Omaha Public Power District

444 South 16th Street Mall
Omaha NE 68102-2247

July 22, 2002
LIC-02-0080

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Reference: Docket No. 50-285

SUBJECT: Fort Calhoun Station Unit No. 1 License Amendment Request, "Removing Reference to Specific Core Tilt Monitoring Computer Program"

Pursuant to 10 CFR 50.90, Omaha Public Power District (OPPD) hereby requests the following amendment to Technical Specification (TS) 2.10.4(4). The proposed amendment removes the reference to a specific computer program for monitoring core radial peaking factors when a core power tilt is present. Instead, the functional requirement is specified. These changes clarify the requirements for core tilt monitoring associated with a computer system upgrade and changes in computer programs. Also, it is proposed to add clarification in the basis section for TS 2.10.4 regarding the application of TS 2.10.4(1)(b) when the plant computer incore detector alarms for monitoring core linear heat rate become inoperable.

Attachment 1 provides the No Significant Hazards Evaluation and the technical bases for this requested change to the Technical Specifications. Attachments 2 and 3 contain a marked-up and clean version reflecting the requested Technical Specification and Basis changes.

OPPD requests approval of the proposed amendment by November 1, 2002, to support the schedule for implementation of the computer system upgrade during the current operating cycle. Once approved, the amendment shall be implemented by January 31, 2003.

I declare under penalty of perjury that the foregoing is true and correct. (Executed on July 22, 2002)

A001

If you have any questions or require additional information, please contact Dr. R. L. Jaworski of my staff at 402-533-6833.

Sincerely,

R. T. Ridenoure
Division Manager
Nuclear Operations

RTR/RLJ/rlj

Attachments
1. Fort Calhoun Station's Evaluation for Amendment of Operating License
2. Mark-up of Technical Specifications
3. Clean Version of Technical Specifications

c: E. W. Merschoff, NRC Regional Administrator, Region IV
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Fort Calhoun Station's Evaluation
For
Removing Reference to Specific Core Tilt Monitoring Computer Program

1.0 INTRODUCTION

This letter is a request to amend Operating License DPR-40 for the Fort Calhoun Station (FCS) Unit No. 1.

The Omaha Public Power District (OPPD) proposes to change the reference to a specific computer program used for monitoring core radial peaking factors in the event that a core power tilt occurs. Instead, the functional requirement for monitoring core radial peaking factors in such an event is specified. This change is being proposed to clarify the requirements regarding core monitoring when a core power tilt is present. This clarification is necessary because the plant computer system is being upgraded, and the specific computer programs used to meet these requirements are being replaced with functional equivalents. Rather than continuing to specify the specific computer programs, it is simpler and more efficient to specify the functional requirements and use codes based upon approved methodology.

Also, it is proposed to provide additional clarification in the basis section for core linear heat rate monitoring. This clarification makes it clear that plant operation may continue for up to seven days with additional operating restrictions already in effect in the event that the incore detector alarms for monitoring linear heat rate become inoperable due to a failure of the plant computer.

2.0 DESCRIPTION OF PROPOSED AMENDMENT

The proposed changes are: 1) revision of the wording of TS 2.10.4(4)(a) to specify that F_R^T be monitored with the incore detectors rather than specifying that Mini CECOR/BASSS be operable and utilized to monitor F_R^T, and 2) adding clarification in the basis section for TS 2.10.4 making it clear that TS 2.10.4(1)(b) is intended to apply to the situation in which the incore detector alarms for linear heat rate monitoring become inoperable due to a failure of the plant computer.

3.0 BACKGROUND

The change to the wording of TS 2.10.4(4)(a) is being performed to clarify the requirements regarding core monitoring when a core power tilt is present. This clarification is necessary because the plant computer system is being upgraded, and the specific computer programs used to meet these requirements are being replaced with functional equivalents. Rather than continuing to specify the specific computer programs, it is simpler and more efficient to specify the functional requirements and use codes based upon approved methodology.

