



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

March 11, 2004

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

**SUBJECT: NRC INSPECTION REPORT NO. 70-1113/2005-001 AND NOTICE OF  
DEVIATION**

Dear Mr. Fuller:

This report refers to the inspection conducted from January 24 - 28, and February 7 - 11, 2005, at your Wilmington facility. The purpose of the inspection was to perform a review of the operations, radiation protection, and chemical safety programs to determine whether activities authorized by the license were conducted in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with the members of your staff who are identified in the enclosed report.

The inspection consisted of an examination of activities conducted under the license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of the license. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress within the plant.

Based on the results of the inspection, the NRC has determined that a deviation from commitments made in the letter that you submitted in response to NRC Bulletin 2003-03 had occurred. The deviation was evaluated in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG 1600, which is included on the NRC's web site at <http://www.nrc.gov/what-we-do/regulatory/enforcement.html>. The deviation is cited in the enclosed Notice of Deviation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

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

Sincerely,

**/RA/** T. Decker acting for

Jay L. Henson, Chief  
Fuel Facility Inspection Branch 2  
Division of Fuel Facility Inspection

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

Enclosure:    1.     Notice of Deviation  
                  2.     NRC Inspection Report

cc w/encls:  
Charles M. Vaughan, Manager  
Facility Licensing  
Global Nuclear Fuel - Americas, L.L.C.  
P. O. Box 780, Mail Code J26  
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Distribution w/encls:

J. Henson, RII  
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 K. Ramsey, NMSS  
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 PUBLIC

**\*See next page for prior concurrence**

X SISP REVIEW COMPLETE: Initials: TRD    **G** SISP REVIEW PENDING\*: Initials: \_\_\_\_\_ \*Non-Public until the review is complete  
**G** PUBLICLY AVAILABLE    **G** NON-PUBLICLY AVAILABLE    **G** SENSITIVE    X NON-SENSITIVE  
 ADAMS: **G** Yes    ACCESSION NUMBER: \_\_\_\_\_

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:EICS		
SIGNATURE	<b>/RA</b>	<b>/RA/</b>	DHartland for	DHartland for	DHartland for		
NAME	*O. Lopez	*C.Taylor	D.Seymour	W.Britz	S.Sparks		
DATE	02/24/2005	03/ /2005	03/09/2005	03/09/2005	03/09/2005	03/ /2005	03/ /2005
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

## NOTICE OF DEVIATION

Global Nuclear Fuel - Americas, L.L.C.  
Wilmington, NC

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

During an NRC inspection conducted on January 24 - 28, 2005, a deviation from your commitments related to NRC Bulletin 2003-003 was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Action", NUREG - 1600, the deviation is listed below:

In the letter dated October 9, 2003, "Response to NRC Bulletin 2003-003: Potentially Defective 1-inch Valves for Uranium Hexafluoride Cylinders," the licensee states, in part, that "GNF-A currently plans to replace or have replaced all Hunt valves in the cylinders we own by September 1, 2004. If we are not able to accomplish this, we will notify the NRC and arrange alternative mutually acceptable solutions."

Contrary to above, as of January 25, 2005, the licensee had failed to replace all Hunt valves on the cylinders that it owned and did not notify the NRC and arrange alternative mutually acceptable solutions.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, Region II in writing within 30 days of the date of this Notice. This reply should be clearly marked as a "Reply to a Notice of Deviation and should include: (1) the reason for the deviation, or if contested, the basis for disputing the deviation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further deviations, and (4) the date when your corrective actions will be completed. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be made publically available, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made publically available without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld, and provide in detail the basis for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguard's information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Enclosure 1

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 11<sup>th</sup> day of March, 2005

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1113

License No.: SNM-1097

Report No.: 70-1113/2005-001

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

Location: Wilmington, NC 28402

Dates: January 24 - 28, 2005  
February 7 - 11, 2005

Inspector: O. López, Fuel Facility Inspector  
W. Britz, Fuel Facility Inspector  
C. Taylor, Health Physicist

Approved By: J. Henson, Chief  
Fuel Facility Inspection Branch 2  
Division of Fuel Facility Inspection

