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RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director
STOLZ,J.F. Operating Reactors Branch 4

SUBJECT: Forwards modified version of justification of proposed changes to startup physics test procedure for determination of moderator temp coefficient of reactivity provided as Attachment 2 to 850122 ltr.

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February 20, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4

Subject: Oconee Nuclear Station, Unit 2
Docket No. 50-270

Dear Sir:

By a January 22, 1985 letter, Duke Power supplemented the Oconee 2, Cycle 8 reload submittal dated December 19, 1984. The supplement provided details of minor changes to be made in the Oconee Startup Physics Test Program.

Attachment 2 to the January 22nd supplement consisted of a justification of proposed changes to the procedure for determination of the moderator temperature coefficient of reactivity. Following the submittal of the January 22nd supplement, it was found that clarification of certain nomenclature in Attachment 2 would be beneficial.

Accordingly, please find included a modified version of Attachment 2 to the January 22nd submittal. Revised portions are indicated by vertical change bars.

Since the present submittal consists of a revision to a previous supplement, Duke Power considers the license fee for the original December 19, 1984 submittal to be sufficient.

Very truly yours,

H.B. Tucker/BSJ

Hal B. Tucker

RFH:slb

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

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cc: Ms. Helen Nicolaras
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Mr. J. C. Bryant
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2600 Bull Street
Columbis, South Carolina 29201

DUKE POWER COMPANY
OCONEE NUCLEAR STATION

Attachment 2

Justification for Change in MTC Test

JUSTIFICATION FOR CHANGE IN MTC TEST

The equation used to calculate the overall temperature coefficient at 532°F will be:

$$\alpha_{\substack{T\text{overall} \\ (532)}} = \frac{\Delta\rho_{12}}{\Delta T_{12}} + \left[\left(\frac{T_1 + T_2}{2}\right) - 532 \right] \left(\frac{\Delta\alpha_T}{\Delta T}\right)$$

where: $\alpha_{T_{overall}}$ -overall temperature coefficient at 532°F (includes moderator temperature coefficient and isothermal doppler coefficient).

$\frac{\Delta\rho_{12}}{\Delta T_{12}}$ -measured overall temperature coefficient between plateau 1 and plateau 2.

$\left(\frac{T_1 + T_2}{2}\right)$ -average reactor coolant temperature for the test.

and $\left(\frac{\Delta\alpha_T}{\Delta T}\right)$ -predicted temperature rate of change of the overall temperature coefficient.

The predicted temperature rate of change of the overall temperature coefficient will be supplied in the Physics Test Manual each cycle by Duke Power. The factor which dominates the temperature rate of change of the overall temperature coefficient is the rate of change of moderator density with temperature. The rate of change of moderator (water) density with temperature is fairly constant, especially over a small temperature interval. Therefore, this approximation is valid.

Duke Power has supplied the following data for Oconee 2 Cycle 8 in support of this change:

MODERATOR TEMPERATURE	TEMPERATURE COEFFICIENT
522°F	1.250×10^{-5} ΔK/K/°F
532°F	0.157×10^{-5} ΔK/K/°F
542°F	-0.964×10^{-5} ΔK/K/°F

The temperature coefficients at a given temperature are calculated from K-eff at +/- 10°F from that temperature. The temperature rate of change of the temperature coefficient is calculated from these data in a similar manner:

MODERATOR TEMPERATURE	$(\Delta\alpha_T/\Delta T)$
527°F	-1.09×10^{-6} (ΔK/K/°F)/°F
537°F	-1.12×10^{-6} (ΔK/K/°F)/°F

These data can be considered typical.