



**Entergy Nuclear Northeast**  
Entergy Nuclear Operations, Inc.  
Vermont Yankee  
322 Governor Hunt Rd.  
P.O. Box 157  
Vernon, VT 05354  
Tel 802-257-7711

February 10, 2004  
BVY 04-017

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

**Subject: Vermont Yankee Nuclear Power Station  
License No. DPR-28 (Docket No. 50-271)  
Technical Specification Proposed Change No. 262 – Supplement No. 8  
Alternative Source Term  
Request for Additional Information**

This letter provides a response to NRC's request of January 29, 2004<sup>1</sup> for additional information regarding Vermont Yankee's<sup>2</sup> (VY) proposed revision to the licensing basis for the Vermont Yankee Nuclear Power Station (VYNPS) by incorporating full scope application of an Alternative Source Term methodology. By letter dated July 31, 2003, as supplemented by letters dated October 10, 2003, November 7, 2003 (two letters), November 20, 2003, December 11, 2003 (two letters), and December 30, 2003, VY proposed to amend Facility Operating License No. DPR-28 for VYNPS.

Attachment 1 to this letter provides a response to the request for additional information (RAI). As discussed in the response to RAI No. 2, VY is amending pages 47 and 54 of the Safety Assessment that were provided as Attachment 5 to the July 31, 2003 submittal. Attachment 2 to this letter provides the replacement pages.

This supplement to the license amendment request does not change the scope or conclusions in the original application, nor does it change VY's determination of no significant hazards consideration.

If you have any questions, please contact Mr. James DeVincentis at (802) 258-4236.

Sincerely,

Jay K. Thayer  
Site Vice President

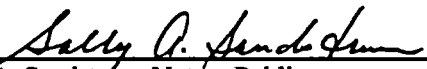
<sup>1</sup> A draft request for additional information was transmitted on January 29, 2004, to VY as documented in NRC memorandum from Richard B. Ennis to Darrell J. Roberts under TAC No. MC0253.

<sup>2</sup> Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. are the licensees of the Vermont Yankee Nuclear Power Station.

A001

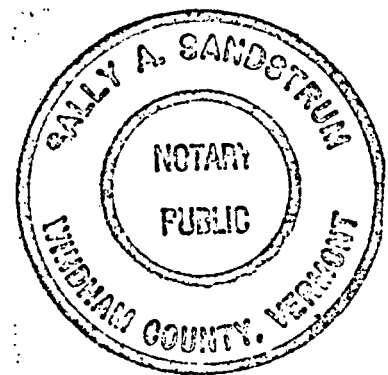
STATE OF VERMONT        )  
                                  )ss  
WINDHAM COUNTY         )

Then personally appeared before me, Jay K. Thayer, who, being duly sworn, did state that he is Site Vice President of the Vermont Yankee Nuclear Power Station, that he is duly authorized to execute and file the foregoing document, and that the statements therein are true to the best of his knowledge and belief.

  
\_\_\_\_\_  
Sally A. Sandstrum, Notary Public  
My Commission Expires February 10, 2007

Attachments (2)

- cc: USNRC Region 1 Administrator (w/o attachments)
- USNRC Resident Inspector – VYNPS (w/o attachments)
- USNRC Project Manager – VYNPS
- Vermont Department of Public Service



Docket No. 50-271  
BVY 04-017

**Attachment 1**

**Vermont Yankee Nuclear Power Station**

**Proposed Technical Specification Change No. 262 – Supplement No. 8**

**Alternative Source Term**

**Response to Request for Additional Information**

RAI No. 1

While reviewing the system boundary, the staff found that valve OG-786 (located in grid E-2 of SUNTAC drawing A217) was not identified on the simplified diagram provided in Appendix A of Attachment 5 of the submittal dated July 31, 2003, nor was it identified on the system boundary description provided in Appendix A of Attachment 5 of the submittal. Provide the basis for concluding that valve OG-786 should not be included within the Alternate Leakage Treatment Seismic Boundary and provide a copy of the latest version of the drawing.

