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SUBJECT: Responds to NRC 871030 request for addl info re fracture toughness requirements.

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U. S. Nuclear Regulatory Commission  
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Gentlemen:

Re: Turkey Point Units 3 and 4  
Docket Nos. 50-250 and 50-251  
Fracture Toughness Requirements

By letter dated October 30, 1987, the Nuclear Regulatory Commission transmitted a Safety Evaluation (SE) of the Florida Power and Light Company (FPL) report, "Reactor Vessel Material Surveillance Program for Turkey Point Unit 3, Analysis of Capsule "V". The letter transmitting this SE required that FPL submit a plan for complying with 10 CFR 50, Appendix G, Section V.C. It further recommended that the Turkey Point (PTN) surveillance program be revised and that an integrated analysis be provided. The attached submittal fulfills the requirement and responds to the recommendations.

The NRC Staff also recommended that the integrated surveillance program be revised to move Capsule "X" to a higher flux location. There are several other options we are reviewing at this time which would accomplish the same end but have a lesser probability of introducing additional uncertainties to fluence determination. All fluence calculations will have a systematic error evaluation performed prior to use in this effort.

We will keep you informed of our continuing efforts in this area.

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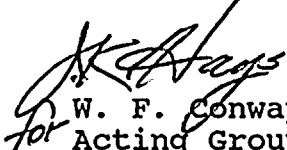
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Should there be any questions on this information, please contact us.

Very truly yours,

  
for W. F. Conway  
Acting Group Vice President  
Nuclear Energy

WFC/TCG/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator,  
Region II, USNRC  
Senior Resident Inspector, USNRC, Turkey Point Plant

TCG.FTR



## ATTACHMENT

### FRACTURE TOUGHNESS REQUIREMENTS

#### PLAN FOR COMPLIANCE WITH 10 CFR 50, APPENDIX G, SECTION V.C

##### A. Appendix G. Requirements

Section V.C. of Appendix G requires that when the Charpy upper shelf energy (USE) is predicted to be less than 50 ft.-lbs. the following requirements be satisfied:

1. A volumetric examination of 100 percent of the beltline materials that are predicted to be less than 50 ft-lb.
2. Additional evidence of the fracture toughness of the beltline materials after exposure to neutron irradiation is to be obtained from results of supplemental fracture toughness tests.
3. An analysis is performed that conservatively demonstrates, making appropriate allowances for all uncertainties, the existence of equivalent margins of safety for continued operation.

##### 1. Volumetric Examination

Turkey Point Units 3 & 4 were examined in accordance with the ASME Boiler and Pressure Vessel Code 1974 Summer 75 Edition, modified by the requirements of Regulatory Guide 1.150.

Turkey Point Unit 3 was examined by Southwest Research Institute (SWRI) during July 1981 and the results were reported in SWRI Project No. 17-4352 report dated December 1981. The regulatory guide requirement to examine the clad base metal interface was accomplished by full vee path 45° examination. No recordable indications were detected.

Turkey Point Unit 4 was also examined by SWRI during November 1982 and the results were reported in SWRI Project No. 4520 report dated January 1983. The full vee path 45° examination was further enhanced by twin element 70° refracted longitudinal wave.

Both Units will be inspected again during the third period of the second inservice inspection interval which starts in February 1991.



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## 2. Supplemental Fracture Toughness Data

FPL is actively pursuing sources of additional fracture toughness data. The following activities are designed to provide confirmation of the adequate toughness of the Turkey Point reactor vessels.

- o With the concurrence of the NRC, FPL did not test the wedge open loading fracture toughness specimens supplied in capsule V as part of the surveillance materials. FPL proposes to perform J-R tests on these specimens to supply Turkey Point specific J-R data.
- o A supplementary fracture toughness test procedure has been previously submitted to the NRC by Westinghouse as part of an EPRI project. Additional procedure description can be supplied should this be required.
- o FPL is actively participating in an EPRI funded project which will test a number of Linde 80 weld samples. Testing should be completed within one year.
- o The critical weld for both Turkey Point Units is SA1101 which has been extensively tested in the HSST Program. Both Babcock and Wilcox (B&W) and Westinghouse are participating in programs which have validation of test reactor data as a goal.
- o FPL is presently considering joining with the B&W Owners' Group in a plant life extension vessel program which will supply fracture toughness data for end of life conditions for Westinghouse Plants.

## 3. Analysis

As noted in the SE, FPL submitted analyses in 1984, updated in 1986, which demonstrate significant margins of safety for continued operation.



B. Surveillance Program Change Recommendations

The NRC Staff recommended that the integrated surveillance program be revised to move Capsule "X" to a higher flux location. There are several other options we are reviewing at this time which would accomplish the same end but have a lesser probability of introducing additional uncertainties to fluence determination. All fluence calculations will have a systematic error evaluation performed prior to use in this effort.

The PTN 3 and 4 pressure-temperature (P-T) limit curves are currently under revision using the methodology and substantial conservatisms built into Regulatory Guide 1.99 Revision 2 draft. An integrated analysis of both Unit 3 and 4 data will be conducted as part of the P-T curve effort.