

10CFR50.46

June 1, 2004
5928-04-20128

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

Three Mile Island, Unit 1 (TMI Unit 1)
Operating License No. DPR-50
Docket No.50-289

Subject: 10 CFR 50.46 Annual Report

References:

1. FANP Topical Report BAW-10104P-A, Rev. 5, "B&W's ECCS Evaluation Model," November 1988.
2. FANP Topical Report BAW-10154-A, Rev. 0, "B&W's Small-Break LOCA ECCS Evaluation Model," July 1985.
3. FANP Topical Report BAW-10192P-A, Rev. 0, "BWNT LOCA – BWNT Loss-of-Coolant Accident Evaluation Model for Once-Through Steam Generator Plants," June 1998.

10 CFR 50.46 (a)(3)(ii) 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 accepted emergency core cooling system (ECCS) evaluation model (EM) or in the application of such a model that affects the peak cladding temperature (PCT) calculation.

For the reporting period from January 1, 2003 through December 31, 2003, AREVA (formally Framatome ANP) has confirmed that no significant errors were reported in the CRAFT2-based B&W ECCS EM (Reference 1 for LBLOCA and Reference 2 for SBLOCA). One change and one application error correction are reported in the RELAP5/MOD2-B&W-based BWNT LOCA EM (Reference 3) as described in Enclosure 1. Enclosure 2 provides a summary of the EM changes applicable to TMI Unit 1 as identified and evaluated by AREVA, and reported in accordance with 10 CFR 50.46(a)(3)(ii).

No new regulatory commitments are established in this submittal.

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If any additional information is needed, please contact David J. Distel at (610) 765-5517.

Very truly yours,

A handwritten signature in black ink, appearing to read "Michael P. Gallagher". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael P. Gallagher
Director - Licensing & Regulatory Affairs
AmerGen Energy Company, LLC

Enclosures: 1) EM Changes and Significant Error Notification
2) Summary of EM Changes Applicable to TMI Unit 1

cc: H. J. Miller, USNRC Administrator, Region I
D. M. Skay, USNRC Senior Project Manager, TMI Unit 1
D. M. Kern, USNRC Senior Resident Inspector, TMI Unit 1
File No. 00068

ENCLOSURE 1

EM CHANGES AND SIGNIFICANT ERROR NOTIFICATION

1.1 CRAFT2 Evaluation Model Error Corrections or Changes

No errors or changes were reported in the CRAFT2-based B&W ECCS EM, BAW-10104P-A, Rev. 5 for LBLOCA (Reference 1.1) and BAW-10154-A, Rev. 0 for SBLOCA (Reference 1.2), during 2003.

1.2 BWNT LOCA Evaluation Model Error Correction or Changes

This evaluation model (EM) is applicable to all B&W-designed pressurized water reactors for large and small break LOCA analyses for zircaloy or M5 cladding. The NRC-approved topical report for this EM is BAW-10192P-A Rev 0 (Reference 1.3).

The large break LOCA 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 1.4),
2. BAW-10171P-A, REFLOD3B to calculate the time for refill of the lower plenum and core reflood rate (Reference 1.5),
3. BAW-10095-A, CONTEMPT to compute the containment pressure response (Reference 1.7), and
4. BAW-10166P-A, BEACH (the RELAP5/MOD2-B&W reflood heat transfer package) to determine the hot pin thermal response during refill and reflood phases (Reference 1.6 and Reference 1.11).

The small break LOCA 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 (Reference 1.4), and
2. BAW-10095-A, CONTEMPT to compute the containment pressure response (Reference 1.7), if needed.

An NRC-approved fuel code (currently BAW-10162P-A, TACO3 (Reference 1.9) or BAW-10184P-A, GDTACO (Reference 1.10)) 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 1.8).

It should be noted that the most recently approved versions of the EM and associated topical reports are referenced above. However, the plant- and fuel-type-specific licensing calculations may be based on an earlier approved method and thus not specifically utilize the enhanced features that were subsequently approved or submitted as a change via 10 CFR 50.46. A summary of the intermediate EM changes and EM error corrections made to BAW-10192P-A is discussed in Section 1.4 and listed in Enclosure 1, Table 1.

One EM change in the RELAP5/MOD2-B&W-based BWNT LOCA EM occurred during 2003.

