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10 CFR 50.46

TMI-09-059
May 15, 2009

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

Three Mile Island Nuclear Station, Unit 1
Facility Operating License No. DPR-50
NRC Docket No. 50-289

Subject: 10 CFR 50.46 Report

Reference: 1) Letter from David P. Helker (AmerGen Energy Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Report," dated May 15, 2008

The purpose of this letter is to submit the 10 CFR 50.46 reporting information for Three Mile Island Nuclear Station (TMI), Unit 1. The most recent annual 50.46 Report for TMI, Unit 1 (Reference 1) provided the cumulative Peak Cladding Temperature (PCT) errors for the most recent fuel designs.

Since the Reference 1 report was issued, no vendor notifications of Emergency Core Cooling System (ECCS) model error/changes that are applicable to TMI, Unit 1 have been issued through May 11, 2009. Also, no ECCS-related changes or modifications have occurred at TMI, Unit 1 that affect the assumptions of the ECCS system.

Two attachments are included with this letter that provide the current TMI, Unit 1, 10 CFR 50.46 status. Attachment 1 ("Peak Cladding Temperature Rack-Up Sheets") provides updated information regarding the PCT for the limiting Small Break Loss of Coolant Accident (SBLOCA) and Large Break Loss of Coolant Accident (LBLOCA) analysis. Attachment 2, "Assessment Notes," contains a detailed description for each change or error reported.

No new regulatory commitments are established in this submittal. If any additional information is needed, please contact Tom Loomis at (610) 765-5510.

Respectfully,

D. P. Helker

David P. Helker
Manager – Licensing

Attachments: 1) Peak Cladding Temperature Rack-Up Sheets
2) Assessment Notes

cc: S. J. Collins, USNRC Administrator, Region I
P. J. Bamford, USNRC Project Manager, TMI Unit 1
D. M. Kern, USNRC Senior Resident Inspector, TMI Unit 1

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

Assessments as of May 11, 2009

Peak Cladding Temperature Rack-Up Sheets

TMI, Unit 1

PLANT NAME: Three Mile Island Nuclear Station, Unit 1
ECCS EVALUATION MODEL: Small Break Loss of Coolant Accident (SBLOCA)
REPORT REVISION DATE: 05/11/09
CURRENT OPERATING CYCLE: 17

ANALYSIS OF RECORD (AOR)

Evaluation Model: BWNT[1]
Calculation: Framatome ANP 86-5011294-00, March 2001
AREVA NP, 86-9049246-000, June 2007
Fuel: Mark-B9, Mark-B12, Mark-B-HTP
Limiting Fuel Type: Mark-B9
Limiting Single Failure: Loss of One Train of ECCS

Limiting Break Size and Location: 0.05 ft^2 Break in Cold Leg Pump Discharge Piping

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

MARGIN ALLOCATION

A. PRIOR LOSS OF COOLANT ACCIDENT (LOCA) MODEL ASSESSMENTS

10 CFR 50.46 report dated June 6, 2002 (see note 3)	ΔPCT = 0 °F
10 CFR 50.46 report dated June 19, 2003 (see note 4)	ΔPCT = 0 °F
10 CFR 50.46 report dated June 1, 2004 (see note 5)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 16, 2005 (see note 6)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 9, 2006 (see note 7)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 16, 2007 (see note 8)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 15, 2008 (see note 9)	ΔPCT = 0 °F

NET PCT **PCT = 1454°F**

B. CURRENT LOCA MODEL ASSESSMENTS

None (see note 10)	ΔPCT = 0 °F

NET PCT **PCT = 1454°F**

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

PLANT NAME: Three Mile Island Nuclear Station, Unit 1
ECCS EVALUATION MODEL: Large Break Loss of Coolant Accident (LBLOCA)
REPORT REVISION DATE: 05/11/09
CURRENT OPERATING CYCLE: 17

ANALYSIS OF RECORD (AOR)

