AEC DISTRIBUTION FOR PART 50 DOCKET MATERIAL
(TEMPORARY FORM)

CONTROL NO: 10564

FILE:

FROM: Duke Power Company Charlotte, N.C. 28201 Mr. A.C. Thies	DATE OF DOC 10-8-74	DATE REC'D 10-11-74	LTR X	TWX	RPT	OTHER
TO: A. Giambusso	ORIG 1 signed	CC	OTHER	SENT AEC PDR XXX SENT LOCAL PDR XXX		
CLASS	UNCLASS XXX	PROP INFO	INPUT	NO CYS REC'D 40	DOCKET NO: 50-269	

DESCRIPTION:

Ltr re their 9-20-74 ltr...concerning their proposed change to tech specs...trans the following...

PLANT NAME: Oconee #1

ENCLOSURES:

Corrections to the BAW-1409 report submitted with their 9-20-74 submittal....

ACKNOWLEDGED
(40 cys encl rec'd)

DO NOT REMOVE

FOR ACTION/INFORMATION
10-11-74 JB

BUTLER (L)
W/ Copies
CLARK (L)
W/ Copies
PARR (L)
W/ Copies
KNIEL (L)
W/ Copies

SCHWENCER (L)
W/ Copies
STOLZ (L)
W/ Copies
VASSALLO (L)
W/ Copies
[✓ PURPLE (L)]
W/ 9 Copies

ZIEMANN (L)
W/ Copies
DICKER (E)
W/ Copies
KNIGHTON (E)
W/ Copies
YOUNGBLOOD (E)
W/ Copies

REGAN (E)
W/ Copies
LEAR (L)
W/ Copies
W/ Copies
W/ Copies

INTERNAL DISTRIBUTION

[✓ REG FILE]
[✓ ~~AEC PDR~~]
[✓ OGC, ROOM P-506A]
[✓ MUNTZING/STAFF]
CASE
GIAMBUSSO
BOYD
MOORE (L) (BWR)
DEYOUNG (L) (PWR)
SKOVHOLT (L)
[✓ GOLLER (L)]
P. COLLINS
DENISE
[✓ REG OPR]
FILE & REGION (3)
MORRIS
STEELE

TECH REVIEW
SCHROEDER
MACCARY
KNIGHT
PAWLICKI
SHAO
STELLO
HOUSTON
NOVAK
ROSS
IPPOLITO
TEDESCO
LONG
LAINAS
BENAROYA
VOLIMER

DENTON
GRIMES
GAMMILL
KASTNER
BALLARD
SPANGLER

ENVIRO
MULLER
DICKER
KNIGHTON
YOUNGBLOOD
REGAN
[✓ PROJECT LDR]
Scaletti
HARLESS

LIC ASST
DIGGS (L)
GEARIN (L)
GOULBOURNE (L)
KREUTZER (E)
LEE (L)
MAIGRET (L)
REED (E)
SERVICE (L)
[✓ SHEPPARD (L)]
SLATER (E)
SMITH (L)
TEETS (L)
WILLIAMS (E)
WILSON (L)

A/T IND
BRAITMAN
SALTZMAN
B. HURT

PLANS
MCDONALD
CHAPMAN
DUBE w/input
E. COUPE
[✓ Schemel]
D. THOMPSON (2)
KLECKER
EISENHUT

EXTERNAL DISTRIBUTION
LB

[✓ 1 – LOCAL PDR Walhalla, S.C.]
[✓ 1 – TIC (ABERNATHY)]
[✓ 1 – NSIC (BUCHANAN)]
1 – ASLB
1 – Newton Anderson
[✓ 16 – ACRS ~~HOLDING~~] Sent to Sheppard 10-11-74

(1)(2)(10) – NATIONAL LABS
1 – ASLBP(E/W Bldg, Rm 529)
1 – W. PENNINGTON, Rm E-201 GT
1 – B&M SWINEBROAD, Rm E-201 GT
1 – CONSULTANTS NEWMARK/BLUME/AGBABIAN

1 – PDR-SAN/LA/NY
1 – BROOKHAVEN NAT LAB
1 – G. ULRIKSON, ORNL
1 – AGMED (RUTH GUSSMAN) Rm B-127 GT
1 – R. D. MUELLER, Rm E-201 GT

