



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

April 28, 2016

Mr. Adam Hilton  
FMO Facility Manager  
Global Nuclear Fuel – Americas, L.L.C.  
P.O. Box 780, Mail Code J20  
Wilmington, NC 28402

**SUBJECT: GLOBAL NUCLEAR FUEL – AMERICAS, L.L.C. – U.S. NUCLEAR REGULATORY  
COMMISSION INTEGRATED INSPECTION REPORT 70-1113/2016-002**

Dear Mr. Hilton:

The Nuclear Regulatory Commission (NRC) conducted announced inspections during the first quarter of calendar year 2016 (January 1 - March 31, 2016), at the Global Nuclear Fuel – Americas, L.L.C. Facility in Wilmington, NC. The purpose of these inspections was to review the implementation of programs and procedures for radiation protection, environmental protection, and radioactive waste. The reviews conducted helped to determine that licensed activities were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of these inspections. At the conclusion of these inspections, the inspectors discussed the results with you and members of your staff at an exit meeting on March 24, 2016.

During the inspections, the staff examined selected activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspections consisted of facility walk-downs; selective examinations of relevant procedures and records; interviews with plant personnel; and plant observations. Throughout the inspections, observations were discussed with your managers and staff. Based on the results of these inspections, no violations of significance were identified.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of NRC's "Rules of Practice and Procedure," a copy of this letter and the enclosure will be made available electronically for public inspection in the NRC Public Document Room, or from the NRC's Agency wide Documents Access and Management System (ADAMS); accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions, please contact Tom Vukovsky of my staff at 404-997-4622.

Sincerely,

*/RA/*

Eric C. Michel, Chief  
Projects Branch 2  
Division of Fuel Facility Inspection

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

Enclosure:  
NRC Inspection Report 70-1113/2016-002  
w/Supplemental Information

cc:  
Scott Murray, Manager  
Facility Licensing  
Global Nuclear Fuels – Americas, L.L.C.  
Electronic Mail Distribution

W. Lee Cox, III, Chief  
North Carolina Department of Health and Human Services  
Division of Health Service Regulation  
Radiation Protection Section  
Electronic Mail Distribution



U.S. NUCLEAR REGULATORY COMMISSION  
REGION II

Docket No.: 70-1113

License No.: SNM-1097

Report No.: 70-1113/2016-002

Licensee: Global Nuclear Fuel - Americas, LLC

Location: Wilmington, North Carolina 28402

Dates: January 1 through March 31, 2016

Inspectors: R. Gibson, Senior Fuel Facility Inspector (Section A.1)  
J. Munson, Fuel Facility Inspector (Section A.1)  
N. Pitoniak, Fuel Facility Inspector (Section A.3)  
P. Startz, Fuel Facility Inspector (Section A.2)

Approved by: E. Michel, Chief  
Projects Branch 2  
Division of Fuel Facility Inspection

Enclosure

## **EXECUTIVE SUMMARY**

Global Nuclear Fuel - Americas, LLC  
NRC Integrated Inspection Report Nos. 70-1113/2016-002  
January 1 through March 31, 2016

NRC regional inspectors conducted inspections during normal shifts in the areas of Radiation Protection, Environmental Protection, and Radioactive Waste Processing, Handling, Storage, and Transportation. During the inspection period, normal production activities were ongoing. These announced, routine inspections consisted of a selective examination of procedures and representative records, observations of activities, walk-downs of items relied on for safety (IROFS), and interviews with licensee personnel. There were no safety significant findings identified during these inspections.

### **Radiological Controls**

- The radiation protection program was implemented in accordance with the license application and regulatory requirements. (Section A.1)
- The effluent control and environmental protection program was implemented in accordance with the license application and regulatory requirements. (Section A.2)
- Radioactive waste processing, handling, storage, and transportation activities were implemented in accordance with the license application and regulatory requirements. (Section A.3)

### **Attachment**

Key Points of Contact  
List of Items Opened, Closed, and Discussed  
Inspection Procedures Used  
Documents Reviewed

## **REPORT DETAILS**

### **Summary of Plant Status**

Global Nuclear Fuel – Americas (GNF-A), LLC manufactures uranium dioxide (UO<sub>2</sub>) powder, pellets, and light water reactor fuel bundles at its Wilmington, NC facility. The facility converts uranium hexafluoride (UF<sub>6</sub>) to UO<sub>2</sub> using a Dry Conversion Process (DCP) and performs UO<sub>2</sub>, gadolinium pellet and fuel fabrication operations. During the inspection period, normal production activities were ongoing.

