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 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250  
 50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251  
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 WOODY, C. O. Florida Power & Light Co.  
 RECIP. NAME RECIPIENT AFFILIATION  
 THOMPSON, H. L. Division of Pressurized Water Reactor Licensing - A (post 8

SUBJECT: Forwards info providing basis for vessel fluence used in resistance temp pressurized thermal shock projections, in response to 10CFR50.61(6)(1).

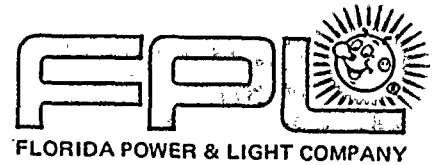
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JUNE 05 1986

L-86-214

Office of Nuclear Reactor Regulation  
Attention: Mr. Hugh L. Thompson, Jr, Director  
Division of PWR Licensing - A  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Thompson:

Re: Turkey Point Units 3 and 4  
Docket Nos. 50-250 and 50-251  
10 CFR 50.61 (b) (1) Report

In order to facilitate your review of the projected Turkey Point Units 3 and 4 RT (PTS) values submitted by Florida Power & Light Company on January 23, 1986 (FPL Letter L-86-09) in response to 10 CFR 50.61 (b) (1), the basis and assumptions for these projections are provided herein.

A copy of this letter and data has also been transmitted to Dr. John Carew of Brookhaven National Laboratory, who is assisting the NRC in the review of our submittal.

Should you have any questions, please contact Mr. Ed Knuckles at (305) 552-3444.

Very truly yours,

C. O. Woody  
Group Vice President  
Nuclear Energy

COW/TCG/cab

Attachment

cc: Dr. John Carew  
Brookhaven National Laboratory  
Department of Nuclear Energy  
Building 475B  
Upton, N. Y. 11973

Harold F. Reis, Esquire  
Dr. J. Nelson Grace, NRC Region II

TCG5/004/I

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The following information is the basis for the vessel fluence used in the Turkey Point Units 3 and 4 RT (PTS) projections.

<u>TABLE #</u>	<u>DESCRIPTION</u>
1	Key Factors of Vessel Fluence Calculation
2	PTP (3,10) Assembly I Cycle Average Axial Power Data
3	PTP (4,10) Assembly I Cycle Average Axial Power Data

<u>FIGURE #</u>	<u>DESCRIPTION</u>
1	PTP (3,10) Core Cycle Average Radial Power Map
2	PTP (4,10) Core Cycle Average Radial Power Map
3	Location of Assembly I For Assembly Axial Power Data



### TABLE 1

The key factors used in the vessel fluence calculations for both units are:

1. Plant License Year: April 27, 2007
2. Plant Loading Factor: 80%
3. Plant-specific time dependent operating spectra.
4. The reactor vessel flux for both plants ( $E \geq 1.0$  MeV) was calculated using DOT 4.3.

The following information summarizes the key aspects used in the calculation.

- a. A single set of material number densities and plant geometry was used.
- b. Effective neutron source region used, i.e., a fraction of the whole homogeneous core region as shown in Figure 3.
- c. The basic neutron source data was obtained from the cycle-specific PDQ-7 pin power files.
- d. An optimized coordinate systems transformation between the PDQ-7 X-Y geometry and the DOT4.3 R-O geometry.
- e. A Mixed (U+PU) core neutron source normalization factor.
- f. A  $P_3$ -scattering cross section and a  $S_8$  symmetrical quadratures.
- g. FPL three-dimensional (3-D) flux synthesis technique for reactor vessel critical weld flux-reduction scheme used.

TABLE 2

## TURKEY POINT UNIT 3 CYCLE 10

CYCLE AVERAGE ASSEMBLY AXIAL NODAL POWER

<u>DISTANCE (INCH)</u>	<u>NODE #</u>	<u>RELATIVE POWER DENSITY (RPD)</u>
141	24	0.165
135	23	0.250
129	22	0.288
123	21	0.302
117	20	0.310
111	19	0.312
105	18	0.313
99	17	0.312
93	16	0.310
87	15	0.308
81	14	0.300
75	13	0.270
69	12	0.193
63	11	0.171
57	10	0.162
51	9	0.161
45	8	0.170
39	7	0.190
33	6	0.268
27	5	0.292
21	4	0.296
15	3	0.285
9	2	0.250
3	1	0.175





