

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

August 7, 2002

SUBJECT: PLAN FOR ADDRESSING NRC SAFETY EVALUATION LIMITATIONS ON  
NEDC-32983P, "GENERAL ELECTRIC METHODOLOGY FOR REACTOR  
PRESSURE VESSEL FAST NEUTRON FLUX EVALUATION" (TAC NO.  
MB4611)

Dear Mr. Stramback:

By letter dated March 19, 2002, you provided the GE Nuclear Energy (GENE) plan for addressing NRC safety evaluation limitations on NEDC-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 had delayed placing the enclosure in the public document room to provide you with the opportunity to comment on the proprietary aspects only. By letter dated July 15, 2002, you provided the staff comments, which if made to the response would make the staff response non-proprietary. We have reviewed those comments and agree that the intent of our response is maintained by these changes. Therefore, we have modified our response and enclosed is a non-proprietary version.

If you have any questions, please contact me 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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GE Nuclear Energy

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 GE 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-32983P:

- (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 with the above proposed work by GENE 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 surveillance capsules. GENE will: (1) provide to the staff the calculated values of the dosimeter activations, (2) provide comparisons of the calculated and measured dosimetry values for all surveillance capsules, and (3) provide an analysis and conclusion regarding the methodology and the possible need to revise the bias factor.

The staff is considering conducting 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 to a statistically significant number.

#### Summary

In summary, the staff agrees to: (1) use the capsules for the removal of the vessel fluence limitation and intends to perform an audit of the dosimetry, analyses and quality assurance, (2) use the shroud 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.