June 17, 2009

Ms. Lisa M. Price
Facility Manager, M/C A20
Global Nuclear Fuel - Americas, LLC
P.O. Box 780
Wilmington, NC 28402

SUBJECT: INSPECTION REPORT NO. 70-1113/2009-202 AND NOTICE OF VIOLATION

Dear Ms. Price:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine announced nuclear criticality safety (NCS) inspection of your facility in Wilmington, North Carolina, from May 18-22, 2009. The purpose of the inspection was to determine whether operations involving special nuclear material were conducted safely and in accordance with regulatory requirements. An exit meeting was conducted at the conclusion of the inspection on May 22, 2009.

The inspection, which is described in the enclosure, focused on the most hazardous activities and plant conditions; the most important controls relied on for safety and their analytical basis; and the principal management measures for ensuring controls are available and reliable to perform their functions relied on for safety. The inspection consisted of analytical basis review, selective review of related procedures and records, examinations of relevant nuclear criticality safety (NCS)-related equipment, interviews with NCS engineers and plant personnel, and facility walkdowns to observe plant conditions and activities related to safety basis assumptions and related NCS controls. Throughout this inspection, observations were discussed with your managers and staff.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy included on the NRC's web site at www.nrc.gov; select What We Do, Enforcement, then Enforcement Policy. The violation is being cited in the enclosed Notice of Violations (Notice), and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified as the result of an NRC inspection. The violation being cited as a Severity Level IV violation is the failure to conduct operations according to an issued and approved procedure.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence is already adequately addressed. Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and the enclosure will be made publicly available in the public electronic reading room of the NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/ADAMS.html.

If you have any questions concerning this report, please contact Thomas Marenchin, of my staff, at (301) 492-3209.

Sincerely,

/RA/

Patricia A. Silva, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office Nuclear Material Safety
and Safeguards

Docket No.: 70-1113

Enclosures: 1. Notice of Violation
2. Inspection Report No. 70-1113/2009-202

Attachment: Supplementary Information

cc: w/enclosures: Scott Murray
Global Nuclear Fuels - Americas, LLC

cc: w/o enclosures: Beverly O. Hall
North Carolina Department of Environmental
Health and Natural Resources

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NOTICE OF VIOLATION

Global Nuclear Fuel - Americas, LLC
Wilmington, NC

Docket No.: 70-1113
License No. SNM-1097

During an Nuclear Regulatory Commission (NRC) inspection from May 18 through 22, 2009, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Safety Condition No. 1 of License No. SNM-1097 requires that material be used in accordance with the statements, representations, and conditions in the license application dated June 5, and December 7, 1999, and supplements thereto.
>
> Chapter 11.5 of the License Application states, in part, that activities will be conducted in accordance with properly issued and approved management control procedures.
>
> Procedure OP 1810.00, Gadolinium Scrap Recycle Furnace and Screener, states in part that the feed hood is limited to: one three gallon can or one rework boat from screen hood or one layer of loaded boats.
>
> Contrary to the above, on May 19, 2009, the licensee failed to conduct operations according to an issued and approved procedure. Specifically, the feed hood for the gadolinium scrap recycle furnace contained a three gallon can of pellets and a rework boat from the screen hood that contained special nuclear material.

This is a Severity Level IV Violation (Supplement VI).

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to be taken to correct the violation and prevent recurrence, and the date when full compliance was achieved, is already adequately addressed. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with copies to the Chief, Technical Support Branch, Division of Fuel Cycle Safety and Safeguards, NMSS, and Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 17 **day of June 2009**

Enclosure 1

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

Docket No.:	70-1113
License No.:	SNM-1097
Report No.:	70-1113/2009-202
Licensee:	Global Nuclear Fuel - Americas, LLC
Location:	Wilmington, North Carolina
Inspection Dates:	May 18-22, 2009
Inspector:	Thomas Marenchin, Criticality Safety Inspector
Approved:	Patricia A. Silva, Chief Technical Support Branch Division of Fuel Cycle Safety and Safeguards

Enclosure 2

EXECUTIVE SUMMARY

Global Nuclear Fuel - Americas, LLC Fuel Fabrication Facility
NRC Inspection Report 70-1113/2009-202

Introduction

Staff of the U.S. Nuclear Regulatory Commission (NRC) performed a routine and announced nuclear criticality safety (NCS) inspection at Global Nuclear Fuel - Americas (GNF), LLC, fuel fabrication facility in Wilmington, North Carolina, from May 18-22, 2009. The inspection included an on-site review of the licensee NCS program, NCS analyses, NCS-related audits and investigations, and plant operations. The inspection focused on risk-significant fissile material processing activities including the dry conversion process (DCP), dry scrap recovery, gadolinium scrap recovery, and pellet pressing operations.

