



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

December 2, 2008

Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - REQUEST FOR
ADDITIONAL INFORMATION RE: LICENSE AMENDMENT REQUEST (LAR)
TO MODIFY CORE POWER CALCULATOR POWER CALIBRATION
ADJUSTMENT LIMIT (TAC NO. MD9657)

Dear Sir/Madam:

By application dated September 17, 2008 to the U.S. Nuclear Regulatory Commission (NRC), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request (LAR) to the NRC requesting an amendment to the license in the form of changes to the Technical Specification 3/4.3.1. The proposed changes are supposed to result in the addition of conservatism to Core Protection Calculator power indications when calibrations are required in certain conditions.

The NRC staff has reviewed the application and determined that additional information contained in the enclosure is needed to complete the review.

NRC discussed the additional information needed with M. Mason of the Entergy staff on November 13, 2008. The Entergy representatives agreed to provide a response within 30 days of the receipt of this letter.

If you have any questions, please contact me at (301) 415-1480.

Sincerely,

A handwritten signature in black ink, appearing to read "N. Kalyanam", with a horizontal line underneath.

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Encl.: Request for Additional Information

Cc (w/encl.): Distribution via Listserv

OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR ADDITIONAL INFORMATION (RAI)
WATERFORD STEAM ELECTRIC STATION, UNIT 3
LICENSE AMENDMENT REQUEST REGARDING
CORE POWER CALCULATOR (CPC)
POWER CALIBRATION ADJUSTMENT LIMIT (NPF-38-276)

Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request, by letter dated September 17, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082630032), to the U.S. Nuclear Regulatory Commission (NRC), requesting changes to the Technical Specification 3/4.3.1, The proposed change results in the addition of conservatism to Core Protection Calculator power indications when calibrations are required in certain conditions.

The NRC staff has reviewed the application and determined that the following information is needed to complete the review.

1. The second paragraph on Page 4 of Attachment 1 to the Entergy submittal indicates that the calibration of CPC power indications is not required at power levels of less than 15 percent rated thermal power (RTP) since inherent conservatisms in the CPC calculations at these power levels compensate for any potential de-calibration. Please discuss the "inherent conservatisms" in the CPC calculations and justify that they are adequate to compensate for potential de-calibration at the designated power levels.
2. A phrase, "as close as practical to calorimetric power," is added to both second paragraph of Notation 2.b for power levels between 15 percent and 80 percent of the RTP and Notation 2.c for power level at or above 80 percent of the RTP. The fourth paragraph on Page 2 of Attachment 4 for INSERT B1 to TS BASES 3/4.3 clarifies that the phrase implies that the as-left difference between the affected CPC power indication and calorimetric power should be as near to 0 percent RTP as possible. However, the proposed TS also allows the affected power to be within -0.5 percent to less than 0 percent of the RTP of calorimetric power (for example, the proposed "as left" difference between the affected CPC power indication and calorimetric power is within -0.5 percent to 10 percent, and -0.5 percent to +2 percent of the RTP as specified in the second paragraph of Notation 2.b and Notation 2.c, respectively). This negative range may be non-conservative as compared with the value used in the safety analysis (see RAI 5 below). Based on the above-discussed concerns for the non-conservatism of the negative range of the difference in the power indications and non-inclusion of the bases section in the TS, please provide the necessary information to justify that the lower range of -0.5 percent to less than 0 percent of the RTP discussed in this RAI is adequate. This RAI is also applied to first paragraph of Notation 2.b that allows the indication of the reactor protection system (RPS) linear

power, or either CPC power indicators to be within -0.5 percent to 10 percent of the RTP of calorimetric power at power levels within 15 percent to 80 percent of the RTP.

