UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

December 18, 2003

Global Nuclear Fuels - Americas, L.L.C.
ATTN: Mr. J. D. Fuller, Chief Executive Officer
and Facility Manager
P. O. Box 780
Wilmington, NC 28402

SUBJECT: NRC INSPECTION REPORT NO. 70-1113/2003-07

Dear Mr. Fuller:

This refers to the inspection conducted on November 17-21, 2003, at the Wilmington facility. The enclosed report presents the results of this inspection.

During the inspection period, your conduct of activities at the Wilmington facility was generally characterized by safety-conscious operations and careful radiological work controls.

Within the scope of the inspection, one violation was identified associated with the review of your report to the NRC dated November 18, 2003, concerning a lack of criticality safety controls in accordance with the requirements of NRC Bulletin 91-01 and its Supplement 1, *Reporting Loss of Criticality Safety Controls.* The violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A.8 of the Enforcement Policy. The NCV is described in the inspection report. If you contest the NCV or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region II, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

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Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA/

Jay L. Henson, Chief
Fuel Facility Inspection Branch 2
Division of Fuel Facility Inspection

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

Enclosure: NRC Inspection Report

cc w/encl:
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-1113
License No.:	SNM-1097
Report No.:	70-1113/2003-07
Licensee:	Global Nuclear Fuel - Americas, LLC
Location:	Wilmington, NC 28402
Dates:	November 17-21, 2003
Inspectors:	W. Britz, Fuel Cycle Facility Inspector C. Taylor, Health Physicist
Accompanying Personnel:	A. Lester, Intern, Division of Waste Management, NMSS
Approved By:	Jay L. Henson, Chief Fuel Facility Inspection Branch 2 Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Global Nuclear Fuel - Americas
NRC Inspection Report 70-1113/2003-07

This routine, announced inspection was conducted in the area of radiation protection and plant operations. The inspection involved observation of work activities, a review of selected records, and interviews with plant personnel.

Radiation Protection

- Implementation of the radiation protection program and procedures was conducted in accordance with the regulations and license (Paragraph 2.a).

- The external exposure monitoring program was implemented in a manner to maintain doses well below the regulatory occupational exposure limits (Paragraph 2.b).

- The internal radiological exposure monitoring program was implemented in a manner to maintain doses well below the regulatory occupational exposure limits (Paragraph 2.c).

- The respiratory protection program was adequately implemented to ensure that personnel respiratory certification was current and up to date (Paragraph 2.d).

- Postings adequately communicated the potential hazard and/or protective equipment requirements for personnel working in areas (Paragraph 2.e).

- The contamination survey program was appropriately implemented to protect workers and identify potential work areas posing radiation hazards to workers. The survey instrument program was adequate for the uses and types of radiation encountered at the facility (Paragraph 2.f).

- The licensee had established and provided a program to provide the required 10 CFR Part 19 and Part 20 notifications and reports to individuals and to the NRC in a timely manner (Paragraph 2.g).

- The licensee had established a successful as low as reasonably achievable (ALARA) program with management participation and oversight (Paragraph 2.h).

Plant Operations

- The licensee identified and reported the degradation of criticality controls in accordance with NRC Bulletin 91-01 and its Supplement 1, *Reporting Loss of Criticality Safety Controls.* As a result a non-cited violation was identified for failure to follow criticality safety controls. The licensee took appropriate immediate corrective actions and had begun a root cause analysis of the event (Paragraph 3.c).

Attachment:
Persons Contacted
Inspection Procedures
List of Items Opened, Closed, and Discussed
List of Acronyms

REPORT DETAILS

1. Summary of Plant Status

During the inspection period, normal operations were observed with powder, pellet, fuel assembly production, and routine maintenance activities. There was a 24-hour reportable event during the period concerning NRC Bulletin 91-01 and its Supplement 1, *Reporting Loss of Criticality Safety Controls* due to criticality controls degradation discussed in Section 3 below.

