FENOC
FirstEnergy Nuclear Operating Company

5501 North State Route 2
Oak Harbor, Ohio 43449

Mark B. Bezilla
Vice President - Nuclear

419-321-7676
Fax: 419-321-7582

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Subject: Davis-Besse Nuclear Power Station
Report of Changes to the Emergency Core Cooling System Evaluation Model in Accordance with 10 CFR 50.46(a)(3)

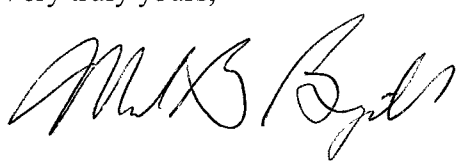
Ladies and Gentlemen:

In accordance with 10 CFR 50.46(a)(3), the FirstEnergy Nuclear Operating Company (FENOC) hereby submits the annual report 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, 2006, to December 31, 2006.

The annual report is included as Attachment 1. Attachment 2, Commitment List, identifies that there are no commitments contained in this letter.

If there are any questions or if additional information is required, please contact Mr. Raymond A. Hruby, Jr., Manager – Regulatory Compliance, at (419) 321-8000.

Very truly yours,



Mark B. Bezilla

GMW/s

Attachments

A002

cc: Regional Administrator, NRC Region III
DB-1 NRC/NRR Project Manager
DB-1 Senior NRC Resident Inspector
Utility Radiological Safety Board

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 calculation of Peak Cladding Temperature (PCT).

EM General Description

The Babcock and Wilcox Nuclear Technologies (BWNT) evaluation model (EM) is applicable to all Babcock & Wilcox (B&W) designed pressurized water reactors for large and small-break loss-of-coolant accident (LOCA) analyses for Zircaloy or M5 cladding. The NRC-approved topical report for this EM is BAW-10192P-A, Rev. 0 (Reference 1).

The large-break LOCA EM consists of four computer codes:

1. BAW-10164P-A, RELAP5/MOD2-B&W: computes the system, core, and hot rod response during blowdown (Reference 2),
2. BAW-10171P-A, REFLOD3B: calculates the time for refill of the lower plenum and core reflood rate (Reference 3),
3. BAW-10095-A, CONTEMPT: computes the Containment Vessel's pressure response (Reference 4) and,
4. BAW-10166P-A, BEACH (the RELAP5/MOD2-B&W reflood heat transfer package): determines the hot pin thermal response during refill and reflood phases (Reference 5).

The small-break LOCA EM consists of two codes:

1. BAW-10164P-A, RELAP5/MOD2-B&W: computes the system, core, and hot rod response during the transient (Reference 2) and,
2. BAW-10095-A, CONTEMPT: computes the Containment Vessel's pressure response (Reference 4), if needed.

An NRC-approved fuel performance 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 as discussed in BAW-10227P-A (Reference 8).

BWNT LOCA Evaluation Model Error Corrections or Changes

There were no error corrections or changes during 2006.

BWNT LOCA Evaluation Model Generic Analyses

No generic analyses were performed during 2006 that were applicable to Davis-Besse.

EM Application Changes and Errors

SBLOCA Analyses Application Error Correction

A complete spectrum of SBLOCA break sizes was analyzed with a 4-second Main Feedwater (MFW) constant flow period due to double accounting of the 2-second delay that was targeted. The resulting effect of this error on the SBLOCA spectrum was evaluated and results are documented in Reference 9. A MFW coastdown sensitivity study was performed as part of the evaluation. The evaluation concluded that the overall PCT predicted for the spectrum of break sizes is reflected in the 2- or 4-second MFW flow period results. The limiting break size may change as the MFW flow interval is varied; however, there is no change in the predicted PCT.

- Application Error Correction – MFW constant flow period.
- Evaluations were performed, including a MFW sensitivity study to address the changes to the SBLOCA spectrum. The effect on the reported licensing PCT was 0 °F.

Mixed-Core Mark-B-HTP LOCA Analysis for Cycle 15

Mixed-core Mark-B-HTP LBLOCA and SBLOCA analyses were performed to support licensing of the new Mark-B-HTP fuel assembly design at Davis-Besse beginning with Fuel Cycle 15. These analyses consisted of LBLOCA and SBLOCA analyses that considered the Mark-B-HTP fuel assembly surrounded by Mark-B10K, Mark-B12 or Mark-B10M fuel assemblies.

The Fuel Cycle 15 licensing calculations were completed in 2005 in order to support operation starting in the spring of 2006. The Fuel Cycle 15 analyses resulted in a PCT increase of 50 °F. Therefore, these results were considered to have a 30-day reporting requirement and were included with the 2005 yearly report items (letter Serial Number 3258 dated May 8, 2006).

Summary

A summary of the changes for the reporting period and the corresponding PCTs is provided in Table 1.

References

1. AREVA/FANP Proprietary 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/FANP Proprietary 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/FANP Proprietary Topical Report BAW-10171P-A, Rev. 3, "REFLOD3B – Model for Multinode Core Reflooding Analysis," December 1995.
4. AREVA/FANP Proprietary Topical Report BAW-10095-A, Rev. 1, "CONTEMPT – Computer Program for Predicting Containment Pressure-Temperature Response to a LOCA," April 1978.
5. AREVA/FANP Proprietary Topical BAW-10166P-A, Rev. 5, "BEACH – A Computer Program for Reflood Heat Transfer During LOCA," November 2003.
6. AREVA/FANP Proprietary Topical Report BAW-10162P-A, Rev. 0, "TACO3 Fuel Pin Thermal Analysis Code," October 1989.
7. AREVA/FANP Proprietary Topical Report BAW-10184P-A, Rev. 0, "GDTACO Urania – Gadolinia Fuel Pin Thermal Analysis Code," February 1995.
8. AREVA/FANP Proprietary Topical Report BAW-10227P-A, Rev. 1, "Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel," June 2003.
9. Davis-Besse calculation number, C-NSA-064.02-036, Rev. 1, "DB-1 LOCA Summary Report," January 17, 2007.

Table 1

Evaluation Model Application Summary

Plant Name:		Davis-Besse Unit 1	***LOCA Spectrum***				
Utility Name:		FirstEnergy	*Mk-B10M LBLOCA*	*Mk-B10K LBLOCA*	*Mk-B12 LBLOCA*	*Mk-B-HTP LBLOCA*	*SBLOCA*
Item #	***Reporting Category***	***Description***	***PCT or (Delta PCT)***				
Licensing Basis at Beginning of Cycle 15 (April 2006)			**<2,102 °F Estimate EM R0.6**	**2,102 °F Analyzed EM R0.6**	**2,099 °F Analyzed EM R0.6**	**2,095 °F Analyzed EM R0.9**	**1,555 °F Analyzed EM R0.9**
2006 Licensing Activity							
1	Application Error Correction	SBLOCA Analyses Application Error Correction.	N/A	N/A	N/A	N/A	(+0 F)
Licensing Basis at End of 2006			**<2,102 °F Estimate EM R0.6**	**2,102 °F Analyzed EM R0.6**	**2,099 °F Analyzed EM R0.6**	**2,095 °F Analyzed EM R0.9**	**1,555 °F Analyzed EM R0.9**

COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by Davis-Besse. They are described only as information and are not regulatory commitments. Please notify the Manager, Regulatory Compliance, at (419) 321-8000 at Davis-Besse of any questions regarding this document or associated regulatory commitments.

COMMITMENTS	DUE DATE
None	N/A