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SUBJECT: Forwards response to NRC 850226 request for addl info re reactor plant surveillance matl program.

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FLORIDA POWER & LIGHT COMPANY

March 6, 1985
L-85-97

Office of Nuclear Reactor Regulation
Attention: Mr. S. A. Varga, Chief
Operating Reactors Branch #1
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Varga:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to Request for Additional
Information on the Reactor Plant
Surveillance Material Program

By letter dated February 26, 1985, you requested additional information concerning the above-referenced subject. The attachment to this letter contains that additional information.

We appreciate your prompt review of this subject and are available should you have any further questions.

Very truly yours,

J. W. Williams, Jr.
Group Vice President
Nuclear Energy

JWW/SAV/js

Attachment

cc: Harold F. Reis, Esquire
File 933.1
PNS-LI-85-092-1

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ATTACHMENT

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to Request for Additional
Information on the Reactor Plant
Surveillance Material Program

Question 1

Are the materials and designs for the core, thermal shield, core barrel and vessel the same for both units (PTP 3 and 4)?

Response

Yes. The materials and designs are the same. The references are:

The Updated Final Safety Analysis Report Volume 2.
(Common for both units)
Materials reference is Table 4.2-1.
Design reference is contained in Sections 3 and 4.

Question 2

Is the figure in Attachment 3 (of the proposed Tech Spec change) representative of both units?

Response

Yes. It is representative of both units.

Reference: SwRI report of project numbers 02-5131 and 02-5380. This document is the capsule "S" surveillance report, May 1979 for both units 3 and 4.

Question 3

What are the materials (base and weld) in the beltline of each vessel? Indicate the material specification, heat numbers (flux and weld wire), amount of Cu, Ni, P, Initial RT_{NDT} for each material. How were initial RT_{NDT}, Cu, Ni and P determined.

Response

Table 1 shows the values. Cu, Ni analyses are based on the statistcal mean of 51 and 41 individual analyses as reported to the NRC in FPL letter L-84-31, dated February 10, 1984. P concentrations are based on WCAPs 7656 and 7660, (Table A1), the surveillance programs for both units. Initial RT_{NDT} for the weld material SA1101 is based on dropweight and charpy data as reported in FPL letter L-84-31. RT_{NDT} (initial) values were never generated for the forging materials using both dropweights and charpy data. Forging charpy curves and data are shown in WCAPs 7656 and 7660.

Question 4

How was it determined that SA1101 was the limiting material. What is the projected EOL RT_{NDT} for this material and how does it compare with other beltline materials.

Response

SA1101 was identified as the limiting material in WCAP 8631 and in SwRI 02-4221, the capsule "T" surveillance reports. USNRC SECY 82-465 also identifies this material as limiting in both units.

Table 1 gives EOL predicted RT_{NDT} for beltline materials. The methodology used Reg. Guide 1.99 Rev. 2 (proposed), EOL fluence 1.25×10^{19} (n/cm^2 and Cu, Ni and initial RT_{NDT} values from Table 1. (This is very conservative for forgings since 50 ft. lb. initial RT_{NDT} was used with the 2 sigma-term.

Question 5

Describe the excore dosimetry program and how it will be used to determine the peak neutron fluence for each vessel. Has benchmarking been completed.

Response

Dosimetry (activation threshold foils, fission foils and HEDL SSTRs) have been installed in the reactor cavity area of both units since the last refueling outages. The dosimentry will verify analytical transport models. We plan to continue to monitor Unit 3. Benchmarking will be completed after Unit 3 cycle 9 and Unit 4 cycle 10 dosimetry has been evaluated.

Question 6

Are the neutron spectrum and neutron flux the same for each vessel at the peak fluence locations? Are the spectrum and flux the same for each capsule T, V, and X in each vessel? How will the dosimetry from one vessel be used to estimate the neutron fluence and spectrum for each vessel?

Response

The variations in neutron spectra ($\geq$ 1.0026 Mev) profiles are negligible for both units at the peak fuence locations. This is based on FPL DOT 4.3 transport code predictions. Fuel management and cycle lenths are very similar. Neutron spectrum at capsule T (270°) is slightly softer than spectrum at capsule X (50°). The higher flux is received at capsule T. Vessel fluence will be estimated by using measured surveillance capsule data and predicted lead factors from each vessel. Unfolded measured spectra from in core and excore dosimetry will be used to refine predicted vessel neutron spectra.

Question 7

What is the end of life peak neutron fluence at the 1/4T location? How was this value and the EOL fluence at the surface determined.

Response

The predicted EOL 1/4T fluence is 6.8×10^{18} n/cm^2. The bases for these predictions are reactor vessel fluence calculations using FPL PDQ7 code for cycle 1 through 9. The PDQ7 power distribution data was transformed into neutron source data by SORREL for input to DOT 4.3. As built dimensions and materials properties were incorporated into the DOT 4.3 calculational models. FPL will document calculational methods, computer codes, benchmarks, and vessel neutron fluence results.

Question 8

What is the projected neutron fluence to be received by each capsule at the time of its withdrawal? Does the withdrawal schedule comply with ASTM E185-82. If it does not, state why the requested schedule is more reasonable.

Response

The projected fluences are as follows:

Capsule #	Unit	Removal Date	Capsule Fluence	E185-82 requirement
3V		12 years	7.9×10^{18} n/cm^2	6.8×10^{18} n/cm^2
4V		24 years	1.6×10^{19} n/cm^2	1.25×10^{19} n/cm^2
3X		33 years	1.1×10^{19} n/cm^2	$> 1.25 \times 10^{19}$ n/cm^2
				$< 2.5 \times 10^{19}$ n/cm^2

The 3V and 4V capsules meet the requirements of the specification. The 3X capsule fluence is lower than the specification requires but the specification allows this value to be modified based on previous testing or it may never be tested since this is the EOL capsule. This schedule is more appropriate because it contains all critical material and will supply much more meaningful results than the existing schedule.

TABLE 1

Unit	Component	Heat Number	Cu	Ni	P	Initial RT_{NDT}	EOL RT_{NDT}
3	intermediate shell	SA 508 CL2 123P461VA-1	0.058	0.70	0.01	-25°F*	73°F
	lower shell	SA 508CL2 123S266VA-1	0.079	0.68	0.01	-41°F*	72°F
	weld wire	PAGE 71249	0.26	0.60	0.011	10°F	257°F
	weld flux	Linde 80 8445					
4	intermediate shell	SA 508 Cl2 123P481VA-1	0.054	0.71	0.01	25°F*	123°F
	lower shell	122S180VA-1	0.056	0.70	0.01	0°F*	98°F
	weld wire	PAGE 71249					
	weld flux	Linde 80 8445	0.26	0.60	0.014	10°F	257°F

*50 ft.lb. Temp