February 24, 2006

Mr. J. D. Fuller
Facility Manager, M/C A20
Global Nuclear Fuel - Americas, LLC
P.O. Box 780
Wilmington, NC 28402

SUBJECT: NRC INSPECTION REPORT 70-1113/2006-201 AND NOTICE OF VIOLATIONS

Dear Mr. Fuller:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine announced nuclear criticality safety (NCS) inspection at the Wilmington facility in North Carolina, from January 23 through 27, 2006. The purpose of the inspection was to determine whether activities involving licensed materials were conducted safely and in accordance with NRC requirements. An exit meeting was held on January 27, 2006.

The inspection, which is described in the enclosure, focused on NCS analysis, risk-significant NCS controls and items relied on for safety, and principal management measures for ensuring that NCS controls are capable, available, and reliable. The inspection consisted of NCS analytical basis review, selective examinations of relevant procedures and records, examinations of NCS-related equipment, interviews with plant personnel, and facility walkdowns and observations of in-plant conditions and activities related to NCS assumptions and controls. Throughout this inspection, observations were discussed with your managers and staff.

Based on the results of the inspection, NRC has determined that two Severity Level IV violations of NRC requirements occurred. The violations were evaluated in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's web site at www.nrc.gov; select What We Do, Enforcement, then Enforcement Policy. The violations are being cited in the enclosed Notice of Violations (Notice) as Severity Level IV violations, and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notice because they were identified by NRC during the inspection. The first violation being cited as a Severity Level IV violation is the failure to properly implement a credited safety control . The second violation being cited as a Severity Level IV violation is the display of an improperly-issued and unapproved NCS posting.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice of Violation when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and the enclosure will be available in the public electronic reading room of the NRC's Agency-Wide 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 Natreon Jordan, of my staff, at (301) 415-7648.

Sincerely,

/RA/

Melanie A. Galloway, Chief
Technical Support Group
Division of Fuel Cycle Safety
and Safeguards, NMSS

Docket No.: 70-1113

License No.: SNM-1097

Enclosures:
1. Notice of Violations
2. NRC Inspection Report 70-1113/2006-201

cc w/enclosures: Charles M. Vaughan
Global Nuclear Fuel - Americas, LLC

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

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NOTICE OF VIOLATIONS

Global Nuclear Fuels - America
Wilmington, NC

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

During an NRC inspection from January 23 through 27, 2006, two violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violations are 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, 1997, and December 7, 1999, and supplements thereto.

A. Section 6.1.3 of the license application states, in part, that each area manager is responsible for developing and maintaining operating procedures that incorporate limits and controls established by the criticality safety function.

Contrary to the above, as of January 25, 2006, the licensee was operating under a temporary operating procedure which did not implement a credited safety control required by approved criticality safety analyses. Specifically, the temporary operating procedure failed to require aging of waste boxes for 60 days prior to uranium content verification by elephant-gun (E-gun) scan.

This is a Severity Level IV violation (Supplement VI)

B. Section 3.9 of the license application states, in part, that licensed material processing or activities will be conducted in accordance with properly issued and approved practices and procedures, plant practices, or operating procedures.

Contrary to the above, as of January 25, 2006, the licensee displayed an NCS posting in the waste box storage area corresponding to a criticality safety analysis which had been cancelled.

This is a Severity Level IV violation (Supplement VI)

Pursuant to the provisions of 10 CFR 2.201, Global Nuclear Fuels - America is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Chief, Technical Support Group, Fuel Cycle Safety and Safeguards, NMSS, and the Regional Administrator, Region II within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response.

