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NINE MILE POINT
NUCLEAR STATION

September 6, 2013

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station, Unit 2
Renewed Facility Operating License No. NPF-69
Docket No. 50-410

Nine Mile Point Nuclear Station License Amendment Request to Relocate the Pressure and Temperature Limit Curves to the Pressure and Temperature Limits Report – Supplemental Information in Response to NRC Request for Additional Information (TAC No. MF0345)

REFERENCES:
(a) Letter from K. Langdon (NMPNS) to Document Control Desk (NRC), dated November 21, 2012, License Amendment Request Pursuant to 10 CFR 50.90: Relocation of Pressure and Temperature Limit Curves to the Pressure and Temperature Limits Report
(b) Letter from C. Costanzo (NMPNS) to Document Control Desk (NRC), dated July 31, 2013, Nine Mile Point Nuclear Station License Amendment Request to Relocate the Pressure and Temperature Limit Curves to the Pressure and Temperature Limits Report – Supplemental Information in Response to NRC Request for Additional Information
(c) Letter from B. Vaiyda (NRC) to C. Costanzo (NMPNS), dated August 22, 2013, Nine Mile Point Nuclear Station, Unit No. 2 - Request for Additional Information Regarding the License Amendment Request for the Relocation of Pressure and Temperature Limit Curves to the Pressure and Temperature Limits Report (TAC No. MF0345)

A001
NRR

This letter forwards proprietary information in accordance with 10 CFR 2.390. The balance of this letter may be considered non-proprietary upon removal of Attachment 3.

Nine Mile Point Nuclear Station, LLC (NMPNS) hereby transmits supplemental information requested by the NRC in support of a previously submitted request for amendment to Nine Mile Point Unit 2 (NMP2) Renewed Facility Operating License NPF-69. The initial request, dated November 21, 2012 (Reference a), proposed to modify Technical Specification (TS) Section 3.4.11, "RCS Pressure and Temperature (P/T) Limits," by replacing the existing reactor vessel heatup and cooldown rate limits and the pressure and temperature (P/T) limit curves with references to the Pressure and Temperature Limits Report (PTLR). Other associated TS changes would also be incorporated. Supplemental information was submitted on July 31, 2013 (Reference b).

The supplemental information, provided in Attachment 1 (non-proprietary), and Attachment 3 (proprietary) to this letter, responds to the request for additional information that was provided in a letter from the NRC to NMPNS on August 22, 2013 (Reference c).

Attachment 3 is considered to contain proprietary information exempt from disclosure pursuant to 10 CFR 2.390. Therefore, on behalf of GE-Hitachi Nuclear Energy Americas LLC (GEH), NMPNS hereby makes application to withhold this attachment from public disclosure in accordance with 10 CFR 2.390(b)(1). The affidavit from GEH detailing the reasons for the request to withhold the proprietary information is provided in Attachment 2.

This supplemental information does not affect the No Significant Hazards Determination analysis provided by NMPNS in Reference (a). Pursuant to 10 CFR 50.91(b)(1), NMPNS has provided a copy of this supplemental information, without the proprietary Attachment 3, to the appropriate state representative. This letter contains no new regulatory commitments.

Should you have any questions regarding the information in this submittal, please contact Theresa H. Darling, Acting Director Licensing, at (315) 349-2221.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 6, 2013.

Very truly yours,

Christopher R Costanzo

CRC/KJK

Attachments:
1. Response to NRC Request for Additional Information, RAI EVIB 3, RAI EVIB 4 and RAI EVIB 5 (Non-Proprietary)
2. Affidavit from GE-Hitachi Nuclear Energy Americas LLC (GEH) Justifying Withholding Proprietary Information Contained in Attachment 3
3. Response to NRC Request for Additional Information, RAI EVIB 3, RAI EVIB 4 and RAI EVIB 5 (Proprietary)

cc: Regional Administrator, NRC
Project Manager, NRC
Resident Inspector, NRC
A. L. Peterson, NYSERDA (without Attachment 3)

ATTACHMENT 1

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

RAI EVIB 3, RAI EVIB 4 and RAI EVIB 5

(Non-Proprietary)

This attachment provides supplemental information in response to the NRC request for additional information that was provided in a letter from the NRC to NMPNS on August 22, 2013; specifically, RAI EVIB 3, RAI EVIB 4 and RAI EVIB 5.

(6 pages attached)

ENCLOSURE 2

GE-PPO-1GYEF-KG1-716

Responses to EVIB RAIs 3, 4, and 5

Non-proprietary Information- Class I (Public)

NON-PROPRIETARY NOTICE

This is a non-proprietary version of the Enclosure 1 of GE-PPO-1GYEF-KG1-716 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 [[ ]].

