VERMONT YANKEE
NUCLEAR POWER CORPORATION

Proposed Change No. 101

2.C.15.1
FVY 82-86

RD 5, Box 169, Ferry Road, Brattleboro, VT 05301

REPLY TO:
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July 22, 1982

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Office of Nuclear Reactor Regulation

References: (a) License No. DPR-28 (Docket No. 50-271)
(b) Letter, YAEC to USNRC, WVY 78-53, June 7, 1978;
Subject: VY Suppression Pool Temperature Transients
(c) "Suppression Pool Temperature Limits for BWR Containment,"
T. M. Su, et. al., USNRC, NUREG-0783 (DRAFT)

Subject: Proposed Change to Suppression Chamber Temperature Limit

Dear Sir:

Pursuant to Section 50.59 of the Commission's Rules and Regulations, Vermont Yankee Nuclear Power Corporation hereby proposes the following modifications to Appendix A of the Operating License:

Proposed Change:

Replace pages 126, 139, and 139a with revised pages 126, 139, and 139a using the attached pages. These pages revise the full power suppression chamber limiting conditions for operation.

Reason for Change:

This proposed change will update the full power suppression chamber temperature limit to take advantage of improved margin to steam quenching instability gained with the installation of the Monticello-type tee quenchers. Raising the full power suppression pool temperature limit minimizes the impact of potentially high river water temperatures on plant operation during the summer months.

Safety Considerations:

The current, full power, torus temperature limit is 90°F. This operating temperature limit prevents transient pool conditions from exceeding 150°F at a ramshead mass flux of 40 lbm/sec-ft^2 or greater. This precludes any potential steam quenching instability for ramshead discharge devices. Analysis justifying plant operation with this limit was submitted to NRC in 1978 via Reference (b). The most limiting full power case is a stuck open SR/V from 100% power. Since that time, Monticello-type tee quencher discharge devices, which improve margin to steam quenching instability, have been installed at Vermont Yankee. However, the suppression pool temperature limit has not been increased to take advantage of the greater margin now available.

Fool w/check $4,000

Shown on Figure 1 is the bulk pool temperature response to a stuck open S/RV from 100% power [from Figure 8 of Reference (b)]. Operator scram is assumed at two minutes and operation of the RHR System with one RHR heat exchanger starts ten minutes after scram. The initial pool temperature was assumed to be 90°F. Also shown on Figure 1 is the suppression pool bulk temperature limit as a function of mass flux for ramshead discharge devices. Steam quenching instability is precluded since the stuck open S/RV transient response remains below this limit line.

The transient pool temperature response to a stuck open S/RV from 100% power has been obtained for the tee quencher discharge device configuration. Assuming the same initial pool temperature of 90°F, the bulk pool temperature response, Curve (a) on Figure 2, shifts only to the left from the response on Figure 1 since the tee quenchers have more total discharge area than the old ramshed discharge devices. Lower mass flux values then result at the same bulk pool temperature since the energy added to the pool is the same in either case.

Increasing the initial pool temperature to 100°F, therefore, only results in the transient response shifting upwards by 10°F at the same mass flux. Thus, Curve (b) on Figure 2 is obtained. It represents the transient pool temperature response to a stuck open S/RV from 100% power for the tee quencher configuration and an initial pool temperature of 100°F.

The transient local pool temperature instability limit currently being proposed [Reference (c)] for Monticello-type tee quenchers is shown as the uppermost line (Curve 1) on Figure 3. The Vermont Yankee Mark I containment is very similar to Monticello's containment, and both have identical tee quenchers. Monticello in-plant tests have shown a maximum bulk to local temperature difference of 43°F without RHR operating, and 15°F with RHR operating.

Applying this data to Vermont Yankee, a revised bulk pool temperature limit for a stuck open S/RV transient is obtained and is shown as Curve 2 on Figure 3. The discontinuity at approximately 64 lbm/sec-ft^2 reflects the initiation of RHR. Also re-plotted on Figure 3 is the stuck open S/RV transient response from Figure 2. A significant improvement in the margin to steam quenching instability has been obtained with the installation of the tee quenchers as evidenced by the difference between the tee quencher bulk temperature limit and the transient responses.

Based on the arguments and the conservatisms inherent to the analysis in Reference (b), the full power suppression pool temperature limit can be safely increased from 90°F to 100°F. This change only applies to the normal operating condition.

This proposed change has been reviewed by the Vermont Yankee Nuclear Safety Audit and Review Committee. The probability of accidents previously evaluated is not increased, the possibility of a different type of accident is not created, nor are the margins of safety as defined in the basis of the Technical Specification reduced by this proposed change.

Fee Determination:

This proposed change requires an approval that involves a single safety issue and is deemed not to involve a significant hazards consideration. For these reasons, Vermont Yankee Nuclear Power Corporation proposes this change as a Class III Amendment. A payment of $4,000.00 is enclosed.

Schedule of Change:

This change to the Vermont Yankee Technical Specifications will be implemented immediately upon NRC approval.

We trust that you will find this submittal satisfactory; however, should you desire additional information, feel free to contact us.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

L. H. Heider
Vice President

COMMONWEALTH OF MASSACHUSETTS)
)ss
MIDDLESEX COUNTY)

Then personally appeared before me, L. H. Heider, who, being duly sworn, did state that he is a Vice President of Vermont Yankee Nuclear Power Corporation, that he is duly authorized to execute and file the foregoing request in the rame and on the behalf of Vermont Yankee Nuclear Power Corporation and that the statements therein are true to be the best of his knowledge and belief.

Robert H. Groce Notary Public
My Commission Expires September 14, 1984