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

September 15, 2000

Global Nuclear Fuels - Americas, L.L.C.
ATTN: Mr. D. K. Dowker, Plant Manager, FMO
Global Nuclear Fuels - Americas, L.L.C.
P. O. Box 780
Wilmington, NC 28402

SUBJECT: NRC INSPECTION REPORT NO. 70-1113/2000-06

Dear Mr. Dowker:

This refers to the inspection conducted on August 14 - 18, 2000, at the Fuel Manufacturing Complex facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the 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.

Within the scope of the inspection, no violations or deviations were 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: (See page 2)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1113

License No.: SNM-1097

Report No.: 70-1113/2000-06

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

Facility Name: Fuel Manufacturing Complex

Location: Wilmington, NC 28402

Dates: August 14-18, 2000

Inspector: W. Gloersen, Senior Fuel Facility Inspector

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

Enclosure

EXECUTIVE SUMMARY

Global Nuclear Fuel - Americas NRC Inspection Report 70-1113/2000-06

The primary focus of this routine unannounced inspection was the evaluation of the licensee's conduct of the transportation program for radioactive materials and the management of solid radioactive waste. The report covered a one week period and included the results of inspection efforts of one regional fuel facility inspector.

Waste Management

- The licensee had made progress towards the reduction of the volume of solid radioactive waste stored on the storage pads (Section 2.a.2).
- The licensee appropriately classified its solid waste streams as Class A waste in stable form and ensured that the waste met the applicable minimum waste characterization requirements specified in 10 CFR 61.56(a) (Section 2.b.2).
- The waste shipping manifests were complete and provided an acceptable level of information in the shipping papers to determine the quantities of individual radionuclides shipped. The licensee's waste shipping tracking records were complete and well organized (Section 2.c.2).

Transportation

- The licensee's performance in the preparation and delivery of completed packages was acceptable (Section 3.a.2).
- The licensee's performance in the fuel bundle packing and powder packing operations was acceptable (Section 3.b.2).
- The licensee had an acceptable program for the safe receipt of radioactive materials (Section 3.c.2).
- The licensee's records pertaining to the certificates of compliance were well maintained and easily retrievable (Section 3.d.2).
- The licensee's identification and correction of an incident that pertained to a safeguards event was acceptable and timely (Section 3.e.2).

Attachment:

Persons Contacted
Inspection Procedures Used
List of Items Closed
List of Acronyms

REPORT DETAILS

1. Summary of Plant Status

The plant had a smooth start up after its annual special nuclear materials (SNM) inventory, which ended in mid-August. In the Dry Conversion Process (DCP), lines 1 and 2 were using virgin material, line 3 was using recycle material. One press was not operational. The licensee had a less than 25 kilogram powder spill in the slugging area. The licensee was investigating. This event was not reportable. The licensee was starting to process clean gadolinium scrap in the solvent extraction area.

2. Waste Management (84850 and 84900) (R3)

a. On Site Waste Storage (R3.05)

(1) Inspection Scope

The licensee's storage of low-level radioactive waste (LLRW) was reviewed, including management controls and surveys, adequacy of the storage area, and waste container integrity.

(2) Observations and Findings

The inspector discussed with the licensee the progress in reducing quantities of waste stored in the outside waste storage areas or "pads". In addition, the inspector toured the waste storage pads. As noted in previous inspections, the pads consisted of several graveled surfaces each surrounded by a fence. Although the fences were not locked, all of the waste was located within the controlled area of the facility. The waste containers were placed directly on the graveled surface. The licensee tracked the number of waste containers on the storage pads to assess performance in reducing the quantities of onsite waste storage. The inspector reviewed the total container inventory as of August 14, 2000 and compared to January 27, 1998, when the waste reduction program was initiated. During the time period referred to above, the licensee had realized an approximately 35 percent reduction in the total volume of waste stored on the storage pads. It should be noted that the percent reduction takes into account the additional waste generated by the licensee's fuel manufacturing process.

