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RECIP. NAME RECIPIENT AFFILIATION
THADANI, A. C. PWR Project Directorate 8

SUBJECT: Forwards justification for reactor pressure vessel surveillance capsule withdrawal sequence of Tech Spec Table 4.4-5, "Reactor Vessel Matl Surveillance Program-Withdrawal Schedule."

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DECEMBER 02 1986

L-86-486

Office of Nuclear Reactor Regulation
Attention: Mr. Ashok C. Thadani, Director
PWR Project Directorate #8
Division of PWR Licensing-B
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Thadani:

Re: St. Lucie Unit 2
Docket No. 50-389
Surveillance Capsule Withdrawal Sequence

By letter dated August 7, 1986 (E. G. Tourigny to C. O. Woody) the staff requested that Florida Power & Light Company (FPL) provide a justification for the St. Lucie Unit 2 reactor pressure vessel surveillance capsule withdrawal schedule or commit to the withdrawal schedule identified in the staff's letter. By letter L-86-435, dated September 4, 1986, FPL committed to propose a Technical Specification Change to the staff by December 1, 1986, if FPL determined that the current withdrawal sequence needed to be revised. By letter dated October 16, 1986 (E. G. Tourigny to C. O. Woody) the staff found this commitment to be acceptable.

The attached information provides FPL's justification that the current surveillance capsule withdrawal sequence of St. Lucie Unit 2 Technical Specification Table 4.4-5, "Reactor Vessel Material Surveillance Program - Withdrawal Schedule", is acceptable. As a result, FPL does not propose to amend the Technical Specification Table 4.4-5 for St. Lucie Unit 2.

Please contact us if you have any questions about this submittal.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/EJW/gp

Attachment

A001
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cc: Dr. J. Nelson Grace, Region II, USNRC
Harold F. Reis, Esquire, Newman & Holtzinger

EJW2/011/1

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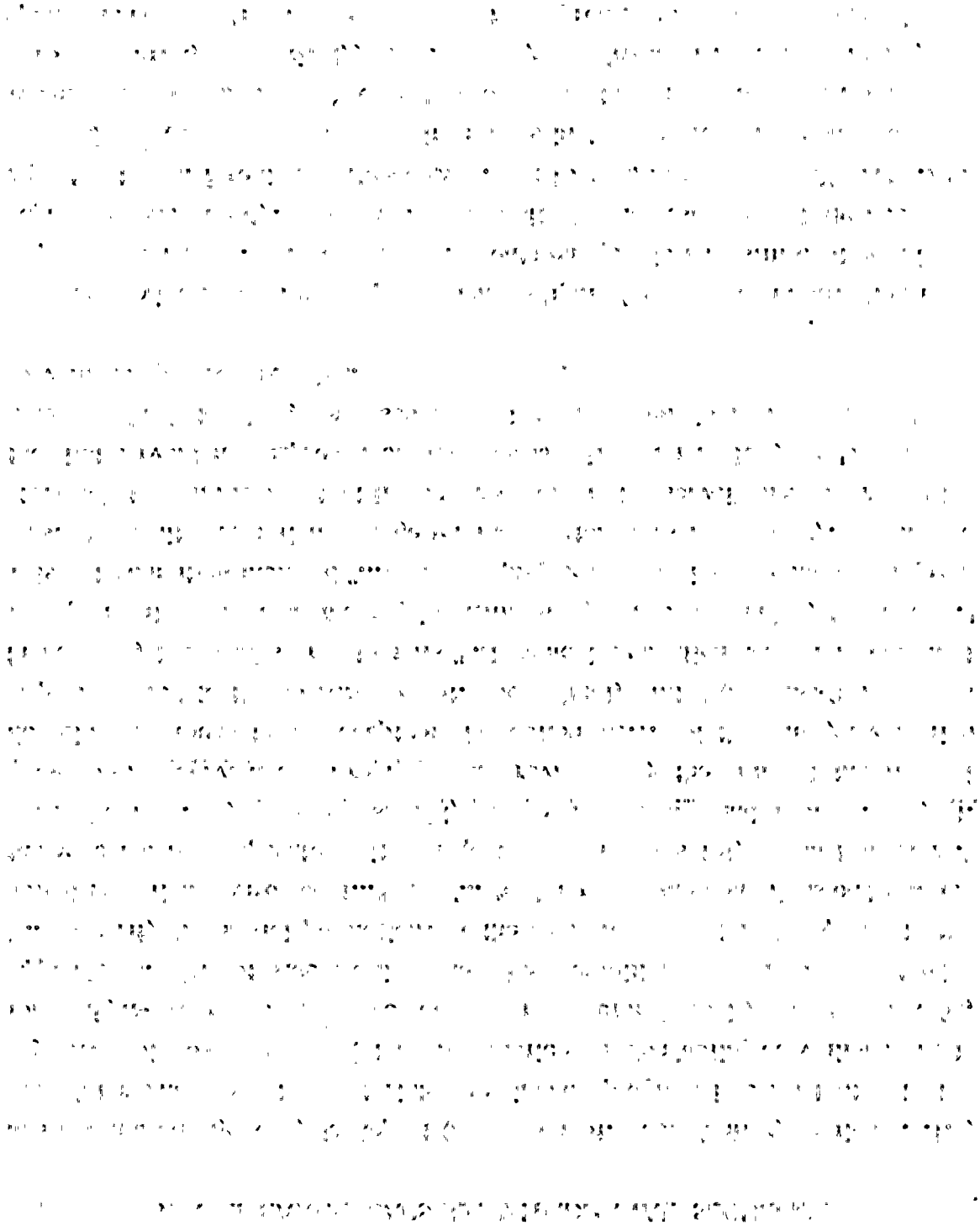
ATTACHMENT

