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November 7, 2003  
BVY 03-102

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. 3  
Alternative Source Term – Modified Exemption Request**

By letter<sup>1</sup> dated July 31, 2003, Vermont Yankee<sup>2</sup> (VY) proposed to amend Facility Operating License DPR-28 for the Vermont Yankee Nuclear Power Station by incorporating an Alternative Source Term (AST) methodology into the facility's licensing basis. The license amendment request (LAR) was prepared in accordance with applicable regulatory guidance, and the analyses performed using the AST demonstrate that postulated accident consequences meet regulatory acceptance limits.

Included in the LAR was a request for an exemption from the requirements of 10CFR50.54(o) and Appendix J to 10CFR50. VY is modifying the exemption request as specified herein. Specifically, VY is rescinding its request that secondary containment bypass leakage be excluded from the overall integrated leakage rate Type A test measurements and from the sum of the leakage rates from Type B and Type C tests specified by Appendix J. However, VY is maintaining its request for exemption for main steam leakage.

Based on discussions with NRC staff and for ease of review, VY is providing as Attachment 1 hereto certain replacement pages for Attachments 1, 3, and 4 to the July 31, 2003 LAR. These replacement pages are one-for-one replacements. Attachment 2 to this letter provides the same replacement pages, but in mark-up fashion showing the original LAR with cross-outs and change bars to clearly indicate changes.

The changes provided herewith do not expand the scope or change the conclusions of the original application for a license amendment, and the prior determination of no significant hazards consideration is unchanged.

<sup>1</sup> Vermont Yankee letter to U.S. Nuclear Regulatory Commission, "Alternative Source Term," Proposed Change No. 262, BVY 03-70, July 31, 2003.

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

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If you have any questions in this regard, please contact Mr. Len Gucwa at (802) 258-4225.

Sincerely,



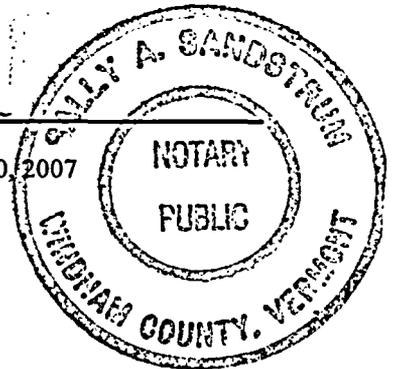
Jay K. Thayer  
Site Vice President

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 (cover letter only)
- USNRC Resident Inspector – VYNPS (cover letter only)
- USNRC Project Manager – VYNPS (two copies/with attachments)
- Vermont Department of Public Service (with attachments)

Docket No. 50-271  
BVY 03-102

**Attachment 1**

**Vermont Yankee Nuclear Power Station**

**Proposed Technical Specification Change No. 262**

**Supplement No. 3**

**Alternative Source Term – Modified Exemption Request**

**Replacement Pages to Original Attachments 1, 3, and 4**

Instructions for replacing pages

Attachment 1 to BVY 03-70

Replace pages 8, 11, 12, 18, 19, 20, and 21 of Attachment 1 to VY's letter of July 31, 2003 (BVY 03-70) with the following attached pages with the same page numbers, but marked as "BVY 03-102 / Attachment 1." This is a one-for-one page replacement.

Assessment (Attachment 5). Plant calculations used in support of plant post-accident vital area access (prepared in accordance with NUREG-0737, Items II.B.2 and II.B.3) were evaluated for impact by AST. The evaluation considered the comparative radiation levels from AST and the existing TID-14844 methodology source terms (such as airborne activity in the reactor building and turbine building, and also as activity in the suppression pool water).

- Post-accident radiation monitor: Post-accident containment high range radiation monitoring calculations were revised for impact by AST (NUREG-0737, Item II.F.1).
- Control room radiation protection: The control room radiological dose impact of AST has been specifically calculated for each of the four DBAs analyzed for AST implementation (NUREG-0737 item III.D.3.4).
- Radioactive sources outside the primary containment: The DBA LOCA control room dose analysis, as well as that for offsite doses, includes the effects of coolant leakage outside the primary containment and (for the control room and TSC dose analyses only) the shine contribution from the reactor building and other source term bearing systems and/or components (NUREG-0737, Item III.D.1.1).

### **Primary Containment Leakage Rate Testing Program**

In accordance with the requirements of TS 6.7.C, VY has implemented leakage rate testing of the primary containment as required by 10CFR50.54(o) and 10CFR50, Appendix J – Option B, as modified by approved exemptions. Option B of Appendix J to 10CFR50 was initially implemented at VYNPS upon the issuance of license amendment no. 152<sup>11</sup>.

### **Background – Primary Containment Leakage Rate Testing Program**

With application of the AST, the proposed changes to primary containment leakage testing requirements will:

- Provide an exemption to 10CFR50 Appendix J, to exclude the measured leakage from the main steam pathways from the combined local leakage rates (Type B and Type C tests) and the overall integrated leakage rate (Type A tests);
- Provide additional exceptions to Regulatory Guide 1.163, NEI 94-01, Rev. 0, and ANSI/ANS 56.8-1994;
- Revise the current provisions of TS 3/4.7.A.4 by (1) increasing the allowable leakage rate for individual MSIVs; (2) establishing the main steam pathway that incorporates five pathways (i.e., the four main steam lines and the main steam drain line); (3) increasing the combined leakage rate from the MSIVs to an aggregate leakage rate from the main steam pathways; (4) adding a specific provision that limits allowable secondary containment bypass leakage; and (5) require testing for the specific pathways in accordance with the PCLRTP. The PCLRTP establishes the test frequency and acceptance criteria for testing; and
- Clarify and correct certain omissions to TS 6.7.C.