In addition, the inspector observed the calcium fluoride (CaF_2) relocation activities for the East and West fluoride lagoons. To date, approximately 51.5 million pounds of CaF_2 has been relocated to the licensee's onsite waste storage warehouses.

(3) Conclusion

The licensee had made progress towards the reduction of the volume of solid radioactive waste stored on the storage pads.

b. Waste Classification and Characterization

(1) Inspection Scope

The inspector reviewed the licensee's waste classification and characterization program. This area had been reviewed previously in Inspection Report (IR) 70-1113/98-03. The inspector used the guidance in the NRC's Branch Technical Position (BTP) paper on "Final Waste Classification and Waste Form" dated May 11, 1983.

(2) Observations and Findings

The requirements for waste classification and characterization are specified in 10 CFR 61.55 and 61.56, respectively. The licensee may rely on any of four methods to classify waste: (1) materials accountability; (2) classification by source; (3) gross radioactivity measurements; and (4) direct measurement of individual nuclides.

GNF-A relied primarily on either of the first two methods to classify waste. The licensee's waste stream contained radionuclides of uranium and its decay products. The licensee also has Technetium-99 (Tc-99) present as an impurity, however, the quantities present were orders of magnitude lower than the concentration limit specified in Table 1 of 10 CFR 61.55 for Class A wastes containing Tc-99. Uranium and its decay products were not listed in either Tables 1 or 2 of 10 CFR 61.55.

The classification by sources method stipulates that the waste generated is classified and characterized through knowledge and control of the source of the waste. The source of the waste at GNF-A was limited to the radionuclides of the uranium and actinium series and the Tc-99 impurity. Therefore, all wastes generated by the fuel manufacturing process were designated as Class A.

The inspector also reviewed selected licensee's procedures for processing, packaging, and manifesting the solid waste. The following procedures were reviewed:

- FMO TOP-0100, Residue Mixing Procedure, Revision 0, August 11, 2000
- FMO TOP-0098, Consolidated Residue Scanning, Revision 0, August 11, 2000
- TOI-A-4071, Residue Drum Shipping (SRP-1), Revision 10, July 5, 2000

The inspector noted that the licensee had performed a characterization and profile of the CaF_2 soil and residue waste mixture being shipped to Envirocare by an offsite contractor laboratory. The radioactive waste profile was required by the disposal site. The inspector verified that the waste physical properties and chemical and hazardous characteristics satisfied the applicable minimum characteristic requirements specified in 10 CFR 61.56(a)(1).

(3) Conclusion

The licensee appropriately classified its solid waste streams as Class A waste in stable form and ensured that the waste met the applicable minimum waste characterization requirements specified in 10 CFR 61.56(a).

c. Waste Shipping

(1) Inspection Scope

The inspector reviewed the licensee's program for preparing waste shipping manifests as it pertained to the requirements of 10 CFR 20.2006 and Appendix G to 10 CFR Part 20.

(2) Observations and Findings

From a review of selected records for solid waste disposals made during 1999 and 2000, it was noted that the licensee had shipped selected noncombustible residue soil mixture waste items to a licensed waste burial facility (Envirocare of Utah). The inspector verified that the licensee provided an acceptable level of information in the shipping papers to determine the quantities of individual radionuclides shipped.

The inspector reviewed manifest records of selected shipments of radioactive waste made since December 1999. The manifests were complete and met the applicable requirements of Appendix G to 10 CFR Part 20. The inspector also verified that the licensee had a procedure and program in place to track waste shipments. The inspector reviewed the licensee's waste shipment tracking log and verified that the licensee received an acknowledgment of receipt of the waste within the 20 day time frame specified in 10 CFR 20 Appendix G.

(3) Conclusion

The waste shipping manifests were complete and provided an acceptable level of information in the shipping papers to determine the quantities of individual radionuclides shipped. The licensee's waste shipping tracking records were complete and well organized.