#### **A. Radiological Controls**

##### **1. Radiation Protection – (Inspection Procedure 88030)**

###### **a. Inspection Scope and Observations**

The inspectors reviewed the Radiological Protection Program and determined that the licensee's program performance was reviewed at least annually to comply with 10 Code of Federal Regulations (CFR) 20.1101. The inspectors reviewed the Nuclear Safety organization chart and interviewed staff regarding their responsibilities. The program's Nuclear Program Manager was scheduled to retire this year and the licensee is interviewing possible candidates for his replacement. The inspectors determined that the radiation protection program responsibilities and functions were independent from operations and maintenance. The inspectors reviewed a sample of radiological procedures and determined that the changes made to these procedures since the last inspection were consistent with regulations and license requirements.

The inspectors reviewed the licensee's training program for radiation protection. The inspectors reviewed initial training and refresher training of the Radiation Safety Technicians and determined that they were trained in accordance with the license application and applicable procedures. The inspectors determined that the licensee was implementing the radiation protection training program consistent with the license requirements.

The inspectors reviewed the records of Individual Contamination Reports. The inspectors verified that trends were captured in the licensee's corrective action program (CAP) and management emphasized the importance of as low as reasonably achievable (ALARA) practices. The inspectors verified that the regulatory limits for a personnel contamination event were not exceeded.

Air monitoring and smear data were reviewed by the inspectors to determine if surveys were effective in the identification of airborne particulates and surface contamination. The inspectors reviewed and determined that the licensee had established schedules for periodic surveys of work areas. The inspectors determined from review of records and interviews with licensee staff, the licensee had changed the periodicity for collecting stationary air samples (SAS) filter elements from eight hours to 12 hours. The change was made by the licensee because it directly relates to a change in the work shift of production operators. The inspectors determined that the licensee application and procedures allows, in part, filters from air samplers to be changed each shift during normal operating periods. The inspectors reviewed a selected sample of survey records for both the eight hours and 12 hours shifts since the last inspection and determined

them to be in accordance with the license application. The inspectors determined that the survey program adequately evaluated the magnitude and extent of radiation and contamination levels in accordance with 10 CFR 20.1501 and the license.

The inspectors reviewed radiation work permits (RWPs), interviewed the Radiation Program Manager and technicians responsible for RWPs, and observed operators and maintenance workers performing work in accordance with the RWPs. The inspectors determined that the operators were trained prior to performing work required by RWPs and that each work was briefed by their supervisor. The inspectors also determined that the RWP was located at the Radiation Safety Office and signed by workers performing the work. The inspectors determined that the licensee was processing RWPs in accordance with the license requirements.

The inspectors examined selected portable survey instruments and fixed monitoring equipment to determine operability and calibration status. The inspectors verified that instruments and equipment used for quantitative radiation and contamination measurements were calibrated at the proper frequency as required in 10 CFR 20.1501. The inspectors interviewed staff and determined that the radiation protection instruments were checked daily for operability and source check weekly as required by the license application.

The inspectors determined that radiological signs and postings at entrances to controlled areas, as well as within the controlled areas, were posted in accordance with the license and regulatory requirements and accurately reflected radiological conditions in the areas. The inspectors conducted walk downs of the Dry Conversion Process, Dry Scrap Recovery and the ceramic areas of the Fuel Manufacturing Operations (FMO) building, and determined that the areas were adequately posted and controlled. The inspectors verified that the Notice to Employees, NRC Form 3, was posted in high traffic areas (near employee entrances/exits) in accordance with 10 CFR 19.11.