Results

- A severity level IV violation was identified for the failure to comply with administrative limits for the gad scrap recycle furnace feed hood.

- An unresolved item was identified regarding possible licensee failure to declare controls related to criticality accident sequences as items relied on for safety (IROFS) and rank the sequence as high consequence.

- A weakness was identified regarding licensee procedural instructions for defining findings and observations during audits.

- No safety concerns were identified during review of NCS audits.

- No safety concerns were noted regarding licensee identified NCS-related events and corrective actions were adequately tracked by the licensee.

REPORT DETAILS

1.0 Plant Status

Global Nuclear Fuels - America, LLC manufactures uranium dioxide (UO_2) powder, pellets, and light water reactor fuel bundles at its Wilmington, NC facility. During the inspection, the facility was converting uranium hexafluoride (UF_6) to UO_2 with a DCP and performing normal powder, UO_2 and gadolinia pellet and fuel fabrication operations. Waste operations consisted primarily of packaging and storage of dry waste and processing of wet sanitary waste.

2.0 Nuclear Criticality Safety Program (88015, 88016)

a. Inspection Scope

The inspector reviewed NCS analyses to determine that criticality safety of risk-significant operations was assured through engineered and administrative controls, with adequate safety margin and preparation and review by qualified staff. The inspector accompanied NCS and other technical staff on walkdowns of NCS controls in selected plant areas. The inspector reviewed selected aspects of the following documents:

- "GEMER Monte Carlo Code Validation Report," Revision 5, dated May 2009
- CSA [Criticality Safety Analysis]-1800.00, "Gad Scrap Recycle Interaction," Revision 4, dated August 1999
- CSA "Nilfisk GM-80CR Vacuum Cleaner Unit Analysis," Revision 0, dated February 18, 2008
- CSA "Grind Rod-Load," Revision 13, dated October 7, 2008
- CSA "Rod Loader with Spring Insertion," Revision 1, dated October 17, 2009
- NSI [Nuclear Safety Instruction] E-4.0, "Criticality Safety Analysis Methods and Verification," Revision 39, dated February 6, 2009
- "GNF-A ISA Reference Report," Revision 12.1, dated February 24, 2009
- NSI E-5.0, "Nuclear Safety Release Requirements," Revision 5, dated February 16, 2009
- NSR/R [Nuclear Safety Release/Requirements] 03.06.07, "Rod-Load," Revision 5, dated August 15, 2003
- NSR/R 03.06.07, "Rod-Load," Revision 6, dated May 19, 2009
- NSR/R 05.02.25, "Empty-Can," Revision 2, dated June 9, 2000
- NSR/R 05.05.03, "Feed-Hood," Revision 1, dated April 10, 2000
- NSR/R 05.05.03, "Feed-Hood," Revision 2, dated May 21, 2009
- NSR/R 05.04.14, "Empty-Can," Revision 0, dated August 26, 1999
- OP [Operating Procedure]1810.00, "Gad Scrap Recycle (GSR) Furnace and Screener," Revision 12, dated March 13, 2009
- OP 1810.00, "Gad Scrap Recycle (GSR) Furnace and Screener," Revision 13, dated May 21, 2009
- P&P [Practices and Procedures] 10-10, "Configuration Management Program – Fuel Manufacturing," Revision 14, dated April 24, 2009

- P&P 10-20-A, “Integrated Safety Analysis,” Revision 2, dated March 4, 2008
- P&P 40-04, “Nuclear Safety Design Criteria,” Revision 16, dated July 27, 2009
- QRA [Quantitative Risk Assessment] 20.1, “Loss of Mass Control in MRA,” Revision 0, dated August 13, 2008
- TOP [Temporary Operating Procedure] 4624, “Operation of the GDSR [Gadolinium Dry Scrap Recycle] Furnace Screener while NSR/R 05.05.03 is Revised,” dated May 19, 2009

b. Observations and Findings

The inspector determined that analyses were performed by qualified NCS engineers and that independent reviews were completed for the evaluations by other qualified NCS engineers. The inspector determined that appropriate NCS controls were identified in NCS analyses and that the controls assured the safety of the operations.

