



Entergy Nuclear Operations, Inc.
Vermont Yankee
320 Governor Hunt Rd
Vernon, VT 05354
Tel 802 257 7711

Michael J. Colomb
Site Vice President

October 14, 2010

BVY 10-052

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, "Vermont Yankee Nuclear Power Station, License No. DPR-28, License Renewal Application," BVY 06-09, dated January 25, 2006
 2. Letter, USNRC to Entergy, "Audit Report Regarding the Vermont Yankee Nuclear Power Station License Renewal Application (TAC No. MC9668)," dated September 3, 2010

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.

This letter provides supplemental information to the LRA to address the results of the VYNPS LRA audit (Reference 2). The LRA audit report covers three areas in which Entergy agreed to evaluate and supplement the LRA, as necessary: 1. Aging management of neutron-absorbing materials; 2. Inspection of socket welds in small-bore piping; and 3. Inspection of buried pipe and tanks. Entergy has completed a review of the audit report and addressed it as discussed in Attachment 1 of this letter.

New regulatory commitments are provided in Attachment 2.

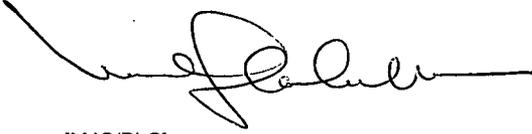
Should you have any questions or require additional information concerning this submittal, please contact Mr. Robert Wanczyk at 802-451-3166.

A117
MLR

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

Executed on October 14, 2010.

Sincerely,



[MJC/PLC]

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
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. William W. Dean, Regional Administrator
U.S. Nuclear Regulatory Commission, Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Mr. Robert Kuntz, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North 11F1
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. James S. Kim, Project Manager
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

USNRC Resident Inspector
Entergy Nuclear Vermont Yankee, LLC
320 Governor Hunt Road
Vernon, Vermont 05354

Mr. David O'Brien, 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 as a result of recent regulatory correspondence potentially relevant to aging management. The information covers the following three areas.

1. Neutron-absorbing material
2. Inspection of socket welds in small-bore piping
3. Buried piping and tanks

Neutron-Absorbing Material

The final license renewal interim staff guidance (LR-ISG) LR-ISG-2009-01, "Aging Management of Spent Fuel Pool Neutron-Absorbing Materials Other than Boraflex," discusses degradation of neutron-absorbing materials. Specifically, the ISG identifies instances of degradation and deformation of neutron-absorbing materials containing carborundum and Boral. The ISG recommends that applicants include in their license renewal application (LRA) information to demonstrate adequate management of loss of material and loss of neutron-absorbing capability of the neutron-absorber material in spent fuel pools for the period of extended operation (PEO).

VYNPS credits the Water Chemistry Control – BWR Program and One-Time Inspection Program for managing loss of material and cracking of Boral material. VYNPS has reviewed the recommendations in LR-ISG-2009-01 and is providing the following commitment for additional action to manage reduction of neutron absorbing capacity on Boral neutron absorbing material in the spent fuel pool.

Commitment #52

The loss of material and the degradation of the neutron-absorbing capacity of Boral will be determined through coupon and/or direct in situ testing. Such testing will include periodic verification of boron loss through areal density measurement of coupons or through direct in situ techniques which may include measurement of boron areal density, geometric changes in the material (blistering, pitting, and bulging), and detection of gaps through blackness testing. Acceptance criteria will be that measured or analyzed neutron absorbing capacity required to ensure 5% subcriticality margin for the spent fuel pool is maintained, assuming neutron-absorber degradation as the applicable aging effect. Results not meeting the acceptance criteria will be entered into the VYNPS corrective action program for disposition. Testing will be performed at least once every 10 years during the PEO.

Inspection of Socket Welds in Small-bore Piping

As indicated in Reference 1, VYNPS committed to use the One-Time Inspection Program to inspect ASME Code Class 1 small-bore piping. License renewal guidance in NUREG-1801, Revision 1 recommends volumetric inspections in the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program. Because the VYNPS One-Time Inspection Program did not include volumetric inspection of socket welds, VYNPS is providing the following commitment to supplement the One-Time Inspection Program with periodic volumetric inspections to ensure an appropriate inspection technique is applied to socket welds in small-bore piping.

Commitment #53

During the period of extended operation, VYNPS will perform periodic volumetric examinations of small-bore Class 1 socket welds. Three Class 1 socket welds will receive volumetric examination during each 10-year ISI interval. One Class 1 socket weld will be examined before the period of extended operation. The examination method will be a volumetric examination of the base metal ½" beyond the toe of the socket fillet weld which allows for the use of qualified ultrasonic examination techniques as close as possible to the fillet weld. The volumetric examinations will be performed by certified examiners following guidelines set forth in ASME Section V consistent with the guidelines for volumetric examination ½" beyond the toe of the weld as established in MRP-146, "Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-isolable Reactor Coolant System Branch Lines."