TABLE 3

TURKEY POINT UNIT 4 CYCLE 10

CYCLE AVERAGE ASSEMBLY AXIAL NODAL POWER

<u>DISTANCE</u> <u>(INCH)</u>	<u>NODE</u> <u>#</u>	<u>RELATIVE POWER</u> <u>DENSITY (RPD)</u>
138	12	0.22
126	11	0.29
114	10	0.31
102	9	0.32
90	8	0.31
78	7	0.30
66	6	0.23
54	5	0.22
42	4	0.22
30	3	0.22
18	2	0.27
6	1	0.22

FIGURE 1

TURKEY POINT UNIT 3 CYCLE 110

CORE CYCLE AVERAGE RADIAL POWER DISTRIBUTION

32,423	31,315	31,328	18,684	38,450	27,244	27,253	34,732
16,494	15,639	15,239	0.0	24,304	10,277	15,239	31,252
15,929	15,676	16,089	18,684	14,146	16,967	12,014	3,480
1.123	1.105	1.134	1.317	0.997	1.196	0.847	*0.257
31,402	18,311	31,253	32,138	18,507	29,624	14,868	33,643
15,737	0.0	15,276	15,418	0.0	12,467	0.0	30,120
15,665	18,311	15,977	26,720	18,507	17,157	14,868	3,523
1.104	1.291	1.126	1.179	1.305	1.210	1.048	*0.261
31,268	31,178	37,593	18,949	32,074	28,474	12,561	
15,147	15,173	22,011	0.0	15,244	11,963	0.0	
16,121	16,005	15,582	18,949	16,830	16,511	12,561	
1.137	1.128	1.099	1.336	1.187	1.164	0.886	
18,708	32,253	19,009	42,941	18,360	14,813	36,027	
0.0	15,529	0.0	27,752	0.0	0.0	30,677	
18,708	16,724	19,009	15,189	18,360	14,813	5,350	
1.319	1.179	1.340	1.071	1.294	1.044	0.377	
38,466	18,539	32,061	18,479	23,986	34,585		
24,304	0.0	15,143	0.0	10,176	28,538		
14,162	18,539	16,918	18,479	13,810	6,047		
0.998	1.307	1.193	1.303	0.974	0.426		
27,247	29,584	28,658	14,947	34,658			
10,277	12,405	12,127	0.0	28,564			
16,970	17,179	16,531	14,947	6,094			
1.196	1.211	1.165	1.054	0.430			
27,131	14,824	12,601	29,736				
15,147	0.0	0.0	24,326				
11,984	14,824	12,601	5,410				
0.845	1.045	0.888	0.381				
34,682	34,596						
31,252	31,192						
3,430	3,404						
*0.254	*0.252						

a a a
b b b
c c c
d d d

EOC Burnup

BOC Burnup

EOC-BOC Burnup

RPD

\*RPD includes a correction factor of 1.049 from cycle average pin power data.

CYCLE BURNUP

14,184 MWD/MTU

CYCLE LENGTH

11,140 EFPD



FIGURE 2

TURKEY POINT UNIT 4 CYCLE 10

CORE CYCLE AVERAGE RADIAL POWER DISTRIBUTION

37,349	26,761	32,762	18,878	34,030	26,859	21,905	45,496
21,883	9,007	17,922	0.0	19,175	9,120	7,479	41,785
15,466	17,754	14,840	18,878	14,855	17,739	14,426	3,711
1.082	1.242	1.038	1.320	1.039	1.241	1.009	*0.265
26,323	17,564	25,464	33,069	18,148	26,270	15,502	37,363
8,484	0.0	8,245	18,281	0.0	8,913	0.0	33,790
17,839	17,564	17,219	14,788	18,148	17,357	15,502	3,573
1.248	1.228	1.204	1.034	1.269	1.214	1.084	*0.255
32,815	25,541	36,655	18,407	32,863	16,095	12,826	
17,993	8,345	21,297	0.0	17,724	0.0	0.0	
14,822	17,196	15,358	18,407	15,139	16,095	12,826	
1.037	1.203	1.074	1.287	1.059	1.126	0.897	
18,896	33,105	18,413	26,399	17,939	15,601	32,190	
0.0	18,312	0.0	8,316	0.0	0.0	26,569	
18,896	14,793	18,413	18,083	17,939	15,601	5,621	
1.322	1.035	1.288	1.265	1.255	1.091	0.393	
34,095	18,194	32,893	17,924	21,976	25,212		
19,175	0.0	17,741	0.0	7,548	18,826		
14,920	18,194	15,152	17,924	14,428	6,386		
1.044	1.272	1.060	1.254	1.009	0.447		
26,445	26,381	16,143	15,662	25,262			
8,509	8,970	0.0	0.0	18,879			
17,936	17,411	16,143	15,662	6,383			
1.254	1.218	1.129	1.095	0.446			
21,944	15,513	12,877	30,623				
7,479	0.0	0.0	24,832				
14,465	15,513	12,877	5,791				
1.012	1.085	0.901	0.405				
45,526	35,347						
41,839	31,868						
3,687	3,479						
*0.263	*0.248						

a	a	a
b	b	b
c	c	c
d	d	d

EOC Burnup  
BOC Burnup  
EOC-BOC Burnup  
RPD

\*RPD includes a correction factor of 1.021  
from cycle average pin power data.