The inspector reviewed selected portions of the licensee’s Preliminary Hazards Analysis, GNF-A ISA Reference Report, to review if the licensee was following the integrated safety analysis methodology as described in the License Application. The inspector observed that for various nodes (accident sequences) in the reference, the licensee had identified the consequence of the sequence as having a criticality. The licensee had ranked the sequence as severity of 1 which from their license application indicates that the sequence is an accident with radiological and/or chemical exposures to workers less than the exposures for the higher severity accidents. A severity ranking of 2 is for accidents with a radiological dose greater than 25 rem but less than 100 to workers and a ranking of 3 is for accidents with radiological dose greater then 100 rem and for a criticality accident. The licensee stated that this was done because they have determined that after the initiating event has occurred the criticality accident is not possible. The inspector determined that the licensee is possibly taking credit for upstream controls in the process to determine that a criticality was not possible. The inspector also determined that the licensee is possibly taking credit for controls that are used to prevent a criticality to lower the severity ranking of the accident. Additional review of the accident sequences is needed to determine if controls are used to show that a criticality is not possible and thus lower the severity of the accident sequence. Possible licensee failure to declare controls related to criticality accident sequences as IROFS and rank the sequence as high consequence will be tracked as **Unresolved Item (URI) URI 70-1113/2009-202-01**.

c. Conclusions

An unresolved item was identified regarding identification of controls on criticality accident sequences as items relied on for safety (IROFS).

3.0 Nuclear Criticality Safety Inspections, Audits, and Investigations (88015)

a. Inspection Scope

The inspector reviewed the licensee's internal audit procedures, records of previously completed audits of fissile material operations, and records of NCS infractions. The inspector observed a licensee audit team conduct an audit in the gadolinium shop. The inspector reviewed selected aspects of the following documents:

- Audit, "Fuel Support, Incinerator, UF_6 Cylinder Storage," dated November 4, 2008
- Audit, "Vapo, Conversion, Powder Outlet," dated November 11, 2008
- Audit, "Gad Shop, Press Feed, Rod Storage, GDSR," dated December 12, 2008
- Audit, "Fuel Support: Pads, Whse #3, WTF, Process Lagoons," dated March 23, 2009
- Audit, "DSR, ADU Powder Prep, ADU Rod Waste, FDL, FMO Rod Waste," dated April 28, 2009
- NSI E-2.0, "Internal Nuclear Safety Audits," Revision 43, dated May 7, 2009
- P&P 40-06, "EHS Regulatory Compliance Audits," Revision 22, dated July 27, 2009

b. Observations and Findings

The inspector found that NCS audits were conducted according to procedural requirements. The inspector noted that NCS audits were focused on determining that plant operational requirements conform to those listed in the applicable NCS specification documents. During the audit of the gadolinium shop, the inspector observed that the licensee's auditors carried a copy of the applicable NCS requirements, examined NCS postings, labels, and other controls and identified appropriate NCS-related deficiencies. The inspector observed that when the licensee's staff identified a deficiency during the audit it was noted and later determined to be a potential non-compliance, finding, or observation. Procedure P7P 40-06 and NSI E-2.0 defines potential non-compliance but does not define what a finding and observation. In discussing with the licensee's staff the differences between findings and observations, the licensee indicated that there is often an inconsistency between auditors on determining what is a finding or an observation. The licensee's staff indicated it would be useful to update both procedures to define what an observation and finding are to ensure consistency between their auditors. The corrective actions associated with updating NSI E-2.0 and P&P 40-06 to incorporate definitions of finding and observation will be tracked as **Inspection Follow-up Item (IFI) 70-1113/2009-202-02.** The inspectors did not identify any immediate safety concerns regarding the inconsistent procedural instructions.

c. Conclusions

A weakness was identified regarding licensee procedural instructions for defining findings and observations. Other than the weakness above, no safety concerns were identified during review of NCS audits.

