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

November 14, 2011

EA-11-095

Ms. Nicole Holmes
Chief Operating Office, Facility Manager
Global Nuclear Fuel – Americas, L.L.C.
P.O. Box 780, Mail Code J20
Wilmington, NC 28402

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY - $17,500, NRC INSPECTION REPORT NUMBER 70-1113/2011-010

Dear Ms. Holmes:

This refers to the onsite inspection conducted March 14 through 18, 2011, at your Global Nuclear Fuel – Americas (GNF-A) facility located in Wilmington, NC, and the subsequent in-office review of your causal analysis documentation which you provided to the NRC on September 19, 2011. The purpose of the inspection was to inspect and assess the facts and circumstances surrounding the failure to maintain mass control within the uranium dioxide ($UO_2$) sinter test grinding station high efficiency particulate air (HEPA) filter enclosure.

On March 2, 2011, the NRC was notified through Event Notification 46650 that GNF-A had failed to maintain mass control of $UO_2$ powder in the sinter test grinding station HEPA filter enclosure. Specifically, on March 1, 2011, your staff identified that an amount of $UO_2$ powder had been present in the sinter test grinder filter housing, which was greater than the analyzed safe mass to prevent a criticality. Both mass and moderation control are required for maintaining double contingency to prevent a criticality accident in the HEPA filter housing. The failure of mass control is a loss of double contingency for the subject filter housing. In response, the NRC initiated a Special Inspection to review the facts and circumstances surrounding the event.

The results of the Special Inspection, which included five unresolved items, were documented in NRC Inspection Report No. 70-1113/2011-006, dated June 29, 2011. Following additional review of these unresolved items, the NRC identified five apparent violations (AVs), which were documented in NRC Inspection Report No. 70-1113/2011-009, dated September 2, 2011, and requested that GNF-A attend a predecisional enforcement conference (PEC) to discuss the apparent violations.

On September 29, 2011, a PEC was conducted at the NRC's Region II office with you and members of your staff, to discuss the significance and root causes of the apparent violations and your corrective actions. At the conference, GNF-A acknowledged the violations, and presented details of its corrective actions to prevent recurrence. GNF-A stated that there was no actual or potential safety significance to the workers, public, or the environment since no criticality event occurred. GNF-A also stated that although double contingency was not

maintained, the risk of a criticality was highly unlikely due to the layers of protection available on moderation control.

Based on the information developed during the inspections and the information that you provided during and after the conference, the NRC has determined that five violations of NRC requirements occurred. These violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in NRC Inspection Report Nos. 70-1113/2011-006 and 70-1113/2011-009. In summary, the violations involve: (Part A) failure to ensure that a process design incorporated sufficient margins of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident was possible; (Part B) failure to apply sufficient controls to the extent needed to reduce the likelihood of occurrence of a criticality, high consequence event, in the sinter test grinder HEPA filter enclosure so that, upon implementation of such controls, the event was highly unlikely; (Part C) failure to verify as part of the change process that the controls selected and installed for the sinter test grinder HEPA enclosure (Change Request 4127) would limit the $UO_2$ holdup to less than 25 kgs by controlling a differential pressure across the ventilation housing to 4-inches of water or less; (Part D) failure to conduct a criticality safety analysis (CSA) on the Sinter Test Grinder, and instead performed a criticality safety summary that did not meet the license requirement of conducting a CSA; and (Part E) failure to notify HVAC and the area manager and request a clean out of the effected Sinter Test Grinder Primary HEPA Filter housing transition when the survey results for the transition exceeded the action limit of 0.5 mr/hr above background.

The NRC determined that these five violations were directly related to the root causes that allowed this event to occur. As a result, the double contingency principle was compromised during the operation of the sinter test grinder and the risk of a high consequence event (criticality accident) increased.

