

# VERMONT YANKEE NUCLEAR POWER CORPORATION

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October 17, 2000  
BVY 00-96

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)  
Additional Information Regarding GL 96-06**

Per discussion with your staff we are providing additional information that was requested to assist in your review of Generic Letter 96-06 issues for the Vermont Yankee station.


Attachment 1 is a summary of Altran Technical Report No. 99251-TR-002, "Analysis of the RBCCW Piping for LOCA/SLB and LOOP Conditions."

Attachment 2 to this letter is a copy of Revision 2 of Altran Technical Report 99251-TR-001, "RBCCW Response to a Simultaneous LOCA/SLB & LOOP Event." This analysis, performed by Altran for Vermont Yankee, is considered proprietary information by Altran Corporation. In accordance with 10CFR2.790(b)(1), an affidavit attesting to the proprietary nature of the information (report) is enclosed with Attachment 2. Additionally, the analysis is current as of the date of this submittal and it is not Vermont Yankee's intention to maintain the docket current with regard to future revisions to this analysis.

If you have any questions concerning this submittal or desire additional information, please contact Mr. Jeffrey Meyer at (802) 258-4105.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

  
\_\_\_\_\_  
Don M. Leach  
Vice President, Engineering

## Attachments

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

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## SUMMARY OF VERMONT YANKEE COMMITMENTS

BVY NO.: 00-96

The following table identifies commitments made in this document by Vermont Yankee. Any other actions discussed in the submittal represent intended or planned actions by Vermont Yankee. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Licensing Manager of any questions regarding this document or any associated commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"
None	N/A

**Docket No. 50-271  
BVY 00-96**

**Attachment 1**

**Vermont Yankee Nuclear Power Station  
Additional Information Regarding GL 96-06**

**SUMMARY:** Altran Technical Report No. 99251-TR-002, Analysis of RBCCW Piping for LOCA/SLB and LOOP Conditions.

**Piping Analysis Methodology**

The loading conditions evaluated consist of loads that result in both primary and secondary stresses. Pipe primary stresses result from loads due to pipe weight ( $D$ ); maximum internal pressure ( $P_{max}$ ); seismic excitation from the Safe Shutdown Earthquake (SSE), together with pressure pulse loading as a result of column closure type waterhammers ( $WH_{cc}$ ). Pipe secondary stresses result from thermal expansion of the piping due to thermal ( $T_{max}$ ) temperature rise of the pipe material as a consequence of the DBA temperature environment within primary containment. Specific load definitions are outlined as follows.

- *Deadweight ( $D$ )*

Deadweight analysis is performed considering the self-weight of the pipe, contents, insulation, and concentrated weights of in-line components and attachments as appropriate.

- *Internal Pressure ( $P_{max}$ )*

The maximum pressure pulse as a result of waterhammer was considered for calculation of primary membrane (hoop) stresses. The pressure pulse value was also utilized to calculate longitudinal pressure stresses for combination with stresses due to bending type loads.

- *Earthquake Inertia Loading ( $SSE_I$ )*

Loading on the piping as a result of inertial motion due to seismic excitation of the supporting building structure. Earthquake loading consists of the Safe Shutdown Earthquake, as outlined in the VYNPS FSAR, Appendix A.

For this evaluation dynamic enveloping response spectra modal analysis was utilized. Ground spectra, based on Reg. Guide 1.60 and floor spectra with ASME Code Case N-411 damping, conforming to the requirements of Reg. Guide 1.84 were utilized.

- *Earthquake Anchor Motion ( $SSE_A$ )*

Loading of the piping as a result of differential anchor motion of equipment/nozzle anchor points between differing anchor locations, due to the Safe Shutdown Earthquake, was considered ( $SSE_A$ ).

- *Column Closure Waterhammer Loading ( $WH_{cc}$ )*

Loading on the piping as a result of unbalanced piping segment forces due to a column closure waterhammer pressure pulse traveling through the piping was addressed ( $WH_{cc}$ ). For the evaluation of the unbalanced piping segment forces due to the column closure waterhammer, a dynamic time history computer analysis was performed.

- *Thermal Expansion ( $T_{max}$ ) & Thermal Anchor Motion ( $TAM$ )*

The temperature expansion of the piping corresponding to the maximum pipe wall temperature as a result of fluid transients and external ambient air transients (during the DBA) were selected for analysis ( $T_{max}$ ).

Thermal motion of the attached piping system anchor locations, i.e., Thermal Anchor Motion (TAM), was considered in the analysis.

### Load Combinations

The evaluation was performed to assess the piping during the outlined Loss of Coolant Accident (LOCA) condition simultaneous with a Loss of Offsite Power (LOOP), which results in a column closure waterhammer. The possibility of occurrence is such that the event was considered in the same category as the SSE.

### Stress Acceptance Criteria

The stress acceptance criteria is shown in Table 1.

