

FROM: Duke Power Company Charlotte, North Carolina 28201. A. C. Thies		DATE OF DOC: 8-23-72	DATE REC'D 8-28-72	LTR X	MEMO	RPT	OTHER
TO: A. Giambusso		ORIG 3 SIGNED	CC	OTHER	SENT AEC PDR X SENT LOCAL PDR X		
CLASS: <u>U</u> PROP INFO		INPUT	NO CYS REC'D 20	DOCKET NO: 50-269			
DESCRIPTION: Ltr re our 7-26-72 ltr...furnishing info re out-of-core detector system to indicate radical tilts w/attached Figure 1.....			ENCLOSURES: ACKNOWLEDGED Do Not Remove				
PLANT NAMES: Oconee, Unit 1							

FOR ACTION/INFORMATION

BUTLER(L) W/ Copies	KNIEL(L) W/ Copies	VASSALLO(L) W/ Copies	ZIEMANN(L) W/ Copies	KNIGHTON(ENVIRO) W/ Copies
CLARK(L) W/ Copies	✓SCHWENCER(L) W/9 Copies	H. DENTON W/ Copies	CHITWOOD(FM) W/ Copies	YOUNGBLOOD(ENVIRO) W/ Copies
GOLLER(L) W/ Copies	STOLZ(L) W/ Copies	SCHEMEL(L) W/ Copies	DICKER(ENVIRO) W/ Copies	W/ Copies

8-29-72

rht

Misc

INTERNAL DISTRIBUTION

✓REG FILE	TECH REVIEW	✓VOLLMER	HARLESS	WADE (E)
✓AEC PDR	✓HENDRIE	DENTON	F & M	SHAFFER (F&M)
✓OGC, ROOM P-506A	✓SCHROEDER	GRIMES	SMILEY	BROWN (E)
✓MUNTZING/STAFF	✓MACCARY	GAMMILL	NUSSBAUMER	G. WILLIAMS(E)
✓CASE	✓LANGE	KASTNER	LIC ASST.	A/T IND
GIAMBUSSO	✓PAWLICKI	BALLARD	SERVICE (L)	BRAITMAN
BOYD-L(BWR)	✓SHAO	FINE	MASON (L)	SALTZMAN
✓DEYOUNG-L(PWR)	✓KNUTH	ENVIRO	WILSON (L)	PLANS
✓SKOVHOLT-L	✓STELLO	MULLER	KARI (L)	MCDONALD
P. COLLINS	✓MOORE	DICKER	SMITH (L)	DUBE
REG OPR	✓THOMPSON	KNIGHTON	GEARIN (L)	INFO
✓FILE & REGION (2)	✓TEDESCO	YOUNGBLOOD	DIGGS (L)	C. MILES
✓MORRIS	✓LONG	PROJECT LEADER	TEETS (L)	
✓STEELE	✓LAINAS			
	✓BENAROYA			

EXTERNAL DISTRIBUTION

- | | | |
|---------------------------------------|--------------------------|------------------------|
| ✓1-LOCAL PDR Walhalla, South Carolina | | |
| ✓1-DTTE(LAUGHLIN) | (1)(5)(9)-NATIONAL LAB'S | 1-PDR-SAN/LA/NY |
| ✓1-NSIC(BUCHANAN) | ANL/ORNL/PNL | 1-GERALD LELLUCHE |
| 1-ASLB-YORE/SAYRE | 1-R. CARROLL-OC, GT-B227 | BROOKHAVEN NAT. LAB |
| WOODWARD/H. ST. | 1-R. CATLIN, A-170-GT | 1-BOLAND, IDAHO FALLS, |
| ✓16-CYS ACRS HOLDING | 1-CONSULANT'S | IDAHO(50-331 Only) |
| | NEWMARK/BLUME/AGABIAN | 1-RD..MULLER.. F-309GT |

DUKE POWER COMPANY

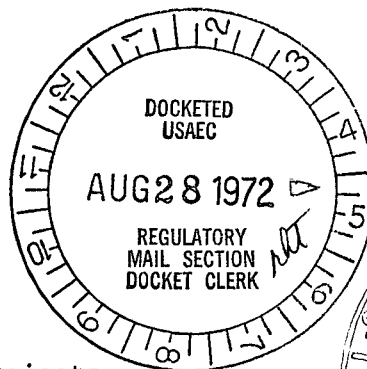
POWER BUILDING

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

A. C. THIES
SENIOR VICE PRESIDENT
PRODUCTION AND TRANSMISSION

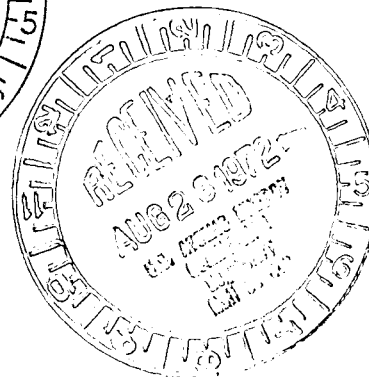
P. O. Box 2178

August 23, 1972



Regulatory

File Cy.