Buried Piping

The following buried piping components are in the scope of license renewal:

- Fire protection system piping (gray cast iron and carbon steel)
- Fire protection system bolting (carbon steel and stainless steel)
- Fire protection system valve body (gray cast iron)
- Diesel generator fuel oil system piping (carbon steel)
- Standby gas treatment system piping (carbon steel)
- Service water system piping (carbon steel)

VYNPS does not have a cathodic protection system for the components subject to aging management review for license renewal. There is reasonable assurance of in-scope piping integrity at VYNPS without cathodic protection for the following reasons:

- VYNPS has a non-aggressive below-grade environment as discussed in LRA Section 3.5.2.2.1.1
- In-scope buried piping components are located above the groundwater level
- In-scope buried piping is protectively coated with tar wrap or epoxy coating
- Review of plant records indicates no age-related failures of in-scope buried piping due to external corrosion at VYNPS
- Backfill adjacent to buried piping components installed during initial construction consisted of a gravel/sand mixture with particle sizes less than 0.5 inch. More recent excavations have specified a gravel/sand mixture with sizes less than 1.5 inches. In general, backfill is free of debris and large rocks that may damage protective coatings on piping during placement
- Over the past seven years, VYNPS has performed opportunistic visual inspections of buried piping on the following in-scope systems:
 - Service water, September 2003
 - Fire protection and service water (2 lines), July 2007
 - Fuel oil (2 lines - approximately 40 ft of 500 total lineal ft), March 2010For each inspection, protective coatings were found in good condition and no indications of loss of material from the piping external surface were observed

The above factors in conjunction with planned inspections will provide reasonable assurance of the integrity of the in-scope buried piping components at VYNPS.

Inspection methods for buried piping include visual inspections of excavated piping components and non-visual methods such as torsional guided wave and ultrasonic thickness

measurements. Other inspection techniques may be employed when they are proven effective for the detection of piping degradation.

VYNPS is aware of the limitations of certain non-visual examination methods, such as the torsional guided wave method. VYNPS will assure those limitations are considered during application of non-visual examination methods such that any method employed is assured of providing valid assessment results for the specific application.

In the LRA, VYNPS committed to the aging management program (AMP) described in NUREG-1801, Revision 1, Section XI.M34, Buried Piping and Tanks Inspection. The NUREG-1801 AMP required at least one inspection prior to the PEO and at least one inspection during the first ten years of the PEO to confirm acceptable condition of the protective coatings on buried piping components. The inspections could be performed opportunistically, when piping components are excavated for maintenance or for any other reason.

Discussion

Having already performed several inspections, as discussed above, VYNPS will exceed the recommendations of NUREG-1801, Revision 1, Section XI.M34. In addition to the completed inspections, prior to the PEO, VYNPS will inspect a portion of the standby gas treatment system buried piping. During normal operation, the standby gas treatment system contains stagnant air at atmospheric pressure with trace amounts of radioactive contamination. During system operation, the buried piping contains filtered air slightly above atmospheric pressure. Consequently, the impact of leakage would be low. The inspection will be a combination of direct visual and non-visual methods that will examine a minimum of 2% of the total linear feet of standby gas treatment system piping. Direct visual inspections following excavation are expected to cover the entire circumference of at least ten linear feet of piping.

During the PEO, an inspection of four carbon steel piping segments of in-scope systems will be performed every 10 years. Direct visual inspections following excavation are expected to cover the entire circumference of at least ten linear feet of piping. These inspections will provide reasonable assurance of the integrity of the buried piping.

VYNPS has also re-evaluated AMP B.1.1 and other aging management programs to determine if the proposed aging management of in-scope underground piping (i.e. contained in a vault or other structure where it is exposed to air and where access is limited) is adequate given recent industry and VYNPS-specific OE. Specifically, VYNPS evaluated piping in environments similar to that of the advanced off-gas system piping which experienced leakage. VYNPS found that some in-scope piping in underground vaults, while not readily accessible during normal operation or refueling outages, is periodically accessed for inspection at least once every 5 years. As a result, VYNPS is revising the Updated Final Safety Analysis Report (UFSAR) Supplement A.2.1.32 associated with the System Walkdown Program to clarify the inspection frequency for external piping surfaces that are not readily accessible during both plant operations and refueling outages. VYNPS has reviewed the environments of in-scope piping and has determined that there is no in-scope piping in vaults or other structures that is inaccessible for periodic inspection of external piping surfaces.

Commitment

The following commitment is provided to augment the aging management program for buried piping.