1.2.1 Change of RELAP5/MOD2-B&W for Mark-B-HTP Fuel

The BHTP CHF correlation from BAW-10241P (BHTP DNB Correlation Applied with LYNXT, Reference 1.15) was implemented into the RELAP5/MOD2-B&W code for analysis of Mark-B-HTP fuel. This change was made to support the EM requirement in Section 4.3.4.8 of Volume 1 of BAW-10192P-A, which states that the LOCA analyses will use the same CHF correlation that is used for the fuel pin DNB analyses. The BHTP DNB correlation used in the LOCA analyses sets the non-uniform axial power distribution factor to unity, which is similar to the method used for defining the Tong factor used in the existing approved CHF correlations. The BHTP correlation ranges for transition to the low-flow or low-pressure CHF correlations were extended consistently with the methods used during implementation of the existing approved CHF correlations. The implementation is described in Reference 1.16.

The Mark-B-HTP design is not currently used at Three Mile Island Unit 1. A PCT change is not applicable to non-Mark-B-HTP fuel assemblies because introduction of this correlation does not affect the temperature calculation for those analyses.

1.3 Error Correction for Containment Pressure Input for 177-FA Lowered-Loop LBLOCA Analyses

An error was discovered in the input of the mass and energy data input to the CONTEMPT model. The error originates from allowing the CONTEMPT code to linearly interpolate in the mass and energy data that was generated over distinct time intervals. The result is that the CONTEMPT integrated mass and energy release is not consistent with the system analyses, and the LOCA containment pressure response is overpredicted. Reference 1.12 summarizes the effect of correcting the mass and energy input to certain CONTEMPT analyses that define the containment pressure input to LBLOCA analyses for the 177-FA lowered-loop analyses performed prior to 2003. The correction of this error results in a reduction of the containment pressure. A characteristic of LOCA analyses for the lowered-loop plant design is that the LBLOCA PCT tends to occur just after the end of the adiabatic heat-up period. Lowering the containment pressure increases the CFT injection flow during the refill period, which shortens the adiabatic heat-up period and reduces the PCT. This application error was reported as AREVA Nonconformance Report 6027345 (Reference 1.13) for ANO-1, TMI-1 and ONS and in AREVA Nonconformance Report 6027344 (Reference 1.14) for CR-3.

This issue is considered an Application Error Correction. The PCT change associated with this Application Error Correction for TMI Unit 1 is reported in Enclosure 2.

1.4 Generic EM Information

General information related to the EM topical reports and associated modeling guidance is provided below. These topics do not constitute EM changes or error corrections, and are provided as information.

1.4.1 Approval of BEACH Topical Report Revision

AREVA previously submitted a revision to the BEACH topical report for large break analyses to extend (i) the range of application for the maximum cladding temperature limit to 2045 F for BEACH, (ii) the minimum reflood rate to 0.4 in/sec, and (iii) the minimum applicable containment pressure to 14.7 psia. The extension of the cladding temperature limit to 2045 F

was previously reported via 10 CFR 50.46 reporting for 1999 and as an EM Error Correction in 2001. The NRC, by letter dated November 7, 2003 (Reference 1.11), approved Revision 5 of the BEACH topical report, BAW-10166P, and its use with the once-through steam generator large break and small break LOCA evaluation models, BAW-10192P-A.

1.4.2 Approval of Reactor Coolant Pump Degradation Model Change for RELAP5/MOD2-B&W

Preliminary Safety Concern 2-00 (Reference 1.27) investigated SBLOCAs with reactor coolant pump (RCP) operation beyond the time of turbine trip. It was discovered that more severe consequences could be predicted for larger SBLOCAs when the RCPs were manually tripped at one to two minutes following loss-of-subcooling margin, and that these consequences were even worse when the M3-modified RCP degradation model (lower bound providing least pump degradation) was applied. The NRC, by letter dated April 10, 2003 (Reference 1.17), approved the use of the M3-modified two-phase reactor coolant pump degradation multiplier in RELAP5/MOD2-B&W for resolution of PSC 2-00. This approval is contingent upon each licensee establishing that the M3-modified curve is conservative for each licensee's plant. AREVA has prepared generic material to justify the use of the M3-modified curve with respect to the plant-specific reactor coolant pumps. This material is currently being reviewed and prepared for submittal to the NRC. Use of the M3-modified RCP degradation multiplier was previously applied as an EM Change in 2000 and 2001.