Mr. Angelo Giambusso
Deputy Director for Reactor Projects
Directorate of Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Re: Oconee Nuclear Station
Docket No. 50-269

Dear Mr. Giambusso:

In response to Mr. R. C. DeYoung's letter of July 26, 1972, the following information is provided.

The ability of the out-of-core detector system to indicate radial tilts has been reevaluated by Babcock & Wilcox. This review shows that the limits in technical specification 3.5.2 provide an adequate indication of a potential for exceeding power distribution limits.

Significant radial tilts are not expected to occur. Potential causes of tilts include dropped rods, rods out-of-sequence, xenon oscillations, enrichment variations, misloaded fuel, and inlet temperature mismatch. The effects of enrichment variations are discussed in FSAR Section 3.2.3.2.2. Misloading of fuel is discussed in FSAR Section 3.2.2.2.1(g). Xenon stability is discussed in FSAR Section 3.2.2.2.2. Of the remaining potential causes of radial tilts, misalignment control rods are most significant.

The reactor control system includes several systems to detect misaligned control rods and has both alarm and power runback provisions. Control rod position is indicated by two separate methods at the control console as discussed in FSAR Section 3.2.4.3.2(j). In addition, an alarm is sounded when a control rod deviates more than a preset value from the group and power is run back when a deviation occurs as indicated in technical specifications 3.5.2 and 4.7.1. Indications are also provided for control rods in the fully inserted or withdrawn position.

An additional provision is available for detection of misaligned control rods through radial tilt indication by out-of-core detectors. Present limits in technical specification 3.5.2 specify that if radial tilt exceeds

4738
ES

Mr. Angelo Giambusso
Page 2
August 23, 1972

10 percent, power shall be limited to 80 percent; and if radial tilt exceeds 20 percent, power shall be limited to 60 percent. During normal operation, these limits prevent exceeding design thermal-hydraulic criteria and the ECCS criteria of 17.4 Kw/ft for unpressurized fuel. The most limiting criterion is the ECCS criteria of 17.4 Kw/ft. During normal equilibrium operation at 2568 MW(t) the maximum expected linear heat rate is 14.24 Kw/ft. This gives a margin of 22.2 percent to the ECCS criteria.

The relationship of increased peaking and radial tilts has been investigated for various conditions and plants. Figure 1 presents results for increased peaking as a function of quadrant tilt as indicated by out-of-core detectors for dropped rods and single and multiple rods out of sequence. The magnitude of a radial tilt as indicated by out-of-core detectors depends on the relationship of tilt axis and the out-of-core detectors. A maximum indication is obtained when the tilt axis is aligned with the out-of-core detectors. A minimum indication is obtained when the tilt axis is at an extreme from the out-of-core detector. An uncertainty of 23 percent is included in tilt indication in Figure 1 to account for the potential difference between nominal quadrant tilt and a minimum indication. Figure 1 is then a plot of peaking increase as a function of indication for a minimum indication by out-of-core detectors. The data were determined with "3D" thermal-hydraulic feedback analyses (PDQ-7) with the exception of the dropped rod cases which are from "2D" PDQ-7 analysis. The data are limited by a line with a slope of $1.84 \frac{\Delta(\text{Kw/ft.}\%)}{\Delta(\text{Indic.}\%)}$. Use of this slope would

then require a minimum margin of 18.4 percent at the 10 percent radial tilt indication limit during normal operation. The ECCS criteria could be exceeded at a quadrant tilt indication of 12.2 percent.

The minimum system of incore detectors as specified in technical specification 3.5.4 has been investigated for the same perturbations. The limiting slope is $1.59 \frac{\Delta(\text{Kw/ft.}\%)}{\Delta(\text{Indic.}\%)}$ requiring a minimum margin of 15.9 percent to the ECCS criteria of 17.4 Kw/ft in normal operation. The ECCS criteria could potentially be exceeded at an incore indication of 13.9 percent.

Either the out-of-core detector system or the minimum system of incore detectors provide an adequate indication of a potential for exceeding safety limits at the present technical specification limit of 10 percent.

