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 STARKEY, R.B. Carolina Power & Light Co.
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 Document Control Branch (Document Control Desk)

SUBJECT: Forwards response to Rev 1 to Generic Ltr 92-01 re reactor vessel structural integrity. No data from surveillance program have exceeded mean-plus-two std deviation bound predicted by Reg Guide 1.99, Rev 2.

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 TITLE: Generic Letter 92-01 Responses (Reactor Vessel Structural Integrity 1

NOTES: Application for permit renewal filed. 05000400

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CP&L

Carolina Power & Light Company

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JUL 06 1992

R. B. STARKEY, JR.
Vice President
Nuclear Services Department

SERIAL: NLS-92-178
10 CFR 50.54(f)

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

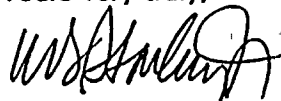
SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
RESPONSE TO GENERIC LETTER 92-01, REVISION 1
REACTOR VESSEL STRUCTURAL INTEGRITY

Gentlemen:

The purpose of this letter is to provide Carolina Power & Light Company's response to NRC Generic Letter 92-01, "Reactor Vessel Structural Integrity," Revision 1. The Generic Letter, which was issued March 6, 1992, requests information needed to assess licensee compliance with requirements and commitments regarding reactor vessel integrity in view of concerns raised in the staff's review of reactor vessel integrity for the Yankee-Rowe Nuclear Power Station. Enclosure 1 provides CP&L's responses to the NRC requests for the Shearon Harris Nuclear Power Plant, Unit 1 (SHNPP).

Please refer any questions regarding this submittal to Mr. S. D. Chaplin at (919) 546-6623.

Yours very truly,



R. B. Starkey, Jr.

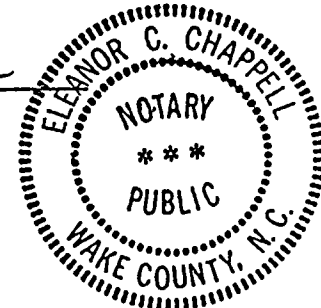
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Enclosure

R. B. Starkey, Jr., having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Eleanor C. Chappell
Notary (Seal)

My commission expires: 2/6/96

cc: Mr. S. D. Ebnetter
Mr. N. B. Le
Mr. J. E. Tedrow



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ENCLOSURE 1

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400 / LICENSE NOS. NPF-63
RESPONSE TO GENERIC LETTER 92-01, REVISION 1
REACTOR VESSEL STRUCTURAL INTEGRITY

NRC REQUEST:

Certain addressees are requested to provide the following information regarding Appendix H to 10 CFR Part 50:

Addressees who do not have a surveillance program meeting ASTM E185-73, -79, or -82 and who do not have an integrated surveillance program approved by the NRC ... are requested to describe actions taken or to be taken to ensure compliance with Appendix H to 10 CFR Part 50. Addressees who plan to revise the surveillance program to meet Appendix H to 10 CFR Part 50 are requested to indicate when the revised program will be submitted to the NRC staff for review. If the surveillance program is not to be revised to meet Appendix H to 10 CFR Part 50, addressees are requested to indicate when they plan to request an exemption from Appendix H to 10 CFR Part 50 under 10 CFR 50.60(b).

CP&L RESPONSE:

This request is not applicable to SHNPP because its surveillance program meets the ASTM E 185-82 standard. A Technical Report describing this program was submitted to the NRC in Reference (1).

NRC REQUEST:

Certain addressees are requested to provide the following information regarding Appendix G to 10 CFR Part 50:

- a. Addressees of plants for which the Charpy upper shelf energy is predicted to be less than 50 foot-pounds at the end of their licenses using the guidance in Paragraphs C.1.2 or C.2.2 in Regulatory Guide 1.99, Revision 2, are requested to provide to the NRC the Charpy upper shelf energy predicted for December 16, 1991, and for the end of their current license for the limiting beltline weld and the plate or forging and are requested to describe the actions taken pursuant to Paragraphs IV.A.1 or V.C of Appendix G to 10 CFR Part 50.
- b. Addressees whose reactor vessels were constructed to an ASME Code earlier than the Summer 1972 Addenda of the 1971 Edition are requested to describe the consideration given to the following material properties in their evaluations performed pursuant to 10 CFR 50.61 and Paragraph III.A of 10 CFR Part 50, Appendix G:
 - (1) the results from all Charpy and drop weight tests for all unirradiated beltline materials, the unirradiated reference temperature for each beltline material, and the method of determining the unirradiated reference temperature from the Charpy and drop weight test;
 - (2) the heat treatment received by all beltline and surveillance materials;

- (3) the heat number for each beltline plate or forging and the heat number of wire and flux lot number used to fabricate each beltline weld;
- (4) the heat number for each surveillance plate or forging and the heat number of wire and flux lot number used to fabricate the surveillance weld;
- (5) the chemical composition, in particular the weight in percent of copper, nickel, phosphorous, and sulfur for each beltline and surveillance material; and
- (6) the heat number of the wire used for determining the weld metal chemical composition if different than Item (3) above.

