UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 11, 2009

Chris L. Burton, Vice President
Shearon HNP Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 – REQUEST FOR ADDITIONAL INFORMATION REGARDING AMENDMENT TO LOWER THE MINIMUM ALLOWED LEVEL OF THE ULTIMATE HEAT SINK MAIN RESERVOIR (TAC NO. MD8676)

Dear Mr. Burton:

By letter dated April 30, 2008, as supplemented by letter dated December 3, 2008, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., submitted a proposed amendment for the Shearon Harris Nuclear Power Plant, Unit 1 (HNP).

The proposed amendment would revise Technical Specification (TS) Section 3.7.5a to restore the Ultimate Heat Sink Main Reservoir minimum level to the value allowed by the initial operating license as a result of improvements made to the Emergency Service Water system. The change will allow continued plant operation to a Main Reservoir minimum level of 206 feet Mean Sea Level (MSL) in Mode 1-4, versus the current minimum allowed level of 215 feet MSL.

The U.S. Nuclear Regulatory Commission staff has determined that it needs additional information in order to complete its review. Kindly respond to the enclosed questions by June 30, 2009, in order to facilitate a timely completion of the staff review. Please contact me at 301-415-3178 if you have any questions on this issue, would like to participate in a conference call, or if you require additional time to submit your responses.

Sincerely,

Marlayna Vaaler, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure: As stated

cc w/enclosure: Distribution via ListServ

REQUEST FOR ADDITIONAL INFORMATION (RAI)

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO LOWER THE MINIMUM ALLOWED LEVEL OF THE

ULTIMATE HEAT SINK MAIN RESERVOIR

DOCKET NO. 50-400

Background

The licensee submitted a License Amendment Request (LAR) to lower the minimum allowed level of the Main Reservoir of the Ultimate Heat Sink (UHS) to 206 feet. The level of the UHS when supplying water to the Service Water System (SWS) is a factor as to whether the SWS can meet the design basis stated in the Final Safety Analysis Report (FSAR) Section 9.2.1.1b. LAR Section 4.1, "Minimum ESW [Emergency Service Water] Flow Rates," and Section 4.2, "Minimum ESW Pressures Inside Containment," address the technical basis for revising the minimum level of the Main Reservoir to 206 feet.

RAI-1

Issue

The design basis of the SWS, as stated in FSAR Section 9.2.1.1b, is to provide cooling water at a maximum temperature of 95 degrees Fahrenheit (°F) in order to remove essential plant heat loads by utilizing the Auxiliary Reservoir or its backup, the Main Reservoir, during emergency operation. This design basis function is performed by the ESW pumps and booster pumps. The licensee stated in Section 4.1 of the LAR that calculation SW-0080 summarizes the minimum required flow rates for each of the components served by ESW. These flow rates are not stated in Section 4.1, nor was the explanation clear as to how the licensee will continue to meet the minimum flow rates at a Main Reservoir level of 206 feet.

Section 4.1 of the LAR states that the results of calculations SW-0080 and HNP-M/MECH-1011 show that there is positive flow margin available with a 206 feet minimum level limit in the Main Reservoir. To explain the positive flow margin, the licensee presented data from EPT-250 (A) and EPT-251 (B), recorded in 2007, and flow balance results from 2005 and 2007. The NRC staff is unclear as to how the licensee obtained the data in these tables as well as how the data in these tables show that the minimum flow requirements of the SWS are met when the Main Reservoir level is lowered to 206 feet.

Request

Please answer the following questions so that the staff has the relevant information needed to make a fully informed and technically correct regulatory decision on the proposed action.

1. What are the minimum required flow rates to the components cooled by the ESW pumps and booster pumps to remove essential plant heat loads at a maximum service water temperature of 95°F? Please state these flow rates in the appropriate LAR section.

2. Explain the EPT-250 (A) and EPT-251 (B) calculations more fully and describe what the associated data tables represent. How do the data in these tables prove that the minimum flow rates to components cooled by the ESW pumps and booster pumps will be met when the Main Reservoir level is 206 feet?

3. Are the "recorded gpm [gallons per minute]" values actual measured flow data or are they calculated results?

4. How are the "limit gpm" values obtained, and what do the comparisons of "recorded gpm" and "limit gpm" mean?

5. The "limit gpm" values are apparently calculated for a Main Reservoir level of 206 feet. Do the results of EPT-250 (A) remain valid in that it appears that the values were obtained when lined up to the Auxiliary Reservoir at a level of 251.3 feet? Please explain this apparent inconsistency.