Enclosure 2

EXECUTIVE SUMMARY  
Global Nuclear Fuel - Americas, L.L.C.  
NRC Inspection Report 70-1113/2005-001

This routine, announced inspection involved observation and evaluation of the licensee's operations, radiation protection, and chemical safety programs. The inspection identified the following aspects of the licensee's programs:

**Plant Operations**

- ! Safety concerns were being identified, effectively communicated to managers, and resolved in a prompt manner (Paragraph 2.a).
- ! The inspectors determined that safety controls identified in the nuclear safety release/requirements reviewed were adequately implemented and maintained (Paragraph 2.b).
- ! The plant activities reviewed were performed safely and in accordance with license requirements. Housekeeping was adequate to not adversely affect radiological safety or facility emergency egress (Paragraph 2.c).
- ! The licensee's configuration control system for facility modifications ensured that safety significant modifications were properly reviewed, approved, and documented (Paragraph 2.d).
- ! Fuel manufacturing operations were conducted in accordance with approved operating procedures (Paragraph 2.e).
- ! The licensee performed the source checks for the criticality detectors at the specified frequencies and in accordance with approved procedures (Paragraph 2.f).
- ! The inspectors determined that licensee staff was trained in the different facility alarms (Paragraph 2.g).
- ! A deviation was identified for failure to implement commitments related to NRC Bulletin 2003-003, "Potentially Defective 1-inch Valves for Uranium Hexafluoride Cylinders" (Paragraph 3).

**Chemical Safety**

- ! The licensee had an adequate program for the development and on-going maintenance of standard operating procedures to provide for safe operations. Systems for quantifying uranium before and after incineration were well designed and implemented (Paragraph 4.a).
- ! The licensee had an adequate site-wide safety program and procedures which provided adequate control measures to carry out routine and non-routine tasks in a safe manner. The licensee had an adequate contractor management program in place (Paragraph 4.b).

- ! The licensee has implemented an adequate incident investigation, audit, and inspection program (Paragraph 4.c).

### **Radiation Protection**

- ! The inspectors determined that the licensee had instruments and equipment that were operational and had proper alarm settings in accordance with the license application and licensee procedures. The inspectors determined that a preventive maintenance system was in place to track and identify instruments needing calibration, repair, and functional testing (Paragraph 5.a).
- ! Based on dosimetry results from January 2004 through January 2005, the collective assigned external and internal exposures were well below the licensee's "as low as reasonably achievable" goals and regulatory limits for occupational exposure as specified in 10 CFR 20.1201 (Paragraph 5.b).
- ! During tours of the various areas, the inspectors noted that radiological signs, postings, and radiation work permits (RWPs) were properly posted or readily available. The licensee's staff was cognizant of the RWPs that were active, and current survey maps were available (Paragraph 5.c).
- ! Based on licensee performance, interviews, and documentation, the inspectors determined that notification and reporting was done in accordance with the regulations and the requirements in the license (Paragraph 5.d).
- ! The inspectors concluded from program documentation reviewed and staff interviews that the licensee was properly implementing a program to maintain exposures as low as reasonably achievable (Paragraph 5.e).

### **Attachment:**

Persons Contacted

Inspection Procedures

List of Items Opened, Closed, and Discussed

List of Acronyms



## REPORT DETAILS

### 1. Summary of Plant Status

This report covered two five-day inspection periods. During the January 24 - 28, and February 7 - 11, 2005, inspection periods, powder and pellet production and fuel assembly proceeded at normal rates. On January 27, the dry conversion process was temporarily shutdown due to maintenance activities on the steam boilers.

### 2. Plant Operations (Inspection Procedure (IP) 88020) (O3)

#### a. Management and Administrative Practices (O3.01)

##### (1) Scope and Observations

The inspectors interviewed plant personnel and reviewed selected unusual incident reports (UIRs) to verify that safety problems were identified, effectively communicated to management, and reported in a timely manner. The inspectors observed that safety issues were captured in UIRs, and corrective actions were assigned and tracked to completion.