2. Radiation Protection (83822) (R1)

a. Radiation Protection Program Implementation and Procedures (R1.01 and R1.02)

(1) Inspection Scope

The inspectors reviewed the licensee's implementation of the radiation protection program and procedures for compliance with regulatory requirements.

(2) Observations and Findings

The inspectors reviewed the licensee's program for radiation protection which includes the procedures, internal and external audits for compliance with license application Chapter 2, *Organization and Administration,* Chapter 3, *Conduct of Operations* and Chapter 5, *Radiation Safety.* The licensee's records for the required weekly and quarterly nuclear safety inspections in Chapter 3, Section 3.6.1, *Criticality, Radiation, Chemical and Fire Safety Audits,* were reviewed. The biennial audits of the radiation protection program required by Chapter 3, Section 3.6.3, *Independent Audits,* were performed. The weekly nuclear safety inspections conducted by radiation protection personnel were all logged as performed and are input to the daily report on the internal web site. The daily reports reviewed were informative, contained descriptive photos and indicate a vigilant inspection, follow up and review of issues concerned with safety. The licensee's radiation protection program and implementation is reviewed on an annual basis via the ALARA review program for compliance with 10 CFR 20.1101(c), *Radiation protection programs.* Procedure reviews and updates are conducted every two years in accordance with license application Section 3.9, *Procedures.* The inspectors found the radiation protection program implementation and procedures were conducted in accordance with the regulations and license.

(3) Conclusions

The licensee's implementation of the radiation protection program and procedures was conducted in accordance with the regulations and license.

b. External Exposure Control (R1.04)

(1) Inspection Scope

The inspectors reviewed the licensee's external exposure control program and radiological exposure records to determine compliance with the 10 CFR Part 20 regulations, license, license application, and licensee's procedures for external exposure.

(2) Observations and Findings

The inspectors reviewed the licensee's procedures to determine compliance with the regulations and license for external exposure control. The procedures contained administrative action limits and radiation exposure goals were established to ensure that exposures were less than the occupational limits in 10 CFR 20.1201, *Occupational dose limits for adults*. Table 1 below contains the maximum assigned exposure data for calendar year (CY) 2001, 2002 and the projected exposures for 2003. No regulatory or license limits were exceeded. The dose results for 2002 and the projected doses for 2003 are consistent with the operational process variations and ALARA process changes made during that time period.

Table 1 Annual Exposures

Year	Highest Individual Deep Dose Equivalent (DDE)	Highest Individual Shallow Dose Equivalent (SDE)	Highest Individual Committed Effective Dose Equivalent (CEDE)	Highest Individual Total Effective Dose Equivalent (TEDE)	Site Collective TEDE (person-rem)
2001	0.75 rem	3.22 rem	0.49 rem	0.75 rem	86
2002	0.71 rem	3.66 rem	0.54 rem	0.71 rem	79
[1]2003	0.90 rem	2.12 rem	0.45 rem	0.90 rem	58

Notes: [1]Exposures for 2003 are projected as of November 20, 2003, through December 31, 2003.

The licensee's program for controlling and monitoring external exposures to radiation was appropriately implemented.

(3) Conclusions

The external radiological exposure monitoring program was implemented in a manner to maintain doses well below the regulatory occupational exposure limits.

c. Internal Exposure Control (R1.05)

(1) Inspection Scope

The inspectors reviewed the licensee's internal exposure control program and radiological exposure records to determine compliance with the 10 CFR Part 20 regulations, license, license application, and licensee's procedures for internal exposure.

(2) Observations and Findings

The inspectors reviewed the licensee's procedures to determine compliance with the regulations and license for internal exposure control. The procedures contained administrative action limits and radiation exposure goals were established to ensure that exposures were less than the occupational limits in 10 CFR 20.1201, *Occupational dose limits for adults*, and 10 CFR 20.1204, *Determination of internal exposure.* Table 1 above contains the maximum assigned internal exposure data for calendar year (CY) 2001, 2002 and the projected exposures for 2003. No regulatory or license limits were exceeded. The dose results for 2002 and the projected doses for 2003 are consistent with the operational process variations and ALARA process changes during that time period. The licensee's program for controlling and monitoring internal exposures to radiation was appropriately implemented.

