

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

October 14, 2011

Mr. William Jefferson, Jr. Vice President Carolina Power & Light Company Shearon Harris Nuclear Plant P.O. Box 165, Mail Zone 1 New Hill, NC 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR PLANT, UNIT 1 – REQUEST FOR ADDITIONAL INFORMATION REGARDING MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE (TAC NO. ME6169)

Dear Mr. Jefferson:

By letter dated April 28, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11124A180), as supplemented on June 23, 2011 (ADAMS Accessions No. ML11179A052), Carolina Power & Light Company requested approval from the U.S. Nuclear Regulatory Commission (NRC) to increase the core thermal power level of Shearon Harris Nuclear Power Plant, Unit 1 from 2,900 megawatts thermal (MWt) to 2,948 MWt, an increase of approximately 1.66 percent over the present licensed power level and to change the power plant technical specifications accordingly.

The NRC staff has reviewed your letter dated September 6, 2011, which was in response to the NRC staff's August 8, 2011, request for additional information (RAI), and has determined that clarification of the additional information is needed. The specific questions are found in the enclosed RAI. It is requested that your response be provided by October 21, 2011, as discussed with your staff on September 28, 2011, via e-mail. If more time is needed to respond to the enclosed RAI, your request for additional time should include a basis for the need for an extension.

Please feel free to contact me at 301-415-2020 or by e-mail at <u>brenda.mozafari@nrc.gov</u> if you have any questions on this issue or require additional time to submit your response.

Sincerely,

Brenda Mozafari, Senior Project Manager Plant Licensing Branch II-2 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure: RAI

cc w/encl: Distribution via Listserv

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1

REQUEST FOR ADDITIONAL INFORMATION (RAI)

REGARDING MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE

TAC NO. ME6169

By letter dated April 28, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11124A180), as supplemented on June 23 and September 6, 2011 (ADAMS ML11179A052 and ML11256A026, respectively), Carolina Power & Light Company (the licensee) requested approval from the U.S. Nuclear Regulatory Commission (NRC) to increase the core thermal power level of Shearon Harris Nuclear Power Plant (HNP), Unit 1 from 2,900 megawatts thermal (MWt) to 2,948 MWt, an increase of approximately 1.66 percent over the present licensed power level and to change the power plant technical specifications accordingly.

RAI 1

In response to an NRC staff RAI, regarding the design code of record used in the evaluation of the reactor vessel internals (RVIs) to support the implementation of a measurement uncertainty recapture (MUR) power uprate at HNP, it was stated in Reference 2 that the HNP RVIs are not American Society of Mechanical Engineers (ASME) Code internals. As such, it was stated that no code of record is applicable to the original design and construction of the RVIs and that the structural integrity of the RVIs were originally using "different design codes." Furthermore, it was stated that the 2004 Edition of the ASME Boiler and Pressure Vessel (B&PV) Code (the Code), Section III, Subsection NG, "Core Support Structures," was used to evaluate the RVIs for acceptability at the conditions that will exist after MUR implementation.

Section 3.9.5.4 of the HNP Final Safety Analysis Report (FSAR) states that the intent of Subsection NG of the Code was utilized in the evaluation of the RVIs, with respect to the allowable stresses used in the design basis analyses of the RVIs. The HNP FSAR also states that the allowable stress limits "... during the design basis accident ..." are based on the 1973 draft of Subsection NG and the criteria for faulted conditions specified in the Code. Specifically, the FSAR cites the limits provided in Figure NG-3221-1 of the Code for the Normal and Upset Conditions, and NG-3224-1 of the Code for Emergency Conditions as those used in the evaluation of the RVIs. Faulted loading conditions were stated to have been evaluated in accordance with Appendix F of the Code.

Confirm that the stress limits cited in the HNP FSAR were utilized in the evaluation of the RVIs to support the proposed MUR power uprate at HNP, and confirm that these limits will remain satisfied following MUR implementation. Additionally, please provide a technical justification regarding the use of the provisions in the 2004 Edition of the Code, Section III, Subsection NG, in lieu of the design basis acceptance criteria cited in the HNP FSAR. This justification should include, but not be limited to, a confirmation that the criteria used in the design basis analyses of the RVIs (i.e., FSAR limits) have been reconciled to the criteria of the 2004 Edition of the Code, Section III, Subsection NG.

Enclosure

RAI 2

In response to an NRC staff RAI, regarding the structural evaluation of the HNP baffle-former bolts to determine their adequacy at the proposed MUR power level, a qualitative discussion was provided that compared the HNP baffle-former bolts to the baffle-former bolts at Almaraz Unit 2. As indicated in response to RAI 3 in Reference 2, the only loads used in the design of the HNP RVIs that are affected by the proposed MUR power uprate are those loads due to heat generation rates. It was stated that the HNP baffle-former bolts (an RVI component) were acceptable for operation at MUR conditions based on the fact that the Almaraz Unit 2 baffle-former bolts were structurally qualified under its current conditions, given the similarities in the geometries, operating parameters, design transients and heat generation rates between each facility.

Provide a quantitative summary of the information described above, which qualitatively compared the HNP and Almaraz Unit 2 baffle-former bolts, to demonstrate the structural qualification of these components at MUR conditions. Include a quantitative summary of the effects of the higher heat generation rates on the analysis of record for the baffle-former bolts, including the effects of the higher heat generation rates on the stresses and fatigue usage factors. Further, compare the expected stresses and fatigue usage factors in the baffle-former bolts to the HNP design basis acceptance criteria for these components such that an explicit determination, that the components will continue to meet their design basis requirements following MUR implementation, can be made.

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Sincerely,

/RA by JPaige for/

Brenda Mozafari, Senior Project Manager Plant Licensing Branch II-2 **Division of Operating Reactor Licensing** Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure: RAI

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OFFICE	LPL2-2/PM	LPL2-2/LA	DE/EMCB/BC (A)	LPL2-2/BC	LPL2-2/PM
NAME	BMozafari	CSola	MMurphy*	DBroaddus (FSaba for)	BMozafari (JPaige for)
DATE	10/06/11	10/06/11	10/06/11	10/13/11	10/14/11

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