



Global Nuclear Fuel

Scott P. Murray
Safety Evaluation Program Manager Delegate
Global Nuclear Fuel

Proprietary Information Notice

This letter transmits ~~proprietary information in accordance with 10 CFR 2.390~~. Upon removal of Enclosure 1, the balance of the letter may be considered non-proprietary.

M220124 Revision 1

October 28, 2022
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: Part 21 60-Day Interim Report Notification: GNF3 Raised Water Rod (SC-22-04 R1)

This letter provides Revision 1 to Global Nuclear Fuel's (GNF) interim report regarding a 10 CFR Part 21 evaluation. The purpose for this revision is to correct an inadvertent redaction of text in the summary in Enclosure 2 regarding the examination's conclusions.

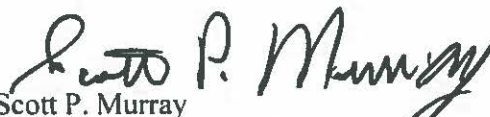
One GNF3 bundle with a raised water rod was found during core verification during the bundle's first cycle of operation. The water rod remained constrained within the envelope of the fuel bundle, which was discharged to the spent fuel pool for examinations. The examinations concluded that no fuel leaks were present, and all hardware was intact with no visible damage. The apparent cause was identified as the water rod not being rotated into its proper orientation during assembly.

The information required for this GNF 60-Day Interim Report Notification per §21.21 (a)(2) is attached as Enclosure 1. Enclosure 1 contains proprietary information.

GNF will complete the evaluation efforts and provide a determination of reportability in accordance with 10 CFR Part 21 no later than December 7, 2022.

Please contact Dr. Brian Moore, General Manager of Core and Fuel Engineering (brian.moore@gnf.com) if there are any questions.

Sincerely,


Scott P. Murray
Safety Evaluation Program Manager Delegate
Global Nuclear Fuel

Enclosures:

1. 60-Day Interim Report Notification Information per §21.21(a)(2) and Safety Communication-Proprietary
2. 60-Day Interim Report Notification Information per §21.21(a)(2) and Safety Communication-Non-Proprietary
3. Affidavit

cc: E. Lenning, USNRC NRR/DORL/LLPB
L. Dudes, USNRC Region II Administrator
J. Giessner, USNRC Region III Administrator
PLM Spec 007N3317 R1

Document Components:

001 M220124 R1 Cover Letter.pdf
002 M220124 R1 Enclosure 1 Proprietary.pdf
003 M220124 R1 Enclosure 2 Non-Proprietary.pdf
004 M220124 R1 Enclosure 3 Affidavit.pdf

ENCLOSURE 2

M220124 Revision 1

60-Day Interim Report Notification Information per §21.21(a)(2) and
Safety Communication-Proprietary

Non-Proprietary Information IMPORTANT NOTICE

This is a non-proprietary version of Enclosure 1 to M220124 Revision 1, which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[]].



Global Nuclear Fuel

10 CFR Part 21 Communication

SC 22-04 R1

October 28, 2022

To: *Affected and Potentially Affected Plants (Attachment 1)*

Subject: *GNF3 Raised Water Rod – Interim Notification*

- | | |
|---|---|
| <input type="checkbox"/> Reportable Condition [21.21(d)] | <input checked="" type="checkbox"/> 60 Day Interim Report [21.21(a)(2)] |
| <input type="checkbox"/> Transfer of Information [21.21(b)] | <input checked="" type="checkbox"/> Safety Information Communication |

Summary:

One GNF3 bundle with a raised water rod was found during core verification during the bundle’s first cycle of operation. The water rod remained constrained within the envelope of the fuel bundle, which was discharged to the spent fuel pool for examinations. The examinations concluded that no fuel leaks were present, and all hardware was intact with no visible damage, including the locking clip in the lower tie plate that engages the water rod bayonet end plug. The apparent cause was identified as the water rod not being rotated into its proper orientation during assembly.