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<sup>11</sup> U.S. Nuclear Regulatory Commission letter to Vermont Yankee Nuclear Power Corporation, "Issuance of Amendment No. 152 to Facility Operating License No. DPR-28, VYNPS (TAC No. M99264)," February 26, 1998.

and SCB pathways to ensure the design bases radiological consequences analyses assumptions remain valid.

Presently, the main steam and SCB pathway Types B and C test results are added to the results from other Types B and C Testing: (1) to establish a combined total primary containment leakage rate which is evaluated against the limit for total primary containment leakage rate; and (2) for computation of the combined leakage rate for penetrations and valves subject to Types B and C tests to be less than La with margin.

#### Proposed Exemption to 10CFR50, Appendix J

10CFR50.54(o) requires that primary reactor containments be subject to the requirements of Appendix J to 10CFR50. Appendix J specifies the leakage rate test requirements, schedules, and acceptance criteria for tests of the leak-tight integrity of the primary reactor containment and systems and components which penetrate the containment. Option B, Section III.A requires that the overall integrated leakage rate must not exceed the allowable leakage (La) with margin, as specified in the TS. The overall integrated leakage rate, as specified in the 10CFR50, Appendix J definitions, includes the contribution from main steam leakage. (Main steam leakage includes leakage through four main steam lines and the main steam drain line.) Option B, Section III.B of 10CFR50, Appendix J requires that the sum of the leakage rates of Type B and Type C local leakage rate tests be less than the performance criterion (La) with margin, as specified in the TS. Concurrent with the request for license amendment, VY hereby requests an exemption from 10CFR50.54(o) and the requirements of 10CFR50, Appendix J, Option B, Sections III.A and III.B to permit exclusion of the main steam pathway leakage contributions from the overall integrated leakage rate Type A test measurement and from the sum of the leakage rates from Type B and Type C tests. This request for exemption is similar to an exemption granted from the requirements of Sections III.A and III.B of Option B for the Browns Ferry nuclear plant on March 14, 2000.<sup>13</sup>

#### 10CFR50.12 – Specific Exemptions

10CFR50.12 states that the Commission will not consider granting an exemption unless special circumstances are present. VY believes this request meets the criterion of a special circumstance as defined in 50.12(a)(2)(ii), which states: “Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.” The underlying purpose of the rule is to establish test requirements that ensure that (1) leakage through these containments or systems and components penetrating these containments do not exceed allowable leakage rates, and (2) integrity of the containment structure is maintained during its service life.

The above cited requirements of Appendix J require that the main steam leakage measurements are included in the leakage measurements of other containment penetrations when containment leakage tests are performed. With the VYNPS AST analyses, these requirements are inconsistent with the design of VYNPS and the analytical models used to calculate the radiological consequences of design basis accidents. At VYNPS, the leakage from primary containment penetrations, under accident conditions, is collected and treated by the secondary containment system, or would bypass the secondary containment. However, the main steam effluent has a different pathway to

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<sup>13</sup> U.S. Nuclear Regulatory Commission letter to Tennessee Valley Authority, “Browns Ferry Nuclear Plant, Units 2 and 3 – Issuance of Exemption From 10 CFR Part 50, Appendix J (TAC Nos. MA6815 and MA6816),” March 14, 2000.

the environment and is not directed into the secondary containment and filtered by the standby gas treatment system as is other containment leakage. Instead, the main steam leakage is collected and treated via an alternative leakage treatment (ALT) path having different mitigation characteristics (see Appendix A to the AST Safety Assessment in Attachment 5).

In performing accident analyses, it is appropriate to group various leakage effluents according to the treatment they receive before being released to the environment (i.e., from main steam pathways). The proposed exemption would more appropriately permit ALT pathway leakage to be independently grouped with their unique leakage limits. In this manner, the VYNPS containment leakage testing program will be made more consistent with the limiting assumptions used in the associated accident consequence analyses. Corresponding changes to the TS, which implement the requested exemption, are also proposed.

VY has analyzed the main steam leakage pathway for an increase in leakage (from 62 scfh to 124 scfh at Pa), the secondary containment bypass leakage pathways, and the containment leakage pathway (La) separately in the dose consequence analyses in Attachment 5. The calculated radiological consequences of the combined leakages are within the criteria of 10CFR50.67, and are therefore acceptable.

It is anticipated that the revised limits on main steam isolation valve leakage will potentially result in a reduction of unnecessary maintenance on these valves simply to maintain the low leakage rate and support reducing maintaining worker exposure to as low as reasonably achievable.

Based on the foregoing, the removal of the main steam pathways from Specifications 6.7.C.3 and 6.7.C.4 is warranted since a separate specification has been provided for these pathways. The revised design basis radiological consequences analyses address these pathways as individual factors, exclusive of the Primary Containment leakage.