6. Please more fully explain the meaning of "Margin [Percent]?" Does the 1596 gpm value for AH-4 of EPT-251 (B) represent the actual flow through AH-4 with a Main Reservoir level of 217.3 feet as measured by an actual flow test? Does 1368 gpm represent what the flow would have been through AH-4 if the Main Reservoir had been at 206 feet as determined by flow model and calculation? If so, would not the real flow margin be 1368 gpm/1352 gpm = a 1.2 percent margin, instead of the 16.6 percent margin listed [assuming, from calculation SW-0080, that 1352 gpm is the minimum flow required to remove the essential heat load from AH-4 with a service water temperature of 95°F at a Main Reservoir Level of 206 feet]? Please explain the basis for the 16.6 percent flow margin calculation and provide any additional information that may help the staff understand how this margin was determined.

7. Please correct or explain the information provided on Page 7 of the LAR: the year 2003 does not correspond to any of the data tables and is apparently a typographical error.

8. Please ensure that all calculations referenced in the LAR contain revision numbers.

9. Section 4.1 of the LAR states that "SW-0080 also assumes that the failure of breaker MCC 1B35SB is the most limiting single failure affecting the 'A' train when, in fact, the loss of an entire ESW train is the most limiting in terms of the entire ESW system." Please explain the significance and relevance of this statement in regard to lowering the Main Reservoir level to 206 feet, as well as how this assumption adds conservatism to the flow limit results of calculation SW-0080.

10. Explain the process by which the licensee will ensure that the minimum Main Reservoir level [proposed to be 206 feet] will continue to be satisfactory over time with respect to ESW flow rates and pressure in containment as the system degrades over time.

RAI-2

Issue

FSAR Section 9.2.1, "Service Water System," states that under accident conditions, the service water booster pumps, in conjunction with the containment fan cooler orifice bypass valves, will function to maintain the service water pressure inside the coolers above the containment design pressure to prevent leaks into the SWS.

Section 4.2 of the LAR states that calculation HNP-M/MECH-1011 demonstrates that there is positive pressure margin available with a 206 feet minimum level in the Main Reservoir. Since the ESW Pumps and the ESW Booster Pumps both contribute to ESW pressure inside containment, the figures shown in the submittal provide the minimum allowable pump differential pressures for both pumps of each train on a single graph. The NRC staff is not clear as to how the licensee generated the figures in the LAR shown on pages 10 of 23 and 11 of 23, and how these figures demonstrate that the licensee will continue to meet the minimum service water pressure requirements inside the containment coolers.

Request

Please answer the following questions so that the staff has the relevant information needed to make a fully informed and technically correct regulatory decision on the proposed action.

1. Explain the shape of the graphs for the "A" and "B" ESW and Booster Pumps, and how the graphs prove that the required service water pressure will be available when the Main Reservoir level is at 206 feet.

2. Explain why 95.1 pounds per square inch (psi) is the minimum A ESW Pump differential pressure. Per the staff's understanding of the graph, why would 90 psi not be sufficient?

3. Explain why 50.7 psi is the minimum A ESW Booster Pump differential pressure. Why would not 49 psi be sufficient, if the A ESW Pump differential pressure were raised?

4. Explain the Operations Surveillance Tests (OST) and how they are different / related to the EPT data from Section 4.1 of the LAR. In addition, provide a frequency on how often these tests are performed for each ESW pump and ESW booster pump.

5. How are the values of the OST 1214 and OST 1215 test windows determined and what do the test windows mean (i.e., what establishes the upper limits and edges of the curves depicted? explain the surveillance requirement box and the curve derivations)?

6. Section 4.8, "OST Considerations," of the LAR states that the "'A' ESW Booster Pump should continue to remain above this new minimum limit." What will be the course of action if the 'A' ESW Booster Pump does not remain above the new limit?

7. Section 4.2 of the LAR states that the results of calculation HNP-M/MECH-1011 show that ESW pressure, not flow, currently defines the available ESW system margin. Do the differential pressure limits shown in the figures on pages 10 of 23 and 11 of 23 in the LAR reflect limits based on ESW flow or ESW pressure or both? Please explain.

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