4.0 Nuclear Critically Safety Event Review and Follow-up (88015)

a. Inspection Scope

The inspector reviewed the licensee's response to internally reported events. The inspectors reviewed the progress of investigations and interviewed licensee staff regarding immediate and long-term corrective actions. The inspector reviewed selected aspects of the following documents:

- UIR EHS-0805, "Online Safety Training System Crash and Incorrectly Recording Passing Score," dated October 2, 2008
- UIR FAB-0840, "Boat of Green Pellets Fell," dated October 14, 2008
- UIR FAB-0844, "Four Boats were Found with some Sintered Pellets with Water Marks," dated October 20, 2008
- UIR FAB-0902, "Multiple 125-ml Sample Vials were Improperly Stored in the GDSR area," dated March 3, 2009
- UIR [Unusual Incident Report] PP&SS-0824, "In calibration Service Request," dated March 31, 2008
- UIR PP&SS-0825, "Two Waste Oil Cans Found Exceeding Gross Weight Limit," dated October 14, 2008

b. Observations and Findings

The inspector observed that the selected licensee internally reportable events were investigated in accordance with written procedures and that appropriate corrective actions were assigned and tracked.

c. Conclusions

No safety concerns were noted regarding licensee identified NCS-related events and corrective actions were adequately tracked by the licensee.

5.0 Plant Operations (88015)

a. Inspection Scope

The inspector performed plant walkdowns to review activities in progress and to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspector interviewed operators, NCS engineers, and process engineers both before and during walkdowns.

b. Observations and Findings

The inspector performed walkdowns of the DCP, dry scrap recovery, gadolinium scrap recovery, and pellet pressing operations. The inspector observed an audit that the licensee staff was performing in the gadolinium shop. During the audit the inspector noted that the feed hood for the gad scrap recycle furnace and screener had a three

gallon can of pellets in the hood and a rework boat from the screen hood that had material in the boat. The NSR/R for the feed hood, NSR/R 05.05.03, stated the limit for the feed hood as: one three gallon can or one rework boat from screen hood or one layer of loaded boats. The normal process for work in the feed hood requires that the operator place a three gallon can of pellets in the hood and then scoop the pellets out of the can into boats. The boats are then pushed out of the hood in a single layer into the furnace. The operating procedure for the feed hood, OP 1810.00, reiterated the same limits as the NSR/R in the procedure. The operators and the licensee's staff stated that if they followed the limits on the NSR/R and operating procedure they would not be able to conduct any operations in the feed hood. Because the NSR/R and operating procedure conflicted with the normal operations in the feed hood, the licensee's staff tagged the feed hood out of service when the issue was identified. The licensee's staff initiated corrective actions to revise the NSR/R and operating procedures immediately. The licensee's staff demonstrated in the CSA for the area, CSA-1800.00, that the feed hood was modeled with a layer of double stacked boats and a three gallon can. The licensee's staff stated that when the NSR/R was generated the requirements were stated incorrectly. The NSR/R and operating procedure were updated to state the limit as: Hood is limited to a single layer of boats and either a 3 gallon can or the GDSR screener oversize bottle. This limit is consistent with what was demonstrated in the CSA. The licensee's staff had completed all corrective actions for this issue by the completion of the inspection. Failure to conduct operations according to an issued and approved procedure is **Violation (VIO) 70-1113/2009-202-03**. The licensee has adequately identified both the root cause of the violation and the corrective action to prevent recurrence. This item is closed.

c. Conclusions

A severity level IV violation was identified for the failure to comply with administrative limits for the gad scrap recycle furnace feed hood.