The assessment to determine whether this condition is a Substantial Safety Hazard (SSH) requires further evaluation. Also, the extent of condition evaluation to establish the susceptible population of bundles is still underway. A Root Cause Analysis (RCA) is currently in-progress that is expected to inform the susceptible population determination. At this time, GNF has not determined this condition to be an SSH.

GNF has not determined that the subject condition is a reportable condition in accordance with 10 CFR Part 21.21(d), and continued evaluation is required to determine reportability under 10 CFR Part 21. Therefore, GNF is issuing this 60-Day Interim Notification in accordance with 10 CFR Part 21.21(a)(2).

GNF expects to complete the evaluation by December 7, 2022.

Please contact Dr. Brian Moore, General Manager of Core and Fuel Engineering (brian.moore@gnf.com) if there are any questions.

Issued by:

Scott P. Murray, Safety Evaluation Program Manager Delegate
Global Nuclear Fuel
3901 Castle Hayne Rd., Wilmington NC 28402

Notice: This 10 CFR Part 21 Notification pertains only to the plants or facilities specifically indicated as being affected. Global Nuclear Fuel (GNF) has not considered or evaluated the applicability, if any, of this information to any plants or facilities other than those specifically indicated as being affected and for which GNF supplied the equipment or services addressed in the Notification. Determination of applicability of this information to a particular plant or facility, and the decision of whether or not to take action based on the Notification, are the responsibilities of the Owner of that plant or facility. This 10 CFR Part 21 Notification, its attachments and enclosures may contain proprietary information of GNF that is maintained in confidence by GNF and is subject to withholding from public disclosure under 10 CFR 2.390 and 9.17. Such GNF proprietary information is furnished in confidence solely for the purpose(s) stated in the attached transmittal letter; no other use, direct or indirect, of this GNF proprietary information is authorized, absent the prior written permission of GNF.

Background

During a mid-cycle outage at a US-based BWR/6, a first cycle GNF3 bundle (designated “GEX290”) was discovered to have a raised water rod during core verification inspection (Figure 1).

After the GEX290 discovery, a second GNF3 bundle was found with a water rod not rotated during fabrication oversight with interim additional quality control verification during manufacturing. This GNF3 bundle did not leave GNF’s manufacturing facility and the condition was corrected.

An RCA is in-progress to inform the extent of condition that will inform the GNF3 susceptible population to define the affected plants. The section below describes the current state of this evaluation.

Discussion

The GNF3 fuel design takes advantage of [[
]], to reduce the two-phase pressure drop as the flow approaches
and passes through the Upper Tie Plate (UTP). [[

]] During bundle assembly, the water rod is locked into place
via manual rotation of the water rod, [[

]]. Eight spacers are distributed axially. Each spacer
is engaged by a set of tabs on the water rod that positively locate each spacer for height and separation.

The primary functions of the spacers are to hold the fuel rods in their proper locations and to improve fuel performance by mixing the water such that the fuel rods maintain the water film responsible for the heat transfer out of the rod and into the coolant. The relevant metric for this thermal-hydraulic behavior and associated limit is the critical power of the assembly, which varies throughout operation of the core.

Figure 2 shows a photo taken during the outage at the discovery of the raised water rod and the unengaged water rod tabs.

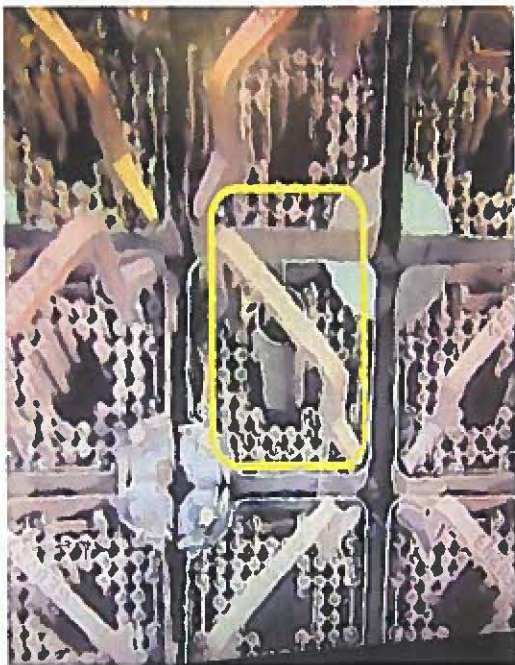


Figure 1: Water Rod Raised Up to Near UTP



Figure 2: Closeup of Spacer 8 Water Rod Tab

After the initial discovery, further inspection of bundle GEX290 indicated that [[

]]. The apparent cause was identified as the water rod not being rotated into its proper orientation during bundle assembly.

