



10 CFR 50.90

LR-N07-0123  
LCR H05-01, Rev. 1  
May 18, 2007

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

Hope Creek Generating Station  
Facility Operating License No. NPF-57  
NRC Docket No. 50-354

Subject: Response to Request for Additional Information  
Request for License Amendment - Extended Power Uprate

Reference: 1) Letter from George P. Barnes (PSEG Nuclear LLC) to USNRC,  
September 18, 2006  
2) Letter from USNRC to William Levis, PSEG Nuclear LLC,  
May 17, 2007

In Reference 1, PSEG Nuclear LLC (PSEG) requested an amendment to Facility Operating License NPF-57 and the Technical Specifications (TS) for the Hope Creek Generating Station (HCGS) to increase the maximum authorized power level to 3840 megawatts thermal (MWt).

In Reference 2, the NRC requested additional information concerning PSEG's request. Attachment 1 to this letter restates questions 3.66, 3.67, 13.18 and 13.19 and provides PSEG's responses. The responses to the remaining questions in Reference 2 are being provided in a separate transmittal.

PSEG has determined that the information contained in this letter and attachment does not alter the conclusions reached in the 10CFR50.92 no significant hazards analysis previously submitted.

There are no regulatory commitments contained within this letter.

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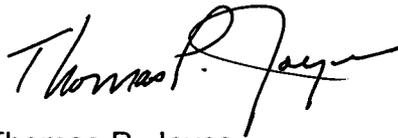
Attachment 1 contains information proprietary to General Electric Company (GE). GE requests that the proprietary information in Attachment 1 be withheld from public disclosure in accordance with 10 CFR 9.17(a)(4) and 2.390(a)(4). An affidavit supporting this request is included with Attachment 1. A non-proprietary version of PSEG's Attachment 1 responses is provided in Attachment 2.

Should you have any questions regarding this submittal, please contact Mr. Paul Duke at 856-339-1466.

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

Executed on 5/18/07  
(date)

Sincerely,



Thomas P. Joyce  
Site Vice President  
Salem Generating Station

Attachments (2)

1. Response to Request for Additional Information (proprietary)
2. Response to Request for Additional Information (non-proprietary)

cc: S. Collins, Regional Administrator – NRC Region I  
J. Shea, Project Manager - USNRC  
NRC Senior Resident Inspector - Hope Creek  
K. Tosch, Manager IV, NJBNE

## PROPRIETARY INFORMATION NOTICE

This enclosure contains proprietary information of the General Electric Company (GE) and is furnished in confidence solely for the purpose(s) stated in the transmittal letter. No other use, direct or indirect, of the document or the information it contains is authorized. Furnishing this enclosure does not convey any license, express or implied, to use any patented invention or, except as specified above, any proprietary information of GE disclosed herein or any right to publish or make copies of the enclosure without prior written permission of GE. The header of each page in this enclosure carries the notation "GE Proprietary Information."

The GE proprietary information is identified by [[dotted underline inside double square brackets<sup>(3)</sup>]]. The superscript notation<sup>(3)</sup> refer to Paragraph (3) of the affidavit provided, which provides the basis for the proprietary determination.

## General Electric Company

### AFFIDAVIT

I, **Bradley J Erbes**, state as follows:

- (1) I am Manager Services Engineering , General Electric Company ("GE") 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 GE's letter, GE-HCGS-EPU-674, Edward D. Schrull (GE) to Larry Curran (PSEG), *Transmittal - Response to Request for Additional Information (RAI) Regarding Amendment Application for Hope Creek Generating Station Extended Power Uprate - RAIs 3.67, 13.18, and 13.19*, GE Proprietary Information, dated May 18, 2007. The proprietary information in Enclosure 1, which is entitled, *GE Responses to NRC RAIs 3.67, 13.18, and 13.19*, is delineated by a [[dotted underline inside double square brackets.<sup>(3)</sup>]] Figures and large equation objects are identified with double square brackets before and after the object. In each case, the superscript notation<sup>(3)</sup> 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, GE 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 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 proprietary information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric 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 aspects of past, present, or future General Electric customer-funded development plans and programs, resulting in potential products to General Electric;
- d. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a., and (4)b, 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 GE, 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 GE, no public disclosure has been made, and it is not 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 proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as 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 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 GE is limited on 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, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE 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 agreements.
- (8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed results and conclusions from evaluations, utilizing analytical models and methods, including computer codes, which GE has developed, obtained NRC approval of, and applied to perform evaluations of transient and accident events in the GE Boiling Water Reactor ("BWR"). The development and approval of these system, component, and thermal hydraulic modes and computer codes were achieved at a significant cost to GE, on the order of several million dollars.

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

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE'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 GE.

