



**Global Nuclear Fuel**

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June 12, 2018

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555-0001

**Subject:** GNF-A Written Follow-up Report – Radwaste Tank Accumulation

**References:** 1) NRC License SNM-1097, Docket 70-1113  
2) GNF-A Event Report 53331, 4/13/2018

Dear Sir or Madam:

In accordance with 10 CFR 70.74(b), Global Nuclear Fuel–Americas, LLC (GNF-A) hereby submits a written follow-up report for Event Notification 53331 that was provided to NRC on April 13, 2018 (Reference 2). As discussed in the initial event report, GNF-A reported a potentially degraded item relied on for safety (IROFS) associated with radioactive waste tanks in the Fuel Manufacturing Operations (FMO) building. Consistent with 10 CFR 70.74(a) and 70.50(c)(1), an email was submitted on April 13, 2018 providing additional information and is included as an attachment to this letter.

Additional information is provided as follows:

**Event Details and Safety Significance**

FMO maintains two 500-gallon favorable geometry radioactive waste (RW) accumulation tanks (V-262 and V-264) to receive and treat certain low level radioactive process liquids from operations. Two IROFS are established in the integrated safety analysis (ISA) as controls to minimize the likelihood of a credible accident sequence in the RW accumulation tanks. The first control is density monitoring to limit the concentration of uranium in the system. The second control is the passive favorable geometry design of the annular tanks. A potential accident in the RW accumulation process would require the failure of both IROFS.

During the annual shutdown work activities beginning on April 7, 2018, several valves in the RW accumulation tank system were replaced because the existing valves would not operate. During this work, it was discovered that a V-264 tank recirculation injection nozzle flow line was plugged and consequently was not working. The recirculation injection nozzle function is credited as part of IROFS 702-06 Accumulation Tank Density Control to provide mixing and minimize settling of particulate in the tanks. The interior of both tanks was inspected for solid material buildup. Tank V-262 was estimated to have approximately 14 inches of material in the bottom, and V-264 was estimated to have approximately 10 inches of material, although visibility of both tanks was limited from the top inspection ports. The accumulation of material is an indication that the tank density control had degraded.

Plant operations attempted to remove and quantify the material per normal procedures. On April 12, 2018 at approximately 1900, GNF-A determined that the material could not be quantified in a timely manner. In the absence of quantification, GNF-A conservatively determined that the condition was a failure to meet performance requirements and reported it to NRC within 24 hours of discovery pursuant to 10 CFR 70 Appendix A (b)(2).

Additional controls on the tank geometry remained intact and at no time was an unsafe condition present. In addition, there were no sources feeding the RW accumulator tanks that could result in a rapid addition of uranium to the system.

### **Immediate Corrective Actions Taken**

A plan was developed to remove and quantify the uranium content in the tanks by collecting and weighing the material and performing lab sample analysis. Temporary procedures and a radiation work permit were developed, tank recirculation piping and injection nozzles were flushed and inspected and tank solids from both tanks were eventually removed and placed into favorable geometry 3-gallon cans and the solids quantified. The amount of material from each tank was estimated to be less than a safe mass limit for uranium based on weight measurements and laboratory analysis.

Other similar active annular vessels were also inspected. None of the other vessels appeared to have a significant accumulation of material or impaired recirculation nozzles.

### **Probable Cause of Event**

An investigation determined that the accumulation occurred due to inadequate management measures on recirculation flow, an engineered feature that mixes the contents of the tank. Although some management measures on tank recirculation were in place to minimize accumulations, sufficient measures were not established in the ISA to assure the density control IROFS remained available and reliable to perform its intended safety function. These include:

- Inadequate management measures were established for the annual preventive maintenance inspections of the accumulation tanks.
- There was only one unused inlet nozzle available per tank for viewing access and this contributed to inadequate tank inspections.
- There was no formal requirement to periodically replace or refurbish the installed injection nozzles.

### **Short Term Corrective Actions**

- 1) Revise the V-262/V-264 annual visual inspection instructions to address removing the nozzles, flushing the tank and inspecting the tank for material accumulation.

Scheduled completion: June 29, 2018

- 2) Create an annual preventive maintenance instruction to facilitate inspection of nozzles and piping flow restrictions.

Scheduled completion: July 31, 2018

**Longer Term Corrective Action**

- 1) Evaluate installing additional inspection ports to facilitate proper tank inspections.

Scheduled completion: December 31, 2018

If you have any questions regarding this matter, please contact me at (910) 819-5950.

Sincerely,



Scott Murray, Manager  
Facility Licensing

Attachment: Event Description

cc: NRC Region II Administrator, Atlanta, GA  
T. Vukovinsky, NRC RII Atlanta. GA  
T. Naquin, NRC NMSS, Washington, DC  
SPM 18-035

## Attachment 1

### Event Notification Description

GNF-A's Fuel Manufacturing Operation maintains a safe geometry Radwaste accumulation tank to receive certain liquid discharges from operations. During the annual shutdown work activities and routine inspections, an accumulation of material was identified in a safe geometry Radwaste accumulation tank.

The accumulation appears to have occurred due to reduced recirculation flow, an engineered feature that mixes the contents of the tank as part of a density control. The accumulation of material is an indication that the tank density control had degraded.

Plant operations attempted to remove and quantify the material per normal requirements. On 4/12/18 at approximately 1900, GNF-A determined that the material could not be quantified in a timely manner.

In the absence of quantification, GNF-A has conservatively determined that this condition is a failure to meet performance requirements and is therefore reporting it within 24 hours of discovery pursuant to Part 70 Appendix A (b)(2).

Additional controls on the tank geometry remained intact and at no time was an unsafe condition present. In addition, there are no sources that could result in a rapid addition of uranium to the system.

Additional corrective actions, extent of condition, and extent of cause are being investigated.

Scott Murray,  
Manager, Facility Licensing  
1500 4/13/2018