Entergy

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Jerry C. Roberts
Director
Nuclear Safety Assurance

GNRO-2002/00063

July 22, 2002

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
Supplement to Amendment Request,
Appendix K Measurement Uncertainty Recovery - Power Uprate
Request (TAC MB3972, GGNS LDC 2002-072)

REFERENCES:
1. Entergy letter dated January 31, 2002, Appendix K Measurement Uncertainty Recovery - Power Uprate Request
2. Entergy letter dated June 12, 2002, Appendix K Measurement Uncertainty Recovery - Power Uprate Request, Response to RAIs
3. Entergy letter dated June 25, 2002, Response to Requests for Additional Information, Part 2 - Appendix K Measurement Uncertainty Recovery - Power Uprate Request

Dear Sir or Madam:

By letter (Reference 1), Entergy Operations, Inc. (Entergy) proposed a change to the Grand Gulf Nuclear Station, Unit 1 (GGNS) Operating License and Technical Specifications to increase the licensed power level from 3,833 MWt to 3,898 MWt.

Entergy provided responses to questions concerning the proposed change in References 2 and 3. Additional staff questions were also raised in recent calls with members of your staff. As a result of these calls, four additional questions were determined to need formal response. Entergy's response is contained in Attachment 1.

Attachment 1 contains information considered proprietary to General Electric (GE) which is designated by a vertical bar in the left margin. It is requested that this proprietary information be withheld from public disclosure pursuant to 10 CFR 2.790. An affidavit signed by an officer of GE is included in Attachment 2. The affidavit references the letter from GE to Entergy, GE-ENTERGY-TPO-204, which transmitted the information and the affidavit. Therefore this letter is included in Attachment 2 for completeness. The letter also contains the address for GE. A non-proprietary version of the information is provided in Attachment 3.

A101

There are no technical changes to the original submittal proposed. The original no significant hazards considerations included in Reference 1 is not affected by any information contained in this supplemental letter. This letter contains one new commitment, which is provided in Attachment 4. In addition, one commitment has been revised as discussed in the response to Question 2 in Attachment 1.

If you have any questions or require additional information, please contact Jerry Burford at (601) 368-5755.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 22, 2002.

Sincerely,

JCR/RWB

Attachments:
1. Response to Requests for Additional Information (Proprietary Version)
2. Letter GE-ENTERGY-TPO-204 with GE Proprietary Affidavit
3. Response to Requests for Additional Information (Non-Proprietary Version)
4. List of Regulatory Commitments

cc: Mr. Ellis W. Merschoff
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-4005

U. S. Nuclear Regulatory Commission
ATTN: Mr. D. H. Jaffe NRR/DLPM
ATTN: FOR ADDRESSEE ONLY
ATTN: U.S. Postal Delivery Address Only
Mail Stop OWFN/7D1
Washington, DC 20555-0001

Mr. T. L. Hoeg, GGNS Senior Resident
Mr. D. E. Levanway (Wise Carter)
Mr. L. J. Smith (Wise Carter)
Mr. N. S. Reynolds
Mr. H. L. Thomas

Attachment 2

To

GNRO-2002/00063

Letter GE-ENTERGY-TPO-204 with
Affidavit for GE Proprietary Information

GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose CA 95125

July 19, 2002
GE-ENTERGY-TPO-204
DRF 0000-0004-0348

Action Requested by: N/A
Response to: Referenced email
Project Deliverable: N/A

cc: K. Cole
H. Hoang
M. Ball
G. Stramback

To: Jerry Burford (EOI)
From: Michael Dick
Author: Michael Lalor
Subject: **GGNS TPO - Response to NRC Action Item #3**

Reference: Email from G. Broadbent (EOI) to M. Ball (GE), "GGNS ATWS Telecon with the NRC," dated July 11, 2002

Per the referenced email, EOI requested that GE prepare a response to the subject action item. The response is attached.

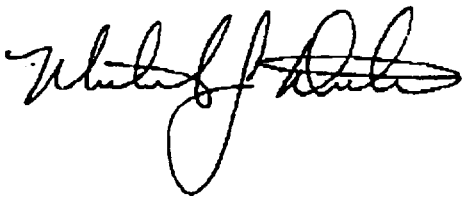
A draft of the attached has been reviewed and accepted by members of the your staff. The enclosed information has been verified. A signed copy of this letter, including the attachments, supporting information and evidence of verification, is included in DRF 0000-0004-0348. Please note that a portion of the suggested response identified by italic type is GGNS scope and has not been verified by GE. Additionally, GE has made changes to the second and third paragraph, but do not change the intent of that originally reviewed by your staff. GE has no further actions regarding the subject response.

This transmittal contains proprietary information as defined by 10CFR2.790, which is provided under the EOI/GE proprietary information agreement. GE customarily maintains this information in confidence and withholds it from public disclosure. The proprietary sidebar markings indicate the specific lines of information, which are considered proprietary. Additionally, a non-proprietary version of the responses is provided.

