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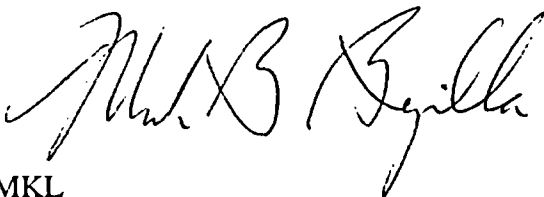
Subject: Annual Report of Changes to the Emergency Core Cooling System Evaluation
Model In Accordance With 10 CFR 50.46(a)(3)

Ladies and Gentlemen:

In accordance with 10 CFR 50.46(a)(3), the FirstEnergy Nuclear Operating Company (FENOC) herewith submits the annual report (Attachment 1) for changes and errors to the Emergency Core Cooling System (ECCS) Evaluation Model (EM) used at the Davis-Besse Nuclear Power Station (DBNPS). This report covers the period of January 1, 2004 to December 31, 2004. A list of any regulatory commitments made in this letter is included in Attachment 2.

If you have any questions or require additional information, please contact Mr. Henry L. Hegrat, Supervisor - Fleet Licensing, at (330) 315-6944.

Very truly yours,



MKL

Attachments

cc: Regional Administrator, NRC Region III
W. A. Macon, NRC/NRR Project Manager
C. S. Thomas, NRC Region III, DB-1 Senior Resident Inspector
Utility Radiological Safety Board of Ohio

A001

Annual Report of Changes to the 10 CFR 50.46 Emergency Core Cooling System Evaluation Model for the Davis-Besse Nuclear Power Station

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 Peak Cladding Temperature (PCT) calculation.

EM Description

The RELAP5/MOD2-B&W-based BWNT loss of coolant accident (LOCA) EM is applicable to all Babcock & Wilcox (B&W) designed pressurized water reactors for large and small break LOCA analyses. The NRC-approved topical report for this EM is BAW-10192P-A (Reference 1).

The large break loss of coolant accident (LBLOCA) Evaluation Model consists of four computer codes:

- (1) BAW-10164P-A, RELAP5/MOD2-B&W to compute the system, core, and hot rod response during blowdown (Reference 2),
- (2) BAW-10171P-A, REFLOD3B to calculate the time for refill of the lower plenum and core reflood rate (Reference 3),
- (3) BAW-10095-A, CONTEMPT to compute the containment pressure response (Reference 4), and
- (4) BAW-10166P-A, BEACH (RELAP5/MOD2-B&W reflood heat transfer package) to determine the hot pin thermal response during refill and reflood phases (Reference 5).

The small break loss of coolant accident (SBLOCA) Evaluation Model consists of two codes:

- (1) BAW-10164P-A, RELAP5/MOD2-B&W to compute the system, core, and hot rod response during the transient, and
- (2) BAW-10095-A, CONTEMPT to compute the containment pressure response, if needed.

An NRC-approved fuel code (currently BAW-10162P-A, TACO3 (Reference 6) or BAW-10184P-A, GDTACO (Reference 7)), is used to supply the fuel rod steady-state conditions at the beginning of the small or large break LOCA. These codes are approved for use with M5 cladding via the Safety Evaluation Report (SER) on BAW-10227P-A (Reference 8).

EM Changes or Errors

There were no EM changes or error corrections in the RELAP5/MOD2-B&W-based BWNT LOCA EM during 2004.