The supplemental information below responds to the request for additional information that was provided in a letter from the NRC to NMPNS on August22, 2013. The NRC RAI is stated first, followed by the NMP2 response.

Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix G, "Fracture Toughness Requirements," states:

> *"this appendix specifies fracture toughness requirements for ferritic materials of pressure-retaining components of the reactor coolant pressure boundary (RCPB) of light water nuclear power reactors to provide adequate margins of safety...".*

In addition, 10 CFR Part 50, Appendix G, Paragraph IV.A states that:

> *"the pressure-retaining components of the RCPB that are made of ferritic materials must meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), supplemented by the additional requirements set forth in [paragraph IV.A.2, "Pressure-Temperature (P-T) Limits and Minimum Temperature Requirements"]..."*

Therefore, 10 CFR Part 50, Appendix G requires that P-T limits be developed for the entire RCPB, consisting of ferritic RCPB materials in the reactor pressure vessel (RPV) beltline (neutron fluence $\geq 1 \times 10^{17}$ n/cm^2, E > 1 MeV), as well as ferritic RCPB materials not in the RPV beltline (neutron fluence $< 1 \times 10^{17}$ n/cm^2, E > 1 MeV).

EVIB - RAI 3

The response to request for additional information (RAI) EVIB-1 states that Tables 4-4 and 4-5 of Reference 1 provide a list of all non-beltline vessel reactor coolant pressure boundary (RCPB) components included in the pressure-temperature (P-T) limit evaluation. It appears that all the listed components are non-beltline components in the RPV.

Requested Information:

Are there any ferritic components in the RCPB that are not part of the RPV that must be considered in the development of the P-T limits, such as piping components or other pressure vessels? If so, describe how these components were considered in the development of the P-T limits, for example through consideration of the lowest service temperature as defined in the ASME Code, Section III.

NMP2 Response:

There are no ferritic components, such as piping components or other pressure vessels, in the RCPB that are not part of the RPV that must be considered in the development of the P-T limits. NMP2 conforms to ASME Section III, NB-2332(b) which states:

> "Pressure retaining material, other than bolting, with nominal wall thickness over 2.5 in. for piping (pipe and tubes) and material for pumps, valves, and fittings with any pipe connections of nominal wall thickness greater than 2.5 in. shall meet the requirements of NB-2331. The lowest service temperature shall not be lower than

> RT_{NDT} + 100°F unless a lower temperature is justified by following methods similar to those contained in Appendix G."

All NMP2 ferritic RCPB piping and piping components connections have wall thickness less than 2.5 inches. The main steam lines are the largest ferritic Class 1 piping and are significantly smaller at 26 inches with a nominal wall thickness of 1.266 inches. Therefore, the requirements of NB-2332 have been met, and there are no ferritic RCPB piping components that require consideration in the RPV PT curves for NMP2.

EVIB - RAI 4

The response to RAI EVIB-1 indicates that all RCPB materials met the applicable ASME Code requirements for fracture toughness, but also states that the Pressure Integrity Specification for the RCPB materials has the following requirement:

> *"For ferritic RCPB materials ordered where the service temperature is less than 250°F when the system is pressurized to more than 20% of the design pressure, impact tests in accordance with the ASME Code were required to demonstrate adequate fracture toughness properties. For RCPB materials having a minimum service temperature of 250°F or more when the system is pressurized to more than 20% of the design pressure, impact testing was not required. Further, impact testing was not required on components or equipment whose rupture could not result in a loss of coolant exceeding the capability of the normal makeup system to maintain adequate core cooling for the duration of reactor shutdown and orderly cooldown."*

The above requirement of the Pressure Integrity Specification appears inconsistent with the requirements of the ASME Code, Section III, NB-2300, "Fracture Toughness Requirements for Material."

Requested Information:

Discuss how the impact testing requirements of the Pressure Integrity Specification are consistent with ASME Code, Section III, NB-2300 requirements for fracture toughness of material.

NMP2 Response

The information cited as being obtained from the Pressure Integrity Specification was reviewed. It was found that the appropriate statement from the specification is as follows:

> "Ferritic materials for pressure retaining components shall be impact tested in accordance with the requirements of NB-2300 to ensure adequate fracture or notch toughness properties. The test temperature shall be as specified in the Design Specification."

The statement included in the original RAI response to EVIB 1 was applicable only to materials ordered prior to July 1, 1972. This is not applicable to NMP2 as the code of construction is 1971 with Addenda up to and including Winter 1972.

