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September 26, 1989

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Supplemental Response to
NRC Bulletin 80-11
NRC Docket Nos. 50-237 and 50-249

- References:
- (a) IE Bulletin 80-11, dated May 8, 1980.
 - (b) J. Wojnarowski (CECo) letter to H. Denton (NRC), dated October 6, 1986.
 - (c) J. Zwolinski (NRC) letter to D. Farrar (CECo), dated December 4, 1986.
 - (d) B. Siegel (NRC) letter to T. Kovach (CECo), dated July 20, 1989.

Dear Dr. Murley:

Reference (a) requested licensees to perform a re-evaluation of the design adequacy of safety-related masonry walls under postulated loads. In Reference (b), Commonwealth Edison (Edison) submitted documentation supporting the use of the leak-before-break concept for establishing the acceptability of the masonry walls associated with the Reactor Water Cleanup System (RWCS) for Dresden Station Units 2 and 3. With Reference (c), the NRC staff issued a safety evaluation for Dresden Station Units 2 and 3. However, the safety evaluation indicated that the concept of leak-before-break was under review as a broad-scope rulemaking issue, and that the adequacy of its application to the RWCS piping would be addressed at a later date. Recently, the NRC informed Edison, in Reference (d), that the leak-before-break approach was not acceptable for the RWCS piping at Dresden Station since the piping material was subject to an active degradation mechanism (intergranular stress corrosion cracking). Additionally, the NRC requested Edison to submit proposed actions which would resolve the staff's concerns with the masonry wall design for Dresden Station. This letter presents the status of Edison's actions in response to that request.

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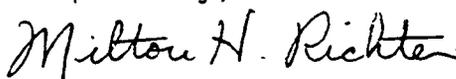
Edison does not believe that full area breaks could realistically occur in the RWCS piping as a result of intergranular stress corrosion cracking. This opinion is based in part on the fact that the stainless steel piping in this system is a highly ductile, fracture-resistant material. Additionally, this opinion is based on nuclear industry experience, which has shown that stainless steel piping with potentially-susceptible materials has not experienced full area breaks, although cracks, and occasional leakage, have occurred. Edison believes this to be the case because variations in the residual stress patterns around the piping circumference in small diameter stainless steel piping would tend to create through-wall crack sites, rather than propagate to larger critical cracks. For these reasons Edison believes that the characteristics of potential flaws in the RWCS piping are such that, while cracks leading to through-wall leakage might occur, full area breaks in the piping should not be considered for evaluating the capability of masonry walls.

As documented in Reference (b), a fracture mechanics analysis of the RWCS piping was performed to determine whether a circumferential through-wall crack would leak before breaking. Two cases were considered: 1) failure by tearing instability due to the membrane stress and fixed-end rotations, and 2) failure by the membrane stresses acting on a large circumferential through-wall defect. For the first case, failure was not considered possible because the critical length-to-radius (L/R) ratios were larger than the largest actual L/R ratio for the piping under consideration. For the second case, the calculated leak rates for critical circumferential crack sizes were much larger than the leak rates which would activate the room temperature sensors. Therefore, it was demonstrated that long before circumferential cracks would reach the critical size, the room temperature sensors would alert the plant operators to isolate the RWCS.

At this time, Edison is performing a study to evaluate the feasibility of demonstrating that masonry walls can withstand the consequences of postulated RWCS full area breaks, and expects to have the initial phase of this study completed by November 30, 1989. Edison will submit proposed actions at that time. In the interim, Edison believes, for the reasons stated above, that full area breaks in this piping are not credible, that the existing leak detection system provides a substantial level of protection (should leakage cracks occur), and that the design of the masonry walls in the vicinity of the RWCS piping is therefore adequate for the intended safety function.

Please direct any questions that you may have on this response to this office.

Respectfully,



M.H. Richter
Generic Issues Administrator

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cc: A.B. Davis

Resident Inspector - Dresden Station