March 3, 2005

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 70-1113/2005-201

Dear Mr. Fuller:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine announced nuclear criticality safety inspection at the Wilmington facility in North Carolina, on January 24 and 25 and February 8 through 10, 2005. The purpose of the inspection was to determine whether activities involving special nuclear material (SNM) were conducted safely and in accordance with NRC regulatory requirements. An exit meeting was held at the conclusion of the inspection on February 10, 2005. The inspection observations and findings were discussed with members of your staff.

The inspection, which is described in the enclosure, focused on: (1) the most hazardous activities and plant conditions; (2) the most important controls relied on for safety and their analytical basis; and, (3) the principal management measures for ensuring controls are capable, available, and reliable to perform their function 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 inspection, your activities involving nuclear criticality hazards were found to be conducted safely and in accordance 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 Dennis Morey, of my staff, at (301) 415-6107.

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

Enclosure: NRC Inspection Report 70-1113/2005-201

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

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

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

Docket Number:	70 -1113
License Number:	SNM-1097
Report Number:	70 -1113/2005-201
Licensee:	Global Nuclear Fuel - Americas, LLC
Location:	Wilmington, North Carolina
Inspection Dates:	January 24 and 25 and February 8 through 10, 2005
Inspector:	Dennis Morey, Criticality Safety Inspector, Headquarters Frederick Burrows, Electrical Engineer, Headquarters
Approved by:	Melanie A. Galloway, Chief Technical Support Group Division of Fuel Cycle Safety and Safeguards, NMSS

Enclosure

EXECUTIVE SUMMARY

Global Nuclear Fuel - Americas, LLC Fuel Fabrication Facility
NRC Inspection Report 70-1113/2005-201

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, on January 24 and 25 and February 8 through 10, 2005. The inspection included an on-site review of the licensee's programs dealing with the NCS analytical basis, NCS functions, general access NCS training, internal audits, and open items. The inspection focused on risk-significant fissile material processing activities including the Dry Conversion Process (DCP), the gadolinium fabrication shop, ammonium di-urinate (ADU) vaporization demolition, and rod and bundle loading.

Results

- A minor violation was identified involving the failure to post a nuclear safety release/requirement (NSR/R) control in accordance with procedure.
- Otherwise, plant operations involving fissile materials were being conducted safely and in accordance with written procedures.
- The NCS function was adequate for maintaining acceptable levels of safety.
- Licensee NCS training for general plant workers is adequate for maintaining acceptable levels of safety.
- A concern was identified regarding weak documentation of completed NCS audit reports.

REPORT DETAILS

1.0 Plant Operations (88015)

a. Scope of Inspection

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 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 fabrication shop, ADU vaporization demolition, and rod and bundle loading. The inspectors reviewed selected aspects of the following documents:

- Criticality Safety Analysis CRR 04.0479, "Empty Tube Storage Cabinet and Tube Cart," Revision 1, dated October 19, 2004
- Procedure 40-08, "Classification and Posting of Areas," Revision 16, dated July 22, 2004
- NSR/R 03.06.03 Nuclear Safety Release/Requirements for Fabrication Manual Loading, Revision 11, dated September 10, 2004
- NSR/R 05.02.10 Nuclear Safety Release/Requirements for Gadolinium Manual Loading, Revision 5, dated September 10, 2004

b. Observations and Findings

The inspector verified that controls identified in NCS analyses were installed or implemented and were adequate to assure safety. The cognizant NCS engineers were knowledgeable and able to explain the basis for changes in operations and controls. No safety issues were identified during the walkdowns.

During a walkdown of the gadolinium shop, the inspectors noted a posting containing a criticality safety requirement "Beakers must be stored in approved storage locations" in white letters on a black background. The posting did not conform to licensee procedure 40-08, "Classification and Posting of Areas," which requires criticality safety postings to have white letters on a red background. The inspectors also noted that the posting did not reference the appropriate NSR/R 05.02.10. The inspectors determined that the posted requirement to store beakers in approved storage locations was the correct control from NSR/R 05.02.10. Licensee staff indicated that the format requirement for postings had been in place for approximately one year and that noncompliant postings were being corrected as they were identified. The inspectors noted that licensee operators are currently trained to recognize criticality safety postings by their red color and were concerned about having multiple NCS posting formats in the plant for an extended time period.

Although this issue should be corrected, it constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the Enforcement Policy. The licensee indicated that the facility would be checked for other noncompliant postings which, when found, would be brought into compliance with procedure. Licensee actions to bring the facility into compliance with procedure 40-08 will be tracked as **Inspection Follow-up Item (IFI) 70-1113/2005-201-01**.

c. Conclusions

A minor violation was identified involving the failure to post an NSR/R control in accordance with procedure. Otherwise, plant operations involving fissile materials were being conducted safely and in accordance with written procedures.

2.0 NCS Functions (88015)

a. Inspection Scope

The inspector reviewed NCS analyses to determine that criticality safety of risk-significant operations was assured through engineered and human performance (controls) with adequate safety margin/certainty, preparation and review by capable staff. The inspector accompanied a licensee NCS engineer during a walkdown of NCS safety controls in the waste water treatment facility. The inspector reviewed selected aspects of the following documents:

- Criticality Safety Analysis CSA 1331.01, “DCP Vaporization Autoclave,” Revision 6, dated December 5, 2003
- Criticality Safety Analysis CSA 1332.01, “DCP Conversion Reactor-Kiln,” Revision 8, dated December 5, 2003
- Criticality Safety Analysis CSA 1333.01, “DCP Conversion Process Powder Outlet,” Revision 7, dated December 20, 2001

b. Observations and Findings

Within the selected aspects reviewed, the inspector determined that the analyses were performed by capable 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 inspector determined that NCS controls for equipment and processes assured the safety of the operations.

