

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR PEACTOR REGULATION SUPPORTING AMENDMENT NO. 119 TO FACILITY OPERATING LICENSE NO. DPR-29 AND AMENDMENT NO. 115 TO FACILITY OPERATING LICENSE NO. DPR-30

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 265

1.0 INTRODUCTION

On Friday, March 10, 1989, excessive ground water leakage was observed in the tunnel which accesses the High Pressure Coolant Injection (HPCI) rooms. An investigation was conducted and determined that the leakage was due to a crack in the Unit 2 Residual Heat Removal (RHR) Service Water System "B" loop piping, which is located underground.

Weekly surveillances have been porformed on the "B" loop of RHR Service Water System since March 13, 1989. The weekly surveillance of the Unit 2 "C" and "D" RHR Service Water pumps demonstrated the flows required by Technical Specifications and these values were crended with no further deterioration noted.

On August 25, 1989, Unit 2 was shutdown to perform various maintenance activities including maintenance performed on the Unit 2 "C" RHR Service Water pump, which required post maintenance testing. On August 27, 1989, the "C" and "D" RHR Service Water pumps were operated simultaneously for approximately 5 seconds and the "D" pump was secured. The "C" RHR Service Water pump flow did not meet the required Technical Specification acceptance criteria for operability. The "D" RHR Service Water pump was subsequently tested resulting in performance similar to the "C" RHR Service Water pump. The "B" loop was subsequently declared inoperable. Technical Specifications preclude startup of Unit 2 with the "B" loop inoperable.

2.0 EVALUATION

The licensee proposed a temporary Technical Specification (TS) change to allow declaring the Unit 2 RHR contrinment cooling loop "B" as operable when the cross-tie line is connected to Unit 1. The TS amendment will allow the use of the cross-tie until November 1, 1989, at which time the repair of the Unit 2 RHR loop "B" service water line will be completed.

8909110307 890901 PDR ADOCK 05000254 PDC The containment cooling mode of the RHR system for each unit consists of two loops. Each loop consists of one heat exchanger, two RHR pumps, associated valves, piping, electrical equipment and instrumentation. Normally, the "B" loop on each unit contains two RHR service water pumps, and the "A" loop on each unit also contains two RHR service water pumps. However, during the time interval from Aug. st 28, 1989, to November 1, 1989, the "B" loop on each unit may utilize the "C" and "D" RHR service water pumps from Unit 1. Service water from Unit 1 to Unit 2 will be delivered via the cross-tie line. Loss of any one loop of the containment cooling mode of the RHR system will leave the remaining loop to perform the containment cooling function. Either loop of the RHR system can satisfy the containment cooling function.

As stated in the Quad Cities FSAR, only one RHR and one RHR service water pump are required to provide containment cooling following a loss-of-coolant accident (LOCA) at a unit. One RHR and one RHR service water pump are also adequate to place and maintain the other unit in the cold shutdown condition. In the cross-tied condition, the boundary design basis accident scenario involves a LOCA on Unit 1, loss of off-site power, and failure of the 1/2 Diesel Generator. After core cooling is restored by the ECCS on Unit 1, the required loads to provide RHR Service Water to both units and maintain core cooling on the accident unit are within the capability of the Unit 1 Diesel Generator. These conditions result in the minimum operability of two RHR Service Water pumps, one per unit as analyzed in the SAR.

In the event of a loss of offsite power and the failure of the Unit 1 Diesel Generator, the Unit 1 "C" and "D" RHR Service Water Pumps can be cross-tied to the Unit 2 Diesel Generator in adequate time to prevent containment overheating.

CECo has stated this modification will be tested prior to startup of Unit 2. To assure that the minimum Technical Specification flow requirements for the "B" containment cooling loops for each unit in the cross-tie configuration are maintained with only the Unit 1 "C" and "D" RHR Service Water pumps operable a preoperational test will be performed by the licensee. Each loop has a flow element (FE) between the cross-tie and RHR heat exchangers to measure flow. The motor operated valves downstream of the RHR heat exchangers can be throttled to balance the flow. CECo has stated that during the preoperational tests the following flow combinations will be tested to assure the minimum Technical Specifications flow requirements are attained: 1C RHR pump to 2B heat exchanger, 1D RHR pump to 2B heat exchanger, and 1C and 1D pump to the 1B and 2B heat exchangers.

