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MFN 04-060
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U.S Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20852-2738

Attention: Chief, Information Management Branch
Program Management
Policy Development and Analysis Staff

Subject: Revised Response to MELLLA Plus AOO & ATWS RAIs (TAC No. MB6157)

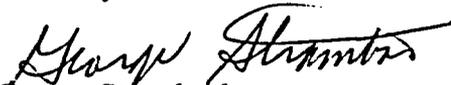
By References 1 and 2, GE provided responses to NRC requests for additional information (RAI) to support review of the Licensing Topical Report (LTR) NEDC-33006P, Revision 1, *General Electric Boiling Water Reactor Maximum Extended Load Line Limit Analysis Plus*. Based on subsequent conversations with the NRC, GE has revised four RAIs: AOO RAI 25, and ATWS RAIs I-2.3, I-3.3, and I-3.4.

A non-proprietary version of the revised RAI responses is provided in Enclosure 1. The revised responses containing the proprietary information, as defined by 10CFR2.390, are provided in Enclosure 2. GE customarily maintains this information in confidence and withholds it from public disclosure.

The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 2 has been handled and classified as proprietary to GE. GE hereby requests that the information of Enclosure 2 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

If you have any questions, please contact, Mike Lalor at (408) 925-2443 or myself.

Sincerely,


George Stramback
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Project No. 710

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References:

1. MFN 04-026, Letter from G. Stramback (GE) to NRC, March 4, 2004, *Completion of Responses to MELLLA Plus AOO RAIs (TAC No. MB6157)"*
2. MFN 04-027, Letter from G. Stramback (GE) to NRC, March 10, 2004, *Response to MELLLA Plus ATWS RAIs (TAC No. MB6157)"*

Enclosures:

1. Revised Response to NRC MELLLA+ RAIs -- Non-Proprietary Information .
2. Revised Response to NRC MELLLA+ RAIs -- Proprietary Information
3. Affidavit George B. Stramback, dated June 4, 2004

cc: MF Fields (NRC)
AB Wang (NRC)
JF Harrison (GE/Wilmington)
MA Lalor (GE/San Jose)
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eDRF 0000-0026-8532

ENCLOSURE 1

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Revised Response to NRC MELLLA+ RAIs

Redacted and Non-Proprietary Information

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Revised Response to AOO RAI 25

NRC RAI 25, Large Break ECCS-LOCA

- a. **Mixed Core.** For a plant-specific EPU/MELLLA+ application, state if equilibrium ECCS-LOCA analyses of each type would be performed or core configuration specific ECCS-LOCA analyses would be performed. If a core configuration specific ECCS-LOCA analyses will be performed, state which NRC-approved codes or methods would be used.
- b. **Reporting Limiting ECCS-LOCA Results.** The MELLLA+ audit indicated that the rated ECCS-LOCA results are reported although it may not be for the most limiting results. For the EPU/MELLLA+ operation, the most limiting ECCS-LOCA result is at the MELLLA+ statepoint of 55 percent CF. Revise the MELLLA+ LTR to state that the ECCS-LOCA result at rated condition, minimum core flow at EPU power level and at the 55 percent CF statepoint will be reported. In addition, revise the applicable documents that specify the GENE licensing methods to state that the ECCS-LOCA result corresponding to the rated and the most limiting statepoint will be provided. Report in the supplemental reload licensing report (SRLR), the ECCS-LOCA results at the rated and the most limiting statepoints. Confirm that the steady-state initial conditions (e.g., operating limit maximum critical power ratio [OLMCPR]) assumed in the ECCS-LOCA analyses will be reported in the SRLR.
- c. **Adder Approach.** Was the licensing bases PCT calculated by incorporating a delta PCT adder to the Appendix K PCT? If this is the method used, please justify why the 10 CFR 50.44 insignificant change criteria is acceptable.