During review of the licensee Integrated Safety Analysis (ISA), reviewers noted that the licensee credited multiple items relied on for safety (IROFS) which shared electronic controllers. The ISA reviewers questioned whether the license double contingency commitment was impacted. The inspectors reviewed criticality safety analyses for two systems where electronic controllers control numerous IROFS: the DCP reactor-kiln and the DCP vaporization autoclave. The inspectors determined that the licensee had identified appropriate accident sequences and established double contingency in accordance with license commitments for these systems. The inspectors noted that, as identified during the previous external NCS audit, the accident sequences in the supporting criticality safety analyses were not always clear from the text. No safety concerns were identified. The inspectors noted that this finding does not affect the ongoing NRC review of the licensee ISA submittal.

c. Conclusions

The NCS function was adequate for maintaining acceptable levels of safety.

3.0 NCS Training (88015)

a. Scope of Inspection

The inspectors reviewed the licensee's criticality safety training for general plant access to determine that the content of the training met license commitments. The inspectors reviewed training materials and test questions and interviewed the NCS engineer responsible for the training.

b. Observations and Findings

The inspectors noted that criticality safety training is a separate module in the general employee safety training. The inspectors determined that the training effectively identified criticality safety parameters and related controls to those parameters. The most important criticality safety controls were clearly identified and emphasized in the training materials. The inspectors determined that the 20-question test that the licensee employees were required to pass at the completion of the training was comprehensive and reinforced key criticality safety concepts such as moderator exclusion. The inspectors observed that licensee employees must scan their badges at a turnstile prior to entering the facility and are denied entry if NCS training is expired.

c. Conclusions

Licensee NCS training for general plant workers is adequate for maintaining acceptable levels of safety.

4.0 Internal Audits (88015)

a. Scope of Inspection

The inspectors reviewed the licensee's internal audit procedure and reviewed records of previously completed NCS audits of fissile material operations. The inspectors reviewed selected aspects of the following documents:

- Procedure 40-06, "EHS Regulatory Compliance Audits," Revision 20, dated October 5, 2004
- Procedure NSI E-2.0, "Internal Nuclear Safety Audits," Revision 36, dated May 27, 2004

b. Observations and Findings

The inspectors observed that the NCS audits were conducted in accordance with procedure. Through discussions with the licensee's NCS staff, the inspectors determined that the licensee audits selected NCS requirements over the entire Wilmington facility every 90 days in order to meet the license requirement that an NCS audit of the facility be performed every 90 days. The licensee has divided the facility into specific operational areas and develops an audit plan for each area every audit cycle using the expertise of the assigned auditor, an NCS engineer, to select which controls or other NCS requirements to audit. The inspectors noted that the CSA or NSR/R related to the issues audited was not identified on the completed audit form so that the next assigned auditor would not know what had previously been audited. The licensee agreed that using the audit form to relate audits to specific CSAs or NSR/Rs

would provide a more systematic review of the plant and assure that no significant issues were overlooked. The licensee committed to revise the audit form to relate the audits to specific requirements. The revision of the criticality safety audit form to relate NCS audits to specific CSAs or NSR/Rs will be tracked as **IFI 70-1113/2005-201-02**.

c. Conclusions

A concern was identified regarding weak documentation of completed NCS audit reports.

5.0 Open Items (88015)

IFI 70-1113/2004-202-01

Tracks revision of the empty tube storage cabinet criticality safety analysis. Geometry was relied upon by analysis for criticality safety in empty tube storage but was not specifically identified as a controlled parameter. The licensee had committed to revise the empty tube storage cabinet criticality safety analysis to clarify the licensee's reliance on geometry control for demonstrating double contingency protection. The inspector reviewed the revised empty tube storage cabinet criticality safety analysis and determined that geometry was identified as a controlled parameter. This item is closed.

6.0 Exit Meetings

The inspector 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 on February 10, 2005. The licensee management acknowledged the results of the inspection and understood the findings presented.

1.0 Items Opened, Closed, and Discussed

Opened

IFI 70-1113/2005-201-01	Tracks actions to bring the facility into compliance with procedure 40-08.
IFI 70-1113/2005-201-02	Tracks revision of the criticality safety audit form to relate NCS audits to specific CSAs or NSR/Rs.

Closed

IFI 70-1113/2004-202-01	Track revision of the empty tube storage cabinet criticality safety analysis.

Discussed

None

2.0 Inspection Procedures Used

IP 88015 Headquarters Nuclear Criticality Safety Program

3.0 Partial List of Persons Contacted

Global Nuclear Fuel

*M. Allen	Program Manager, Emergency Preparedness
*Q. Ao	Principal Criticality Safety Engineer
*S. Coleman	Leader, Bundle Assembly
*M. Dodds	Senior Criticality Safety Engineer
*J. DeGolyer	Radiological Safety Engineer
*R. Haughton	Principal Engineer, FMO Technology
*A. Mabry	Program Manager, Radiological Engineering
*C. Monetta	Manager, Environment, Health, & Safety
*L. Paulson	Manager, Nuclear Safety
*J. Reeves	Manager, Integrated Safety Analysis
*S. Smith	Radiation Protection Monitor
*E. Saito	Manager, Liability Reduction
*H. Strickler	Manager, Site Environment, Health and Safety

NRC

*D. Morey, Criticality Safety Inspector
F. Burrows, Electrical Engineer

* Indicates attendance at the exit meeting on February 10, 2005.

Attachment