**Table 6**  
(continued)

Change #4	Current TS Bases:	Proposed Change:
	<p>Current TS 6.7.C specifies that the Primary Containment Leak Rate Test Program (PCLRTP) shall be in accordance with Regulatory Guide (RG) 1.163 as modified by an exception to NEI 94-01. (RG 1.163 endorses, with certain exceptions, NEI 94-01, and ANSI/ANS-56.8-1994.)</p> <p>The structure of TS 6.7.C could be improved for usability. The title heading of TS 6.7.C is "Primary Containment Leak [sic] Rate Testing Program." A typographical error exists in TS 6.7.C.1 in that the primary containment leakage rate acceptance criterion is given as "&lt; 1.0 La."</p>	<p>TS 6.7.C is revised to incorporate the exemption to Sections III.A and III.B of 10CFR50, Appendix J, Option B that is requested herein.</p> <p>TS 6.7.C is revised such that the leakage contributions from the main steam pathways are excluded from both the sum of the leakage rates from Type B and Type C tests and the overall integrated leakage rate from Type A tests.</p> <p>Editorial changes are made to restructure the format and clarify TS 6.7.C. Revised terminology is implemented for consistency and correctness (e.g., "leak" is changed to "leakage").</p> <p>The first paragraph of TS 6.7.C is revised to state:</p> <p><i>A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, entitled "Performance Based Containment Leak-Test Program," dated September 1995, as modified by the following:</i></p> <ul style="list-style-type: none"> <li>• <i>The first Type A test after the April 1995 Type A test shall be performed no later than November 2005. (This is an exception to Section 9.2.3 of NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J.")</i></li> <li>• <i>The leakage contributions from the main steam pathways are excluded from the sum of the leakage rates from Type B and Type C tests specified in (1) Section</i></li> </ul>

**Table 6**  
(continued)

<p><b>Change #4</b></p>		<p><b>Proposed Change: (continued)</b></p> <p><i>III.B of 10CFR50, Appendix J – Option B; (2) Section 6.4.4 of ANSI/ANS 56.8-1994; and (3) Section 10.2 of NEI 94-01, Rev. 0.</i></p> <ul style="list-style-type: none"> <li>• <i>The leakage contributions from the main steam pathways are excluded from the overall integrated leakage rate from Type A tests specified in (1) Section III.A of 10CFR50, Appendix J – Option B; (2) Section 3.2 of ANSI/ANS 56.8-1994; and (3) Sections 8.0 and 9.0 of NEI 94-01, Rev. 0.</i></li> </ul> <p>TS 6.7.C.1 is changed to correct a typographical error, such that the acceptance criterion is now stated as “≤ 1.0 La.”</p>
<p><b>Basis / Safety Assessment:</b></p> <p>As discussed previously in this request for a change in the licensing basis for VYNPS, VY is requesting an exemption from the requirements of Sections III.A and III.B of 10CFR50, Appendix J, Option B to exclude the leakage contributions of main steam pathways from the overall integrated leakage rates from Type A tests and from the sum of the leakage rates from Type B and Type C tests. Because TS 6.7.C invokes compliance to RG 1.163, which endorses, with certain exceptions, NEI 94-01, and ANSI/ANS-56.8-1994, certain exceptions are also need to these associated guidelines. For Type A tests, in addition to the exemption to Section III.A of Appendix J, Option B, exceptions are needed to Section 3.2 of ANSI/ANS 56.8-1994 and Sections 8.0 and 9.0 of NEI 94-01, Revision 0. Compliance with ANSI/ANS 56.8-1994 is required as a condition of compliance with RG 1.163. For Type B and Type C tests, in addition to the exemption to Section III.B of Appendix J, Option B, exceptions are needed to Section 6.4.4 of ANSI/ANS 56.8-1994 and Section 10.2 of NEI 94-01, Revision 0. These exceptions are acceptable because they conform to the exemption requested.</p> <p>Upon granting the requested exemption, the exceptions for including main steam pathways leakage rates in the introductory paragraph of TS</p>		

