-A's response to the violations.

Please contact me at (910) 819-5950 if you have any questions or would like to discuss this matter further.

Sincerely,

Scott Murray, Manager  
Facility Licensing

Commitment: Complete long term preventive actions by 3/31/13

cc:

V. M. McCree, NRC Regional Administrator, Region II Atlanta  
M. L. Thomas, NRC Region II, Atlanta  
T. G. Hiltz, NRC NMSS, Washington, D.C.  
M. N. Baker, NRC NMSS, Washington, D.C.  
L. Cox, NCDECNR

Attachment 1

The information provided below summarizes the Notice of Violation 03 dated April 30, 2012 associated with NRC Inspection Report 70-1113/2012-002

**VIOLATION NO. 2012-002-03**

During an NRC inspection conducted between January 1 and March 30, 2012, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. 10 CFR 70 Appendix A (a)(4)(i), Reportable Safety Events, states, in part, that licensees shall report events to the NRC Operations Center within 1 hour of discovery, an event or condition such that no IROFS, as documented in the ISA Summary, remain available and reliable to perform their function in the context of the performance requirements in § 70.61(b) and § 70.61(c).**

**Accident sequence, 3.4.3, A Fixed Combustible Fire Occurs in the Press Area, of Quantitative Risk Assessment (QRA), QRA-401/503, "Fabrication - Press", Revision 0, designates the feed tube level sensor as a SOLE IROFS 503-16 for the Gadolinia (gad) Press. The QRA also states that the failure of the feed tube level sensor IROFS is failure to stop feed when the specified limit is reached.**

**Contrary to above, at approximately 9:47 a.m. on February 13, 2012, the licensee failed to report to the NRC Operations Center within one hour of discovery an event such that no IROFS, as documented in the ISA Summary, remain available and reliable to perform their function in the context of the performance requirements. Specifically, on February 13, 2012, SOLE IROFS 503-16 failed for approximately one hour. The mass limit of 36 kilograms (kgs) in the gad press feed tube was exceeded when the feed tube level sensor failed to stop feed when the specified limit was reached. As a result, no IROFS remained available and reliable for this high consequence accident sequence, and a one-hour report was required to be performed.**

**This is a Severity Level IV violation (Section 6.9).**

**GNF-A's Response to Violation:**

GNF-A does not contest the violation for failure to report the event.

**1) The reason for the violation**

As documented in the GNF-A criticality safety analysis, three controls are provided to prevent a criticality accident in the gadolinia rotary press operation:

- 1) Geometry – the gad press is limited to a 4 inch diameter powder feed system**
- 2) Moderation – the powder from the 3 gallon can feed system is limited to not more than 50,000 ppm equivalent water by upstream controls. In addition, the process equipment is designed to minimize the potential for significant water intrusion.**
- 3) Mass – Feed powder is limited to not more than 36 kg via a feed tube upper level sensor which automatically stops a rotary feed valve. The press feed mass control was conservatively designated as a sole IROFS on February 2, 2012 in the accident sequence for a fixed combustible fire occurring in the press area.**

The geometry and moderation controls are not considered independent because a large fire scenario is recognized as a common mode failure that has the potential to defeat both controls; however, because of process equipment material of construction, a fire of significant size and duration would

be needed to impact both of these controls. Should a fire occur in the press operations area, the consequence of concern is a criticality accident resulting from the development of unfavorable geometries and the introduction of moderator as a result of firefighting activities. The total initiating event frequency for a fixed combustible fire in the area is  $7.0 \times 10^{-4}$  events per year.

In the event that occurred and was discovered on February 13, 2012, an improperly installed rotary feed valve allowed a total of approximately 43 kg to enter the feed tube which exceeded the 36 kg mass limit. This resulted in a condition where a required criticality control was not maintained and the process was immediately shutdown and secured. Since a fire did not occur, the other controls on geometry and moderation were maintained and available to prevent a criticality accident.

For reportability determination, GNF-A was guided by NRC's guidance "NRC Fuel Cycle Safety Interim Staff Guidance (ISG)-12", (July 2010). ISG-12 states that a report is required except when:

IROFS listed for other accident sequences are applicable to the accident sequences where the ISA summary indicates that the failed or degraded IROFS were needed to meet the performance requirements. These other IROFS must be in place physically where the event occurred; the IROFS must also perform a safety function that prevents or mitigates the event in question. In this case, the performance requirements were met, but had not been adequately demonstrated in the ISA Summary.