The inspectors noted that, in order to close an UIR, the area manager and the product line manager had to review the corrective actions and agree with the actions taken. The inspectors reviewed recent UIRs related to the dry conversion process (DCP) and the ceramic and bundle assembly areas. The inspectors verified that corrective actions were implemented adequately and in a timely manner. No problems were noted.

##### (2) Conclusions

Safety concerns were being identified, effectively communicated to managers, and resolved in a prompt manner.

#### b. Safety Function (O3.02) Maintenance of Nuclear Criticality Safety Systems (O3.07)

##### (1) Scope and Observations

The inspectors toured the dry scrap recycle (DSR) area with a nuclear criticality safety engineer to verify that controls were identified and double contingency was provided. The inspectors also reviewed the nuclear safety release/requirements (NSR/Rs) for the DSR, homogenizer, and conversion areas to verify that administrative controls and active engineered controls (AECs) were presented and implemented adequately. The inspectors noted no issues with regard to the DSR area and NSR/Rs reviewed.

The inspectors reviewed functional test records for safety significant controls identified in the selected NSR/Rs. The inspectors also reviewed the functional test instructions. The inspectors noted that functional tests were performed at the required frequency and that instructions contained the appropriate amount of detail to perform the test. No safety problems were identified.

(2) Conclusions

The inspectors determined that safety controls identified in the nuclear safety release/requirements reviewed were adequately implemented and maintained.

c. Plant Activities (O3.03)

(1) Scope and Observations

The inspectors observed activities and housekeeping in the DCP, uranium oxide and gadolinium ceramic areas, hydrofluoric acid building, and CHEMET laboratory to assess whether they were performed safely and in accordance with license requirements.

The inspectors noted that nuclear criticality safety postings, radiological signs, and procedures were properly posted or available to the operators. The inspectors did not observe any issues where the housekeeping could affect the radiological safety or emergency egress of the facility. The inspectors observed that plant personnel working in radiological control areas wore dosimetry and the proper personal protective equipment. The inspectors also observed proper spacing practices and controls in storage locations.

The inspectors observed activities and interviewed the operators in the DCP control room. The inspectors also observed a turn-over in the control room. The operators demonstrated detailed knowledge of the safety systems involved in the operation of the DCP area. The inspectors noted that operators complied with approved NSR/R limits and controls. No safety problems were identified.

(2) Conclusions

The plant activities reviewed were performed safely and in accordance with license requirements. Housekeeping was adequate to not adversely affect radiological safety or facility emergency egress.

d. Configuration Control (O3.04)  
Nuclear Criticality Safety Change Control (O3.05)

(1) Scope and Observations

The inspectors reviewed recent facility modifications to verify that safety significant modifications were reviewed, approved, and documented according to licensee procedures. The inspectors discussed and reviewed with the cognizant engineer and nuclear safety manager the change request reports related to recent modifications performed in vaporization and conversion areas. The inspectors verified that the safety controls were incorporated in the respective operating procedure and that control room operators were aware of the changes. The inspectors also verified that the safety controls were tested before they were put in use.

The inspectors also reviewed the respective criticality safety analysis and walked down the systems with the drawings that were affected to verify that they were accurately

revised. The inspectors confirmed that modifications to safety systems were adequately controlled and sufficient reviews were performed before and after installation. The change request records adequately detailed the extent of the modifications.

(2) Conclusions

The licensee's configuration control system for facility modifications ensured that safety significant modifications were properly reviewed, approved, and documented.

e. Operating Procedures (O3.06)

(1) Scope and Observations

The inspectors observed operations throughout the facility and reviewed operating procedures for vaporization, conversion, and homogenizer areas to verify that appropriate procedures were being used. The inspectors observed DCP and ceramics operators to verify that they complied with operating procedures. The inspectors noted that operators were knowledgeable of the operating procedures and nuclear criticality safety requirements in their process areas.

The inspectors noted that procedures reviewed adequately identified safety significant controls and addressed process parameters, startup, routine operations, and shutdown (emergency and normal). The inspectors also walked down affected systems with selected sections of the operating procedure for the conversion area. No problems were identified.

