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October 14, 2005

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Request for Additional Information Re: Measurement Uncertainty Recapture Power Uprate (TAC Nos. MC6210 and MC6211)

REFERENCES:

(a) Letter from Mr. K. J. Nietmann (CCNPP) to Document Control Desk (NRC), dated January 31, 2005, License Amendment Request: Appendix K Measurement Uncertainty Recapture – Power Uprate Request

(b) Letter from Mr. G. Vanderheyden (CCNPP) to Document Control Desk (NRC), dated July 18, 2005, Request for Additional Information Re: 1.38 Percent Measurement Uncertainty Recapture Power Uprate License Amendment Request (TAC Nos. MC6210 and MC6211)

(c) Letter from Mr. P. D. Milano (NRC) to G. Vanderheyden (CCNPP), dated August 30, 2005, Request for Additional Information Re: Measurement Uncertainty Recapture Power Uprate (TAC Nos. MC6210 and MC6211)

Reference (a) submitted a request to increase the maximum steady state thermal power level for Calvert Cliffs Units 1 and 2 based on the use of more accurate feedwater flow measurement instrumentation. This request was supplemented on July 18, 2005 (Reference b). The Nuclear Regulatory Commission has determined that additional information is needed to complete their review (Reference c). Attachment (1) to this letter provides the requested information. The information contained in these responses supplements the information provided in References (a) and (b), and does not affect the No Significant Hazards Determination or the Environmental Consideration provided in Reference (a).

A001

Should you have questions regarding this matter, please contact Mr. L. S. Larragoite at (410) 495-4922.

Very truly yours,

STATE OF MARYLAND :
: **TO WIT:**
COUNTY OF CALVERT :

I, George Vanderheyden, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP), and that I am duly authorized to execute and file this License Amendment Request on behalf of CCNPP. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other CCNPP employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of Calvert, this 14 day of October, 2005.

WITNESS my Hand and Notarial Seal:

Notary Public

My Commission Expires: 7/1/06
Date

GV/PSF/bjd

Attachment: (1) Request for Additional Information Regarding Measurement Uncertainty Recapture Power Uprate

cc: P. D. Milano, NRC
S. J. Collins, NRC
Resident Inspector, NRC
R. I. McLean, DNR

ATTACHMENT (1)

REQUEST FOR ADDITIONAL INFORMATION REGARDING

MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE

Calvert Cliffs Nuclear Power Plant, Inc.
October 14, 2005

By letter dated January 31, 2005, as supplemented on July 18, 2005, Calvert Cliffs Nuclear Power Plant (CCNPP), Inc. requested authorization to increase the maximum steady-state thermal power at CCNPP, Unit Nos. 1 and 2, from 2700 megawatts thermal (MWt) to 2737 MWt, which is a 1.38% power uprate. To complete its review, the Nuclear Regulatory Commission staff requests the following information:

NRC Question

1. *Discuss the effect, if any, from the proposed power uprate on the actuation setpoints for the diverse reactor scram, main turbine trip, and auxiliary feedwater system trip signals.*

CCNPP Response

The proposed power uprate will have no effect on the actuation setpoints for the diverse scram system, diverse turbine trip, or diverse auxiliary feedwater actuation system. No changes will be made to these actuation setpoints as a result of the proposed power uprate.

NRC Question

2. *Provide a statement concerning whether CCNPP, Inc. and its vendor have ongoing processes to assure that the large-break and small-break loss-of-coolant accident analyses input values for CCNPP, Unit No. 1 conservatively bound the as-operated plant values for Unit No. 1. Provide a similar statement regarding CCNPP, Unit No. 2.*

CCNPP Response

Calvert Cliffs and its vendor have ongoing processes to assure that the large-break and small-break loss-of-coolant accident analysis input values for Calvert Cliffs Units 1 and 2 conservatively bound the as-operated plant values for Calvert Cliffs Units 1 and 2, respectively.

NRC Question

3. *Discuss the results of the post-accident fuel cladding oxidation and the assumption regarding pre-accident oxidation levels to assure that the overall cladding oxidation remains below 17%.*

CCNPP Response

All assumptions, inputs, and methodologies for calculating maximum post-accident cladding oxidation resulting from a loss-of-coolant accident (LOCA) are documented and verified to be consistent with Nuclear Regulatory Commission-approved LOCA models and methodologies approved in associated Safety Evaluation Reports (References 1 and 2). Approved in that methodology is a conservative measure of pre-accident cladding oxidation that results in a conservatively large post-accident rate of oxidation on the cladding surface. Additionally, if we considered pre-accident oxidation consistent with Figure 4.5.2-1 (Maximum ZIRLO™ Cladding Oxide Thickness versus Rod Average Burnup) of References 3 and 4, along with the documented LOCA results in current Analysis of Record the results would remain below the 10 CFR 50.46 oxidation limits. This supports operation at current and proposed measurement uncertainty power uprate conditions with respect to maximum cladding oxide thickness, both prior to and following the postulated occurrence of a LOCA.