GE-Entergy TPO-204, Revision 0
July 19, 2002

The attached affidavit identifies that the designated information has been handled and classified as proprietary to GE. The designated information is suitable for review by the NRC when accompanied by the attached affidavit. GE hereby requests that the designated information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790 and 9.17.

If there are any questions in this matter, please contact the undersigned or Michael Lalor at 408-925-2443.



MJD
Attachment: Posted on ProjectNet

ATTACHMENT 1

GE-Entergy TPO-204, Revision 0

GE RESPONSES TO NRC ACTION ITEM #3

Redacted

NRC Action Item #3:

In response to questions 3a and 8 of Reference 3, it was noted that the ATWS containment analysis was performed at the CLTP of 3833 MW and that the impact of TPO on suppression pool temperature was less than 1 degree F. (a) Since the GE containment analysis considered a GE core, explain why the GE standard 'TPO impact' of 1-2 degrees F for the suppression pool is applicable to the GGNS mixed core. (b) Also, state whether the use of alternate rod insertion (ARI) is the licensed ATWS termination approach for GGNS and why this approach is conservative compared to crediting the Standby Liquid Control system.

GE Response to (b)

[GGNS Scope in italic text: On September 11, 1991, a GGNS submittal to increase the ATWS-RPT setpoint credited ARI for terminating the ATWS. Although previous GGNS analyses credited Standby Liquid Control (SLC) injection, credit of ARI in lieu of SLC led to more conservative (higher) suppression pool temperatures. This submittal did not request approval of ARI for ATWS termination and GGNS considers the SLC injection method to be the current licensed approach for ATWS termination.]

[Redacted]

This conclusion was confirmed with the generic BWR ATWS studies in NEDE-24222. The peak suppression pool temperature of the baseline BWR/6 plant (4146 MWt) was calculated in NEDE-24222 to be 170 degrees F using SLC injection. The increase in the ATWS-RPT setpoint increases the time of initiation of the SLC injection by a fraction of a second and the impact to the suppression pool temperature is less than 1 degree F. Therefore, the result in the submitted GGNS ATWS analysis (175.7 degree F) with a 10-minute delay of ARI bounds the SLC case.

The impact of the TPO power uprate on this GGNS ARI analysis is expected to be very small since the EOC-RPT in the evaluation happens immediately after the turbine trip. Afterward, the power/flow conditions are identical to that before TPO since the plant still operates at the same load line (MELLLA line). The only impact is the slight higher power before the core flow coastdown completes for the TPO conditions. Hence, the impact to the suppression pool temperature is approximately the same as that from the boron injection case, which the impact of TPO is also limited to the higher power level during the short period of time before the core flow coastdown is accomplished.

ATTACHMENT 3

GE-Entergy TPO-204, Revision 0

GE RESPONSES TO NRC ACTION ITEM #3

Proprietary Affidavit

General Electric Company

AFFIDAVIT

I, George B. Stramback, state as follows:

(1) I am Project Manager, Regulatory Services, 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 Attachment 2 to letter GE-ENTERGY-TPO-204, *GGNS TPO - Response to NRC Action Item #3*, dated July 19, 2002. The proprietary information in Attachment 2 (*GE-ENTERGY-TPO-204, Revision 0, GE Responses to NRC Action Item #3,* (GE Company Proprietary)), is identified by bars marked in the margin adjacent to the specific material.

(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), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions 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 cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. 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 both paragraphs (4)a. and (4)b., above.

(5) 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 further details regarding the GE proprietary report NEDC-33048P, *Safety Analysis Report for Grand Gulf Nuclear Station Units 1 and 2 Thermal Power Optimization,* Class III (GE Company Proprietary Information), dated January 2002, which contains detailed results of analytical models, methods and processes, 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 models and computer codes was 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 19th day of July 2002.

George B. Stramback

George B. Stramback
General Electric Company

Attachment 3

To

GNRO-2002/00063

Response to Requests for Additional Information
(Non-Proprietary Version)

Response to Request for Additional Information Related to Appendix K Measurement Uncertainty Recovery - Power Uprate

Question 1:

How is the operator made aware that the Leading Edge Flow Meter (LEFM) is out of service?

Response:

The LEFM status information is made available to the operator on computer displays in the Control Room. Operators will be required to check the LEFM status at least once every 12 hours. This will be administratively controlled by the Technical Requirements Manual. It is likely that operators would identify that the LEFM is unavailable sooner than the required check due to LEFM status messages that would be observed during routine computer monitoring. There is no immediate action to be taken in response to the LEFM being out of service (OOS) as the allowed outage time for the LEFM is 72 hours and the LEFM being OOS does not cause a change in core thermal power.

Question 2:

Which version of ANSI/ANS 3.5 is GGNS committing to use to implement simulator changes? The original application dated January 31, 2002 referenced the 1985 version and a supplemental letter dated June 25, 2002 referenced the 1998 version. Excerpts from the two letters are provided below.