1.4.3 Change to RELAP5/MOD2-B&W Evaluation Model Guidance Documents

Several ancillary guidance documents that supplement BAW-10192P-A and the code topical reports were created or updated in 2003 to facilitate the uniform application of the approved methods. They make no changes to the approved methods used to perform licensing calculations.

Limitations and Restrictions on BAW-10192P-A (Reference 1.18). This guidance document outlines the NRC limitations and restrictions imposed on BAW-10192 and the associated code topical reports. The document was revised to include recent NRC approvals.

RELAP5 Modeling Guidelines (Reference 1.19). This guidance document outlines generic RELAP5/MOD2-B&W modeling practices and was revised to incorporate more detailed information and recent NRC approvals.

CONTEMPT Modeling Guidelines (Reference 1.20). This guidance document outlines generic CONTEMPT modeling practices for use in LOCA containment pressure calculations.

TACO3/GDTACO Output Guidelines (References 1.21 and 1.22). These documents describe the conversion of the output from the TACO3 and GDTACO3 steady-state fuel initialization cases to input to the RELAP5/MOD2-B&W code.

REFLOD3B Methods (Reference 1.26). This document reviews the history of the various REFLOD3B models utilized in B&W plant licensing calculations and identified categories of REFLOD3B input parameters to facilitate updating of future models.

REFLOD3B Output Guidelines (References 1.23, 1.24 and 1.25). These documents describe the conversion of the output from the REFLOD3B code to input to the BEACH code.

1.4.4 Outline of Evolution of BAW-10192P-A Changes

The general outline for application of the Evaluation Model is described in BAW-10192P-A. The code topical report revisions identified in BAW-10192P-A Rev. 0 for use in LOCA analyses are:

BAW-10164P-A, Revision 3, RELAP5/MOD2-B&W,
BAW-10171P-A, Revision 3, REFLOD3B,
BAW-10166P-A, Revision 4, BEACH,
BAW-10095-A, Revision 1, CONTEMPT, and
BAW-10162P-A, Revision 0, TACO3.

Since the approval of BAW-10192P-A, the codes and methods have evolved through approved code revisions, identification of specific codes not identified in the EM, and the addition of new methods and error corrections made under 10 CFR 50.46. The following NRC-approved topical reports have been added as part of the EM. However, these revisions are not explicitly identified in BAW-10192P-A Rev. 0.

BAW-10164P-A, Revision 4, RELAP5/MOD2-B&W

BAW-10166P-A, Revision 5, BEACH

BAW-10227P-A, Revision 0, M5 Cladding

BAW-10184P-A, Revision 0, GDTACO

The addition of new methods and error corrections made under 10 CFR 50.46 are reported to the utilities at least annually for including in plant-specific 10 CFR 50.46 reports to the NRC.

In the case of new methods, acceptable licensing cases are typically not reanalyzed or reevaluated in order to take advantage of the new methods. (Error corrections are applied to current licensing basis cases as necessary.) Therefore, the last acceptable licensing cases for a specific plant may not have been performed with the most recent EM changes (approved or made via 10 CFR 50.46). In order to assist the utility in identifying which EM and 10 CFR 50.46 changes were utilized in their licensing cases, Table 1 was created. The different stages of models available via reference to BAW-10192P-A are identified in Table 1 as versions by denoted by "RN.n", where "R" stands for revision, "N" represents the revision of BAW-10192P-A (in all cases, 0) and "n" is the subrevision identifier of the modeling change not explicitly described in the NRC-approved Revision of BAW-10192P-A. These informal revision levels are for internal tracking purposes in order to identify those EM and 10 CFR 50.46 changes that are applied in the analyses. The revision level is reported in the plant-specific PCT summary tables alongside the final licensing PCT.

