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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: Davis-Besse Nuclear Power Station
Fourth Supplemental Letter Regarding License Amendment Application to Support Mark B-HTP Fuel Design for Cycle 15
(License Amendment Request (LAR) 05-0002; TAC No. MC6888)

Ladies and Gentlemen:

By letter dated May 2, 2005 (Serial Number 3131), as supplemented on August 28, 2005 (Serial Number 3166), September 15, 2005 (Serial Number 3183) and January 12, 2006 (Serial 3213), the FirstEnergy Nuclear Operating Company (FENOC) submitted License Amendment Request (LAR) 05-0002, an application for amendment of the Operating License, Appendix A, Technical Specifications (TS) for the Davis-Besse Nuclear Power Station (DBNPS). The proposed amendment would revise TS Section 2.1.1, "Safety Limits -Reactor Core," and TS Section 2.2.1, "Limiting Safety System Settings - Reactor Protection System Setpoints" to support use of the Framatome Mark B-HTP Fuel design for Cycle 15, which is scheduled to begin following refueling in March 2006. This letter provides a fourth supplement to the license amendment application, in response to a December 22, 2005 Request for Additional Information (Log Number 6375).

Enclosure 1 provides responses to the December 22, 2005 Request for Additional Information. Enclosure 2 identifies that there are no commitments contained in this letter.

If there are any questions or if additional information is required, please contact Mr. Gregory A. Dunn, Manager – FENOC Fleet Licensing, at (330) 315-7243.

A001

The statements contained in this submittal, including its associated enclosures are true and correct to the best of my knowledge and belief. I am authorized by the FirstEnergy Nuclear Operating Company to make this submittal. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 1/13/06

By: Kevin L. Ostrowski for
Mark B. Bezilla, Vice President-Nuclear

MSH

Enclosures

cc: Regional Administrator, NRC Region III
Executive Director, Ohio Emergency Management Agency,
State of Ohio (NRC Liaison)
DB-1 NRC/NRR Project Manager
DB-1 NRC Senior Resident Inspector
Utility Radiological Safety Board

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING LAR 05-0002
DATED DECEMBER 22, 2005**

Question 1.

Please provide the uncertainty calculation by which temperature and pressure measurement uncertainties are combined into the composite 30.239 psi "total combined error" and the 10.72 psi M&TE/drift error. Show how the temperature uncertainty is accounted for in the development of the uncertainty associated with the pressure limit corresponding to a measured (as opposed to actual) value of temperature.

Response:

The method for development of the Allowable Value specified in Technical Specification Table 2.2-1, "Reactor Protection System Instrumentation Trip Setpoints," for Functional Unit 7, "RC Pressure-Temperature," is described in Framatome Topical Report BAW-10179P-A, *Safety Criteria and Methodology for Acceptable Cycle Reload Analyses,* Section 7.6, "Variable Low Pressure Trip." This topical report was previously approved by the NRC.

Figure 7-5 of the topical report depicts a sample curve resulting from the Departure from Nucleate Boiling (DNB) analysis. The x and y intercepts of the curve and the resulting slope is determined between points A and B, establishing the values for the "y = mx + b" formula. The x-axis is temperature and the y-axis is pressure.

Framatome calculation 32-1172392-03, *"TED-1 Reactor Protection System String Error Calculations,"* establishes the instrument uncertainties associated with both the pressure and temperature components. These uncertainties, in percentages, are combined to establish a resultant pressure / temperature uncertainty. The percentage uncertainty of 3.780% is translated to a pressure uncertainty of 30.239 psi, based on an 800-psig range of the instruments. This proprietary Framatome calculation can be made available for inspection upon request; however, a summary of this calculation is provided below.

Using the values from the curve previously established by DNB analysis, the y intercept is adjusted in the conservative direction by the 30.239 psi uncertainty. The slope is adjusted (rounded) to a more conservative 16.25. Using the new intercept point, a formula is developed to translate the x and y intercept points into the Technical Specification value. The 603.0 degree-F intercept point shown in proposed Technical Specification Figure 2.1-1, when multiplied by the 16.25 slope shown in proposed Technical Specification Table 2.1-1, results in a value of 9798.75. Subtracting 7899 (as shown on proposed Table 2.2-1) from 9798.75 results in 1899.75, or approximately the 1900 psig intercept point.

With respect to the trip setpoint, the uncertainties related to temperature alone are multiplied by the slope value, to reflect a pressure uncertainty, and combined with the other pressure uncertainties. The y-axis intercept point is moved up based on this uncertainty, resulting in the temperature intercept point being moved to the left along the 1900 psig low pressure trip setpoint line, while maintaining the 16.25 slope. The 10.72 psig error in the current calculation, and discussed in DBNPS letter Serial 3166, dated August 28, 2005, has been increased to 13.5 psig error in the revised calculation. This is comprised of 4.3 psig drift uncertainty, 2.098 psig M&TE uncertainty, 1.102 psig margin, and 6 psig setting tolerance. These values continue to be conservatively summed instead of using the square root sum of the squares method. The accuracy components for the rack instruments, normally included between the Allowable Value and the Trip Setpoint, are included between the Analytical Limit and the Allowable Value.

Question 2.