(2) Conclusions

Fuel manufacturing operations were conducted in accordance with approved operating procedures.

f. Criticality Alarm System (O3.10)

(1) Scope and Observations

The inspectors reviewed the monthly and annual source check records for the criticality detectors located throughout the facility to verify that they were performed in accordance with approved procedures and at the frequency specified by the procedures. The inspectors noted that the source checks were performed at the required frequency. The inspectors also noted that when a detector failed the source check, a work order was submitted to repair the detector or the detector was replaced. No problems were identified.

(2) Conclusion

The licensee performed the source checks for the criticality detectors at the specified frequencies and in accordance with approved procedures.

g. Emergency Response (O3.11)

(1) Scope and Observations

The inspectors interviewed emergency response staff and reviewed emergency response procedures to verify that criticality and chemical emergencies were addressed. Emergency response staff stated that the criticality and general building alarms were tested quarterly. The inspectors also reviewed the "blue dot" training video, which described the different facility alarms and required responses. The inspectors interviewed operations personnel to verify that they were trained and knew how to respond to the different evacuation alarms.

(2) Conclusions

The inspectors determined that licensee staff was trained on the different facility alarms.

3. **Verification of Disposition of Potentially Defective 1-inch Hunt valves for uranium hexafluoride cylinders. (Temporary Instruction 2600/011)**

(1) Scope and Observations

This temporary instruction was issued to verify the safe disposition of 1-inch Hunt valves designed for use on 30-inch and 48-inch uranium hexafluoride (UF<sub>6</sub>) cylinders, as follow-up to the issuance of NRC Bulletin 2003-003, "Potentially Defective 1-inch Valves for Uranium Hexafluoride Cylinders," on August 29, 2003. The inspectors reviewed the licensee's cylinder inventory list and toured the UF<sub>6</sub> cylinder dock, storage areas and vaporization area. Also, the inspectors reviewed the licensee's operating procedures to determine if the licensee was in compliance with requested actions of NRC Bulletin 2003-03 and any subsequently approved licensee-specific exceptions.

The inspectors noted that, upon receipt of the cylinders, the licensee conducted a complete inspection. The licensee inspected the packing nut, body, and threaded areas of the valve. Also, the inspection required that a log entry be made if the cylinders had a Hunt valve, and a unique identification number was assigned to cylinders that had Hunt valves. The inspectors noted that the same inspection was performed prior to processing the cylinders. The inspectors also noted that, prior to processing a cylinder and after a cylinder valve was changed, a pressure test was performed to ensure that the valve was not leaking. No problems were identified.

In order to account for all cylinders with Hunt valves, the licensee performed an inventory of all the cylinders. The inspectors noted that the inventory list showed whether or not the cylinders had Hunt valves. The inspectors also noted that the licensee replaced the Hunt valves on all of the active cylinders that it owned. The inspectors reviewed records of cylinder valve replacement and no problems were identified.

However, during a tour of the cylinder dock area, the inspectors noted a cylinder that had a Hunt valve. Licensee staff stated that the cylinder was going to be re-certified and, for that reason, they did not replace the valve. Further investigation revealed that

the licensee had not replaced Hunt valves on cylinders that were out of service or waiting for re-certification because the original inventory list was modified to include only certified cylinders for valve replacement. The inventory list was modified because there was a mis-communication among the personnel involved in managing the UF<sub>6</sub> cylinder fleet. As an immediate corrective action, the licensee verified that UF<sub>6</sub> cylinders it owned that were being shipped did not have Hunt valves. Also, the licensee initiated a root cause investigation.

According to the letter dated October 9, 2003, "Response to NRC Bulletin 2003-003: Potentially Defective 1-inch Valves for Uranium Hexafluoride Cylinders," the licensee stated, in part, "that GNF-A currently plans to replace or have replaced all Hunt valves in the cylinders we own by September 1, 2004. If we are not able to accomplish this, we will notify the NRC and arrange alternative mutually acceptable solutions." Failure to replace all Hunt valves on cylinders owned by GNF-A by September 1, 2004, without notifying the NRC and arranging alternative mutually acceptable solutions was considered a deviation from licensee commitments related to NRC Bulletin 2003-003 (DEV 70-1113/2005-01-01).