**Table 6**  
(continued)

<p>Change #4</p>	<p><b>Basis / Safety Assessment: (continued)</b></p> <p>6.7.C are acceptable because the leakage rates for the subject pathways will be contained in separate specifications (i.e., proposed TS 3.7.A.4. a and 3.7.A.4.b) and the leakage rate acceptance criteria from all measured pathways are consistent with the leakage rates assumed in the AST analyses. The sum of the limiting leakage rates from all leakage pathways does not result in radiological doses exceeding the limits specified in 10CFR50.67.</p> <p>Editorial changes are made to TS 6.7.C to clarify the meaning and understanding of the TS to avoid confusion and potential error. These changes are acceptable because they do not change the technical meaning or intent of the specification. These changes include slight reformatting of the specification and changing the word “leak” to “leakage” in TS 6.7.C. These changes are acceptable because they do not change the intent or technical meaning of the specifications and are made for clarity and consistency purposes. The change in terminology from “leak rate” to “leakage rate” is also consistent with the definition of this term in ANSI/ANS 56.8-1994.</p> <p>TS 6.7.C.1 is changed to correct a typographical error, such that the acceptance criterion is now properly stated as “≤ 1.0 La.” When Option B of Appendix J was adopted through license amendment 152, the acceptance criterion expression for primary containment leakage rate properly stated “≤ 1.0 La.” VY’s request for license amendment that became Amendment no. 215<sup>14</sup> inadvertently modified the “≤” symbol. This change, therefore, corrects that administrative error and is acceptable because the inadvertent change in Amendment 215 was unintended and not within the scope of changes incorporated by that license amendment.</p>	
<p>Change #5</p>	<p><b>Current TS Bases:</b></p> <p>Current TS 6.7.C.3 and 6.7.C.4 provide conditions and acceptance criteria for primary containment leakage rate testing. The leakage contributions from main steam pathways are currently included in determining the sum of the leakage rates from Type B and Type C tests.</p>	<p><b>Proposed Change:</b></p> <p>The acceptance criteria specified in TS 6.7.C.3 and 6.7.C.4 for allowable Type B and Type C leakage rate testing are revised to exclude the contributions from main steam pathways.</p> <p>TS 6.7.C.3 is also clarified by stating that requirement is applicable where <u>primary</u> containment integrity is required (addition of the word, “primary”).</p> <p>TS 6.7.C.3 and 6.7.C.4 are revised to state:</p> <p>3. <i>The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage</i></p>

<sup>14</sup> U.S. Nuclear Regulatory Commission letter to Vermont Yankee, “Vermont Yankee Nuclear Power Station – Issuance of Amendment Re: One-Time Extension of Appendix J Type A Integrated Leakage Rate Test Interval (TAC No. MB6507),” (License Amendment No. 215), June 2, 2003.

**Table 6**  
(continued)

<p>Change #5</p>		<p><b>Proposed Change: (continued)</b></p> <p><i>contributions from the main steam pathways) is <math>\leq 0.6 La</math>, calculated on a maximum pathway basis, prior to entering a mode of operation where primary containment integrity is required.</i></p> <p>4. <i>The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from the main steam pathways) is <math>\leq 0.6 La</math>, calculated on a minimum pathway basis, at all times when primary containment integrity is required.</i></p>
<p><b>Basis / Safety Assessment:</b></p> <p>Upon granting the requested exemption, the exclusion of main steam pathway leakage rates in 6.7.C.3 and 6.7.C.4 is acceptable because the leakage rates for the subject pathways will be contained in separate specifications (i.e., proposed TS 3.7.A.4. a and 3.7.A.4.b). The leakage rate acceptance criteria from all measured pathways are consistent with the leakage rates assumed in the AST analyses. The sum of the limiting leakage rates from all leakage pathways does not result in radiological doses exceeding the limits specified in 10CFR50.67. This is an administrative change to incorporate the provisions of the requested exemption.</p>		

### Instructions for replacing pages

#### Attachment 3 to BVY 03-70

Attachment 3 to BVY 03-70 provided a mark-up of the current Technical Specifications pages. Included with the mark-ups was a page for insertions to Technical Specification 6.7.C. The only change to the mark-ups appears on the insertion page. Therefore, replace the attached insertion page in Attachment 3 to BVY 03-70 with the following page. This is a one-for-one page replacement.

### INSERT #1 to TS 6.7.C

as modified by the following:

- The first Type A test after the April 1995 Type A test shall be performed no later than November 2005. (This is an exception to Section 9.2.3 of NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J.")
- The leakage contributions from the main steam pathways are excluded from the sum of the leakage rates from Type B and Type C tests specified in (1) Section III.B of 10CFR50, Appendix J – Option B; (2) Section 6.4.4 of ANSI/ANS 56.8-1994; and (3) Section 10.2 of NEI 94-01, Rev. 0.
- The leakage contributions from the main steam pathways are excluded from the overall integrated leakage rate from Type A tests specified in (1) Section III.A of 10CFR50, Appendix J – Option B; (2) Section 3.2 of ANSI/ANS 56.8-1994; and (3) Sections 8.0 and 9.0 of NEI 94-01, Rev. 0.

### INSERT #2 to TS 6.7.C

3. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from the main steam pathways) is  $\leq 0.6 L_a$ , calculated on a maximum pathway basis, prior to entering a mode of operation where primary containment integrity is required.
4. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from the main steam pathways) is  $\leq 0.6 L_a$ , calculated on a minimum pathway basis, at all times when primary containment integrity is required.

Instructions for replacing pages

Attachment 4 to BVY 03-70

Attachment 4 to BVY 03-70 provided the re-typed Technical Specifications pages. Replace page 265 of the re-typed Technical Specifications pages in Attachment 4 to BVY 03-70 with the following page. This is a one-for-one page replacement.

VYNPS

Report for the period of the report in which any change to the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (e.g., month/year) the change was implemented.

C. PRIMARY CONTAINMENT LEAKAGE RATE TESTING PROGRAM

A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, entitled "Performance Based Containment Leak-Test Program," dated September 1995, as modified by the following:

- The first Type A test after the April 1995 Type A test shall be performed no later than November 2005. (This is an exception to Section 9.2.3 of NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J.")
- The leakage contributions from the main steam pathways are excluded from the sum of the leakage rates from Type B and C tests specified in (1) Section III.B of 10CFR50, Appendix J - Option B; (2) Section 6.4.4 of ANSI/ANS 56.8-1994; and (3) Section 10.2 of NEI 94-01, Rev. 0.
- The leakage contributions from the main steam pathways are excluded from the overall integrated leakage rate from Type A tests specified in (1) Section III.A of 10CFR50, Appendix J - Option B; (2) Section 3.2 of ANSI/ANS 56.8-1994; and (3) Sections 8.0 and 9.0 of NEI 94-01, Rev. 0.

