

**Proprietary Information Withhold from Public Disclosure
Under 10 CFR 2.390
This letter is decontrolled when separated from Enclosure 1**



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-19-017

January 25, 2019

10 CFR 50.90
10 CFR 2.390

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

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus - Supplement 7, Response to Requests for Additional Information**

- References:
1. Letter from TVA to NRC, CNL-18-002, "Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus," dated February 23, 2018 (ML18057B276)
 2. Letter from NRC to TVA, "Browns Ferry Nuclear Plant - Request for Additional Information Regarding Maximum Extended Load Line Limit Analysis Limit Plus License Amendment Request (EPID L-2018-LLA-0048)," dated December 6, 2018 (ML18331A546)
 3. Letter from TVA to NRC, CNL-19-007, "Proposed Technical Specifications (TS) Change TS-510 - Request for License Amendments - Maximum Extended Load Line Limit Analysis Plus - Supplement 5, Response to Requests for Additional Information," dated January 16, 2019

By the Reference 1 letter, Tennessee Valley Authority (TVA) submitted a request for a Technical Specification (TS) amendment (TS-510) to Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3, respectively. The proposed amendment allows operation in the expanded Maximum Extended Load Line Limit Analysis Plus (MELLLA+) operating domain and use of the Detect and Suppress Solution - Confirmation Density (DSS-CD) stability solution. During their technical review of the LAR, the Nuclear Regulatory Commission (NRC) identified the need for additional information. The Reference 2 letter provided NRC Requests for Additional Information (RAIs) from the Reactor Systems Branch (SRXB) and the Nuclear Performance and Code Review Branch (SNPB). The Reference 3 letter provided the responses to these NRC RAIs, with the exception of SRXB RAI-6 and SRXB RAI-7. Enclosures 1 and 2 to this letter provide the responses to SRXB RAI-6 and SRXB RAI-7.

General Electric - Hitachi Nuclear Energy Americas LLC (GEH) considers portions of the information provided in Enclosure 1 to this letter to be proprietary and, therefore, exempt from public disclosure pursuant to 10 CFR 2.390. An affidavit for withholding information, executed by GEH, is provided in Enclosure 3. Enclosure 2 to this letter provides a non-proprietary version of the responses to the RAIs provided in Enclosure 1. Therefore, on behalf of GEH, TVA requests that Enclosure 1 be withheld from public disclosure in accordance with the GEH affidavit and the provisions of 10 CFR 2.390.

TVA has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in the Reference 1 letter. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the supplemental information in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed license amendment. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and the non-proprietary enclosures to the Alabama State Department of Public Health.

There are no new regulatory commitments associated with this submittal. If there are any questions or if additional information is needed, please contact Michael A. Brown at (423) 751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 25th day of January 2019.

Respectfully,



E. K. Henderson
Director, Nuclear Regulatory Affairs

Enclosures

cc: See Page 3

Enclosures:

1. Responses to SRXB RAI-6 and SRXB RAI-7 (Proprietary)
2. Responses to SRXB RAI-6 and SRXB RAI-7 (Non-proprietary)
3. Affidavit

cc:

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant
State Health Officer, Alabama Department of Public Health
(w/o Enclosure 1)

ENCLOSURE 1

**Responses to SRXB RAI-6 and SRXB RAI-7
(Proprietary)**

ENCLOSURE 2

**Responses to SRXB RAI-6 and SRXB RAI-7
(Non-proprietary)**

ENCLOSURE 2

DOC-0007-4283-139

Responses to SRXB-RAI 6 and SRXB-RAI 7 in Support of BFN
MELLLA+ LAR

Non-Proprietary Information

NON-PROPRIETARY NOTICE

This is a non-proprietary version of Enclosure 1 of DOC-0007-4283-139 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 [[]].

SRXB RAI-6

The M+SAR justifies the use of DSS-CD with ATRIUM 10XM fuel. Justify that ATRIUM 10 fuel, which will also be present in the core when MELLLA+ is implemented, is bounded by ATRIUM 10XM fuel such that no explicit analysis for ATRIUM 10 is necessary to ensure both fuels meet draft GDC 6 and 7.