GE Response

- a. The ECCS-LOCA analysis for EPU/MELLLA+ follows the approved SAFER/GESTR application methodology documented in NEDE-23785-1-PA Rev. 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-Of-Coolant Accident Volume III, SAFER/GESTR Application Methodology," October 1984. [[

]] The analytical models used to perform ECCS-LOCA analyses are also documented in NEDE-23785-1-PA together with NEDE-30996P-A, "SAFER Model for Evaluation of Loss-of-Coolant Accidents for Jet Pump and Non-jet Pump Plants, Volume I, SAFER – Long Term Inventory Model for BWR Loss-of-Coolant Analysis," October 1987, and NEDC-32950P, "Compilation of Improvements to GENE's SAFERECCS-LOCA Evaluation Model," January 2000.
- b. The MELLLA+ LTR will be revised to state that the MELLLA+ plant submittals will include calculations of the Appendix K and Nominal PCT at rated power/rated core flow, rated power/MELLLA+ boundary and the low flow point on the MELLLA plus boundary at which off rated thermal limits begin to apply (versus the 55% core flow point). [[

] The Licensing Basis PCT considering all calculated statepoints as described in 1) below will be reported in the plant-specific MELLLA+ Safety Analysis Report.

GE agrees to change the future SAFER/GESTR analyses and SRLRs as follows:

- 1) The SAFER/GESTR report will provide the Licensing Basis PCT considering all calculated statepoints. The Licensing Basis PCT will be calculated either using the previous Licensing Basis PCT plant variable uncertainty (e.g., NEDE-23875-1-PA, Section 3.1.3) or with a plant variable uncertainty specific to the calculated statepoint with the highest Appendix K PCT. Only one Licensing Basis PCT will be reported because it is the single PCT which considers all required licensing conservatism.
- 2) Only SRLRs, for both MELLLA+ plants and non-MELLLA+ plants, which report these future SAFER/GESTR analyses will report the Licensing Basis PCT considering all calculated statepoints as described in 1). No change will be made in SRLR reporting of previous SAFER/GESTR analyses.
- 3) Section 6 of NEDC-32950P will be revised to include determining the Licensing Basis PCT considering all calculated statepoints as described in 1). No other documents that specify the GENE licensing methods will be revised.

Operating Limit Minimum Critical Power Ratio

The Operating Limit Minimum Critical Power Ratio [OLMCPR]) assumed in the ECCS-LOCA analyses is reported in the SRLR.

- c. The 10 CFR 50.46 (a)(3)(i) change criterion does not apply to the MELLLA+ evaluation because the MELLLA plus evaluation is not a change to an acceptable evaluation model or error. The MELLLA+ ECCS performance evaluation demonstrates that plant operation in the MELLLA+ power/flow region meet the 10CFR50.46 acceptance criteria and is in compliance with NRC requirements for the SAFER/GESTR application methodology. These results are reported to the NRC in the plant-specific MELLLA+ licensing submittal.

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Revised Responses to ATWS RAIs I-2.3, I-3.3, and I-3.4

NRC RAI I-2.3

Justify why the sensitivity results, based on performance of GE fuel (up to GE14), form the bases for [[

]] Alternatively, state that the coolable geometry (e.g., PCT) and the 17 percent local cladding oxidation acceptance limit for the ATWS analyses would be demonstrated on a plant-specific basis, if another vendor's fuel, new GNF fuel, or mixed vendor cores are involved. In the latter case, revise the MLTR and include a specific applicability statement.

GE Response

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]] The operating conditions listed in RAI 2.20 response cover the range of ELLLA to MELLLA+ and 100% Original Licensed Thermal Power (OLTP) to 120% OLTP (EPU). The fuel types evaluated include GE9, GE13 and GE14. [[

]] PCT values during the ATWS events would meet the 2200°F limit and the oxidation would be insignificant.

However, GE will revise the M+ LTR to require the following plant- -specific ODYN ATWS calculations using the NRC approved methodology be presented in the M+SAR:

- The containment response (as measured by the suppression pool temperature) based on plant-specific parameters
- Fuel integrity (as measured by the PCT during the initial overpressure transient)

NRC RAI I-3.3

Provide the results of a set of TRACG calculations to evaluate the effect of the ODYN modeling limitations. Compare the TRACG results to the ODYN licensing calculation, including the PCTs. At a minimum, provide TRACG calculations based on limiting conditions that follow the EPGs (i.e., depressurization if HCTL is reached) at the three water level setpoints: TAF+5, TAF, and MSCWL and compare to the ODYN licensing methodology results.