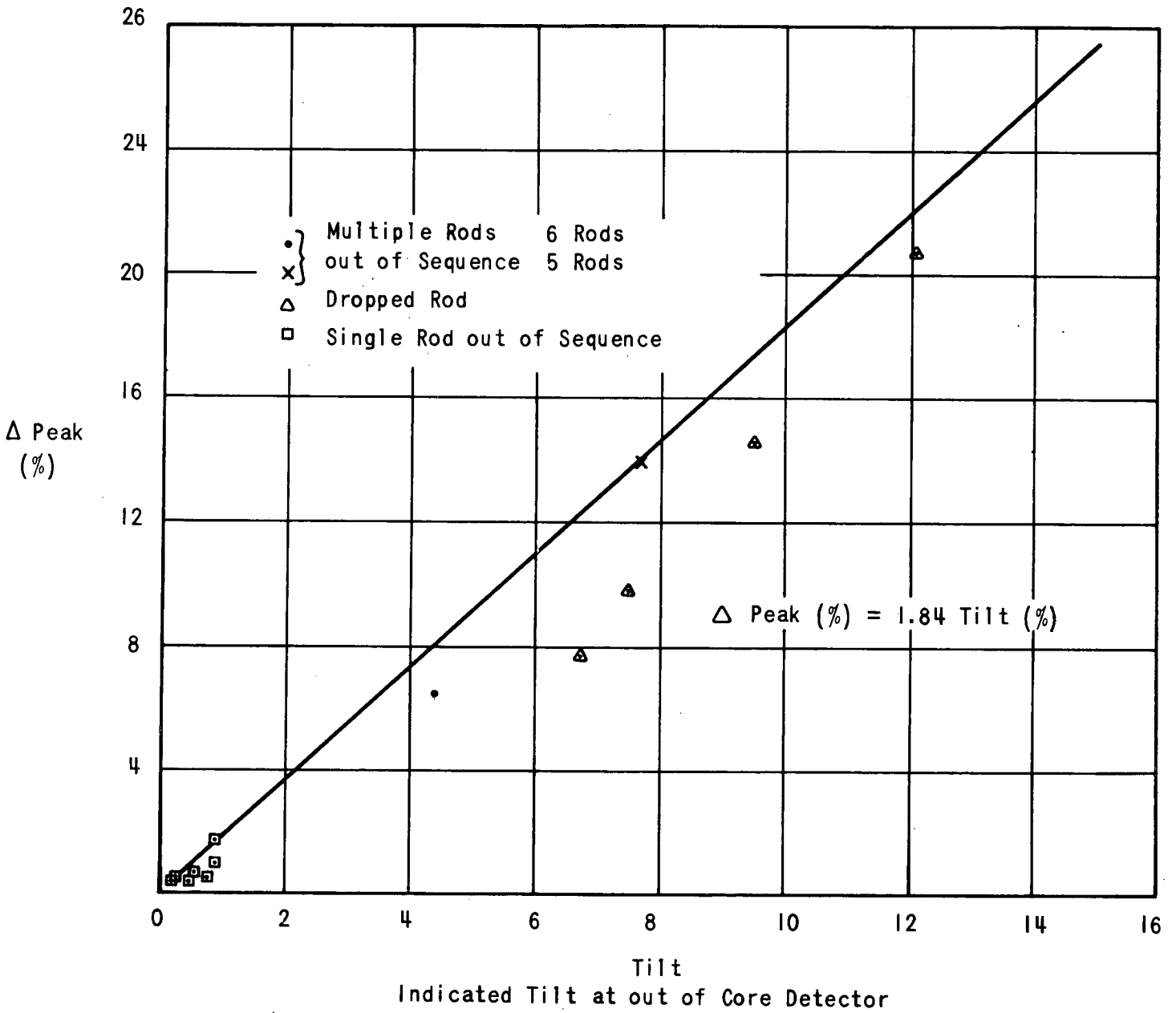
Please advise if you require further information.

Very truly yours,



A. C. Thies

ACT:vr



PERCENT CHANGE IN PEAK POWER
VS PERCENT CHANGE IN RADIAL TILT

Figure 1

OK Central file

DUKE POWER COMPANY
POWER BUILDING, BOX 2178, CHARLOTTE, N. C. 28201

WILLIAM S. LEE
SENIOR VICE PRESIDENT,
ENGINEERING AND CONSTRUCTION

57-269

June 22, 1972

Mr Lawrence D Low
Acting Director, Regulatory Operations
U S Atomic Energy Commission
Washington, D C 20545

Re: Oconee 1-3
CP's 50-269, -270 & -287

Dear Mr Low:

In accordance with 10CFR50.55(e), this is to give you preliminary notice of a matter that may be a reportable deficiency pending the results of a full investigation now under way.

As I advised the Regional Director by telephone on June 6, 1972, that morning we learned that some X-ray film of pipe welds had been marked with a pencil in such a way as to obscure the true penetrameter reading. Through professionally-conducted interrogation of personnel, we have determined that the marking was done by one individual, and no others. We are undertaking a program of investigation to re-examine all film, to cleanse film where marks are found under procedures developed by the film manufacturer, and to repeat NDT procedures in such instances where valid penetrameter readings may not be obtainable. Our program and all procedures thereunder will be fully documented and a report prepared of results. We cannot give you a schedule of completion until we are further into the program, but we will keep your inspector fully advised of our progress.

Yours very truly,



W S Lee

WSL/s

cc Mr John G Davis, Regional Director, AEC, Atlanta, Ga
Mr Carl Horn, Jr, President, Duke Power
Mr B B Parker, Executive Vice President, Duke Power

Rec'd Off. Dir. of Reg. 1
Date 6/27/72 *W.S.L.*
Time 8:45 *Apex*