References

- 1.1 AREVA Topical Report BAW-10104P-A, Rev. 5, "B&W's ECCS Evaluation Model," November 1988.
- 1.2 AREVA Topical Report BAW-10154-A, Rev. 0, "B&W's Small-Break LOCA ECCS Evaluation Model," July 1985.
- 1.3 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.
- 1.4 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.
- 1.5 AREVA Topical Report BAW-10171P-A, Rev. 3, "REFLOD3B – Model for Multinode Core Reflooding Analysis", December 1995.
- 1.6 AREVA Topical BAW-10166P, Rev. 5, "BEACH – A Computer Program for Reflood Heat Transfer During LOCA", December 2001.
- 1.7 AREVA Topical Report BAW-10095-A, Rev. 1, "CONTEMPT – Computer Program for Predicting Containment Pressure-Temperature Response to a LOCA", April 1978.
- 1.8 AREVA Topical Report BAW-10227P-A, Rev. 1, "Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel", June 2003.
- 1.9 AREVA Topical Report BAW-10162P-A, Rev. 0, "TACO3 Fuel Pin Thermal Analysis Code", October 1989.
- 1.10 AREVA Topical Report BAW-10184P-A, Rev. 0, "GDTACO Urania – Gadolinia Fuel Pin Thermal Analysis Code", February 1995.
- 1.11 Letter dated 11/7/03 from H. N. Berkow USNRC to J. F. Mallay (Areva), "Issuance of Revised Safety Evaluation for Referencing of Appendices H and I to BAW-10166P-A, "BEACH – Best Estimate Analysis Core Heat Transfer, A Computer Program for Reflood Heat Transfer During LOCA", (TAC No. MC0341)", USNRC ADAMS Accession Number ML033140275.
- 1.12 AREVA Proprietary Document 51-5031991-00, "Resolution of NCR 6027345, CONTEMPT M&E Input", 10/7/03.
- 1.13 AREVA Document T5.16-6027345-00, (CONTEMPT LOCA Modeling Error for ONS, TMI-1 and ANO-1).
- 1.14 AREVA Document T5.16-6027344-00, (CONTEMPT LOCA Modeling Error for CR-3).
- 1.15 AREVA Topical Report BAW-10241P, "BHPT DNB Correlation Applied with LYNXT," December 2002.
- 1.16 AREVA Proprietary Document 2A4-RELAP5/MOD2-26.0HP, "RELAP5/MOD2 Version 26.0HP Certification File," 4/3/03.
- 1.17 Letter dated April 10, 2003 from H. N. Berkow USNRC to J. Mallay (Areva), Subject: Evaluation of Framatome ANP Preliminary Safety Concern (PSC) 2-00 Relating to Core Flood Line Break and Operator Action Time (TAC No. MA 9973), Project No. 728.
- 1.18 AREVA Proprietary Document 51-5001731-02, "BWNT LOCA EM Limitations and Restrictions", 6/4/03.
- 1.19 AREVA Proprietary Document 51-1203953-02, "R5/M2 B&W Plant LOCA Modeling Guidelines", 6/2/03.

- 1.20 AREVA Proprietary Document 32-5025388-00, "BWNT LOCA Containment Pressure Calculation Guidance", 5/30/2003.
- 1.21 AREVA Proprietary Document 32-5023856-00, "T3XN Script Development", 5/30/03.
- 1.22 AREVA Proprietary Document 32-5023856-01, "T3XN Script Development", 7/2/03.
- 1.23 AREVA Proprietary Document 32-5022597-00, "R3DOC Script Development and Usage", 6/4/03.
- 1.24 AREVA Proprietary Document 32-5022597-01, "R3DOC Script Development and Usage", 7/2/03.
- 1.25 AREVA Proprietary Document 32-5022597-02, "R3DOC Script Development and Usage", 11/4/03.
- 1.26 AREVA Proprietary Document 51-5019524-00, "R3 Input Deck History and Model Updates", 6/2/03.
- 1.27 AREVA Document 51-5009856-00, "Summary of PSC 2-00 Analyses", 4/13/01.