The licensee's ALARA program was reviewed to determine if the program and ALARA goals were developed and implemented in accordance with the license. On a monthly basis, the licensee conducted ALARA Committee meetings detailing ALARA goals and exposure summaries in order to identify undesirable trends. The inspectors interviewed the manager responsible for the ALARA evaluations and assessments and determined the evaluations and assessments to be in accordance with their license. The inspectors determined that the licensee utilized procedures and engineering controls to achieve occupational doses which were ALARA as required by 10 CFR 20.1101.

b. Conclusion

No violations of significance were identified.

2. Effluent Control and Environmental Protection (Inspection Procedure 88045)

a. Inspection Scope and Observations

The inspectors reviewed samples of environmental programmatic changes, procedures, and operations that had been revised since the last inspection to evaluate and verify that the program and associated procedures remained in compliance with license and regulatory requirements. The inspectors reviewed an audit titled "3<sup>rd</sup> Quarter 2015 Quality Assurance Report", dated March 22, 2016, performed by Teledyne Brown

Engineering Environmental Services. The audit evaluated the accuracy and validity of analytical laboratory analysis of GNF-A environmental samples submitted to that laboratory.

The inspectors performed physical evaluations of processing equipment involved in the final treatment system utilized for processing liquid waste discharges. The inspectors evaluated the material condition of the treatment system including waste storage tanks, chemical treatment tanks, filtration banks, pH adjustment tank, lagoons, and final liquid effluent composite sampling devices. The inspectors observed manual sampling activities of the lagoons and the operation of the composite samplers to determine compliance with facility procedures EPI No. 0-1.0 and EPI No. OP 1080.69. The review included an analysis of calibration records to determine if licensee personnel had maintained sampling devices to ensure the equipment had been maintained in an accurate and functional state. The inspectors reviewed summaries of uranium analytical data results for January 2015 through December 2015, and determined that the monthly averages had been significantly less than the values described in 10 CFR 20 Appendix B.

Inspectors observed a radiological technician change out stack sample filters on a random number of gaseous effluent exhaust stacks to evaluate compliance with facility procedure EPI No. 0.6.0. Samples of various environmental operating procedures, onsite and offsite laboratory analysis results, and sampling equipment calibration compliance records were evaluated. The inspectors concluded that the activities had been conducted in accordance with the applicable procedures and at the required frequency.

The inspectors reviewed 2015 property fence line dosimeter results used, in part, to calculate the public dose. Inspectors evaluated samples of radiological airborne effluent-specific public dose calculations using the COMPLY code to determine if the public dose results remained less than the ALARA constraint on air emissions as required in 10 CFR 20.1101(d). The inspectors determined that the annual public dose associated with licensed activities remained less than 100 mrem/year as required by 10 CFR 20.1301.

The inspectors reviewed samples of environmental monitoring locations for soil, surface water, ambient air, and external radiation immediately around the facility and including the Cape Fear River to determine compliance with Chapter 9 of their license requirements. The inspectors determined that the locations and physical characteristics of the sampling locations were appropriate, would provide satisfactory data, and were in compliance with license conditions.

b. Conclusion

No violations of significance were identified.

3. Radioactive Waste Processing, Handling, Storage and Transportation (Inspection Procedure 88035)

a. Inspection Scope and Observations

The inspectors determined that the licensee had established and maintained adequate procedures and a quality assurance program to ensure compliance with the



requirements of 10 CFR Part 20 and 10 CFR Part 61, as applicable to low-level radioactive waste form, classification, stabilization, and shipment manifests/tracking.

The inspectors reviewed procedures and observed performance of tasks related to radioactive waste. The procedures were clearly written with adequately delineated responsibilities related to radioactive waste management. The inspectors observed operators processing radioactive filters and packaging radioactive combustible and non-combustible wastes. The inspectors also observed activities associated with determining the radioactive waste classification, labeling, and storage of these packages. The operators were knowledgeable of their responsibilities and performed their tasks in accordance with facility procedures.

The inspectors reviewed the quality assurance program for radioactive waste management and determined that the required audits were being performed. The findings from the audits were entered into the licensee's corrective action program for resolution.