At this time, the assessment of a SSH is not complete as evaluations are ongoing. Until the susceptible population is determined and the evaluations completed, the potentially affected plants (Attachment 1) are conservatively taken as all plants having GNF3 reloads.

While there has not been any indication that another similarly affected bundle has been delivered (besides GEX290 having an unlocked water rod), the full multi-disciplinary RCA, initiated on August 02, 2022, is needed to inform evaluations of the potential for other GNF3 bundles to have an unlocked water rod. Additional time is needed for GNF to complete the evaluation to determine whether the subject condition is a reportable condition under 10 CFR Part 21.

Recommended Actions

GNF has provided supplemental instructions to inspection procedures to be used during new fuel receipt of GNF3 fuel bundles at licensees' facilities. These instructions provide a receipt inspection method for licensees to independently verify that the GNF3 water rod is in the correct orientation prior to insertion of the bundle in the fuel pool. There are no additional recommended actions at this time.

Attachment 1
List of Potentially Affected Plants

BWR Plants and Associated Facilities

<u>Utility</u>	<u>Plant</u>
<u>X</u>	Clinton
	Dresden 2-3
<u>X</u>	FitzPatrick
<u>X</u>	LaSalle 1-2
<u>X</u>	Limerick 1-2
<u>X</u>	Nine Mile Point 1-2
<u>X</u>	Peach Bottom 2-3
	Quad Cities 1-2
<u>X</u>	Fermi 2
	Columbia
<u>X</u>	Grand Gulf
<u>X</u>	River Bend
	Pilgrim
	Perry 1
	Duane Arnold
	Oyster Creek
	Cooper
	Vermont Yankee
	Millstone
	Susquehanna 1-2
	Brunswick 1-2
	Hope Creek
<u>X</u>	Hatch 1 - 2
	Browns Ferry 1-3
	Monticello

Non-Domestic BWR Plants

<u>Utility</u>	<u>Plant</u>
_____ BKW-FMB, Ltd	Mühleberg
_____ Chubu Electric Power Co.	Hamaoka 1-4
_____ Chubu Electric Power Co.	Hamaoka 5
_____ Chugoku Electric Power Co.	Shimane 1-2
_____ Chugoku Electric Power Co.	Shimane 3
_____ Comision Federal de Electricidad	Laguna Verde 1-2
_____ Forsmark Kraftgrupp AB	Forsmark 1-3
_____ Hokuriku Electric Power Co.	Shika 1
_____ Hokuriku Electric Power Co.	Shika 2
_____ Iberdrola SA	Cofrentes
_____ Japan Atomic Power Co.	Tokai 2
_____ Japan Atomic Power Co.	Tsuruga 1
_____ Kernkraftwerk Gundremmingen GmbH	Gundremmingen B, C
_____ Kernkraftwerk Brunsbuettel GmbH	Brunsbuettel
_____ Kernkraftwerk Kruemmel GmbH	Kruemmel
_____ Kernkraftwerk Philippsburg	Philippsburg
_____ Kernkraftwerk Leibstadt AG	Leibstadt
_____ Kraftgrupp AB	Forsmark
_____ Kraftgrupp AB	Ringhals 1
_____ Nuclenor SA	Santa Maria De Garoña
_____ OKG Aktiebolag	Oskarshamn 1-3
_____ Taiwan Power Company	Chinshan 1-2
_____ Taiwan Power Company	Kuosheng 1-2
_____ Taiwan Power Company	Lungmen 1-2*
_____ Teollisuuden Voima Oy	Olkiluoto 1-2
_____ Tokyo Electric Power Company	Fukushima Daiichi 1-6
_____ Tokyo Electric Power Company	Fukushima Daini 1-4
_____ Tokyo Electric Power Corporation	Kashiwazaki 1-5
_____ Tokyo Electric Power Corporation	Kashiwazaki 6-7
_____ Tohoku Electric Power Company	Higashidori 1
_____ Tohoku Electric Power Company	Onagawa 1-3

