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NUCLEAR POWER

SYSTEMS DIVISION

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September 14, 1981

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: L. S. Rubenstein, Assistant Director for Reactor Systems
Division of System Integration

Gentlemen:

SUBJECT: GENERAL ELECTRIC ANALYTICAL MODEL FOR CALCULATION OF LOCAL OXIDATION IN LOCA ANALYSIS

Reference:
1) Letter from R. H. Buchholz (GE) to L. S. Rubenstein (NRC), "General Electric Fuel Clad Swelling and Rupture Model," May 15, 1981
2) Letter from G. G. Sherwood to L. S. Rubenstein (NRC), "Impact of Large Rupture Strains on BWR LOCA Analysis," August 14, 1981
3) "General Electric Company Analytical Model for Loss of Coolant Analysis in Accordance with 10CFR50, Appendix K, Volume 1," NEDE-20566-P, November 1975

This letter discusses the current method used to calculate the local oxidation fraction in General Electric's LOCA heatup code (CHASTE). This additional information supports previous submittals (References 1 and 2) and completes General Electric's commitments on this issue.

Concern had been expressed that use of a bundle planar averaged strain value to determine the maximum local oxidation would produce non-conservative results. In the General Electric heatup model, planar averaged strains are only used in determining the peak cladding temperature (PCT). The maximum local oxidation is conservatively determined using a higher value of cladding strain following perforation. Details and justification for the current General Electric oxidation model and calculation are documented in the GE LOCA analysis model description (Response 23 of Section I.B.6 of Reference 3).

Licensing calculations using the current GE oxidation model typically result in a maximum oxidation fraction of 0.08 for perforated rods which is substantially below the Appendix K limit of 0.17. A change in

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the perforation strain will result in a small change in the calculated maximum oxidation. This is because the higher strain results in lower calculated temperatures which offsets any increase in oxidation fraction from using a higher strain.

This letter in combination with Reference 1 and 2 letters completes all of General Electric's commitments necessary to close this issue. If you have any questions related to the information presented, please contact D. K. Dennison of my staff at (408) 925-3302.

Very truly yours,

J. F. Quirk

J. F. Quirk, Manager
BWR Systems Licensing
Nuclear Safety Licensing Operation

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