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L-09-125

10 CFR 50.46

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:**

Davis-Besse Nuclear Power Station, Unit No. 1  
Docket No. 50-346, License No. NPF-3  
Report of Changes to the Emergency Core Cooling System Evaluation Model and in the Application of the Model in Accordance with 10 CFR 50.46(a)(3)

In accordance with 10 CFR 50.46(a)(3), FirstEnergy Nuclear Operating Company (FENOC) hereby submits the annual report for changes and errors in the Emergency Core Cooling System (ECCS) evaluation model (EM) and in the application of the model used at the Davis-Besse Nuclear Power Station, Unit No. 1. The attached report covers the period of January 1, 2008 to December 31, 2008.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 761-6071.

Sincerely,



Barry Allen

Attachment: Annual Report of Changes to the 10 CFR 50.46 Emergency Core Cooling System Evaluation Model and in the Application of the Model for the Davis-Besse Nuclear Power Station, Unit No. 1

cc: NRC Region III Administrator  
NRR Project Manager – Davis-Besse Nuclear Power Station  
NRC Resident Inspector – Davis-Besse Nuclear Power Station  
Utility Radiological Safety Board

A002  
NRR

Annual Report of Changes to the 10 CFR 50.46 Emergency Core Cooling System Evaluation Model and in the Application of the Model for the Davis-Besse Nuclear Power Station, Unit No. 1  
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10 CFR 50.46 (a)(3) states that each holder of an operating license shall report to the Nuclear Regulatory Commission (NRC), at least annually, each change or error in an acceptable Emergency Core Cooling System (ECCS) evaluation model (EM) or in the application of such a model that affects the calculation of peak cladding temperature (PCT).

**EVALUATION MODEL CHANGES AND ERRORS**

Babcock & Wilcox Nuclear Technologies (BWNT) Loss of Coolant Accident (LOCA) Evaluation Model

No errors were identified and no changes were implemented during the reporting period.

CRAFT2 LOCA Evaluation Model

No errors were identified and no changes were implemented during the reporting period.

**EVALUATION MODEL APPLICATION CHANGES AND ERRORS**

Fuel Temperature Uncertainty

During development of the cycle 16 LOCA linear heat rate limits, it was discovered that the fuel temperature uncertainty applied to account for the decrease in fuel thermal conductivity at end-of-life (i.e., 62,000 megawatt thermal per metric ton of uranium) for the 2, 4, 6, and 8 weight percent gadolinia fuel was specified incorrectly in the large-break LOCA analyses. It was confirmed that the UO<sub>2</sub> fuel pins at end-of-life utilized the correct fuel temperature uncertainty factor. The fuel temperature uncertainty error resulted in a peak clad temperature (PCT) error of 0°F. The small-break LOCA PCTs were determined to be unaffected.

REFLOD3 Model

During review of the REFLOD3 model it was discovered that the Low Pressure Injection (LPI) system's flowrate data were specified incorrectly. The result of this input error was that a slightly lower LPI head flow curve was used because the pressure was specified in terms of pounds-force per square inch gauge rather than pounds-force per square inch absolute that is required by the REFLOD3 code. The result of the 14.7 pounds per square inch difference in LPI pressure was evaluated and the Mark-B-HTP large-break PCTs were not affected. Because REFLOD3 is not utilized for the small-break LOCA analyses, these analyses were not affected by this error.

**Summary**

A summary of the errors identified during the reporting period and the corresponding PCT changes is provided in Table 1.

**Table 1**  
**10 CFR 50.46 Summary for 2008**

|   |                           |  |  |  |  |  |  |
|---|---------------------------|--|--|--|--|--|--|
| <b>Plant Name:</b>                          |                           | Davis-Besse Unit 1                                       | <b>LOCA Spectrum</b>                                     |  |  |  |  |
| <b>Utility Name:</b>                        |                           | FirstEnergy  | <i>Mk-B10M<br/>LBLOCA</i>                                | <i>Mk-B10K<br/>LBLOCA</i>                | <i>Mk-B12<br/>LBLOCA</i>                 | <i>Mk-B-HTP<br/>LBLOCA<br/>Mixed-<br/>Core</i> | <i>SBLOCA</i>                            |
| <b>Item #</b>                               | <b>Reporting Category</b> | <b>Description</b>                                       | <b>PCT or (Delta PCT)</b>                                |  |  |  |  |
| <b>Licensing Basis at Beginning of 2008</b> |                           |  | <b>&lt;2,102 °F<br/>Estimate<br/>EM R0.6<sup>1</sup></b> | <b>2,102 °F<br/>Analyzed<br/>EM R0.6</b> | <b>2,099 °F<br/>Analyzed<br/>EM R0.6</b> | <b>2,098 °F<br/>Analyzed<br/>EM R0.9</b>       | <b>1,555 °F<br/>Analyzed<br/>EM R0.9</b> |
| <b>2008 Licensing Activity</b>              |                           |  |  |  |  |  |  |
| 1   | Application Error         | Fuel Temperature Uncertainty for Gadolinia Fuel          | N/A  | N/A                                      | N/A                                      | 0 °F   | N/A                                      |
| 2   | Application Error         | Low Pressure Injection System Flow Data Error in REFLOD3 | N/A  | N/A                                      | N/A                                      | 0 °F   | N/A                                      |
| <b>Licensing Basis at End of 2008</b>       |                           |  | <b>&lt;2,102 °F<br/>Estimate<br/>EM R0.6</b>             | <b>2,102 °F<br/>Analyzed<br/>EM R0.6</b> | <b>2,099 °F<br/>Analyzed<br/>EM R0.6</b> | <b>2,098 °F<br/>Analyzed<br/>EM R0.9</b>       | <b>1,555 °F<br/>Analyzed<br/>EM R0.9</b> |

Footnotes: (1) Evaluation Model revision number.