

NRR-PMDAPEm Resource

From: Mozafari, Brenda
Sent: Wednesday, September 28, 2011 6:24 PM
To: Caves, John
Cc: Saba, Farideh
Subject: Additional MUR RAI (EMCB part 2)(ME6169).docx

Importance: High

John,

By letter dated April 28, 2011 (Agencywide Documents Access and Management System Accession No. ML11124A180), 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% over the present licensed power level and to change the power plant technical specifications accordingly.

The NRC staff has reviewed the supplemental information provided by the licensee in letter dated September 6, 2011. Based on our review of the response, the staff requests the following additional information:

RAI 1

In response to an NRC staff request for additional information (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 Shearon Harris Nuclear Power Plant, Unit 1 (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, Section III, Subsection NG, "Core Support Structures," was used to evaluate the RVIs for acceptability at the conditions which 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 ASME B&PV 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 ASME B&PV 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 ASME B&PV Code, Section III, Subsection NG.

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 which

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 which 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 (a 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.

It is requested that your RAI response be provided by October 21, 2011, as discussed with your staff on September 28, 2011. If more time is needed to respond to the RAI, your request for additional time should include a basis for the need for an extension.

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