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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD



| | |
|---|---|
| In the Matter of | |
| FLORIDA POWER & LIGHT COMPANY | Docket Nos. 50-250 OLA-4<br>50-251 OLA-4 |
| (Turkey Point Plant, Units 3 and 4) | (P/T Limits) |

LICENSEE'S RESPONSE TO INTERVENORS'
FIRST SET OF DISCOVERY REQUE .S TO LICENSEE

Florida Power & Light Company (FPL or Licensee) hereby files its response to the interrogatories and the document requests contained in "Intervenors' First Set of Discovery Requests to Licensee" (August 7, 1989). The requested documents will be made available to the Intervenors for inspection and copying beginning September 5, 1989, during normal business hours at Steel, Hector & Davis, 4000 Southeast Financial Center, Miami, Florida. Intervenors are requested to provide John Butler, co-counsel for Licensees, with notice (at least two business days) prior to seeking such inspection.

Interrogatory A.1 -

Identify the facts and documents that Licensee relies upon in alleging that .26 is the proper and conservative percentage of copper to use in calculating the $RT_{NDT}$ for use in revising the P/T limits for Turkey Point units 3 and 4.



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Licensee's Response -

FPL did not utilize any percentage of copper in calculating the $RT_{NDT}$ used in revising the P/T limits for Turkey Point Unit 3 and 4 in 1988. Instead, in accordance with the provisions of Revision 2 to Regulatory Guide 1.99, FPL calculated the $RT_{NDT}$ using surveillance capsule data.

If FPL had calculated the $RT_{NDT}$ using a percentage of copper, 0.26% would have been the appropriate value to utilize. Revision 2 to Regulatory Guide 1.99 states that, when using a copper percentage to calculate $RT_{NDT}$, the "best estimate" of the copper percentage should be utilized. As stated in FPL letter L-84-31 to the NRC dated February 10, 1984, and the NRC's Safety Evaluation for Turkey Point dated April 26, 1984, the mean value of the copper content in the Turkey Point reactor vessel welds is 0.26%. This mean value is the best estimate of the copper content of the welds.

Document Request A.2 -

Provide copies of any and all historical or other documents that prove that the copper content of the limiting welds is 0.26%.

Licensee's Response -

The following documents are responsive to this request:

1) FPL Letter L-84-31 to the NRC dated February 10, 1984

2) NRC's Safety Evaluation for Turkey Point dated April 26, 1984

Additionally, the following documents provide information which was used to calculate a copper percent of 0.26%.

3) Supplement to FPL Letter L-77-113 to the NRC dated June 27, 1977

4) W.A. Van der Sluys, et al., An Investigation of Mechanical Properties and Chemistry Within a Thide Mn-Mo-Ni Submerged Arc Weldment, EPRI NP-373, Electric Power Research Institute, Palo Alto, California, February 1977

5) B&W 177-FA Reactor Vessel Beltline Weld Chemistry Study, BAW 1799, Babcock and Wilcox, Lynchburg, Virginia, July 1983

6) FPL Letter L-77-113 to the NRC, dated April 11, 1977

7) S.E. Yanichco, FP&L Co. Turkey Point Unit 3 Reactor Vessel Radiation Surveillance Program, WCAP 7656, Westinghouse Electric Corp., Pittsburgh, PA, May 1971

8) S.E. Yanichco, FP&L Co. Turkey Point Unit 4 Reactor Vessel Radiation Surveillance Program, WCAP 7660, Westinghouse Electric Corp., Pittsburgh, PA, May 1971

9) Point Beach Unit 1 Reactor Vessel Radiation Surveillance Program, WCAP 8743, Westinghouse Electric Corp., Pittsburgh, PA

FPL believes that documents 1,2,3,5,6,7,8, and 9 are in the NRC's Public Document Room (PDR). If Intervenors are unable to locate these documents in the PDR, FPL will make these documents (together with document 4) available for inspection by Intervenors and, upon request, will provide copies to the Intervenors at a cost of $.10 per page.

**Interrogatory A.3** -

State whether the 0.26% copper content is the mean value and explain whether or not Licensee factored in a standard deviation when calculating the percentage of copper.

