



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

SAFETY EVALUATION REPORT

RELATED TO AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NPF-9

AND TO AMENDMENT NO. 15 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTRODUCTION

By letter dated June 14, 1984, Duke Power Company proposed to amend Facility Operating Licenses NPF-9 and NPF-17 for McGuire Nuclear Station, Units 1 and 2, respectively. The proposed amendments expand the Power Distribution Limits section of the McGuire Unit 1 Technical Specifications to include Base Load Operation in addition to the currently approved Relaxed Axial Offset Control (RAOC) operation. The licensee's submittal contains changes to implement Base Load Operation and corresponding changes to the Bases and administrative sections of the specifications.

The need for the change in the technical specifications arose subsequent to the Unit 1 Cycle 2 zero power physics testing in early May during which a quadrant power tilt was identified. All zero power physics parameters met acceptance criteria except the all rods out hot zero power critical boron concentration and the radial power distribution. A review of the hot zero power results was performed by Westinghouse, and power escalation was performed consistent with the Westinghouse position statement on core tilt. At 100% full power the measured incore quadrant power tilt decreased and the measured power distribution met acceptance criteria, although the power in the peripheral fuel assemblies remained higher than predicted. On June 6, 1984, the transient adjusted LOCA peaking factor was determined by the licensee to exceed its limit, forcing the reduction in the RAOC limits, thus derating the reactor to less than 100% RTP (i.e. 95% RTP). The licensee acted promptly in providing the required technical bases to support a request for an immediately effective change in the McGuire Technical Specifications.

EVALUATION

McGuire Unit 1 is currently derated to 95% of Rated Thermal Power (RTP) because of a quadrant power tilt and in-out shift in core power distribution which has been experienced since Cycle 2 start-up, forcing a reduction in the RAOC limits such that the unit is effectively restricted to 95% RTP.

Both the new proposed Base Load Operation and RAOC establish a maximum total core peaking factor, F_0 , by multiplying a steady-state measured actual core peaking factor by a transient factor, $W(Z)$. The RAOC $W(Z)$ factors are large (up to about 1.3) because they are derived from analysis of a broad spectrum of load following maneuvers, with a wide band of allowable axial flux difference (AFD). Base Load Operation proposes to restrict the allowed load

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following maneuvers to a very restricted band of power level (80 to 100% RTP is currently proposed) and the AFD to $\pm 3\%$. Additionally, the reactor must have been operated within the $\pm 3\%$ AFD band at the lower allowed Base Load Operation power level or, if greater, the highest power level allowed by RAOC, for 24 hours prior to entering the Base Load Operation mode. Because the Base Load Operation mode closely approximates running the reactor at equilibrium at full power with no change in axial shape (AFD), there is very little chance for change in the xenon concentration. Therefore, the transient factor $W(Z)_{BL}$ is much smaller (1.08 or less) than the 1.3 $W(Z)$ for RAOC. The product of the $W(Z)_{BL}$ x the measured F_Q can more easily meet the F_Q limit of 2.15, so the reactor probably will not have to be derated.

Because the licensee is trading the ability to maneuver the reactor with RAOC for a lower peaking factor with Base Load Operation using the same analysis techniques with appropriate changes in the assumptions, Base Load Operation is acceptable. There is no change in the F_Q limit of 2.15 used as an input condition for the LOCA analysis, and derates in either mode of operation are required similarly by the Specifications if the F_Q limit is exceeded.

We reviewed each of the Technical Specification changes proposed in the licensee's June 14 submittal and find they appropriately define the requirements for Base Load Operation and transitions to and from RAOC operation presently specified. We also reviewed the changes to the corresponding Bases and administrative sections of the specifications and find them appropriate and acceptable.

Specification 6.9.1.9 requires submittal of Peaking Factor Limit Reports which define the RAOC $W(Z)$ and $W(Z)_{BL}$ functions and the lower power level assumed for Base Load Operation 60 days before their intended use unless otherwise exempted by the Commission. The licensee's submittal included a revised report for RAOC and a report for Base Load Operation. We have reviewed these reports for McGuire Unit 1 Cycle 2 and find them acceptable for use as of the date of this evaluation.

FINAL NO SIGNIFICANT HAZARDS CONSIDERATION (SHC) DETERMINATION

For the reasons discussed above we conclude that the proposed Technical Specification changes do not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated or (3) involve a significant reduction in a margin of safety, in that they do not permit operation outside previously evaluated limits in a mode not previously evaluated, and therefore do not involve a significant hazards consideration.

The Commission consulted with the State of North Carolina. The State of North Carolina did not have any comments. Based on the Commission's final review and the absence of State comments, the Commission has made a final determination that these amendments involve no significant hazards consideration.

ENVIRONMENTAL CONSIDERATION

The amendments involve a change in use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off-site and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has made a final no significant hazards consideration finding with respect to the amendments. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 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 the amendments.

CONCLUSION

Based on the considerations discussed above, we have concluded that: (1) the amendment (a) does not significantly increase the probability or consequences of accidents previously considered, (b) does not create the possibility of a new or different kind of accident from any accident previously evaluated, and (c) does not significantly reduce a margin of safety and therefore does not involve significant hazards considerations; (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 the amendment will not be inimical to the common defense and security or the health and safety of the public.

Principal Contributors: M. Dunenfeld - Core Performance Branch, DSI
R. Birkel - Licensing Branch No. 4, DL

Dated: September 13, 1984

September 13, 1984

AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NPF-9 - McGUIRE NUCLEAR STATION, UNIT 1
AMENDMENT NO. 15 TO FACILITY OPERATING LICENSE NPF-17 - McGUIRE NUCLEAR STATION, UNIT 2

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