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.

Thomas A. Lynch
Plant General Manager

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CENG
a joint venture of
Constellation Energy · EDF

NINE MILE POINT
NUCLEAR STATION

June 3, 2010

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

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit No. 2; Docket No. 50-410

Response to Request for Additional Information Regarding Nine Mile Point Nuclear Station, Unit No. 2 – Re: The License Amendment Request for Extended Power Uprate Operation – Reactor Systems Review (TAC No. ME1476)

REFERENCES:

(a) Letter from K. J. Polson (NMPNS) to Document Control Desk (NRC), dated May 27, 2009, License Amendment Request (LAR) Pursuant to 10 CFR 50.90: Extended Power Uprate

(b) Letter from R. V. Guzman (NRC) to S. L. Belcher (NMPNS), dated May 11, 2010, Request for Additional Information Regarding Nine Mile Point Nuclear Station, Unit No. 2 - Re: The License Amendment Request for Extended Power Uprate Operation – Reactor Systems Review (TAC No. ME1476).

(c) E-mail from R. Guzman (NRC) to T. H. Darling (NMPNS), dated May 10, 2010, Request for Additional Information Re: LOCA Analyses

Nine Mile Point Nuclear Station, LLC (NMPNS), hereby transmits revised and supplemental information in support of a previously submitted request for amendment to Nine Mile Point Unit 2 (NMP2) Renewed Operating License (OL) NPF-69. The request, dated May 27, 2009 (Reference a), proposed an amendment to increase the power level authorized by OL Section 2.C. (1), Maximum Power Level, from 3467 megawatts-thermal (MWt) to 3988 MWt.

By letter dated May 11, 2010 (Reference b), the NRC staff requested additional information to support its review. The response to this Request for Additional Information (RAI) is provided in Attachments 1 and 3.

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.

A001
NRR

By e-mail dated May 10, 2010 (Reference c), the NRC staff requested additional information pertaining to the NMP2 Loss of Coolant Accident (LOCA) analyses. The NMPNS response to this request is provided in Attachments 1 and 3. Attachment 1 provides a non-proprietary version of the information provided in Attachment 3. 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). An affidavit from GEH detailing the reason for the request to withhold the proprietary information is provided in Attachment 2.

Should you have any questions regarding the information in this submittal, please contact T. F. Syrell, Licensing Director, at (315) 349-5219.

Very truly yours,

Tlynch

STATE OF NEW YORK :
: **TO WIT:**
COUNTY OF OSWEGO :

I, Thomas A. Lynch, being duly sworn, state that I am Plant General Manager, and that I am duly authorized to execute and file this response on behalf of Nine Mile Point Nuclear Station, LLC. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other Nine Mile Point employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Tlynch

Subscribed and sworn before me, a Notary Public in and for the State of New York and County of Oswego, this 3rd day of June, 2010.

WITNESS my Hand and Notarial Seal:

Lisa M. Doran
Notary Public

My Commission Expires:

9/12/2013
Date

TAL/BC

Lisa M. Doran
Notary Public in the State of New York
Oswego County Reg. No. 01DO6029220
My Commission Expires 9/12/2013

Attachments:

1. Response to Request for Additional Information Related to Reactor Systems and the NMP2 LOCA Analyses Regarding License Amendment Request for Extended Power Uprate Operation (Non-Proprietary)

2. Affidavit from GE Hitachi Nuclear Energy Americas, LLC Justifying Withholding Proprietary Information

3. Response to Request for Additional Information Related to Reactor Systems and the NMP2 LOCA Analyses Regarding License Amendment Request for Extended Power Uprate Operation (Proprietary)

cc: NRC Regional Administrator, Region I
NRC Resident Inspector
NRC Project Manager
A. L. Peterson, NYSERDA (w/o Attachment 3)

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RELATED TO REACTOR SYSTEMS AND THE NMP2 LOCA ANALYSES REGARDING LICENSE AMENDMENT REQUEST FOR EXTENDED POWER UPRATE OPERATION (NON-PROPRIETARY)

Certain information, considered proprietary by GE Hitachi Nuclear Energy Americas, LLC (GEH) has been deleted from this attachment. The deletions are identified by double square brackets.