**Licensee's Response** -

The value of 0.26% is the mean value of the copper content of the Turkey Point reactor vessel welds. This value does not include a standard deviation.

**Interrogatory A.4** -

If the answer to interrogatory no. 3 is no, provide the reason and/or justification for not applying a standard deviation.

**Licensee's Response** -

Both Revision 2 to Regulatory Guide 1.99 and 10 CFR 50.61 call for the use of a "best estimate" of the copper percentage. Inclusion of a standard deviation would be inconsistent with the concept of a "best estimate."

**Interrogatory A.5** -

Provide the reasons and/or justifications for the Licensee's use of 0.31% of copper in calculating $RT_{NDT}$ and setting the P/T Limits for the first 10 years of operation and explain how Licensee can justify the use of 0.26% copper in setting the P/T limits for 20 years rather than the 0.31% copper content.

**Licensee's Response** -

As stated in Licensee's Response to Interrogatory A.1, FPL did not utilize a value of 0.26% in calculating the P/T limits in 1988. FPL previously utilized a value of 0.31% in calculating the P/T limits for 10 EFPY because that was the best estimate of the copper percentage based upon the limited data then available.

Interrogatory A.6 -

State whether Licensee agrees that the use of 0.31% copper rather than 0.26% copper in calculating $RT_{NDT}$ and revising P/T limits for units 3 and 4 would result in the P/T limits being more conservative and/or restrictive. If Licensee disagrees, state the basis for your disagreement.

Licensee's Response -

As stated in Licensee's Response to Interrogatory A.1, FPL did not utilize a value of 0.26% copper in calculating the P/T limits in 1988. If a value for copper content had been utilized, a value of 0.31% copper would have resulted in P/T limits that would be slightly more restrictive (especially at higher temperatures) than a value of 0.26% copper, utilizing the methodology in Revision 2 to Regulatory Guide 1.99.

Interrogatory A.7 -

State whether Licensee or the NRC Staff attempted to calculate $RT_{NDT}$ and revise the P/T limits using a 0.28 or above copper content. If any such calculations were performed, please provide copies of documents containing such calculations.

Licensee's Response -

FPL does not know whether the NRC Staff attempted to calculate the $RT_{NDT}$ for Turkey Point using a value of 0.28% or above for the copper content. For purposes of litigation (and not for revising the P/T limits for Turkey Point), FPL did calculate $RT_{NDT}$ using a copper content of 0.30% copper. A copy of this calculation will be made available for inspection by the Intervenors and, upon request, will be provided to the Intervenors at a cost of $.10 per page. As stated in Licensee's Response to Interrogatory A.1, use of a value of 0.28% copper would have been appropriate under Revision 2 to Regulatory Guide 1.99; use of a value of 0.30% copper would have been inconsistent with the regulatory guide. However, no percentage of copper value was in fact used.

Interrogatory A.8 -

State whether Licensee agrees that a reduction in the percentage of copper content could result in an increase of EFPY.

**Licensee's Response** -

The Licensee does not understand this interrogatory. The copper content of the Turkey Point reactor vessel welds is based upon the materials used in fabricating the reactor vessels and is not subject to being "reduced". Furthermore, the current EFPY for the Turkey Point units is unrelated to the copper content of the Turkey Point reactor vessel welds.

**Document Request A.9** -

Copies of any and all calculation of $RT_{NDT}$ for Turkey Point Units 3 and 4 for revision of the P/T limits as set out by Regulatory Guide 1.99, Revision 2.

**Licensee's Response** -

The Licensee previously provided the Intervenors with a copy of the calculation of the $RT_{NDT}$ used in revising the P/T limits for Turkey Point in 1988. See letter dated August 4, 1989, from Steven P. Frantz to Joette Lorion.

**Interrogatory B.1** -

Documents that provide information concerning the respective design, fluence, and operating histories for Turkey Point Units 3 and 4, including but not limited to documents that provide information on the following:

a) weld wire heat number and flux lot for the welds and surveillance test capsules;

b) operating procedures;

c) EFPY;

d) loading history;

e) accumulated neutron spectra, flux and fluence;

f) cycle lengths;

g) capacity factor;

h) fuel management.

