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50-269

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FILE NUMBER

TO: Mr. E. Case

FROM: Duke Power Company
Charlotte, N.C. 28201
A.C. Thies

DATE OF DOCUMENT
10-26-77

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10-28-77

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DESCRIPTION Ltr notarized 10-26-77 requesting for amdt to OL/tech specs to delete the existing reactor core quadrant power tilt & control rod position limits & trans the following: 2P

PLANT NAME: Oconee Unit 1

DHL 10-28-77

ENCLOSURE Proposed tech spec revisions...3P
Justification for proposed revision to tech specs.... 3P
TOTAL: 6P

3 cys ENCL Rec'd *

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DUKE POWER COMPANY

POWER BUILDING

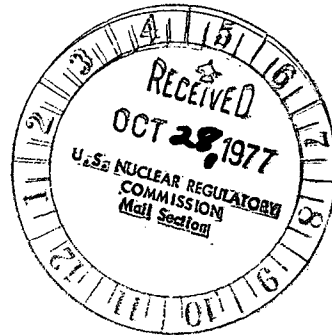
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28201

A. C. THIES
SENIOR VICE PRESIDENT
PRODUCTION AND TRANSMISSION

October 26, 1977

P. O. Box 2178

Mr. Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Reference: Oconee Unit 1
Docket No. 50-269

Dear Sir:

Pursuant to 10CFR50.90, an amendment is requested to Oconee Nuclear Station Facility Operating Licenses DPR-38, -47 and -55 to delete the existing reactor core quadrant power tilt and control rod position limits for Oconee Unit 1 specified in Technical Specifications 3.5.2.4.a and 3.5.2.5.c. The attached Technical Specification revision pages indicate those more conservative limits which will be instituted. The justification for this action is provided in Attachment 2 to this letter.

This change is requested on a prompt basis with approval requested by October 31, 1977.

Very truly yours,

A handwritten signature in cursive script that reads "A. C. Thies".

A. C. Thies

ACT:ge

Attachments

773000286

October 26, 1977

Page 2

A. C. THIES, being duly sworn, states that he is Senior Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this request for amendment of the Oconee Nuclear Station Facility Operating Licenses DPR-38, DPR-47, and DPR-55; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

A. C. Thies

A. C. Thies, Senior Vice President

Subscribed and sworn to before me this 26th day of October 1977.

Vivian B. Robbines

Notary Public

My Commission Expires:

Feb. 15, 1982

ATTACHMENT 1

OCONEE NUCLEAR STATION

PROPOSED TECHNICAL SPECIFICATION REVISION

October 26, 1977

pump operation. Also, excepting physics tests exercising control rods, the axial power shaping control rod insertion/withdrawal limits are specified on figures 3.5.2-4A1, 3.5.2-4A2 and 3.5.2-4A3 (Unit 1); 3.5.2-4B1, 3.5.2-4B2, and 3.5.2-4B3 (Unit 2). If the control rod position limits are exceeded, corrective measures shall be taken immediately to achieve an acceptable control rod position. An acceptable control rod position shall then be attained within two hours. The minimum shutdown margin required by Specification 3.5.2.1 shall be maintained at all times.

d. Except for physics tests, power shall not be increased above the power level cutoff as shown on Figures 3.5.2-1A1, 3.5.2-1A2 and 3.5.2-1A3 (Unit 1), 3.5.2-1B1, 3.5.2-1B2, and 3.5.2-1B3 (Unit 2), and 3.5.2-1C1, 3.5.2-1C2, 3.5.2-1C3 (Unit 3), unless the following requirements are met.

- (1) The xenon reactivity shall be within 10 percent of the value for operation at steady-state rated power.
- (2) The xenon reactivity worth has passed its final maximum or minimum peak during its approach to its equilibrium value for operation at the power level cutoff.