If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room (PDR), or from the NRC's document system (ADAMS), accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld, and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated at Rockville, Maryland

this 24th day of February 2006

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

Docket No.:	70 -1113
License No.:	SNM-1097
Report No.:	70-1113/2006-201
Licensee:	Global Nuclear Fuel - Americas, LLC
Location:	Wilmington, North Carolina
Inspection Dates:	January 23 through 27, 2006
Inspectors:	Dennis Morey, Senior Criticality Safety Inspector, Headquarters Natreon Jordan, Criticality Safety Inspector, Headquarters
Approved by:	Melanie A. Galloway, Chief Technical Support Group Division of Fuel Cycle Safety and Safeguards, NMSS

Enclosure 2

EXECUTIVE SUMMARY

Global Nuclear Fuel - Americas, LLC Fuel Fabrication Facility
NRC Inspection Report 70-1113/2006-201

Introduction

Staff of the U.S. Nuclear Regulatory Commission (NRC) performed an announced routine nuclear criticality safety (NCS) inspection at Global Nuclear Fuel - Americas, LLC, fuel fabrication facility in Wilmington, North Carolina, from January 23 through 27, 2006. The inspection included an on-site review of the licensee NCS program, NCS analyses, NCS-related internal events, criticality warning system issues, plant operations, and open item followup. The inspection focused on risk-significant fissile material processing activities including the dry conversion process (DCP), the gadolinium shop, outside waste and scrap storage, and rod and bundle loading.

Results

- A Severity Level IV violation was identified regarding the failure to properly implement a credited safety control requiring 60 days aging of waste boxes prior to uranium content verification by elephant-gun (E-gun) scan.

- A Severity Level IV violation was identified regarding the failure to post a properly-issued and approved nuclear safety release/requirement (NSR/R).

- The licensee's internal event reporting, investigation, and correction was adequate for maintaining acceptable levels of safety.

- New licensee maintenance procedures assure the reliability of criticality warning system horns.

- No other safety concerns were identified during walkdowns of the facility and operations.

REPORT DETAILS

1.0 NCS Program (88015)

a. Scope of Inspection

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

- CSA [criticality safety analysis] 1930.00, "FMO Radwaste Quarantine," Revision 3, dated April 2, 2003
- CSA 1334.01, "DCP - Homogenization," Revision 7, dated October 22, 2003
- CSA 1320.02, "Non-Uniform Moderation Limits for UO_2 Powder," Revision 5, dated September 21, 2004
- CSA 1338.05, "Hybrid Container Unit Analysis," Revision 0, dated May 2, 2005
- CSA 2310.00, "Primary HEPA Filter Systems," Revision 1, dated January 23, 2006
- CSA 2310.01, "Secondary Exhaust HEPA Filter Systems," Revision 1, dated October 28, 2005
- SAR 350-12, "Controlled Area Air Balance and Certification," Revision 6, dated September 12, 2005
- CSA - Warehouse, Area: Support FCR #94.0238
- CSA 1080.12, "Waste Box Storage," Revision 3, dated December 15, 2005
- CSA 1080.12, "Waste Box Storage," Revision 2, dated April 12, 2005
- CSA 1080.12, "Waste Box Storage," Revision 1, dated December 10, 2004
- CSA "Criticality Safety Analysis of the Collection, Handling, and Storage of Combustible Waste in Cardboard Boxes," FCR # 87.046
- Correction to Analysis "Project No. 4 - Waste Box Storage," dated February 23, 1982
- CSA - "Waste Boxes for 5% BUY," FCR # 90.203, dated April 6, 1991
- CSA - "Miscellaneous Unit Waste - Box," dated March 27, 1985
- "Verification of Waste Box Storage Final Report," NSE-22-81
- "Project No. 4 - Waste Box Storage Final Report," SAIO1380-613LJ, dated December 18, 1980
- DCP CSA 1338.02, "Product Container Storage Array," Revision 5, dated December 7, 2000
- DCP CSA 1339.01, "DCP Powder Pack," Revision 6, dated December 15, 2005

b. Observations and Findings

The inspectors determined that analyses were performed by qualified NCS engineers, that independent reviews were completed for the evaluations by other qualified NCS engineers, that subcriticality of the systems and operations was assured through appropriate limits on controlled parameters, and that double contingency was assured for each credible accident sequence leading to inadvertent criticality. The inspectors determined that NCS controls for equipment and processes assured the safety of the operations.

