



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 55 TO FACILITY OPERATING LICENSE NO. DPR-40

OMAHA PUBLIC POWER DISTRICT
FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

Background and Discussion

By application dated January 14, 1981, Omaha Public Power District (OPPD) requested an interim change to the Fort Calhoun Station Technical Specifications. This change would add a Specification to allow the use of less than 75% of the incore detector strings, for monitoring linear heat rate and power distribution, during the remainder of core Cycle 6 operation. Since the existing Technical Specification (2.10.3) prohibits the use of the incore detector system for peak linear heat rate and power distribution monitoring with less than 75% of the detector strings operable, several additional requirements were incorporated into the proposed Interim Special Technical Specification (6.4) to compensate for the system's degradation.

The incore detector system at the Fort Calhoun Station consists of 28 detector strings each having 4 rhodium detectors. In order for a detector string to be considered operable and therefore useable, at least 3 of 4 detectors must be functional. As of January 14, 1981, 23 of these detectors had failed in such a manner as to require the removal from use of 7 detector strings (25%); subsequently, on January 22, 1981, an additional detector failed on a string with one other detector already inoperable, thereby causing more than 25% of the incore detector strings to be inoperable.

The detectors which are experiencing the highest frequency of failure are those which were installed prior to startup for Cycle 5 operation. These detectors are from the same manufacturing batches which were installed prior to Cycle 4 and the present Cycle 6 operation. Since the Cycle 4 and 6 installed detectors are not failing at the same rate as those installed for Cycle 5, the failure mechanism is not as yet understood. OPPD will replace all of the failed detector strings during the refueling outage prior to startup for Cycle 7 operation in accordance with existing procedures and will continue to investigate the cause of detector failure.

Evaluation

The licensee's application essentially contains the following three changes to the existing requirements.

1. The uncertainty factors to be used in determining the planar radial

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peaking factor, integrated radial peaking factor and total peaking factor would be calculated once every 31 days in accordance with the methods described in INCA/CECOR "Power Peaking Uncertainty" - CENPD-153-P, Revision 1-P-A, May 1980.

2. The alarms for the minimum margin to the linear heat rate (kw/ft) limit would be set on all of the detectors rather than the existing method of setting the alarms in each axial quarter of the core based on the maximum kw/ft at each level.
3. The determination of F_R^T and F_{xy}^T would cease if the incore detector system became inoperable (less than 20% of the detector strings available) and the peak linear heat rate is monitored by the excore detectors.

We have reviewed the licensee's application and have found it acceptable based on the following.

1. The method to be used to compute the uncertainty factors for the stated peaking factors has been approved by the NRC as noted in the referenced report (CENPD 153). The uncertainty factors are expected to increase, but only by one or two percent during the remainder of Cycle 6 operation. Since there is a margin in excess of 6% in F_R and F_{xy} at the present time, and since this margin is expected to increase with fuel burnup during Cycle 6 operation, we have determined that sufficient margin exists for conservative operation. The 31EFPD frequency for determining the uncertainty factors is also acceptable since this conforms to present staff requirements. In addition, at our request, the licensee has agreed to furnish the NRC Project Manager the results of the 31EFPD evaluation of the uncertainty factors with the margins present to each of the peaking factor limits. A copy of this report will also be provided to the NRC Resident Inspector. If our review of the provided information indicates that the postulated margins have unexpectedly deteriorated or show unexpected trends, we will take appropriate action.
2. The change in the alarm settings will tend to produce sufficiently more monitoring for changes in power distribution to offset the reduced number of detector strings. Since the unit does not operate in the load follow mode, we expect there to be substantial margin to the linear power density limits at all times during the remainder of Cycle 6 operation.
3. The deletion of the requirement to measure F_R^T and F_{xy}^T if the incore detector system becomes inoperable (less than 20% of the detector strings operable) is appropriate because measurement of these quantities would be of questionable worth with the limited number of detectors available. The present margin to these limits is substantial and is expected to increase during operation. The reporting of these margins, as indicated in 1. above, will serve to alert the staff of any potential problems in the unlikely event that the excore monitoring option is required.

In view of the foregoing, we have concluded that the proposed Technical Specifications will not result in any loss of safety margin and are, therefore, acceptable.

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