The peak calculated containment internal pressure for the design basis loss of coolant accident, Pa, is 44 psig.

The maximum allowable primary containment leakage rate, La, at Pa, shall be 0.8% of primary containment air weight per day.

Leakage rate acceptance criteria are:

1. Primary containment leakage rate acceptance criterion  $\leq 1.0 L_a$ .
2. The as-left primary containment integrated leakage rate test (Type A test) acceptance criterion is  $\leq 0.75 L_a$ .
3. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from the main steam pathways) is  $\leq 0.6 L_a$ , calculated on a maximum pathway basis, prior to entering a mode of operation where primary containment integrity is required.
4. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from the main steam pathways) is  $\leq 0.6 L_a$ , calculated on a minimum pathway basis, at all times when primary containment integrity is required.

Docket No. 50-271  
BVY 03-102

Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 262

Supplement No. 3

Alternative Source Term – Modified Exemption Request

Marked-Up Replacement Pages to Original Attachments 1, 3, and 4

Assessment (Attachment 5). Plant calculations used in support of plant post-accident vital area access (prepared in accordance with NUREG-0737, Items II.B.2 and II.B.3) were evaluated for impact by AST. The evaluation considered the comparative radiation levels from AST and the existing TID-14844 methodology source terms (such as airborne activity in the reactor building and turbine building, and also as activity in the suppression pool water).

- Post-accident radiation monitor: Post-accident containment high range radiation monitoring calculations were revised for impact by AST (NUREG-0737, Item II.F.1).
- Control room radiation protection: The control room radiological dose impact of AST has been specifically calculated for each of the four DBAs analyzed for AST implementation (NUREG-0737 item III.D.3.4).
- Radioactive sources outside the primary containment: The DBA LOCA control room dose analysis, as well as that for offsite doses, includes the effects of coolant leakage outside the primary containment and (for the control room and TSC dose analyses only) the shine contribution from the reactor building and other source term bearing systems and/or components (NUREG-0737, Item III.D.1.1).

### **Primary Containment Leakage Rate Testing Program**

In accordance with the requirements of TS 6.7.C, VY has implemented leakage rate testing of the primary containment as required by 10CFR50.54(o) and 10CFR50, Appendix J – Option B, as modified by approved exemptions. Option B of Appendix J to 10CFR50 was initially implemented at VYNPS upon the issuance of license amendment no. 152<sup>11</sup>.

### **Background – Primary Containment Leakage Rate Testing Program**

With application of the AST, the proposed changes to primary containment leakage testing requirements will:

- Provide an exemption to 10CFR50 Appendix J, to exclude the measured leakage from the ~~secondary containment bypass pathways and the main steam pathways~~ from the combined local leakage rates (Type B and Type C tests) and the overall integrated leakage rate (Type A tests);
- Provide additional exceptions to Regulatory Guide 1.163, NEI 94-01, Rev. 0, and ANSI/ANS 56.8-1994;
- Revise the current provisions of TS 3/4.7.A.4 by (1) increasing the allowable leakage rate for individual MSIVs; (2) establishing the main steam pathway that incorporates five pathways (i.e., the four main steam lines and the main steam drain line); (3) increasing the combined leakage rate from the MSIVs to an aggregate leakage rate from the main steam pathways; (4) adding a specific provision that limits allowable secondary containment bypass leakage; and (5) require testing for the specific pathways in accordance with the PCLRTP. The PCLRTP establishes the test frequency and acceptance criteria for testing; and
- Clarify and correct certain omissions to TS 6.7.C.

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<sup>11</sup> U.S. Nuclear Regulatory Commission letter to Vermont Yankee Nuclear Power Corporation, “Issuance of Amendment No. 152 to Facility Operating License No. DPR-28, VYNPS (TAC No. M99264),” February 26, 1998.

and SCB pathways to ensure the design bases radiological consequences analyses assumptions remain valid.

Presently, the main steam and SCB pathway Types B and C test results are added to the results from other Types B and C Testing: (1) to establish a combined total primary containment leakage rate which is evaluated against the limit for total primary containment leakage rate; and (2) for computation of the combined leakage rate for penetrations and valves subject to Types B and C tests to be less than La with margin.