(2) Conclusions

A deviation was identified for failure to implement commitments relate to NRC Bulletin 2003-003, "Potentially Defective 1-inch Valves for Uranium Hexafluoride Cylinders."

**4. Chemical Operations (IP 88058, 88059, 88065, 88066)**

a. Standard Operating Procedures (IP 88058, O2.03)

(1) Inspection Scope and Observations

The inspectors reviewed the standard operating procedures to determine whether the licensee had in place an adequate program for the development and on-going maintenance of the procedures so that operations were carried out safely.

The licensee's procedures reviewed by the inspectors were prepared, reviewed and approved by qualified personnel in plant operations and process technology. PRI 6-09, "*FMO Operating Procedures*," provided instructions for the preparation, review, revision and implementation of the operating procedures. The configuration management center in fuel manufacturing operations was responsible for the control of all operating procedures. Procedures were being reviewed and updated every three years as required.

The inspectors observed that controlled copies of procedures were available in designated locations in the plant as well as on computer screens in the workplace. The controlled copies were observed to be current. Temporary procedures were issued with start and end dates. Training required for new procedures was determined by the engineering and shop supervisors. Procedure change reviews for material movements were flagged and interlocked with the computer system inputs to ensure required reviews were performed. Hands-on training was provided as needed. No problems or issues were noted.

Three procedures and their systems were inspected in detail: OP 1336.00, "*HF Recovery*," OP 1081.01, "*Incinerator*," and OP 1080.60, "*Elephant Gun Scanning*." The procedures contained the safety requirements and instructions for startup, normal operations, shutdown, abnormal operations, emergency operations and basic maintenance. The systems were inspected with the responsible engineers. Safety requirements and features were discussed.

The hydrofluoric acid (HF) monitors were inspected. The inspectors noted that the number of HF releases has been very low. HF lines to the monitors had been replaced, and plans were being made to replace the HF lines from the plant to the HF Building.

Uranium input and output calculations for the incinerator and monitoring for system holdup was discussed. The box fill monitors at the incinerator and the elephant gun scanning process to measure uranium content after incineration were inspected in detail. The inspectors determined that the systems for identifying and quantifying uranium were well designed and implemented, including ensuring that representative densities of the standards for the material being measured were used and that transmission corrections were made for the box contents. No problems or issues were noted.

(2) Conclusions

The licensee had an adequate program for the development and on-going maintenance of standard operating procedures to provide for safe operations. Systems for quantifying uranium before and after incineration were well designed and implemented.

b. Site-wide Safety Procedures (IP 88059, O2.04)

(1) Inspection Scope and Observations

The inspectors reviewed the licensee's site-wide safety procedures to ensure that adequate control measures were in place to carry out non-routine tasks in a safe manner, that the licensee's contractor management program ensured contractors were adequately prepared to perform their tasks, and that a mechanism existed to update safety procedures based on operational experiences.

The inspectors reviewed safety in the workplace, toured inside and outside the plant, and reviewed chemical storage locations. Storage locations were marked. Safety meetings were held weekly in the plant. The inspectors observed safety display boards with photographs displaying good and bad safety practices.

The inspectors reviewed the procedures which provided control measures for non-routine tasks such as hot work, radiation work, combustible and flammable materials work, confined space work, lock-out tag-out and equipment opening. A work site with a hot work permit was observed by the inspectors. No problems or issues were noted.

The integration of the contractor work force with the licensee's work force was discussed. The licensee's *Site Health and Safety Plan* was reviewed. The plan addressed training, injuries, oversight, motor vehicle safety, ergonomics, hazard analysis, environmental compliance, accident investigations, weekly safety and

housekeeping inspections, and the Environmental Health and Safety group and contractor responsibilities. Health and safety specifications were written into new contracts.

