



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

February 20, 2003

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

SUBJECT: NRC INSPECTION REPORT NO. 70-1113/2003-01

Dear Mr. Fuller:

This report refers to the inspection conducted from January 28-31, 2003 at the Wilmington facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with United States Nuclear Regulatory Commission (NRC) requirements. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Based on the results of the inspection, no violations or deviations were identified.

In accordance with 10 CFR 2.790 of NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in NRC's Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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

Sincerely,

/RA/

David Ayres, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

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

Enclosure: (See Page 2)

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.: 70-1113/2003-001

Licensee: Global Nuclear Fuel - Americas, LLC

Facility: General Electric

Location: Wilmington, NC 28402

Dates: January 28 - 31, 2003

Inspectors: W. Gloersen, Senior Fuel Facility Inspector, RII

Accompanying
Personnel: D. Collins, Director
Division of Nuclear Materials Safety, RII

Approved By: D. Ayres, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Global Nuclear Fuel - Americas NRC Inspection Report 70-1113/2003-001

This routine unannounced inspection involved observation and evaluation of the licensee's programs for environmental protection and waste management. The inspection identified the following aspects of the licensee's programs:

Waste Management

- The effluent air sampling equipment, including the sample delivery lines was in good material condition. Ventilation equipment was operating within the limits specified in the license application. A decreasing trend was noted in radioactivity levels in airborne effluents from 1997 to the first half of 2002. Calculated offsite doses were well below the as low as reasonably achievable constraint of 10 millirem/year specified in 10 CFR 20.1101(d) (Paragraph 2.a.(3)).
- The monitoring requirements and concentration limits specified in license SNM-1097 and 10 CFR Part 20 for liquid effluents were adequately met (Paragraph 2.b.(3)).
- The licensee took the initiative to further reduce the quantities of radioactive materials released to the liquid effluent streams from the facility by designing and operating a sodium hydroxide based liquid waste processing system (Paragraph 2.c.(3)).

Environmental Protection

- The environmental monitoring program was implemented in accordance with license requirements. No new additional environmental contamination problems were noted (Paragraph 3.c.).

Attachment:

Persons Contacted

Inspection Procedures Used

List of Items Opened, Closed, and Discussed

List of Acronyms

REPORT DETAILS

1. Summary of Plant Status

This report covered a four-day period. Powder, pellet, and fuel assembly production proceeded at normal rates.

2. Waste Management (88035) (R3)

a. Airborne Effluent Program Controls, Instrumentation, Ventilation, and Airborne Effluent Monitoring Results

(1) Inspection Scope

The inspector examined selected stack effluent sampling stations to ensure that equipment was maintained and representative samples were being collected. In addition, the inspector reviewed ventilation system checks as required by the license application. The inspector also reviewed the facility's airborne effluent monitoring results to verify that releases were within the limits specified in 10 CFR Part 20 and license requirements.

(2) Observations and Findings

The inspector observed a technician collect air particulate filter samples from five stacks that were designated to be collected on a daily basis due to their operational performance and/or quantity of material released (Fuel Manufacturing Operations (FMO) and Fuel Manufacturing Operations Expansion (FMOX)), Incinerator Building, Hydrofluoric Acid Recovery Building, and the Dry Conversion Process building). The technician used Environmental Protection Instruction (EPI) No. 0-6.0, Stack Sampling Program, Revision 43, March 23, 2001. The inspector observed no changes to the program or procedure since the last inspection. The technician was observed to properly collect, document, and prepare the samples for gross alpha analysis. The sampling equipment was in good working order. The licensee used stainless steel enclosures to protect the sampling equipment from environmental conditions. The inspector noted the use of stainless steel sample delivery lines which was in good condition and showed no signs of corrosion. Heat tracing was used on the sample delivery line systems that had experienced condensation problems in the past. No obvious problems were noted with the sampling equipment.

The inspector reviewed ventilation system checks as required by Section 5.3.3 of the license application. Specifically, the inspector reviewed 38 heating, ventilation, and air conditioning (HVAC) units monthly pressure differential checks for the period December 2002 - January 2003. All HVAC flows and differential pressures were within the specifications of the license application. During plant tours, the inspector also verified that selected HVAC units differential pressures were within the license application specifications.

The inspector also reviewed the stack sampling results and quantities of airborne radioactive materials released for the first six months of 2002 and reviewed the airborne

release trends back to 1997. The review included the semi-annual effluent release reports to the NRC for the first half of 2002 and both reporting periods for 2001. The review of these data is summarized in Table 1 below.

