

RS-10-164

October 15, 2010

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

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Additional Information Supporting Request for License Amendment Regarding Revised Pressure/Temperature Curves

- References:
1. Letter from P. R. Simpson (Exelon Generation Company, LLC) to U.S. NRC, "License Amendment Request Regarding Reactor Coolant System Pressure and Temperature Limit Curves," dated April 19, 2010
 2. Letter from C. Gratton (U.S. NRC) to M. J. Pacilio (Exelon Nuclear), "LaSalle County Station, Units 1 and 2 – Request for Additional Information Related to Exelon Generation Company's Request to Incorporate Revised Pressure/Temperature Curves (TAC Nos. ME3801 and ME3802)," dated August 20, 2010
 3. Letter from J. L. Hansen (Exelon Generation Company, LLC) to U.S. NRC, "Additional Information Regarding Request for License Amendment Regarding Revised Pressure/Temperature Curves," dated October 5, 2010

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Facility Operating License Nos. NPF-11 and NPF-18 for LaSalle County Station (LSCS), Units 1 and 2, respectively. Specifically, the proposed change revises Technical Specifications (TS) to incorporate revised Pressure and Temperature (P-T) curves that are valid for up to 32 effective full power years of operation. In Reference 2, the NRC requested additional information to support review of the proposed change and requested a 30-day response. EGC requested to extend the response submittal date, as documented in Reference 3, and the NRC agreed to the extension.

In response to this request, EGC is providing the attached information. Specifically, Attachment 1 provides responses to NRC Requests 1, 2, and 4 from Reference 2. The response to NRC Request 3 is provided in Attachment 2.

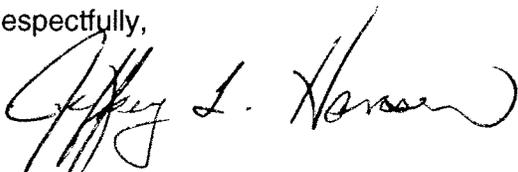
Portions of the information in Attachment 2 are proprietary to GE Hitachi Nuclear Energy (GEH) and are supported by an affidavit signed by GEH. The affidavit, provided in Attachment 3, sets forth the basis on which the information may be withheld from public disclosure by the NRC and addresses with specificity the considerations listed in paragraph (a)(4) of 10 CFR 2.390, "Public inspections, exemptions, requests for withholding" and paragraph (a)(4) of 10 CFR 9.17, "Agency records exempt from public disclosure." Accordingly, it is requested that the information be withheld from public disclosure in accordance with 10 CFR 2.390 and 10 CFR 9.17. In addition, GEH relies upon the exemption from disclosure set forth in the Freedom of Information Act, 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905. A non-proprietary version of the information contained in Attachment 2 is provided in Attachment 4.

EGC has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration that were previously provided to the NRC in Attachment 1 of Reference 1. The additional 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 additional information provided 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 amendment.

There are no regulatory commitments contained in this letter. If you have any questions concerning this letter, please contact Ms. Jean Smith at (630) 657-2813.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15th day of October 2010.

Respectfully,



Jeffrey L. Hansen
Manager – Licensing

Attachments:

1. Response to Request for Additional Information
2. GE Hitachi Nuclear Energy Letter No. 7491-1-2JBAHO-HAO-1 R1, "Transmittal of GEH Comments on LaSalle P-T RAIs," Enclosure 2 (PROPRIETARY INFORMATION)
3. GE Hitachi Nuclear Energy Affidavit
4. Non-Proprietary Version of Attachment 2

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector – LaSalle County Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 3

GE Hitachi Nuclear Energy Affidavit

ATTACHMENT 1
Response to Request for Additional Information

NRC Request 1

Provide an evaluation for the small-diameter, possibly drill-hole type instrument nozzles (e.g., water level nozzles) which exist in the LSCS, Unit 1 reactor pressure vessel (RPV) beltline region, as indicated in Figure 4-1 of the GE-NE-0000-0003-5526-02R1a report, "Pressure-Temperature [P-T] Curves for Exelon LaSalle Unit 1," dated May 2004. The stress concentration factor associated with the drill-hole type nozzle in the beltline may make it more limiting than the limiting beltline material that was identified and used in the proposed P-T limits for LSCS, Unit 1.

Response

The LSCS Unit 1 and Unit 2 vessels have a J-weld penetration water level instrument (WLI) nozzle in the beltline region. This nozzle was not included in the May 2004 P-T curve reports developed by GE Hitachi Nuclear Energy (GEH) for LSCS Units 1 and 2.