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

October 8, 1974

RECEIVED
OCT 11 1974
U.S. ATOMIC ENERGY COMMISSION
Regulation
Mail Section

Mr. Angelo Giambusso
Deputy Director for Reactor Projects
Directorate of Licensing
Office of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Re: Oconee Unit 1
Docket No. 50-269

Dear Mr. Giambusso:

In my letter of September 20, 1974, which proposed certain changes in the Oconee Nuclear Station Technical Specifications for operation of Oconee Unit 1, Cycle 2, I enclosed Babcock and Wilcox Report BAW-1409 which contained the supporting safety analyses. Certain typographical errors have been discovered in BAW-1409 since its distribution.

Please correct your copies of BAW-1409 by inserting the attached replacement pages.

Very truly yours,

ACThies

A. C. Thies

ACT:vr

Attachment

DOCKETED
USAEC
OCT 11 1974
REGULATORY
MAIL SECTION
DOCKET CLERK

10564

Table 2-2. Oconee 1 Cycle 2 Physics Paramters

	Cycle 2	Cycle 1
Cycle length, EFPD	290	310
Cycle burnup, MWd/mtU	9,000	9,600
Average core burnup - EOC, MWd/mtU	14,550	9,600
Initial core loading, mtU	82.6	82.9
Critical boron — BOC, ppm		
HZP - all rods out	1,285	1,476
HZP - banks 7 and 8 inserted	1,159	1,335
HFP - banks 7 and 8 inserted	1,028	1,230
Critical boron — EOC, ppm		
HZP - all rods out	285	405
HFP - bank 8 (37.5% wd, equil Xe)	75	210
Control rod worths — HFP, BOC, %Δk/k		
Banks 1-7 (bank 8, 37.5% wd)	10.30	11.41
Bank 6	1.12	1.17
Bank 7	1.14	1.18
Bank 8 (37.5% wd)	0.36	0.55
Control rod worths — HFP, EOC, %Δk/k		
Banks 1-7	11.20	10.13
Bank 7	1.97	1.24
Bank 8 (37.5% wd)	0.41	0.49
Ejected rod worth — HFP, %Δk/k		
EOC	0.35	0.32
BOC	0.25	0.23
Stuck rod worth — HZP, %Δk/k		
BOC	2.55	2.20
EOC	1.96	1.69
Power deficit, HZP to HFP, %Δk/k		
BOC	-1.34	-1.09
EOC	-1.99	-1.78
Power Doppler coeff - BOC, 10^{-4}(%Δk/k-% power)		
100% power (0 Xe)	-0.99	-0.99
95% power (0 Xe)	-1.01	-1.00
75% power (0 Xe)	-1.03	-1.05
40% power (0 Xe)	-1.03	-1.14
Power Doppler coeff - EOC, 10^{-4}(%Δk/k-% power)		
95% power (equil Xe)	-1.15	-1.14
Moderator coeff — HFP, 10^{-4} (%Δk/k-°F)		
BOC (0 Xe, 1000 ppm)	-0.79	-0.12
EOC (equil Xe, 17 ppm)	-2.35	-2.27
Boron worth — HFP, ppm/%Δk/k		
BOC (1000 ppm)	97.0	84.0
EOC (17 ppm)	91.0	82.0
Xenon worth — HFP, %Δk/k		
BOC (4 days)	2.64	2.77
EOC (equilibrium)	2.69	2.74

