REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8607280057 DOC. DATE: 86/07/22 NOTARIZED: NO DOCKET #
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

AUTH. NAME AUTHOR AFFILIATION
WOODY, C. O. Florida Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION
MCDONALD, D. G. PWR Project Directorate 2

SUBJECT: Forwards responses to 860616 request for addl info re resistor temp for pressurized thermal shock projected values.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PWR-A EB	1	1	PWR-A EICSB	2	2
	PWR-A FOB	1	1	PWR-A PD2 LA	1	0
	PWR-A PD2 PD 01	5	5	McDONALD, D	1	1
	PWR-A PSB	1	1	PWR-A RSB	1	1
INTERNAL:	ADM/LFMB	1	0	ELD/HDS4	1	0
	NRR/ORAS	1	0	REG FILE 04	1	1
	RGN2	1	1			
EXTERNAL:	EG&G BRUSKE, S	1	1	LPDR 03	1	1
	NRC PDR 02	1	1	NSIC 05	1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 22 ENCL 18

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8607280087 DOC.DATE: 86/07/22 NOTARIZED: NO DOCKET #
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
AUTH.NAME AUTHOR AFFILIATION
WOODY, C.O. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
MCDONALD, D. PWR Project Directorate 2

SUBJECT: Forwards responses to 860516 request for addl info re reactor temp for pressurized thermal shock projected values.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR _ ENCL _ SIZE: ___
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PWR-A EB	1	1	PWR-A EICSB	2	2
	PWR-A FOB	1	1	PWR-A PD2 LA	1	0
	PWR-A PD2 PD 01	5	5	McDONALD, D	1	1
	PWR-A PSB	1	1	PWR-A RSB	1	1
INTERNAL:	ADM/LFMB	1	0	ELD/HDS4	1	0
	NRR/ORAS	1	0	REG FILE 04	1	1
	RGN2	1	1			
EXTERNAL:	EG&G BRUSKE,S	1	1	LPDR 03	1	1
	NRC PDR 02	1	1	NSIC 05	1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 22 ENCL [illegible]

FLORIDA POWER & LIGHT COMPANY

JUL 2 2 1986
L-86-303

Office of Nuclear Reactor Regulation
Attn: Mr. D. G. McDonald, Project Manager
PWR Project Directorate #2
Division of PWR Licensing - A
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. McDonald:

RE: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Request for Additional Information
10 CFR 50.61(b)(1) Report
NRC TAC Nos. 59992 and 59993

The attached information is provided in response to your June 16, 1986 request for additional information to support your review of the projected Turkey Point Units 3 and 4 RT (PTS) values submitted by Florida Power & Light on January 23, 1986 (FPL Letter L-86-09).

If you have any further questions, please call us.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/PLP/eh

attachment

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

Harold F. Reis, Esquire
Dr. J. Nelson Grace, NRC Region II
PNS-LI-86-220

L4:1

A001
1/1

Question 1

The initial Westinghouse vessel fluence calculational methodology employed P-1 rather than P-3 cross-sections. In some cases, this simplification resulted in approximately 16% underprediction of the vessel inner-wall fluence. Is this approximation implicit in the FPL fluence analysis (e.g., Cycles 1-7)?

Response

The initial Westinghouse (W)vessel fluence calculational methodology employed the P-1 scattering cross-section approximation. These cross-sections were generated with the (W) version of the GAMBIT code system. The basic nuclear data was ENDF/B2 file. The APPROPOS and ANISN codes were used to collapse fine groups to broad groups. However, the FPL fluence analysis uses FPL's version of the BUGLE-80 cross-section library, which contains only 27-group (>0.1 MeV) P-3 neutron scattering cross-sections. Therefore, FPL does not expect significant fluence underpredictions.

Question 2

In Table-2 of the January FPL submittal, the present (January, 1986) TP-3 fluence is approximately 6% higher than the corresponding TP-4 fluence, while the fluences for TP-3 and TP-4 are essentially identical at EOL (2007). Since the two plants are using the same fluence reduction method, what is the cause of this difference?

Response

The projected intermediate to lower girth weld (critical weld) fluence at EOL (2007) consists of three fluence terms. They are previous cycles fluence term, current cycle fluence term, and future cycles fluence term. Summation of the three fluence terms equals the projected fluence at EOL (2007). The following table lists the 3 fluence terms:

Plant	Cycles 1-9 Fluence	Current Cycle 10 Fluence	Current Cycle 10 EOC Date (planned)	Remaining Time Factor (EFPY)	Future Fluence (End of Current Cycle 10 through 2007)
TP-3	1.24(19)	6.57(17)	Jan. 3, 1987	16.25	8.40(18)
TP-4	1.12(19)	6.98(17)	Jan. 4, 1986	17.05	9.67(18)

The TP-3 fluence at EOL (2007) is
1.24(19) + 6.57(17) + 8.40(18) = 2.15(19)

The TP-4 fluence at EOL (2007) is
1.12(19) + 6.98(17) + 9.67(18) = 2.16(19)

Based upon our fluence calculational method described above, both units fluences at EOL (2007) are almost identical at present projection.