3. Transportation (86740) (R4)

The inspector reviewed the licensee's program for routine radioactive materials shipments to determine whether the licensee had established and was maintaining an effective program, to ensure radiological and nuclear safety in the packaging and delivery to a carrier of licensed radioactive materials, and to determine whether transportation activities were in compliance with the applicable NRC and the Department of Transportation (DOT) transport regulations noted below. During the inspection, transportation activities associated with fissile material shipments, including procedural guidance, quality control (QC) activities, and record completeness conducted in accordance with 10 CFR Part 71, and 49 CFR Parts 171-178 were reviewed.

10 CFR 71.5(a) requires that licensees who transport licensed material outside the confines of its plant or other place of use, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the DOT in 49 CFR Parts 170 through 189.

a. Preparation and Delivery of Completed Packages for Shipment (R4.01)

(1) Inspection Scope

The inspector examined the licensee's written procedures and shipment records related to the preparation and delivery of completed packages for shipment of fissile material.

(2) Observations and Findings

The inspector verified that the licensee had acceptable procedures for the preparation of shipping packages and delivery of the packages to the carrier for shipment. The inspector reviewed selected portions of the shipping procedures and noted that there were no significant changes to the procedures since the last inspection of this program area. The inspector also verified that the appropriate personnel in the traffic department had current copies of the applicable DOT regulations.

During the onsite inspection, licensee transportation activities regarding shipments of unirradiated fuel, uranium dioxide (UO₂) powder, and uranium hexafluoride (UF₆) heels were reviewed. Selected records covering the period January 2000 to August 2000 for those consignments were reviewed in detail. The inspector reviewed and discussed the documentation used, and subsequently maintained in the licensee's records for each radioactive material shipment, including, the Bill of Lading, Radioactive Material Shipment Record, Vehicle Inspection Report, Receipt and Loading Verification Checklist, Packing List (Fuel Assemblies/Component Assemblies), Fuel Shipment Information Form, Container Log Sheet, and Health Physics Survey Forms. The inspector noted that the shipping records were complete and the information supplied on the shipping papers was appropriate. The inspector noted that for a shipment of UF₆ cylinders to Westinghouse on August 9, 2000, the shipping papers indicated the cylinders as "heels." The total quantity of UF₆ shipped was 19,591 pounds. The inspector verified that all of the other required descriptions on the shipping papers were correct, including the designation as a reportable quantity (RQ). Apparently, the problem was with the shipping paper template in the computer system could only accommodate heel shipments. The licensee immediately corrected the problem by adding a template in the computer system to accommodate full UF₆ cylinders and re-instructing the shipping technicians.

(3) Conclusion

The licensee's performance in the preparation and delivery of completed packages was acceptable.

b. Fuel Bundle and Powder Packing

(1) Inspection Scope

The inspectors reviewed the fuel powder and unirradiated fuel bundle packing operations with certified operators and the Bundle Assembly Team Leader.

(2) Observations and Findings

The fuel bundle operators used operating procedure (OP) No. 1050.70, Fuel Bundle Packing, Revision 4-C, April 27, 2000. The inspectors observed fuel bundle loading operations and reviewed the procedure and noted that it was relatively easy to follow. The licensee required that at least one certified operator be present on each shift for loading operations. The inspector observed three out of four operators were certified. The certified operator was trained to perform quality control checks to ensure each container was loaded properly. The QC checks were performed in accordance with QCOR 2.8.1.2, Refurbishment and Acceptance of RA Inner Containers, Revision 19, June 20, 2000 and QCOR 2.8.1.3, Refurbishment and Acceptance of RA Inner Containers, Revision 9, June 20, 2000. In addition, approximately twice per week an independent quality assurance (QA) audit was performed by a certified operator when container loading activities were performed. These audits were performed in accordance with P/PQP 1.1.0, Quality at the Source (QATS) Implementation and Maintenance Plan - Fuel Manufacturing Operations (FMO), Revision 10, July 13, 2000 and QC II 1.1.0, FMO Surveillance Plan, Revision 21, June 26, 2000.