Ventilation System Analyses

The inspectors noted that the licensee has revised and consolidated NCS analysis for plant-wide ventilation systems as part of a comprehensive response to NRC Information Notice 05-22, "Inadequate Criticality Safety Analysis of Ventilation Systems at Fuel Cycle Facilities." The inspectors noted that the licensee used the pressure differential on high-efficiency particulate air (HEPA) filters as a significant NCS control over mass accumulation. The inspectors observed that maintenance procedures for the pressure detection instrument (magnahelic) indicated only that maintenance consisted of assuring that the magnahelics were in good working order. Although not specified in the procedure, maintenance of the magnahelics was accomplished by taking flow measurements at the filter housing, determining the pressure differential across the housing based on the flow measurements, and comparing the resulting pressure differential with the magnahelic reading. The licensee acknowledged that the maintenance instruction relied excessively on process knowledge and that the maintenance instructions could be improved. The licensee committed to provide specific maintenance instructions for the HEPA filter magnahelic pressure detectors. Licensee development of specific written maintenance instructions for the plant HEPA filter magnahelic pressure detectors will be tracked as **Inspection Follow-up Item (IFI) 70-1113/2006-201-01**.

Waste Box Storage

While performing a walkdown of the waste box storage area, the inspectors observed that the licensee was allowing waste boxes to be stored in high-density storage arrays. A high-density storage array allows the waste boxes to be stored without a 4-foot spacing restriction. The licensee's waste box uranium verification process calls for candidate waste boxes to undergo a 60-day uranium aging period prior to uranium content verification by E-gun scan since criticality safety analysis showed that not allowing at least 60 days of aging could cause up to a 65% underestimation of the uranium content. Uranium content verification by E-gun scan after a 60-day aging period is a credited safety control. The inspectors determined that waste boxes were being stored in high-density storage arrays without the required 60-day aging.

The inspectors noted that the licensee was operating under an approved temporary operating procedure (TOP) and that the applicable criticality safety analysis was undergoing revision. The TOP required uranium content verification before placing the waste boxes into high-density storage arrays and had excluded the 60-day aging requirement resulting in the storage of waste boxes in high-density storage arrays before their uranium content had been properly verified, as required by approved NCS analysis. The inspectors determined that the storage of improperly verified waste boxes in high-density storage arrays was of low risk significance due to controls credited for other accident scenarios that assured minimal uranium content. The license application requires that each area manager is responsible for developing and maintaining operating procedures that incorporate limits and controls established by the criticality safety function. The licensee's failure to properly implement a credited safety control requiring 60-days aging of waste boxes prior to uranium content verification by E-gun scan is **Violation (VIO) 70-1113/2006-201-02**. Following identification of the issue, the licensee implemented,

through an analysis, appropriate criticality controls that corrected the noncompliance associated with inadequate verification of waste box uranium content.

During review of waste box storage, the inspectors observed that the licensee was operating the waste box storage area with a nuclear safety rules and requirements (NSR/R) posting based on a criticality safety analysis which had been cancelled several months prior to the current inspection. Licensee management and staff stated that this analysis had been issued and that a change request was immediately issued requiring its revision. The NSR/R was posted before the analysis was approved. When the analysis was cancelled, the NSR/R was not replaced. The inspectors determined that the incorrect posting was not risk significant because the safety requirements reflected in the NSR/R were appropriate. The license application requires that licensed material processing or activities will be conducted in accordance with properly-issued and approved practices and procedures. The licensee's failure to post a properly-issued and approved NSR/R is **VIO 70-1113/2006-201-03**.

c. Conclusions

Two severity level IV violations were identified regarding failure to properly implement a credited safety control requiring 60-days aging of waste boxes prior to uranium content verification by E-gun scan and failure to post a properly-issued and approved NSR/R.

