January 24, 2001

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

FROM: Robert M. Pulsifer, Project Manager ***/RA/***
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: VERMONT YANKEE, DRAFT REQUEST FOR ADDITIONAL INFORMATION, PROPOSED CHANGE TO EXISTING PRESSURE-TEMPERATURE LIMITS (TAC NO. MB0763 AND MB0764)

The enclosed draft request for additional information (RAI) was transmitted by facsimile on January 18, 2000, to Tom Silko of Vermont Yankee Nuclear Power Corporation (licensee) and followed up by a conference call that same day. A review of the RAI before the call allowed the licensee to determine and agree upon a schedule to respond to the RAI. This memorandum and the enclosure do not convey a formal request for information or represent an NRC staff position.

Docket No. 50-271

Enclosure: Draft Request for Additional Information

January 24, 2001

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

FROM: Robert M. Pulsifer, Project Manager ***/RA/***
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: VERMONT YANKEE, DRAFT REQUEST FOR ADDITIONAL INFORMATION, PROPOSED CHANGE TO EXISTING PRESSURE-TEMPERATURE LIMITS (TAC NO. MB0763 AND MB0764)

The enclosed draft request for additional information (RAI) was transmitted by facsimile on January 18, 2000, to Tom Silko of Vermont Yankee Nuclear Power Corporation (licensee) and followed up by a conference call that same day. A review of the RAI before the call allowed the licensee to determine and agree upon a schedule to respond to the RAI. This memorandum and the enclosure do not convey a formal request for information or represent an NRC staff position.

Docket No. 50-271

Enclosure: Draft Request for Additional Information

DISTRIBUTION
PDI-2 R/F
PUBLIC
Project Manager
KWichman
JMedoff

DOCUMENT NAME: C:\rai.wpd ML010240511

OFFICE	PDI-2/PM	PDI-2/SC
NAME	RPulsifer	KWichman
DATE	1/22/01	1/22/01

OFFICIAL RECORD COPY

Draft Request for Additional Information Regarding
License Amendment for the Vermont Yankee Nuclear Power Station
- Proposed Changes to Existing Pressure-Temperature Limits

1. In Table 2 of Structural Integrity Associates (SIA) Assessment No. SIR-00-155, Rev. 0, you list the following Initial RT_{NDT} values for the Vermont Yankee Nuclear Power Station (VYNPS) beltline materials:

   Plate No. I-14: Initial RT_{NDT} value of 30°F
   Plate No. I-15: Initial RT_{NDT} value of -10°F
   Plate No. I-16: Initial RT_{NDT} value of 0°F
   Plate No. I-17: Initial RT_{NDT} value of 0°F
   Beltline Weld: Initial RT_{NDT} value of 0°F

   In contrast, both the NRC's Reactor Vessel Integrity Database and the Vermont Yankee Nuclear Power Corporation (VYNPC) submittal of September 24, 1993, list the Initial RT_{NDT} values for these materials as:

   Plate No. I-14: Initial RT_{NDT} value of 40°F
   Plate No. I-15: Initial RT_{NDT} value of 30°F
   Plate No. I-16: Initial RT_{NDT} value of 30°F
   Plate No. I-17: Initial RT_{NDT} value of 30°F
   Beltline Weld: Initial RT_{NDT} value of -70°F

   Your value for the limiting 1/4T and 3/4T material (i.e., Plate No. I-14) decrease the 1/4T and 3/4T RT_{NDT} values for this material by 10°F. Since this is non-conservative, and since you appear to be changing the Initial RT_{NDT} values for the VYNPS RPV materials, discuss your methods for establishing the Initial RT_{NDT} values for all VYNPS RPV materials that were evaluated as P-T limits amendment request, and justify all methods and values used to establish your new Initial RT_{NDT} values for the VYNPS RPV materials.