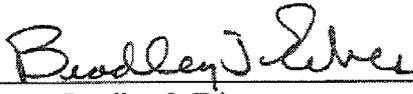
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE 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 GE 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 GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing 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 18th day of May 2007.

  
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Bradley J. Erbes  
General Electric Company

**Hope Creek Generating Station  
Facility Operating License NPF-57  
Docket No. 50-354**

**Extended Power Uprate**

**Response to Request for Additional Information**

In Reference 1, PSEG Nuclear LLC (PSEG) requested an amendment to Facility Operating License NPF-57 and the Technical Specifications (TS) for the Hope Creek Generating Station (HCGS) to increase the maximum authorized power level to 3840 megawatts thermal (MWt).

In Reference 2, the NRC requested additional information concerning PSEG's request. Questions 3.66, 3.67, 13.18 and 13.19 are restated below followed by PSEG's responses.

**3 Reactor Systems Branch (SRXB) (additional question)**

- 3.66 Please provide the evaluation models (computer codes and version) used for each transient and accident analyzed in the EPU application according to the order of Review Standard for EPU (RS001) Section 2.8.5. If multiple codes were used, please specify all the codes and version used for each event.

Response

Table 3.66-1 identifies the computer codes and version used for each transient and accident analyzed in the plant-specific Hope Creek EPU analyses described in the Hope Creek PUSAR, NEDC-33076P, Rev. 2, according to the order of Review Standard for EPU (RS001) Section 2.8.5. Multiple codes were identified as applicable. Codes and versions are not identified for areas of review that were assessed generically in approved licensing topical reports for extended power uprate.

Table 3.66-1

RS-001 Section	Section Title	Computer Code	Version
2.8.5.1	Decrease in Feedwater Temperature	PANACEA	11
2.8.5.1	Increase in Feedwater Flow	PANACEA ODYN ISCOR TASC	11 10 09 03A
2.8.5.1	Increase in Steam Flow, and Inadvertent Opening of a Main Steam Relief or Safety Valve	See Note 1	
2.8.5.2	Decrease in Heat Removal by the Secondary System		
2.8.5.2.1	Loss of External Load, Turbine Trip	PANACEA ODYN ISCOR TASC	11 10 09 03A
2.8.5.2.1	Steam Pressure Regulator Failure (Closed) (BWR6)	Not Applicable	
2.8.5.2.1	Loss of Condenser Vacuum	See Note 1	
2.8.5.2.1	Closure of Main Steam Isolation Valve	PANACEA ODYN	11 10
2.8.5.2.2	Loss of Nonemergency AC Power to the Station Auxiliaries	See Note 1	
2.8.5.2.3	Loss of Normal Feedwater Flow	SAFER	04
2.8.5.3	Decrease in Reactor Coolant System Flow		
2.8.5.3.1	Loss of Forced Reactor Coolant Flow	See Note 1	
2.8.5.3.2	Reactor Coolant Pump Rotor Seizure and Reactor Coolant Pump Shaft Break		
2.8.5.4	Reactivity and Power Distribution Anomalies		
2.8.5.4.1	Uncontrolled Control Rod Assembly Withdrawal from a Subcritical or Low Power Startup Condition	See Note 1	
2.8.5.4.2	Uncontrolled Control Rod Assembly Withdrawal at Power	PANACEA	11
2.8.5.4.3	Startup of an Inactive Loop or Recirculation Loop at an Incorrect Temperature	See Note 1	
2.8.5.4.3	Flow Controller Malfunction Causing an Increase in BWR Core Flow Rate	PANACEA ODYN ISCOR TASC	11 10 09 03A
2.8.5.4.4	Spectrum of Rod Drop Accidents	See Note 2	
2.8.5.5	Inadvertent Operation of ECCS or Malfunction that Increases Reactor Coolant Inventory	See Note 1	
2.8.5.6	Decrease in Reactor Coolant Inventory		
2.8.5.6.1	Inadvertent Opening of a Pressure Relief Valve	See Note 1	

<b>RS-001 Section</b>	<b>Section Title</b>	<b>Computer Code</b>	<b>Version</b>
2.8.5.6.2	Emergency Core Cooling System and Loss-of-Coolant Accidents	LAMB GESTR SAFER ISCOR TASC	08 08 04 09 03A
2.8.5.7	Anticipated Transients Without Scram	ODYN STEMP PANACEA ISCOR TASC SHEX	10 04 11 09 03A 05

**Note 1**

Plant-specific analyses not performed for power uprate consistent with the Hope Creek PUSAR, NEDC-33076P. Event dispositioned in accordance with the application of approved generic topical reports.

**Note 2**

Event dispositioned by confirmation of continued applicability of Banked Position Withdrawal Sequence. Computer codes not used for this confirmation.