3. The fourth paragraph of Notation 2(b), on page 2 of Attachment 3 in INSERT A requires that the affected CPC power indication be within 8 percent to 10 percent of the RTP greater than calorimetric power. The fifth paragraph on page 3 of Attachment 1 indicates that the analysis assumes that if adjustments are required, the resulting indication will be within 8 percent to 10 percent of the RTP above calorimetric power. Please discuss the referenced analysis and address the acceptance of the analysis in support of the power adjustment range within 8 percent to 10 percent of the RTP above calorimetric power.
4. The third and fourth paragraphs of Notation 2.b in insert A specify the power adjustment range for power indication that is more than 10 percent of the RTP above the calorimetric power when power levels are within 15 percent to 80 percent of the RTP. The proposed adjustment range is within 0 percent to 10 percent of the RTP greater than calorimetric power for the RPS linear power indication, and within 8 percent to 10 percent of the RTP greater than calorimetric power for the CPC delta T (ΔT) power, or CPC neutron flux power indicator. Please provide bases to justify that the difference values of the power adjustment ranges (i.e., 0 percent - 10 percent vs. 8 percent - 10 percent) are proposed for different power indicators (i.e., the RPS linear power indicator vs. CPC ΔT power, or CPC neutron flux power indicator).
5. Notation 2.c in INSERT A specifies that for power levels at or above 80 percent of the RTP, when the indication of the RPS linear power is not within ± 2 percent of the RTP of calorimetric power, then calibrate the affected indication as close as practical to calorimetric power but within -0.5 to +2 percent of the RTP of calorimetric power.

A similar TS specified as SR 3.3.1.4 of NUREG-1432, Standard Technical Specifications for Combustion Engineering Plants, requires the operator perform a CPC calibration to make the CPC ΔT power, or CPC neutron flux power calculations agree with (underlined for emphasis) the calorimetric power, if the absolute difference is \geq [2] percent (underlined for emphasis). The number in the bracket is a plant specific number and should be justified by the licensee for each specific plant. The associated BASESS section clarifies that the value of 2 percent in the bracket is used because this value is assumed for power measurement uncertainty in the safety analysis.

In the Update Final Safety Analyses Report (UFSAR) (Revision 14B) for Waterford 3, Chapter 15 indicates that a uncertainty of power measurement of 0.5 percent is assumed in determining an initial power level used for transient and accident analyses. For example: the fourth assumption on page 15.2-5 for the heatup event analysis indicates that an initial power of 3735 megawatt thermal (MWt) is based on a RTP of 3716 MWt and 0.5 percent (underlined for emphasis) uncertainty; and assumption b.1 on page 15.6-19 indicates that the reactor power is based on post LOCA long-term operation at a core thermal power of 3735 MWt that is 100.5 percent (underlined for emphasis) of the RTP of 3716 MWt.

Please provide information to justify that the value of ± 2 percent of the RTP discussed above for Notation 2.c is adequate by addressing its consistency with the SR 3.3.1.4 of NUREG-1432 and Waterford UFSAR Chapter 15 assumed power measurement uncertainty used for safety analysis. Also, please justify that the adjusted as-left range of -0.5 to 2 percent (specifically, the negative range from -0.5 percent to less than 0 percent) of the RTP of calorimetric power is adequate by showing that the range is bounded by the value used in the safety analysis.

December 2, 2008

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Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - REQUEST FOR ADDITIONAL INFORMATION RE: LICENSE AMENDMENT REQUEST (LAR) TO MODIFY CORE POWER CALCULATOR POWER CALIBRATION ADJUSTMENT LIMIT (TAC NO. MD9657)

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/RA/

N. Kalyanam, Project Manager
Plant Licensing Branch IV
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ADAMS Accession No. ML083190089

*No major change from Staff provided RAI

OFFICE	NRR/LPL4/PM	NRR/LPL4/PM	NRR/DSS/SRXB *	NRR/LPL4/BC	NRR/LPL4/PM
NAME	NKalyanam <i>h</i>	GLappert <i>g</i>	GCranston	MMarkley <i>m</i>	NKalyanam <i>h</i>
DATE	12-2-08	11-25-08	10-22-08	12/2/08	12-2-08

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