The addition to the basis for TS 2.10.4 is being performed to make it clear that the provisions of TS 2.10.4(1)(b) are intended to allow continued operation in the

event that a plant computer failure renders the incore detector alarms inoperable in addition to other scenarios that cause the incore detector alarms to become inoperable.

4.0 REGULATORY REQUIREMENTS & GUIDANCE

The Fort Calhoun Station design meets criteria similar to those now contained in 10 CFR 50 Appendix A, General Design Criteria for Nuclear Power Plants. The Fort Calhoun Station USAR Appendix G, Responses to 70 Criteria, describes how those criteria are met. The criteria that govern core power distribution monitoring are USAR Appendix G Criterion 6, Criterion 12 and Criterion 13. Criterion 6 – Reactor Core Design, states: "The reactor core shall be designed to function throughout its design lifetime without exceeding acceptable fuel damage limits which have been stipulated and justified. The core design together with reliable process and decay heat removal systems, shall provide for this capability under all expected conditions of normal operation with appropriate margins for uncertainties and for transient situations which can be anticipated, including the effects of the loss of power to recirculation pumps, tripping out of a turbine generator set, isolation of the reactor from its primary heat sink, and loss of all off-site power." Criterion 12 - Instrumentation and Control Systems, states: "Instrumentation and controls shall be provided as required to monitor and maintain variables within prescribed operating ranges." Criterion 13 – Fission Process Monitors and Controls, states: "Means shall be provided for monitoring and maintaining control over the fission process throughout core life and for all conditions that can reasonably be anticipated to cause variations in reactivity of the core, such as indication of position of control rods and concentration of soluble reactivity control poisons."

5.0 TECHNICAL ANALYSIS

5.1 Design Basis

The proposed amendment does not change the design basis or methodology for core power distribution monitoring. Core power distribution monitoring is performed as described in an approved topical report referenced in the Technical Specifications (References 10.2 and 10.3).

The Technical Specification limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System or the Incore Detector Monitoring System, provides adequate monitoring of the core power distribution and is capable of verifying that the linear heat rate (LHR) does not exceed its limit.

The Excore Detector Monitoring System performs this function by continuously monitoring the axial shape index (ASI) with the operable quadrant symmetric excore neutron flux detectors. The axial shape index is maintained within the allowable limits of the Limiting Condition for Operation for Excore Monitoring of LHR Figure provided in the COLR.

The Incore Detector Monitoring System provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments. The incore alarms ensure that the peak linear heat rates will be continuously maintained within the allowable limits of the Allowable Peak Linear Heat Rate vs. Burnup Figure provided in the COLR.

The limitation on Azimuthal Power Tilt (T_q) is provided to ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local Power Density – High LCOs and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. The limitations of F_R^T and T_q are provided to ensure that the assumptions used in the analysis establishing the DNB Margin LCO and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If F_R^T or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed by the action statements since these additional restrictions provide adequate assurance that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density – High LCOs and LSSS setpoints remain valid (Basis, Reference 10.1).

The surveillance requirements for verifying that F_R^T and T_q are within their limits provide assurance that the actual values of F_R^T and T_q do not exceed the assumed values.

5.2 Risk Information

The proposed amendment does not involve application or use of risk-informed decisions. The risk to the health and safety of the public as a result of these clarifications to core power distribution monitoring requirements is minimal.

6.0 REGULATORY ANALYSIS

The proposed amendment removes the reference to a specific computer program used for monitoring core radial peaking factors in the event that a core power tilt occurs and provides additional clarification in the basis section for core linear heat rate monitoring complies with the design criteria by continuing to protect the fuel from exceeding the design basis limits.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be

endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 NO SIGNIFICANT HAZARDS CONSIDERATION

OPPD has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. **Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No.