**Licensee's Response** -

Based upon discussions with the Intervenors on August 15, 1989, Licensee understands that this request will be satisfied if the Licensee provides information corresponding to the information set forth below. In accordance with the Licensing Board's Memorandum and Order, this information corresponds to operation of Turkey Point for the years since 1985, when the NRC accepted the integrated surveillance program for Turkey Point.

a)

| | Weld Number | Heat Number | Flux Lot Number |
|---|---|---|---|
| Units 3&4 Critical Welds | SA 1101 | 71249 | Linde 80, Lot 8445 |
| Unit 3 Weld Capsule | SA 1101 | 71249 | Linde 80, Lot 8445 |
| Unit 4 Weld Capsule | SA 1094 | 71249 | Linde 80, Lot 8457 |

b) The operating procedures for Turkey Point Units 3 and 4 are required to conform with the Technical Specifications for Turkey Point. The limits in the Technical Specifications applicable to operation of the reactors are the same for each unit. Therefore, the operating procedures for each unit are similar if not identical.

c) Annual EFPH

| | Unit 3 | Unit 4 |
|---|---|---|
| 1985 | 5032.5 | 7706.5 |
| 1986 | 6652.9 | 2601.8 |
| 1987 | 1344.6 | 3950.2 |
| 1988 | 5176.3 | 4828.9 |
| 1985-1988 | 18,206.3 | 19,087.4 |

Total lifetime EFPY for Turkey Point Units 3 and 4 as of August 23, 1989, are 10.203 and 9.732, respectively.

d) The design features utilized in each core loading since 1985 are similar in mechanical design, type of neutron absorbers, enrichments and arrangements within the core.

e)

Unit 3

| Cycle | End of Cycle | Lifetime Cumulative Fluence $N/cm^2$; E> 1.0 MEV | Cycle Fluence $N/cm^2$; E> 1.0 MEV |
|---|---|---|---|
| 9 | 3/30/85 | $1.3 \times 10^{19}$ | $7.1 \times 10^{17}$ |
| 10 | 3/15/87 | $1.3 \times 10^{19}$ | $7.4 \times 10^{17}$ |
| 11 | 2/15/90* | $1.4 \times 10^{19*}$ | $8.3 \times 10^{17*}$ |
| 9-11 | -- | -- | $2.3 \times 10^{18*}$ |

Unit 4

| | | | |
|---|---|---|---|
| 10 | 1/10/86 | $1.2 \times 10^{19}$ | $8.7 \times 10^{17}$ |
| 11 | 9/20/88 | $1.3 \times 10^{19}$ | $8.0 \times 10^{17}$ |
| 12 | 10/7/90* | $1.4 \times 10^{19*}$ | $8.6 \times 10^{17*}$ |
| 10-12 | -- | -- | $2.5 \times 10^{18*}$ |

*Estimated

f)

| | Unit 3 | | Unit 4 | |
|---|---|---|---|---|
| Cycle | Start | End | Start | End |
| 9 | 1/7/84 | 3/30/85 | -- | -- |
| 10 | 7/17/85 | 3/15/87 | 6/1/84 | 1/10/86 |
| 11 | 9/5/87 | 2/15/90* | 8/31/86 | 9/20/88 |
| 12 | -- | -- | 6/10/89 | 10/7/90* |

*Estimated

g) Capacity Factors

| | Unit 3 | | Unit 4 | |
|---|---|---|---|---|
| | Lifetime Cumulative | Annual | Lifetime Cumulative | Annual |
| 1985 | 65.9 | 57.4 | 68.9 | 88.0 |
| 1986 | 66.8 | 75.9 | 65.1 | 29.7 |
| 1987 | 63.2 | 15.3 | 63.7 | 45.1 |
| 1988 | 63.0 | 58.9 | 63.3 | 55.0 |
| 1985-88 | -- | 51.9 | -- | 54.4 |

h) See response to (d), above

**Document Request B.2** -

Copies of any and all documents that Licensee has supplied to the NRC since 1985 as required by 10 CFR Appendix H, Section II C, Parts 1-6 [sic].