The inspector observed powder loading operations which occurred in a ventilated enclosure in a controlled area to minimize any potential airborne contamination. The inspector observed the loading of BU/J containers for powder shipments overseas (to Japan). The powder was packaged into water tight inner containers before being placed into the BU/J. The procedure controlling the loading operation was OP-1339, DCP Powder Pack/Powder Transfer, Revision 27. Currently, the licensee uses only the model BU/J shipping container for international shipments of UO_2 powder. The DOT has authorized the use of the BU/J for international shipments only via a Competent Authority Certification for fissile radioactive materials package design certification USA/0220/AF-85, Revision 9, approved by DOT on July 19, 2000. The certificate will expire on May 13, 2001. The licensee was not authorized to use the BU/J for domestic shipments of powder or pellets. The quality control and quality assurance oversight of the powder packaging activities were performed using the same QA/QC procedures noted above for fuel bundle loading.

The inspector observed the hydrostatic testing of the inner container of the BU/J container. The inner containers were hydrostatically tested before first use in accordance with FP-1485, Inspection Requirements for Water Tight Inner Pails, Revision 1, September 17, 1999 to insure resistance to water intrusion. The inspector noted, however, that the inner containers were not re-tested after each international shipment of UO_2 powder to insure resistance to water intrusion. Upon further review, the inspector noted that re-testing of the inner container was not required under the current DOT license. The inspector discussed this concern with the licensee, who indicated that each inner container would probably be used only two to three times before the certificate expires on May 13, 2001. After that date, the licensee anticipates using another type of package currently in the application review process.

(3) Conclusion

The licensee's performance in the fuel bundle packing and powder packing operations was acceptable.

c. Receipt of Packages (R4.03)

(1) Inspection Scope

The inspector examined the licensee's procedures and records of incoming shipments to verify compliance with the applicable requirements of 10 CFR 20.1906 relating to the pickup from a carrier, receiving, and safe opening of packages.

(2) Observations and Findings

The inspector reviewed the records and discussed with licensee employees the program for the safe receipt and handling of UF₆ cylinders and incoming powder shipments. The inspector examined the receipt survey records for the first six months of 2000 and noted that the correct direct and contamination surveys were performed within the time frame specified in 10 CFR 20.1906(b).

(3) Conclusion

Through the review of survey records for the receipt of radioactive materials, evaluation of written procedures, and discussions with personnel responsible for performing the surveys, it was concluded that the licensee had an acceptable program for the safe receipt of radioactive materials.

d. Certificates of Compliance

(1) Inspection Scope

The inspector reviewed the licensee's records pertaining to selected NRC Certificates of Compliance (CoC) and verified that the licensee was an authorized user of the applicable NRC certified packages.

(2) Observations and Findings

10 CFR 71.12 (Subpart C) requires, in part, that (a) a general license is issued to any licensee of the Commission to deliver to a carrier for transport, licensed material in a package for which a license, CoC, or other approval has been issued by the NRC and; and applies only to a licensee who (c)(1) has a copy of the specific CoC, and other approval of the package and has the drawings and other documents referenced in the approval relating to the use and maintenance of the packaging and to the actions to be taken prior to shipment and (c)(2) complies with the terms and conditions of the license, CoC, or other approval as applicable, and the applicable requirements of Subparts A, G, and H of this Part.

The inspector noted that the fuel rod and assembly shipments were shipped using NRC CoC No. 4986, USA/4986/AF, Model Numbers RA-2 and RA-3 packaging. The inspector verified that the licensee maintained the most recent revision of CoC No. 4986 (Revision 37) and referenced documents in accordance with 10 CFR 1.12(c)(1) requirements. In addition, the inspector verified that the licensee was a registered user of the package in accordance with 71.12(c)(3).

The inspector also verified that the licensee was a registered user of the NRC CoC 9196, USA/9196/AF, Model UX-30, which was an UF₆ cylinder overpack. The inspector verified that the licensee maintained the most recent revision of CoC No. 9196 (Revision 16) and referenced documents in accordance with 10 CFR 71.12(c)(1) requirements.

Lastly, the inspector verified that the licensee was a registered user of the NRC CoC 9285, USA/9285/AF-85, Model SRP-1, which was a container for solid uranium contaminated residues. The inspector verified that the licensee maintained the most recent revision of CoC No. 9285 (Revision 0) and referenced documents in accordance with 10 CFR 71.12(c)(1) requirements.