GNF-A had available, reliable and physically in-place IROFS where the event occurred listed for other accident sequences. These other IROFS perform a safety function that would have prevented the event in question (criticality accident) and are documented in the ISA Summary, Revision 15 dated January 30, 2012. The applicable IROFS listed for other accident sequences are geometry (IROFS 30304) and moderation (IROFS 30301), and both remained available to perform their intended safety function throughout the event.

Consequently, based on the Staff's guidance, GNF-A concluded that the event condition was not reportable.

2) Short term corrective actions taken

- 1) The GNF-A internal reportability procedure (WI-27-104-01) has been revised to clarify the reporting determination process for a failed or degraded sole IROFS that could lead to a one hour event report. Complete: March 29, 2012
- 2) The fabrication ISA Summary has been updated to more clearly describe the press operation controls for a potentially challenging fire in or near the press operations area. Complete: April 30, 2012.
- 3) The event has been reported to the NRC Operations Center. Complete: June 29, 2012.

3) Longer term preventive action

- 1) Enhance both the mass control (in addition to the existing feed tube level sensor) and the feed tube geometry control on the gadolinia press operation. Update the affected ISA press operation accident sequences.

Scheduled completion: March 31, 2013

4) The date when full compliance will be achieved

Full compliance has been achieved. A longer term preventive action has been scheduled.

The information provided below summarizes the Notice of Violation 04 dated April 30, 2012 associated with NRC Inspection Report 70-1113/2012-002

**VIOLATION NO. 2012-002-04**

- B. 10 CFR 70.62 (d) Management Measures, states, in part, that management measures shall ensure engineered and administrative controls and control systems that are identified as IROFS are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of § 70.61 of this subpart.**

Contrary to above, on February 13, 2012, the licensee failed to ensure that management measures for an engineered control identified as an IROFS was implemented and maintained, as necessary, to ensure that it was available and reliable to perform its function when needed, to comply with the performance requirements. Specifically, during the cleanout and re-installation of the gad press rotary valve and the subsequent start-up of the gad press, management measures were not implemented and maintained for SOLE IROFS 503-16, gad press feed tube level sensor. As a result, the critical mass limit of 36 kilograms was exceeded in the gad press feed tube due to material bypassing the valve that was not fully installed.

This is a Severity Level IV violation (Section 6.2).

**GNF-A's Response to Violation:**

GNF-A concurs with violation 04 in that there was a failure to implement and maintain adequate management measures for the gadolinia press operation feed tube mass control.

- 1) The reason for the violation

During a routine reassembly of the rotary feed valve on February 13, 2012, an operator error caused an incomplete valve assembly and led to an open pathway for powder from the feed hood to enter the feed tube. During the subsequent system startup, a second operator improperly loaded three cans of material to the feed hood. Due to improper seating of the rotary valve, material in excess of 36 kg was able to enter the feed tube. A root cause investigation determined the root causes of the event were less than adequate error prevention and detection practices and less than adequate worker oversight systems, processes and practices.

- 2) Short term corrective actions taken

- 1) Notified operations and EHS of the situation. Approval was given to run out the material in the gad press feed tube per procedure. The gad press operation was shut down along with other operations with similar feed hoods. A fit-up go-no go gauge was fabricated and implemented for the valve reassembly process to ensure proper valve assembly.

Complete: February 13, 2012

- 2) Conducted stand downs with all fuel manufacturing operators to review the event and reinforce procedure adherence expectations.

Complete: February 16, 2012

- 3) Convened a Special Wilmington Safety Review Committee (WSRC) meeting to discuss event and issued EHS stop work notice for all press feed operations.

Complete: February 16, 2012

- 4) Completed retraining and recertification of affected operators including confirmed understanding of procedural compliance expectations. Additional surveillance of fuel manufacturing activities provided by supervision and engineers.

Complete: February 20, 2012

- 5) Convened a Special WSRC meeting to review completed actions and authorize restart of fabrication press feed operations.

Complete: February 20, 2012

- 6) Established ongoing surveillances of fuel manufacture activities regarding procedure compliance.

Complete: March 12, 2012

- 3) Longer term preventive actions

- 1) Enhance management measures to ensure proper reassembly of press operation mechanical feeders.

Scheduled completion: August 31, 2012

- 4) The date when full compliance will be achieved

Full compliance has been achieved. A longer term preventive action has been scheduled.