MAR 17 1978

MEMORANDUM FOR: G. Lear, Chief, Operating Reactors Branch 4
Division of Operating Reactors

FROM: L. C. Shao, Chief, Engineering Branch, Division of Operating Reactors

SUBJECT: OCONEE, UNIT 1 - PRESSURE-TEMPERATURE OPERATING LIMITS (TAC 7375)

Plant Name: Oconee, Unit 1
NSSS Vendor: Babcock and Wilcox
Docket Number: 50-269 ✓
Operating Reactors Branch and Project Manager: ORB-4, M. Fairtile
Operational Technology Branch Involved: Engineering Branch
Description of Task: Review Change to Pressure-Temperature Operating Limits
Due Date: April 14, 1978
Review Status: Complete

In letter dated February 21, 1978, Duke Power Company submitted a proposed amendment to Technical Specification 3.1.2 for Oconee, Unit 1 regarding pressure-temperature operating limits. The new limits were proposed for operation through 8 EFPY. They were based on the results of tests on Capsule OCI-E specimens recently removed from Oconee, Unit 1. These test results are reported in BAW-1436, September 1977. Copies of this report were enclosed for NRC review.

We have reviewed the BAW-1436 report. Data shows that weld metal is the limiting material. The weld metal in Capsule OCI-E is identified as Procedure Qualification (PQ) number WF-112. At a fluence of 1.5×10^{18} m/cm^2 it showed an increase in RT_{NDT} of 124°F. This report also includes fluence calculations based on data from dosimeters removed from the reactor vessel with Capsule OCI-E. The maximum fluence (E > 1 mev) on the vessel wall at 1/4T location after 10 EFPY is calculated to be 3.2×10^{18} m/cm^2. From our review we conclude that the mechanical properties data and the fluence values reported are valid.

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In letter dated August 31, 1977, Duke Power Company submitted information to NRC on Oconee 1 reactor vessel materials. This letter lists six different weld metals in the vessel beltline region; WF-25, SA-1073, SA-1135, SA-1229, SA-1430, SA-1493 and SA-1585. All of these welds are estimated to receive the maximum fluence on the vessel wall. Also, we note that the surveillance weld, WF-112, is not identical to any of these welds; i.e., it was not made from the same weld wire and flux. Therefore, we feel that the upper limit damage predictions of Regulatory Guide 1.99, Revision 1 should be used to establish the changes in RT_{NDT} used in calculating the pressure-temperature operating limits. The operating limits submitted by Duke Power Company are calculated for an RT_{NDT} of 165°F at the end of the operating period. Using the Regulatory Guide to predict radiation damage and assuming an initial RT_{NDT} of 20°F, we calculate that RT_{NDT} will be 165°F at a fluence of 1.9×10^{18} n/cm^2. The reactor vessel wall at ¼ T location is expected to reach this fluence level in 6 EFPY.

From our review we conclude that the proposed pressure-temperature operating limits and changes to Technical Specification 3.1.2 are acceptable through only 6 EFPY instead of 8 EFPY proposed by Duke Power Company. For this operating period the proposed pressure-temperature operating limits are in accordance with Appendix G, 10 CFR Part 50. Compliance with Appendix G in establishing safe operating limitations will ensure adequate safety margins during operation, testing, maintenance and postulated accident conditions and constitute an acceptable basis for satisfying the requirements of NRC General Design Criterion 31, Appendix A, 10 CFR Part 50.

L. C. Shao, Chief
Engineering Branch
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cc: V. Stello
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