EM Application Changes or Errors

Reduced High Pressure Injection (HPI) Flows

Analyses and evaluations were performed in 2003 to support a reduction in the HPI flows for the SBLOCA spectrum. These are discussed in Reference 9. New analyses and evaluations were performed in 2004 with additional changes to the HPI flows assumed in the LOCA analyses. A non-safety-related evaluation of the HPI Line Balancing Guideline in Revision 13 of emergency operating procedure DB-OP-02000 was documented in Reference 10 that summarized conditions under which there could be a flow deficit compared to the previous analyses of record. Additional analyses and evaluations were performed based on a revised set of HPI flow curves (available flow to core). Reference 11 analyzed partial HPI line break areas and determined that the full line HPI line break remained the limiting case. This information and an evaluation of the remainder of the SBLOCA spectrum was utilized to provide input to a Mode 1 Operability Evaluation (Reference 12). Reference 13 explicitly reanalyzed the limiting cold leg pump discharge (CLPD) break size and evaluated the entire CLPD spectrum, again confirming that the full line HPI line break case remained limiting.

High Pressure Injection is not directly credited in the LBLOCA PCT analyses. However, it is used in the minimum containment pressure analyses. The Reactor Coolant System (RCS) depressurized to near containment pressure in less than 30 seconds and the variation in flows at high pressures would have a negligible effect on the mass released to containment.

The final data for the PCTs applicable to the entire SBLOCA spectrum was documented in Reference 14. Reference 14 also included the 10 CFR 50.46 PCT deltas compared to the work that was completed in 2003.

In summary:

- The LBLOCA PCT change is estimated as 0 °F.
- The SBLOCA PCT change for the additional reduction in HPI flow is 0 °F.

References

1. AREVA Topical Report BAW-10192P-A, Rev. 0, "BWNT LOCA - BWNT Loss-of-Coolant Accident Evaluation Model for Once-Through Steam Generator Plants," June 1998.
2. AREVA Topical Report BAW-10164P-A, Rev. 4, "RELAP5/MOD2-B&W – An Advanced Computer Program for Light Water Reactor LOCA and Non-LOCA Transient Analysis," November 2002.
3. AREVA Topical Report BAW-10171P-A, Rev. 3, "REFLOD3B – Model for Multinode Core Reflooding Analysis," December 1995.
4. AREVA Topical Report BAW-10095-A, Rev. 1, "CONTEMPT – Computer Program for Predicting Containment Pressure-Temperature Response to a LOCA," April 1978.
5. AREVA Topical Report BAW-10166P-A, Rev. 5, "BEACH - A Computer Program for Reflood Heat Transfer During LOCA," November 2003.
6. AREVA Topical Report BAW-10162P-A, Rev. 0, "TACO3 Fuel Pin Thermal Analysis Code," October 1989.
7. AREVA Topical Report BAW-10184P-A, Rev. 0, "GDTACO Urania – Gadolinia Fuel Rod Thermal Analysis Code," February 1995.
8. AREVA Topical Report BAW-10227P-A, Rev. 1, "Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel," June 2003.
9. Letter to NRC, Serial Number 3017, dated January 5, 2004, Subject: Notification of Significant Change of Input to the Emergency Core Cooling System Evaluation Model in Accordance with 10 CFR 50.46(a)(3).
10. AREVA Document 12-5040734-00, "Davis Besse HPI Line Balancing Evaluation," March 30, 2004.
11. AREVA Proprietary Document 32-5004328-04, "DB Mk-B10K SBLOCA Spectrum," March 30, 2004.
12. AREVA Letter FANP-04-702 dated March 6, 2004 from J. A. Klingenfus (AREVA) to K. S. Zellers (First Energy), "Davis Besse Mode 1 10 CFR 50.46 Operability Evaluation," Task 4160529.
13. AREVA Proprietary Document 32-5004328-05, "DB Mk-B10K SBLOCA Spectrum," March 30, 2004.
14. AREVA Letter FANP-04-798 (Rev. 1) dated April 12, 2004, from J. A. Klingenfus (AREVA) to K. S. Zellers (First Energy), "Davis Besse 10 CFR 50.46 SBLOCA Analyses and Evaluations," Task 4160529.

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Attachment 2

Commitment List

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Henry L. Hegrat, Supervisor – Licensing, at 330-315-6944 of any questions regarding this document or associated regulatory commitments.

<u>Commitment</u>	<u>Due Date</u>
None.	N/A