NRC Question

4. *In its letter dated July 18, 2005, the licensee stated (see answer to question no. 16) that the projected thermal power had not been updated for the purpose of calculating the projected reactor pressure vessel (RPV) neutron fluence values.*

Provide the end-of-license (EOL) neutron fluence values for the RPVs based on either: (1) a direct neutron transport code calculation of the impact of operating at power uprate conditions, or (2) a qualitative assessment of the impact of the proposed power uprate and a bounding quantitative calculation of the EOL neutron fluence values.

Based on the results of the EOL RPV neutron fluence evaluation, revise the July 18, 2005, response to question no. 17, as necessary, as it relates to the projected EOL material properties (upper shelf energy, nil-ductility transition reference temperature) for the CCNPP, Unit Nos. 1 and 2, RPVs.

CCNPP Response

The Unit 1 and Unit 2 extended end-of-life (EOL) fluence values were re-evaluated assuming a 1.4% MUR power uprate (which bounds the requested MUR power uprate of 1.38%).

The fluence results are listed in the following table.

	Unit 1 Fluence Current	Unit 1 Fluence 1.4% Power Uprate	Unit 2 Fluence Current	Unit 2 Fluence 1.4% Power Uprate
Critical Weld	5.09E+19	5.12E+19	5.74E+19	5.79E+19
1/4 T Location	2.96E+19	2.98E+19	3.02E+19	3.05E+19
3/4 T Location	6.09E+18	6.13E+18	6.33E+18	6.38E+18

The 1/4 T upper shelf energy values as reported in the response to question 17 of Reference (b) assume a Unit 1 EOL fluence of 3.0E+19, which bounds the 2.98E+19 fluence value calculated above, and a Unit 2 EOL fluence of 3.4E+19, which bounds the 3.05E+19 value calculated above.

For completeness, the RT_{PTS} values for the reactor vessel welds and plates are listed in the following table. Note that the RT_{PTS} values are well below the 10 CFR 50.61 pressurized thermal shock screening criteria limits of 270°F for plates, forgings, and axial weld materials, and 300°F for circumferential weld materials.

Seam/ Plate	Unit 1 Current Fluence n/cm2	Unit 1 Current RT_{PTS} deg-F	Unit 1 1.4% Power Uprate Fluence n/cm2	Unit 1 1.4% Power Uprate RT_{PTS} deg-F
WELDS				
2-203-A/B/C	5.09E+19	243.6	5.12E+19	243.8
3-203-A/B/C	5.09E+19	254.1	5.12E+19	254.3
9-203	5.09E+19	53.4	5.12E+19	53.5
PLATES				
D-7206-1	5.09E+19	158.0	5.12E+19	158.1
D-7206-2	5.09E+19	105.1	5.12E+19	105.2
D-7206-3	5.09E+19	145.1	5.12E+19	145.2
D-7207-1	5.09E+19	170.5	5.12E+19	170.6
D-7207-2	5.09E+19	139.3	5.12E+19	139.4
D-7207-3	5.09E+19	118.0	5.12E+19	118.1

Seam/ Plate	Unit 2 Current Fluence n/cm2	Unit 2 Current RT_{PTS} deg-F	Unit 2 1.4% Power Uprate Fluence n/cm2	Unit 2 1.4% Power Uprate RT_{PTS} deg-F
WELDS				
2-203-A/B/C	5.74E+19	122.9	5.79E+19	123.0
3-203-A/B/C	5.74E+19	55.1	5.79E+19	55.3
9-203	5.74E+19	72.3	5.79E+19	72.4
PLATES				
D-8906-1	5.74E+19	198.3	5.79E+19	198.5
D-8906-2	5.74E+19	149.7	5.79E+19	149.8
D-8906-3	5.74E+19	179.0	5.79E+19	179.2
D-8907-1	5.74E+19	183.1	5.79E+19	183.3
D-8907-2	5.74E+19	167.0	5.79E+19	167.1
D-8907-3	5.74E+19	128.0	5.79E+19	128.1

<u>References</u>

1. Letter from S. A. Richards (NRC) to P. W. Richardson (WEC), "Safety Evaluation of Topical Report CENPD-132, Supplement 4 Revision 1, 'Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model' (TAC No. MA5660)," dated December 15, 2000

2. Letter from T. H. Essig (NRC) to I. C. Rickard (WEC), "Acceptance for Referencing of the Topical Report CENPD-137(P), Supplement 2, 'Calculative Methods for the C-E Small Break LOCA Evaluation Model' (TAC NO. M95687)," dated December 16, 1997

3. Safety Evaluation of Topical Report CENPD-404-P, Revision 0, "Implementation of ZIRLO Cladding Material in CE Nuclear Power Fuel Designs," dated September 12, 2001

4. Correction to Safety Evaluation on Topical Report CENPD-404-P, Revision 0, "Implementation of ZIRLO Cladding Material in CE Nuclear Power Fuel Designs," dated October 12, 2001