2.0 NCS-Related Internal Events (88015)

a. Scope of Inspection

The inspectors reviewed recently reported internal events related to NCS. The inspectors reviewed selected aspects of the following documents:

- UIR FAB-0519 Bi-cone overturned
- UIR PP&SS-0524 Powder hopper dumped without sampling
- UIR PP&SS-0529 Bi-cone out of storage
- UIR PP&SS-0537 Uni-cone discharge valve left open
- UIR PP&SS-0541 Uni-cone overfilled during blend operations

b. Observations and Findings

The inspectors reviewed selected licensee internally-reported events. The inspectors observed that internal events were investigated in accordance with written procedures and appropriate corrective actions were assigned. The events reviewed involved minor infractions of NCS controls. The inspectors had no safety concerns regarding licensee reporting, investigation, and correction of internal NCS-related events.

c. Conclusions

The licensee's internal event reporting, investigation, and correction was adequate for maintaining acceptable levels of safety.

3.0 Criticality Warning System (88015)

a. Scope of Inspection

The inspectors reviewed licensee corrective actions related to a recent inadequate audibility concern. The inspectors reviewed selected aspects of the following documents:

- Drawing 2004E977 Sheet 7, "Criticality Alarm System Instrumentation Locations for Site," Revision 1, dated October 5, 2005
- Drawing 2004E97 Sheet 6, "Plant Site Criticality Alarm Address List," Revision 3, dated March 18, 1997
- Drawing 2004E97 Sheet 1, "Criticality Alarm System Instrument Locations," Revision T, dated May 20, 1975
- NSI [Nuclear Safety Instruction] O-4.0, "Nuclear Safety Instrumentation," Revision 58, dated January 19, 2006
- TID CH28, "XXVIII. CWS System Operation," Revision 5, dated November 24, 2004
- Technical Report NDA-CWS-001, "GNF-A Criticality Warning System," Revision 1, dated November 2005

b. Observations and Findings

The inspectors reviewed the licensee's criticality warning system (CWS) including detector placement, audibility, maintenance, and outage procedures. During recent audibility testing of CWS horns, licensee maintenance staff identified questionable audibility of horns from the exterior system known as data acquisition monitor (DAM) #23. During a previous inspection, the inspectors were informed that DAM #23 had five horns, one on a pole at the detector site, one at the incinerator building, and three at the fuel examination technology building. During the current inspection, the inspectors were informed that an additional horn at the nitrogen building was connected to DAM #23. The inspectors determined that the licensee has implemented new maintenance procedures that assure the reliability of CWS horns. The inspectors determined that all horns on all CWS systems had been recently verified, in accordance with procedural timeframes, to be operable.

c. Conclusions

New licensee maintenance procedures assure the reliability of CWS horns.

4.0 Plant Operations (88015)

a. Inspection Scope

The inspectors 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 inspectors interviewed operators, NCS engineers, and process engineers both before and during walkdowns.

b. Observations and Findings

The inspectors verified the adequacy of management measures for assuring the continued availability, reliability, and capability of safety-significant controls relied upon by the licensee for controlling criticality risks to acceptable levels. The inspectors performed walkdowns of the DCP, the gadolinium shop, outside waste and scrap storage, and rod and bundle loading.

c. Conclusions

No safety concerns were identified during walkdowns of the facility and operations.

5.0 Open Items (88015)

IFI 70-1113/2005-202-01

This item tracks the licensee's actions to revise the analysis for waste boxes. During a previous inspection, the inspectors noted that waste boxes were stored without the required gamma scan, and the basis for double contingency was not clear in the new consolidated analysis. This item is discussed in Section 3.0 of this report. This item remains open.

VIO 70-1113/2005-202-02

This item concerns the licensee's failure to maintain a required moderation control. During a previous inspection, the inspectors noted an open door at the boundary of the moderator restricted area. The door was required to be kept closed to maintain the moderator restriction. During the current inspection, the inspectors noted that the licensee has repaired the door to improve operation, installed an alarm on the door that will set off a work station alarm after a specified time period, and trained operators to monitor the door to assure that it is kept closed when not monitored. The inspectors determined that the licensee corrective actions were adequate to assure the effectiveness of the moderator restricted area boundary. This item is closed.

