



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

January 16, 2014

Mr. Amir Vexler  
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. – NUCLEAR REGULATORY  
COMMISSION INTEGRATED INSPECTION REPORT NO. 70-1113/2013-005**

Dear Mr. Vexler:

The Nuclear Regulatory Commission (NRC) conducted announced, routine inspections from October 1 through December 31, 2013, at the Global Nuclear Fuel – Americas facility in Wilmington, North Carolina. The purpose of the inspections was to review the implementation of programs and procedures for radiation protection, emergency preparedness, and permanent plant modifications. The reviews were performed to determine whether activities authorized by your license were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of these inspections. At the conclusion of the inspections, the inspection results were also discussed with members of your staff at exit meetings on October 24 and November 8, 2013.

During the inspections, the staff examined 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. Based on the results of the inspection, no findings of significance were identified.

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

If you have any questions, please call me at (404) 997-4629.

Sincerely,

**/RA/**

Marvin D. Sykes, Chief  
Projects Branch 2  
Division of Fuel Facility Inspection

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

Enclosure:  
NRC Inspection Report No. 70-1113/2013-005  
w/Attachment: 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  
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U.S. NUCLEAR REGULATORY COMMISSION  
REGION II

Docket No.: 70-1113

License No.: SNM-1097

Report No.: 70-1113/2013-005

Licensee: Global Nuclear Fuel - Americas, LLC

Location: Wilmington, North Carolina 28402

Dates: October 1 through December 31, 2013

Inspectors: M. Thomas, Senior Fuel Facility Inspector (Sections A.1 and B.1)  
B. Adkins, Senior Fuel Facility Inspector (Sections A.1 and B.1)  
S. Mendez-Gonzalez, Fuel Facility Inspector (Section B.1)  
M. Schweig, Brunswick Resident Inspector, (Section B.1)  
L. Pitts, Senior Fuel Facility Inspector (Section B.2)  
K. Kirchbaum, Fuel Facility Inspector (Sections B.1 and B.2)

Approved by: M. Sykes, Chief  
Projects Branch 2  
Division of Fuel Facility Inspection

Enclosure

## **EXECUTIVE SUMMARY**

Global Nuclear Fuel - Americas, LLC  
NRC Integrated Inspection Report No. 70-1113/2013-005  
October 1 through December 31, 2013

Inspections were conducted by NRC regional inspectors during normal shifts in the areas of safety operations, emergency preparedness, and permanent plant modifications. 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. No safety significant findings were identified.

### **Radiation Protection**

- The radiological protection program was implemented in accordance with the license application and regulatory requirements. (Section A.1)

### **Emergency Preparedness**

- The evaluation of exercises and drills was implemented in accordance with the emergency plan and regulatory requirements. (Section B.1)

### **Permanent Plant Modifications**

- The permanent plant modifications program was implemented in accordance with the license application and regulatory requirements. (Section B.2)

### **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 (IP 88030)**

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

The inspectors reviewed the 2013 radiation safety committee meeting minutes and the current As Low As Reasonably Achievable (ALARA) program in order to ensure that the program performance was being reviewed, at least annually, to comply with 10 CFR 20.1101. The inspectors interviewed the nuclear safety manager, the radiological program manager, and two radiation supervisors to determine that the radiation protection program responsibilities, functions, and independence is separated from operations. The inspectors reviewed radiological protection procedures in order to determine that changes to these procedures, made since the last inspection, were consistent with regulations and licensee requirements.

The inspectors reviewed calibration stickers on survey instruments and monitoring equipment, corresponding calibration records, and functional test records. In addition, the inspectors observed source/response checks. As a result, the inspectors determined that the performance of radiation survey/detection instruments and equipment was in accordance with licensee requirements and procedures.

The inspectors reviewed the Total Effective Dose Equivalent (TEDE) results for plant personnel and determined that they were less than the regulatory limit of 5 rem/year. The inspectors reviewed the latest available 2013 plant personnel dosimeter results, as submitted by the licensee, to their contractor and determined that the Lens Dose Equivalent and Shallow Dose Equivalent results were less than the regulatory limit of 15 rem/year and 50 rem/year, respectively. The inspectors verified that records were maintained in accordance with 10 CFR 20.2106. The contractor used for dosimetry processing was approved by the National Voluntary Laboratory Accreditation Program (NVLAP).