Table 1: Evolution of Changes to BAW-10192P-A [1]

Date First Introduced	BAW-10192P-A Revision 0	Description of Change		Method of Change and/or Approval
		LBLOCA	SBLOCA	
1993	R0.0	--	--	Original (approved 1997)
1994	R0.1	CFT Inventory (PSC 5-94)	CFT Inventory (PSC 5-94)	50.46 Change
1999	R0.2	M3-Modified RCP degradation multiplier (PSC 1-99)	<i>Not Applicable</i>	50.46 Change
1999	R0.3	Extension of BEACH acceptable range of application for initial cladding temperature	<i>Not Applicable</i>	50.46 Change Approved BAW-10166P-A Rev. 5 (2003)
1999	R0.4	M5 Cladding (if used)	M5 Cladding (if used)	Approved Change BAW-10227P-A (2000)
2000	R0.5	<i>Not Applicable</i>	M3-Modified RCP degradation multiplier (via PSC 2-00)	50.46 Change Approved via Reference 2.6 (2003)
		<i>Not Applicable</i>	Void-dependent cross-flow (via PSC 2-00)	50.46 Change Approved via BAW-10164P-A Rev. 4 (2002)
2002	R0.6	Appendix K Power Uprate (if applicable)	Appendix K Power Uprate (if applicable)	50.46 Change
2002	R0.7	Hot pin modeling for LBLOCA	<i>Not Applicable</i>	Approved Change BAW-10164P-A Rev. 4 (2002)
2003	R0.8	BHTP CHF correlation for analysis of Mark-B-HTP fuel (if used)	BHTP CHF correlation for analysis of Mark-B-HTP fuel (if used)	50.46 Change (2003)

[1] Higher revision levels implicitly include the changes contained in the previous revisions. Some changes are specific to a fuel assembly design or plant change, and are not applicable to all analyses (marked as "if used" or "if applicable").

ENCLOSURE 2
SUMMARY OF EM CHANGES AND SIGNIFICANT ERRORS APPLICABLE TO
TMI UNIT 1

Each of the 2003 licensing analyses or evaluations applicable to TMI Unit 1 is described below, with the inclusion of the AREVA recommended reporting category and applicable PCT change. Each activity and the effect on the limiting ECCS analysis are summarized in Enclosure 2, Attachment 1. Limiting ECCS analyses are tracked for the Mark-B9 and the Mark-B12 fuel rod designs. The modified Mark-B9 fuel rod design and Mark-B9 gadolinia fuel rods are considered with the limiting Mark-B9 ECCS analysis. The Mark-B12 gadolinia fuel rods are considered with the limiting Mark-B12 ECCS analysis.

2.1 Error Correction for Containment Pressure Input for 177-FA Lowered-Loop LBLOCA Analyses

The error in the containment pressure input to LBLOCA, discussed in Generic Issue 1.3 in Enclosure 1, affected the TMI-1 Mark-B9 and Mark-B12 LBLOCA analyses for UO₂ and gadolinia fuel rods. The most recent applicable LBLOCA analyses were performed with EM R0.3 for zircaloy cladding and with R0.4 for M5 cladding. (The limiting SBLOCA analysis is based on the Mark-B9 assembly with zircaloy cladding, which was analyzed based on EM R0.1. The PSC 2-00 SBLOCA cases were evaluated with EM R0.5, however those cases remain non-limiting with a one minute RCP trip.)

Analyses were specifically performed for CR-3 to determine the magnitude of the PCT change for correction of this error. As summarized in Reference 2.5, the PCT change determined for CR-3 is also applicable to the TMI-1 LBLOCA analyses. Therefore, new PCTs were estimated for application to the Mark-B9 (Reference 2.1 and Reference 2.2) and the Mark-B12 (Reference 2.3) fuel designs. The limiting PCT and PCT changes were reported to Exelon via Reference 2.4.

This issue is considered an Application Error Correction. The LBLOCA PCT change for Mark-B9 fuel is estimated to be (-25) F. The LBLOCA PCT change for Mark-B12 fuel is estimated to be (-35) F.

References

- 2.1 AREVA Proprietary Document 32-1266332-04, "BWOOG 20% TP LBLOCA", 12/16/03.
- 2.2 AREVA Proprietary Document 32-5003746-03, "TMI-1 20% SGTP Mod Mk-B9 and 2 wt% Gadolinia", 12/16/03.
- 2.3 AREVA Proprietary Document 32-5009152-01, "TMI-1 Mk-B12 LBLOCA Analyses", 12/16/03.
- 2.4 AREVA Letter FANP-04-245, dated 1/30/04 from J. A. Klingenfus (AREVA) to R. P. Jaffa (Exelon), "10 CFR 50.46 LBLOCA PCT Reporting Change".
- 2.5 AREVA Proprietary Document 51-5031991-00, "Resolution of NCR 6027345, CONTEMPT M&E Input", 10/7/03.
- 2.6 Letter dated April 10, 2003 from H. N. Berkow USNRC to J. Mallay (Areva), Subject: Evaluation of Framatome ANP Preliminary Safety Concern (PSC) 2-00 Relating to Core Flood Line Break and Operator Action Time (TAC No. MA 9973), Project No. 728.