   The change does not result in any changes to the existing core power distribution monitoring requirements. There is no change in the analysis values used in the evaluation of the transients and accidents. All of the evaluated transients and accidents currently show acceptable results and will not be affected by this change. Incorporating this change will not affect the probability of an accident, since core power distribution monitoring is not changed. The change to the wording of the core power distribution monitoring specifications will not change the failure possibilities for reactor protective features. The effect of the proposed change is the clarification of the existing core power distribution monitoring requirements.

2. **Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   Response: No.

   The change to the wording of the core power distribution monitoring specifications does not provide the possibility of the creation of a new or different type of accident. Changing the wording of the core power distribution monitoring specifications does not change the method of core power distribution monitoring or the expected response of reactor protective features. The reactor will operate within previously analyzed limits.

3. **Does the proposed change involve a significant reduction in a margin of safety?**

Response: No.

The proposed change to the wording of the core power distribution monitoring specifications does not constitute a significant reduction in the margin of safety due to the core power distribution monitoring requirements are not changed and are consistent with the assumptions contained in the transient and accident analyses contained in the Updated Safety Analysis Report shown to produce acceptable results.

The acceptance criteria used in the analysis have been developed for the purpose of use in design basis accident analyses such that meeting these limits demonstrates adequate protection of public health and safety. An acceptable margin of safety is inherent in these licensing limits. Therefore, the proposed changes do not involve a reduction in a margin of safety.

Based on the above, OPPD concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

8.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment is confined to administrative clarification. The changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) for the following reasons:

1) As demonstrated in Section 7.0, the proposed amendment does not involve a significant hazards consideration.
2) The proposed amendment does not result in a significant change in the types or increase in the amounts of any effluents that may be released offsite. Also, the TS change does not introduce any new effluents or significantly increase the quantities of existing effluents. As such, the change cannot significantly affect the types or amounts of any effluents that may be released offsite.
3) The proposed amendment does not result in a significant increase in individual or cumulative occupational radiation exposure. The proposed change does not result in any physical plant changes. No new surveillance requirements are anticipated as a result of these changes that would require additional personnel entry into radiation controlled areas. Therefore, the amendment has no significant affect on either individual or cumulative occupational radiation exposure.

Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

9.0 PRECEDENCE

None

10.0 REFERENCES

10.1 Fort Calhoun Unit 1 Technical Specifications Section 2.10.4, Reactor Core Power Distribution Limits

10.2 Fort Calhoun Unit 1 Technical Specifications Section 5.9.5, Core Operating Limits Report

10.3 "Reload Core Analysis Methodology Overview," OPPD-NA-8301-P-A, Section 6.1, "Incore LCO Monitoring"

Mark-up of Technical Specifications

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.10 Reactor Core (Continued)
2.10.4 Power Distribution Limits (Continued)

(4) Azimuthal Power Tilt (T_q)

When operating above 70% of rated power,

(a) The azimuthal power tilt (T_q) shall not exceed 0.10 whenever ~~Mini CECOR/BASSS is operable,~~ the CEA's are at or above the Long Term Insertion Limit and ~~Mini CECOR/BASSS is being utilized to monitor~~ F_R^T is being monitored with the incore detectors.

(b) The azimuthal power tilt (T_q) shall not exceed 0.03 whenever the provisions of 2.10.4(4)(a) do NOT allow ~~Mini CECOR/BASSS to be utilized to monitor~~ F_R^T to be monitored with the incore detectors. With the indicated azimuthal power tilt determined to be >0.03 but <0.10, correct the power tilt within two hours or determine within the next 6 hours and at least once per subsequent 8 hours, that the total integrated radial peaking factor, F_R^T, is within the limit of Specification 2.10.4(2) or reduce power to less than 70% of rated power within 8 hours of confirming T_q >0.03.

