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Michael J. Colomb  
Site Vice President

BVY 11-013

February 10, 2011

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: License Renewal Application Supplemental Information  
Vermont Yankee Nuclear Power Station  
Docket No. 50-271  
License No. DPR-28

REFERENCES: 1. Letter, Entergy to USNRC, "License Renewal Application," BVY  
06-09, dated January 25, 2006

Dear Sir or Madam:

On January 25, 2006, Entergy Nuclear Operations, Inc. and Entergy Nuclear Vermont Yankee, LLC (Entergy) submitted the License Renewal Application (LRA) for the Vermont Yankee Nuclear Power Station (VYNPS) as indicated by Reference 1.

Attachment 1 of this letter provides supplemental information to the LRA to address questions discussed with the NRC staff on teleconferences held on February 9, 2011 and February 10, 2011.

Revised regulatory commitments are provided in Attachment 2.

Should you have any questions or require additional information concerning this submittal, please contact Mr. Robert Wanczyk at 802-451-3166.

I declare under penalty of perjury, that the foregoing is true and correct.

Executed on February 10, 2011.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Colomb".

[MJC/PLC]

A117  
NRC

Attachments: 1. License Renewal Application Supplemental Information  
2. List of License Renewal Commitments

cc: Mr. Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
One White Flint North 13H16M  
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Mr. William M. Dean, Regional Administrator  
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475 Allendale Road  
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Mr. Robert Kuntz, Senior Project Manager  
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One White Flint North 11F1  
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Mr. James S. Kim, Project Manager  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
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USNRC Resident Inspector  
Entergy Nuclear Vermont Yankee  
320 Governor Hunt Road  
Vernon, Vermont 05354

Ms. Elizabeth Miller, Commissioner  
VT Department of Public Service  
112 State Street – Drawer 20  
Montpelier, Vermont 05620-2601

**Attachment 1**

**Vermont Yankee Nuclear Power Station  
License No. DPR-28 (Docket No. 50-271)**

**License Renewal Application**

**Supplemental Information**

## **Vermont Yankee Nuclear Power Station License Renewal Application - Supplemental Information**

Vermont Yankee Nuclear Power Station (VYNPS) provides the following supplemental information to address questions discussed with the NRC staff on teleconferences held on February 9, 2011 and February 10, 2011. The information covers the following areas:

1. Neutron-absorbing material
2. Buried piping

### **Neutron-Absorbing Material**

#### **Background**

VYNPS provided additional information related to the Neutron Absorber Monitoring Program in License Renewal Application (LRA) supplemental information letters dated October 14, 2010 (BVY 10-052), December 21, 2010 (BVY 10-058) and February 4, 2011 (BVY 11-010). The program description in Section B.1.31 stated that the first testing of the Boral material would be completed prior to the end of 2014. Based on a teleconference held with NRC staff on February 10, 2011, VYNPS is providing the following supplemental information in order to support the staff's evaluation of the program.

#### **Discussion**

As stated in BVY 11-010, VYNPS has nine racks installed in the spent fuel pool that were manufactured by Nuclear Energy Services (NES). There are two racks installed which were manufactured by Holtec. Three coupon strings are installed in the NES racks, each holding three Boral coupons.

VYNPS will test one coupon prior to the period of extended operation (PEO) to measure B-10 areal density and to assess the geometric and physical condition of the tested coupon. If coupons are not able to be retrieved and tested or if coupons cannot be demonstrated representative of the Boral in the Holtec racks, then VYNPS will perform neutron attenuation testing using in-situ methods, as described in BVY 11-010, (BADGER or blackness testing method) prior to the end of 2014.

Section A.2.1.37 of Appendix A to the LRA remains unchanged. The program description for Section B.1.31 of Appendix B to the LRA is revised to read as follows:

### **B.1.31 Neutron Absorber Monitoring Program**

#### **Program Description**

The Neutron Absorber Monitoring Program is a new program that manages loss of material and reduction of neutron absorption capacity of Boral neutron absorption panels in the spent fuel racks. The program will rely on periodic inspection, testing, monitoring and analysis of the criticality design to assure that the required five percent subcriticality margin is maintained during the period of extended operation.

