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

February 16, 2012

Mr. Paul A. Harden
Site Vice President
Beaver Valley Power Station
FirstEnergy Nuclear Operating Company
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 - INFORMATION REQUEST PURSUANT TO 50.54(f) RELATED TO THE ESTIMATED EFFECT ON PEAK CLADDING TEMPERATURE RESULTING FROM THERMAL CONDUCTIVITY DEGRADATION IN THE WESTINGHOUSE FURNISHED REALISTIC EMERGENCY CORE COOLING SYSTEM EVALUATION (TAC NO. M99899)

Dear Mr. Harden:

This letter is being issued in accordance with the U.S. Nuclear Regulatory Commission's (NRC) regulation in Section 50.54(f) of Title 10 of the *Code of Federal Regulations* (10 CFR). Pursuant to this regulation, FirstEnergy Nuclear Operating Company (FENOC), is required to provide information regarding the effect of a potentially significant error, as defined in 10 CFR 50.46(a)(3)(i), associated with thermal conductivity degradation (TCD), on peak cladding temperature in the Westinghouse Electric Company (Westinghouse)-furnished realistic emergency core cooling system (ECCS) evaluation models, to enable the NRC staff to determine whether the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2) licenses should be modified, suspended, or revoked.

The NRC staff issued Information Notice (IN) 2011-21, "Realistic Emergency Core Cooling System Evaluation Model Effects Resulting from Nuclear Fuel Thermal Conductivity Degradation," on December 13, 2011. The IN identified an error in the Westinghouse-furnished realistic ECCS evaluation models, the estimated effect of which was potentially significant, as defined in 10 CFR 50.46(a)(3)(i), in plant-specific applications. According to 10 CFR 50.46(a)(3)(i), "a significant change or error is one which results in a calculated peak fuel cladding temperature different by more than 50 °F [degrees Fahrenheit] from the temperature calculated for the limiting transient using the last acceptable model..."

FENOC has received approval to implement Westinghouse realistic ECCS evaluation models as follows:

- BVPS-1 received approval to implement Automated Statistical Treatment of Uncertainty Method (ASTRUM) by Amendment No. 286 dated July 1, 2010.

- BVPS-2 received approval to implement the Code Qualification Document (CQD) ECCS evaluation model by Amendment No. 154 dated February 6, 2006.

To date, the NRC does not have information from FENOC estimating the effect of the TCD error on the BVPS-1 and 2 peak cladding temperature calculated for the limiting transient using the last acceptable ECCS evaluation model.

The regulation at 10 CFR 50.46(a)(1)(i) requires the identification and assessment of uncertainties in the analysis method and inputs so that the uncertainty in the calculated results can be estimated. This uncertainty must be accounted for, so that, when the calculated ECCS cooling performance is compared to the criteria set forth in 10 CFR 50.46 (b), there is a high level of probability that the criteria would not be exceeded.

The information obtained from Westinghouse, and discussed in IN 2011-21, indicates that the uncertainty assessments in the Westinghouse realistic ECCS evaluation models are in error, because they do not realistically model the effects of thermal conductivity degradation.

The currently reported ECCS evaluation results are as follows:

- At BVPS-1, the predicted peak cladding temperature is 2163 °F.
- At BVPS-2, the predicted peak cladding temperature is 2017 °F.

Based on the proximity of these peak cladding temperatures to the regulatory limit of °F, and in combination with the information obtained by the NRC to date, the NRC staff is currently unable to verify that there remains a high probability that the 2200 °F acceptance criterion would not be exceeded, consistent with the regulation at 10 CFR 50.46(a)(1)(i).

Therefore, further information is needed so that the Commission can verify that the BVPS-1 and 2 ECCS evaluations are consistent with the 10 CFR 50.46 analysis and reporting requirements.

In accordance with 10 CFR 50.54(f), this information is required to "verify licensee compliance with the current licensing basis," which includes the applicable requirements contained in 10 CFR 50.46(a)(1)(i). Specifically, the information sought will be used to ensure that, once corrected for TCD, the realistic ECCS evaluations demonstrate, with a high level of probability, that the 10 CFR 50.46(b)(1) acceptance criterion, concerning peak fuel cladding temperature, would not be exceeded.

Additionally, 10 CFR 50.46(a)(2), states that the Director, NRR, may impose restrictions on operation if ECCS evaluations submitted are inconsistent with the requirements of 10 CFR 50.46(a)(1)(i). The information sought by the Commission will enable it to determine whether your license should be modified as permitted by 10 CFR 50.46(a)(2).

Accordingly, pursuant to Sections 161c, 161o, 182a, and 186 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR 50.54(f), in order for the Commission to determine whether your license should be modified, suspended or revoked, you are required to provide information within 30 days of the date of this information request.

The FENOC response shall address the following specific issues:

1) An estimation of the effect of the thermal conductivity degradation error on the peak fuel cladding temperature calculation for the ECCS evaluations at BVPS-1 and 2.

2) A description of the methodology and assumptions used to determine the estimates. This description shall include consideration of experimental data relevant to thermal conductivity degradation and specific information regarding any computer code model changes which were necessary to address these data.

FENOC's response should provide sufficient detail to allow the NRC staff to determine whether, consistent with 10 CFR 50.46(a)(1)(i), there remains a high level of probability that the acceptance criterion at 10 CFR 50.46(b)(1), concerning the peak fuel cladding temperature, would not be exceeded, when the model is corrected for TCD.

This request is covered by the Office of Management and Budget (OMB) clearance number 3150-0011, which expires October 21, 2014. The estimated reporting burden for this collection of information is 72 hours. This estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, performing necessary analyses, and completing and reviewing the collection of information. Send comments on any aspect of this information collection, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T5-F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet electronic mail to infocollects@nrc.gov; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, DC 20503. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

In accordance with 10 CFR 2.390, "public inspections, exemptions, and requests for withholding," a copy of this letter and your response will be made available for inspection and copying at the NRC Website at www.nrc.gov, and/or at the NRC Public Document Room. If you believe that any of the information to be submitted meets the criteria in 10 CFR 2.390 for withholding from public disclosure, you must include sufficient information, as required by the subsection, to support such a determination.

Please address the required written response to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852 under oath or affirmation under the provisions of Section 182a of the Atomic Energy Act of 1954, as amendment and 10 CFR 50.54(f). In addition, please submit a copy of the response to the Director of NRR.

After reviewing your response, the NRC will determine whether further action is necessary in accordance with 10 CFR 50.46(a)(2) to ensure compliance with regulatory requirements.

If you have any questions on this matter, please contact Nadiyah Morgan at 301-415-1016.

Sincerely,

Allen G. Howe for

Michele G. Evans, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

cc: Listserv

After reviewing your response, the NRC will determine whether further action is necessary in accordance with 10 CFR 50.46(a)(2) to ensure compliance with regulatory requirements.

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Sincerely,

/RA by A. Howe for/

Michele G. Evans, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

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