Prior to the implementation of this mod fication, CECo has committed to revise or develop procedures as necessary to address surveillance requirements, outage report requirements, and operability of Unit 1 "C" and "D" RHR Service Water pumps, and Unit 1 Diesel Generator during this interim period. In addition, controls will be implemented to assure the operators are aware that a loss of Unit 1 "C" or "D" RHR Service Water pump will render one containment cooling loop inoperable.

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The staff has reviewed the temporary modification and finds it acceptable for the following reasons: the minimum cooling requirements for RHR containment cooling are maintained for the worst case scenario identified in the FSAR; CECo will perform adequate preoperational testing to assure that minimum Technical Specification flow requirements are satisfied; and adequate administrative controls will be in place to assure that both units can be safely operated under all conditions associated with the modified containment cooling configuration.

3.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

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NRC staff reviewed the licensee's amendment application and determined, in accordance with the criteria of 50.92(c), that operation of Quad Cities according to the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated because, as described in Section 6 of the Quad Cities Safety Analysis Report (SAR), one RHR pump and one RHR Service Water pump will provide adequate containment cooling following a loss of coolant accident. A similar combination of equipment is adequate on the non-accident unit to place and maintain the reactor in a cold shutdown condition. This minimum combination of equipment is only experienced in the degraded conditions of loss of offsite power, loss of coolant accident on one unit, and failure of one diesel generator to start. Cross-tied RHR Service Water systems do not reduce the minimum required system availability as described in the SAR, (2) create the possibility of a new or different kind of accident from any accident previously evaluated because a cross-tied configuration shares two RHR Service Water pumps between Units 1 and 2 in the same manner that emergency power supplies are shared between the two units. Shared safety-related systems are an integral characteristic of the Quad Cities design and, (3) involve a significant reduction in a margin of safety because cross-tied configuration of the RHR service water systems do not result in plant conditions outside the bounds of minimum system operability assumed in SAR analysis for design basis accident scenarios.

Accordingly, the Commission finds that this request does not involve a significant hazards consideration.

The State of Illinois was informed by telephone on August 31, 1989, of the staff's final no significant hazards consideration determination. The State contact had no comment on the determination.

4.0 FINDINGS OF EMERGENCY WARRANTING AN AMENDMENT WITHOUT NOTICE

The licensee's application for the TS change was timely, and provided a summary of the events leading to the necessity for an emergency amendment request. The NRC staff concurs that the sudden complete failure of the Unit 2 "8" Loop RHR Service Water train to meet TS flow requirements could not have been predicted. Furthermore, the staff finds that failure to grant the proposed changes in a timely manner would increase the outage time of Quad Cities Unit 2 by delaying restart. We also find that the licensee could not have reasonably avoided this situation, that the licensee responded in a timely manner, and did not delay its application to take advantage of the

Emergency License Amendments provisions of 10 CFR 50.91. Accordingly, the staff concludes that the licensee has satisfied the requirements of 10 CFR 50.91(a)(5), and that a valid emergency exists.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to the use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that these amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission made a final determination that these amendments do not involve a significant hazards consideration. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of these amendments.

6.0 CONCLUSION

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The staff has concluded, based on the considerations discussed above, that: the amendment does not (a) significantly increase the probability or consequences of an accident previously evaluated, (b) create the possibility of a new or different kind of accident from any previously evaluated or (c) significantly reduce a safety margin and, therefore, the amendment does not involve significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (3) such activities will be conducted in compliance with the Commission's regulations, and (4) the issuance of these amendments will not be inimical to the common defense and security, nor to the health and safety of the public.

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