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NUCLEAR ENERGY BUSINESS OPERATIONS

GENERAL ELECTRIC COMPANY . 175 CURTNER AVENUE . SAN JOSE CALIFORN 22 12 48:43

April 17 1986 MFN-030-086

U. S. Nuclear Regulatory Commission Rules and Procedures Branch Division of Rules and Records Office of Administration Washington, D. C. 20555

Gentlemen:

BKG-4/22/86

COMMENTS ON REV. 2 OF RG 1.99 SUBJECT:

General Electric Company has reviewed the proposed Revision 2 to Regulatory Guide 1.99 "Radiation Damage to Reactor Vessel Materials" and requests your consideration resolution of the comments provided.

Although the stated intention for the proposed Revision 2 to Regulatory Guide 1.99 is to upgrade the procedures for calculating radiation damage to reactor vessel materials in a light water reactor, the proposed change was clearly influenced by the pressurized thermal shock rule affecting pressurized water reactors (PWR). Because of the overwhelming amount of PWR fluence data in the data base, the proposed Revision 2 provides more realistic procedures for PWRs (characterized by high neutron fluence). However, it increases the calculated adjustments in reference temperatures for the boiling water reactor (BWR), which operate at much lower fluence levels than PWRs, with little data to support such a significant increase.

The application of Revision 2 for BWR operating conditions poses no problems since the BWR follows the saturation curve and operates at temperatures well in excess of the minimum required following the Revision 2 guidelines. However, severe BWR operational hardships arise for hydrostatic pressure tests since temperatures calculated with Revision 2, rather than Revision 1 guidelines, will be shifted as much as 100°F or 125% more for limiting beltline materials.

General Electric agrees with the need to provide sufficient margin against brittle fracture of the reactor vessel. However, General Electric believes that since the hydrotest is performed with the core subcritical, there is more than sufficient safety margin in current practice, and the use of Revision 2 only results in excessive conservatism and operational hardship. Modification of analysis techniques applicable only to the hydrotest condition would alleviate BWR operational hardships while maintaining sufficient plant safety margin.

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General Electric has performed a technical evaluation of the impact of Revision 2 on the BWR for the BWR Owners' Group and has documented its findings in NEDC-31140, "BWR Owners' Group Evaluation of Regulatory Guide 1.99, Revision 2 impact on BWRs", dated January 1986 and submitted to the Commission in March 1986. Our conclusion was that the combined effect of the inherent safety margins is such that the current ASME Code Appendix G procedures provide operating limits with a safety factor of 4 or more against initiation of a brittle fracture even with a large quarter thickness postulated flaw. General Electric believes that there is extra margin which could be reduced for only the hydrotest operating limits in order to alleviate unnecessary operational hardships.

The proposed modification to relieve the operational hardship uses the crack initiation toughness (K_{TC}) to determine the required temperature for pressure tests alone when the core is not critical. All other criteria, e.g., flaw size and margins on stress, would remain unchanged. Because of more limiting locations in the flange and nozzle areas, it is expected that the proposed modification would not reduce overall safety margins. Furthermore, the inherent safety margin in the proposed modification is well in excess of that accepted by the NRC and the ASME Code for the overpressure and overcooling transients in PWRs. Also, the available material toughness under the proposed modification exceeds the upper shelf value deemed acceptable in the NRC resolution of the Task A-11 reactor vessel materials toughness safety issue (NUREG-0744). Thus, the proposed change maintains required safety margins, relieves operational hardships and does not create new precedents. We, therefore, believe that the proposed modification should be approved concurrent with the implementation of Revision 2 of the Regulatory Guide.

General Electric, representing either its Nuclear Energy Business Operations or through its support of the BWR Owners' Group activity, would welcome the opportunity to discuss these concerns with the Commission and assist in achieving a satisfactory solution to this issue.

If there are any questions relative to these comments, please contact G. B. Stramback of my staff at (408) 925-1913.

Very truly yours,

Glenn G! Sherwood, Manager Safety & Licensing

GGS/dc

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