The inspectors noted that the licensee and two of its main contractors had been awarded the Carolina Voluntary Protection Program Star Award. The program was based upon the state's agreement with OSHA to implement the safety program recognizing organizations meeting the safety standards for the award. The inspectors reviewed the annual assessments performed by the licensee to maintain the award. The inspectors observed that the statistics for injuries had declined significantly over the years in which the licensee had participated in the program. The routine safety inspections performed by the licensee and the routine safety meetings with the workers provided input to update the safety standards and procedures for the plant.

(2) Conclusions

The licensee had an adequate site-wide safety program and procedures which provided adequate control measures to carry out routine and non-routine tasks in a safe manner. The licensee's had an adequate contractor management program in place.

c. Incident Investigation (IP 88065, O2.10)  
Audit and Inspection (IP 88066, O2.11)

(1) Inspection Scope and Observations

The inspectors reviewed the licensee's incident investigation and audit/inspection programs to ensure that the licensee's procedures and practices were being followed properly and maintained. The inspectors reviewed licensee Procedure "*Incident Classification and Investigation*" and the licensee's computerized tracking system for unusual incident reports. The tracking system provided for various report levels and sorting of information to support management tracking needs. The system tracked open and closed items. The inspectors observed that the system was utilized by the licensee for tracking corrective actions developed as a result of incidents, audits and inspections. Licensee personnel performing investigations had been trained in various root cause analysis programs. The investigations were being performed as required by License Safety Condition 3.7, "*Incident Investigations.*"

The inspectors reviewed the biennial audit report "*Independent Assessment of Chemical Safety, Fire Protection, Industrial Safety, Environmental Protection and Emergency Preparedness*" for 2001 and 2003, which was required by the License Safety Condition 3.6.3, "*Independent Audits.*" The inspectors also reviewed the minutes of the Wilmington Safety Review Committee for 2004. Other periodic inspection and audit findings performed by Environment, Health and Safety and entered into the licensee's tracking system were reviewed. The licensee documented good findings and was observed to be tracking them to conclusion. No problems or issues were noted.

(2) Conclusions

The licensee has implemented an adequate incident investigation, audit and inspection program.

**5. Radiation Protection (Inspection Procedure (IP) 83822)**a. Radiation Protection Program Equipment (R1.03)(1) Inspection Scope and Observations

Equipment used to identify the presence of radioactive materials on smears, air samples, and personnel was examined to determine if the selected equipment was adequately maintained and reliable to perform the intended safety function. The inspectors interviewed personnel performing operability checks on laboratory analytical equipment and survey meters. The documentation for selected equipment routine checks, calibrations and functional testing was also reviewed and cross-checked against the licensee's preventive maintenance program. Based on interviews and review of documentation, the selected equipment was properly maintained and results from the operability checks and calibrations indicated that the equipment provided reliable results.

(2) Conclusions

The inspectors determined that the licensee had instruments and equipment that were operational and had proper alarm settings in accordance with the license application and licensee procedures. The inspectors determined that a preventative maintenance system was in place to track and identify instruments needing calibration, repair and functional testing.

b. External and Internal Exposure Control (R1.04 and R1.05)(1) Inspection Scope and Observations

The inspectors reviewed and discussed with licensee representatives personnel exposure data to determine if exposures were in compliance with 10 CFR Part 20 limits, and if controls were in place to maintain occupational doses as low as reasonably achievable (ALARA). Table 1 below displays the maximum assigned exposure data for calendar year (CY) 2003 and projected data for 2004.

When CY 2004 exposures were compared to CY 2003, the maximum assigned exposures had decreased except for the shallow dose equivalent (SDE). All results remained significantly less than the regulatory occupational limits of 5 rem to the whole body and 50 rem to the skin or extremities. The maximum assigned whole body dose was 0.450 rem for CY 2004 (9 percent of limit), and the maximum assigned skin or extremity dose was 1.943 rem (3 percent of limit). The maximum assigned total effective dose equivalent (TEDE) (internal and external exposure) was .466 rem (9 percent of the limit).