However, since the development of the LSCS P-T curves, the NRC reviewed the GEH P-T Curve Licensing Topical Report (LTR) NEDC-33178P-A (Reference RAI-1-1) and questioned the adequacy of the methodology used to evaluate the WLI for the GEH P-T curves. In response, GEH performed a detailed Finite Element Analysis (FEA) of a representative and bounding WLI nozzle of the J-weld configuration such as on LSCS Units 1 and 2. The NRC reviewed the FEA and the corresponding Appendix J evaluation that was developed for inclusion in the LTR and has issued a final unconditional Safety Evaluation that is contained in the Reference RAI-1-1 Licensing Technical Report.

Additionally, the NRC requested that GEH demonstrate the effect of this nozzle on the P-T curves that GEH has provided to its customers. GEH performed an impact assessment that demonstrated for LSCS Units 1 and 2 the WLI nozzle curves are bounded by the beltline and upper vessel curves provided in reports GE-NE-0000-0003-5526-02R1a (Unit 1) and GE-NE-0000-0003-5526-01R1a (Unit 2).

Reference:

RAI-1-1: Licensing Topical Report NEDC-33178P-A, "Licensing Topical Report GE Hitachi Nuclear Energy Methodology for Development of Reactor Pressure Vessel Pressure-Temperature Curves," June 2009.

NRC Request 2

The NRC staff has verified the proposed P-T limits for LSCS, Units 1 and 2, but found no mention of temperature and pressure instrument uncertainties in the submittals. Explain how temperature and pressure instrument uncertainties are addressed in the P-T limit application.

Response

The pressure and temperature instruments used to monitor compliance with the pressure-temperature curves are monitoring instruments, not actuating instruments; therefore, they are excluded from the guidance in Regulatory Guide 1.105, "Setpoints for Safety Related

ATTACHMENT 1
Response to Request for Additional Information

Instrumentation". The temperature and pressure numeric values used to monitor the P-T limits are examples of Technical Specification values without Allowable Values; therefore, the P-T limits are considered to be nominal values. A nominal value is a value that is used as-is in the surveillance acceptance criteria. The inherent conservative engineering practices used in the design of the units have already incorporated enough margin in the selection of these acceptance criteria that the instrument measurement uncertainty will be bounded.

NRC Request 4

The NRC staff's evaluation revealed that the proposed P-T limits for the bottom head and the upper vessel are based on the generic P versus (T-RT_{NDT}) limits reported in the Topical Report, NEDC-33178P, "General Electric Methodology for Development of Reactor Pressure Vessel Pressure-Temperature Curves." To avoid unnecessary duplicate review on the very details of the P-T limit methodologies, please confirm that the methodologies for the RPV beltline, the bottom head, and the upper vessel curves in this application are identical to those in the approved NEDC-33178P report, so that this application can be considered as a plant specific application of the NEDC-33178P report. Point out the deviations of the LSCS P-T limit methodology from the NEDC-33178P methodology.

Response

The methodology used in the development of the Unit 1 P-T curves as documented in GE-NE-0000-0003-5526-02R1 and in the development of the Unit 2 P-T curves as documented in GE-NE-0000-0003-5526-01R1 is the same as the methodology documented in NEDC-33178P-A (Reference RAI-4-1). The significant aspects of the methodology include the use of the following:

- K_{IC} from Figure A-4200-1 of ASME Code Appendix A in lieu of Figure G-2210-1 in Appendix G to determine T-RT_{NDT};
- the M_m calculation in the ASME Code paragraph G-2214.1 for a postulated defect normal to the direction of maximum stress;
- the generation of separate curves for the upper vessel, beltline, and bottom head;
- the geometry of the RPV shells and discontinuities;
- the initial RT_{NDT} of the RPV materials as defined in Paragraph NB-2331 of Section III of the ASME Boiler and Pressure Vessel Code;
- the adjusted reference temperature (ART) for the beltline materials;
- the use of Charpy energy data tabulated from the Certified Material Test Report to determine the initial RT_{NDT} values;
- the method in Regulatory Guide 1.99, Rev. 2 for calculating ART; and
- the inclusion of the bottom head methods as discussed in Appendix H of the LSCS Unit 1 and Appendix G of the LSCS Unit 2 P-T curve reports.

Reference:

RAI-4-1: Licensing Topical Report NEDC-33178P-A, "Licensing Topical Report GE Hitachi Nuclear Energy Methodology for Development of Reactor Pressure Vessel Pressure-Temperature Curves," June 2009.