URI 70-1113/2005-005-02

This item tracks further NRC review of the audibility of the licensee criticality warning system. During a previous inspection, the inspectors noted that four of five horns connected to the outside criticality warning system designated DAM #23 were inoperable, and alarms annunciated by DAM #23 could not be heard in all areas of coverage. This item is discussed in Section 3.0 of this report. Pending completion of NRC investigation, this item remains open.

IFI 70-1113/2005-005-03

This item tracks revision of the criticality warning system horn audibility test procedure to improve identification of inoperable horns. During a previous inspection, the inspectors noted that the licensee did not have a systematic means to determine audibility of

individual criticality warning system horns. The licensee committed to revise the criticality warning system test procedure to check individual horns. During the current inspection, the inspectors observed that the licensee had modified the test procedure NSI O-4.0 to specifically check individual horns and document the test on checklists added as Appendix C. The inspectors determined that the proceduralized horn check implemented by the licensee is adequate to assure CWS horn reliability. This item is closed.

IFI 70-1113/2005-005-04

This item tracks development of a written procedure to cover criticality warning system outages. During a previous inspection, the inspectors noted that the licensee did not have a written procedure directing actions to take when criticality warning system horns are silenced. The licensee committed to issue a procedure to direct annunciator outage actions. During the current inspection, the inspectors noted that the licensee has placed outage instructions in test procedure NSI O-4.0. The inspectors determined that the licensee written outage procedure was adequate to assure appropriate staff response to CWS alarms during scheduled system outages. This item is closed.

6.0 Exit Meetings

The inspectors communicated observations and findings to licensee management and staff throughout the week of the inspection and presented the final results to licensee management during an exit meeting held on January 27, 2006. The licensee management acknowledged the results of the inspection and understood the findings presented.

SUPPLEMENTARY INFORMATION

1.0 Items Opened, Closed, and Discussed

Opened

IFI 70-1113/2006-201-01 Tracks development of specific written maintenance instructions for the plant HEPA filter pressure detectors.

VIO 70-1113/2006-201-02 Failure to properly implement a credited safety control requiring 60 days aging of waste boxes prior to uranium content verification by E-gun scan.

VIO 70-1113/2006-201-03 Failure to post a properly issued and approved NSR/R.

Closed

VIO 70-1113/2005-202-02 This item concerns the licensee's failure to maintain a required moderation control.

IFI 70-1113/2005-005-03 This item tracks revision of the criticality warning system horn audibility test procedure to improve identification of inoperable horns.

IFI 70-1113/2005-005-04 This item tracks development of a written procedure to cover criticality warning system outages.

Discussed

IFI 70-1113/2005-202-01 This item tracks the licensee's actions to revise the analysis for waste boxes.

URI 70-1113/2005-05-02 This item tracks further NRC review of the audibility of the licensee criticality warning system.

2.0 Inspection Procedures Used

IP 88015 Headquarters Nuclear Criticality Safety Program

3.0 Partial List of Persons Contacted

Global Nuclear Fuel

Q. Ao	Principal Criticality Safety Engineer
M. Dodds	Senior Criticality Safety Engineer
*E. Saito	Manager, Environmental Safety and Helath
A. Mabry	Program Manager, Radiological Engineering
*S. Smith	Team Leader, Maintenance Support
*C. Vaughan	Manager, Facility Licensing

Attachment

*L. Paulson	Manager, Nuclear Safety
*S. Smith	Radiation Protection Monitor
*H. Strickler	Manager, Site Environment, Health and Safety

NRC

*D. Morey	Senior Criticality Safety Inspector
*N. Jordan	Criticality Safety Inspector

* Indicates attendance at the exit meeting on January 27, 2006.

4.0 List of Acronyms and Abbreviations

ADAMS	agency-wide documents access and management system
CSA	criticality safety analysis
CWS	criticality warning system
DAM	data acquisition monitor
DCP	dry conversion process
HEPA	high-efficiency particulate air
IFI	inspection follow-up item
IP	inspection procedure
NCS	nuclear criticality safety
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	U.S. Nuclear Regulatory Commission
NSI	Nuclear Safety Instruction
NSR/R	nuclear safety release/requirement
TOP	temporary operating procedure
VIO	violation