CP&L RESPONSE:

- (a) This request is not applicable to SHNPP because the Charpy upper shelf energy (USE) at the end of its license is predicted to be greater than 50 foot-pounds using Regulatory Guide 1.99, Revision 2 methodology. Further information regarding USE was provided to the NRC in Reference (1).
- (b) The SHNPP reactor vessel was designed and fabricated to ASME Section III, 1971 Edition through Winter 1971 Addenda. However, the reactor vessel beltline materials were fracture toughness tested to the requirements of paragraphs NB-2322 and NB-2330 of the ASME Code, Summer 1972 Addenda. The NRC evaluated SHNPP compliance to 10CFR50 Appendix G in Reference (2).

On this basis, the requested information for items (1) through (6) is not applicable. Further information on material properties was provided to the NRC in Reference (1).

NRC REQUEST:

Addressees are requested to provide the following information regarding commitments made to respond to GL 88-11:

- a. How the embrittlement effects of operating at an irradiation temperature (cold leg or recirculation suction temperature) below 525°F were considered. In particular licensees are requested to describe consideration given to determining the effect of lower irradiation temperature on the reference temperature and on the Charpy upper shelf energy.
- b. How their surveillance results on the predicted amount of embrittlement were considered.
- c. If a measured increase in reference temperature exceeds the mean-plus-two standard deviations predicted by Regulatory Guide 1.99, Revision 2, or if a measured decrease in Charpy upper shelf energy exceeds the value predicted using the guidance in Paragraph C.1.2 in Regulatory Guide 1.99, Revision 2, the licensee is requested to report the information and describe the effect of the surveillance results on the adjusted reference temperature and Charpy upper shelf energy for each beltline material as predicted for December 16, 1991, and for the end of its current license.

CP&L RESPONSE:

- (a) Consideration of embrittlement effects of operation at an irradiation temperature (cold leg) of less than 525°F are not applicable to SHNPP. Technical Specification 3.1.1.4 requires that the Reactor Coolant System (RCS) loop average temperature be equal to or greater than 551°F for core criticality, except for special physics testing, in which case a temperature of 541°F is still required. The Technical Specification imposes a 15 minute LCO Action if the RCS loop average temperature drops below 551°F while the core is critical. There have been no reported instances of exceeding this limitation, i.e., no Licensee Event Reports against this Specification. On this basis, no significant vessel irradiation has or should occur below the minimum temperature limit of 525°F denoted in Regulatory Guide 1.99, Rev. 2, Paragraph 1.3.2.
- (b) For SHNPP operation through the current service life of five effective full power years (EFPY) reported in Technical Specification Figures 3.4-2, 3.4-3, and Bases 3/4.4.9, the surveillance data was not explicitly considered in the prediction of the amount of embrittlement.

Reference (1) describes the results of evaluation of surveillance capsules removed from the SHNPP reactor vessel. The results indicate that the observed surveillance material property changes (i.e., increase in 30 ft-lb transition temperature and decrease in Charpy Upper Shelf Energy) are bounded by that predicted based on Regulatory Guide 1.99 Revision 2. The predicted amount of embrittlement (adjusted RT_{NDT} and USE) reported in Reference (1) for the reactor vessel materials were conservatively established using Position 2.1 of Regulatory Guide 1.99, Rev. 2 rather than the actual capsule surveillance data.

- (c) No data from the SHNPP Surveillance Program have exceeded the mean-plus-two standard deviation bound predicted by Regulatory Guide 1.99, Revision 2 for the increase in reference temperature; nor have the data exceeded the decrease in charpy upper shelf energy predicted by Paragraph C.1.2 of the Regulatory Guide. Therefore, the requested information is not applicable.

REFERENCES

- (1) CP&L (R.W. Prunty) to USNRC Document Control Desk, Serial NLS-92-097, April 2, 1992, "Reactor Vessel Material Surveillance Report."
- (2) USNRC "Safety Evaluation Report, Related to Operation of Shearon Harris Nuclear Power Plant Unit 1," NUREG-1038, November 1983.

