

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 1 TO FACILITY LICENSE NO. DPR-38
CHANGE NO. 23 TO TECHNICAL SPECIFICATIONS;

AMENDMENT-NO 13 TO FACILITY LICENSE NO. DPR-47
CHANGE NO. 18 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 10 TO FACILITY LICENSE NO. DPR-55
CHANGE NO. 10 TO TECHNICAL SPECIFICATIONS

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

Introduction

By letter dated August 26, 1975, Duke Power Company (the licensee) requested a change in the Technical Specifications of Licenses No. DPR-38, DPR-47, and DPR-55 for the Oconee Nuclear Station, Units 1, 2, and 3. The proposed amendments would (1) modify the axial power imbalance limits for the Core Protection Safety Limits and the Reactor Protective System (RPS) Maximum Allowable Setpoints, (2) reduce the flux/flow ratio from 1.07 to 0.961 for single-loop operation, and (3) change the identification of the maximum thermal power for three-pump operation from 86.0% to 86.4%.

Discussion

The present Technical Specifications contain axial power imbalance limitations for Oconee Units 2 and 3 which were derived on the basis of allowed power distributions during the entire first cycle and include considerations of the characteristically high peaking factor at Beginning of Life (BOL). As the depletion of the fuel occurs through the operating cycle of the units, the core peaking factor decreases and the original limitations become increasingly more conservative. In particular, the high peaking factor at BOL may no longer be the limiting factor after about 100 Effective Full Power Days (EFPD) of operation. Once this situation is reached, the original axial power imbalance limitations may be overly restrictive and would therefore preclude the optimum utilization of the fuel. The licensee is, therefore, requesting a change to the Technical Specifications which would take into account the decrease in the BOL peaking factor and would

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provide greater flexibility in reactor operation by relaxing certain specific axial power imbalance setpoints.

The above proposed changes in axial power imbalance setpoints would require that the flux/flow ratio allowed for single-loop operation be reduced from that presently permitted for other pump combinations. The licensee has, therefore, proposed a reduction in the flux/flow ratio for single-loop operation from 1.07 to 0.961.

The licensee is additionally requesting a change to the Technical Specifications which would redefine the maximum thermal power for three-pump operation from 86.0 to 86.4% by applying error adjustments which are more consistent with other Babcock and Wilcox units.

Evaluation

The licensee's proposed amendments which would relax the axial power imbalance setpoints for the Core Protection Safety Limit and the RPS setpoints is based on the fact that after about 100 EFPD of operation, the power peaking factor which exists near BOL becomes an overly restrictive criterion for establishing the axial power imbalance limitations. We agree in that with the fuel depletion experienced through the initial 100 EFPD of operation a corresponding decrease in the maximum linear heat generation rate would be realized. This decrease in the heat generation rate would result in an increase in the core safety margin over the value existing at BOL. By relaxing axial power imbalance limitations, as is proposed, an increase in peaking factor would result with a consequent increase in linear heat generation rate. It has been determined, however, that the reduction in peaking factor realized after about 100 EFPD of operation more than compensates for the increase in peaking factor which would result from the proposed revised power imbalance limits. The original safety margins are therefore maintained. At the present time, Oconee Units 2 and 3 have operated through approximately 300 and 230 EFPD, respectively. We, therefore, find the proposed changes to the axial power imbalance limits to be acceptable.

The licensee is also proposing a reduction in the flux/flow ratio for single-loop operation in order to provide adequate margin from the revised imbalance safety limits discussed above. The flux/flow ratio determines the RPS trip setpoint limits and is derived from a combination of reactor coolant system flow in percent and the existing axial power imbalance. The proposed reduction from 1.07 to 0.961 would result in a more restrictive trip setpoint for the single-loop mode of operation and has been determined to adequately compensate for the revised power imbalance limitations discussed above.

In summary, the above requested changes would allow the licensee to take credit for fuel depletion in Oconee Units 2 and 3 which more than compensates for the proposed relaxation of the axial power imbalance limitations. The resultant effect of this action does not involve any reduction in core safety margins nor decrease in any RFS trip setpoint. Accordingly, we find the proposed changes to be acceptable.

The proposed change in the maximum thermal power for the three-pump operation from 86.0 to 86.4% results from the application of revised error adjustment factors such as are utilized on other Babcock and Wilcox (B&W) units. The error adjustment factors referred to are the maximum calibration and instrument errors used to determine the maximum thermal power for the various modes of coolant pump operation. The error adjustment factors are added to the RFS trip setpoint (80% for three-pump operation) to arrive at the maximum thermal power value. The revised value of 86.4% for Oconee Units 2 and 3 is consistent with other B&W units with identical cores and which have been evaluated subsequent to the initial evaluation performed for the Oconee Units. The more recent analysis has shown that the DNBR ratio of 1.3 is maintained for values of thermal power greater than 86.4%. The proposed revision, therefore, does not involve any reduction in core safety margins and does not affect the RFS flux/flow trip setpoint for three-pump operation of 80%. Based on the above, we have concluded that the proposed change is acceptable.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the change 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 change 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: OCT 31 1975