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RELATED TO REACTOR SYSTEMS AND THE NMP2 LOCA ANALYSES REGARDING LICENSE AMENDMENT REQUEST FOR EXTENDED POWER UPRATE OPERATION (NON-PROPRIETARY)

By letter, dated May 27, 2009, as supplemented on August 28, 2009, December 23, 2009, February 19, 2010, April 16, 2010 and May 7, 2010, Nine Mile Point Nuclear Station, LLC (NMPNS) submitted for Nuclear Regulatory Commission (NRC) review and approval, a proposed license amendment requesting an increase in the maximum steady-state power level from 3467 megawatts thermal (MWt) to 3988 MWt for Nine Mile Point Unit 2 (NMP2). This attachment provides supplemental information in response to the request for additional information (RAI) provided by NRC letter, dated May 11, 2010 and e-mail, dated May 10, 2010. The NRC request is repeated (in italics), followed by the NMPNS response.

NMP2-SRXB-RAI-1

In response to RAI D6 in your letter dated February 19, 2010, you state that, "[t]here are no Boraflex racks in use at NMP2. " Are there Boraflex racks still present in Unit 2 pool? If so, what controls are in place to ensure that fuel bundles will not be placed in Boraflex racks? Are there Boraflex racks still present in Unit 1 pool? If so, what controls are in place to ensure that fuel will not be loaded in Unit 1 Boraflex racks? If these scenarios are not credible, explain why.

NMPNS Response

There are no Boraflex racks in the NMP2 spent fuel pool. Boraflex racks are in use at Nine Mile Point 1 (NMP1); however, the NMP1 spent fuel pool is in a separate building from NMP2 with no fuel transfer capability between the NMP1 and NMP2 spent fuel pools.

NMP2-SRXB-RAI-2

In response to RAI D8, you simply provided a list of parameters. Provide the bounding values used in the analysis to be compared to the nominal values for EPU reactor conditions.

NMPNS Response

The table below shows the bounding values used in the TGBLA06A Lattice depletions analysis:

Depletion Conditions	
Volumetric power density (kW/l)	50.0
Fuel temperature (°C)	[[ ]]
Moderator temperature (°C)	286.0
Moderator liquid density (g/cc)	0.73749
Moderator vapor density (g/cc)	0.03733
Void fractions	0%, 40%, and 70%

NMP2-SRXB-RAI-3

In response to RAI D8, you state, "process includes studies on a number of "extreme lattice" designs to satisfy the spent fuel storage rack eigenvalue criteria." What are the key parameter values that define the "extreme" lattices? How many lattices were considered? What criteria did you use for the selection of the design basis lattice?

NMPNS Response

Eight lattices were considered in the analysis. The key parameter variables used in the extreme lattice design selection were:

Variable	Range
Lattice geometry	Dominant and vanished
Exposure history	0 – 65 GWd/ST
Fuel enrichment	Average lattice enrichment: 4.4 - 4.9 w% U^{235}
Void fractions	0%, 40%, and 70%
Number of gadolinia rods	11 – 16
Gadolinia rod enrichment	3 - 8 w% Gd_2O_3

Using the range of variables above, 672 in-core eigenvalues were calculated. The peak in-core eigenvalue state point for each of eight lattices was used in the in-rack eigenvalue evaluations and the calculation of the rack efficiency. The rack efficiency is the ratio of a particular lattice state point in-rack eigenvalue to its associated lattice in-core eigenvalue. The lattice corresponding to the highest rack efficiency (in conjunction with the desired in-core eigenvalue) was chosen as the design basis lattice.

NMP2-SRXB-RAI-4

Who performed the current depletion and criticality analyses (GE, Holtec, NETCO, etc.)?

NMPNS Response

General Electric/Global Nuclear Fuel (GE/GNF) performed the depletion and criticality analyses in 2004 as reflected in Section 2.8.6 of NEDC-33351P, Attachment 11 of the May 27, 2009 License Amendment Request.

NMP2-SRXB-RAI-5

What Monte Carlo code and version did you use? Where is the validation documented? Did you identify and address any validation gaps (e.g., non-uranium actinides, fission products, significant materials missing from the validation set, significant materials present in the validation set that are not in the analysis models, neutron energy spectra variation, etc.)?