Through numerous recent discussions and correspondence between NRC and Nuclear Energy Institute, it has been established that the following would be appropriate:

- *the* limiting setpoint *should be designated limiting safety system setpoint (LSSS).*
- as-found setpoint deviation *in excess of some limiting value would result in a need for a positive channel operability assessment and invocation of the plant corrective action program (CAP) before the channel could be declared OPERABLE and returned to service.*
- *An* as-found setpoint *in excess of the Allowable Value (AV) would result in the channel being declared inoperable.*

The licensee has asserted that the AV, not the limiting setpoint, is the LSSS. The proposed technical specifications (TS) do not provide any criteria at all by which operability would be assessed, or by which CAP would be invoked. The proposed TS appear to accept any value at all for the as-found setpoint without explicitly invoking any particular consequences other than reset to an acceptable value. Please explain how the proposed TS and the associated testing provide for the assessment of channel operability as required in 10CFR50.36, "Technical Specifications."

Response:

Davis-Besse will conform to guidance provided in the September 7, 2005 letter from Patrick L. Hiland, Chief, Reactor Operations Branch, to Mike Schoppman, Nuclear Energy Institute. Specifically, Notes 1 and 2 of Section A of the September 7, 2005 letter will be added to the Technical Specifications (see DBNPS Letter Serial Number 3213). These notes address the requirement to address Operability with respect to the As-Found acceptance criteria band, the Allowable Value, and the As-Left tolerance of the Limiting Trip Setpoint or a value more conservative than the Limiting Trip Setpoint.

In addition, Section B of the September 7, 2005 letter specified requirements for the Technical Specification Bases. The applicable Technical Specification Bases were included as an attachment to DBNPS Letter Serial Number 3213.

Based on conformance to the September 7, 2005 letter, the proposed TS changes comply with 10CFR50.36.

Question 3.

The licensee proposes to evaluate the as-found setpoint against the nominal setpoint, rather than against the previous as-left value. Please explain why this does not result in the masking of excessive deviation. It would seem that with an as-left setting on one side of the nominal setpoint and an as-found value on the other, the portion of the setpoint deviation from the as-left setting to the nominal setpoint would be ignored. Please explain how the proposed approach would be sufficiently sensitive and effective in the detection of excessive deviation.

Response:

The DBNPS staff considers setpoint deviation in terms of operability and in terms of trends that may suggest problems with instrument performance or that may indicate a need to update the input data used in the setpoint analyses. Operability of the instruments affected by LAR 05-0002 is ensured by maintaining the as-found instrument tolerance acceptance band narrower than the sum of the various uncertainty factors for the instrument, and by the conservative method of summing all uncertainties, then moving the trip setpoint away from the analytical limit by an amount at least equal to the uncertainty sum. If the as-found setpoint is within the setting tolerance for the trip function, all instrument uncertainties are still included between the as-found setpoint and the analytical limit.

A trending program for these instruments has been established in association with the DBNPS Business Practice DBBP-PES-0001, "System and Component Trending." Under this program, surveillance test results are routed to the responsible plant engineer following

test completion. At this time, the engineer does consider the previous as-left value. If the instrument shifted more than the one-sided setting tolerance during the surveillance period, this would typically be identified and tracked for potential degraded conditions. Condition reports are generated to document significant shifts in operating parameters, even when the parameter remains within acceptable limits.

The setting tolerance value is 6.0 psig or 0.75% of the 800 psig range. This value is conservative with respect to the accuracies of the three modules included in the instrument string (i.e., the pressure buffer amplifier (0.399%), the temperature signal converter (0.5%), and the bistable (0.5852%)). Combining these uncertainties using Square Root of the Sum of the Squares would result in 0.867% of the 800 psig range, or 6.9 psi. Additional margin is added between the Limiting Trip Setpoint and maximum setting tolerance for the Nominal Trip Setpoint. However, this margin is not considered when evaluating instrument performance.

The setting tolerance full range of 12 psig (+6 psig to –6 psig) is smaller than the combined uncertainties for accuracy (6.9 psig), drift (4.3 psig), and M&TE (2.098 psig), or a total of 13.298 psig. This will ensure that even with the worst case change from end to end of the setting tolerance, the calculated uncertainty is bounded. In addition, if the actual trip setpoint shifts more than the 6.0 psig setting tolerance, this would not necessarily indicate that the channel is degraded. As stated in Instrument Society of America Recommended Practice 67.04.02-2000, *Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation,* Annex E, "Plant Specific As-found/As-left Data," the as-found/as-left data may include the combined effects of reference accuracy, inherent drift, measurement and test equipment, humidity, vibration, normal radiation, normal temperature, and power supply variations during the time period under surveillance. The acceptance criteria described in the response above includes only a portion of these uncertainties.

COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station, Unit Number 1, (DBNPS) in this document. Any other actions discussed in the submittal represent intended or planned actions by the DBNPS. They are described only for information and are not regulatory commitments. Please notify Gregory A. Dunn, Manager – Fleet Licensing (330-315-7243) of any questions regarding this document or associated regulatory commitments.

COMMITMENTS	DUE DATE
Davis-Besse will conform to guidance provided in the September 7, 2005 letter from Patrick L. Hiland, Chief, Reactor Operations Branch, to Mike Schoppman, Nuclear Energy Institute. Specifically, Notes 1 and 2 of Section A of the September 7, 2005 letter will be added to the Technical Specifications (see DBNPS Letter Serial Number 3213).	Completed