The NRC recognizes that the violations did not result in any actual consequences to the workers, the public, or the environment. In this case, moderation control was maintained to prevent an inadvertent nuclear criticality accident. However, the potential consequences were significant because an inadvertent criticality was no longer highly unlikely under credible abnormal scenarios. In reaching this conclusion, the NRC determined that GNF-A did not have adequate management measures to ensure the reliability and availability of the layers of protection available on moderation control. GNF-A did not have an inspection program in place to ensure the integrity of the primary HEPA housings and associated ventilation ductwork; and the procedure used for maintenance on the HEPA system did not include requirements to verify that an adequate seal existed after maintenance work was performed on the system. Based on the above, these violations have been characterized collectively as a Severity Level III Problem in accordance with the Enforcement Policy.

In accordance with the Enforcement Policy, a base civil penalty in the amount of $17,500 is considered for a Severity Level III problem. Because your facility has been the subject of escalated enforcement within the past two years[1], the NRC considered whether credit was warranted for *Identification* and *Corrective Action* in accordance with the civil penalty assessment process in Section 2.3.4 of the Enforcement Policy. With regard to the factor of *Identification*, the NRC has concluded that credit is not warranted because the violations were identified as the result of an event.

[1] A Severity Level III problem was issued to GNF-A on June 9, 2010 (EA-09-268).

With regard to the factor of Corrective Action, the NRC acknowledged corrective actions taken by GNF-A for the violations included, but were not limited to: 1) The prompt restoration of compliance with double contingency requirements by installing 6 inch favorable geometry HEPA filter; 2) Confirmed assumptions regarding relationship between differential pressure and powder collected in HEPA filters during typical applications; 3) Completion of extent of condition reviews; 4) Modified procedures in the areas of configuration management, radiation protection, and HVAC; 5) Updated criticality safety analysis for primary HEPA filters; 6) Improved preventive maintenance for applicable HEPA filters and pre-filters; 7) Conducted an independent assessment of radiation protection program; 8) Evaluated the work order prioritization process; 9) Modified the Safety Event Communication and Notification procedure; and 10) Training on procedural compliance, conservative decision making, and questioning attitude.

The NRC also noted that GNF-A plans to take additional corrective actions in the areas of safety culture, training, radiation protection, staffing, procedures, and maintenance as a result of a MORT Root Cause Analysis and an Operational Performance Assessment that were performed. In addition, GNF-A is in the process of developing a process excellence program called “Raise the Bar.” The objectives of the program are to: 1) Implement compensatory measures; 2) Complete commitments from event root cause analyses; 3) Enhance problem identification and resolution; 4) Simplify procedures and improve requirements flow-down; 5) Strengthen process surveillance and human performance observations; 6) Improve training program; 7) Engage employees to assure organizational learning; and 8) Communicate internally and externally. Based on the above and other corrective actions discussed at the PEC, the NRC has concluded that credit is warranted for the factor of Corrective Action.

Therefore, to emphasize the importance of maintaining double contingency to prevent a criticality accident, to emphasize the importance of prompt identification of violations, and in recognition of your previous escalated enforcement action, I have been authorized, after consultation with the Director, Office of Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty in the base amount of $ 17,500 for the Severity Level III problem.

You are required to respond to this letter and should follow the instruction specified in the enclosed Notice. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements. Furthermore, in its written response, the NRC requests that GNF-A include an implementation plan and a detailed schedule for the corrective actions in the areas of safety culture, training, radiation protection, staffing, procedures, and maintenance as a result of a MORT Root Cause Analysis and a Operational Performance Assessment that were performed.

Administratively, AVs 70-1113/2011-009-01, -02, -03, -04, and -05 are closed. The following violations are opened: 70-1113/2011-010-01, -02, -03, -04, and -05 (Violations A, B, C, D, and E.)

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. The NRC also includes significant enforcement actions on its Web site at (http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/).

Should you have any questions concerning this letter, please contact Mr. Anthony Gody at (404) 997- 4700.