Evaluation Model: BWNT[2]
Calculation: Framatome ANP 86-5002073-02, July 1999 (Mark-B9)
Framatome ANP 86-5011294-00, March 2001 (Mark-B12)
AREVA NP 86-9049246-000, June 2007 (Mark-B-HTP)
Fuel: Mark-B9, Mark-B12, Mark-B-HTP
Limiting Fuel Type: Mark-B9
Limiting Single Failure: Loss of One Train of ECCS
Limiting Break Size and Location: Guillotine Break in Cold Leg Pump Discharge Piping

Reference Peak Cladding Temperature (PCT) PCT = 2083°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 5, 2000 (see note 1)	ΔPCT = 0 °F
10 CFR 50.46 report dated June 11, 2001 (see note 2)	ΔPCT = 0 °F
10 CFR 50.46 report dated June 6, 2002 (see note 3)	ΔPCT = 0 °F
10 CFR 50.46 report dated June 19, 2003 (see note 4)	ΔPCT = 0 °F
10 CFR 50.46 report dated June 1, 2004 (see note 5)	ΔPCT = -25 °F
10 CFR 50.46 report dated May 16, 2005 (see note 6)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 9, 2006 (see note 7)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 16, 2007 (see note 8)	ΔPCT = 0 °F
10 CFR 50.46 report dated May 15, 2008 (see note 9)	ΔPCT = 0 °F

NET PCT **PCT = 2058°F**

B. CURRENT LOCA MODEL ASSESSMENTS

None (see note 10)	ΔPCT = 0 °F

NET PCT **PCT = 2058°F**

[2] The BWNT EM is based on RELAP5/MOD2-B&W.

ATTACHMENT 2

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

Assessments as of May 11, 2009

Peak Cladding Temperature Rack-Up Sheets

TMI, Unit 1

Assessment Notes

1. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated June 5, 2000 reported new LBLOCA and SBLOCA analyses to support operations at 20% steam generator tube plugging conditions for Mark-B9 fuel.

2. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated June 11, 2001 reported evaluations for LBLOCA and SBLOCA model changes which resulted in 0 °F PCT change.

3. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated June 6, 2002 reported new LBLOCA analyses to support operations with Mark-B12 fuel. For SBLOCA, an increase in SBLOCA PCT of 42 ºF for Mark-B9 fuel was reported due to increase in emergency feedwater temperature and is already included in the reported Reference Peak Cladding Temperature, therefore a 0 °F PCT change is assigned. This analysis is applicable to both Mark-B12 fuel and Mark-B9 fuel.

4. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated June 19, 2003 reported evaluation for LBLOCA model change which resulted in 0 °F PCT change. SBLOCA was not impacted.

5. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated June 1, 2004 reported evaluation for LBLOCA and SBLOCA model changes which resulted in 0 °F PCT change. An error correction in containment pressure input resulted in a reduction in PCT for the LBLOCA analysis.

6. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated May 16, 2005 reported evaluations for LBLOCA model changes which resulted in a 0 °F PCT change. LOCA oxygen/hydrogen recombination was considered and the PCT effect was determined to be 0 °F. SBLOCA was not impacted.

7. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated May 9, 2006 reported evaluations for LOCA model changes which resulted in a 0 °F PCT change. Reported changes included operation with no APSR pull and batch 18 fuel design changes. These were applicable for SBLOCA and LBLOCA.

8. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated May 16, 2007 reported an evaluation for a LOCA model change which resulted in a 0 °F PCT change. The reported evaluation considered the effect on the containment pressure response for LOCA due to GSI-191 related reactor building sump screen replacement. The evaluation resulted in 0 °F impact for both LBLOCA and SBLOCA PCTs.

9. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated May 15, 2008 reported evaluations for LOCA model changes which resulted in a 0 °F PCT change. Reported changes included the impact of a RELAP5 pin pressure calculation logic limitation which resulted in a SBLOCA PCT impact of 0 °F, and an energy deposition factor error which resulted in a LBLOCA PCT impact of 0 °F.

10. Current LOCA Model Assessment

None