**Table 1**

**RBCCW Piping LOOP + LOCA: Stress Acceptance Criteria**

Load Condition	Stress Equation	Acceptance Criteria	B31.1 EQ
1	$\frac{P_{\max} + D_o}{2t_{\min}}$	$\leq 1.2Sh$	--
2	$\frac{P_{\max} D_o}{4t_n} + \frac{0.75iM_A}{Z}$	$\leq 1.2Sh$	11
3	$\frac{P_{\max} D_o}{4t_n} + \frac{0.75iM_A}{Z} + \frac{0.75i(M_{B1})}{Z}$	$\leq 1.8Sh$	12
4	$\frac{i}{Z}(M_{C1})$ or $\frac{P_{\max} D_o}{4t_n} + \frac{0.75iM_A}{Z} + \frac{i(M_{C1})}{Z}$	$\leq S_A$  $\leq Sh + S_A$	13  14

Where:

$P_{\max}$ ,  $D_o$ ,  $t_{\min}$  as defined per B31.1

$M_A$  = Resultant moment defined per B31.1

$i$  = SIF defined per B31.1

$M_{B1}$  =  $M_B$  defined per B31.1, based on  $((SSE_1)^2 + (WH_{cc})^2)^{1/2}$

$M_{C1}$  =  $M_C$  defined per B31.1, based on  $(T_{\max} + TAM + SSE_A)$

$Z$ ,  $Sh$ ,  $S_A$  defined per B31.1.

### **Support Qualification**

The capacity of the RBCCW pipe support system was verified for pipe support loads determined from the piping analyses. Pipe support loads produced from pipe deadweight, thermal expansion with anchor movement, and dynamic loadings were considered.

### **Acceptance Criteria**

Structural Steel Supports – AISC, Manual of Steel Construction, Allowable Stress Design, Ninth Edition.

Component Supports – Manufacturer's Load Capacity Data Sheets and Catalogs.

**Docket No. 50-271  
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**Attachment 2**

**Vermont Yankee Nuclear Power Station**

**Additional Information Regarding GL 96-06**

## **AFFIDAVIT OF MOHSEN A. EISSA**

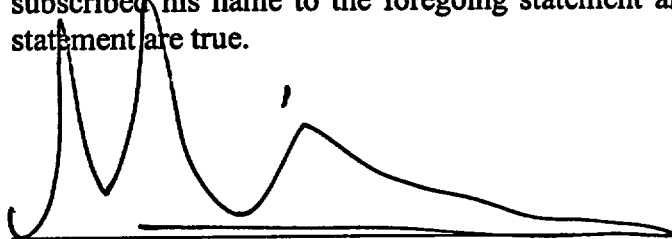
1. I am Senior Vice President, Altran Corporation (Altran), and as such have the responsibility of reviewing the proprietary information sought to be withheld from public disclosure in connection with the nuclear plant analysis, and am authorized to apply for its withholding on behalf of Altran.
2. I am making this affidavit in conformance with the provisions of 10 CFR 2.790 of the regulations of the Nuclear Regulatory Commission (NRC) and in conjunction with Altran's application for withholding, which accompanies this affidavit.
3. Pursuant to the provisions of Paragraph (b)(4) of 10 CFR 2.790, the following is furnished for consideration by the NRC in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned by Altran and has been held in confidence by Altran and its consultants.
  - (ii) The information is of a type that would customarily be held in confidence by Altran. The information consists of analysis methodology details, analysis results, testing results, supporting data, and aspects of development programs relative to a method of analysis that provides a competitive advantage to Altran.
  - (iii) The information was transmitted to the NRC in confidence and under the provisions of 10 CFR 2.790, it is to be received in confidence by the NRC.
  - (iv) The information sought to be protected is not available in public to the best of our knowledge and belief.
  - (v) The proprietary information sought to be withheld in the submittal is Altran Technical Report 99251-TR-001, Rev. 2, "RBCCW Response to a Simultaneous LOCA/SLB & LOOP Event."

This information enables Altran to support BWR and PWR plants with analyses in response to USNRC Generic Letter 96-06.

  - (vi) The proprietary information sought to be withheld from the public disclosure has substantial commercial value to Altran.
    - (a) Altran intends to sell the information to nuclear utilities for the purpose of supporting the operation and licensing of nuclear power plants.
    - (b) The subject information could only be duplicated by competitors at similar expense to that incurred by Altran.
4. Public disclosure of this information is likely to cause harm to Altran because it would allow competitors in the nuclear industry to benefit from the results of a significant development program without requiring a commensurate expense or allowing Altran to recoup a portion of its expenditures or benefit from the sale of the information.

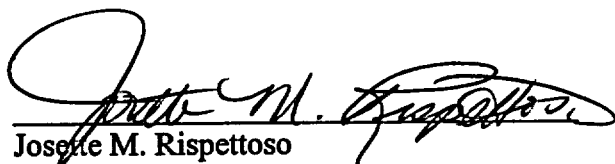


Mohsen A. Eissa, being duly sworn, on his oath deposes and says that he is the person who subscribed his name to the foregoing statement and that the matters and facts set forth in the statement are true.

A handwritten signature in black ink, appearing to read 'Mohsen A. Eissa', written over a horizontal line.

Mohsen A. Eissa, Sr. Vice President

Sworn to and subscribed before me this 9<sup>th</sup> day of October, 2000. Witness my hand and official seal.

A handwritten signature in black ink, appearing to read 'Joseph M. Rispettoso', written over a horizontal line.

Joseph M. Rispettoso  
Notary Public

My commission expires 6/18/04