EVIB - RAI 5

The response to RAI EVIB-2, Item 1, Water Level Instrumentation (WLI) Nozzle states that the General Electric-Hitachi (GEH) methodology is that any partial penetration nozzle that is located in the beltline region is evaluated using the [[ ]] *methodology as defined in Appendix F of Reference 1. The calculation provided for the pressure-temperature relationship of the WLI nozzle appears to follow the methodology of Appendix F. However, the calculation uses the* [[ ]] *from Appendix J of Reference 1.*

Requested Information:

1. *Clarify whether the NMP2 WLI nozzle is a partial penetration or full penetration nozzle and whether the methodology of Appendix F or Appendix J was used to calculate the P-T limits required for the WLI nozzle.*
2. *If the NMP2 WLI nozzle is a full-penetration nozzle, justify the use of the* [[ ]] *values from Appendix J for evaluating the P-T limits for this nozzle, since the Appendix J methodology is for a partial penetration welded nozzle.*
3. *Provide the inputs and the calculation of* [[ ]]

References:

1. *NEDC-33178P-A, "GE Hitachi Nuclear Energy Methodology for development of Reactor Pressure Vessel Pressure-Temperature Curves," Enclosure 1 to MFN 09-506, June 30, 2009 (ADAMS Accession No. ML092370488).*

NMP2 Response

Item 1 & Item 2: WLI Configuration and Methodology Used

The EVIB-RAI-2 incorrectly referenced Appendix F in item 1. The WLI nozzle is a partial penetration welded nozzle. The core not critical sample calculation was based on the correct partial penetration welded nozzle configuration from Appendix J. A supplemental example calculation is provided for both the pressure test curve and the core not critical curve.

Pressure Test (Curve A)

K_I for the discontinuity is determined considering the K_I obtained from Table 7 of Appendix J (for hydrotest). For 1050 psig, this K_I is [[ ]] as follows:

K_I = [[ ]]

T-RT_{NDT} is calculated in the following manner:

T-RT_{NDT} = [[ ]]

The ART is added to T-RT_{NDT} to obtain the required T:

T = [[ ]]

This temperature is not obvious from the PT curve as it is bounded by the [[ ]].

Core Not Critical (Curve B)

K_I for the discontinuity is determined considering the K_I obtained from Table 5 of Appendix J.

[[ ]]

The transient used for the WLI nozzle, defined in Appendix J, is used in determination of K_I.

The total K_I is therefore:

K_I = [[ ]]

$T\text{-}RT_{NDT}$ is calculated in the following manner:

$T\text{-}RT_{NDT}$ = [[ ]]

The ART is added to $T\text{-}RT_{NDT}$ to obtain the required T:

T = [[ ]]

This temperature is not obvious from the PT curve as it is bounded by the [[ ]]

Item 3: Correction Factor

The total stress for the WLI exceeds the yield stress; therefore, the correction factor, R, is calculated to consider the nonlinear effects in the plastic region according the following equation based on the assumptions and recommendation of WRC Bulletin 175 as shown in Equation 4-7 of Reference 1.

$$R = [\sigma_{ys} - \sigma_{pm} + ((\sigma_{total} - \sigma_{ys})/30]/(\sigma_{total} - \sigma_{pm})$$

Applied to the WLI:

R = [[ ]]

References:

1. GEH Nuclear Energy, NEDC-33178P-A, Revision 1, "GE Hitachi Nuclear Energy Methodology for Development of Reactor Pressure Vessel Pressure-Temperature Curves," Report for BWR Owners' Group, Sunol, California, June 2009.

ATTACHMENT 2

AFFIDAVIT FROM GE-HITACHI NUCLEAR ENERGY AMERICAS LLC (GEH) JUSTIFYING WITHHOLDING PROPRIETARY INFORMATION CONTAINED IN ATTACHMENT 3

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, Linda C. Dolan, state as follows:

(1) I am the Manager of Regulatory Compliance, of 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, GE-PPO-1GYEF-KG1-716, "GEH Responses to NMP2 PTLR RAIs," dated September 5, 2013. The GEH proprietary information in Enclosure 1, which is entitled "Responses to EVIB RAIs 3, 4, and 5," 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, 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.

(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. 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 or confidentiality agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains the detailed GEH methodology for pressure-temperature curve analysis for the GEH Boiling Water Reactor (BWR). These methods, techniques, and data along with their application to the design, modification, and analyses associated with the pressure-temperature curves were achieved at a significant cost to GEH.

The development of the evaluation processes along with the interpretation and application of the analytical results is derived from the extensive experience 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.

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 5th day of September 2013.

Linda C. Dolan
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