

TMI-10-084
September 7, 2010

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

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

Subject: 10 CFR 50.46 30-Day Report

- References:
- 1) Letter from David P. Helker (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Report," dated May 14, 2010
 - 2) Letter from G. A. Thomas (AREVA) to R. Jaffa (Exelon Generation Company, LLC), "10 CFR 50.46 LOCA Report of EM Error Correction (AREVA CR 2010-4150: EOC SBLOCA axial power shape)," dated August 20, 2010

The purpose of this letter is to submit a 30-day 10 CFR 50.46 report 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. This report provided the results of the most recent small break LOCA (SBLOCA) analysis. The peak clad temperature (PCT) reported for the SBLOCA was 1444°F.

Subsequent to the issuance of Reference 1, AREVA notified Exelon Generation Company, LLC (Exelon) of an Evaluation Model (EM) error correction in the Reference 2 letter. This EM error only affects SBLOCA and the error relates to the assumption of axial power shape. The axial power shape assumed by AREVA in the SBLOCA analysis in support of TMI, Unit 1 was determined to be not bounding from middle to end-of-cycle (MOC to EOC) conditions. As a result, AREVA developed a bounding axial power shape which conservatively meets all 10 CFR 50.46 requirements, and it resulted in an increase in the reported SBLOCA peak clad temperature (PCT).

The PCT is estimated to increase by 225°F from that reported in Reference 1, resulting in an estimated PCT of (1444°F + 225°F) 1669°F for the limiting fuel type. This revised PCT of 1669°F remains well within the NRC 10 CFR 50.46 acceptance criteria of 2200°F. Additionally, the licensing basis SBLOCA analyses for TMI, Unit 1 have been performed at a power level of 2827 MWt (to support future power uprate) which represents a power uprate of 7.9% over the current licensed power level of 2619 MWt (considering uncertainty). The PCT increase was developed at an uprated power level, and would be largely negated if the plant was analyzed at the current licensed power level. The large break LOCA is not affected by this axial power shape issue.

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 Sheet") provides updated information regarding the PCT for the limiting SBLOCA analyses. 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,



Pamela B. Cowan
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

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

cc: USNRC Region I, Regional Administrator
USNRC Project Manager, TMI, Unit 1
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 September 7, 2010

Peak Cladding Temperature Rack-Up Sheet

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: 9/7/10
CURRENT OPERATING CYCLE: 18

ANALYSIS OF RECORD

Evaluation Model: BWNT¹
Calculation: AREVA NP, 86-9111507-000, August 2009 (Mark-B-HTP with EOTSGs)
Fuel: Mark-B12, Mark-B-HTP
Limiting Fuel Type: Mark-B-HTP
Limiting Single Failure: Loss of One Train of ECCS

Limiting Break Size and Location: 0.07 ft² Break in Cold Leg Pump Discharge Piping

Reference Peak Cladding Temperature (PCT) PCT = 1444°F

MARGIN ALLOCATION

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

CFR 50.46 Report dated May 14, 2010 (see Note 1, Attachment 2)	Δ PCT = 0°F
NET PCT	PCT = 1444°F

B. CURRENT LOCA MODEL ASSESSMENTS

Small Break Axial Power Shape (see Note 2, Attachment 2)	Δ PCT = 225°F
NET PCT	PCT = 1669°F

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

ATTACHMENT 2

10 CFR 50.46

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TMI, Unit 1

Assessment Notes

1. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated May 14, 2010, identified a new SBLOCA analysis, implemented beginning with the Cycle 18 operation. This SBLOCA analysis was evaluated with the mixed core of Mark-B12 and Mark-B-HTP and a new PCT of 1444°F was calculated for the limiting Mark-B-HTP fuel type, which bounds the Mark-B12 fuel type. This analysis also includes consideration of the effect of reduced EFW wetting associated with the Enhanced Once-Through Steam Generators (EOTSGs).

2. Current LOCA Model Assessment

The axial power shape assumed by AREVA in their small break LOCA (SBLOCA) analysis in support of TMI, Unit 1 was determined to be not bounding from middle-of-cycle to end-of-cycle (MOC to EOC) conditions. As a result, AREVA developed a bounding axial power shape which conservatively meets all requirements, and this bounding axial power shape resulted in an increase in the reported SBLOCA PCT. The PCT is estimated to increase by 225°F from that previously reported in Note 1 above, resulting in a PCT of 1669°F for the limiting fuel type. The large break LOCA is not affected by this axial power shape issue.