The inspectors reviewed the licensee's program for assessing internal exposure to verify that administrative and physical controls were in place to maintain occupational dose ALARA. Table 1 below presents the maximum assigned internal dose, referred to as the committed effective dose equivalent (CEDE). When CY 2004 exposures were compared to CY 2003, the maximum assigned CEDE had decreased and remained significantly less than the regulatory occupational limits of 5 rem (.466 rem or 9 percent of the limit). The collective CEDE had increased, and the licensee attributed the increase to a higher production output and processing of higher enriched material, which had higher specific activity.

The inspectors reviewed the licensee's program for monitoring internal exposure and determined that the program was adequately based on the type of operations and work activity taking place at the site. The inspectors reviewed the methodology by which workers were selected to participate in the bioassay program and found no problems. Based on the current site activity, the licensee's personnel monitoring program for external and internal exposures was properly implemented.

Table 1. Annual Exposures

Year	Deep Dose Equivalent (DDE)	Shallow Dose Extremity (SDE)	Total Effective Dose Equivalent (TEDE)	Collective TEDE (person-rem)	Committed Effective Dose Equivalent (CEDE)
2003	.547 rem	1.809 rem	.574 rem.	57.263	.517 rem
2004	.450 rem*	1.943 rem*	.466 rem*	67.844*	.466 rem

\* Projected for 2004

(2) Conclusions

Based on dosimetry results from January 2004 through January 2005, the collective assigned external and internal exposures were well below the licensee's ALARA goals and regulatory limits for occupational exposure as specified in 10 CFR 20.1201.

c. Surveys, Posting and Labeling (R1.07)

(1) Scope and Observations

The inspectors reviewed radiation work permits (RWPs), radiological surveys, radiological precautions, and general work practices in the process areas and chemical and analytical laboratories to verify that work was conducted safely and in compliance with regulations and the license application.

During tours of the various areas, the inspectors noted that radiological signs, postings, and RWP procedures were properly posted or readily available. The inspectors

observed that instruments used to measure radioactive contamination and airborne radioactivity were in proper working condition. The inspectors observed that proper personal protective clothing and dosimetry were issued and worn.

After interviewing the licensee's staff and reviewing the licensee's daily incident reporting logs, quarterly Health Physics audits, and RWPs, the inspectors determined that the licensee's staff was aware and knowledgeable of the log entries and monthly audits performed by the radiation staff. The licensee's staff was cognizant of the RWPs that were active, and current survey maps were available.

(2) Conclusions

During tours of the various areas, the inspectors noted that radiological signs, postings, and RWP procedures were properly posted or readily available. The licensee's staff was cognizant of the RWPs that were active, and current survey maps were available.

d. Notifications and Reports (R1.09)

(1) Inspection Scope and Observations

The inspectors selected an incident involving leakage of  $UO_2$  powder from a conversion line to determine the adequacy of the licensee's review and evaluation, and to determine if the event met the requirements for reportability to NRC. The inspectors verified that the selected incident did not require notification to NRC. The licensee's review and evaluation of the incident was prompt and actions to prevent a recurrence were timely.

Randomly selected workers were questioned regarding the availability and/or provision to provide exposure data by the licensee. In every interview, the workers indicated that at least annually the exposure information was provided. In addition, the inspectors confirmed the licensee's reporting of exposures via NRC Form 5 data which was provided to the NRC in a timely manner.

(2) Conclusions

Based on licensee performance, interviews, and documentation, the inspectors determined that notification and reporting was done in accordance with the regulations and the requirements in the license.

e. Implementation of ALARA Program (R1.10)

(1) Inspection Scope and Observations

The licensee's ALARA program was reviewed to determine if the licensee was periodically performing audits/evaluations to determine if exposures resulting from high activity projects may be lowered, and if ALARA goals were being developed and implemented on a regular basis. In addition, the program for reinforcing the ALARA concept among employees was assessed.

On an annual basis, the licensee issued an ALARA Performance Report containing exposure summaries to identify undesirable trends. In those cases where exposures were elevated, consideration was given to ways for reducing exposures. ALARA goals and objectives were established in 2004. A majority of the goals were completed. Those not finished were carried over into the 2005 ALARA goals.

