



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

December 14, 2001

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

SUBJECT: NRC INSPECTION REPORT NO. 70-1113/2001-05

Dear Mr. Fuller:

This refers to the inspection conducted on November 13-16, 2001, at the Wilmington facility. The enclosed report presents the results of this inspection.

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.

Within the scope of the inspection, violations or deviations were not identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC 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/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

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

Sincerely,

*/RA/*

Edward J. McAlpine, Chief  
Fuel Facilities Branch  
Division of Nuclear Materials Safety

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

Enclosure: NRC Inspection Report

cc w/encl:

Charles M. Vaughan, Manager  
 Facility Licensing  
 Global Nuclear Fuel - Americas, L.L.C.  
 P. O. Box 780, Mail Code J26  
 Wilmington, NC 28402

Mel Fry, Director  
 Division of Radiation Protection  
 N. C. Department of Environmental  
 Health & Natural Resources  
 Electronic Mail Distribution

Distribution w/encl:

A. Boland, RII  
 J. Muszkiewicz, NMSS  
 L. Roche, NMSS  
 P. Hiland, RIII  
 W. Britz, RIV  
 B. Spitzberg, RIV  
 PUBLIC

PUBLIC DOCUMENT (circle one):    YES    NO

OFFICE	RII:DNMS	RII:DNMS	RII:DNMS	
SIGNATURE	/RA by W. Gloersen for/	/RA/	/RA/	
NAME	AGOODEN	WGloersen	DAyres	
DATE	12/10/2001	12/10/2001	12/11/2001	
E-MAIL COPY?	YES                  NO	YES                  NO	YES                  NO	YES                  NO

OFFICIAL RECORD COPY      DOCUMENT NAME: C:\Program Files\Adobe\Acrobat 4.0\PDF

Output\GNF-A2001-05skeleton.wpd

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1113

License No.: SNM-1097

Report No.: 70-1113/2001-05

Licensee: Global Nuclear Fuel - Americas, L.L.C.

Site: General Electric Nuclear Energy

Location: Wilmington, NC 28402

Dates: November 13-16, 2001

Inspector: W. Gloersen, Senior Fuel Facilities Inspector  
A. Gooden, Health Physicist

Approved By: E. McAlpine, Chief  
Fuel Facilities Branch  
Division of Nuclear Materials Safety

Enclosure

## EXECUTIVE SUMMARY

### Global Nuclear Fuel - Americas NRC Inspection Report 70-1113/2001-05

This routine unannounced inspection involved observation of work activities, a review of selected records, and interviews with plant personnel involving the areas of emergency preparedness, environmental protection, and waste management.

#### **Emergency Preparedness**

- The emergency preparedness exercise scenario was low on challenges to the Emergency Response Organization but associated messages were adequate and provided exercise participants with conditions to demonstrate various aspects of the emergency response program (Paragraph 2.a).
- Poor communications and exercise control by the controller organization resulted in the exercise termination without recovery and re-entry performance. Exercise control was discussed as an area for improvement (Paragraph 2.a).
- In response to the simulated emergency, the emergency organization implemented the Radiological Contingency and Emergency Plan and Emergency Procedures, and correctly classified the emergency and completed the offsite notifications in a timely manner. The licensee's response to the postulated accident was considered a successful demonstration of the capability to mitigate an onsite incident with potential impact to workers, the public and the environment (Paragraph 2.a).
- Performance deficiencies were noted in the access control to the incident area; the evaluation and prioritization of an injured victim; and the control of potentially contaminated equipment and/or personnel (Paragraph 2.a).

#### **Environmental Protection**

- The environmental monitoring program was implemented in accordance with license requirements. No new additional environmental contamination problems were noted. Significant improvement in documenting and tracking of environmental sample data; identifying environmental action level exceedances; and timeliness in performing the appropriate environmental action level investigations were also noted (Paragraph 3.c).

#### **Waste Management**

- The effluent air sampling equipment, including the sample delivery lines was in good material condition. A decreasing trend was noted in radioactivity levels in airborne effluents from 1997 to the first half of 2001. Calculated offsite doses were well below the as low as reasonably achievable (ALARA) constraint of 10 mrem/yr as specified in 10 CFR 20.1101(d).
- The monitoring requirements and concentration limits specified in license SNM-1097 and 10 CFR Part 20 for liquid effluents were adequately met.

- A proactive approach was taken 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.

Attachment:

Persons Contacted

Inspection Procedures

List of Items Opened, Closed, and Discussed

List of Acronyms

Scenario Description and Exercise Objectives

## Report Details

### 1. Summary of Plant Status

There were no unusual plant operational occurrences during the inspection. With the exception of line 3 being temporarily shutdown for repairs, plant operations were normal with routine maintenance activities.