Table 1: Airborne Effluent Summary (microcuries)

Year	Total Uranium Released (microcuries)	Stack Air Dose Calculations (millirem)
1997	195.8	0.4
1998	124.6	0.2
1999	42.6	0.1
2000	32.5	0.1
2001	22.5	<0.1
2002 (first half)	7.9	<0.1

The data show a decreasing trend in radioactivity levels in airborne effluents from 1997 to the first half of 2002. The decreasing trend was attributable to the operation of the dry conversion process which commenced at the end of 1997. In addition, the average concentrations of uranium released were well below the most conservative uranium concentration limit specified in 10 CFR Part 20, Appendix B, Table 2. Calculated offsite doses (using the Comply code) were well below the as low as reasonably achievable (ALARA) constraint of 10 millirem/year (mrem/yr) specified in 10 CFR 20.1101(d).

(3) Conclusion

The licensee's effluent air sampling equipment, including the sample delivery lines was in good material condition. Ventilation equipment was operating within the limits specified in the license application. A decreasing trend was noted in radioactivity levels in airborne effluents from 1997 to the first half of 2002. Calculated offsite doses were well below ALARA constraint of 10 mrem/yr specified in 10 CFR 20.1101(d).

b. Liquid Effluent Monitoring Results

(1) Inspection Scope

The inspector reviewed the licensee's results for liquid effluent monitoring from 1997 to the first half of 2002 to verify that releases were within the limits specified in 10 CFR Part 20 and license requirements.

(2) Observations and Findings

The inspector reviewed the liquid effluent sampling results and quantities of liquid radioactive materials released for the first six months of 2002 and reviewed the liquid release trends back to 1997. The review included the semi-annual effluent release

reports to the NRC for the first half of 2002 and both reporting periods for 2001. The review of these data is summarized in Table 2 below.

Table 2: Liquid Effluent Summary (millicuries)

Year	Total Uranium Released (millicuries)
1997	44.7
1998	59.6
1999	57.1
2000	70.7
2001	55.3
2002 (first half)	25.3

The inspector discussed with the licensee the slight increase in total uranium released in process liquid effluent waste for the first half of 2002. After a review of the operational data, the licensee attributed the increase to the flushing of vessels and piping as part of the safe store process and transition to the new (sodium hydroxide based) radioactive liquid waste system. In addition, the inspector verified that the average concentrations of uranium released were well below the most conservative uranium concentration specified in 10 CFR Part 20, Appendix B, Table 2.

(3) Conclusion

The licensee adequately met the monitoring requirements and was well below the concentration limits specified in license SNM-1097 and 10 CFR Part 20 for liquid effluents.

c. Liquid Effluent Controls and Processes

(1) Inspection Scope

The inspector reviewed the licensee's liquid effluent waste process system to determine if changes were made since the last inspection.

(2) Observations and Findings

The inspector noted that the licensee had completed the pre-operational testing of a new liquid waste processing system since the last inspection of this program area. The process was developed to replace the use of lime with sodium hydroxide (NaOH). The system was operational at the end of 2001. The new process used some of the existing liquid waste processing equipment. The new equipment included the aging tank, reactor, feed filter tank, and the polishing filter. The licensee expected the following benefits from the new system:

- Reduced liquid effluent and total uranium releases
- Reduced nitrogen discharges to the lagoons
- Reduced metal discharges to the lagoons
- Reduced quantities of solid waste generation

The inspector toured the new liquid waste processing system and observed no problems with equipment functionality. The inspector acknowledged the licensee's approach to further reduce the quantities of radioactive materials released to the liquid effluent streams from the facility.

(3) Conclusion

The licensee took the initiative to further reduce the quantities of radioactive materials released to the liquid effluent streams from the facility by designing a sodium hydroxide based liquid waste processing system.

3. **Environmental Protection (88045) (R2)**

a. Inspection Scope

The inspector reviewed selected portions of the licensee's Environmental Protection Program to verify that program implementation and sample results were consistent with license requirements and to verify that plant operations had not significantly increased radioactivity levels in environmental media. In addition, the inspector reviewed the licensee's environmental program audit program results.

b. Observations and Findings

The inspector reviewed selected results from soil, vegetation, surface water, and environmental air samples collected in 2002 and observed that environmental gross alpha, gross beta, and uranium values consistently remained below licensee action levels for the majority of environmental media samples. The inspector observed that when the environmental samples for radioactivity and uranium levels had exceeded licensee action levels, the licensee had issued Environmental Action Level (EAL) investigation statements in a timely manner. The EAL investigation statements had recommended appropriate corrective actions (i.e. re-sampling, trending, etc.). Additionally, the inspector observed the collection of a groundwater sample at well PL-11A. The technician followed the groundwater sample collection and preparation steps specified in O-8.0, Sample Collection from Monitoring Wells, Revision 24, May 31, 2002. The inspector noted that procedure O-8.0 did not provide guidance on ensuring the chain of custody of the sample which presented some challenges to the licensee's environmental laboratory upon receipt of the groundwater sample. The licensee corrected the situation by adding the necessary steps to procedure O-8.0 to ensure that a process was in place for the proper chain of custody of samples.