The inspectors determined the respiratory protection program was in compliance with 10 CFR 20.1703. The inspectors determined that the respiratory protection program adequately identified potential hazards and that users were properly trained and qualified in the use of respiratory protection equipment. The respirators inspected were NIOSH-approved and did not show any physical indications of deterioration.

The inspectors toured various areas of the Fuel Manufacturing area and outside support buildings and verified that radiological signs and postings accurately reflected radiological conditions. Areas were posted in accordance to 10 CFR Part 20 and the Notice to Employees, NRC Form 3, was posted in a high traffic area (at the security turnstiles) in accordance with 10 CFR 19.11.

The inspectors observed two dose rate surveys and two contamination surveys. Based on reviews of the procedures and observations, the inspectors determined that the surveys adequately evaluated the magnitude and extent of radiation levels in accordance with 10 CFR 20.1501. The inspectors reviewed the latest leak test survey records for sealed sources and determined that the licensee was in compliance with the license application.

b. Conclusion

No findings of significance were identified.

B. Facility Support

1. Evaluation of Exercises and Drills (IP 88051)

a. Inspection Scope and Observations

The inspectors reviewed the emergency drill scenario and discussed the exercise objectives with licensee personnel before the exercise. The inspectors walked down the plant to assess the effectiveness of the visual aids used during the drill and verified that the licensee had not pre-staged equipment in anticipation of the exercise.

The inspectors observed and evaluated the licensee graded biennial exercise conducted on October 24, 2013. The scenario included a forest fire that spread to Pad 10, an area where the licensee stores radioactive waste before it is incinerated. The licensee has a high volume of material stored on Pad 10 due to the incinerator being inoperable. If all of the material on Pad 10 were to burn, the radioactive plume could potentially spread outside the Owner Controlled Area.

At the initiation of the emergency drill, the inspectors verified that the licensee assessed the accident scenario, analyzed the plant conditions, and adequately classified the event. The event was classified as an Alert and later as a Site Area Emergency in accordance with the Emergency Plan. The inspectors observed the activation of the Emergency Operations Center (EOC) and the Emergency Organization and noted that all required positions were fully staffed and the necessary personnel were dispatched in accordance with the Emergency Plan. The inspectors verified that the Protective Action Recommendations (PARs) implemented by the EOC and emergency organization were appropriate for the accident scenario and in accordance with the Emergency Plan.

The inspectors verified that the initial offsite notifications were within the time period specified in the Emergency Plan and contained the required information. The licensee adequately discussed the PARs in the EOC but failed to effectively communicate the PAR to the offsite agencies as part of the drill. The licensee notified the county about the protective action 19 minutes after declaring the Site Area Emergency and failed to notify the state about the PAR. The Radiological Contingency and Emergency Plan (RC&EP),

Revision (Rev.) 21 dated December 7, 2012, states in part that "Notification to the local and state agencies will normally be initiated within 15 minutes after the event has been assessed and classified. This notification will include a recommendation for off-site protective actions." This issue was discussed during the licensee's critique, but the impact of the issue was not fully discussed. This failure does not constitute a violation of NRC requirements, but it is of concern because the licensee could have impacted the off-site agencies ability to effectively designate appropriate protective actions. In addition, the licensee failed to notify the agencies as they downgraded from a Site Area Emergency to an Alert once the fire was extinguished. This failure was discussed during the licensee's critique, but the impact of the issue was not fully discussed. This failure does not constitute a violation of NRC requirements, but it is of concern because the licensee could have impacted the off-site agencies ability effectively designate appropriate protective actions. These failures were entered into the licensee's corrective action program as Condition Report 8893, "Classification and Notification." The licensee stated in this condition report that they would develop and implement a classification procedure that clearly indicates what classification and notification actions to take during initial classification as well as the downgrade of a classification and event.

The inspectors verified that the onsite communications to the occupational workers were consistent with the PARs implemented by the EOC and Emergency Organization. The occupational workers participated in the shelter-in-place protective action in accordance with approved procedures. The inspectors reviewed the press releases released by the emergency organization communicators and determined that the press releases were approved by the Emergency Director prior to issuance and were in accordance with the Emergency Plan.

The inspectors determined that the Emergency Director maintained adequate command and control of the EOC. The inspectors reviewed the offsite dose assessment conducted by the dose assessor using the Radiological Assessment System for Consequence Analysis (RASCAL) software. The inspectors verified that the Emergency Director utilized the dose assessment, radiation survey results, and environmental monitoring results during the assessment of the accident scenario. The inspectors observed that the licensee ran RASCAL twice to re-evaluate the situation and informed the Emergency Director of new information.