Response to RAI No. 1

The simplified diagram was intended to show active valves that are required to change state to establish the alternative leakage treatment (ALT) pathways. Other, normally closed valves that are part of the boundary were not included in the simplified drawing. However, all components within the boundary will be evaluated. During a conference call with the NRC reviewer on February 2, 2004, Vermont Yankee (VY) clarified this information. The NRC reviewer stated that it is not necessary to provide a copy of SUNTAC drawing A217.

The manual valves in the ALT boundary that are normally closed are verified to be closed prior to plant start-up in accordance with pre-established normal valve line-up procedures. In the event one of these valves is inadvertently left open, the local environment would heat-up very quickly due to the steam entering this environment. Such a condition would be promptly detected and corrected.

Post LOCA access to the locations in the vicinity of these valves is not necessary for establishing the ALT boundary. As a result, the implementation of the AST methodology with the ALT treatment does not result in any new operator missions [Reference AST Submittal, Attachment 5, Safety Assessment, Pages 7 and 53].

Access to this area of the plant is not expected for any other reason under design basis LOCA conditions. As a result, there would not be a need post-LOCA to have the operations crew manipulate equipment in this area. Furthermore, the post-LOCA AST source term would result in dose rates well above background requiring access control.

RAI No. 2

Attachment 5, page 54, of the licensee's submittal dated July 31, 2003, states that: "Since the radiological analysis accounts for leakage through the turbine stop valves (0.5% of total MSIV leakage), it is not necessary to meet the flow area fraction ratio described in Section 4.0 to Appendix C of NEDC-31858P Rev. 2."

- a. Provide the basis for the assumption that leakage through the turbine stop valves will not exceed 0.5% of total MSIV leakage.
- b. Provide the flow area fraction as described in Section 4.0 to Appendix C of EDC-31858P Rev. 2, including an explanation of how it was determined.

Response to RAI No. 2

(a) The 0.5% is an error. The analytical value used in the AST analysis is actually 0.008 or 0.8% and is based on the BWROG formula for the "Fraction of MSIV Leakage to the HP [high pressure] Turbine."

VY also identified an error in establishing the value of 0.8%. The calculation used a non-conservative value for flow area in the ALT pathway. Therefore, VY will be making a plant modification involving one of the ALT pathways to meet the 1% criterion and achieve the analytical value of 0.8%. Provided herewith is a replacement Page 54 for the AST Safety Assessment provided as attachment 5 to VY's letter of July 31, 2003.

(b) NEDC-31858P-A, Rev. 2, Appendix C in Section 4 provides the formula for calculating the "Fraction of MSIV Leakage to the HP Turbine." The Vermont Yankee Nuclear Power Station (VYNPS) analysis applied this formula along with the minimum flow areas of the ALT pathways to the condenser to obtain a fraction of 0.8%. The VYNPS fraction meets the NEDC-31858P-A, Rev. 2, Appendix C criterion of 0.01 (1%). A revised page 54 of the Safety Assessment is provided, which states the following:

The radiological analysis accounts for leakage through the turbine stop valves (0.8% of total MSIV leakage). The "Fraction of MSIV Leakage to the HP Turbine" is less than 0.01 (1%) and meets the flow area fraction ratio described in Appendix C (Section 4) of NEDC-31858P-A, Rev. 2. Vermont Yankee will be making a plant modification involving a valve in the ALT pathways to meet the 1% criterion and achieve the analytical value of 0.8%.

It should also be pointed out that in the VYNPS analysis, this leakage through the turbine stop valves is untreated; that is, the VYNPS analysis does not credit the HP turbine for deposition.

VY has reviewed the Safety Assessment in light of findings discussed in the response to RAI No. 2 and has found another inconsequential error in Table 3-1 (page 47) of the Safety Assessment. The current licensing basis control room LOCA doses should be 0.11 rem whole-body and 28.46 rem thyroid. A revised Table 3-1 is provided to reflect this correction.