**Licensee's Response** -

10 CFR Part 50, Appendix H, Section II.C (which contains only four subsections) does not require a licensee to submit any documents to the NRC. In documents submitted on February 8, 1985, and March 6, 1985, FPL applied for amendments to the Turkey Point Technical Specifications to permit use of an integrated surveillance program under 10 CFR Part 50, Appendix

H, Section II. C. These documents should be in the NRC Public Document Room. If Intervenors are unable to obtain copies from this source, Licensee will make these documents available to the Intervenors for inspection and upon request will provide a copy to the Intervenors at a cost of $.10 per page.

Interrogatory B.3 -

State whether Licensee has a contingency plan as required by Appendix H to assure that the surveillance program for each reactor will not be jeopardized by operation at a reduced power level or by an extended outage of another reactor from which data are expected. If yes, provide a copy of the plan and/or any documents provided to the NRC as a result of such outage. If the answer is no, state why no such plan exists.

Licensee's Response -

FPL has a contingency plan. This plan is documented in the letters identified in Licensee's Response to Interrogatory B.2. Turkey Point has not experienced operation at a reduced power level or an extended outage sufficient to invoke this contingency plan.

Interrogatory B.4 -

State whether Licensee believes that the Charpy weld metal test results for capsule T of Unit 4 agreed with the original embrittlement predictions for that reactor unit.

Licensee's Response -

The adjusted reference temperature of Unit 4 capsule T was higher than the adjusted reference temperature predicted by Revision 1 to Regulatory Guide 1.99, which was the applicable regulatory guide at the time capsule T was tested. Using currently applicable Revision 2 to Regulatory Guide 1.99 (and utilizing 0.26% copper and 0.60% nickel), the predicted adjusted reference temperature is about 2% below the ART determined from the capsule T test results.

Interrogatory B.5 -

State whether TP Units 3 and 4 have had equivalent core loadings since 1985 and provide documents that support your response.

**Licensee's Response** -

Turkey Point Units 3 and 4 have had equivalent core loadings since 1985. The design features utilized in each core loading since 1985 are similar in mechanical design, type of neutron absorbers, enrichments, and arrangement within the core. Copies of documents that provide support for this response will be made available for inspection by the Intervenors and, upon request, will be provided to be Intervenors at a cost of $.10 per page.

**Interrogatory B.6** -

State whether the neutron spectra profiles for Turkey Point Units 3 and 4 are and have been equivalent and provide documents that support your response.

**Licensee's Response** -

The Licensee concludes that the neutron spectra profiles for Turkey Point Units 3 and 4 are and have been similar since 1985. The conclusion is based on the similarity in core

loadings (see response to Interrogatory B.5) and the similarity in neutron fluences above 1.0 MEV (see response to Interrogatory B.1.e). The Licensee does not have any documents that explicitly address this issue.

Document Request B.7 -

Provide documents that show the prediction of radiation damage as a function of power output for both Turkey Point Units 3 and 4.

Licensee's Response -

Radiation damage is not directly a function of power output. Instead, radiation damage is a function of neutron irradiation, which is affected by power output. Regulatory Guide 1.99, Revision 2 contains equations that identify $RT_{NDT}$ as a function of neutron fluence. This document was previously provided to the Intervenors in a letter dated August 4, 1989, from Steven P. Frantz to Joette Lorion. While radiation damage could be expressed as a function of cummulative power output, FPL has no documents that do this.

**Interrogatory B.8** -

State whether Licensee conducts in cavity dosimetry testing for units 3 and 4 in order to reduce uncertainties in projected neutron fluence. If the answer is yes, provide the results of tests for TP 3 and 4. If the answer is no, explain why no such tests are conducted.

**Licensee's Response** -

FPL installed in cavity dosimetry for Turkey Point Units 3 and 4 to bench-mark FPL's fluence calculational methods in support of the initiation of the integrated surveillance program in 1985. FPL has not conducted any additional in cavity dosimetry to project neutron fluence, because in-reactor dosimetry is sufficient for this purpose. Copies of the documents containing the test results will be made available for inspection by the Intervenors and, upon request, will be provided to the Intervenors at a cost of $.10 per page.

**Interrogatory B.9** -

State whether in cavity dosimetry testing was ever incorporated into the integrated surveillance program for

Units 3 and 4.