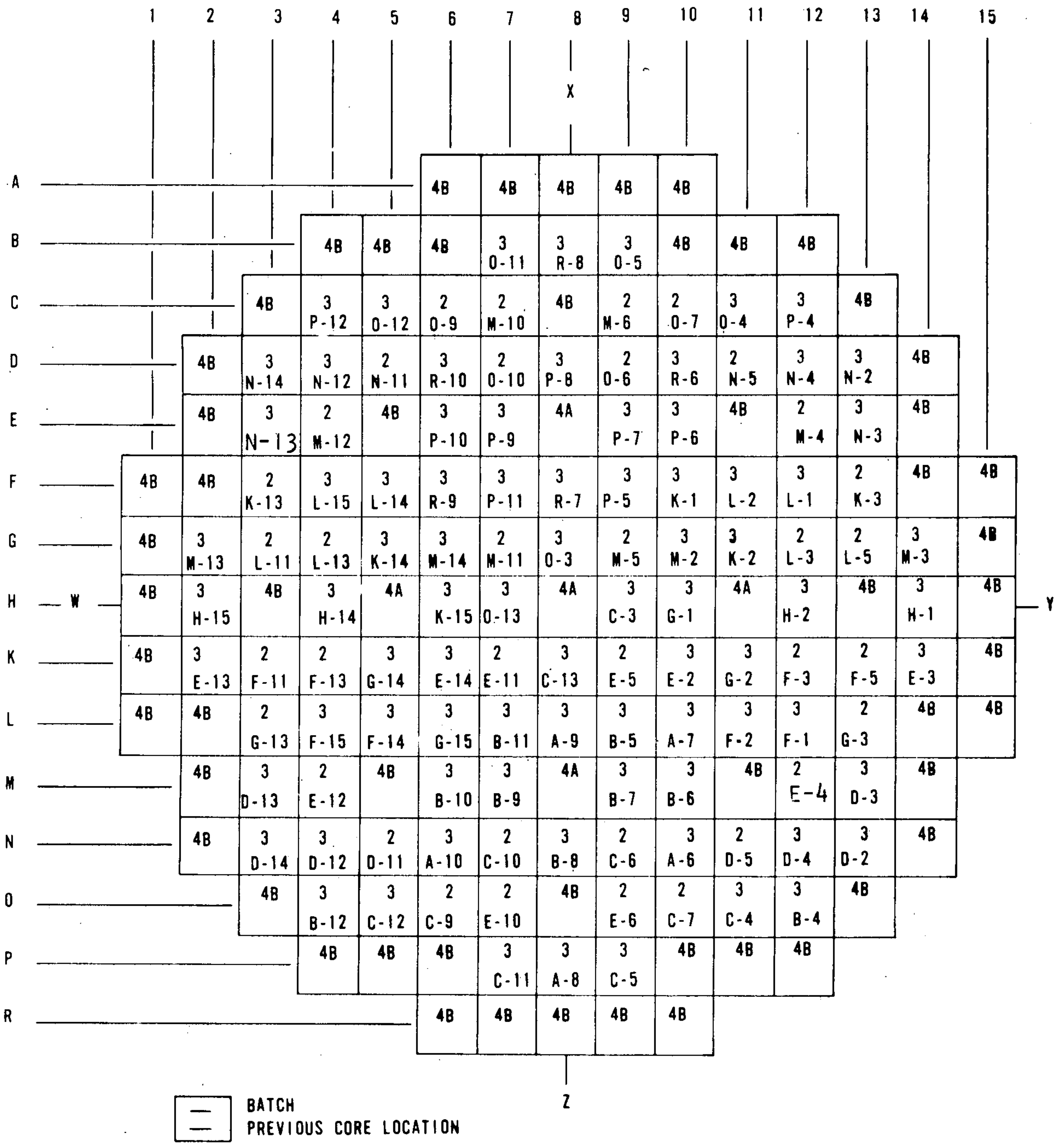
Table 2-3. Shutdown Margin Calculation — Oconee 1, Cycle 2

	BOC, %ΔP	EOC, %ΔP*
1. Available Rod Worth		
Total rod worth, HFP**	10.30	11.00
Worth reductions		
Poison material burnup	10.16	10.64
HFP to HZP	8.53	8.94
Stuck rod worth (HZP)	2.55	1.96
Net	5.98	6.98
10% uncertainty	0.60	0.70
a. Total available rod worth	5.38	6.28
2. Required Rod Worth		
Power deficit, HFP to HZP	1.34	1.99
Inserted rod worth, HZP	1.05	1.89
Flux redistribution	0.40	1.00
a. Total required worth	2.79	4.88
Shutdown Margin (1a - 2a)	2.59	1.40

*For shutdown margin calculations this is defined as ∿265 FPD, the time at which the transient control rod group (7) begins to move out of the core.