Several workers were interviewed regarding ALARA and demonstrated an adequate knowledge and/or understanding of concepts. The inspectors interviewed radiation protection personnel assigned responsibility for the ALARA evaluations and assessments associated with the major activities contributing to exposures. Based on the interview and support documentation associated with the past project evaluations, the inspectors concluded that the licensee was properly implementing a program to maintain exposures as low as is reasonably achievable.

(2) Conclusions

The inspectors concluded from program documentation reviewed and staff interviews that the licensee was properly implementing a program to maintain exposures as low as reasonably achievable.

**6. Exit Meeting**

The inspection's results were summarized on January 28, and February 11, 2005, with licensee management representatives. 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.

## ATTACHMENTS

### 1. PARTIAL LIST OF PERSONS CONTACTED

\*M. Allen, Program Manager, Emergency Preparedness and Site Security  
\*Q. AO, Principal Criticality Safety Engineer  
J. Ball, Manager, Global Supply Chain  
\*D. Barbour, Leader, Radiation Protection  
K. Clark, Manager, Ceramics Operations  
+T. Crawford, Sr. Environmental Engineer  
\*+R. Crate, Manager, Fuel Manufacturing Operations  
\*+G. Dickman, Nuclear Material Control & Accounting Engineer  
\*M. Dodds, Sr. Criticality Safety Engineer  
\*R. Foleck, Program Manager, Facility Licensing  
+R. Houghton, Principal Engineer, FMO Technology  
\*B. Hines, Black Belt, Fuel Manufacturing Operations  
+S. Leverage, Environmental Health and Safety  
\*+A. Mabry, Program Manager, Radiological Engineering  
\*+R. Martyn, Manager, Material Control and Accounting  
\*C. Monetta, Manager, Environmental, Health & Safety  
+P. Ollis, Manager, Industrial Hygiene & Safety  
\*+L. Paulson, Manager, Nuclear Safety  
+J. Reeves, Manager, Integrated Safety Analysis  
R. Roessler, Manager, Facilities  
+E. Saito, Manager, Liability Reduction  
+C. Savage, Leader, Shop Support & Waste Treatment  
\*G. Smith, Team Leader, FMO Technical Resources  
\*+R. Stevens, Technical Leader, FMO Maintenance Support Team  
\*+H. Strickler, Manager, Site Environment, Health, and Safety  
\*C. Vaughan, Manager, Facility Licensing

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

\*Attended exit meeting on January 28, 2005

+Attended exit meeting on February 11, 2005

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

IP 88020	Regional Criticality Safety Inspection Program
IP 88058	Standard Operating Procedures
IP 88059	Site-Wide Safety Practices
IP 88065	Incident Investigation
IP 88066	Audit and Inspection
IP 83822	Radiation Protection
TI 2600/011	Verification of Disposition of Potentially Defective 1-inch Hunt Valves for UF <sub>6</sub> cylinders.

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

<u>Item</u>	<u>Status</u>	<u>Description</u>
DEV 70-1113/2005-01-01	Open	Failure to replace all the Hunt valves in GNF-A own cylinders by September 1, 2004 (Paragraph 3).

### 4. LIST OF ACRONYMS USED

AEC	Active Engineered Control
ALARA	As Low Reasonable Achievable
CY	Calendar Year
CEDE	Committed Effective Dose Equivalent
CFR	Code Of Federal Regulations
DDE	Deep Dose Equivalent
DCP	Dry Conversion Process
DEV	Deviation
DSR	Dry Scrap Recovery
FMO	Fuel Manufacturing Operations
GNF-A	Global Nuclear Fuel - Americas
HF	Hydrofluoric Acid
IP	Inspection Procedure
IR	Inspection Report
KW	Kilowatt
NCS	Nuclear Criticality Safety
NRC	Nuclear Regulatory Commission
NSR\R	Nuclear Safety Release\Requirement
OP	Operating Procedure
OSHA	Occupational Health & Safety Administration
RWPs	Radiation Work Permits
SDE	Shallow Dose Equivalent
TEDE	Total Effective Dose Equivalent
UF <sub>6</sub>	Uranium Hexafluoride
UIR	Unusual Incident Report
UO <sub>2</sub>	Uranium Dioxide