US PWR Plants

<u>Utility</u>	<u>Plant</u>
_____ AmerenUE	Callaway
_____ Arizona Public Service	Palo Verde 1-3
_____ Constellation Energy Generation	Braidwood 1-2
_____ Constellation Energy Generation	Byron 1-2
_____ Constellation Energy Generation	Calvert Cliffs 1-2
_____ Constellation Energy Generation	Fort Calhoun
_____ Constellation Energy Generation	Ginna
_____ Constellation Energy Generation	Three Mile Island 1
_____ Dominion	Kewaunee
_____ Dominion	Millstone 2
_____ Dominion	Millstone 3
_____ Dominion	North Anna 1-2
_____ Dominion	Surry 1-2
_____ Duke Energy Corporation	Catawba 1-2
_____ Duke Energy Corporation	Crystal River 3
_____ Duke Energy Corporation	McGuire 1-2
_____ Duke Energy Corporation	Oconee 1-3
_____ Duke Energy Corporation	Robinson
_____ Duke Energy Corporation	Shearon Harris
_____ Entergy	Arkansas Nuclear One 1-2
_____ Entergy	Indian Point 2-3
_____ Entergy	Palisades
_____ Entergy	Waterford 3
_____ FirstEnergy Nuclear Operations Co.	Beaver Valley 1-2
_____ FirstEnergy Nuclear Operating Co.	Davis-Besse
_____ Florida Power & Light	Seabrook
_____ Florida Power & Light	St. Lucie 1-2
_____ Florida Power & Light	Turkey Point 3-4
_____ Florida Power & Light	Point Beach 1-2
_____ Indiana Michigan Power Corp	D C Cook 1-2
_____ Northern States Power	Prairie Island 1-2
_____ Pacific Gas & Electric Co.	Diablo Canyon 1-2
_____ PSEG Nuclear LLC	Salem 1
_____ PSEG Nuclear LLC	Salem 2
_____ South Carolina Electric & Gas Co.	Summer
_____ South Texas Project Nuclear Operating Co.	South Texas Project 1-2
_____ Southern California Edison Co.	San Onofre 2-3
_____ Southern Nuclear Operating Co.	Farley 1-2
_____ Southern Nuclear Operating Co.	Vogtle 1-2
_____ Tennessee Valley Authority	Sequoyah 1-2
_____ Tennessee Valley Authority	Watts Bar 1
_____ Tennessee Valley Authority	Watts Bar 2
_____ TXU Electric Generation Co.	Comanche Peak 1-2
_____ Wolf Creek Nuclear Operating Corp.	Wolf Creek

Attachment 2 – Recent GE Hitachi Nuclear Energy 10 CFR Part 21 Communications

The following is a list of recent 10 CFR Part 21 communications that GE Hitachi Nuclear Energy (GEH) and Global Nuclear Fuel (GNF) have provided to affected licensees as Reportable Conditions (RC), Transfers of Information (TI), 60-Day Interim Reports (60 Day) and/or Safety Information Communications (SC).

<u>Number</u>	<u>Ref.</u>	<u>Subject</u>	<u>Date</u>
SC 22-01	PRC 22-01	Inadequately sized / rated equipment used to perform dedication testing on a safety related transformer	5/26/2022
SC 22-02	PRC 22-03	Design Change Implemented by Manufacturer Impacts Qualification	6/8/2022
SC 22-03	PRC 22-02	Updated Lifetime Limits for Marathon-C+ Control Rods	6/16/2022
SC 22-04	PRC 22-04	GNF3 Raised Water Rod – Interim Notification	9/28/2022
SC 22-04	PRC 22-04	GNF3 Raised Water Rod – Interim Notification	10/27/2022

