July 27, 2001

Mr. Michael A. Balduzzi
Senior Vice President and Chief Nuclear Officer
Vermont Yankee Nuclear Power Corporation
185 Old Ferry Road
P.O. Box 7002
Brattleboro, VT 05302-7002

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - RELIEF REQUEST FOR THE USE OF ASME CODE CASE N-597 AS AN ALTERNATIVE ANALYTICAL EVALUATION OF WALL THINNING (TAC NO. MB1530)

Dear Mr. Balduzzi:

By letter dated March 19, 2001, Vermont Yankee Nuclear Power Corporation (the licensee) submitted a request for relief from the American Society of Mechanical Engineers (ASME) Code Section XI (IWA-3100) that provides the process for the disposition of flaw examination evaluations that exceed the acceptance standards for materials and welds applicable to the construction of the component. The licensee proposed use of the provisions of ASME Boiler and Pressure Vessel Code Case N-597 for the analytical evaluation of Class 1, 2, and 3 carbon and low-alloy steel piping items subjected to wall thinning as a result of flow accelerated or other corrosion phenomena. The licensee plans to implement the code case through their Appendix B procedure program. The plant procedures will utilize industry standard, NSAC-202L-R2, "Recommendations for an Effected Flow Accelerated Corrosion Program" for calculating remaining life, predicting remaining wall thickness, and calculating wear rates. In addition, the procedures will eliminate the ambiguity contained in the industry standard by substituting the word "shall" for "should" or "can" in critical steps related to performing the evaluations.

Code Case N-597 has not been endorsed by the Nuclear Regulatory Commission (NRC). Since the code case does not address inspection requirements and wall thinning rates, the NRC staff has determined that the code case needs to be reviewed prior to use.

Based on its review, the staff has concluded that the licensee's alternative to use Code Case N-597 and industry standard NSAC-202L-R2 with implementation through their Appendix B procedure program, provides an acceptable level of quality and safety. Therefore, the proposed alternative to use Code Case N-597 for the analytical evaluation of Class 1, 2, and 3 carbon and low-alloy steel piping items subjected to wall thinning as a result of flow accelerated or other corrosion phenomena provides an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

In accordance with Code requirements, components to which this code case is applied must be repaired or replaced in accordance with the construction code of record and owners requirements prior to reaching the allowable minimum wall thickness as specified in this code case.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosure: Safety Evaluation

cc w/encl: See next page

Vermont Yankee Nuclear Power Station

cc:

Regional Administrator, Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. David R. Lewis
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N.W.
Washington, DC 20037-1128

Ms. Christine S. Salembier, Commissioner
Vermont Department of Public Service
112 State Street
Montpelier, VT 05620-2601

Mr. Michael H. Dworkin, Chairman
Public Service Board
State of Vermont
112 State Street
Montpelier, VT 05620-2701

Chairman, Board of Selectmen
Town of Vernon
P.O. Box 116
Vernon, VT 05354-0116

Mr. Richard E. McCullough
Operating Experience Coordinator
Vermont Yankee Nuclear Power Station
P.O. Box 157
Governor Hunt Road
Vernon, VT 05354

G. Dana Bisbee, Esq.
Deputy Attorney General
33 Capitol Street
Concord, NH 03301-6937

Chief, Safety Unit
Office of the Attorney General
One Ashburton Place, 19th Floor
Boston, MA 02108

Ms. Deborah B. Katz
Box 83
Shelburne Falls, MA 01370

Mr. Raymond N. McCandless
Vermont Department of Health
Division of Occupational
and Radiological Health
108 Cherry Street
Burlington, VT 05402

Mr. Gautam Sen
Licensing Manager
Vermont Yankee Nuclear Power
Corporation
185 Old Ferry Road
P.O. Box 7002
Brattleboro, VT 05302-7002

Resident Inspector
Vermont Yankee Nuclear Power Station
U. S. Nuclear Regulatory Commission
P.O. Box 176
Vernon, VT 05354

Director, Massachusetts Emergency
Management Agency
ATTN: James Muckerheide
400 Worcester Rd.
Framingham, MA 01702-5399

Jonathan M. Block, Esq.
Main Street
P. O. Box 566
Putney, VT 05346-0566

In accordance with Code requirements, components to which this code case is applied must be repaired or replaced in accordance with the construction code of record and owners requirements prior to reaching the allowable minimum wall thickness as specified in this code case.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
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cc w/encl: See next page

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* Input received June 19, 2001; no major changes were made.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE USE OF CODE CASE N-597 AS AN ALTERNATIVE

FOR THE ANALYTICAL EVALUATION OF CLASS 1, 2, AND 3

CARBON AND LOW-ALLOY STEEL PIPING ITEMS

VERMONT YANKEE NUCLEAR POWER STATION

VERMONT YANKEE NUCLEAR POWER CORPORATION

DOCKET NO. 50-271

1.0 INTRODUCTION

The inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable edition and addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(a)(3). Title 10 of the *Code of Federal Regulations* Section 50.55a(a)(3) states, in part, that alternatives to the requirements may be used provided the licensee demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR Section 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein and subject to Commission approval.