**HFP denotes Hot, Full Power
HZP denotes Hot, Zero Power

Figure 2-1. Cycle 2 - Core Loading Diagram



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A						4B	4B	4B	4B	4B					
B				4B	4B	4B	3 O-11	3 R-8	3 O-5	4B	4B	4B			
C			4B	3 P-12	3 O-12	2 O-9	2 M-10	4B	2 M-6	2 O-7	3 O-4	3 P-4	4B		
D		4B	3 N-14	3 N-12	2 N-11	3 R-10	2 O-10	3 P-8	2 O-6	3 R-6	2 N-5	3 N-4	3 N-2	4B	
E		4B	3 N-13	2 M-12	4B	3 P-10	3 P-9	4A	3 P-7	3 P-6	4B	2 M-4	3 N-3	4B	
F	4B	4B	2 K-13	3 L-15	3 L-14	3 R-9	3 P-11	3 R-7	3 P-5	3 K-1	3 L-2	3 L-1	2 K-3	4B	4B
G	4B	3 M-13	2 L-11	2 L-13	3 K-14	3 M-14	2 M-11	3 O-3	2 M-5	3 M-2	3 K-2	2 L-3	2 L-5	3 M-3	4B
H	4B	3 H-15	4B	3 H-14	4A	3 K-15	3 O-13	4A	3 C-3	3 G-1	4A	3 H-2	4B	3 H-1	4B
K	4B	3 E-13	2 F-11	2 F-13	3 G-14	3 E-14	2 E-11	3 C-13	2 E-5	3 E-2	3 G-2	2 F-3	2 F-5	3 E-3	4B
L	4B	4B	2 G-13	3 F-15	3 F-14	3 G-15	3 B-11	3 A-9	3 B-5	3 A-7	3 F-2	3 F-1	2 G-3	4B	4B
M		4B	3 D-13	2 E-12	4B	3 B-10	3 B-9	4A	3 B-7	3 B-6	4B	2 E-4	3 D-3	4B	
N		4B	3 D-14	3 D-12	2 D-11	3 A-10	2 C-10	3 B-8	2 C-6	3 A-6	2 D-5	3 D-4	3 D-2	4B	
O			4B	3 B-12	3 C-12	2 C-9	2 E-10	4B	2 E-6	2 C-7	3 C-4	3 B-4	4B		
P				4B	4B	4B	3 C-11	3 A-8	3 C-5	4B	4B	4B			
R						4B	4B	4B	4B	4B					

BATCH
PREVIOUS CORE LOCATION

2. The option in the code for no restructuring of fuel has been used in the analysis presented here in accordance with AEC's interim evaluation of TAFY.[8]

3. The calculated gap conductance is reduced by 25% by the code, also in accordance with AEC's interim evaluation of TAFY.[8]

All fuel lots were inspected for average and LTL density and diameter values. Each lot was then evaluated as to its limiting linear heat rate in accordance with reference 4. As a result, three assemblies will be selectively loaded as described in section 2.4.

3.1.5. Summary

This analysis assumes that densification and associated phenomena will affect the hot channel, which has the most limiting thermal-hydraulic characteristics in the core. In addition, the power spike is assumed to be located at the hot channel position that minimizes the DNBR. The resultant 5.4% DNBR loss, or 3.0% reduction in power peaking margin, will be compensated by changes in the Technical Specifications, so that the plant can function at rated power without violating the initial design criteria for DNBR and/or fuel melting.

Table 3-1 compares thermal-hydraulic operating conditions for cycles 2 and 1.

3.2. Nuclear Analysis

The RPS power/imbalance limits (DNBR and centerline fuel melt protection) and the operational limits (administrative LOCA kW/ft controls) have been established for cycle 2 operation according to the methods and procedures described in BAW-10079[3] and BAW-1388[2]. Following is a summary of cycle 2 design parameters utilized in the analysis:

Parameter	Cycle 2 value
Fuel melt limit, kW/ft	20.15
DNB peaking margin penalty due to densification, %	-3.0
Overpower, % of 2568 MWt	112
Densified nominal heat rate at 100% power, kW/ft	5.80
Power spike factor	Figure 3-2
Nuclear power peaking uncertainty	1.075
LOCA limit, kW/ft	Figure 3-8