(3) Conclusions

The internal radiological exposure monitoring program was implemented in a manner to maintain doses well below the regulatory occupational exposure limits.

d. Respiratory Protection (R1.06)

(1) Inspection Scope

The inspectors reviewed the respiratory protection equipment issuance, storage, maintenance, and training verification to assure equipment was being adequately maintained and used by certified personnel.

(2) Observations and Findings

The inspectors had the radiation technician demonstrate and explain how the respiratory equipment was fit tested, stored, maintained and certified to the appropriate personnel. Based on discussions with the licensee, the inspectors determined that after the individuals had received a medical approval from administration, the radiation safety office was responsible for performing fit testing on individuals. After the individuals had received on-line computer training, passed both the on-line training test and fit test, the individual would be certified and all information including an expiration date entered into the Radiation Data Management System (RDMS). The inspectors observed the storage and maintenance areas for the respiratory equipment and had no concerns.

(3) Conclusions

The respiratory protection program was implemented in a manner to ensure that personnel respiratory certification was current and up to date.

e. Posting, Labeling, and Control (R1.07)

(1) Inspection Scope

The inspectors reviewed the licensee's program for posting and controls as required by 10 CFR Part 19 and 20 to determine if documents were posted in sufficient places to permit individuals engaged in licensed activity to observe them, that posting for radiation and exposure areas are visible and conspicuous and that containers are labeled.

(2) Observations and Findings

The inspectors observed the locations for postings required by 10 CFR 19.11, *Posting of notices to workers.* The locations for postings contained the applicable documents (e.g., NRC Form 3) and/or references to their locations.

The inspectors observed the postings and labels required by 10 CFR 20.1801, *Security of stored material,* 10 CFR 20.1802, *Control of material not in storage,* 10 CFR 20.1902, *Posting requirements,* and 10 CFR 20.1904, *Labeling containers*. During a tour of the facility, several work locations were reviewed to assess the adequacy of the posting of radiation areas, contamination control barriers and container labeling. Radiation Work Permits were reviewed to determine the adequacy of the requirements posted for worker protection and the degree to which those requirements were being implemented.

All observed work areas involving radioactive material or potentially contaminated material were properly posted. Containers were either labeled or had information stenciled on the container in accordance with requirements. The security and control of special nuclear material appeared adequate. The inspectors observed site activities at several work locations and no problems were noted.

(3) Conclusions

The licensee's postings communicated the potential hazards and protective equipment requirements for working in specified areas.

f. Radiation Protection Program Equipment and Surveys (R1.03 and R1.08)

(1) Inspection Scope

The inspectors reviewed the contamination control survey program to determine if surveys were effective in the identification of contamination and performed in accordance with procedures. The inspectors also reviewed the survey instrument inventories and calibration procedures to determine adequacy and implementation of a system which identifies all instruments and identifies when they are due for calibration or functional testing.

(2) Observations and Findings

During the inspection, the licensee had a minor contamination incident that was not reportable to the NRC. A sealed gasket in the dry conversion area had blown releasing fine uranium powder into a powder outlet room. A system malfunction alarm alerted the

appropriate operators who notified the radiation safety department. The inspectors reviewed the licensee's technician log and interviewed one of the radiation technicians responsible for clean-up and contamination control of the area. After a review of the documentation and discussions with the technician, the inspectors determined that the incident was handled in a timely manner and clean-up and contamination control was adequately addressed.

The inspectors reviewed a random sample of routine area surveys and determined that the results disclosed that the routine surveys were adequate in the identification of potentially contaminated areas. Based on interviews and a limited review of documentation, in the event smear results exceeded action limits, actions were taken to decontaminate the area of the smear to acceptable limits.

