April 10, 2001

Mr. James Scarola, Vice President
Shearon Harris Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING AMENDMENT REQUEST FOR STEAM GENERATOR REPLACEMENT/POWER UPRATE - SHEARON HARRIS NUCLEAR POWER PLANT (TAC NOS. MB0199 AND MB0782)

Dear Mr. Scarola:

By letters dated October 4, and December 14, 2000, you requested license amendments to revise the Shearon Harris Nuclear Power Plant Facility Operating License and Technical Specifications to support steam generator replacement and to allow operation at an uprated core power level of 2900 MWt.

During the course of our review of these requests, the NRC staff has determined that additional information is necessary to complete our review. The enclosed request for additional information was e-mailed to your licensing staff on March 12, 2001, and discussed during a conference call on March 29, 2001. A mutually agreeable target date of May 18, 2001, for your response was established. If circumstances result in the need to revise the target date, please call me at the earliest opportunity.

Sincerely,

/RA/

Richard J. Laufer, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure: As stated

cc w/encl: See next page

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ADAMS ACCESSION NUMBER: ML011000124 * no major change to RAI

OFFICE	PM:PDII/S2	LA:PDII/S2	SC:SPSB	SC:PDII/S2
NAME	RLaufer	EDunnington	MReinhart *	RCorreia
DATE	04/05/01	04/04/01	03/08/01	04/06/01
COPY	Yes/No	Yes/No	Yes/No	Yes/No

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Request for Additional Information
Request for License Amendment: Steam Generator Replacement/Power Uprate
Shearon Harris Nuclear Power Plant
Docket No. 50-400

1. Large-Break Loss-Of-Coolant Accident (LOCA)

In Table 2.22-10 of Appendix A to Reference 1, you have provided the major assumptions and parameters used for the radiological consequence analysis for the large-break LOCA. Provide the following additional information:

- Termination time of containment spray injection.
- Beginning time of containment spray recirculation phase.
- Termination time of containment spray recirculation phase.
- Time to reach elemental iodine decontamination factor of 100.
- Time to reach particulate iodine decontamination factor of 50.
- Explain how you obtained a containment atmosphere mixing rate of 1.60 between the sprayed and unsprayed regions.
- Provide technical basis for assuming flashing fraction of 2 percent for the emergency core coolant system (ECCS) leakage. A constant enthalpy method should be used to determine the flashing fractions.

2. Steamline Break Accident

- In Table 2.22-1 of Attachment A to Reference 1, you have provided an iodine protection factor of 51.1 using 45 cfm unfiltered air inleakage rate into the control room while reference 3 showed the iodine protection factor of 81.8. State the unfiltered air inleakage rate used in Reference 3 and explain the discrepancy.
- Provide delay times (if applicable) in control room isolation after an isolation signal is generated. Explain how you obtained the control room operator thyroid doses in reference 3 for (1) initial blowdown of secondary coolant, (2) pre-existing iodine spike case, and (3) accident-initiated iodine spike case. Did you use the ratios of the atmospheric dispersion factors between exclusion area boundary (EAB) and control room adjusting with the EAB dose and the iodine protection factor?
- Include a copy of reference 3 in your response so it will be included as a docketed submittal for this review.

3. Steam Generator Tube Rupture Accident

In Section 6.3.2 of Reference 2, you have provided the major assumptions and parameters used for the radiological consequence analysis for the steam generator tube rupture accident. Provide the following additional information.

For pre-existing iodine spike

- Iodine activity released (Ci) to the environment through flashed break flow from ruptured steam generator with iodine partition factor of 1.0.

- Iodine activity released (Ci) to the atmosphere from ruptured steam generator and intact steam generators over 0 to 2 hours and 2 to 8 hours with iodine partition factor of 100.

For accident-initiated iodine spike

- Iodine activity released (Ci) to the environment through flashed break flow from ruptured steam generator with iodine partition factor of 1.0.

- Iodine activity released (Ci) to the atmosphere from ruptured steam generator and intact steam generators over 0 to 2 hours and 2 to 8 hours with iodine partition factor of 100.

- Post-trip average primary coolant iodine concentrations for 0 to 2 hour and 2 to 8 hour durations.

4. Control Rod Ejection Accident

In Table 2.22-7 of Appendix A to Reference 1, you have provided the major assumptions and parameters used for the radiological consequence analyses for the control rod ejection accident. In the table, you stated that you assumed a credit for fission product removal by the containment spray. State what initiated the containment spray and describe its operation.

5. Meteorology

As a result of the February 22, 2001, meeting on the Harris alternate source term analysis, it is the staff's understanding that either 1) one set of relative concentration (X/Q) values for control room dose calculations is considered to be the design basis input for all of the Harris design basis accident dose assessments, or 2) because this set is associated with the design basis accident currently resulting in the highest estimated dose, other X/Q values do not need to be considered.

- If this is correct, confirm and discuss why this single set of X/Q values is adequate (e.g., they bound the X/Q values for all of the other accidents).

- If the set of X/Q values is not bounding for all accidents, then for all sets not bounded, provide the X/Q values, and the methodology, inputs, and assumptions used to calculate the other X/Q values.

- In addition, list the accidents for which each set applies, as well as the postulated release location/receptor pairs. A figure would be helpful in understanding the physical relationship of the release locations and receptor pairs with respect to heights, distances, directions, and plant structures.

- At the February 22, 2001, meeting, a handout related to iodine activity was provided. Please submit a copy of that handout with this response so it will be included as a docketed submittal for this review.

During the meeting, two relatively recent license amendments were discussed. Both

Amendments 88 and 97 relate to fuel-handling dose assessments. In both Safety Evaluations, the staff agreed with the licensee's finding that the fuel-handling dose to control room personnel was bounded by the dose for the LOCA. In the case of Amendment 97, staff concluded that the acceptability applied for Outage 9 and Operating Cycle 10. Other design-basis accidents were not considered and acceptability was discussed in terms of dose. X/Q values are a function of release location/receptor pairing that may be a function of accident. The highest X/Q values are not necessarily associated with the highest dose since dose is also a function of other inputs that may vary as a function of accident and, for a given accident, change over time with changes in assumptions related to plant design and/or operation. While Amendments 88 and 97 may provide some useful information, additional justification is needed for X/Q values for other release location/receptor pairings and other accidents.

References:

1. Carolina Power & Light Company letter to the NRC dated December 14, 2000, titled "Power Uprate."

2. Carolina Power & Light Company letter to the NRC dated October 4, 2000, titled "Steam Generator Replacement."

3. Carolina Power & Light Company, Harris Nuclear Plant Calculation Sheet, HNP-F/NFSA-0072, titled "SGRP/POWER UPRATE PROJECT," dated August 28, 2000. (Faxed to NRC to support a conference call)

cc:

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