NMPNS Response

The Monte Carlo code used was MCNP01A. MCNP01A is the General Electric version of Los Alamos National Laboratory code, MCNP4A – General Monte Carlo N-Particle Transport Code. MCNP01A is maintained though GE's Software Quality Management System and its validation and bias calculation are documented in GE internal reports.

MCNP01A has been compared to 22 critical experiments for different temperatures, moderator-to-fuel ratios and fissile materials (uranium and plutonium). The set of critical experiments chosen included metallic uranium, uranium oxide and mixed uranium-plutonium oxide fuels in single cell configurations, uranium and plutonium nitrate solutions in finite homogeneous configurations, a small core critical with BWR fuel bundles with and without borated poison curtains, and a set of small core criticals with BWR bundles, some of which contained burnable absorbers (Gadolinia).

The critical experiments to which MCNP01A has been compared are:

- Cross Section Evaluation Working Group (CSEWG) thermal reactor benchmark problems: TRX-1, TRX-2, ORNL-1, ORNL-2, PNL-1 and PNL-2;
- Babcock and Wilcox Small Lattice Facility;
- Small Core Criticals with and without Poison Curtains;
- Small Core Criticals with and without Burnable Absorbers

Fission products benchmarks were not available and thus were not included in the validation set.

NMP2-SRXB-RAI-6

What specific uncertainty components are covered by the "Uncertainties" in Table 2.8-12 of NEDC-33351 P, Rev. 0, "Safety Analysis Report for Nine Mile Point Nuclear Station, Unit 2 Constant Pressure Power Uprate?"

NMPNS Response

The following uncertainty components are covered by the "uncertainties" in Table 2.8-12 of NEDC-3335P:

	Uncertainty	Variation	Reactivity
1.	MCNP problem specific error	-	0.0006
2.	TGBLA06A cold eigenvalue uncertainty	-	0.0034
3.	MCNP critical benchmark bias uncertainty	-	0.0010
4.	B10 volumetric density	Minimum areal density	0.0056
5.	Boral thickness	10% reduction	0.0064
6.	Boral width	1/8 " reduction	0.0037
7.	Fuel enrichment	0.5% increase	0.0014
8.	Stainless steel box thickness	0.006" increase	0.0009
9.	Cold water temperature	4°C	0.0013
10.	Eccentric loading	Moved to corner	(-0.0043)
11.	Non-channel fuel loading	No channel	(-0.0048)
12.	Lattice spacing	0.0625" decrease	0.0040
	Total		0.0109*

*Negative effects were not included in the roll-up, and are indicated parenthetically.

NMP2-SRXB-RAI-7

Describe your depletion uncertainty treatment approach.

NMPNS Response

TGBLA06A is the GE/GNF lattice design computer program for conventional BWRs. It was approved for use by the NRC in November of 1999 and is used to provide the incore bundle depletion characteristics. TGBLA is a static, multi-group, 2-dimensional, coupled transport-diffusion theory code that assumes infinite lattice behaviors. No depletion uncertainty was included in the GE Hitachi Nuclear Energy Americas, LLC (GEH) analysis as this was not a standard uncertainty component included in the analysis that was done in 2004.

Based on linear reactivity theory, the nominal reactivity decrease for a BWR lattice is 1% per GWd/ST of burnup. This nominal rate of reactivity change can be determined from the difference between the reactivity of the design basis lattice at beginning of life (BOL) without gadolinium and reactivity of the design basis lattice at the lattice average exposure determined from lattice average exposure at the peaking reactivity of the design basis lattice with gadolinium.

The peak reactivity for the NMP2 design basis lattice with gadolinium was determined to be at a lattice average exposure of 10 GWd/ST. Calculating the depletion uncertainty as 5% of the reactivity decrease from 0 to 10 GWd/ST will result in approximately 0.005. The maximum reactivity calculated in the NMP2 spent fuel analysis was 0.9413. Thus, including the depletion uncertainty in the maximum reactivity rollup will still result in a maximum reactivity below 0.95, and with sufficient margin.

NMP2-SRXB-RAI-8

For the tolerance analysis, what specific uncertainty components were considered? How were they varied? What was the total delta K associated with the tolerances?

