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

July 12, 2010

Mr. George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RE: PROPOSED TRANSITION FROM WESTINGHOUSE TO AREVA NUCLEAR FUEL - CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 - (TAC NOS. ME2831 AND ME2832)

Dear Mr. Gellrich:

By letter dated November 23, 2009, Calvert Cliffs Nuclear Power Plant, LLC requested a license amendment for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. The amendment would modify the Calvert Cliffs licensing basis and the Technical Specifications to allow the use of AREVA Advanced CE-14 High Thermal Performance fuel in the Calvert Cliffs reactors. Calvert Cliffs currently uses Westinghouse Turbo 14x14 fuel assemblies in both units.

The NRC staff has reviewed the information provided and has determined that additional information is needed to complete its review. Enclosed is the staff's request for additional information (RAI) regarding the realistic large break loss-of-coolant accident. As discussed with your staff, we understand that you intend to respond to this RAI within 30 days of the date of this letter.

Please contact me at 301-415-1364 if you have any questions.

Sincerely,

Douglas V. Pickett

Douglas V. Pickett, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosure:
As stated

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

CALVERT CLIFFS NUCLEAR POWER PLANT (CCNPP), UNIT NOS. 1 AND 2

TRANSITION TO AREVA NUCLEAR FUEL

1. Please provide more information about the management of the fuel thermal conductivity degradation issue identified in NRC Information Notice 2009-23, "Nuclear Fuel Thermal Conductivity Degradation." Specifically:

    a. ANP-2834(P), Page 1-3, states, "For each specific time in cycle, the fuel conditions are computed using RODEX3A prior to starting the S-RELAP5 portion of the analysis. A steady state condition for the given time in cycle using S-RELAP5 is established. A base fuel centerline temperature is established in this process. Then two-transformation adjustment to the base fuel centerline temperature is computed. The first transformation is a linear adjustment for an exposure of 10 MWd/MTU or higher. In the new process, a polynomial transformation is used in the first transformation instead of a linear transformation." Please clarify the following:

        i. Explain how the fuel pellet radial temperature profile is computed.

        ii. Explain which code is used to calculate this profile, both for initial conditions and through the postulated accident.

        iii. Explain whether the polynomial transformation is applied merely to the centerline temperature, or to the entire pellet temperature.

    b. Provide additional information to describe the polynomial transformation. Summarize data used to develop the polynomial transformation and discuss consideration of applicable uncertainties.

2. The current licensing basis, deterministic loss-of-coolant accident (LOCA) analysis concluded that the limiting condition did not involve a worst-case single failure, but rather that it depended on injected coolant delivered in such a condition that the resultant containment environment, specifically the lower containment pressure, contributed to the limiting peak cladding temperature (PCT). Please provide information describing how this potentially limiting scenario was evaluated using the proposed best-estimate methodology.

Enclosure

3. Please provide additional information summarizing the single-failure evaluation performed to establish compliance with General Design Criterion (GDC) 35 requirements. Identify which single failures were considered, discuss whether each failure was evaluated or explicitly analyzed, and for those failures which were explicitly analyzed, explain whether they were analyzed in a reference case or explicitly as a part of the statistical methodology. Also discuss the basis for the single failure evaluation. For example, were single failures considered as a matter of experience with CCNPP specifically, or with a generic Combustion Engineering nuclear steam supply system design?

4. Page 3-6 states, "the RLBLOCA [realistic large break loss-of-coolant accident] transients are of sufficiently short duration that the switchover to sump cooling water (i.e., RAS [recirculation actuation signal]) for ECCS [emergency core cooling system] pumped injection need not be considered." For the limiting transient, the collapsed core liquid level from 200-350 seconds appears to trend downward (Figure 3-20). An indication of stable and increasing collapsed liquid level would substantiate the statement quoted above, but this is not the case for Figure 3-20. Is the SRELAP-5 model of the limiting case capable of generating credible results after 350s? If so, please provide results for a period of the transient sufficient to demonstrate that the core collapsed liquid levels are stable or increasing.

5. Please provide information to enable comparison between Technical Specifications (TS) requirements and analytic input parameters for Pressurizer Level. The TS requirement is given in inches and the input parameters are specified in percent span.

6. Please provide discussion to confirm that the assumed 60 °F containment temperature is an acceptable minimum without a TS requirement.

7. The TS minimum for the refueling water storage tank (RWST) temperature is 45 °F. Previous, deterministic analyses demonstrated that minimum safety injection temperatures resulted in a limiting PCT. In light of this information, please explain why a minimum RWST temperature case was not evaluated, or if a minimum RWST temperature case was evaluated, please summarize the evaluation and discuss its conclusions.

8. As noted in Section 1 of ANP-2834(P), deviations from the approved RLBLOCA evaluation model (EMF-2103(P)(A), Revision 0) are necessary to demonstrate compliance with 10 CFR 50.46 requirements. Please provide a commitment to adhere to the deviations noted in Section 1 of ANP-2834(P)(A) until such time as:

a. AREVA develops a new revision of EMF-2103,

b. The NRC approves the new revision of EMF-2103, and

c. CCNPP implements the new, NRC-approved revision of EMF-2103.

The commitment should include language to indicate that meeting Conditions a, b, and c, above, or submitting a license action request to implement a different evaluation method, will obviate the need for this commitment.

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Douglas V. Pickett, Senior Project Manager
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