

July 20, 2007

Mr. Robert J. Duncan II
Vice President
Carolina Power & Light Company
P.O. Box 165, Mail Zone 1
New Hill, NC 27562

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1, LICENSE RENEWAL
APPLICATION

Dear Mr. Duncan:

By letter dated November 14, 2006, Carolina Power & Light Company submitted an application pursuant to 10 CFR Part 54, to renew the operating license for Shearon Harris Nuclear Power Plant, Unit 1, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

These requests for additional information were discussed with Roger Stewart, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-3137 or e-mail MLH5@nrc.gov.

Sincerely,

/RA/

Maurice Heath, Project Manager
License Renewal Branch A
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure:
Requests for Additional Information

cc w/encl: See next page

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**SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION (RAIs)**

RAI-B.2.17

(A) The applicant states that the surveillance capsule that is to be withdrawn during the 16th refueling outage would have been exposed to a neutron fluence value that is equivalent to the peak reactor pressure vessel (RPV) fluence at 55 effective full power year (EFPY). Please confirm this statement. The staff requests that the applicant provide the following information related to this test:

- (1) Lead factor of the surveillance capsule
- (2) Identification number of the capsule, and
- (3) Heat number of the surveillance material in the capsule

(B) Program element 6, item 2 of aging management program (AMP) B.2.17 states that the applicant intends to test one surveillance capsule after the 16th refueling outage. The staff requests that the applicant submit the following information that pertains to the test:

- (1) The projected refueling outage of withdrawal
- (2) Projected capsule neutron fluence value at the time of withdrawal
- (3) Corresponding EFPY for the peak RPV fluence to equal the capsule fluence
- (4) The identification number of the capsule, and
- (5) Heat number of the surveillance material in the capsule

(C) The staff requests that the applicant confirm that the withdrawal schedule of the final two capsules for the extended period of operation is consistent with the requirements, specifically the limitations on lead factor, specified in paragraph 7.6.2 of the American Society of Testing Materials E 185 (ASTM E 185), "Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels."

(D) Section 5.3.1.6 of the final safety analysis report states that the applicant intends to use two standby capsules with identifications Y and Z for future tests. However, the "operating experience" Section of AMP B.2.17 indicates that three capsules will remain in the RPV for future tests to manage neutron embrittlement during the extended period of operation. The staff requests that the applicant provide an explanation for this inconsistency.

(E) The staff requests that the applicant include the following statements in the commitment table of the license renewal application (LRA):

- (1) The applicant will notify the staff if there is any change in the withdrawal schedules of the surveillance capsules.

Enclosure

(2) If a standby capsule is removed from the RPV without the intent to test it, the capsule will be stored in manner which maintains it in a condition which would permit its future use, including during the period of extended operation, if necessary.

RAI-4.2.3 (Editorial Correction)

In Tables 4.2-2 and 4.2-3 of the LRA, the chemical composition values of elements Copper and Nickel for the surveillance capsule test sample representing the intermediate shell plate (heat number-B4197-2) and the RPV's intermediate shell plate (heat number-B4197-2) are identical. However, the chemistry factors are different. The staff requests that the applicant add a footnote stating that the chemistry factor for the surveillance capsule test sample representing the intermediate shell plate is derived from the surveillance test data.

RAI-4.2.4

The staff requests that the applicant include the following items in Section 4.2.4 of the LRA:

(A) The current pressure-temperature (P-T) limits are valid through 36 EFPY. The P-T limits for the extended period of operation will be managed by using approved fluence calculations when there are changes in power of core design in conjunction with surveillance capsule results.

(B) Any change in P-T curves will be implemented by the license amendment process (i.e., modifications of technical specifications) and will meet the requirements of Title 10 of the *Code of Federal Regulations* Section 50.60 (10 CFR 50.60) and 10 CFR Part 50, Appendix G.

RAI-4.2.5

Since the P-T limits for the extended period of operation are not yet developed, the applicant should make a statement in the LRA that they will submit the appropriate analysis for the low temperature overpressure (LTOP) setpoints that will be valid for the license renewal period. Any change in the LTOP setpoints will be implemented by the license amendment process (i.e., modifications of technical specifications) and will meet the requirements of 10 CFR 50.60 and 10 CFR Part 50, Appendix G.

RAI-4.2.6

During the audit at the Harris Nuclear Plant, the staff was informed by the applicant that one reactor vessel nozzle was projected to achieve a neutron fluence greater than 1×10^{17} n/cm² (E > 1 MeV) at the end of the extended period of operation. This nozzle material was not listed in Tables 4.2-1, 4.2-2 and 4.2-3 of the LRA. According to Table 1V A-2 of NUREG-1801, Revision 1, ferritic materials are subject to neutron embrittlement when they are exposed to neutron fluence greater than 1×10^{17} n/cm² (E > 1 MeV) at the end of the extended period of operation. Therefore, the staff requests that the applicant provide the following for this nozzle material and its associated welds:

(1) The RT_{PTS} value of the nozzle material and its associated welds per the requirements of Title 10 of the Code of Federal Regulations (CFR) Section 50.61.

(2) The adjusted reference temperature value of the nozzle material and its associated welds that will be used for developing pressure-temperature limits per the requirements of 10 CFR Part 50, Appendix G.

(3) The upper shelf energy value of the nozzle material and its associated welds per the requirements of 10 CFR Part 50, Appendix G.

Letter to R. J. Duncan II from M. Heath dated July 20, 2007

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Shearon Harris Nuclear Power Plant, Unit 1

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Shearon Harris Nuclear Power Plant, Unit 1 -2-

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