6.0 Open Item Review

IFI 70-1113/2008-206-01

During the previous inspection the inspector identified that during the review of the annual, web-based training required by all employees for plant access to controlled areas. The inspector observed an employee who had taken the training three separate times within one week, receiving a grade of 100% each time. Copies of the employees completed tests revealed that the employee had taken the training on a laptop which crashed at each attempt, prior to completion of the course. Each attempt was recorded by the Radiation Data Management System as a 100% score. During this inspection the inspector reviewed the licensee's corrective actions for this issue. The licensee had reviewed the scores of employees who had scored 100% on the annual refresher training and verified that the employees had completed the exam and scored 100%. The licensee staff had determined that the problem occurred because of the use of a

laptop to take the annual refresher test and now has a requirement that all annual refresher testing be completed on a desktop computer. The licensee's staff has completed all of their corrective actions for this item to prevent re-occurrence. This item is closed.

7.0 Exit Meeting

The inspector communicated observations and findings to licensee's management and staff throughout the week of the inspection and presented the final results to licensee's management during an exit meeting held on May 22, 2009. The licensee's management acknowledged the results of the inspection and understood the findings presented.

SUPPLEMENTARY INFORMATION

1.0 Items Opened, Closed, and Discussed

Items Opened

URI 70-1113/2009-202-01	Possible licensee failure to declare controls related to criticality accident sequences as IROFS and rank the sequence as high consequence.
IFI 70-1113/2009-202-02	Tracks the licensee's corrective actions associated with updating NSI E-2.0 and P&P 40-06 to incorporate definitions of finding and observation.
VIO 70-1113/2009-202-03	Failure to conduct operations according to an issued and approved procedure.

Items Closed

VIO 70-1113/2009-202-03	Failure to conduct operations according to an issued and approved procedure.
IFI 70-1113/2008-206-01	Tracks licensee actions to correct inaccurate computer scoring of annual safety refresher test results

2.0 Inspection Procedures Used

IP 88015	Nuclear Criticality Safety Program
IP 88016	Nuclear Criticality Safety Evaluations and Analyses

3.0 Key Points of Contact

Global Nuclear Fuel

A. Allen	Material Control and Accountability
C. Bough	Logistics
L. Butler	Manager, GEH-EHS
G. Dickman	Dry Conversion
M. Dodds	Senior Criticality Safety Engineer
S. Fuller	GNF Chief Operating Officer
M. Grimstead	Project Manager
A. Hilton	Engineer, Dry Conversion
A. Kennedy	GLE-Licensing
H. Knight	Manager, Fuels EHS
U. Latham	Senior Admin Specialist, Licensing and Liabilities
A. Mabry	Radiation Safety Program Manager

Attachment

K. Maloy	Radiological Safety Engineer
R. Martin	Manager Material control and Accountability
A. Mulligan	Manager, GNF-A Quality
S. Murray	Manager, Licensing
P. Ollis	Licensing Engineer, Licensing and Liabilities
L. Paulson	Manager, Nuclear Safety
L. Quintana	EHS Licensing
J. Reeves	Manager, Integrated Safety Analysis
J. Rohner	Criticality Safety Engineer
C. Savage	Engineer, Dry Conversion
T. Sloma	Criticality Safety Engineer
S. Spinola	Ceramics Engineer
A. Vexler	FMO Operations Leader
J. Zino	Program Manager, Criticality Safety

NRC

T. Marenchin	Criticality Safety Inspector

All attended the exit meeting on May 22, 2009

4.0 List of Acronyms and Abbreviations

ADAMS	Agency-wide Documents Access and Management System
CSA	criticality safety analysis
CFR	code of federal regulations
DCP	dry conversion process
FMO	fuel manufacturing operation
GDSR	gadolinium dry scrap recycle
GNF	Global Nuclear Fuels - America (licensee)
IP	inspection procedure
IFI	Inspection Follow-up Item
IROFS	item relied on for safety
ISA	integrated safety analysis
NCS	nuclear criticality safety
NMSS	Office of Nuclear Material Safety and Safeguards
NSI	Nuclear Safety Instructrion
NSR/R	Nuclear Safety Release/Requirements
OP	Operating Procedure
P&P	Practices and Procedures
QRA	Quantitative Risk Assessment
TOP	Temporary Operating Procedure
UF_6	uranium hexafluoride
UO_2	uranium dioxide
UIR	Unusual Incident Report
URI	Unresolved Item
VIO	violation