The inspectors reviewed the licensee's program for classifying low-level radioactive waste. The inspectors reviewed the procedures for classifying waste as well as records relating to waste. The inspectors reviewed the licensee's program for ensuring that waste was properly packaged to ensure the waste form met the requirements of 10 CFR 61.56.

The inspectors reviewed the licensee's procedures for labeling waste shipments and tracking radioactive waste. Additionally, the inspectors reviewed the procedures for placement, inspection, and repackaging of radioactive waste.

The inspectors performed walk-downs of selected radioactive material storage areas. The storage areas had adequate postings to ensure that the proper material was being stored in the designated area and the material was safely stored in accordance with the nuclear criticality safety requirements. The containers were properly labeled to reflect their contents and were in adequate physical condition.

b. Conclusion

No violations of significance were identified.

B. Exit Meeting

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and were summarized on March 24, 2016, to A. Hilton and staff. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

## **SUPPLEMENTAL INFORMATION**

### **1. KEY POINTS OF CONTACT**

<u>Name</u>	<u>Title</u>
Balderson, R.	Decontamination Facility Supervisor
Berger, J.	Manager, PP and SS
Cable, R.	Radiation Protection Engineer
Crott, R.	EHS Program Manager
Eghbali, D.	Environmental Health and Safety
Haney, M.	Radiation Protection Supervisor
Hilton, A.	FMO Operations Leader & Facility Manager
Howard, J.	Radiation Safety Technician
Kontz, P.	Radiation Safety Technician
Latham, U.	Sr. Admin Specialist, Licensing
Mabry, A.	Radiation Safety Program Manager
Matthews, J.	Radiation Waste Engineer
McKay	Radiation Safety Technician
Murray, S	Manager, Licensing
Nay, D.	FMO Manufacturing Engineering Manager
O'Conner	Environmental, Water SME, EH&S
Ollis, P.	Licensing Engineer, Licensing and Liabilities
Paulson, L	Sr. Criticality Safety Analysis
Ruffin, R.	Radiation Safety Technician
Saito, E.	EHS and Nuclear Safety Manager
Williams, K.	Environmental, Air SME, EH&S

### **2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

None

### **3. INSPECTION PROCEDURES USED**

88030	Radiation Protection
88035	Radioactive Waste Management
88045	Effluent Control and Environmental Protection

### **4. DOCUMENTS REVIEWED**

#### Records:

Semi-annual Effluent Monitoring Report, For the Period of January through June 2015,  
dated August 28, 2015

Semi-annual Effluent Monitoring Report, For the Period of July through December 2015,  
dated February 13, 2015

KATS training records for E-Gun qualification

Work Order 182832, Calibration Inspection Accountability Scale, New Decon room HEPA  
Hood, Scale Z5005, dated august 15, 2015

Work Order 233024, Quarterly Calibration: Verification and Set-up of Fill Box Monitor in the  
New Decontamination Room, Monitor Z0006415, dated February 1, 2016

Work Order 175172, Annual Calibration of Cart Monitor, Z0006416, dated July 1, 2015

Attachment

Procedures:

BP-20-01, Competence, Awareness and Training, Revision (Rev.) 1.0  
 CP-06-216, Functional Test Instructions, Rev. 1.0  
 CP-06-216-T01, Functional Test Instruction for Rad Permeate Flow to Sewer  
 CP-08-111, Enrichment Control of Nuclear material, Rev. 0  
 CP-12-102, Calibration Program for Instrument and Controls, Rev. 2.0  
 CP-16-108, Corrective Action Program, Rev. 8  
 CP-20-301, Quality and Technical Training, Rev. 1.1  
 CP-20-305, Radiation Protection Training, Rev. 0  
 EPI No. 0-2.0 Rev. 42, Environmental Sampling of the Final Process Lagoon System, Aeration Basin, and Site Dam  
 EPI No. 0-1.0, Operation of Final Process Effluent Control System  
 EPI No. 0.6.0 Rev. 70, Stack Sampling Program  
 EPI No. O-9.0, Rev. 36, Environmental Ambient Air Sampling Stations  
 EPI No. OP 1080.69, Rev. 19, Waste Treatment Sampling  
 OP 1080.20.000, Decon Facility, Rev. 01  
 OP 1080.20.100, Decon Facility – General Information, Rev. 01  
 OP 1080.20.201, Decon Facility – Startup, Rev. 00  
 OP 1080.20.202, Decon Facility – Waste Box Normal Operations, Rev. 01  
 OP 1080.20.203, Decon Facility – Waste Oil Normal Operations, Rev. 01  
 OP 1080.20.204, Decon Facility – Auxiliary Waste Operations, Rev. 01  
 OP 1080.20.205, Decon Facility – Abnormal Operations, Rev. 00  
 OP 1080.20.206, Decon Facility – Alarm Response and Emergency Operations, Rev. 00  
 OP 1080.20.300, Decon Facility – Process Information, Rev. 00  
 OP 1900, Rad Waste General Op, Rev. 20  
 OP 1922.00, FMO Rad Waste Filtration, Rev. 17  
 OP 1930.00, FMO Rad Waste Quarantine, Rev. 12  
 OP 1930.01, FMO Rad Waste System – Slab Tanks, Rev. 9  
 OP 1940.00, Laundry and Scrubber Surge System, Rev. 13  
 WI-16-108-04, Cause Analysis, Rev. 4.0  
 WI-16-108-01, Condition Review Process, Rev. 3.0  
 WI-27-105-05, Control of Radioactive Material, Rev. 3  
 WI-27-105-07, Airborne Radioactivity Measurement and Control, Rev. 0  
 WI-27-105-14-01, Calibration and Operation of the Argos 3/5 Personnel Contamination Monitors, Rev. 2  
 WI-27-105-14-02, Calibration and Operation of the Canberra AFH 2000 Hand and Foot Monitor, Rev. 1  
 Z00044Z4-RAD2-PD, Functional Test Instruction, Rev. 4

Condition Reports Written as a Result of the Inspection:

CR 18801  
 CR 18827  
 CR 18844  
 CR 18849

Condition Reports Reviewed:

CR 14183  
 CR 14571  
 CR 14695  
 CR 14700  
 CR 15121  
 CR 15779

CR 16079  
 CR 18631  
 CR 18780  
 CR 16738  
 CR 16814  
 CR 17122  
 CR 17326  
 CR 17418  
 CR 17788

Other Documents:

CP-20-107-F0x, Gad Automated Rod Load Operator Qualification Card, Rev. 0  
 TD-702-20, Quarantine Tank Uranium Monitor, Rev. 0  
 TD-702-21, Quarantine Tank Pipe Detector, Rev. 0  
 DCP Blend Pre-compact Granulate (BPG) and Second Floor Additive Make-up Qualification Card  
 P/N 1000006053, Shur-Shot X-Proof Hydrogen Fluoride Alarm Operations Manual, Rev. E  
 UM SITRPDS3-1, SITRANSP, Series DSIII Transmitter for Pressure, Differential Pressure, Flanged Level, and Absolute Pressure Model 7MF4\*33, Rev. 4  
 Criticality Safety Analysis 1331.01  
 DET-TRONICS Instructions 95-8444  
 Infiniti Gas Transmitter U9500  
 PHA 803, Rev. 3  
 QRA-803/804 HVAC, Rev. 7  
 ANI Nuclear Liability Insurance Inspection Report L111215-169 Wilmington Fuel Fabrication Facility, November 10-12, 2015  
 North Carolina Department of Health and Human Services Division of Health Service Regulation, Amendment to Radioactive Materials License No. 065-0317-1, dated December 22, 2015  
 QRA-701, Quantitative Risk Assessment – Decon, Rev. 11  
 QRA-702/703, Quantitative Risk Assessment – Radwaste/Waste Treatment, Rev. 5  
 QRA-801/802, Quantitative Risk Assessment – Auxiliary Operations, Rev. 9  
 WO-238590, Calibration Procedure for the ASP-2 and HP-380 A Probe, Rev. 0  
 WO-239923, HVAC Annual Preventative Maintenance on Roof Scrubbers  
 COMPLY computer program, Environmental Protection Agency Web Site

Radiation Work Permit:

RWP 5484  
 RWP 5553  
 RWP 5538  
 RWP 5555