#### Proposed Exemption to 10CFR50, Appendix J

10CFR50.54(o) requires that primary reactor containments be subject to the requirements of Appendix J to 10CFR50. Appendix J specifies the leakage rate test requirements, schedules, and acceptance criteria for tests of the leak-tight integrity of the primary reactor containment and systems and components which penetrate the containment. Option B, Section III.A requires that the overall integrated leakage rate must not exceed the allowable leakage (La) with margin, as specified in the TS. The overall integrated leakage rate, as specified in the 10CFR50, Appendix J definitions, includes the contribution from main steam and secondary containment bypass leakage. (Main steam leakage includes leakage through four main steam lines and the main steam drain line.) Option B, Section III.B of 10CFR50, Appendix J requires that the sum of the leakage rates of Type B and Type C local leakage rate tests be less than the performance criterion (La) with margin, as specified in the TS. Concurrent with the request for license amendment, VY hereby requests an exemption from 10CFR50.54(o) and the requirements of 10CFR50, Appendix J, Option B, Sections III.A and III.B to permit exclusion of the main steam and secondary containment bypass pathway leakage contributions from the overall integrated leakage rate Type A test measurement and from the sum of the leakage rates from Type B and Type C tests. This request for exemption is similar to an exemption granted from the requirements of Sections III.A and III.B of Option B for the Browns Ferry nuclear plant on March 14, 2000.<sup>13</sup>

#### 10CFR50.12 – Specific Exemptions

10CFR50.12 states that the Commission will not consider granting an exemption unless special circumstances are present. VY believes this request meets the criterion of a special circumstance as defined in 50.12(a)(2)(ii), which states: “Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.” The underlying purpose of the rule is to establish test requirements that ensure that (1) leakage through these containments or systems and components penetrating these containments do not exceed allowable leakage rates, and (2) integrity of the containment structure is maintained during its service life.

The above cited requirements of Appendix J require that the main steam and secondary containment bypass leakage measurements are included in the leakage measurements of other containment penetrations when containment leakage tests are performed. With the VYNPS AST analyses, these requirements are inconsistent with the design of VYNPS and the analytical models used to calculate the radiological consequences of design basis accidents. At VYNPS, the leakage from primary containment penetrations, under accident conditions, is collected and treated by the secondary containment system, or would bypass the secondary containment. However, the main steam effluent has a different pathway to

<sup>13</sup> U.S. Nuclear Regulatory Commission letter to Tennessee Valley Authority, “Browns Ferry Nuclear Plant, Units 2 and 3 – Issuance of Exemption From 10 CFR Part 50, Appendix J (TAC Nos. MA6815 and MA6816),” March 14, 2000.

the environment and is not directed into the secondary containment and filtered by the standby gas treatment system as is other containment leakage. Instead, the main steam leakage is collected and treated via an alternative leakage treatment (ALT) path having different mitigation characteristics (see Appendix A to the AST Safety Assessment in Attachment 5).

In performing accident analyses, it is appropriate to group various leakage effluents according to the treatment they receive before being released to the environment, ~~i.e., secondary containment bypass leakage is grouped, leakage into secondary containment is grouped, and ALT leakage (i.e., from main steam pathways) is grouped, with specific limits for each group defined in the TS.~~ The proposed exemption would more appropriately permit ALT and secondary containment pathway leakage to be independently grouped with their unique leakage limits. In this manner, the VYNPS containment leakage testing program will be made more consistent with the limiting assumptions used in the associated accident consequence analyses. Corresponding changes to the TS, which implement the requested exemption, are also proposed.

VY has analyzed the main steam leakage pathway for an increase in leakage (from 62 scfh to 124 scfh at Pa), the secondary containment bypass leakage pathways, and the containment leakage pathway (La) separately in the dose consequence analyses in Attachment 5. The calculated radiological consequences of the combined leakages are within the criteria of 10CFR50.67, and are therefore acceptable.

It is anticipated that the revised limits on main steam isolation valve leakage will potentially result in a reduction of unnecessary maintenance on these valves simply to maintain the low leakage rate and support reducing maintaining worker exposure to as low as reasonably achievable.

Based on the foregoing, the removal of the SCB and main steam pathways from Specifications 6.7.C.3 and 6.7.C.4 is warranted since a separate specification has been provided for these pathways. The revised design basis radiological consequences analyses address these pathways as individual factors, exclusive of the Primary Containment leakage.

**Table 6**  
(continued)

Change #4	Current TS Bases:	Proposed Change:
	<p>Current TS 6.7.C specifies that the Primary Containment Leak Rate Test Program (PCL RTP) shall be in accordance with Regulatory Guide (RG) 1.163 as modified by an exception to NEI 94-01. (RG 1.163 endorses, with certain exceptions, NEI 94-01, and ANSI/ANS-56.8-1994.)</p> <p>The structure of TS 6.7.C could be improved for usability. The title heading of TS 6.7.C is "Primary Containment Leak [sic] Rate Testing Program." A typographical error exists in TS 6.7.C.1 in that the primary containment leakage rate acceptance criterion is given as "&lt; 1.0 La."</p>	<p>TS 6.7.C is revised to incorporate the exemption to Sections III.A and III.B of 10CFR50, Appendix J, Option B that is requested herein.</p> <p>TS 6.7.C is revised such that the leakage contributions from the <del>secondary containment bypass pathways</del> and the main steam pathways are excluded from both the sum of the leakage rates from Type B and Type C tests and the overall integrated leakage rate from Type A tests.</p> <p>Editorial changes are made to restructure the format and clarify TS 6.7.C. Revised terminology is implemented for consistency and correctness (e.g., "leak" is changed to "leakage").</p> <p>The first paragraph of TS 6.7.C is revised to state:</p> <p><i>A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, entitled "Performance Based Containment Leak-Test Program," dated September 1995, as modified by the following:</i></p> <ul style="list-style-type: none"> <li>• <i>The first Type A test after the April 1995 Type A test shall be performed no later than November 2005. (This is an exception to Section 9.2.3 of NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J.")</i></li> <li>• <i>The leakage contributions from the <del>secondary containment bypass pathways</del> and the main steam pathways are excluded from the sum of the leakage rates from Type B and Type C tests specified in (1) Section</i></li> </ul>