**Licensee's Response** -

The in cavity (ex vessel) dosimetry was used in conjunction with the initiation of the integrated surveillance program for Turkey Point Units 3 and 4 to bench-mark FPL's fluence calculations. FPL expects to use in cavity dosimetry again in conjunction with FPL's flux reduction program but has no plans to conduct further in cavity dosimetry tests in conjunction with the integrated surveillance program.

**Interrogatory B.10** -

State whether Licensee agrees with the NRC Staff statement on page 6 of the Safety Evaluation for the P/T amendments that flux lot number is only of minor importance in determining the sensitivity of irradiation embrittlement. State the basis and or justification for Licensee's agreement or disagreement.

**Licensee's Response** -

Bulk chemistry, specifically percent copper and nickel, are the primary variables in determining the sensitivity of reactor vessel materials to irradiation embrittlement. However, flux type and concentrations of other elements also affect this sensitivity.

The flux lot numbers for the weld capsule material and the weld material for Turkey Point Unit 4 are different. Based upon test results for capsule T for Unit 4, FPL believes that this difference may result in an $RT_{NDT}$ for Unit 4 that is higher (i.e., more conservative) than would be the case if the flux lot numbers were the same. At this time, it is not possible to quantify with certainty the impact of this difference. Therefore, FPL is not at this time in a position to agree or disagree with the NRC's statement.

**Interrogatory B.11** -

Provide Licensee's basis and justification for their assertion that the operating features of Turkey Point Units 3 and 4 are sufficiently similar to predict accurate comparisons of the predicted amount of radiation damage as a function of total power output. Name the documents that support this position.

**Licensee's Response** -

Responses to discovery requests B.1,B.5,and B.6 discuss the similarity in the operatining features for Turkey Point Units 3 and 4. Licensee has not asserted that radiation damage can be predicted as a function of total power output. Instead, Licensee has stated that the $RT_{NDT}$ of reactor vessel can be

predicted based upon the materials in the reactor vessel and the neutron fluence for the materials. This position is supported by, among other documents, Revision 2 to Regulatory Guide 1.99.

Document Request B.12 -

Provide copies of any and all documents in which a 30 ft-lb charpy energy level rather than a 42 ft-lb level were used to calculate $RT_{NDT}$ based on Unit 4 capsule T surveillance data.

Licensee's Response -

The $RT_{NDT}$ used in preparing the P/T limits for Turkey Point Units 3 and 4 in 1988 were calculated using a 30 ft-lb charpy adjusted reference temperature for the surveillance capsules of both Unit 3 and Unit 4. This calculation was previously provided to the Intervenors in a letter dated August 4, 1989, from Steven P. Frantz to Joette Lorion.

Respectfully submitted,

Harold F. Reis
Steven P. Frantz
Kenneth C. Manne

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August 28, 1989

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STATE OF FLORIDA
COUNTY OF PALM BEACH

J. A. DeMastry, being first duly sworn, deposes and says: I am the Staff Engineer-Licensing for Florida Power & Light Company (FPL) and am responsible for coordinating FPL's activities for the Turkey Point P/T Limits proceeding. The foregoing responses to Intervenors' first set of discovery requests were prepared under my supervision and control and are true and correct to the best of my knowledge, information, and belief.

J. A. DeMastry

J.A. DeMastry

Dated August 28, 1989

Subscribed and sworn to
before me this 28th day of
August, 1989.

Cheryl L. Fredrick
Notary Public

My Commission Expires:

NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. OCT.30,1991
BONDED THRU GENERAL INS. UND.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



BEFORE THE ATOMIC SAFETY AND LICENSING BOARD



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| In the Matter of | ) | |
| | ) | |
| FLORIDA POWER & LIGHT COMPANY | ) | Docket Nos. 50-250 OLA - 4<br>50-251 OLA - 4 |
| | ) | |
| (Turkey Point Plant, Units 3 and 4 | ) | (P/T Limits) |

## CERTIFICATE OF SERVICE

I hereby certify that copies of "Licensee's Response to Intervenors' First Set of Discovery Requests to Licensee" were served on the following by deposit in the United States mail, first class, properly stamped and addressed, on the date shown below.

B. Paul Cotter, Chairman
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Attention: Chief, Docketing and Service Section
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Dated this 28th day of August 1989.

Kenneth C. Manne

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