- 3.67 Provide a demonstration analysis using the Statistical Method for Analysis of Anticipated Operational Occurrences (TRACG) to determine the Delta CPR/Initial CPR Vs. Oscillation Magnitude (DIVOM) slope based on a limiting SVEA 96+ legacy fuel bundle in order to demonstrate that any uncertainties in the void reactivity feedback for these legacy bundles would not impact the DIVOM curve determination for fuel Cycle 15.

Response

The Statistical Method for Analysis of Anticipated Operational Occurrences is not approved for use in the development of the Delta CPR over Initial CPR Versus Oscillation Magnitude (DIVOM) curve.

However, a TRACG analysis of an HCGS EPU cycle containing approximately 50% SVEA-96+ (twice burnt and thrice burnt assemblies) and 50% GE14 (fresh and once burnt assemblies) was performed and previously provided to the NRC as an EPU demonstration analysis in document NEDC-33186P, Revision 1, "MELLLA TRACG DIVOM Evaluation for Hope Creek at CPPU Conditions" (Accession No. ML053180370) (Reference 3). The rated power for this HCGS EPU cycle was 3840 MWt, which is 116.6% of Original Licensed Thermal Power (OLTP). The DIVOM slope determined in this analysis was [[ ]] based on the GE14 fuel being limiting for the EPU demonstration cycle. The radial peaking factor of the limiting GE14 bundle in the DIVOM analysis was [[ ]].

[[ ]] in radial peaking factor for control rod pattern variation during operation. The unadjusted radial peaking factor for GE14 fuel in this EPU demonstration cycle was [[ ]]. Results for SVEA-96+ (legacy) fuel were not reported in this analysis because the legacy fuel was not limiting for the purpose of determining DIVOM. The legacy fuel radial peaking factors for the limiting group were in the range of [[ ]]. Using information from this analysis, a DIVOM slope for the limiting SVEA 96+ legacy fuel bundles was estimated to be [[ ]]. This inherent difference between the resulting DIVOM slopes is sufficiently conservative to accommodate any uncertainty in the void reactivity feedback for these legacy bundles.

For the actual initial EPU cycle (fuel Cycle 15), the maximum steady state radial peaking factor for the twice-burnt and thrice-burnt SVEA-96+ legacy fuel assemblies has been determined to be [[ ]]. The maximum steady state radial peaking factor for the fresh, once burnt, and twice burnt GE14 fuel assemblies has been determined to be [[ ]]. Since the slope of the DIVOM curve is directly influenced by radial peaking factor, the GE14 fuel will be limiting and continue to be the prevalent factor for the determination of the Cycle 15 DIVOM. Similar to the EPU demonstration analysis provided, the uncertainty magnitude in the void reactivity feedback for the legacy fuel will have no significant impact on the determination of the limiting DIVOM slope for fuel Cycle 15.

**13) Containment and Ventilation Branch (SCVB) (additional question)**

13.18 Explain why the drywell head region [does not] have to be reanalyzed for subcompartment analyses?

Response

The drywell head region subcompartment analysis is based on mass and energy releases from a high-energy line containing saturated steam at the reactor vessel dome pressure. [[

]]; the mass and energy releases to the drywell head region are unchanged. The subcompartment analysis is therefore unchanged at EPU conditions.

13.19 Explain why the MELL[L]A 66% power/40% flow is the most limiting point on the power flow map for subcompartment analysis.

Response

The mass and energy releases for High Energy Line Breaks for the RWCU lines increase as a result of EPU, with the maximum increase in mass flow rates occurring at the 66% power/40% core flow condition.

[[

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The results show that:

- The mass flow increases are highest at the 66% power/40% flow condition, relative to the CLTP condition, for all four postulated RWCU line breaks (up to 35% increase).
- The energy release increases are highest at the 66% power/40% flow condition, relative to the CLTP condition, for three of four postulated RWCU line break locations (between 6% and 27% increase). These correspond to the Pump Suction, Pump Discharge, and Heat Exchanger Inlet thermal-hydraulic conditions. At the F/D Inlet, the CLTP remains bounding [[

]] the 66% power/40%

flow condition shows that the energy release decreases by approximately 7%.

As stated in PUSAR section 10.1, the Reactor Building (RB) subcompartment pressures and temperatures post-RWCU line break were determined at each break location at CPPU conditions. The resulting pressures and temperatures were found to be within current licensing values.

### **References**

1. PSEG letter LR-N06-0286, Request for License Amendment: Extended Power Uprate, September 18, 2006
2. NRC letter, Hope Creek Generating Station - Request for Additional Information Regarding Request for Extended Power Uprate (TAC NO. MD3002), May 14, 2007
3. NEDC-33186P, Revision 1, "MELLLA TRACG DIVOM Evaluation for Hope Creek at CPPU Conditions" (Accession No. ML053180370)