The program will be initiated prior to the period of extended operation. One coupon will be tested prior to the PEO to measure B-10 areal density and to assess the geometric and physical condition of the tested coupon. If coupons are not able to be retrieved and tested or if coupons cannot be demonstrated representative of the Boral in the Holtec

racks, then neutron attenuation testing using in-situ methods, as described in BVY 11-010, (BADGER or blackness testing method) will be completed prior to the end of 2014.

Commitment 52 is revised to read as follows:

**Commitment 52**

Implement the Neutron Absorber Monitoring Program as described in LRA Section B.1.31.

Test one coupon prior to the PEO to measure B-10 areal density and assess the geometric and physical condition of the tested coupon. If coupons are not able to be retrieved and tested or if coupons cannot be demonstrated representative of the Boral in the Holtec racks, then perform neutron attenuation testing using in-situ methods, as described in BVY 11-010, (BADGER or blackness testing method) prior to the end of 2014.

**Buried Piping**

**Background**

VYNPS provided additional information related to the buried piping program in LRA supplemental information letters dated October 14, 2010 (BVY 10-052), December 21, 2010 (BVY 10-058) and February 4, 2011 (BVY 11-010). Based on a teleconference held with NRC staff on February 9, 2011 VYNPS is providing the following supplemental information in order to support the staff's evaluation of the program.

**Discussion**

In BVY 11-010, VYNPS agreed to use a soil corrosivity index greater than 10 as a basis for an increased number of buried piping inspections during the PEO. In accordance with American Water Works Association (AWWA) Standard C105, VYNPS will determine the soil corrosivity index based on soil resistivity, pH, redox potential, sulfides and moisture.

Also in BVY 11-010, VYNPS committed to perform at least two inspections of buried carbon steel piping segments in the service water system every 10 years during the PEO, with the number increasing to three inspections if the soil resistivity is < 20,000 ohm-cm or the soil scores higher than 10 points on the soil corrosivity index using AWWA C105. After discussion with NRC staff, VYNPS will revise Commitment 54 to perform at least four inspections of buried carbon steel piping segments in the service water system every 10 years during the PEO. If the soil resistivity is < 20,000 ohm-cm or the soil corrosivity index is higher than 10 points using AWWA C105, the number of inspections of the service water system buried piping will be increased to six.

**Inspection Summary**

<b>System</b>	<b>10 yr prior to PEO</b>	<b>1<sup>st</sup> 10 year of PEO</b>	<b>2<sup>nd</sup> 10 yr of PEO</b>
FP	1 (8')*	System monitoring	System monitoring
DGFO	2 (8% of total)*	8%	8%
SBGT	2 inspections	2 inspections	2 inspections
SW	2 (6' and 8')*	4 inspections	4 inspections

\* = Inspection already completed

If the soil resistivity is < 20,000 ohm-cm or the soil corrosivity index is higher than 10 points using AWWA C105, the number of inspections of the standby gas treatment system buried piping will be increased to three inspections and service water system buried piping will be increased to six inspections and the inspection regime will be as follows.

<b>System</b>	<b>10 yr prior to PEO</b>	<b>1<sup>st</sup> 10 year of PEO</b>	<b>2<sup>nd</sup> 10 yr of PEO</b>
FP	1 (8')*	System monitoring	System monitoring
DGFO	2 (8% of total)*	12%	12%
SBGT	2 inspections	3 inspections	3 inspections
SW	2 (6' and 8')*	6 inspections	6 inspections

\* = Inspection already completed

Commitment 44 addresses performing buried piping inspections during the PEO. This commitment is replaced by Commitment 54; therefore Commitment 44 is deleted. Commitment 54 is revised to read as follows.

**Commitment 54**

Prior to the PEO, VYNPS will inspect portions of the standby gas treatment system buried piping. The inspections will consist of direct visual examination of a minimum of two sections of piping and cover the entire circumference of at least ten linear feet of piping in each section.