**Table 6**  
(continued)

<p>Change #4</p>	<p><b>Proposed Change: (continued)</b></p> <p><i>III.B of 10CFR50, Appendix J – Option B; (2) Section 6.4.4 of ANSI/ANS 56.8-1994; and (3) Section 10.2 of NEI 94-01, Rev. 0.</i></p> <ul style="list-style-type: none"> <li>• <i>The leakage contributions from the secondary-containment-bypass pathways and the main steam pathways are excluded from the overall integrated leakage rate from Type A tests specified in (1) Section III.A of 10CFR50, Appendix J – Option B; (2) Section 3.2 of ANSI/ANS 56.8-1994; and (3) Sections 8.0 and 9.0 of NEI 94-01, Rev. 0.</i></li> </ul> <p>TS 6.7.C.1 is changed to correct a typographical error, such that the acceptance criterion is now stated as “≤ 1.0 La.”</p>
<p><b>Basis / Safety Assessment:</b></p> <p>As discussed previously in this request for a change in the licensing basis for VYNPS, VY is requesting an exemption from the requirements of Sections III.A and III.B of 10CFR50, Appendix J, Option B to exclude the leakage contributions of <del>secondary-containment-bypass pathways and</del> main steam pathways from the overall integrated leakage rates from Type A tests and from the sum of the leakage rates from Type B and Type C tests. Because TS 6.7.C invokes compliance to RG 1.163, which endorses, with certain exceptions, NEI 94-01, and ANSI/ANS-56.8-1994, certain exceptions are also need to these associated guidelines. For Type A tests, in addition to the exemption to Section III.A of Appendix J, Option B, exceptions are needed to Section 3.2 of ANSI/ANS 56.8-1994 and Sections 8.0 and 9.0 of NEI 94-01, Revision 0. Compliance with ANSI/ANS 56.8-1994 is required as a condition of compliance with RG 1.163. For Type B and Type C tests, in addition to the exemption to Section III.B of Appendix J, Option B, exceptions are needed to Section 6.4.4 of ANSI/ANS 56.8-1994 and Section 10.2 of NEI 94-01, Revision 0. These exceptions are acceptable because they conform to the exemption requested.</p> <p>Upon granting the requested exemption, the exceptions for including <del>secondary-containment bypass pathways and</del> main steam pathways leakage rates in the introductory paragraph of TS</p>	

**Table 6**  
(continued)

<p>Change #4</p>	<p><b>Basis / Safety Assessment: (continued)</b></p> <p>6.7.C are acceptable because the leakage rates for the subject pathways will be contained in separate specifications (i.e., proposed TS 3.7.A.4. a, and 3.7.A.4.b and 3.7.A.4.c.) and the leakage rate acceptance criteria from all measured pathways are consistent with the leakage rates assumed in the AST analyses. The sum of the limiting leakage rates from all leakage pathways does not result in radiological doses exceeding the limits specified in 10CFR50.67.</p> <p>Editorial changes are made to TS 6.7.C to clarify the meaning and understanding of the TS to avoid confusion and potential error. These changes are acceptable because they do not change the technical meaning or intent of the specification. These changes include slight reformatting of the specification and changing the word “leak” to “leakage” in TS 6.7.C. These changes are acceptable because they do not change the intent or technical meaning of the specifications and are made for clarity and consistency purposes. The change in terminology from “leak rate” to “leakage rate” is also consistent with the definition of this term in ANSI/ANS 56.8-1994.</p> <p>TS 6.7.C.1 is changed to correct a typographical error, such that the acceptance criterion is now properly stated as “≤ 1.0 La.” When Option B of Appendix J was adopted through license amendment 152, the acceptance criterion expression for primary containment leakage rate properly stated “≤ 1.0 La.” VY’s request for license amendment that became Amendment no. 215<sup>14</sup> inadvertently modified the “≤” symbol. This change, therefore, corrects that administrative error and is acceptable because the inadvertent change in Amendment 215 was unintended and not within the scope of changes incorporated by that license amendment.</p>	
<p>Change #5</p>	<p><b>Current TS Bases:</b></p> <p>Current TS 6.7.C.3 and 6.7.C.4 provide conditions and acceptance criteria for primary containment leakage rate testing. The leakage contributions from secondary containment bypass pathways and main steam pathways are currently included in determining the sum of the leakage rates from Type B and Type C tests.</p>	<p><b>Proposed Change:</b></p> <p>The acceptance criteria specified in TS 6.7.C.3 and 6.7.C.4 for allowable Type B and Type C leakage rate testing are revised to exclude the contributions from both secondary containment bypass pathways and main steam pathways.</p> <p>TS 6.7.C.3 is also clarified by stating that requirement is applicable where <u>primary</u> containment integrity is required (addition of the word, “primary”).</p> <p>TS 6.7.C.3 and 6.7.C.4 are revised to state:</p> <p>3. <i>The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage</i></p>

<sup>14</sup> U.S. Nuclear Regulatory Commission letter to Vermont Yankee, “Vermont Yankee Nuclear Power Station – Issuance of Amendment Re: One-Time Extension of Appendix J Type A Integrated Leakage Rate Test Interval (TAC No. MB6507),” (License Amendment No. 215), June 2, 2003.

