

June 17, 2002

Mr. George Stramback
Regulatory Services Project Manager
GE Nuclear Energy
175 Curtner Ave
San Jose, CA 95125

SUBJECT: PLAN FOR ADDRESSING NRC SAFETY EVALUATION LIMITATIONS ON
NEDC-32983P, "GENERAL ELECTRIC METHODOLOGY TO REACTOR
PRESSURE VESSEL FAST NEUTRON FLUX EVALUATION" (TAC NO.
MB2774)

Dear Mr. Stramback:

By letter dated March 19, 2002, you provided the General Electric Nuclear Energy (GENE) plan for addressing NRC safety evaluation limitations on NECD-32983P, "General Electric Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluation." The NRC staff and GENE representatives met on February 11, 2002, to discuss the approach to be followed in the plan.

The NRC staff has evaluated the plan and the staff's response is enclosed. As stated in the enclosure, the staff found deficiencies in the plan and recommends steps to address them. We will delay placing the enclosure in the public document room for a period of 10 working days from the date of this letter to provide you with the opportunity to comment on the proprietary aspects only. If you believe that any information in the enclosure is proprietary, please identify such information line by line and define the basis pursuant to the criteria of 10 CFR 2.790.

If you have any questions, please contact Alan Wang, GENE Project Manager, at (301) 415-1445.

Sincerely,

/RA/

Alan Wang, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Project No. 710

Enclosure: Response to Plan

cc w/encl: See next page

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Project No. 710

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**RESPONSE TO THE GE NUCLEAR ENERGY PLAN FOR ADDRESSING NRC
SAFETY EVALUATION LIMITATIONS ON NEDC-32983P, "GENERAL ELECTRIC
METHODOLOGY FOR REACTOR PRESSURE VESSEL FAST
NEUTRON FLUX EVALUATION"**

The NRC staff issued a safety evaluation (SE) for the General Electric Nuclear Energy (GENE) Licensing Topical Report NEDC-32983P, "General Electric Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluations" (Reference 1). The staff's SE of NEDC-32983P included limitations requiring confirmatory dosimetry measurements and associated calculations for their removal. On February 11, 2002, the NRC and GENE staff met in NRC headquarters to discuss potential paths for the resolution of the NEDC-32983P limitations. In Reference 2, GENE requested a clarification of their understanding for several items discussed in the February 11 meeting and submitted a plan for the resolution and removal of the NEDC-32983P limitations.

By letter dated March 19, 2002, GENE requested the NRC staff to confirm that the following would resolve and remove the limitations for the use of NEDC-32983:

- (a) Plants with approved pressure-temperature (P-T) curves using the approved GENE methodology do not require resubmittal after three years.
- (b) Plants with current time limitations on their P-T curves can request a license amendment to remove such time limitations.
- (c) For the plan to be submitted by GENE, if the time required to remove the safety evaluation limitation is greater than three years, then the time required for the completion of the work will be negotiated with the NRC.
- (d) If the proposed additional confirmatory work reveals a substantial change in the bias term, plants would be required to review and address the potential effects on any licensing action.
- (e) GENE will perform confirmatory shroud calculations on existing dosimetry from shroud samples for comparison with the corresponding results of the methodology.
- (f) GENE's understanding is that the staff stated that the approved methodology is conservative when applied to shroud calculations.

The staff agrees with GENE on items (a), (b), (c), and (e) above. The staff however, disagrees with GENE on items (d) and (f).

Regarding item (d): There are two elements in this item: (1) the potential modification of the bias term, and (2) the impact on a plant's existing licensing actions. First the staff agrees that if the calculations "...reveal a substantial change in the bias term,..." then the required change should be evaluated and if necessary GENE must revise the methodology. Given that the credibility of the methodology is tied to the credibility of the data base, any revision of the methodology should arise from a corresponding revision of the data base. If four additional points make a difference in the data base (mean value and error band) beyond the estimated uncertainty, that would be an indication that the data base is not robust and should be revised

or reconsidered and licensing actions based on that methodology should be reexamined. The staff anticipates that GENE with the proposed work will establish the credibility of the data base

in order to continue the licensing status of NEDC-32983P. Second, if the methodology is changed, individual plants would need to decide on an appropriate course of action to assure that the licensing basis is accurate.

Regarding item (f): The staff reexamined the portion of the evaluation dealing with the shroud. The evaluation does not quantify the shroud conservatism. As recommended in the limitations section of the safety evaluation, GENE will make an effort to remove these limitations.

Proposed Plan for the Resolution of the Limitations

GENE proposed to measure four surveillance capsules (one each from BWR/6, /5, /4 and /3). Except for the BWR/6 which will be a "blind" test of the remaining three capsules that exist and have been measured for dosimetry. GENE will: (1) provide to the staff the calculated values of the dosimeter activations for the BWR/6 capsule, (2) provide comparisons of the calculated and measured dosimetry values for all surveillance capsules, and (3) provide an analysis and conclusions regarding the methodology and the possible need to revise the bias factor.

However, the three measured capsules do not serve the purpose as originally intended, that is to demonstrate the adequacy of the data base through a blind test in an unambiguous and clear manner. The staff is considering conducting of an audit of the analysis, the associated dosimetry measurements and the quality assurance records for compliance to the quality assurance criteria of 10 CFR Part 50, Appendix B. GENE should facilitate such an audit.

Shroud Fluence

The staff finds that GENE's request to use the NUREG-6115 benchmark problem (in the mix of the test data) is not acceptable. The benchmark is a purely arithmetic exercise and is not based on a measurement nor does it represent a real reactor. Therefore, GENE should make an effort to increase the number of actual measurements from two to a statistically significant number.

Summary

In summary, the staff agrees to: (1) use the four capsules (one future and three existing) for the removal of the vessel fluence limitation and intends to perform an audit of the dosimetry, analyses and quality assurance, (2) use the existing two shroud scrapings (and possibly increase the number of samples) to remove the limitation from the shroud, and (3) complete this work within three years from the date of NEDC-32983P publication (i.e., on or before September 2004).

References

1. Letter, from S.A. Richards US NRC to J.F. Klapproth GE Nuclear Energy, "Safety Evaluation for NEDC-32983P, General Electric Methodology for Reactor Pressure Vessel Fast Neutron Evaluation," dated September 14, 2002.
2. Letter, from G. Stramback, GE Nuclear Energy, to US NRC, "Plan for Addressing NRC SER Limitations on NEDC-32983P," dated March 19, 2002.