CYCLE BURNUP

14,298 MWD/MTU

CYCLE LENGTH

11,207 EFPD (actual 10,779 EFPD has  
been used in fluence  
calculation)

# TURKEY POINT REACTOR VESSEL MODEL

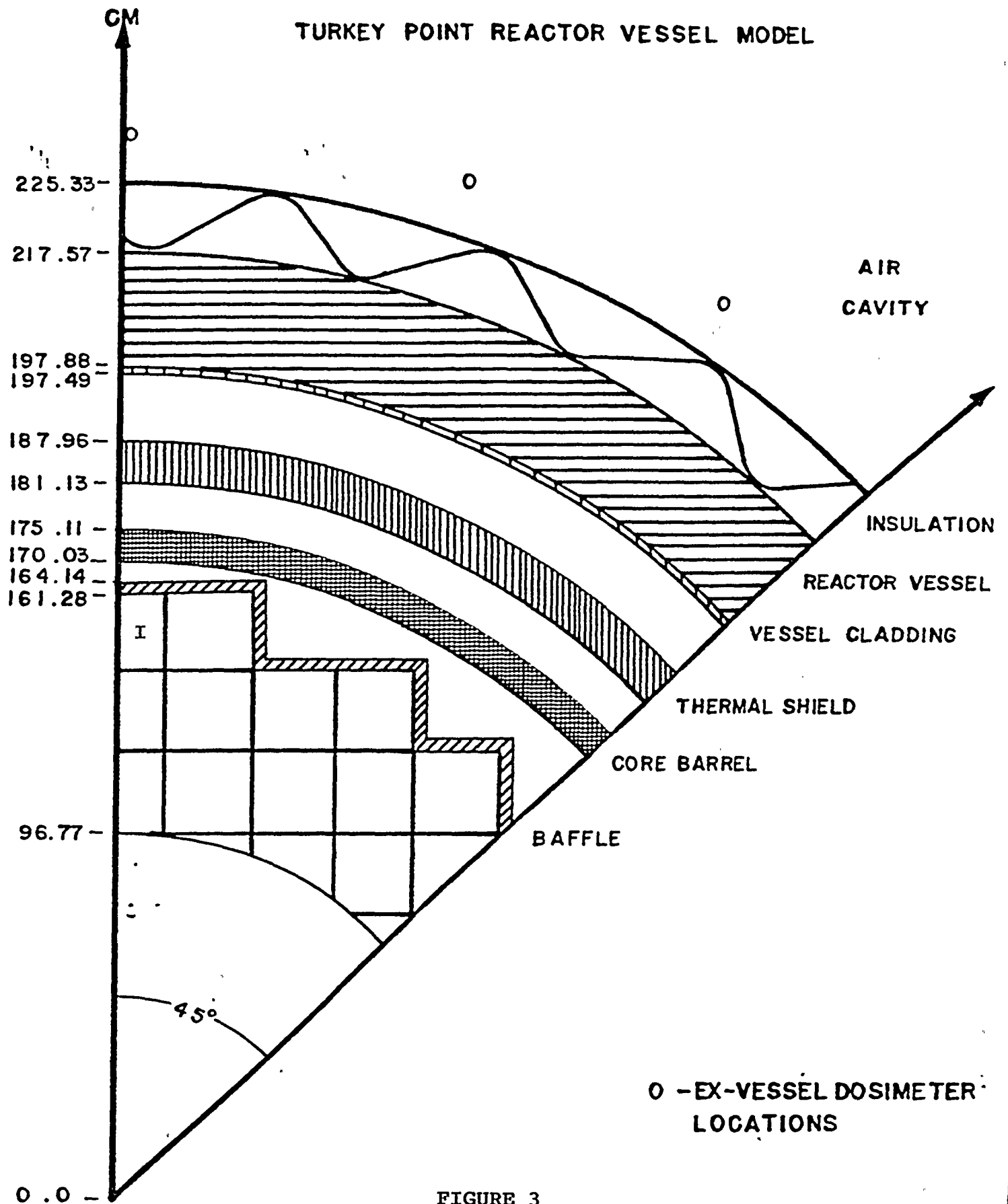


FIGURE 3