Revision 1

ENCLOSURE 3

Global Nuclear Fuel-Americas, LLC

AFFIDAVIT

I, **Scott P. Murray**, state as follows:

- (1) I hold the position of Manager, Facility Licensing, for Global Nuclear Fuel-Americas, LLC (“GNF-A” in this affidavit), have been delegated the responsibility of reviewing the information belonging to GNF-A described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding from public disclosure.
- (2) The sensitive security-related information and confidential commercial (hereinafter referred to as “proprietary”) information and personally identifiable information requested to be withheld from public disclosure is contained in Enclosure 1 of GNF-A’s letter, Scott P. Murray to U.S. NRC Document Control Desk, Letter No. M220124 Revision 1, “Part 21 60-Day Interim Report Notification: GNF3 Raised Water Rod (SC-22-04 R1)” dated October 28, 2022. GNF proprietary information in M220124, Revision 1 is identified by a dotted underline inside double square brackets. [[This sentence is an example.⁽³⁾]]. GNF proprietary information in figures and large objects is identified by double square brackets before and after the object. In each case, the superscript notation ⁽³⁾ refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.
- (3) In making this application for withholding of confidential information of which it is the owner, GNF-A relies upon the exemptions from disclosure set forth in the Freedom of Information Act (“FOIA”), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 9.17(a)(6), 2.390(a)(4), and 2.390(a)(6) for “trade secrets and commercial or financial information” (Exemption 4) and “personnel and medical files” (Exemption 6) and 10 CFR 2.390(d), as well as the guidance in NRC RIS 2005-31, for “security-related information”. The material for which exemption from disclosure is here sought is all “confidential commercial or financial information” or “personnel information”, and some portions also may also qualify under the narrower definition of “trade secret”, within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of confidential, trade secret, or proprietary information are:
 - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GNF-A’s competitors without license from GNF-A constitutes a competitive economic advantage over other companies.

- b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
- c. Information which reveals organizational structures, cost or price information, production capacities, budget levels, or commercial strategies of GNF-A, its customers, or its suppliers;
- d. Information which reveals aspects of past, present, or future GNF-A customer-funded development plans and programs, resulting in potential products to GNF-A;
- e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

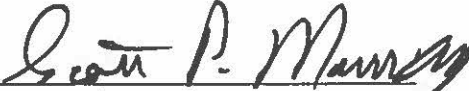
The information requested to be withheld is considered to be confidential because it reveals confidential commercial and/or financial information regarding the operations of GNF-A and its related joint venture entities or reveals personal information of individuals, and some of the former information is also considered proprietary for the reasons set forth in paragraph (4)c. above.

- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GNF-A and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GNF-A, no public disclosure has been made, and it is not available in public sources. Notwithstanding the foregoing, in the case of certain summaries, tables, charts, and similar compilations of information, while the overall compilation is deemed proprietary by GNF-A, discrete pieces of information within the larger compilation may not be proprietary and may have been separately publicly disclosed or be available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or confidentiality or proprietary information agreements which provide for maintenance of the information in confidence. Its initial designation as confidential or proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.
- (6) Initial approval of confidential or proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GNF-A is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by, as applicable, the staff manager, project manager, principal scientist or other equivalent authority; the manager of the cognizant marketing function (or his delegate); and the Legal organization, for technical content, competitive effect, and determination of the accuracy of the confidential or proprietary designation. Disclosures outside GNF-A are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or confidentiality or proprietary information agreements.

- (8) The information identified in paragraph (2), above, is designated as confidential because it reveals: (a) commercial and/or financial information regarding the operations of GNF-A and its related joint venture entities; (b) security-related information; and/or (c) personal privacy information of individuals.
- (9) Public disclosure of the information sought to be withheld is inconsistent with the intent of the requirements for submittal and is likely to cause harm to GNF-A's competitive position and foreclose or reduce the availability of profit-making opportunities and would reveal personal privacy information and potentially reduce information security.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 28th day of October 2022.



Scott P. Murray
Manager, Facility Licensing
Global Nuclear Fuel-Americas, LLC