SURVEILLANCE CAPSULE WITHDRAWAL SEQUENCE

In the Final Safety Analysis Report (FSAR) for St. Lucie Unit 2, Section 5.3.1.6, FPL determined that the materials surveillance program is consistent with the objectives of ASTM E185-82 (Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels) and 10 CFR 50, Appendix H. The St. Lucie Unit 2 Materials Surveillance Program was intended "... to verify the initial predictions of the surveillance material response to the actual radiation environment..." and "... to determine the conditions under which the vessel can be operated with adequate margins of safety against fracture." FSAR Table 5.3-9, Capsule Assembly Removal Schedule, and Table 5.3-9a, St. Lucie Unit 2 Surveillance Program were reviewed by the staff at the time of licensing and found to be acceptable in Section 5.3.1.3 of the Safety Evaluation Report related to the operation of St. Lucie Plant, Unit 2 (NUREG-0843) (SER). In the SER, the staff stated that its "...technical evaluation has determined that the applicant has met all the requirements of Appendices G and H, 10 CFR 50." This determination included "...that an appropriate material surveillance program exists to monitor radiation damage for the reactor pressure boundary." While the staff did state in the SER that it would re-evaluate the surveillance program after the first surveillance capsule test data was submitted for review, FPL's review of data obtained to date, as discussed later, does not indicate a need for a surveillance program revision.

We have reviewed our fluence projections in light of the recent information from Capsule No. 1 (83°). Fluence measurements and predictions still contain a large degree of uncertainty. Recent FPL submittals addressing vessel fluence have reported two different EOL fluences: 3.64×10^{19} N/cm^2 ($E \geq 1$ MeV) and 4.79×10^{19} N/cm^2 ($E \geq 1$ MeV). The differences in the two reported values of EOL fluence reported in the 83° capsule report and the Pressurized Thermal Shock (PTS) submittal, respectively, are caused by the different number of fuel cycles upon which each estimate was based and the degree of conservatism included in



each submittal. Each individual fuel load, summed on a cycle by cycle basis, will yield a different EOL fluence if projected to EOL at any time, depending on the amount of new fuel and its location with respect to the critical material. The 3.64×10^{19} N/cm^2 value in the capsule report was based on the first cycle of operation using measured activity for the dosimetry in the capsule. The 4.79×10^{19} N/cm^2 value in our PTS submittal was based on cycles 1 and 2 and projected to EOL. The 4.79×10^{19} N/cm^2 number was submitted for PTS considerations because it reflected a more recent and more conservative fluence projection while still showing a large PTS margin.

The capsule removal schedule was included as Table 4.4-5, Reactor Vessel Material Surveillance Program - Withdrawal Schedule, of the St. Lucie Unit 2 Technical Specifications. It should be noted that this withdrawal schedule also includes three standby capsules which allow for capsule removal and examination at times in addition to those called out in the removal schedule.

Surveillance capsule data from Capsule No. 1 (83°) indicated fluence and material properties as predicted at the time of licensing. The measured data from this capsule showed a maximum of 35°F shift in RT_{NDT} at 1.6×10^{18} N/cm^2. This projection to an end of life (EOL) fluence of 3.64×10^{19} N/cm^2 based on both measurements and calculations is equivalent to a 200°F shift in RT_{NDT}. Therefore, it is our opinion that the curve in the Technical Specifications Bases Figure B3/4 4-1 is still a bounding, conservative indication of material behavior.