Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

329 BATH ROAD • BRUNSWICK, MAINE 04011 • (207) 798-4100

January 16, 1997
MN-97-14 JRH-97-20

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, DC 20555

References: (a) License No. DPR-36 (Docket No. 50-309)
(b-o) Please see the attached

Subject: 1996 Annual Report in Accordance with 10CFR50.46(a)(3)(ii) for Maine Yankee

Gentlemen:

Maine Yankee is providing the following information in accordance with 10CFR50.46, Reference (b). This information which consists of PCT data for the limiting transient analysis for the Small and Large Break LOCA evaluation models is being provided to meet the annual reporting requirements of 10CFR50.46 for the year 1996.

The present small break evaluation model for Maine Yankee includes the following method:

> Combustion Engineering's Small Break LOCA Method as applied in Cycle 4 to Maine Yankee as a base, with the impact of changes since that time on Cycle 15 at power levels up to 2440 MWt estimated by hand calculation.

This method is described in Reference (c) and (d) and was designated by the NRC for use on Maine Yankee in Reference (e) .

The present Large Break Evaluation Model for Maine Yankee includes the following computer codes and methods:

> YAEC WREM-based generic PWR ECCS Evaluation Model, modified to include modifications for Injection delta P, multiple axial power shapes, and enhanced steam cooling, and enhanced fuel performance methodology using the FROSSTEY-2 computer code. The computer codes used in this method include:
>
> RELAP4 MOD3
> CONTEMPT LT026
> TOODEE2-EM
> FROSSTEY-2

A001

280043

This method is described in References (f - i) and approved by the NRC for use on Maine Yankee in References (j - m).

The most recent 50.46 report generated for the Small Break LOCA evaluation model was the Annual Report provided to the NRC January 18, 1996, in Reference (d). The limiting transient for the small break analysis provided in Reference (d) had a maximum peak clad temperature of 1758°F. The present peak clad temperature for the limiting transient is 1806°F, including all changes since the last report. The change in peak clad temperature since the last report is 48°F. Changes that have been evaluated since this report include:

Increase in Steam Generator Hydraulic Resistance due to Tube Plugging/Sleeving

The additional hydraulic resistance due to tube plugging/sleeving increases the time for the primary system to depressurize and hence a longer core uncovery. This effect was included in the original Cycle 15 analysis. The resultant change in PCT for this effect was less than 10°F. The increase in steam generator hydraulic resistance due to tube plugging/sleeving also results in a slightly earlier core uncovery due to the increased pressure drop between the core exit and the break. This effect was not included in the original Cycle 15 analysis. The calculated change in PCT resulting from this effect is 2°F for the limiting Small Break LOCA transient.

Main Steam Safety Valve (MSSV) Setpoint Assumption

The Reference (d) analysis assumed nominal valve setpoints for the Main Steam Safety Valves with no allowance for valve accumulation. This assumption is consistent with the Cycle 4 CE analysis assumption (c). The accepted practice is to set these valves at ± 1% of their setpoint. Testing of these valves indicates that drift is minimal. The estimated increase in Small Break LOCA PCT resulting from variation in the MSSV setpoints and valve accumulation is 46°F. It should be noted that a new Small Break LOCA evaluation model analysis has been provided to the NRC in Reference (n). In this analysis bounding MSSV setpoints were assumed with allowance for valve accumulation. The Small Break LOCA evaluation model and analysis is presently under review at the NRC.

The cumulative (absolute value) change in the limiting small break transient peak clad temperature based on the evaluated changes is 48°F. Table 1 summarizes the PCT changes for the limiting small break LOCA transient.

The most recent 50.46 report generated for the Large Break LOCA evaluation model was the 30 Day Report provided to the NRC September 20, 1996, in Reference (o). This 30 Day Report provided results from the new analysis of record, using the Large Break LOCA evaluation model, References (f - i). No changes have been made to the Large Break LOCA analysis since the 30 Day Report was issued. Therefore, the previous peak clad temperature for the limiting transient of 2144°F is unchanged for this annual report and thus there is no change in PCT for the Large Break LOCA for this annual report. Table 1 summarizes that there are no PCT changes for the limiting Large Break LOCA transient using the evaluation model described in References (f - i), since the last 50.46 report, Reference (o).

We trust this information is satisfactory; however, should you have any questions, please do not hesitate to contact us.