Docket No. 50-271  
BVY 04-017

**Attachment 2**

**Vermont Yankee Nuclear Power Station**

**Proposed Technical Specification Change No. 262 – Supplement No. 8**

**Alternative Source Term**

**Replacement Pages to Safety Assessment**

<b>Table 3-1 (Revision 2)</b> <b>LOCA Radiological Consequence Analysis</b> (rem TEDE)			
Dose Component	Offsite Dose		Control Room Dose
	EAB	LPZ	
<b>SGTS Single Failure Case</b>			
Direct Primary Containment Leakage <sup>1</sup>	1.8	0.08	2.8
Release Via RB and Plant Stack	1.3	0.44	0.036
Release Via Main Steam Lines and MC	0.035	0.008	0.53
<b>TOTAL SGTS Failure</b>	<b>3.14</b>	<b>0.53</b>	<b>3.40</b>
<b>MSIV Single Failure</b>			
Direct Primary Containment Leakage <sup>1</sup>	1.1	0.053	1.4
Release Via RB and Plant Stack	1.3	0.44	0.036
Release Via Main Steam Lines and MC	0.039	0.008	0.56
<b>TOTAL MSIV Failure</b>	<b>2.44</b>	<b>0.50</b>	<b>2.00</b>
<b>Regulatory Limit</b>	<b>25</b>	<b>25</b>	<b>5</b>
<b>Current Analysis (Regulatory Limit) <sup>-2</sup> rem</b>	4.30E-01 (25) Gamma 9.4E+01 (300) Thyroid	2.80E-01 (25) Gamma 8.4E+00 (300) Thyroid	1.1E-01 (5) Gamma 2.85E+01 (30) Thyroid

<sup>1</sup> Primary leakage direct to the environment includes the reactor building bypass and reactor building siding pathways.

<sup>2</sup> Current analysis two hour doses were evaluated at the maximum off site distance of 1900 meters due to the topographical considerations since there is no effective stack height at this distance. Thirty day doses at 8050 meters. (Reference 4, Table 14.9.4)

The primary ALT drain path is via the MS low point drain valves, LCVs-101-38A,B,C and D which as previously stated are air operated valves that fail open on loss of air or power. Any of the 4 valves provides adequate drainage. These valves are operated at CRP 9-23.

The backup ALT drain path is via the MS low point drain air operated valve located just downstream of the MSIVs, LCV-2-143, that fails open on loss of air or power. This valve is located downstream of normally open manual valve V60-24 which serves as an orifice. LCV-2-143 is operated at CRP 9-23.

A third ALT drain path is via the SJAE supply line low point drain air operated valve, LCV-101-39 that fails open on loss of air or power. This valve is operated at CRP 9-23.

The radiological analysis accounts for leakage through the turbine stop valves (0.8% of total MSIV leakage). The "Fraction of MSIV Leakage to the HP Turbine" is less than 0.01 (1%) and meets the flow area fraction ratio described in Appendix C (Section 4) of NEDC-31858P-A, Rev. 2. Vermont Yankee will be making a plant modification involving a valve in the ALT pathways to meet the 1% criterion and achieve the analytical value of 0.8%.

#### ALT Seismic Boundary

The ALT seismic boundary includes the main condenser and all piping and tubing located off the MS lines between the MSIVs and the turbine stop valves which could result in steam leakage. In addition to the above the following leakage paths are within the ALT seismic boundary:

- AOG steam supply
- MS sample line
- Steam to turbine steam seal system
- Steam to SJAEs
- Steam to turbine bypass valves
- Steam to EPR, MPR and miscellaneous instruments
- Stop valve and stop valve drains

Valves required to close must have high reliability. High reliability infers power from a reliable source or failure to the required position on loss of power or air along with the ability to operate the valve in the required time frame from the control room. The turbine stop valves have high reliability and fail closed on turbine trip.

Air operated valves PRV-OG-834A&B, FCV-101-37 and PCV-101-35 and the MSIVs fail closed on loss of air or power. Failure of an EDG does not compromise the ability of these valves to close. These valves operate independently of each other. Failure of a MSIV does not cause failure of the other valves and vice versa.

The AOG boundary is at valves PRV-OG-834A & B, which are air operated valves arranged in parallel that fail closed on loss of air or power. These valves are operated at CRP 9-50.

The SJAE boundary is at valves FCV-101-37 and PCV-101-35 which are air operated valves that fail closed on loss of air or power. These valves are operated at CRP 9-6.