



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

PDR

July 30, 1993

Docket Nos. 50-237, 50-249
and 50-254, 50-265

MEMORANDUM FOR: Thomas O. Martin, Acting Director
Division of Reactor Safety
Region III

FROM: John A. Zwolinski, Assistant Director
for Region III Reactors
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

SUBJECT: RESOLUTION OF REQUEST FOR TECHNICAL ASSISTANCE (TASK
INTERFACE AGREEMENT) ISOLATION OF THE ECCS PUMP ROOM COOLERS
(AITS 91-0523) (TAC NOS. M81264, M81265, M82692, AND M82693)

By letter dated October 18, 1991, Region III requested that the Office of Nuclear Reactor Regulation assess the operability of emergency core cooling system (ECCS) equipment without the room cooler heat removal capability at the Dresden and Quad Cities stations. Commonwealth Edison Company (CECo, the licensee) isolated flow of Diesel Generator Cooling Water (DGCW) to the ECCS pump room coolers at Dresden Station following on-site review of a study providing technical justification for this action. The purpose of the action taken at Dresden Station was to prevent marginal-flow cooling to the diesel generators. A similar study and on-site review concluded that certain ECCS pump room coolers were no longer required as attendant equipment at the Quad Cities Station. The purpose of the action at Quad Cities Station was to improve ECCS availability due to past failures of the ECCS pump room coolers. Both facilities perform the evaluations subject to the requirement of 10 CFR 50.59.

The staff reviewed the licensee's evaluation of HPCI pump room and reactor building corner room transient temperature response to a LOCA at Dresden Station without room cooling, documented in RSA-D-90-01, "ECCS Pump Room Transient Response to Loss of Room Cooler for Dresden Units 2 and 3," Revision 0, and the associated on-site review report 90-23, Revision 1. Enclosed is the NRR Staff Evaluation. In the licensee's analysis, the staff identified numerous deficiencies including: inadequate justification of the lumped parameter model used in the analysis, failure to evaluate the impact of an uneven temperature distribution on the conclusion of the analysis, inadequate justification of heat transfer parameters used in the analysis, incomplete evaluation of the effects of the failure of unqualified support equipment, and incomplete evaluation of the effects of heat transfer from the ECCS pump rooms to adjacent compartments.

The staff subsequently reviewed RSA-D-92-06, "HPCI Room Thermal Response With Loss of HPCI Room Cooler at Dresden Station," Revision 0, and RSA-D-92-07, "LPCI Room Thermal Response due to Loss of Room Cooler at Dresden Station,"

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Revision 0, which superseded previous evaluations of ECCS operability without room cooler heat removal capability for Dresden Station. Based on our review of these studies, we concluded that the NRR staff's concerns with regard to the earlier analysis were adequately addressed and that acceptable assumptions and methodologies were employed in the subsequent analyses. The licensee performed an evaluation of the equipment located within the affected areas to ensure that equipment which is within the scope of 10 CFR 50.49 is qualified in accordance with the requirements of 10 CFR 50.49 for the higher operating temperatures expected following a LOCA without room cooling, and that all other safety-related equipment will perform the required safety functions at the elevated temperatures indicated by the analyses. Therefore, the staff concludes that equipment important to safety located in the ECCS pump rooms is capable of performing its design function post-LOCA without room cooling.

The licensee indicated that similar engineering evaluations for Quad Cities Station would be performed. Due to the physical similarities of the ECCS pump rooms at Dresden and Quad Cities Stations, the staff considers analytical methods found to be acceptable for use at Dresden to also be acceptable for use in analyses for Quad Cities.

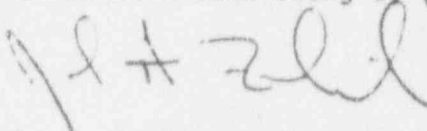
Due to the amount and importance of equipment affected by increased temperatures following a LOCA without room cooling, we recommend a spot inspection of the licensee's equipment qualification review to verify that safety-related equipment will perform the required safety functions at elevated temperatures. Components of particular concern to the NRR staff include: LPCI and LPCS pump motors (bearings and windings), HPCI isolation temperature switches, HPCI system instrumentation located in the LPCI/LPCS corner rooms, and reactor building switchgear exposed to temperatures above 130°F due to the natural circulation air flow from the corner rooms during LPCI/LPCS pump operation. We also recommend a review of the licensee's administrative controls to ensure that procedures are in place which address instances when assumptions used in the analyses are not met, such as: an inoperable HPCI room cooler fan, a blockage of openings necessary for natural circulation cooling of the LPCI/LPCS corner room, a room temperature above the initial temperature assumed in the analysis, or steam leakage greater than that assumed in the HPCI room analysis.

Steam piping identified within the ECCS pump rooms which is not qualified to seismic Category I standards should be evaluated using the guidance contained in the memorandum responding to a Region III request for technical assistance regarding rooms containing heating steam piping at Kewaunee, dated April 1, 1993. That is, if equipment in the ECCS pump rooms containing unqualified steam piping is required to function during or following a safe shutdown earthquake (SSE), this equipment must be shown to remain functional following a steam pipe break in accordance with the requirements of 10 CFR 50.49. This evaluation should consider failure of the room coolers since they are normally only supplied by the normal service water (NSW) system, which is also not qualified to seismic Category I standards.

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Having addressed the initial safety concern by concluding that the room coolers are not required for Dresden or Quad Cities following a loss of coolant accident, the staff is concerned that this appears to be another example of the licensee taking a non-conservative approach to solving a problem. The problem is the lack of adequate margin in the DGCW system to assure proper cooling of all loads. Instead of engineering a reasonable modification to increase DGCW system capacity, the licensee has chosen to intentionally isolate the HPCI room coolers at Dresden and demonstrate through costly analyses, that the reliability of the HPCI system will not be affected. While the staff was able to agree with the licensee's analysis after several iterations, their approach does not provide evidence of aggressive engineering efforts to "do the right thing" in assuring safety is of highest importance. This appears to be another example of engineering management, in 1990 at Dresden, not displaying a safety philosophy the Agency expects when evaluating a proposed plant modification.

This completes our review of the subject TIA (AIT 91-0523). If you have questions regarding our response, please contact John Stang at (301) 504-1345.



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Enclosure:
Evaluation

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