NMPNS Response

The uncertainty components and variations are included in the response to NMP2-SRXB-RAI-6 above.

NMP2-SRXB-RAI-9

Table 2.8-12 of NEDC-33351 P includes the code bias. What other biases were considered (e.g., variation in fuel pool temperature, etc.)?

NMPNS Response

Only the Monte Carlo calculational bias was included in the bias shown in Table 2.8-12.

The maximum k-effective (k-eff) shown in Table 2.8-12 of NEDC-33351P is based on an infinite array of storage cells, loaded with the most reactive lattice analyzed, and did not incorporate any radial or axial leakage. This configuration bounded the accident conditions considered, which were:

- Lateral movement of a rack module (rack sliding)
- Misplacement of a fuel assembly
- Dropped assembly

Thus, no bias was added for these accidents conditions.

The fuel pool temperature effect was included in the uncertainty components (see response to NMP2-SRXB-RAI-8 above).

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RELATED TO REACTOR SYSTEMS AND THE NMP2 LOCA ANALYSES REGARDING LICENSE AMENDMENT REQUEST FOR EXTENDED POWER UPRATE OPERATION (NON-PROPRIETARY)

NMP2-LOCA-RAI-1

Please provide the limiting top skewed axial power shape for the limiting small break loss-of-coolant accident (SBLOCA) analyses evaluating the Appendix K conditions.

NMPNS Response:

This response provides the limiting power shapes for both large-break and small-break used in the EPU LOCA analyses.

[[

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The following pages contain the [[
]] axial power shapes.

[[

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[[

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NMP2-LOCA-RAI-2

Please provide the head vs. flow curves for all of the Emergency Core Cooling (ECC) injection pumps credited in the analyses.

NMPNS Response

The following pump flow vs. vessel to drywell differential pressure information was used to perform the GEH LOCA analysis using SAFER 4 approved methods for NMP2 EPU. Specific curves were not developed using this data.

Table 1. Low Pressure Core Injection (LPCI) Pump Characteristics Used in LOCA Analyses (One Pump)

Vessel to Drywell Pressure (psid)	Pump Flow into Vessel (gpm)
[[	
	]]

Table 2. Low Pressure Core Spray (LPCS) Pump Characteristics Used in LOCA Analyses (One Pump)

Vessel to Drywell Pressure (psid)	Pump Flow into Vessel (gpm)
[[	
	]]

Table 3. High Pressure Core Spray (HPCS) Pump Characteristics Used in LOCA Analyses

Vessel to Drywell Pressure (psid)	Pump Flow into Vessel (gpm)
[[	
	]]

ATTACHMENT 2

AFFIDAVIT FROM GE HITACHI NUCLEAR ENERGY AMERICAS, LLC JUSTIFYING WITHHOLDING PROPRIETARY INFORMATION

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, Edward D. Schrull, state as follows:

(1) I am the Vice President, Regulatory Affairs, Services Licensing, 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 GEH letter, GE-PPO-1GYEF-KG1-530, G. Carlisle, GEH, to T. Darling, Constellation Energy Nuclear Group, "NMP2 EPU Round 4 RAI Responses," dated May 21, 2010. The proprietary information in Enclosure 4, which is entitled, *GEH Responses to NMP2 NRC RAIs SRXB-2 through 9 Proprietary*, Enclosure 5, which is entitled *Top-skewed Axial Power Shape Proprietary*, and Enclosure 6, which is entitled *Pump Head vs. Flow Proprietary*, is identified by a dotted underline inside double square brackets, [[This sentence is an example.{3}]]. Figures and large equation 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 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 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 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 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 results of an analysis performed by GEH to support the Nine Mile Point-2 Extended Power Uprate (EPU) license application. This analysis is part of the GEH EPU methodology. Development of the EPU methodology and the supporting analysis techniques and information, and their application to the design, modification, and processes were achieved at a significant cost to GEH.

The development of the evaluation 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 21st day of May 2010.

Edward D. Schrull
Vice President, Regulatory Affairs
Services Licensing
GE-Hitachi Nuclear Energy Americas LLC
3901 Castle Hayne Rd.
Wilmington, NC 28401
edward.schrull@ge.com