ORIGINAL (dated 1/31/02)
Simulator changes and validation for the TPO uprate will be performed in accordance with **ANSI/ANS 3.5 1985**. (TSAR Section 10.6)

SUPPLEMENT (dated 6/25/02)
Simulator changes and validation are controlled in accordance with TQ-202, which references **ANSI/ANS 3.5-1998**. (note - TQ-202 was revised in March, 2002 to incorporate a newer version of the standard than that referenced in the TSAR.)

Response:

It was Entergy's intent to revise the commitment to reference the 1998 version of ANSI/ANS 3.5. The simulator configuration control procedure was written to the 1985 version of the standard when the amendment request was submitted (1/31/02). As noted in the supplement, the procedure was revised in March, 2002 to incorporate the 1998 version of the standard. Therefore, the commitment to perform simulator changes and validation in accordance with ANSI/ANS 3.5 1985 is revised to perform the changes and validation in accordance with ANSI/ANS 3.5 1998.

Question 3:

In response to questions 3a and 8 of Reference 3, it was noted that the Anticipated Transient Without Scram (ATWS) containment analysis was performed at the Current Licensed Thermal Power (CLTP) of 3833 MW and that the impact of Thermal Power Optimization (TPO) on suppression pool temperature was less than 1 degree F. (a) Since the GE containment analysis considered a GE core, explain why the GE standard 'TPO impact' of 1-2 degrees F for the suppression pool is applicable to the GGNS mixed core. (b) Also, state whether the use of alternate rod insertion (ARI) is the licensed ATWS termination approach for GGNS and why this approach is conservative compared to crediting the Standby Liquid Control system.

Response to 3(a)

Framatome explicitly evaluates the pressurization portion of the ATWS analysis. The limiting ATWS events have been analyzed at the TPO power level for GGNS Cycle 12 and concluded that there is 237 psi of margin to the acceptance limit. The analysis is performed using cycle specific core characteristics and NRC-approved methodology (COTRANSA2). The events evaluated for ATWS vessel pressurization are the MSIV closure and the Pressure Regulator Failure Open (PRFO) transients.

Framatome does not explicitly evaluate the ATWS containment analysis. However, based on the similar hydraulic and neutronic characteristics to the GE fuel, the impact of the Framatome fuel on the steam blowdown to the suppression pool during an ATWS is negligible when integrated over the duration of the ATWS analysis. The Framatome fuel is hydraulically compatible with the co-resident GE fuel. From a neutronic perspective, the Framatome fuel is sufficiently similar to the co-resident GE fuel so that differences in the void reactivity coefficients between the fuel types is not significant for the ATWS containment analysis.

To illustrate the small changes associated with the introduction of Framatome fuel, the ATWS peak vessel pressure changed by only 2 psi when going from a core that was 26% ATRIUM-10 (Cycle 12) to one that is 56% ATRIUM-10 (Cycle 13).

Response to 3(b)

On September 11, 1991, a GGNS submittal to increase the ATWS-RPT setpoint credited ARI for terminating the ATWS. Although previous GGNS analyses credited Standby Liquid Control (SLC) injection, credit of ARI in lieu of SLC led to more conservative (higher) suppression pool temperatures. This submittal did not request approval of ARI for ATWS termination and GGNS considers the SLC injection method to be the current licensed approach for ATWS termination.

[Redacted]

This conclusion was confirmed with the generic BWR ATWS studies in NEDE-24222. The peak suppression pool temperature of the baseline BWR/6 plant (~4146 MWt) was calculated in NEDE-24222 to be 170 degrees F using SLC injection. The increase in the ATWS-RPT setpoint increases the time of initiation of the SLC injection by a fraction of a second and the impact to the suppression pool temperature is less than 1 degree F. Therefore, the result in the submitted GGNS ATWS analysis (175.7 degrees F) with a 10-minute delay of ARI bounds the SLC case.

The impact of the TPO power uprate on this GGNS ARI analysis is expected to be very small since the EOC-RPT in the evaluation happens immediately after the turbine trip. Afterward, the power/flow conditions are identical to that before TPO since the plant still operates at the same load line (MELLLA line). The only impact is the slight higher power before the core flow coastdown completes for the TPO conditions. Hence, the impact to the suppression pool temperature is approximately the same as that from the boron injection case, which the impact of TPO is also limited to the higher power level during the short period of time before the core flow coastdown is accomplished..

Question 4:

Regarding the power/flow map, are the MELLA and 100% rodlines extended at the same slope to the new power level?

Response:

Yes. The minimum core flow at CLTP is 75%. The minimum core flow at TPO conditions is 77.1%. The MELLA and rodlines are extended, at the same slope, to the new power level.

Attachment 4

To

GNRO-2002/00063

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
Operators will be required to check the LEFM status at least once every 12 hours. This will be administratively controlled by the TRM.		X	Prior to use of the amendment