



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

August 24, 2010

Christopher L. Burton, Vice President  
Shearon Harris 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 – CORRECTIONS OF  
TYPOGRAPHICAL ERRORS REGARDING AMENDMENT NO. 134 AND THE  
ASSOCIATED SAFETY EVALUATION (TAC NO. ME3281)

Dear Mr. Burton:

On July 16, 2010, the U.S. Nuclear Regulatory Commission (NRC) issued Amendment No. 134 to Renewed Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1 (HNP) [Agencywide Documents Access and Management System Accession No. ML101880126], in response to your application dated January 27, 2010, as supplemented by letter dated March 22, 2010.

The amendment revised Technical Specification (TS) Limiting Condition for Operation Section 3.6.2.2.a to incorporate an expanded range of eductor flow rates for the HNP Containment Spray Additive System as a result of the use of a new chemical model and new boric acid equilibrium data, revised sump pH limits, and changes to the Containment Spray Additive Tank concentration and volume limits.

Members of the Carolina Power & Light Company (now doing business at Progress Energy Carolinas, Inc.) staff subsequently identified a typographical error in the NRC safety evaluation (SE) associated with the amendment. Specifically, the correction impacts page 6 of the SE.

The fourth paragraph on page 6 of the NRC SE currently reads:

The HNP TS SRs ensure that at least once every 6 months the licensee verifies the concentration and volume of the NaOH solution in the spray additive tank. In addition, the TS limit on minimum sodium tetraborate mass will ensure that there is sufficient NaOH available to maintain the post-LOCA sump pH above 7.0.

However, HNP does not utilize sodium tetraborate for pH control, and the minimum TS limit being impacted by this amendment is for sodium hydroxide (NaOH) mass. Accordingly, the word "tetraborate" was changed to "hydroxide" in the enclosed corrected SE page 6.

The NRC staff determined that this typographical error was inadvertently introduced. The correction does not change any of the conclusions in the safety evaluation related to the amendment and does not affect the associated *Federal Register* notice to the public.

C. Burton

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We regret any inconvenience this may have caused. If you have any questions regarding this issue, please contact me at 301-415-3178.

Sincerely,

A handwritten signature in black ink, appearing to read 'Marlayna Vaaler', written in a cursive style.

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

Docket No. 50-400

Enclosure:  
Correction to NRC SE  
for Amd. No.134 to NPF-63

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ENCLOSURE

CORRECTED PAGE 6 OF THE  
SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 134 TO  
RENEWED FACILITY OPERATING LICENSE NO. NPF-63  
CAROLINA POWER & LIGHT COMPANY  
SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1  
DOCKET NO. 50-400

considered minimum and maximum boron concentrations and volumes for the refueling water storage tank, accumulators, pressurizer, and reactor coolant system. Additional inputs included the impact of strong acids generated by radiation of cable insulation and sump water. The licensee used conservative values for the quantity of cable material inside containment and considered the maximum water volume when determining the amount of sump fluid present. The NRC staff finds the licensee's calculations for strong acid generation acceptable based on the conservative assumptions used to create the calculation inputs.

The licensee's minimum pH evaluation used the maximum borated water source volumes and concentrations, as well as the contribution of acid from the radiolysis of cables and sump fluid, to determine the minimum sodium hydroxide concentration and CSAT volume necessary to ensure an equilibrium sump pH greater than 7.0. The calculation determined that a CSAT volume of 3268 gallons with a 27 weight-percent NaOH solution would be sufficient to maintain the overall pH greater than 7.0. Any quantity of NaOH greater than this will ensure that the sump pool pH will remain in an alkaline regime under the worst case boron concentrations, sump fluid volumes, and quantities of strong acid generated.

The maximum pH case was also analyzed based on the proposed TS limit of a CSAT volume of 3768 gallons containing a 29 weight-percent NaOH solution. The maximum pH case remains consistent with the previous maximum pH of 11.0.

The HNP TS SRs ensure that at least once every 6 months the licensee verifies the concentration and volume of the NaOH solution in the spray additive tank. In addition, the TS limit on minimum sodium hydroxide mass will ensure that there is sufficient NaOH available to maintain the post-LOCA sump pH above 7.0.

A change in the post-LOCA pH profile for the containment spray and the sump pool also impacts the corrosion rate and solubility of materials that can contribute to chemical effects in the form of precipitates that may impact ECCS strainer performance. Accordingly, the licensee's calculation of post-accident chemical precipitate formation has been revised based on output from the post-accident pH calculation to show that the new spray pH histories do not affect the input assumptions used during recirculation sump screen testing.

In addition, the quantity of chemical precipitate generated under the proposed conditions for eductor flow rates and CSAT volume and concentration are less than or equal to the quantity used for the HNP ECCS strainer qualification testing. The NRC staff will review the licensee's ECCS strainer performance as part of the response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors"; however, it is noted that this proposed change will not adversely impact the licensee's current analysis and testing for Generic Safety Issue 191.

The NRC staff reviewed the licensee's analysis for maintaining suppression pool pH greater than or equal to 7.0 for 30 days following a LOCA, and concluded that the assumptions and analysis used conservative values for the key parameters of the calculation. The assumptions are appropriate and consistent with the methods accepted by the staff for the calculation of post-accident containment sump pH. The staff also verified that the proposed TS requirements for NaOH concentration and volume will ensure sufficient buffering of the sump pool such that the pH will not drop below 7.0. Finally, the staff determined that HNP's proposed changes are consistent with the guidance contained in RG 1.183, which states that maintaining the pH at or

C. Burton

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We regret any inconvenience this may have caused. If you have any questions regarding this issue, please contact me at 301-415-3178.

Sincerely,

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

Docket No. 50-400

Enclosure:  
Correction to NRC SE  
for Amd. No.134 to NPF-63

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