GE Response

The dome pressure and integrated SRV flow comparisons between TRACG and ODYN are attached in Figures I-3.3-1 thru I-3.3-3. A PCT plot is also presented for the TRACG sensitivity study. The TRACG calculated integrated SRV flow during an isolation ATWS event with reactor depressurization is bounded by the ODYN integrated SRV flow without depressurization. This conclusion is valid for all three TRACG cases corresponding to the water level controlled at TAF+5, TAF and MSCWL. [[

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However, GE will revise the M+ LTR to require the following plant- -specific ODYN ATWS calculations using the NRC approved methodology be presented in the M+SAR:

- The containment response (as measured by the suppression pool temperature) based on plant-specific parameters
- Fuel integrity (as measured by the PCT during the initial overpressure transient)

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Figure I-3.3-1
Integrated SRV Flow

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Figure I-3.3-2
Dome Pressure

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Figure I-3.3-3
Peak Cladding Temperature

NRC RAI I-3.4

Based on the data provided above, demonstrate whether the approved ODYN ATWS methodology is conservative relative to TRACG analyses following the emergency operating procedures (EOPs). Compare the results of the ODYN and TRACG (at different water levels) in terms of meeting the ATWS acceptance criteria. Demonstrate that: (1) the TRACG sensitivity analyses and results are bounding or conservative for all the BWR fleet for EPU/MELLLA+ operating conditions, or (2) that the plant-specific ODYN analyses based on the TAF+5 water level strategy would bound the TRACG sensitivity analyses for all of the BWR fleet, or (3) propose a margin criteria for the ATWS acceptance criteria such that a TRACG analyses following the EOP would be performed for the plant-specific application if the margin criteria is not met.

GE Response

The ODYN code has been previously approved by the NRC to perform BWR overpressure licensing calculations independent of the TRACG evaluation (by NEDE-24154-P-A, "Licensing Topical Report, Qualification of the One-Dimensional Core Transient Model For Boiling Water Reactors Volume 3, Application of One-Dimensional Transient Model to Licensing Basis Transients," August 1986). Therefore, it is unnecessary to qualify the peak vessel pressure value from the ODYN code against that from the TRACG. Similarly, the ODYN/ISCOR/TASC methodology is independent of the TRACG evaluation.

Nevertheless, a comparison of the overpressure results under the same plant conditions is provided in RAI 3.3. The peak vessel pressure from ODYN calculation bounds those from the TRACG code. After the initial pressurization, the performance between ODYN and TRACG is similar. [[

]] These PCT values are comparable to the results from the ODYN/ISCOR/TASC methodology.

The integrated SRV flow from ODYN bounds those cases from TRACG assuming reactor depressurization. Therefore, the ODYN is conservative in predicting the suppression pool heatup in comparison with TRACG code. The qualification of ODYN for long-term calculation is still valid for MELLLA+ domain for all the water level control strategies.

It is concluded that the plant-specific ODYN analysis based on the TAF+5 water level strategy

would bound the TRACG analysis with or without depressurization, for the entire BWR fleet. However, GE will revise the M+ LTR to require the following plant-specific ODYN ATWS calculations using the NRC approved methodology be presented in the M+SAR:

- The containment response (as measured by the suppression pool temperature) based on plant-specific parameters
- Fuel integrity (as measured by the PCT during the initial overpressure transient)

ENCLOSURE 3

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AFFIDAVIT

General Electric Company

AFFIDAVIT

I, **George B. Stramback**, state as follows:

- (1) I am 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 Enclosure 2 to GE letter MFN 04-060, George Stramback to NRC, *Revised Response to MELLA Plus AOO & ATWS RAIs (TAC No. MB6157)*, dated June 4, 2004. The proprietary information is delineated by a double underline inside double square brackets. Figures and large equation objects 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, 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 of the safety-significant changes necessary to demonstrate the regulatory acceptability for the expended power/flow range of MELLLA+ for a GE BWR, 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 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.

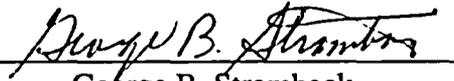
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

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 4th day of June 2004.


George B. Stramback
General Electric Company