



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 108 TO LICENSE NO. DPR-49

IOWA ELECTRIC LIGHT AND POWER COMPANY
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 Introduction

By a letter dated July 20, 1983, Iowa Electric Light and Power Company (the licensee/IELP) proposed a change to the Duane Arnold Energy Center (DAEC) Technical Specifications to permit Residual Heat Removal Service Water (RHRSW) flow reduction. This change would allow the excess capacity of the service water flow (above the design basis performance requirements) currently required for operation of the Residual Heat Removal (RHR) system to be eliminated. Subsequently, the licensee by a letter dated January 27, 1984, revised the July 20, 1983 submittal to correct a discrepancy between the bases of the Technical Specifications and the Updated Final Safety Analysis Report (UFSAR), discovered subsequent to the original application.

The current Technical Specification Bases state that only one RHRSW pump is required to be operable to meet the design bases requirements, while the UFSAR states that two pumps are required to provide the necessary coolant flow. The licensee's investigation shows that the UFSAR analysis is correct and the current Technical Specifications need to be revised to require at least two RHR pumps to be operable. Furthermore, the licensee's analysis has shown that if one pump is operable in each of the two RHR systems, the resulting condition is similar to having one RHR system operable and adequate RHRSW flow is achieved. The licensee has also proposed to modify the diesel generator surveillance requirements for the RHRSW system eliminating the daily testing requirements.

2.0 Evaluation

The licensee has requested that the service water system flow be reduced below the currently documented and approved rated value of 4800 gpm to each RHR heat exchanger for design basis heat removal. There is no change in RHR system flow in the primary side. Only the service water flow is reduced. This change was prompted by a number of instances of failures to meet the above flow rate during surveillance testing.

8411190070 841029
PDR ADDCK 05000331
P PDR

The primary function of the RHR service water system is to provide cooling water to the RHR system heat exchangers during various modes of operation of the RHR system. The design specification for the RHR system states that the shutdown cooling mode is considered to be the limiting case for design basis heat removal, but that the steam condensing mode should also be evaluated as it may sometimes govern heat removal requirements. While not a limiting mode of operation, the RHR system is also used for suppression pool cooling during certain plant transients.

The licensee contracted General Electric Company (GE) to analyze the RHR service water system to determine the minimum flow rate required to meet the design basis conditions. In support of the licensee's requested change, GE performed analysis and provided a licensing letter report, "Duane Arnold Energy Center Reduced RHR Service Water Flow and Suppression Pool Temperature Response." The GE analysis considered the operation of the RHR system in both the shutdown cooling and steam condensing modes. The analysis verified that with both RHR heat exchangers operating and with 30% reduced RHR service water flow, the shutdown cooling subsystem meets its performance requirement of cooling the reactor to 125° within 20 hours following reactor trip.

Our position, Reactor Systems Branch (RSB) Technical Position 5-1, requires that the RHR system(s) shall be capable of bringing the reactor to a cold shutdown condition, with only offsite or onsite power available, within a reasonable period of time following shutdown, assuming the most limiting single failure. (The cold shutdown condition, as described in the Standard Technical Specifications, refers to a subcritical reactor with a reactor coolant temperature no greater than 200°F for a PWR, 212°F for a BWR.)

In a telephone conference with the licensee on November 15, 1983, we requested clarification regarding the number of RHR heat exchangers assumed in the licensee's analysis to be in operation. The licensee confirmed that with a single RHR heat exchanger, the reactor coolant temperature would be less than 212°F in 20 hours following reactor trip. This satisfies RSB Technical Position 5-1.

Our review of the analysis indicated that the RHR service water system flow can be reduced and still satisfy design basis heat removal requirements. The analysis showed that the RHR service water flow rate to each RHR heat exchanger may be reduced by approximately 30% in the shutdown cooling mode and still meet the design basis heat removal performance requirements. Further, the analysis determined that the steam condensing mode was not limiting as a large excess capacity existed. Operation of the RHR system in the suppression pool cooling mode was analyzed only for a 15% reduction in service water flow. Based on the above, the licensee has requested a 15% total reduction in the limiting RHR service water system flow to bound

the cooling requirements in each mode of operation. The reduction of 15% in the minimum required flow rate does not require any system hardware changes.

Based on our evaluation of the results of the supporting analysis presented by the licensee, we conclude that with the 15% reduction of the RHR service water flowrate, the RHR system is adequate to meet our RSB Technical Position 5-1. The licensee's request is, therefore, acceptable.

The licensee proposed to relax the requirements of daily testing of the diesel generators required for the operation of the RHR service water system. The daily testing requirement is not consistent with the diesel generators testing in relation to other Emergency Core Cooling System (ECCS) subsystems. The licensee has proposed to change the Technical Specifications to eliminate the daily testing of the diesel generators when the RHR service water system becomes inoperable. Instead the licensee proposes to demonstrate that the diesel generators will be operable only immediately after a RHR service water system becomes inoperable. The diesel generators will not be tested daily thereafter. The staff, as a part of the evaluation of Generic Issue B-56, has concluded that excessive testing of diesel generators results in degradation of diesel engines. Therefore, the staff is considering a generic reduction, from the plant Technical Specifications, of unnecessary test starts of diesel generators when ECCS systems are inoperable. The licensee's request for reduced diesel generator testing is consistent with the current staff position on this issue, and is therefore acceptable.

3.0 Environmental Considerations

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in inspection and surveillance requirements. The staff has determined that the amendment involves 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 has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets 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 or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 Conclusion

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the

public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: George Thomas and Mohan Thadani

Dated: October 29, 1984