Sincerely,

***/RA/***

Victor M. McCree
Regional Administrator

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

Enclosures:
1. Notice of Violation and Proposed Imposition of Civil Penalty
2. NUREG/BR-0254 Payment Methods (Licensee only)

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

Lee Cox, Chief
Radiation Protection Section
N.C. Department of Environmental
Commerce and Natural Resources
Electronic Mail Distribution

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Radiation Protection Section
N.C. Department of Environmental
Commerce and Natural Resources
Electronic Mail Distribution

X PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE X NON-SENSITIVE
ADAMS: X Yes ACCESSION NUMBER: ML11318A219 X SUNSI REVIEW COMPLETE X FORM 665 ATTACHED

| OFFICE | RII:DFFI | RII:DFFI | RII:EICS | RII:OE | RII:ORA | | |
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| NAME | MSykes | AGody | CEvans | SSparks | LWert | | |
| DATE | 10/24/11 | 10/24/11 | 10/24/11 | 11/7/11 | 11/9/11 | 11/ /2011 | 11/ /2011 |
| E-MAIL COPY? | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO |
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| NAME | BKulkan | FRivera | MBailey | | | | |
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| E-MAIL COPY? | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO |

OFFICIAL RECORD COPY DOCUMENT NAME:

Letter to Ms. Nicole Holmes from Victor M. McCree dated November 14, 2011

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY - $17,500, NRC INSPECTION REPORT NUMBER 70-1113/2011-010

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NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTY

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

Docket No. 70-1113
License No. SNM-1097
EA-11-095

During an NRC inspection conducted from March 14, through 25, 2011, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the NRC proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violation and associated civil penalty is set forth below:

A. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 5.1.1, Criticality Safety Design Philosophy, of the License Application, states that the Double Contingency Principle as identified in nationally recognized American National Standard ANSI/ANS-8.1 (1998) is the fundamental technical basis for design and operation of processes within the GNF-A fuel manufacturing operations using fissile materials. As such, "process designs shall incorporate sufficient margins of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible." For each significant portion of the process, a defense of one or more system parameters is documented in the criticality safety analysis, which is reviewed and enforced.

Section III.B, Criticality Safety Controls for Dry Uranium Dioxide ($UO_2$) Processes (MCA), of Criticality Safety Analysis (CSA) - No. 2310.00, Primary HEPA Filter Systems, Revision 2 states, in part, that mass and moderation controls as necessary controls to meet this analysis. In order to achieve mass control the $UO_2$ holdup is limited to less than 25 kilograms (kgs) by controlling $\Delta p$ across the housing to 4-inches of $H_2O$ or less.

Contrary to the above, on March 1, 2011, the licensee failed to ensure that a process design incorporated sufficient margins of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident was possible. Specifically, the licensee failed to ensure that the $UO_2$ holdup in the high efficiency particulate air (HEPA) filter enclosure for the Sinter Test Grinder was limited to less than 25 kgs.

B. 10 CFR 70.61(b) states that the risk of each credible high-consequence event must be limited. Engineered controls, administrative controls, or both, shall be applied to the extent needed to reduce the likelihood of occurrence of the event so that, upon implementation of such controls, the event is highly unlikely.

Contrary to the above, on March 1, 2011, the licensee failed to apply sufficient controls to the extent needed to reduce the likelihood of occurrence of a criticality in the Sinter Test

grinder HEPA filter enclosure so that, upon implementation of such controls, the event is highly unlikely.

C. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 5.4.1, Control Practices, of the License Application dated February 24, 2009, states that criticality safety analyses identify specific controls necessary for the safe and effective operation of a process. Prior to use in any enriched uranium process, nuclear criticality safety controls are verified against criticality safety analysis criteria.

Section 5.4.1.1, Verification Program, of the License Application dated February 24, 2009, states that the purpose of the verification program is to assure that the controls selected and installed fulfill the requirements identified in the criticality safety analyses. All processes are examined in the "as-built" condition to validate the safety design and to verify the installation. Criticality safety function personnel observe or monitor the performance of initial functional tests and conduct pre-operational audits to verify that the controls function as intended and the installed configuration agrees with the criticality safety analysis.

Section III.B, Criticality Safety Controls for Dry Uranium Dioxide ($UO_2$) Processes (MCA), of CSA - No. 2310.00, Primary HEPA Filter Systems, Revision 2 states, in part, that the $UO_2$ holdup is limited to less than 25 kgs by controlling $\Delta p$ across the housing to 4-inches of $H_2O$ or less.

