UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REACTOR PRESSURE VESSEL STRUCTURAL INTEGRITY

COMMONWEALTH EDISON COMPANY

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

In letter dated December 6, 1994, the Commonwealth Edison Company (ComEd) submitted for staff review and approval, its assessment of the plant-specific applicability of General Electric Company's (GE) topical report, NEDO-32205-A, Revision 1, "10 CFR 50, Appendix G, Equivalent Margin Analysis for Low Upper Shelf Energy in BWR/2 Through BWR/6 Vessels," to its Dresden Nuclear Power Station, Units 2 and 3, reactor vessels. As part of the submittal, the licensee provided plant-specific worksheets to demonstrate that the reactor vessel materials of all three plants are bounded by the analysis provided in the GE topical report.

Appendix G to 10 CFR Part 50, requires that reactor vessel beltline material must maintain an upper-shelf energy (USE) of no less than 50 ft-lb, unless it is demonstrated in a manner approved by the Director, Office of Nuclear Reactor Regulation (NRC), that lower values of USE will provide margins of safety against fracture equivalent to those required by Appendix G of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. ASME Code Case N-512 and Appendix K contain analytic procedures and acceptance criteria for demonstrating that reactor vessel beltline materials with low Charpy USE will have margins of safety against fracture equivalent to Appendix G of the ASME Code.

In a letter from J.T. Wiggins (USNRC), to L.A. England, dated December 9, 1993, the staff reviewed the GE topical report NEDO-32205-A, Revision 1. The staff concluded that the reactor pressure vessels of the participating utilities should have margins of safety against ductile failure in low USE plates and welds until the end of their licenses (32 effective full-power years) for level A, B, C, and D conditions, and meet the criteria of ASME Code Case N-512 and Appendix K. Individual licensees that reference the topical report as the basis for addressing the USE requirements of 10 CFR Part 50, Appendix G, were requested to confirm the plant-specific applicability of the report by comparing the predicted percentage decrease in the USE to the allowable decrease in the USE from the topical report.

ENCLOSURE

2.0 EVALUATION

Methods acceptable to the staff for determining the percentage decrease in USE are documented in Regulatory Guide (RG) 1.99, Revision 2. Figure 2 in the RG indicates that the percentage decrease in USE increases with increasing amounts of copper and neutron fluence. However, the percent decrease in USE could be affected by surveillance test results. If surveillance data indicate that the percent decrease in USE is greater than the amount predicted by Figure 2 in this RG, the percent decrease in USE for the material must be increased. If surveillance data indicate that the percent decrease in USE is less than the amount predicted by Figure 2 in the RG, the percent decrease in USE for the material may be decreased from the amount predicted by Figure 2.

As a result of the information provided by the licensee in their responses to information requested in Generic Letter (GL) 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)," the staff has determined that insufficient information existed for beltline materials of the Dresden, Units 2 and 3, reactor vessels to determine that they will have USE greater than 50 ft-lb at expiration of their licenses. The licensee reported that the percent decreases in USE of the surveillance materials for Dresden, Units 2 and 3, are less than those obtained by using Figure 2 in the RG. The staff concluded that the applicability requirements of NEDO-32205-A have been satisfied, and the conclusions of the topical report are applicable to the Dresden, Units 2 and 3, reactor vessels.

3.0 CONCLUSIONS

1. Since the projected decreases in USE for the beltline materials are less than the allowable decrease in USE from the topical report, the conclusions of the topical report are applicable to the Dresden, Units 2 and 3, reactor vessels.

2. The Dresden, Units 2 and 3, reactor vessels satisfy the criteria in ASME Code Case N-512 and Appendix K, and, therefore, will have margins of safety against fracture equivalent to those required by Appendix G of the ASME Code at the expiration of their licenses.

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Date: February 3, 1995