2. Regarding SIA Assessment No. SIR-00-155, Rev. 0, a limiting beltline 1/4T ART_{NDT} value of 89°F was used in P-T Limit Calculation Tables 6 and 8 (i.e., the tables for the pressure test and normal operations cooldown curve calculations for the beltline materials), and a limiting beltline 3/4T ART_{NDT} value of 73°F was used in P-T Limit Calculation Tables 5 and 7 (i.e., the tables for the pressure test and normal operations heatup curve calculations for the beltline materials). Regarding Tables 5, 6, 7, and 8 of SIA Assessment No. SIR-00-155, Rev. 0, explain (discuss) why the 1/4T and 3/4T ART_{NDT} values of 89°F and 73°F were selected as the conservative 1/4T and 3/4T ART_{NDT} values used for the beltline P-T limit calculations (i.e., as compared to the less conservative 1/4T and 3/4T ART_{NDT} values listed in Table 2 of SIA Assessment No. SIR-00-155, Rev. 0.).

3. In the P-T limit calculation results, SIA used the 3/4T location as the basis for evaluating the beltline region during heatups of the reactor, and the 1/4T location as the basis for evaluating the beltline region during cooldowns of the reactor. For P-T limit calculations for RPV beltline materials, the 1/4T location of the vessel is always limiting for cooldown

evaluations of the beltline region. However, for heatups of the reactor, both the 1/4T and 3/4T locations must be assessed, as the 3/4T location may not always be the limiting location for the stress intensity/pressure calculation (i.e., the 1/4T location gets the more conservative effect from having a higher fluence than the 3/4T location, but the 3/4T location gets a more conservative effect from having a higher thermal stress added to it than the 1/4T location). State whether the P-T limit calculations for heatups in Tables 5 and 7 included P-T assessments of the 1/4T location, and state whether or not the P-T limit points generated for the 3/4T location were always found to be conservative relative to the P-T limit points generated for the 1/4T location of the beltline.

4. In VYNPC letter BVY-00-113, the P-T limit points for the upper region in Technical Specification Figure 3.6.2, "Reactor Vessel Pressure-Temperature Limitations, Normal Operations, Core Not Critical," is based on the data from Table 11 of SIA Assessment No. SIR-00-155, Rev. 0. Relative to the issue identified in RAI question 3. above, state whether the evaluation in Table 11 for the N2 Recirculation Nozzle will always yield conservative P-T limit points relative to the P-T limit evaluation of the beltline region for normal operating conditions with the core not critical.

5. Appendix 5 to Welding Resource Council (WRC) Bulletin 175 provides a alternative basis for estimating the stress intensity factors for nozzles to pressure vessels. To allow the staff to perform an independent assessment of the N2 Recirculation Nozzle and the feedwater nozzle to the VYNPC RPV, provide the following plant specific dimensional data relative to the design configuration documents for the nozzles and the VYNPC RPV, and relative to the evaluation dimension criteria used in Appendix 5 of WRC Bulletin 175:

   A. Thickness of the each nozzle in inches
   B. Assumed nozzle crack size "a" for each nozzle, in inches
   C. Apparent radius of the each nozzle (r_n value) in inches
   D. Actual inner radius of each nozzle (r_i value) in inches
   E. Nozzle corner radius (r_c value) for each nozzle in inches
   F. RPV thickness and inner radius values, in inches, at the points were the nozzles are joined to the vessel.

6. Confirm that the neutron fluence levels for the feedwater nozzles and N2 recirculation nozzles are lower than the NRC assumed threshold value for neutron irradiation embrittlement (i.e., less than $1x10^{17}$ n/cm^2). If not, the effects of neutron irradiation embrittlement need to be accounted in the ART_{NDT} assessments for the nozzle materials.

7. Confirm that Figures G-2214-1 and G-2214-2 in Appendix G to Section XI of the ASME Code are being utilized as the basis for calclating the thermal stress intensity values and $\Delta T_{1/4}$ and $\Delta T_{3/4}$ values used in the P-T limit calculations. If not, state whether plant-specific finite element modeling of the RPV thermal stress intensity and temperature profiles is being used for the thermal stress intensity assessments, a provide the thermal stress intensity values for the 1/4T and 3/4T locations and $\Delta T_{1/4}$ and $\Delta T_{3/4}$ values as a function of the temperature for the RPV inner surface during heatups and cooldowns.