The inspector also reviewed the State of North Carolina's 1999 Annual Report that provided a comparison of environmental sample results that were split with the licensee and the State of North Carolina. The annual reports were typically published three years

after the samples were collected and split. The inspector noted that given the relatively high measurement uncertainties, surface water, soil, vegetation, and groundwater split samples were in reasonable agreement.

The licensee had identified two areas on the plant site that historically had concentrations of uranium detected in the groundwater. These areas were identified as FMOX and the northwest calcium fluoride (CaF₂) area (which the NRC had released in license Amendment 16). Contaminated groundwater at site sampling locations were appropriately noted where licensee action levels were consistently exceeded. Contamination levels at these locations remained consistent with previous reporting periods and no further migration of the contamination was observed. In addition, no new areas of contaminated groundwater were identified. The inspector noted that the NRC's Safety Evaluation Report dated October 15, 1999, acknowledged that some of the wells in the vicinity of the northwest CaF₂ storage area had elevated uranium concentrations above the Environmental Protection Agency's proposed drinking water maximum contaminant level for uranium. The licensee submitted a corrective action plan to the State of North Carolina's Department of Environmental and Natural Resources proposing natural attenuation. The corrective action plan was approved by North Carolina on November 5, 1999.

The inspector also reviewed selected portions of the 2002 quarterly audits of the environmental protection program. These audits were performed by an Environmental Health and Safety engineer. The inspector noted that the quarterly audits were of sufficient depth and appropriately targeted. Audit findings and recommendations were documented, assigned, and tracked to completion or follow-up. In addition, the licensee indicated to the inspector that an audit of the licensee's contract laboratory was performed in 2002, however, an audit report was not documented. The inspector discussed with licensee representatives that Section 10.5 of the license application concerning the use of spike or replicate sample submittals should be reviewed before conducting the next vendor audit.

In addition, the inspector reviewed selected unusual incident reports pertaining to environmental protection and waste management for the period December 2001-December 2002. The inspector verified that proper notification and follow-up actions were taken as appropriate. There were no concerns noted in this area.

c. Conclusion

The licensee had implemented the environmental monitoring program in accordance with license requirements. No new additional environmental contamination problems were noted.

4. **Exit Meeting**

The inspection results were summarized on January 31, 2003, with those persons indicated in the Attachment. Although proprietary documents and processes were reviewed during this inspection, the proprietary nature of these documents or processes has been deleted from this report. No dissenting comments were received from the licensee.

ATTACHMENT

1. **PARTIAL LIST OF PERSONS CONTACTED**

M. Allen, Manger, Industrial Hygiene & Safety
J. Ball, Manager, Global Supply Chain
D. Barbur, Radiation Protection Team Leader
F. Beaty, Technical Resource, FMO
R. Crate, Manager, Powder Production & Support Services
T. Crawford, Senior Environmental Engineer
R. Foleck, Program Manager, Facility Licensing
H. Knight, Manager, Logistics
A. Mabry, Program Manager, Radiological Engineering
P. Marthur Environment, Health and Safety Specialist
S. Murray, Outage Services Environmental, Health and Safety
S. O'Connor, Engineer, FCO
R. Pace, Manager Environmental Projects
L. Paulson, Manager, Nuclear Safety
A. Scott, GNF-A Lead Auditor
G. Smith, Manager, Configuration Management Center
R. Stevens, Technical Leader, FMO Maintenance Support Team
H. Strickler, Manager, Site Environment, Health and Safety
C. Vaughan, Manager, Facility Licensing
M. Watkins, Team Leader, Shop Support

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

2. **INSPECTION PROCEDURES (IP) USED**

IP 88035	Radioactive Waste Management
IP 88045	Environmental Protection

3. **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

<u>Item</u>	<u>Status</u>	<u>Description</u>
none		

4. **LIST OF ACRONYMS USED**

ALARA	As Low As Reasonably Achievable
CaF ₂	calcium fluoride
EAL	Environmental Action Level
FMO	Fuel Manufacturing Operations
FMOX	Fuel Manufacturing Operations Expansion
HVAC	Heating, Ventilation, and Air Conditioning
mrem/yr	millirem/year