Very truly yours,

James R. Hebert

James R. Hebert, Manager
Licensing & Engineering Support Department

JRH

Attachments

c: Mr. H. J. Miller
Mr. J. T. Yerokum
Mr. D. Dorman
Mr. Patric J. Dostie
Mr. Uldis Vanags

TABLE 1
Limiting LOCA Transient PCT Summary for Large and Small Break ECCS Evaluation Models

Description	Peak Clad Temperature or Change in Peak Clad Temperature	Is the Change an Estimate Requiring a Schedule for Reanalysis?
Small Break LOCA Evaluation Model		
Previous peak clad temperature for the limiting transient. (This is the PCT for the limiting transient from last Analysis of Record from the last 50.46 Report.)	1758°F	NA
Present peak clad temperature for the limiting transient. (This is the PCT for the limiting transient from the new analysis of record or latest PCT estimate.)	1806°F	NA
Change in Peak Clad Temperature from previous to present limiting transient	48°F	NA
Change due to increased hydraulic resistance in the steam generators from increased tube plugging	2°F	No
Change due to MSSV setpoint assumption	46°F	No*
Cumulative (Absolute Value) Change in Peak Clad Temperature Since Last 50.46 Report	48°F	NA
Cumulative (Absolute Value) Estimated Change in Peak Clad Temperature Since Last Analysis of Record	46°F	NA
Large Break LOCA Evaluation Model		
Previous peak clad temperature for the limiting transient. (This is the PCT for the limiting transient from last Analysis of Record from the last 50.46 Report.)	2144°F	NA
Present peak clad temperature for the limiting transient. (Unchanged, since there has been no new analysis since the last 50.46 report, Reference (b).)	2144°F	NA
Change in Peak Clad Temperature from previous to present limiting transient	None, since there has been no new analysis since the last 50.46 report, Reference (o).	NA
Change or Error since last analysis of record	None	NA
Cumulative (Absolute Value) Change in Peak Clad Temperature Since Last 50.46 Report	None	NA
Cumulative (Absolute Value) Estimated Change in Peak Clad Temperature Since Last Analysis of Record	None	NA

* A new analysis has already been provided to the NRC in Reference (n).

References:

(b) 10CFR50.46: Acceptable Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors

(c) Letter, Maine Yankee to USNRC, WMY-77-87, dated September 22, 1977

(d) MY Letter to USNRC dated January 18, 1996 (MN-96-06) - Revision 2 of the Cycle 15 Core Performance Analysis Report and 10CFR50.46 Report

(e) USNRC Letter, William T. Russell to C. D. Frizzle, Confirmatory Order Suspending Authority for and Limiting Power Operation and Containment Pressure (Effective Immediately) and Demand for Information (TAC No. M94194), dated January 3, 1996

(f) YAEC-1160, Application of Yankee WREM-BASED Generic PWR ECCS Evaluation Model to Maine Yankee, July 1978

(g) Letter, G. D. Whittier (MYAPC) to A. C. Thadani (NRC), MN-86-141, dated November 10, 1986

(h) Letter, G. D. Whittier (MYAPC) to V. Nerses (NRC), MN-87-59, Maine Yankee LOCA Analysis, dated May 21, 1987

(i) YAEC-1912P-A, Methods for the Analysis of Oxide Fuel Rod Steady-State Thermal Effects (FROSSTEY-2), January 1995 (Proprietary)

(j) Letter R. W. Reid (NRC) to R. H. Groce (MYAPC), Review of Application of Yankee WREM-Based Generic PWR ECCS Evaluation Model to Maine Yankee (3-Loop Sample Problem), dated January 17, 1979

(k) Letter P. R. Sears (NRC) to J. B. Randazza (MYAPC), NMY-87-1, ECCS Evaluation Model Modifications Related to Axial Power Shape Issue, Phase I, and Enclosed Safety Evaluation, dated January 6, 1987

(l) Letter NRC to Maine Yankee, NMY 88-84, Evaluation of Maine Yankee Steam Cooling Model for Large Break, Tac. No. 65463, dated June 28, 1988

(m) Letter NRC to Vermont Yankee, NVY 92-178, Vermont Yankee Nuclear Power Station, Safety Evaluation of FROSSTEY-2 Computer Code (Tac. No. M68216), dated September 24, 1992

(n) Letter, C. D. Frizzle (MYAPC) to W. T. Russell (USNRC), Submittal of Maine Yankee SBLOCA Licensing Analysis in Compliance with 10 CFR 50.46 and in Satisfaction of TMI Action Items II.K.3.30, II.K.3.31, and II.K.3.5, MN-96-056, dated April 25, 1996

(o) MY letter to USNRC dated September 20, 1996 (MN-96-139) - 10CFR 50.46 Report - Change in Calculated Peak Fuel Cladding Temperature (PCT)