(c) With the indicated power tilt determined to be $\geq$0.10, power operation may proceed up to 2 hours provided F_R^T does not exceed the power limits of the F_R^T and the Core Power Limitations Figure provided in the COLR, or be in at least hot standby within 6 hours. Subsequent operation for the purpose of measurement to identify the cause of the tilt is allowable provided the power level is restricted to 20% of the maximum allowable thermal power level for the existing reactor coolant pump combination.

The Incore Detector Monitoring system provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments ensure that the peak linear heat rates will be continuously maintained within the allowable limits of the Allowable Peak Linear Heat Rate vs. Burnup Figure provided in the COLR. The setpoints for these alarms include allowances, set in the conservative directions. If the plant computer fails, the incore detector alarms become inoperable. The provisions of Section 2.10.4(1)(b) are intended to address this situation and assure safe operation of the reactor for up to 7 days.

Calibration of the ex-core detector input to the APD calculator is required to eliminate ASI uncertainties due to instrument drift and axially nonuniform detector exposure. If the recalibration is not performed in the period specified, the prescribed steps will assure safe operation of the reactor.

Total Integrated Radial Peaking Factor (F_R^T) and Azimuthal Power Tilt (T_q)

The limitation of T_q are provided to ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local Power Density - High LCO's and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. The limitations of F_R^T and T_q are provided to ensure that the assumptions used in the analysis establishing the DNB Margin LCO and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If F_R^T or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed by the action statements since these additional restrictions provide adequate assurance that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density - High LCO's and LSSS setpoints remain valid. An azimuthal power tilt >0.10 is not expected and if it should occur, subsequent operation would be restricted to only those operations required to identify the cause of this unexpected tilt.

The value of T_q that must be used in the equation $F_R^T = F_R(1 + T_q)$ is the measured tilt.

The surveillance requirements for verifying that F_R^T and T_q are within their limits provide assurance that the actual values of F_R^T and T_q do not exceed the assumed values. Verifying F_R^T after each fuel loading prior to exceeding 70% of rated power provides additional assurance that the core was properly loaded.

DNBR Margin During Power Operation Above 15% of Rated Power

The selection of limiting safety system settings and reactor operating limits is such that:

1. No specified acceptable fuel design limits will be exceeded as a result of the design basis anticipated operational occurrences, and

2. The consequences of the design basis postulated accidents will be no more severe than the predicted acceptable consequences of the accident analysis in Section 14.

Clean Version of Technical Specification

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.10 Reactor Core (Continued)
2.10.4 Power Distribution Limits (Continued)

(4) Azimuthal Power Tilt (T_q)

When operating above 70% of rated power,

(a) The azimuthal power tilt (T_q) shall not exceed 0.10 whenever the CEA's are at or above the Long Term Insertion Limit and F_R^T is being monitored with the incore detectors.

(b) The azimuthal power tilt (T_q) shall not exceed 0.03 whenever the provisions of 2.10.4(4)(a) do NOT allow F_R^T to be monitored with the incore detectors. With the indicated azimuthal power tilt determined to be >0.03 but <0.10, correct the power tilt within two hours or determine within the next 6 hours and at least once per subsequent 8 hours, that the total integrated radial peaking factor, F_R^T, is within the limit of Specification 2.10.4(2) or reduce power to less than 70% of rated power within 8 hours of confirming T_q >0.03.

(c) With the indicated power tilt determined to be $\geq$0.10, power operation may proceed up to 2 hours provided F_R^T does not exceed the power limits of the F_R^T and the Core Power Limitations Figure provided in the COLR, or be in at least hot standby within 6 hours. Subsequent operation for the purpose of measurement to identify the cause of the tilt is allowable provided the power level is restricted to 20% of the maximum allowable thermal power level for the existing reactor coolant pump combination.

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The selection of limiting safety system settings and reactor operating limits is such that:

1. No specified acceptable fuel design limits will be exceeded as a result of the design basis anticipated operational occurrences, and

2. The consequences of the design basis postulated accidents will be no more severe than the predicted acceptable consequences of the accident analysis in Section 14.