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **James F. Harrison**, state as follows:

- (1) I am the Vice President, Regulatory Affairs, Fuel Licensing, GE-Hitachi Nuclear Energy Americas LLC (GEH). I 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 2 of GEH letter, 7491-1-2JBAHO-HA0-1 R1, Larry Beese (GEH) to Joann Shields (Exelon), "Transmittal of GEH Comments on LaSalle P-T RAIs," dated October 13, 2010. The proprietary information in Enclosure 2 entitled, "Lasalle P-T RAIs - Proprietary," is identified by a dotted underline inside double square brackets. [[This sentence is an example.^{3}]] In each case, the superscript notation ^{3} refers to Paragraph (3) of this affidavit that 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 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC 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 F2d 871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F2d 1280 (DC 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 GEH and/or 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, that may include potential products of GEH.
 - d. Information that discloses trade secret and/or potentially patentable subject matter for which it may be desirable to obtain patent protection.
- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to the 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 and/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. Access to such documents within GEH is limited to a “need to know” basis.
- (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 and/or confidentiality agreements.
- (8) The information identified in paragraph (2) above is classified as proprietary because it contains information regarding the development of the GEH P/T Curve analysis methodology and supporting analysis techniques and information. The development and the application of this methodology to the design, modification, and processes was achieved at a significant cost to GEH.

The development of the methodology along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GEH asset.

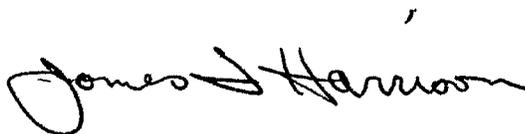
- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial 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.

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 affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 13th day of October 2010.



James F. Harrison
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ATTACHMENT 4

Non-Proprietary Version of Attachment 2

ENCLOSURE 3

7491-1-2JBAHO-HA0-1

Lasalle PT RAIs – Non-Proprietary

NON-PROPRIETARY NOTICE

This is a non-proprietary version of the Enclosure 2 of 7491-1-2JBAHO-HA0-1 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 [[]].

RAI-3

For LSCS, Units 1 and 2, the upper vessel P-T limits were derived from a generic P versus (T-RT_{NDT}) (nil-ductility transition reference temperature) limits shown on Page 41 of the GE-NE-0000-0003-5526-02R1a report, or on Page 40 of the GE-NE-0003-5526-01R1a report, "Pressure-Temperature Curves for Exelon LaSalle Unit 2." Demonstrate that you can apply these generic P versus (T-RT_{NDT}) limits to the LSCS, Units 1 and 2 feedwater nozzles, considering the difference between the plant-specific information, such as the units' nozzle and RPV dimensions, and the generic plant (or analysis) information.

RAI-3 Response

As discussed in Section 4.3.2.1.4, "Example Core Not Critical Heatup/Cooldown Calculation for Feedwater Nozzle/Upper Vessel Region," the stresses used to analyze the feedwater (FW) nozzle region were from a [[]] finite element analysis (FEA). The FEA used a bounding FW nozzle configuration to develop the stresses.

The K_I calculated for the [[]] FW nozzle is [[]] ksi-in^{1/2}. The K_I for LSCS Unit 1 FW nozzle is [[]] ksi-in^{1/2} (Section 4.3.2.1.3 of Unit 1 report) and for LSCS Unit 2 is [[]] ksi-in^{1/2} (Section 4.3.2.1.3 of Unit 2 report). Because the nozzle K_I used for the [[]] FEA is greater than the K_I for LSCS Units 1 and 2, the FEA bounds the LSCS Unit 1 and Unit 2 evaluations.

Additionally, the limiting transient used in the [[]] FEA is a step change from [[]]°F to [[]]°F as shown in Figure 4-3, "Feedwater Nozzle Fracture Toughness Limiting Transient" for both LSCS Units 1 and 2. In the LSCS-specific nozzle thermal cycle diagram [4] for the FW nozzle, the LSCS-specific limiting transient is a step change from [[]]°F to [[]]°F. The LSCS-specific transient is less severe than the [[]] transient, and is therefore bounded by the [[]] transient.

The (P) versus (T-RT_{NDT}) results from the [[]] analysis are included in Section 4.3.2.1.4 of both the LSCS Unit 1 and Unit 2 reports. The T-RT_{NDT} values calculated for the [[]] plant were increased by the highest non-beltline (upper vessel) RT_{NDT} for the LSCS FW nozzles. The maximum non-beltline (upper vessel) RT_{NDT} for the components/discontinuities defined in Table 4-7 as being represented by the FW (upper vessel) curve for LSCS Unit 1 and Table 4-6 for Unit 2 is [[]]°F based on Unit 1 Tables 4-1, 4-2, and 4-3, and Unit 2 Tables 4-1 and 4-2.

Therefore, the [[]] analysis bounds the LSCS Unit 1 and Unit 2 designs and it is acceptable to apply the [[]] analysis to the LSCS Unit 1 and Unit 2 analyses.