### 2. Emergency Preparedness (88050) (F3)

#### a. Drills and Exercises (F3.05)

##### (1) Inspection Scope

Section 7.3 of the Radiological Contingency and Emergency Plan (RC&EP) required a biennial exercise be performed involving the onsite emergency response organization (ERO) and offsite support agencies. The exercise scenario and objectives were reviewed for adequacy in testing both the onsite and offsite response capability. The effectiveness of the licensee's critique to self identify areas of improvement was also reviewed.

##### (2) Observations and Findings

The licensee submitted for NRC review the information on the scope, objectives, and scenario in advance of the exercise date. Minor problems were identified and resolved in advance of the exercise. The scenario simulated a fire involving a truck loaded with shipping containers of uranium staged outside the fuel shipping warehouse. A fire was postulated to start inside the engine compartment of the truck, and quickly spreading to engulf the vehicle and shipping containers. The truck's driver was to be unable to extinguish the fire using a portable extinguisher, suffer significant burns, and be overcome by the exposure to the smoke, and collapse. As the fire was postulated to spread to engulf the shipping containers, the potential for an explosion, or the rupture of shipping containers was to result in the release of materials. The scenario was low on challenges to the ERO but associated pre-panel written messages to the exercise participants were adequate to demonstrate various aspects of the emergency response program. The inspector noted that the exercise was terminated in less than an hour without any discussions and/or performance involving accident recovery and re-entry planning by the ERO. Based on interviews and further evaluation of the scenario events, it was determined that poor communications and exercise control by the controller organization resulted in the exercise termination without recovery and re-entry performance. Exercise control was discussed as an area for improvement.

Exercise participants included the New Hanover County Emergency Management Agency (EMS), several members of the mutual aid fire departments, and emergency medical services. In response to the simulated emergency, the emergency organization implemented the RC&EP and Emergency Procedures, and correctly classified the emergency and completed the offsite notifications in a timely manner. The licensee's response to the postulated accident was considered a successful demonstration of the capability to mitigate an onsite incident with potential impact to workers, the public and the environment. The inspector informed the licensee that three areas were noted as

response weaknesses: (1) failure to establish timely and effective access control to the area of incident resulted in the site Emergency Medical Services vehicle and two non-emergency vehicles entering downwind and remaining downwind of the projected plume for extended periods; (2) failure to provide timely medical attention to the simulated injured victim in light of potential life threatening injuries (resulting from burns and unconsciousness from smoke inhalation) in order to perform radiation surveys for contamination; and (3) failure to perform contamination surveys of equipment and/or emergency response personnel leaving the immediate area of impact. The inspector indicated that the corrective actions to ensure effective access control to incident scene, proper prioritization of actions in response to an injured victim, and contamination control surveys following potential release of material was considered an inspector follow up item (IFI 70-1113/2001-05-01). As required by the RC&EP, the licensee conducted a critique following the exercise which afforded players, controllers/evaluators, and observers an opportunity to provide comments. Several items were identified as requiring corrective actions during the licensee's self critique. The actions taken by the licensee to review, assign, and track corrective actions to resolution will be reviewed during a subsequent inspection.

(3) Conclusions

Based on the exercise and critique observations, interviews, and documentation, the licensee was conducting drills and exercises in accordance with Section 7.3 of the RC&EP. The scenario details met the minimum criteria for testing emergency procedures, equipment, and personnel. The critique process was effective in the identification of emergency response strengths and weaknesses, and items requiring corrective actions. The licensee's response to the postulated accident was considered successful. Performance deficiencies were noted in the access control to the incident area; the evaluation and prioritization of an injured victim; and the control of potentially contaminated equipment and/or personnel.

b. Follow up On Previously Identified Issues (F3.07)

(1) Inspection Scope

The inspector reviewed the actions taken by the licensee to correct a previous issue to verify that the corrective actions were adequate and had been completed.

(2) Observations and Findings

The following item was reviewed:

(Closed) IFI 70-1113/99-06-01: Verify the corrective actions to the items identified during the biennial exercise.

The licensee's corrective actions resolved items identified during the 99 biennial exercise by NRC and/or licensee evaluators. During the 2001 exercise, access control was again an area of weakness but resulted from vehicular traffic to the area downwind of the incident. The previous access control problems noted during the 1999 exercise

were associated with the lack of access controls to and from building locations near incident scene. The licensee's access control at building exits to area of impact was effectively implemented immediately after the area of impact was identified.

(3) Conclusion

Based on the licensee's effective performance in those areas previously identified as requiring corrective actions, this item is closed.

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 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.). Historically 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. No new areas of contaminated groundwater were identified. The inspector observed significant improvement in the licensee's documenting and tracking of environmental sample data; identifying EAL exceedances; and much improved timeliness in performing the appropriate environmental action level investigations.

The inspector also reviewed selected portions of the first three 2001 quarterly audits of the environmental protection program. These audits were performed by an Environmental Health and Safety engineer. The inspector noted that the next biennial independent audit of the environmental protection program was scheduled for December 2001. The inspector noted that the three 2001 quarterly audits were of sufficient depth and appropriately targeted. Audit findings and recommendations were documented and assigned.

c. Conclusion

The licensee had implemented the environmental monitoring program in accordance with license requirements. No new additional environmental contamination problems were noted. Significant improvement in documenting and tracking of environmental sample data; identifying EAL exceedances; and timeliness in performing the appropriate environmental action level investigations were noted.