Contrary to the above, on February 4, 2009, the licensee failed to assure that controls selected and installed fulfilled the requirements identified in CSA – No. 2310.00, Primary HEPA Filter Systems. Specifically, the licensee failed to assure that the $UO_2$ holdup would be limited to less than 25 kgs by controlling $\Delta p$ across the housing to 4-inches of $H_2O$ or less.

D. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 5.3.1, General Configuration Management, of the License application dated February 24, 2009, states, in part, that a CSA is prepared or updated for new or significantly modified fissile units, processes, or facilities within GNF-A.

Section 5.4.5.5, Criticality Safety Analysis, of the License application dated February 24, 2009, states in part that a CSA includes applicable information requirements as follows: Scope, General Discussion, Criticality Safety Controls/Bounding Assumptions, Model Description, Calculational Results, Safety During Upset Conditions, Specifications and requirements for Safety, Compliance, Verifications, and Appendices.

Contrary to the above, on February 18, 2009, the licensee failed to conduct a CSA on the Sinter Test Grinder, and performed a criticality safety summary (CSS) that did not meet the license requirement of conducting a CSA. Specifically, the licensee failed to conduct all

Model Description, and Calculational Results sections; and parts of the Criticality Safety Controls/Bounding Assumptions.

E. Safety Condition No. S-1 of Special Nuclear Material License No. 1097 requires that material be used in accordance with statements, representations, and conditions of application dated and supplements dated June 29, 2007; February 14, 2008; November 28, 2008; January 8, 2009; August 13, 2010; and December 2, 2010.

Section 11.5, Procedures, of the License Application dated March 30, 2007, states that licensed material processing or activities will be conducted in accordance with properly issued and approved management control procedures.

Section 5.2.3.3, Primary HEPA Filter Housing Transition, of Nuclear Safety Instruction O-15.0, Revision 33, states, in part, that if the survey results of a transition exceed the action limit of 0.5 mr/hr above background notify HVAC and the area manager and request a clean out of the effected transition.

Contrary to the above, on August 1, 2010, and January 23, 2011, the licensee failed to notify HVAC and the area manager and request a clean out of the effected Sinter Test Grinder Primary HEPA Filter housing transition when the survey results for the transition exceeded the action limit of 0.5 mr/hr above background.

This is a Severity Level III Problem (Enforcement Policy Section 6.2)
Civil Penalty - $17,500 (EA-11-095)

Pursuant to the provisions of 10 CFR 2.201, Global Nuclear Fuel - Americas, L.L.C (Licensee) is hereby required to submit a written statement or explanation to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice of Violation and Proposed Imposition of Civil Penalty (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation: (EA-11-095)" and should include for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons for the violation if admitted, and if denied, the basis for denying the validity of the violation; (3) the corrective steps that have been taken and the results achieved; (4) the corrective steps that will be taken; and (5) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, the NRC may issue an order or a Demand for Information requiring you to explain why your license should not be modified, suspended, or revoked or why the NRC should not take other action as may be proper. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time provided for the response required under 10 CFR 2.201, the Licensee may pay the civil penalty proposed above, in accordance with NUREG/BR-0254 and by submitting to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, a statement indicating when and by what method payment was made, or may protest imposition of the civil penalty in whole or in part, by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission. Should the Licensee fail to answer within 30 days of the date of this Notice, the NRC will issue an order imposing the civil penalty. Should the Licensee elect to file an answer in accordance with 10 CFR 2.205 protesting the civil

penalty, in whole or in part, such answer should be clearly marked as an "Answer to a Notice of Violation" and may: (1) deny the violation listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty.

In requesting mitigation of the proposed penalty, the response should address the factors addressed in Section 2.3.4 of the Enforcement Policy. Any written answer addressing these factors pursuant to 10 CFR 2.205, should be set forth separately from the statement or explanation provided pursuant to 10 CFR 2.201, but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of the Licensee is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalty which subsequently has been determined in accordance with the applicable provisions of 10 CFR 2.205 to be due, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282c.

The responses noted above, i.e., Reply to Notice of Violation, Statement as to payment of civil penalty, and Answer to a Notice of Violation, should be addressed to: Roy P. Zimmerman, Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region II.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), to the extent possible, it should not include any personal privacy, proprietary. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. 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 that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (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 safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated this 14th day of November 2011