Commitment #54

Prior to the PEO, VYNPS will inspect a portion of the standby gas treatment system buried piping. The inspection will be a combination of direct visual and non-visual methods that will examine a minimum of 2% of the total linear feet of the system buried piping. Direct visual inspections following excavation are expected to cover the entire circumference of at least ten linear feet of piping.

During the PEO, inspections of four carbon steel piping segments of in-scope systems will be performed every 10 years. Each of these direct visual inspections following excavation is expected to cover the entire circumference of at least ten linear feet of piping.

Sections A.2.1.1 and A.2.1.32 of Appendix A to the VYNPS LRA are modified as shown below. Deleted text is shown as strikethrough and added text is underlined.

A.2.1.1 Buried Piping Inspection Program

The Buried Piping Inspection Program includes (a) preventive measures to mitigate corrosion and (b) inspections to manage the effects of corrosion on the pressure-retaining capability of buried carbon steel, stainless steel, and gray cast iron piping components. Preventive measures are in accordance with standard industry practice for maintaining external coatings and wrappings. Buried components are inspected when excavated during maintenance. During the PEO, inspections of four carbon steel piping segments of in-scope systems will be performed every 10 years. Each of these direct visual inspections following excavation is expected to cover the entire circumference of at least ten linear feet of piping. If trending within the corrective action program identifies susceptible locations, the areas with a history of corrosion problems are evaluated for the need for additional inspection, alternate coating, or replacement.

~~A focused inspection will be performed within the first 10 years of the period of extended operation, unless an opportunistic inspection (or an inspection via a method that allows an assessment of pipe condition without excavation) occurs within this ten year period.~~

A.2.1.32 System Walkdown Program

The System Walkdown Program entails inspections of external surfaces of components subject to aging management review. The program is also credited with managing loss of material from internal surfaces, for situations in which internal and external material and environment combinations are the same such that external surface condition is representative of internal surface condition.

Surfaces that are inaccessible during plant operations are inspected during refueling outages. Surfaces that are not readily accessible during plant operations and refueling outages, such as piping located in underground vaults, are inspected at least once every 5 years. ~~Surfaces are inspected at~~ The inspection frequencies to provide reasonable assurance that the effects of aging will be managed such that applicable components will perform their intended function during the period of extended operation.

Reference: 1. Letter, USNRC to Entergy, "Audit Report Regarding the Vermont Yankee Nuclear Power Station License Renewal Application (TAC No. MC9668)," dated September 3, 2010

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
LIST OF LICENSE RENEWAL COMMITMENTS**

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 new 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
52	<p>The loss of material and the degradation of the neutron-absorbing capacity of Boral will be determined through coupon and/or direct in situ testing. Such testing will include periodic verification of boron loss through areal density measurement of coupons or through direct in situ techniques which may include measurement of boron areal density, geometric changes in the material (blistering, pitting, and bulging), and detection of gaps through blackness testing. Acceptance criteria will be that measured or analyzed neutron absorbing capacity required to ensure 5% subcriticality margin for the spent fuel pool is maintained, assuming neutron-absorber degradation as the applicable aging effect. Results not meeting the acceptance criteria will be entered into the VYNPS corrective action program for disposition. Testing will be performed at least once every 10 years during the PEO.</p>	March 21, 2012	BVY 10-052	Audit Report dated 9/3/10
53	<p>During the period of extended operation, VYNPS will perform periodic volumetric examinations of small-bore Class 1 socket welds. Three Class 1 socket welds will receive volumetric examination during each 10-year ISI interval. One Class 1 socket weld will be examined before the period of extended operation. The examination method will be a volumetric examination of the base metal 1/2" beyond the toe of the socket fillet weld which allows for the use of qualified ultrasonic examination techniques as close as possible to the fillet weld. The volumetric examinations will be performed by certified examiners following guidelines set forth in ASME Section V consistent with the guidelines for volumetric examination 1/2" beyond the toe of the weld as established in MRP-146, "Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-isolable Reactor Coolant System Branch Lines."</p>	March 21, 2012	BVY 10-052	Audit Report dated 9/3/10

**VERMONT YANKEE NUCLEAR POWER STATION
LIST OF LICENSE RENEWAL COMMITMENTS**

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
54	<p>Prior to the PEO, VYNPS will inspect a portion of the standby gas treatment system buried piping. The inspection will be a combination of direct visual and non-visual methods that will examine a minimum of 2% of the total linear feet of the system buried piping. Direct visual inspections following excavation are expected to cover the entire circumference of at least ten linear feet of piping.</p> <p>During the PEO, inspections of four carbon steel piping segments of in-scope systems will be performed every 10 years. Each of these direct visual inspections following excavation is expected to cover the entire circumference of at least ten linear feet of piping.</p>	March 21, 2012	BVY 10-052	<p>A.2.1.1, A.2.1.32 B.1.1</p> <p>Audit Report dated 9/3/10</p>