(3) Conclusion

The licensee's records pertaining to the CoC were well maintained and easily retrievable.

e. Review of Transportation Unusual Incidents

(1) Inspection Scope

The inspector reviewed unusual incident reports (UIRs) and 30 day reports pursuant to 10 CFR 71.95 and 73.71(a)(4) as they pertained to transportation of radioactive materials events. The inspector reviewed the events since the last inspection of this program area with licensee representatives and discussed the appropriate corrective actions that were taken.

(2) Observations and Findings

The inspector reviewed a 30 day report dated January 12, 2000 that was made in accordance with 10 CFR 73.71(a)(4). The report pertained to a safeguards event. 10 CFR 73.71(a)(1) requires the licensee to notify the NRC Operations Center within one hour after the discovery of the loss of any shipment of SNM or spent fuel and within one hour after recovery of or accounting for such loss of a shipment. 10 CFR 73.71(a)(4) specifies the requirements for the written report.

On December 14, 1999, an incoming Transnuclear shipment of four UF₆ cylinders was unaccounted for four hours after the established estimated time of arrival (ETA). Apparently, the driver of the truck carrying the UF₆ cylinders had overslept in a location approximately three miles north of GNF-A. The truck driver had been told by his company that GNF-A was concerned about receiving early deliveries. During the evaluation of the incident, both GNF-A and transnuclear clarified and resolved the misunderstandings in communications regarding the ETA and deliveries to the Wilmington Facility.

The resolution and solution to the communication misunderstandings was acceptable. Therefore, no further follow-up to this event from a shipping and transportation perspective was warranted.

(3) Conclusion

The licensee's identification and correction of an incident that pertained to a safeguards event was acceptable and timely.

4. Exit Interview

The routine inspection scope and results were summarized on August 18, 2000 with those persons indicated in the attachment. The inspectors discussed in detail the program areas inspected and the identified findings. 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 expressed by the licensee.

ATTACHMENT

1. PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

*M. Allen, Hygiene and Safety Engineer
*D. Barbour, Radiation Protection Team Leader
*R. Bragg, Manager, Chemical Product Line
*D. Brown, Team Leader, Environmental Programs
*R. Foleck, Program Manager, Facility Licensing
*H. Knight, Manager, Site Security and Emergency Preparedness
G. Luciano, Area Manager, Fuel Support
*A. Mabry, Program Manager, Radiation Safety Engineering
*R. Martyn, Manager, Material Control and Accounting
*C. Monetta, Manager, Global Nuclear Fuels, Environment, Health & Safety
*L. Paulson, Manager, Nuclear Safety
R. Strine, Packaging Engineer
*J. Reynolds, Manager, Environmental Programs
*C. Vaughan, Manager, Facility Licensing
*M. Watkins, Team Leader, Shop Support
*K. Williams, Senior Quality Engineer
*R. Yopp, Specialist, Shipping and Transportation

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

*Denotes those present at the exit meeting on August 18, 2000.

2. INSPECTION PROCEDURES USED

IP 84850	Radioactive Waste Management (10 CFR Parts 20 and 61)
IP 84900	Low-Level Radioactive Waste Storage
IP 86740	Inspection of Transportation Activities

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
none		

4. ACRONYMS

BTP	Branch Technical Position
CaF ₂	Calcium Fluoride
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
DCP	Dry Conversion Process
DOT	Department of Transportation
ETA	Estimated Time of Arrival

FMO	Fuel Manufacturing Operations
GNF-A	Global Nuclear Fuels-Americas
IP	Inspection Procedure
IR	Inspection Report
LLRW	Low Level Radioactive Waste
NRC	Nuclear Regulatory Commission
OP	Operating Procedure
QA	Quality Assurance
QATS	Quality at the Source
QC	Quality Control
RQ	Reportable Quantity
SNM	Special Nuclear Material
SRPs	Solid Residue Packs
Tc-99	Technetium-99
UIR	Unusual Incident Report
UF ₆	Uranium Hexafluoride
UO ₂	Uranium Dioxide