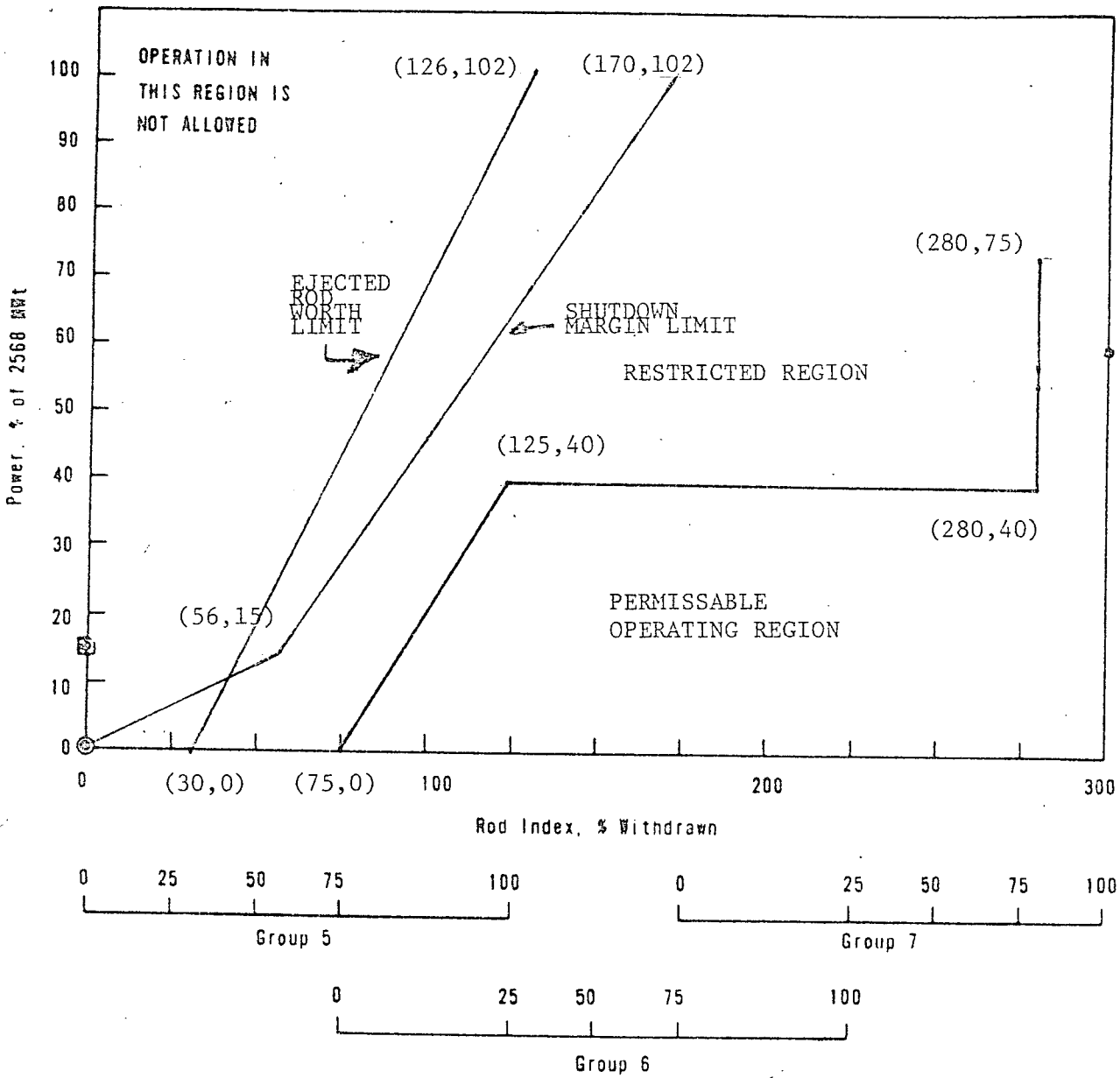
3.5.2.6 Reactor power imbalance shall be monitored on a frequency not to exceed two hours during power operation above 40 percent rated power. Except for physics tests, imbalance shall be maintained within the envelope defined by Figures 3.5.2-3A1, 3.5.2-3A2, 3.5.2-3A3, 3.5.3-3B1, 3.5.2-3B2, 3.5.2-3B3, 3.5.2-3C1, 3.5.2-3C2, and 3.5.2-3C3. If the imbalance is not within the envelope defined by these figures, corrective measures shall be taken to achieve an acceptable imbalance. If an acceptable imbalance is not achieved within two hours, reactor power shall be reduced until imbalance limits are met.

3.5.2.7 The control rod drive patch panels shall be locked at all times with limited access to be authorized by the manager or his designated alternate.

3.5.2.8 For Oconee Unit 1, in the event Specifications 3.5.2.4.a or 3.5.2.5.c are not met, operation shall be restricted as follows:

- a. The core thermal power shall be limited to 75 percent full power.
- b. The nuclear power maximum setpoint shall be 84 percent full power.
- c. The quadrant tilt shall not exceed 6.03 percent.
- d. The regulating control rod insertion/withdrawal limits are specified on Figure 3.5.2-6A1

If any of the above provisions are not met within two hours, the reactor shall be in the hot shutdown condition within an additional 4 hours.