ENCLOSURE 2

Attachment 1

10 CFR 50.46

**“Acceptance Criteria for Emergency Core Cooling Systems
for Light-Water Nuclear Power Reactors”**

**Report of the Emergency Core Cooling System Evaluation Model Changes and
Errors**

Assessments as of December 31, 2003

Peak Cladding Temperature Rack-Up Sheets

Attachment 1

PLANT NAME: Three Mile Island Unit 1
ECCS EVALUATION MODEL: Small Break Loss of Coolant Accident (SBLOCA)
REPORT REVISION DUE DATE: June 19, 2004
CURRENT OPERATING CYCLE: 15

ANALYSIS OF RECORD (AOR)

Evaluation Model: BWNT ¹
Calculation: Framatome ANP 86-5011294-00, March 2001
Fuel: Mark-B9, Mark-B12
Limiting Fuel Type: Mark-B12
Limiting Single Failure: Loss of Offsite Power
Steam Generator Tube Plugging (SGTP) = 20%
Limiting Break Size and Location: 0.05 ft² Break in Cold Leg Pump Discharge Piping

Reference Peak Cladding Temperature (PCT) PCT = 1454°F ²

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated June 6, 2002 Δ PCT = 0°F
10 CFR 50.46 Report dated June 19, 2003 Δ PCT = 0°F

NET PCT PCT = 1454°F

B. CURRENT LOCA MODEL ASSESSMENTS

Change of RELAP5/MOD2-B&W for Mark-B-HTP Fuel
CHF Correlation (see Enclosure 1) Δ PCT = 0°F

NET PCT PCT = 1454°F

¹ The BWNT EM is based on RELAP5/MOD2-B&W.

² This represents a 42°F increase over the reference PCT from the earlier Mk-B9 SBLOCA analysis.

Attachment 1 (continued)

PLANT NAME: Three Mile Island Unit 1
ECCS EVALUATION MODEL: Large Break Loss of Coolant Accident (LBLOCA)
REPORT REVISION DUE DATE: June 19, 2004
CURRENT OPERATING CYCLE: 15

ANALYSIS OF RECORD (AOR)

Evaluation Model: BWNT³
 Calculations: Framatome ANP 86-5002073-02, July 1999 (Mark-B9)
 Framatome ANP 86-5011294-00, March 2001 (Mark-B12)
 Limiting Single Failure: Loss of Offsite Power
 Steam Generator Tube Plugging (SGTP) = 20%
 Limiting Break Size and Location: Guillotine Break in Cold Leg Pump Discharge Piping

Fuel Type:	Mark-B9	Mark-B12
Limiting Fuel Type:	Mark-B9	Mark-B12
Reference Peak Cladding Temperature (PCT)	PCT = 2083°F	1989°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated June 5, 2000	Δ PCT =	0°F	N/A
10 CFR 50.46 Report dated June 11, 2001	Δ PCT =	0°F	N/A
10 CFR 50.46 Report dated June 6, 2002	Δ PCT =	0°F	0°F
10 CFR 50.46 Report dated June 19, 2003	Δ PCT =	0°F	0°F

NET PCT	PCT =	2083°F	1989°F ⁴
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B. CURRENT LOCA MODEL ASSESSMENTS

Change of RELAP5/MOD2-B&W for Mark-B-HTP Fuel CHF Correlation (see Enclosure 1)	Δ PCT =	0°F	0°F
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Error Correction for Containment Pressure Input for 177-FA Lowered-Loop LBLOCA Analyses (see Enclosure 1)	Δ PCT =	-25°F	-35°F
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NET PCT	PCT =	2058°F	1953.8°F
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³ The BWNT EM is based on RELAP5/MOD2-B&W.

⁴ The actual analysis result from RELAP5 was 1988.8 F.