During the PEO, inspections of two carbon steel piping segments in the standby gas treatment system and four carbon steel piping segments in the service water system will be performed every 10 years if measured soil resistivity is > 20,000 ohm-cm and the soil corrosivity index is 10 or less using AWWA C105. If the soil resistivity is < 20,000 ohm-cm or the soil corrosivity index is higher than 10 points using AWWA C105, the number of inspections of the standby gas treatment system buried piping will be increased to three and the number of inspections of the service water system buried piping will be increased to six. Each of these direct visual inspections following excavation will cover the entire circumference of at least ten linear feet of piping.

During the PEO, two inspections covering at least 8% of the total length of in-scope buried fuel oil piping (~40 feet) will be performed at least once every 10 years. If the soil resistivity is < 20,000 ohm-cm or the soil corrosivity index is higher than 10 points using AWWA C105, the percentage of fuel oil buried piping inspected will be increased to 12%.

Soil samples will be taken prior to the period of extended operation and at least once every 10 years thereafter to confirm the initial sample results.

Section A.2.1.1 of Appendix A to the LRA and Section B.1.1 of Appendix B to the LRA remain unchanged.

- References:
1. Letter, Entergy to USNRC, "License Renewal Application Supplemental Information," BVY 11-010, dated February 4, 2011
  2. Letter, Entergy to USNRC, "License Renewal Application Supplemental Information," BVY 10-052, dated October 14, 2011
  3. Letter, Entergy to USNRC, "License Renewal Application Supplemental Information," BVY 10-058, dated December 21, 2011

**Attachment 2**

**Vermont Yankee Nuclear Power Station  
License No. DPR-28 (Docket No. 50-271)**

**List of License Renewal Commitments**

**VERMONT YANKEE NUCLEAR POWER STATION  
LICENSE RENEWAL COMMITMENT LIST**

During the development and review of the Vermont Yankee Nuclear Power Station License Renewal Application, Entergy made commitments to provide aging management programs to manage the effects of aging on structures and components during the extended period of operation. The following table lists the revised license renewal commitments made in this submittal, along with the implementation schedule and the source of the commitment.

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
44	This Commitment has been deleted and replaced with Commitment 54.	March 21, 2012	BVY 07-018 BVY 11-013	Regional inspection
52	Implement the Neutron Absorber Monitoring Program as described in LRA Section B.1.31.  Test one coupon prior to the PEO to measure B-10 areal density and assess the geometric and physical condition of the tested coupon. If coupons are not able to be retrieved and tested or if coupons cannot be demonstrated representative of the Boral in the Holtec racks, then perform neutron attenuation testing using in-situ methods, as described in BVY 11-010, (BADGER or blackness testing method) prior to the end of 2014.	March 21, 2012	BVY 10-052 BVY 10-058 BVY 11-013	B.1.31 Audit Report dated 9/3/10

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
54	<p>Prior to the PEO, VYNPS will inspect portions of the standby gas treatment system buried piping. The inspections will consist of direct visual examination of a minimum of two sections of piping and cover the entire circumference of at least ten linear feet of piping in each section.</p> <p>During the PEO, inspections of two carbon steel piping segments in the standby gas treatment system and four carbon steel piping segments in the service water system will be performed every 10 years if measured soil resistivity is &gt; 20,000 ohm-cm and the soil corrosivity index is 10 or less using AWWA C105. If the soil resistivity is &lt; 20,000 ohm-cm or the soil corrosivity index is higher than 10 points using AWWA C105, the number of inspections of the standby gas treatment system buried piping will be increased to three and the number of inspections of the service water system buried piping will be increased to six. Each of these direct visual inspections following excavation will cover the entire circumference of at least ten linear feet of piping.</p> <p>During the PEO, two inspections covering at least 8% of the total length of in-scope buried fuel oil piping (~40 feet) will be performed at least once every 10 years. If the soil resistivity is &lt; 20,000 ohm-cm or the soil corrosivity index is higher than 10 points using AWWA C105, the percentage of fuel oil buried piping inspected will be increased to 12%.</p> <p>Soil samples will be taken prior to the period of extended operation and at least once every 10 years thereafter to confirm the initial sample results.</p>	March 21, 2012	BVY 10-052 BVY 10-058 BVY 11-010 BVY 11-013	A.2.1.1, A.2.1.32 B.1.1  Audit Report dated 9/3/10