**Table 6**  
(continued)

<p>Change #5</p>	<p><b>Proposed Change: (continued)</b></p> <p><i>contributions from both the secondary containment bypass pathways and the main steam pathways) is <math>\leq 0.6 La</math>, calculated on a maximum pathway basis, prior to entering a mode of operation where primary containment integrity is required.</i></p> <p>4. <i>The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from both the secondary containment bypass pathways and the main steam pathways) is <math>\leq 0.6 La</math>, calculated on a minimum pathway basis, at all times when primary containment integrity is required.</i></p>
<p><b>Basis / Safety Assessment:</b></p> <p>Upon granting the requested exemption, the exclusion of secondary containment bypass pathway and main steam pathway leakage rates in 6.7.C.3 and 6.7.C.4 is acceptable because the leakage rates for the subject pathways will be contained in separate specifications (i.e., proposed TS 3.7.A.4. a, and 3.7.A.4.b, and 3.7.A.4.e). The leakage rate acceptance criteria from all measured pathways are consistent with the leakage rates assumed in the AST analyses. The sum of the limiting leakage rates from all leakage pathways does not result in radiological doses exceeding the limits specified in 10CFR50.67. This is an administrative change to incorporate the provisions of the requested exemption.</p>	

### INSERT #1 to TS 6.7.C

as modified by the following:

- The first Type A test after the April 1995 Type A test shall be performed no later than November 2005. (This is an exception to Section 9.2.3 of NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J.")
- The leakage contributions from ~~the secondary containment bypass pathways and~~ the main steam pathways are excluded from the sum of the leakage rates from Type B and Type C tests specified in (1) Section III.B of 10CFR50, Appendix J – Option B; (2) Section 6.4.4 of ANSI/ANS 56.8-1994; and (3) Section 10.2 of NEI 94-01, Rev. 0.
- The leakage contributions from ~~the secondary containment bypass pathways and~~ the main steam pathways are excluded from the overall integrated leakage rate from Type A tests specified in (1) Section III.A of 10CFR50, Appendix J – Option B; (2) Section 3.2 of ANSI/ANS 56.8-1994; and (3) Sections 8.0 and 9.0 of NEI 94-01, Rev. 0.

### INSERT #2 to TS 6.7.C

3. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from ~~both the secondary containment bypass pathways and the main steam pathways~~) is  $\leq 0.6 L_a$ , calculated on a maximum pathway basis, prior to entering a mode of operation where primary containment integrity is required.
4. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from ~~both the secondary containment bypass pathways and the main steam pathways~~) is  $\leq 0.6 L_a$ , calculated on a minimum pathway basis, at all times when primary containment integrity is required.

VYNPS

Report for the period of the report in which any change to the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (e.g., month/year) the change was implemented.

C. PRIMARY CONTAINMENT LEAKAGE RATE TESTING PROGRAM

A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, entitled "Performance Based Containment Leak-Test Program," dated September 1995, as modified by the following:

- The first Type A test after the April 1995 Type A test shall be performed no later than November 2005. (This is an exception to Section 9.2.3 of NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J.")
- The leakage contributions from ~~the secondary containment bypass pathways~~ and the main steam pathways are excluded from the sum of the leakage rates from Type B and C tests specified in (1) Section III.B of 10CFR50, Appendix J - Option B; (2) Section 6.4.4 of ANSI/ANS 56.8-1994; and (3) Section 10.2 of NEI 94-01, Rev. 0.
- The leakage contributions from ~~the secondary containment bypass pathways~~ and the main steam pathways are excluded from the overall integrated leakage rate from Type A tests specified in (1) Section III.A of 10CFR50, Appendix J - Option B; (2) Section 3.2 of ANSI/ANS 56.8-1994; and (3) Sections 8.0 and 9.0 of NEI 94-01, Rev. 0.

The peak calculated containment internal pressure for the design basis loss of coolant accident, Pa, is 44 psig.

The maximum allowable primary containment leakage rate, La, at Pa, shall be 0.8% of primary containment air weight per day.

Leakage rate acceptance criteria are:

1. Primary containment leakage rate acceptance criterion  $\leq 1.0 L_a$ .
2. The as-left primary containment integrated leakage rate test (Type A test) acceptance criterion is  $\leq 0.75 L_a$ .
3. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from ~~both the secondary containment bypass pathways~~ and the main steam pathways) is  $\leq 0.6 L_a$ , calculated on a maximum pathway basis, prior to entering a mode of operation where primary containment integrity is required.
4. The combined local leakage rate test acceptance criterion for Type B and Type C tests (excluding the leakage contributions from ~~both the secondary containment bypass pathways~~ and the main steam pathways) is  $\leq 0.6 L_a$ , calculated on a minimum pathway basis, at all times when primary containment integrity is required.