Rod index is the percentage sum of the withdrawal of Groups 5, 6 and 7

ROD POSITION LIMITS FOR
FOUR-PUMP OPERATION FROM 0
TO 100 (± 10) EFPD, UNIT 1
OCONEE NUCLEAR STATION



FIGURE 3.5.2-6A1

ATTACHMENT 2

OCONEE NUCLEAR STATION

JUSTIFICATION FOR PROPOSED REVISION

TO THE

TECHNICAL SPECIFICATIONS

October 26, 1977

JUSTIFICATION FOR PROPOSED REVISIONS
TO THE OCONEE TECHNICAL SPECIFICATIONS

Revisions to the Oconee Nuclear Station Technical Specifications were approved by the NRC on October 4, 1977 to permit the operation of Oconee 1, Cycle 4. Subsequent pre-critical control rod drive trip time tests and zero power critical boron concentrations, temperature reactivity coefficients, and control rod group worth measurements demonstrated that these parameters were within the established acceptance criteria. Ejected rod worth measurements were made of Group 6, rod 4 at core location N-12 which had been predicted to be the highest worth ejected rod. The test showed this rod to have 38% less worth than predicted. The established acceptance criteria for ejected rod worth is $\pm 20\%$ of the predicted value. Three other Group 6 rods located symmetrically to this control rod were then measured for ejected rod worth and all had greater worths than the rod in question, but all were still less than the predicted value.

The data from these measurements also indicated a difference in the worth of symmetric rods. Another series of ejected rod worth measurements were made for each location in the inner ring of Group 6 control rods and these indicated close agreement.

Since all other parameters were within the acceptance criteria and the ejected rod worth measurements were more conservative than predicted, power escalation testing to further evaluate this situation was considered prudent and safe. At the first plateau at 15% full power a core tilt was observed on the out of core detectors. An incore power map was taken which indicated a tilt of approximately $+10\%$ in the WX quadrant and -12% in the YZ quadrant. The positive tilt quadrant contains the rod of maximum measured ejected rod which is consistent with the presence of the tilt. An evaluation of this situation was made to determine possible causes of the tilt. Power escalation to 40% full power was performed to obtain an accurate incore power map and to observe the effects of increased power on the tilt. The results of the power map confirmed the presence of the tilt and showed that the magnitude decreased with power level and the tilt did not appear to be significantly axially dependent.

Numerous verifications have been performed to detect a misloaded fuel assembly, control rod, or orifice rod. Testing has been accomplished designed to detect an uncoupled control rod and/or missing pins on control rods with no significant findings. The integrity of the control rods has been assured by the absence of silver concentrations in the reactor coolant. Also, operation in an all rods out configuration has not significantly reduced the magnitude of the tilt. Reviews have also been conducted of manufacturing and design records and of changes to the initially designed core and these have not revealed the cause of the core tilt.

As permitted by the Oconee Technical Specifications, continued physics testing at the 40 percent plateau is in progress. Escalation to the 75 percent plateau is planned on October 28, 1977 to obtain more information on the core power distribution and on the power dependence of the tilt limitations as outlined in the attached Technical Specifications.

The operating limits provided in the proposed Technical Specification 3.5.2.8 are based on both analysis and measured data. The analyses which established the current quadrant tilt and rod position limits in Specifications 3.5.2.4 and 3.5.2.5 were based on a maximum quadrant tilt of 3.41%, which would produce a maximum power peaking increase of 5.1%. The provision to operate at up to 6.03% quadrant tilt would produce a maximum power peaking increase of 9.0%, or 4% more than originally considered. However, the imbalance limits in Specification 3.5.2.6 applicable to Oconee I, Cycle 4, for the period of 0-100 + 10 EFPD are quite conservative below 90% of full power. Based on maintaining the limits of 3.5.2.6 at and below 75% of full power and on maintaining the rod position limits of 3.5.2.8, the maximum clad temperature in the event of a LOCA will not exceed the Final Acceptance Criteria.

The rod position limits of 3.5.2.8 also provide that the shutdown margin and ejected rod worth criteria are met. The measured hot zero power values of the worth of banks 5-7 and the ejected rod were compared to the predicted values, and the most conservative set of values were used to determine new shutdown margin and ejected rod worth insertion limits. Figure 3.5.2-6A1 shows the interim rod position limits and the shutdown and ejected rod worth insertion limits derived as described above.