The inspectors interviewed personnel responsible for calibration and maintenance of survey instruments. Based on discussions with the licensee, the inspectors determined that the licensee tracks survey instruments, calibrations and maintenance through a database tracking system. The licensee explained that some instruments were calibrated in-house while others that required stronger sources for calibrations were sent to licensed vendors. The inspectors reviewed a limited sample of calibrations' certificates and work orders and found no concerns.

(3) Conclusions

The contamination survey program was implemented in a manner to protect workers and identify potential work areas posing radiation hazards to workers. The survey instruments were found to be operable and adequate for the uses and types of radiation encountered at the facility. In addition, a system had been implemented for keeping track of inventories, calibrations and maintenance.

g. Notifications and Reports (R1.09)

(1) Inspection Scope

The inspectors reviewed the licensee's program and compliance for reporting events and data required by the regulations and the license.

(2) Observations and Findings

The inspectors reviewed the licensee's programs for reporting the requirements of 10 CFR 19.13, *Notifications and reports to individuals,* 10 CFR 20.2201, *Reports of theft or loss of licensed material,* 10 CFR 20.2202, *Notification of incidents,* and 10 CFR 20.2203, *Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits.* Radiation workers questioned regarding the provision of exposure data by the licensee stated they were receiving the required once a year exposure information. The inspectors observed that issues were being identified and corrective actions were made. During the inspection, an event occurred which was reported to the NRC within 24 hours pursuant to NRC Bulletin 91-01 and its Supplement 1, *Reporting Loss of Criticality Safety Controls*, as discussed in Section 3 of this report. The RDMS was reviewed. The RDMS appeared to be an effective

management system for providing current exposure data to employees with an estimated or actual record in a timely manner.

(3) Conclusions

The licensee had established and provided a program to provide the required 10 CFR Part 19 and Part 20 notifications and reports to individuals and to the NRC in a timely manner.

h. Implementation of ALARA Program and Management Oversight of Program (R1.10 and R1.11)

(1) Inspection Scope

The inspectors reviewed the licensee's program for assuring radiological occupational doses and doses to members of the public are ALARA. Review the licensee's management oversight of the radiological protection program.

(2) Observations and Findings

The inspectors reviewed the licensee's ALARA program. The licensee's program is documented in a binder of monthly meeting notes. The notes include extensive graphics of occupational doses by plant operational areas. The notes also contain the discussions and actions taken to assure these radiological doses are ALARA. The licensee reviews the doses by each operational area and determines whether or not further actions are worthy of action by the ALARA principle. The inspectors reviewed past and future projects which included blender airborne contamination reduction, incinerator improvements and a rearrangement of a gadolinia processing area to further reduce radiological exposures. The licensee's collective dose for the site was 86 person-rem in 2001, 79 person-rem in 2002 and is projected to be 58 person-rem in 2003. The licensee's management was involved in the monthly meetings and the process of selecting the ALARA projects. The involvement of management in the ALARA program and the collective dose for the past years reflect a successful program.

(3) Conclusions

The licensee had established a successful ALARA program with management participation and oversight.

3. Plant Operations (88020) O3.09

a. Inspection Scope

The inspectors reviewed an operations incident to confirm that procedural violations, equipment, or system failures related to nuclear criticality safety are reported, reviewed, and that resolutions are tracked.

b. Observations and Findings

At approximately 3:55 p.m. on November 18, 2003, the licensee observed the storage of miscellaneous items in a hood in the ammonium diuranate processing area. The items included valves, small diameter pipes, and other objects wrapped in plastic.

The criticality safety basis for the hood is based upon not exceeding the uranium dioxide limit and the geometry of the objects in the hood. Since the geometry control is based upon only a single type of process component in the hood (e.g.: a specified number of 1" valves, or a specified length of 1" pipe), the as found condition was not consistent with the documented criticality safety analysis (only one type and specified quantity of component can be processed at a time).