GEH Response

Third cycle fuel is typically located on or near the periphery of the core in non-limiting locations. Regional oscillations are driven by the high harmonic regions of the core and corewide oscillations are driven by central peaking bundles of the core. Therefore, the low-powered third cycle bundles on or near the periphery do not play a major role in developing and sustaining thermal-hydraulic instabilities. At the time that Maximum Load Line Limit Analysis Plus (MELLLA+) will be implemented at Browns Ferry, the only ATRIUM 10 fuel in the core will be low powered thrice burned bundles located on or near the periphery. Additionally, in the Browns Ferry analysis for Detect and Suppress Solution - Confirmation Density (DSS-CD), the limiting Critical Power Ratio (CPR) bundles were not bundles on the periphery but were instead ATRIUM 10XM bundles in the high power, high harmonic regions of the core. Therefore, the Browns Ferry DSS-CD analysis with ATRIUM 10XM sufficiently covers a core that contains limited quantities of ATRIUM 10 fuel on or near the periphery.

SRXB RAI-7

Section 2.4.1 of the M+SAR states that a [[]]] for DSS-CD will be used for BFN. To ensure the analysis meets draft GDC 6 and 7, provide the following:

- a. The minimum period for all the cases analyzed.
- b. Justification that the cases analyzed produced the minimum expected period in the ranges where DSS-CD will be applied.

GEH Response

The Browns Ferry MELLLA+ DSS-CD analysis [[]]

]] The periods for the other cases are shown in Figures 7-1 through 7-3 along with the Oscillation Power Range Monitor (OPRM) scram time. The minimum period is determined when thermal-hydraulic instability oscillations develop. Prior to the development of thermal-hydraulic instability oscillations, the reactor is in a state of reaching equilibrium where the period will fluctuate before a true thermal-hydraulic instability develops. Once the core starts to develop thermal-hydraulic instability oscillations, the period will level out and become stable, so the period from this condition is the period of interest for thermal-hydraulic instability concerns. [[]]

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The expected period of a thermal-hydraulic instability is dependent upon the fluid transit time through the core. Therefore, at higher core flow rates the fluid transit time is shorter, and the period is shorter. Likewise, at low core flow rates the fluid transit time is longer, and the period is longer. [[]]

]] Therefore, there is ample margin to
justify a T_{\min} setting of 1.20 seconds for the Browns Ferry MELLLA+ license amendment
request.

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Figure 7-1: [[]]

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Figure 7-2: [[]]

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Figure 7-3: [[]]

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Figure 7-4: [[

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ENCLOSURE 3

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Lisa K. Schichlein**, state as follows:

- (1) I am a Senior Project Manager, NPP/Services Licensing, Regulatory Affairs, GE-Hitachi Nuclear Energy Americas LLC (“GEH”), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in Enclosure 1 of GEH letter, DOC-0007-4283-139, “GEH Responses to MELLLA+ RAIs SRXB-RAI 6 and SRXB-RAI 7,” dated January 17, 2019. The GEH proprietary information in Enclosure 1, which is entitled “Responses to SRXB-RAI 6 and SRXB-RAI 7 in Support of BFN MELLLA+ LAR,” is identified by a dotted underline inside double square brackets. [[This sentence is an example.^{3}]] Figures and large objects containing GEH proprietary information are identified with 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 proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the *Freedom of Information Act* (“FOIA”), 5 U.S.C. Sec. 552(b)(4), and the *Trade Secrets Act*, 18 U.S.C. Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for trade secrets (Exemption 4). The material for which exemption from disclosure is here sought also qualifies 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, 975 F.2d 871 (D.C. Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F.2d 1280 (D.C. Cir. 1983).
- (4) The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b. Some examples of categories of information that fit into the definition of proprietary information are:
 - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without license from GEH constitutes a competitive economic advantage over other companies;
 - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
 - c. Information that reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;
 - d. Information that discloses trade secret or potentially patentable subject matter for which it may be desirable to obtain patent protection.

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- (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 GEH, 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 GEH, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary or confidentiality agreements that provide for maintaining the information in confidence. The initial designation of this information as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in the following paragraphs (6) and (7).
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to GEH.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist, or other equivalent authority for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GEH 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 proprietary or confidentiality agreements.
- (8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed results and conclusions regarding supporting evaluations of the safety-significant changes necessary to demonstrate the regulatory acceptability of the Maximum Extended Load Line Limit Analysis Plus analysis for a GEH Boiling Water Reactor ("BWR"). The analysis utilized analytical models and methods, including computer codes, which GEH has developed, obtained NRC approval of, and applied to perform evaluations of Maximum Extended Load Line Limit Analysis Plus for a GEH BWR.

The development of the evaluation processes along with the interpretation and application of the analytical results is derived from the extensive experience and information databases that constitute a major GEH asset.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

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The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GEH. The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial. GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 17th day of January 2019.



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