4. **Waste Management (88035) (R3)**

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

(1) Inspection Scope

The inspector reviewed the licensee's airborne effluent monitoring results to verify that releases were within the limits specified in 10 CFR Part 20 and license requirements. The inspector also examined selected stack effluent sampling stations to ensure that equipment was maintained and representative samples were being obtained.

(2) Observations and Findings

The inspector reviewed the stack sampling results and quantities of airborne radioactive materials released for the first six months of 2001 and reviewed the airborne release trends back to 1997. 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 (mrem)
1997	195.8	0.4
1998	124.6	0.2
1999	42.3	0.1
2000	32.5	0.1
2001 (first half)	12.8	<0.1

The data shows a decreasing trend in radioactivity levels in airborne effluents from 1997 to the first half of 2001. 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 mrem/yr specified in 10 CFR 20.1101(d).

In addition, 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 FMOX), Incinerator Building, Hydrofluoric Acid Recovery Building, and the Dry Conversion Process building). The technician used procedure EPI No. 0-6.0, Stack Sampling Program, Revision 43, March 23, 2001. 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. No obvious problems were noted with the sampling equipment.

(3). Conclusion

The licensee's effluent air sampling equipment, including the sample delivery lines was in good material condition. A decreasing trend was noted in radioactivity levels in airborne effluents from 1997 to the first half of 2001. Calculated offsite doses were well below the as low as reasonably achievable (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 2001 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 2001 and reviewed the liquid release trends back to 1997. 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 (first half)	31.7

The inspector discussed with the licensee the slight increase in total uranium released for calendar year 2000. After a review of the operational data, the licensee attributed the increase to a longer run time on line 5 (recovery) compared to the previous year. 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 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 to determine if changes were made since the last inspection.

(2) Observations and Findings

The inspector noted that the licensee had been designing, developing, constructing, and testing a new liquid waste processing system. The process was developed to replace the use of lime with sodium hydroxide (NaOH). During this inspection the licensee was in the final phases of its operational readiness review. The system was scheduled to be operational before 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 was expecting to derive the following benefits from the new process:

- 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 acknowledged the licensee's proactive approach to further reduce the quantities of radioactive materials released to the liquid effluent streams from the facility.

(3) Conclusion

The licensee took a proactive approach 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.

5. **Exit Interview**

The inspection scope and results were summarized on November 14 and 16, 2001, 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. No dissenting comments were received from the licensee.

## ATTACHMENT

### LIST OF PERSONS CONTACTED

#### Licensee

- \*M. Allen, Acting Manager, Industrial Hygiene and Safety
- \*D. Barbour, Radiation Protection Team Leader
- \*S. Cathey, Manager, Facilities and Maintenance  
T. Crawford, Senior Environmental Engineer
- \*\*D. Dowker, Manager, Fuel Material Supply
- \*\*R. Foleck, Program Manager, Facility Licensing
- \*P. Godwin, Emergency Response Coordinator and Site Fire Chief
- \*\*H. Knight, Manager, Emergency Preparedness and Site Security  
P. Mathur, Environmental Engineer
- \*\*C. Monetta, Manager, GNF-A, Environmental Health and Safety
- \*S. Murray, Manager, Outage Services, Environmental Health and Safety
- \*R. Pace, Manager, Environmental Projects and Site Emergency Director
- \*J. Reynolds, Program Manager, Fuel Support
- \*D. Tashjian, Manager, Fuel Fabrication
- \*G. Smith, Project Manager, Radioactive Waste
- \*H. Strickler, Manager, Site Environmental Health and Safety

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

#### Other Organizations

M. George, Coordinator, Emergency Management New Hanover County  
D. Summers, Director, Emergency Management New Hanover County

- \*Attended exit meeting on November 14, 2001
- \*Attended exit meeting on November 16, 2001

### INSPECTION PROCEDURES USED

IP 88050      Emergency Preparedness  
IP 88035      Waste Management  
IP 88045      Environmental Protection

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-1113/99-06-07	Closed	IFI - Verify the corrective actions to the items identified during the biennial exercise (Paragraph 2.b).

70-1113/01-05-01	Open	IFI - Verify the corrective actions to ensure effective access control to incident scene, proper prioritization of actions in response to an injured victim, and contamination control surveys following potential release of material (Paragraph 2.a).
------------------	------	---

#### List Of Acronyms Used

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulation
EAL	Environmental Action Level
ECC	Emergency Control Center
EP	Emergency Procedures
EPI	Environmental Protection Instruction
ERO	Emergency Response Organization
FMO	Fuel Manufacturing Operations
IFI	Inspector Follow up Item
mrem	millirem
RC&EP	Radiological Contingency and Emergency Plan
SNM	Special Nuclear Material