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Docket No. 50-251

Dr. Robert E. Uhrig, Vice President
Advanced Systems and Technology
Florida Power and Light Company
Post Office Box 529100
Miami, Florida 33152

Dear Dr. Uhrig:

We have reviewed your "60 day" response dated October 31, 1981, to our letter dated August 21, 1981, concerning Pressurized Thermal Shock (PTS). Enclosure 1 to this letter identifies additional information needed as a result of our review of your response. We request that the additional information identified in Enclosure 1 be provided with your "150-day" response to our August 21 letter.

In addition, we have been assessing what information will be provided in the "150-day" responses due in January 1982 and the information expected to be supplied from the PWR Owners' Group. Since the staff is committed to provide its recommendations for further actions regarding PTS to the Commission in the Spring of 1982, it is important that your "150-day" response to our August 21 letter provide two significant pieces of information. First, you must provide your basis for continued operation, pending completion of any longer term studies. We emphasize that continued operation of your facility, without any immediate modifications to your facility or its operation, will be dependent upon our evaluation of your response. Secondly, your response should fully address the information addressed in Enclosure 2. We have prepared Enclosure 2 to provide amplification to the "150-day" information request of the August 21, 1981 letter.

The additional information requested by the letter should be provided in accordance with 10 CFR 50.54(f) of the Commission's regulations.

The reporting and/or recordkeeping requirements of this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

ORIGINAL SIGNED

Thomas M. Novak, Assistant Director
for Operating Reactors
Division of Licensing

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P PDR

Enclosures:
1. Evaluation of the "60-day" Response to 8/21/81 Ltr.
2. Amplification of "150-day" Request to 8/21/81 Ltr.

cc w/enclosures:
See next page

*see previous 318 for concurrence.

D:DSD
SHanauer
12/18/81

OFFICE		ORB#1:DL	ORB#4:DL	C-ORB#1:DL	AD-OR:DL
SURNAME		MGrotenhuis*	GVissing/cb*	SVarga*	TNovak
DATE		12/17/81	12/17/81	12/17/81	12/18/81

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(3) Your assessment of the sensitivity of your analyses to uncertainties in input values, such as initial crack size, copper content, fluence, and inital reference temperature at welds.

(4) A list of assumptions relied upon in reaching your conclusions.

a. If this list includes "credit" for operator actions, describe the basic instructions given the operators (for example, if a "sub-cooling" band is used, describe it). Submit the procedures the operator will follow, and describe the training being given to establish operator readiness to cope with PTS events.

b. If the list includes credit for the effects of warm prestressing for some event sequences, include your justification and analyses showing that such events will follow a pressure-temperature pathway for which warm pre-stress is effective.

The reporting and/or recordkeeping requirements of this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Thomas M. Novak, Assistant Director
for Operating Reactors
Division of Licensing

Enclosure:
Evaluation of 60 Day
Response to 8/21/81
NRC ltr. on PTS &
Request for Additional
Information

cc w/enclosure:
See next page

OFFICE	ORB#1:DL	ORB#4:DL	C-~~ORB#1:DL~~	DST	AD:OR:DL		
SURNAME	MGrotenhuis	cf GWissing	SVarga	SHanauer	TNovak		
DATE	12/11/81	12/12/81	12/11/81	12/ /81	12/ /81		

Robert E. Uhrig
Florida Power and Light Company

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ENCLOSURE (1)

EVALUATION OF THE FLORIDA POWER AND LIGHT COMPANY 60 DAY RESPONSE TO THE NRC LETTER DATED AUGUST 21, 1981 CONCERNING PRESSUREIZED THERMAL SHOCK (PTS) AND REQUEST FOR ADDITIONAL INFORMATION

TURKEY POINT, UNIT NO. 4

DOCKET NO. 50-251

1. RT_{NDT} Values

We intend to use the initial RT_{NDT} values as provided in your letter dated October 21, 1981. In arriving at a current RT_{NDT} value for the girth welds of Unit 4 you provided a ΔRT_{NDT} value that was based on Unit 3 surveillance test results. Extrapolcation of the ΔRT_{NDT} from the capsule fluence ($\sim 8 \times 10^{18}$ n/cm^2) to the present fluence (1.1×10^{19} n/cm^2) was based on the slope of the ASTM trend curve. We cannot accept the idea that it is proper to use the Unit 3 surveillance test results in this way. The following discussion will disclose our reasons for that conclusion.

