



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO.60 TO FACILITY OPERATING LICENSE NO. DPR-74

INDIANA AND MICHIGAN ELECTRIC COMPANY

DONALD C. COOK NUCLEAR PLANT UNIT NO. 2

DOCKET NO. 50-316

Introduction

The Facility Operating License (No. DPR-74) for the D. C. Cook Nuclear Plant, Unit 2, includes a license condition; i.e., 2.C.(3)(g), which required the licensee to submit an analysis of the transient temperature and pressure response of the containment to postulated main steam line ruptures. The licensee submitted information regarding the required analysis by letters, dated September 20 and 22, 1978, and April 1, 1980 (1, 2, 3).

Evaluation

The licensee has calculated the containment response to a spectrum of main steam line breaks (MSLBs) using the LOTIC-3 computer program. This program has been described in Supplement 2 to the Westinghouse Topical Report WCAP-8354. The staff has completed a generic review of the LOTIC-3 code and has concluded that the LOTIC-3 code is acceptable for the calculation of long-term ice-condenser containment response to postulated secondary system pipe break accidents (see NRC letter to Westinghouse May 3, 1978). At the staff's request additional small MSLBs were analyzed, extending the spectrum down to a 0.1 ft² break size. These analyses were performed by Westinghouse for a "generic" ice condenser plant. Specifically, these analyses concerned the containment response to postulated 0.6 ft², 0.35 ft², and 0.1 ft² main steamline split breaks. In all cases the effects of containment spray and return air fan operation were considered in the analyses. In all cases a containment lower compartment pressure high enough to initiate automatic operation of the sprays and fans was calculated in the LOTIC-3 analysis of the postulated event.

The licensee has presented data comparing the containment input parameters assumed in the analysis of the "generic" plant with the same parameters for the D. C. Cook station. This information is sufficient for the staff to conclude that the "generic" plant parameters are equivalent to, or more

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conservative than, the D. C. Cook parameters pertinent to these analyses. Therefore, the staff concludes that the "generic" plant MSLB analyses are applicable to D. C. Cook.

The mass and energy release for postulated MSLBs are calculated using the Westinghouse MARVEL code.

The only remaining open issue in the generic review of the MARVEL code, in relation to ice condenser plants, concerns the model used to account for heat transfer to steam during tube bundle uncover in the steam generator. This would have the effect of superheating the steam that was released from the steam line break, and would result in higher temperature inside the containment.

Westinghouse is investigating the magnitude of this effect for all ice condenser plants. However, D. C. Cook is unique among ice condenser plants in that it has a containment spray system in the lower compartment of the containment, in addition to the one in the upper compartment. The lower compartment spray would quickly remove the superheat energy. Thus, the atmospheric temperature profile in the lower compartment would not be significantly affected by the transfer of heat from the uncovered tube bundle to steam in the steam generator.

Therefore, for the D. C. Cook Nuclear Plant, Unit 2, we conclude that the MARVEL code is acceptable for use in calculating the mass and energy released from postulated MSLB's inside containment. This conclusion would also apply to Unit 1 of the D. C. Cook plant.

Summary

Based on the above review, the staff concludes that the Licensee has submitted a satisfactory analysis regarding the containment temperature and pressure transient response to postulated ruptures of a main steam line inside containment, and that the analysis is acceptable.

We have also concluded that the Licensee has satisfactorily met the requirements of the License Condition.

Environmental Consideration

We have determined that the amendment does not authorize a change to effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

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.

Dated: November 28, 1983

REFERENCES

1. Letter, T. M. Anderson (Westinghouse) to H. R. Denton (NRC), "Response to Question 022.9" dated September 20, 1978.
2. Letter, J. Tillinghast (Indiana & Michigan Power Company) to H. R. Denton (NRC), "Containment Long-Term Temperature and Pressure Response," dated September 22, 1978.
3. Letter, G. P. Maloney (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Request for Additional Information 022.17," dated April 1, 1980.

