



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 37 TO FACILITY OPERATING LICENSE NO. DPR-66

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

BEAVER VALLEY POWER STATION, UNIT NO. 1

DOCKET NO. 50-334

Introduction

By letter to the licensee dated August 27, 1980 (Reference 1), the NRC issued Amendment No. 28 to Facility Operating License No. DPR-66 for the Beaver Valley Power Station, Unit 1. The amendment reflected modifications made to alleviate Net Positive Suction Head (NPSH) problems with the Low Head Safety Injection and Recirculation Spray Pumps.

Along with the hardware modifications, the licensee proposed changes to Technical Specification Figures 3.6-1 (Maximum Allowable Primary Containment Air Pressure versus River Water Temperature and RWST Water Temperature), 3.6-2 (Minimum Allowable Primary Containment Average Air Temperature versus River Water Temperature), and Limited Condition for Operation statement 3.6.1.5.

Although the staff incorporated both the hardware modifications and the proposed Technical Specification changes regarding limiting pressures and temperature in the NPSH review, the Safety Evaluation Report stated that the staff had not completed its review of the proposed Technical Specifications identified above and that these proposed changes would be addressed through a separate and subsequent review. That review has verified that by using the Limiting Conditions for Operation, found in the proposed Technical Specifications, the facility will not (1) Exceed the containment design pressure following the design basis accident or (2) Violate the minimum containment pressure analysis calculated for the ECCS performance evaluation.

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Evaluation

The initial containment pressure and temperature is important when calculating containment pressure transients. Maximizing the initial vapor temperature and the partial pressure due to air will result in the maximum calculated pressure and vice versa.

The revised Technical Specifications tend to increase the minimum vapor temperature and decrease the maximum partial pressure due to air for lower river water temperatures. These two effects tend to cancel out. In addition, for higher river water temperatures, the revised Technical Specifications tend to decrease the minimum vapor temperature and increase the partial pressure due to air. Again, these two effects tend to cancel each other. Plugging nozzles in the spray header, however, tends to decrease the containment heat removal rate which increases both the peak calculated containment pressure and the containment depressurization time (subatmospheric containments are required to depressurize and return to subatmospheric conditions within one hour following a design basis accident).

The licensee identified the postulated hot leg DER with minimum ESF as being the break which results in the highest calculated containment pressure. The licensee calculated a peak containment pressure of 38.97 psig. The containment design pressure is 55.0 psig.

Using the CONTEMPT-LT/028 computer code, we have performed several confirmatory analyses of the hot leg DER with minimum ESF using various combinations of limiting conditions of operation from the proposed Technical Specification Figures. Our analyses are in good agreement with those performed by the licensee and we conclude that the proposed changes will not result in a postulated pipe break exceeding the containment design pressure. The worst case for containment depressurization was reviewed and found acceptable in Reference 1.

When performing the ECCS evaluation as required by Appendix K to 10 CFR 50, a minimum containment backpressure must be assumed. The core flooding rate is directly affected by the ability of the ECCS water to displace the steam generated in the reactor vessel during the core reflooding period. For PWR plants, the core flooding rate decreases with decreasing containment backpressure which in turn allows for a greater heat-up of the reactor fuel. Therefore, it is conservative to assume a minimum containment backpressure for this evaluation.

The licensee calculated the minimum containment backpressure for the ECCS evaluation by assuming maximum operation of all heat removal systems. Reference 2 discusses the staff's evaluation and approval of the licensee's model.

The modifications proposed by the licensee to improve the available NPSH to the Low Head Safety Injection and Recirculation Spray Pumps decreases the total heat removal systems. Part of the modifications consisted of diverting cold quench spray water to the suction side of the recirculation spray pumps. Nozzles in the quench spray header were plugged to account for the diverted water. The result of this modification is a reduction in the total spray flow rate and a subsequent reduction in the total containment heat removal rate. Reducing the total containment heat removal rate increases the calculated containment backpressure thereby assuring that the containment backpressure assumed in the ECCS performance evaluation has not been violated. Changes in the initial containment pressure and temperature have been judged to have negligible effects on the containment backpressure.

Environmental Consideration

We have determined that the amendment does not authorize a change in 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) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a 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, and (3) 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.

Date: February 2, 1981

REFERENCES:

1. C. N. Dunn to R. W. Reid letter dated November 17, 1977, proposed permanent modifications to correct NPSH inadequacies.
2. D. Eisenhut to C. N. Dunn letter dated August 27, 1980, transmitted Amendment 26 to Operating License No. DPR-66.