We are aware that the surveillance weld for Unit 3 had the same weld wire heat no. (71249) and the same flux lot no. (8445) as the beltline weld in Unit 4. Also, that the surveillance weld in Unit 4 had the same weld wire heat number (71249) but a different flux lot no. (8457). However, we consider the Charpy shift to be primarily dependent on copper content and, therefore, on weld wire heat number. Thus, we have two surveillance results, both of which happen to be at $\sim 8 \times 10^{18}$ n/cm^2 (according to the latest fluence estimates from FP&L) which show 30 ft. lb. shift values of 155°F and 225°F. Copper content, from several measurements of the surveillance weld metal and broken Charpy bars ranged from 0.21 to 0.35 percent.

As part of the thermal shock studies, we have compiled a PWR surveillance data base for the materials in question and drawn separate, tentative trend curves for high (0.5% nominal) and low (0.2% nominal) nickel materials. When the Unit 3, Capsule T surveillance result for the weld material is compared with the PWR data base, it appears to be an outlier, the measured shift being considerably lower than the mean for the data base at the fluence.

Based on the high nickel curves, the predicted shift is 290°F for a fluence of 1.1×10^{19} n/cm^2, and copper content of 0.30% or greater. (Being on the upper limit line, the trend curve for 0.30% and 0.35% copper is the same). Using Reg. Guide 1.99, the predicted shift is also 290°F.

In summary, the Unit 3 surveillance data are not sufficiently credible to provide the sole basis for estimation of ΔRT_{NDT}. Trend curves based on pertinent data are the alternative that must be used. The MPC/ASTM upper bound curves have not been accepted by the NRC because they are not a very good upper bound of the data in the 10^{19} n/cm^2 fluence range. The study of PWR surveillance data confirmed that Reg. Guide 1.99 Rev. 1 is conservative, but not too conservative for fluence values near 10^{19} n/cm^2.

2. The Rate of Increase of RT_{NDT}

We have no disagreement with your answer to Question 2, but should point out that although the 10 year average change in RT_{NDT} is 7°F, the change in one EFPY from today if 11°F, based on the MPC trend curves. In addition please provide the rate of increase of RT_{NDT} per EFPY taking into consideration any contemplation changes in core configuration.

3 & 4. RT_{NDT} Limit and Basis for the Limit

You have indicated in your letter dated September 23, 1981 that the response to Item 3 & 4 of the August 21 letter will be delayed until March 1, 1982. Since the "60-day" responses from other licensees stated that PWR owners generally do not consider a limit on RT_{NDT} to be an appropriate basis for continued operation, the staff needs to develop a quantitative criterion for continued operation that, if implemented, would assure maintenance of an acceptably low risk of vessel failure from PTS events for the near-term, pending longer term results of more detailed analyses or research. We will be developing this criterion, considering recommendation that you may provide in your 150 day response.

5. Operator Actions

The extent to which the overall concern of thermal shock is being emphasized at Turkey Point Unit No. 4 has been the subject of discussions between staff personnel (Project Manager and Resident Inspector). From these discussions we are aware that PTS is addressed in training and the operators have experience in handling events which could lead to PTS and are sensitive to thermal shock consideration. However, we cannot determine from your "60-day" response to our letter of August 21, 1981, the degrees of emphasis which is currently planced on the need for changes in procedures, training and management involvement.

We request that you expand your response to provide us a more detailed discussion of what steps have been taken to ensure that your operators have a firm grasp of this issue and can be expected to cope with the events which serve to initiate PTS.