An assay confirmed less than 4 kilograms of uranium was contained in the components. Therefore, the mass limit was not exceeded. The mass control was not violated and no unsafe condition existed. The situation was corrected in less than four hours.

Immediate corrective action included the suspension of activities in the affected area and a tag out of the equipment until an investigation to determine the root cause and any necessary long term corrective actions had been completed. The condition, due to a degradation of criticality controls, was reported to the NRC within 24 hours pursuant to NRC Bulletin 91-01 and its Supplement 1, *Reporting Loss of Criticality Safety Controls*.

The NRC inspectors reviewed the licensee's event report, the procedures and equipment involved in the event, and the licensee's immediate corrective actions taken. The inspectors determined that the immediate corrective actions taken were appropriate and sufficient. The licensee's investigation to determine the root cause and any further corrective actions to prevent recurrence were ongoing.

License Safety Condition S-1 authorizes use in accordance with the conditions of the application. Application section 3.9.2, *Operating Procedures,* states "Nuclear safety control procedure requirements for workers in uranium processing areas are incorporated into the appropriate operating, maintenance and test procedures in place for uranium processing operations." Nuclear Safety Release/Requirements (NSR/R) implement the procedural requirements for criticality safety operational requirements. NSR/R #01.04.39 for a cleaning station in the ammonium diuranate area specifies the limitations on type and quantity of items that can be stored in the cleaning station (hood). Contrary to the NSR/R requirements, items in excess of the limitations were found in the cleaning station by the licensee. Based upon the inspector's review, this non-repetitive, licensee identified, and corrected violation is being treated as a non-cited violation (NCV), consistent with Section VI.A.8 of the NRC Enforcement Policy (NCV 70-1113/2003-07-01: Criticality controls degradation. Follow-up on licensee's investigation results)

c. Conclusions

The licensee identified and reported the degradation of criticality controls in accordance with NRC Bulletin 91-01 and its Supplement 1, *Reporting Loss of Criticality Safety Controls.* As a result, a non-cited violation was identified for failure to follow criticality

safety controls. The licensee took appropriate immediate corrective actions and had begun a root cause analysis of the event.

4. Exit Interview

The inspection scope and results (including the non-cited violation) were summarized on November 21, 2003, with those persons indicated in the Attachment. Although proprietary documents and processes were occasionally reviewed during this inspection, the proprietary nature of these documents or processes has been deleted from this report. Dissenting comments were not received from the licensee.

ATTACHMENT

1. LIST OF PERSONS CONTACTED

Licensee

*D. Barbour, Team Leader, Radiation Protection
*S. Coleman, MC&A/NSE Engineer
*M. Dodds, Sr. Criticality Safety Engineer
*A. Mabry, Program Manager, Radiological Engineering
*C. Monetta, Manager, Environment, Health and Safety
*L. Paulson, Manager, Nuclear Safety
*E. Saito, Senior Radiological Engineer
*C. Vaughan, Manager, Facility Licensing

Other licensee employees contacted included engineers, technicians, production staff, security, and office personnel.

*Attended exit meeting on November 21, 2003

2. INSPECTION PROCEDURES (IP) USED

IP 83822	Radiation Protection
lP 88020	Plant Operations

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Description
70-1113/2003-07-01	Opened	NCV: Criticality controls degradation. Follow-up licensee's investigation results (Paragraph 3).

4. LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management Systems
ALARA	As Low As Reasonably Achievable
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulation
CY	Calendar Year
DDE	Deep Dose Equivalent
IP	Inspection Procedures
NCV	non cited violation
NRC	Nuclear Regulatory Commission
NSR/R	Nuclear Safety Release/Requirement
PARS	Publicly Available Records
RDMS	Radiological Data Management System
rem	Roentgen Equivalent Man
SDE	Shallow Dose Extremity
SNM	Special Nuclear Material
TEDE	Total Effective Dose Equivalent