Question 3

What are the cycle lengths for Turkey Point Unit 4 Cycles 1-7?

Response

The cycle lengths for Turkey Point Unit 4 Cycles 1-7 are presented below:

Plant	Cycle	EFPH*	Cumulative EFPH	Cumulative EFPY**
TP-4	1	10,277	10,277	1.17
	2	6,390	16,667	1.90
	3	5,792	22,459	2.56
	4	7,487	29,946	3.42
	5	3,300	33,246	3.80
	6	10,078	43,324	4.95
	7	6,200	49,524	5.65

* EFPH = Effective Full Power Hour
**EFPY = Effective Full Power Year

1 EFPY = 8760 EFPH

Question 4

Is the fluence reduction factor relative to Cycle 7 or Cycle 8? What is the fast (greater than 1 MeV) flux at the inner-wall (intermediate to) lower girth weld, the corresponding axial factor-P(z), and the cycle length for each cycle 1-8 of the Turkey Point Units 3 and 4?

Response

a) We presume the fluence reduction factor means the flux reduction factor. If this is the case, the FPL flux reduction factor defined as the ratio of the critical weld peak neutron ($E > 1.0$ MeV) flux generated by previous "8 Cycle Average" power distribution to the critical weld peak neutron ($E > 1.0$ MeV) flux generated by plant-specific and cycle-specific power

[illegible]

distribution. The critical weld "8 Cycle Average" peak neutron flux is a fixed value of 6.108(10) including a 1.2 axial power peaking factor. For instance, the flux reduction factor for TP-4 Cycle 10 is:

$$\frac{6.108(10)}{1.800(10)} = 3.39$$

where the critical weld peak neutron flux, 1.800(10) is for TP-4 Cycle 10.

b) The following table presents the requested neutron flux at the inner-wall (intermediate to) lower girth weld, P(z), and both units' cycle lengths for cycles 1 through 8:

Unit	Cycle	Ø (> 1.0 MeV)	Cycle length(sec)	P(z)
TP-3	1	5.971 (10)	3.609 (7)	1.156
	2	5.809 (10)	2.451 (7)	1.132
	3	4.950 (10)	2.418 (7)	1.111
	4	5.046 (10)	2.462 (7)	1.113
	5	7.094 (10)	2.453 (7)	1.144
	6	6.773 (10)	1.587 (7)	1.153
	7	3.813 (10)	2.902 (7)	1.074
	8	4.414 (10)	4.302 (7)	1.091
TP-4	1	6.132 (10)	3.700 (7)	1.184
	2	5.475 (10)	2.300 (7)	1.129
	3	5.443 (10)	2.085 (7)	1.150
	4	5.481 (10)	2.695 (7)	1.327
	5	3.038 (10)	1.188 (7)	1.077
	6	5.439 (10)	3.628 (7)	1.118
	7	5.183 (10)	2.232 (7)	1.123
	8	4.797 (10)	2.254 (7)	1.103

Question 5

How do the fluence calculations for the TP-3 and TP-4 in-vessel surveillance capsules compare with measurement? Is there a calculational/measurement bias and, if so, is this accounted for in the FPL predictions of RT_{PTS}?

Response

As reported in our written responses to the Office of Nuclear Reactor Regulation of January 21, 1982 and May 3, 1982 letters L-82-26 and L-82-179 respectively, the agreement between measurement and calculation for surveillance capsule S and T for Turkey Point Unit 4 is excellent. Based on this agreement and the limited data available from the reactor vessel material surveillance and ex-vessel dosimetry programs, no bias is currently warranted in FPL predictions of RT_{PTS}. Additional data from these programs will provide the basis for any future decision to incorporate a calculational/measurement bias.

Question 6

Assuming the location of maximum axial source peaking, what is the present (January 1986) and EOL (2007) limiting (1) inner-wall fluence, (2) material chemistry and (3) RT_{PTS} for the TP-3&4 intermediate shells?

Response - See updated TABLE 2 and TABLE 1 of the January FPL submittal.

UPDATED TABLE 2

TURKEY POINT FLUENCE DATA AND RT(PTS) FOR BELTLINE MATERIALS (INNER WALL)

Unit Location	Fluence(7) Jan 1986 (n/cm^2)	RT(PTS) Jan 86	Fluence(7) April 2007 (n/cm^2)	RT(PTS) April 2007
Intermediate shell	$1.34x10^{19}$	133°F	$2.55X10^{19}$	139.5°F
Lower shell	$1.35X10^{19}$	139°F	$2.33X10^{19}$	147.0°F
Intermediate to lower girth weld	$1.27X10^{19}$	236°F	$2.15X10^{19}$	263.0°F
Intermediate shell	$1.18X10^{19}$	139°F	$2.35X10^{19}$	145.0°F
Lower shell	$1.21X10^{19}$	131°F	$2.15X10^{19}$	136.0°F
Intermediate to lower girth weld	$1.19X10^{19}$	233°F	$2.16X10^{19}$	263.0°F