By letter dated March 19, 2001, Vermont Yankee Nuclear Power Corporation (the licensee) submitted a request for relief from the ASME Code Section XI (IWA-3100) for Vermont Yankee Nuclear Power Station (VY) which provides the process for the disposition of flaw examination evaluations which exceed the acceptance standards for materials and welds specified in Section III Edition applicable to the construction of the component. The flaw evaluation

requirement is from the 1986 Edition of the ASME Code, Section XI, no Addenda. The request provides for an analytical evaluation of Class 1, 2, and 3 carbon and low-alloy steel piping items subjected to wall thinning as a result of flow accelerated or other corrosion phenomenon.

2.0 BACKGROUND

2.1 ASME Section XI Code Requirement

ASME Boiler and Pressure Vessel Code Section XI (IWA-3100) provides the process for the disposition of flaw examination evaluations which exceed the acceptance standards for materials and welds specified in the Code applicable to the construction of the component. This provision stipulates that the disposition shall be subjected to review by the regulatory and enforcement authorities having jurisdiction at the plant site. This flaw evaluation requirement for VY is from the 1986 Edition of the ASME Code, Section XI.

2.2 Proposed Alternative

As an alternative to the requirements of IWA-3100, "Evaluation," the licensee proposes to use the provisions of ASME Boiler and Pressure Vessel Code Case N-597 for the analytical evaluation of Class 1, 2, and 3 carbon and low-alloy steel piping items subjected to wall thinning as a result of flow accelerated or other corrosion phenomena rather than to repair the component if the construction code minimum wall thickness has been reached. This code case stipulates that the methods of predicting the rate of wall thickness loss and the predicted remaining wall thickness shall be the responsibility of the owner. The licensee plans to implement the code case through their Appendix B procedure program. The plant procedures will utilize industry standard, NSAC-202L-R2, "Recommendations for an Effected Flow Accelerated Corrosion Program" for calculating remaining life, predicting remaining wall thickness, and calculating wear rates. In addition, the procedures will eliminate the ambiguity contained in the industry standard by substituting the word "shall" for "should" or "can" in critical steps related to performing the evaluations.

3.0 EVALUATION

The ASME Code requires that the component whose flaws exceed the acceptance standards shall be evaluated to determine disposition which shall be subjected to review by the regulatory and enforcement authorities having jurisdiction at the plant site. As an alternative to the Code requirements, the licensee has proposed to use Code Case N-597, Requirements for Analytical Evaluation of Pipe Wall Thinning, Section XI, Division 1 for Class 1, 2, and 3 carbon and low-alloy steel piping items. The staff has previously reviewed this code case in preparing its position for incorporation into 10 CFR Part 50 and determined that it is conditionally acceptable. Since the code case does not address inspection requirements and wall thinning rates, the staff has determined that the code case needs to be reviewed and approved prior to use.

The NRC staff finds that the licensee's plan will effectively implement this code case for Class 1, 2, and 3 carbon and low-alloy steel piping items. The licensee's use of Code Case N-597 provides an acceptable approach for determining wall thinning as a result of flow-accelerated or other corrosion phenomena. However, the approach makes note of the owner's responsibility in developing the methods of predicting the rate of wall thickness loss and the value of the predicted remaining wall thickness. The licensee stated that plant inspection and evaluation

procedures for calculating wear rates, remaining life, and predicting remaining wall thickness will be based on NSAC-202L-R2, “Recommendations for an Effected Flow Accelerated Corrosion Program” and these procedures satisfy the provisions of Generic Letter 89-08, “Erosion/Corrosion Induced Pipe Wall Thinning”. The staff finds the licensee’s plan to eliminate the ambiguities in NSAC-202L-R2 by substituting the word “shall” for “should” or “can” in critical steps related to performing the evaluations an acceptable approach to implementing this code case.

In accordance with ASME Code requirements, components to which this code case is applied must be repaired or replaced in accordance with the construction code of record and owner’s requirements prior to reaching the allowable minimum wall thickness as specified in this code case.

Therefore, the NRC staff finds that the licensee’s alternative to the use of Code Case N-597 and industry standard NSAC-202L-R2, with elimination of the ambiguities contained in that industry standard through the substitution of “shall” for “should” or “can”, provides an acceptable level of quality and safety.

4.0 CONCLUSION

The staff concludes that the use of Code Case N-597 and industry standard NSAC-202L-R2, with substitution of “shall” for “should” or “can” in this standard, as an alternative evaluation for Class 1, 2, and 3 carbon and low-alloy steel piping items provides an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i). In addition, components to which this code case is applied must be repaired or replaced in accordance with the construction code of record and owner’s requirements prior to reaching the allowable minimum wall thickness as specified in this code case. At such time that Code Case N-597 is incorporated into 10 CFR Part 50 and the licensee intends to continue to implement Code Case N-597, the licensee should follow all the provisions in Code Case N-597 with any limitations issued in the rule.

Principal Contributor: C. Lauron

Date: July 27, 2001