The inspectors observed members of the licensee's emergency response team assemble at the designated assembly area and the arrival of the off-site emergency responders including licensee's fire responders and county EMT. The inspectors observed the emergency response team's search and rescue activities for the injured victim including radiological surveys of the victim prior to transport to off-site medical facilities, the assessment of the affected area, and response to additional emerging situations. The Incident Commander, Fire Brigade Officer, Safety Officer maintained adequate command and control of the emergency response team and coordinated action with the off-site emergency responders. The inspectors verified that the emergency response team activities were appropriate for the exercise scenario and were adequate in meeting the drill objectives.

b. Conclusion

No findings of significance were identified.



## 2. Permanent Plant Modifications (IP 88070)

### a. Inspection Scope and Observations

The inspectors interviewed six senior managers, supervisors and engineers to verify that the licensee had established an effective configuration management system to evaluate, implement, and track permanent plant modifications (PPMs) to the site which could affect safety.

The inspectors reviewed a selection of plant modifications to evaluate the licensee's implementation of the configuration management system to ensure the modifications did not degrade the performance capabilities of items relied on for safety (IROFS) or other safety controls. The inspectors verified that the licensee's work control program had provisions to ensure the adequate pre-job planning and preparation of PPM design packages.

The inspectors performed plant tours with plant engineering and management representatives and several plant modifications were discussed in detail. The safety significance of these modifications as well as their effect on IROFS were reviewed and determined to have a minimal safety impact.

The inspectors reviewed PPM design packages completed since the last PPMs inspection for accuracy. The inspectors verified that applicable post maintenance installation and testing requirements were adequately identified and performed prior to implementation of PPM design packages. Completed modifications were adequately reviewed prior to implementation and before returning affected equipment to service.

The inspectors verified that the licensee addressed baseline design criteria stipulated in 10 CFR 70.64 in the designs of PPMs.

The inspectors verified that the licensee addressed the impacts of modifications to the Integrated Safety Analysis (ISA), ISA Summary, and other safety program information developed in accordance with 10 CFR 70.62.

The inspectors reviewed the licensee's problem identification and resolution program to verify that issues relating to the preparation and installation of PPMs were entered into the corrective action program and the adequacy of corrective actions.

The inspectors observed the ongoing installation of a new Criticality Accident Alarm System (CAAS). No issues were noted.

b. Conclusion

A review of plant modifications was completed with a focus in the Dry Conversion Plant and changes with safety significance or a direct effect on IROFS. No findings of significance were identified.

C. 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 October 25 and November 8, 2013, with A. Vexler and staff. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

## **SUPPLEMENTAL INFORMATION**

### **1. LIST OF PERSONS CONTACTED**

<u>Name</u>	<u>Title</u>
E. Anderson	GLE Industrial Safety
W. Bascome, PE	Facilities Engineer
S. Brown	EMT Training Coordinator
R. Cable	Radiation Supervisor, FMO
M. Campbell	Fire Safety Manager
R. Crott	Nuclear Safety Manager
C. Davidson	ERT Training Coordinator
J. DeGolyer	Nuclear Safety Projects
L. Frith	Project Manager IROFS Verification Project
M. Gaul	Integrate Safety
M. Haney	Radiation Supervisor, FMO
J. Head	Senior Vice President, Regulatory Affairs
Hilton, A	FAB Manager
B. Howell	PP&SS Manager
M. Huntley	Criticality Warning System Engineer
P. Lachance	Engineering (emergency lighting)
U. Latham	Sr. Admin Specialist, Licensing
D. Livengood	GAD Ceramics Process Engineer
P. Ollis	Licensing Engineer
A. Mabry	Radiological Program Manager
S. Murray	Licensing and Liabilities Manager
L. Paulson	GLE EHS/Nuclear Safety Manager
D. Raines	Training Coordinator
J. Reeves	Integrated Safety Analysis Manager
J. Rohner	Criticality Safety Program Manager
M. Venters	Emergency Preparedness Program Manager

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

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

None

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

IP 88030 Radiation Protection  
IP 88051 Evaluation of Exercises and Drills  
IP 88070 Permanent Plant Modifications

### **4. DOCUMENTS REVIEWED**

Attachment

Procedures:

P/P 10-10, Configuration Management Program – Nuclear Manufacturing Operations, Rev. 24.0, Issue Date May 24, 2013  
 CP-27-114 Integrated Safety Analysis, Rev. 1.1, Issue Date June 4, 2013  
 E-02, Respiratory protection, Rev. 6  
 GNFA Radiation Worker Training, Annual REDBAR Refresher, 2013  
 CP-20-305, Radiation Protection training Program, Rev. 0  
 NSI No. 0-2.0, Bioassay (Excreta) Program, Rev. 48  
 OP 1080.81, Mask Cartridge Testing Operations, Rev. 1  
 WI-27-105-04, Radioactive Sealed Source Control, Rev. 0.0  
 WI-27-105-14, Calibration and Operation of Personnel Contamination Monitors, Rev. 0  
 WI-27-105-14-01, Calibration and Operation of the ARGOS-3/5 PCM, Rev. 0

Records:

Air Sampling Representativeness Demonstration, September 22, 2009  
 Bioassay results for the following pay numbers: #28972, 31312, 27009, 29816, and 22023  
 CR-9280, Implement Electronic Timing Circuits for CWS DAM Actuation /Autocall Response Timing  
 CR-9693, PHA Update for DCP Cylinder Storage Pad  
 CR-10186, Update Manuf/Model for VFD used in DCP Conversion  
 CR-10425, Update NSR/RS and OPS Regarding new CSA on Slab and Annular tanks  
 CR-9172, Change Line 3 conversion manual and actuated steam valves  
 CR-9180, Remove Existing /Re-install new UF6 Piping in Vaporization Line 3  
 CR-9795, Replace Check Alarm for Riser 317  
 CR-6293, Replace Incinerator SAS Pump  
 CR-9389, QRA 405A-504A Calculation Error Corrections  
 CR-9291, ISA Update for Fab Press Feed  
 CR-9481, Install Rotary Valve at GAD MRA Vibromill  
 CR-9232, Change DCP Process Boilers  
 CR-7527, Sprinkler Resolutions – Incinerator BLG (321)  
 CR-9172, Change Line 3 Conversion Manual and Actuated Steam Valves  
 CR-9180, Remove Existing /Re-install new UF6 Piping in Vaporization Line 3  
 CR-7786, Change Line 1 Conversion Manual and Actuated Steam Valves  
 CR-10144, Natural Uranium Pellet Storage PHA Update  
 CR-9383, Update FAB QRA and TDS 405-17 / 504-12  
 CR-9805 Running Recycle Operations without full functionality of IROFS 202-05  
 CR-10063, Test of Recycle and UF6 Gas Flow  
 CR-10757, Separation of Gate Solenoids ad GAD MRA receipt Hood  
 CR-10745, DSR Furnace IROFS PLC Output Modification  
 CR-8518, Repair/Replace Section of corroded Rad Waste piping in hallway to DRVF  
 CR-7817, Monitor and record suction pressure available at selected HEPA filter housings; add manual damper above HEPA housing  
 CR-9248, CWS Uninterruptible power supply  
 CR-8940, CWS Output to fire alarm system  
 CR-7542, Remove abandoned crit alarm light  
 CR-10062, Add crit horn C-5-A-2B in FGE Building  
 CR-19480, Temporarily postpone Monthly and weekly CWS test  
 CR-6700, Idle eyewash at FMO tank farm south of incinerator  
 CR-5633, removal of safety showers

CR-9596, UO2 press feed tube to hood seal improvement  
CR-9597, GAD press feed tube to hood seal improvement  
CR-8409, GAD slugger dump station rotary valve installation  
CR-9481, Install rotary valve at GADMRA vibromill  
CR-9179, Process Russian cylinders with no sample.  
CR-9863, Sinter test update  
CR-9731, Remove truck venting requirement  
CR-10106, Continuous Boat Dumping  
CR-9738, GAD MRA U3O8 Receipt Hood Entrance Feed Program  
CR-10136, Use of Nilfisk vacuum cleaner in URU  
CR-10226, Instructions for torqueing clamps for siletta feeder  
CR-10666, Update NSR/R 15.04.03 to remove RP notification  
CR-10035, Replace door alarm with functional equivalent  
CR-7664, Failure to properly post full face mask area during maintenance  
QN-01327, Qualification of Argos-5AB Whole Body Monitors – Calibration Results and  
Initial Alarm Set Points for Men's-235, Men's-239, Women's 238  
WI-27-105-04-F03, GEH/GNF-A/GLE – Radioactive Seal Source Test Record for Source  
GEID#94053, 09/15/13  
Work Order #466204, Semi-annual Calibration & Calibration Inspection RM-20, 08/27/13