Global Nuclear Fuel

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December 8, 2022

Attn: Document Control Desk
Director, Division of Fuel Management
Office of Nuclear Material Safety and Safeguards
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: 10 CFR 71.95 – 60 Day Report – NPC Certificate Condition of Approval Not Observed

Reference: 1) NRC Certificate of Compliance (CoC) USA/9294/AF-96, Rev 9 - Docket 71-9294, 6/19/2020

Dear Sir or Madam:

Global Nuclear Fuel – Americas, L.L.C. (GNF-A) in Wilmington, NC hereby submits this report for a discovery involving use of the NPC package in which a condition of approval in USNRC Certificate of Compliance (CoC) (Reference 1) was not observed. Specifically, a GNF-A owned NPC package was shipped with a condition that failed to meet the loading requirements as specified in the package safety analysis report and internal procedures.

An evaluation has determined that this event was of very low safety significance and there was no release of material while using the NPC package with this condition. All other requirements of the CoC were met. An internal condition report was opened to track and remedy the cause of the event.

I am the individual knowledgeable about this event and can provide additional information as needed. If there are any questions regarding this report, please contact me at (910) 819-5950.

Sincerely,

Scott P. Murray, Manager
Facility Licensing

Attachment

Cc: NRC Region II Administrator, Atlanta, GA
J. Rivera, USNRC/RII/DFFI
J. Rowley, USNRC/NMSS/DFM/FFLB
SPM 22-040

Attachment
10 CFR 71.95- Type A Transportation Package Report USA/9294/AF-96

(1) Brief abstract describing the major occurrences - (71.95(c)(1)

The NPC package is a cubic metal box used to transport type A quantities of low-enriched uranium oxide powder, pellets, and uranium compounds. It is comprised of a stainless-steel outer shell with a three-by-three array of cylindrical containment vessels. The outer packaging is equipped with a top cover that is secured to the outer packaging body using closure cap screws and bolts prior to shipment. Internal procedures require a visual inspection that the cover channel receptacle ceramic fiber braided rope gasket is in-place and undamaged.

NRC CoC USA/9294AF-96, Revision 9 (and previous revisions), specifies in condition 6(a) that:

> 6 (a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Chapter 7 of the application.

GNF-A shipped NPC package serial number N-0033 containing low enriched uranium oxide powder to a customer site with a wrench that was improperly placed on the gasket of the outer packaging body. There were no incidents or accident conditions during the use of the affected package and no components or systems of the package failed.

(2) Narrative description of the event – (71.95(c)(2)

i) Status of components or systems that were inoperable at the start of the event and that contributed to the event.

Except for the improperly placed wrench, the affected NPC packaging was properly prepared by GNF-A in accordance with applicable procedures and regulations before being shipped. There were no inoperable components or systems.

ii) Dates and approximate times of occurrences.

On October 17, 2022, a foreign customer site notified GNF-A that it discovered a ratcheting wrench improperly placed on the Outer Containment Assembly (OCA) gasket of NPC N-0033. There were no other NPC packages in the shipment with this nonconformance.

iii) The cause of each component or system failure or personnel error, if known.

There were no known system or component failures.

iv) The failure mode, mechanism, and effect of each failed component, if known.

There were no known system or component failures.

v) A list of systems or secondary functions that were also affected for failures of components with multiple functions.

No systems or secondary functions were affected by the improperly placed wrench.

vi) The method of discovery of each component or system failure or procedural error.

The improperly placed wrench was discovered and reported by a foreign customer site.

vii) For each human performance-related root cause, a discussion of the cause(s) and circumstances.

An investigation of the GNF-A package loading procedural requirements determined the issue was likely caused by a human performance related issue. There was no requirement for a final visual inspection of the top of the OCA for foreign materials prior to lowering the top cover lid into place.

viii) The manufacturer and model number (or other identification) of each component that failed during the event.

There were no component failures.

ix) For events occurring during use of a packaging, the quantities and chemical and physical form(s) of the package contents.

The affected NPC package contained low enriched uranium oxide powder. The radioactive material is in the form of a solid inside an Inner Container Canister Assembly (ICCA). The proper shipping name was RQ, UN3328, Radioactive Material, Type A Package, Fissile, Class 7, Solid, Uranium Dioxide (Enriched to 20% or less).

(3) Assessment of Safety Consequences and Implications of the Event – (71.95(c)(3)

The stainless-steel channel receptacle for the braided rope gasket was undamaged; however, the channel was obstructed by the wrench which had the potential to negatively affect the effectiveness of the seal. Prior to shipment, GNF-A did inspect the channel prior to packing the ICCA with powder. A wrench is used in the process as each of the ICCAs is packed with powder and the ICCA lids are installed and band clamps applied. The wrench is used to start the nut on the band clamp. It remained on top of the OCA during the packing process for the ICCAs. Prior to putting the OCA lid in place, all tools are to be removed and relocated for use at the next NPC to be packed at an adjacent station.

An evaluation determined that a box wrench in the seal may allow water penetration through the seal if subjected to a water spray or immersion. However, this was not the case for this shipment and the Criticality Safety analysis considers water intrusion into the NPC foam area. So had any water leaked into the NPC foam area due to the box wrench, the condition is bounded by the Criticality Safety Analysis of Record. The primary uranium powder containment boundary is the ICCA with its lid and band clamp. The presence of the box wrench had no effect on the ICCA containment boundary. The SAR thermal analysis modeled the ceramic rope as missing completely and a 1/8" gap between the lid and the container. This was not the case. Further, the safety class for the component is B, indicating that it needs a secondary failure, and the safety quality assessment of record shows that a failure of the braided rope gasket still needs a

secondary failure of the OCA before it would create a safety concern. Since the secondary failure was presumably not present, there was not a safety concern, even if a Hypothetical Accident Condition had occurred.

A 10 CFR 21 evaluation was also performed to determine if the condition could have created a substantial safety hazard or contribute to exceeding a technical specification safety limit. Since the NPC safety analysis report modelled the OCA gasket as missing completely and the primary containment boundary is the ICCA, the wrench had no effect on the containment boundary. As a result, no substantial safety hazard or technical specification violation exists as a result of the condition and no additional 10 CFR 21 reporting is required.

(4) Corrective actions taken – (71.95(c)(4)

1) An internal condition report (CR 40767) was opened to track and remedy the cause of the event.

   Complete: October 17, 2022

2) GNF-A will revise the NPC package operating procedure to perform a final visual inspection of the OCA top for any foreign materials prior to lowering the OCA lid assembly into place.

   Scheduled Completion: January 31, 2023

(5) Reference to any previous similar events – (71.95(c)(5)

None

(6) Contact – (71.95(c)(6)

Please contact Scott Murray at (910) 819-5950 for any additional information about this report.

(7) Extent of Exposure to Radiation – (71.95(c)(7)

No individuals were exposed to radiation or radioactive material due to this issue. There was no leakage of contents due to the nonconformance.