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March 23, 2007
Docket No. 50-271
BVY 07-018
TAC No. MC 9668

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

Reference: 1. Letter, Entergy to USNRC, "Vermont Yankee Nuclear Power Station, License No. DPR-28, License Renewal Application," BVY 06-009, dated January 25, 2006.

**Subject: Vermont Yankee Nuclear Power Station
License No. DPR-28 (Docket No. 50-271)
License Renewal Application, Amendment 26**

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 contains attachments to address issues raised during the Aging Management Programs Audit and Regional Inspection. A list of attachments is included on page 3 of 3.

An updated License Renewal Commitment List is being provided with the following changes:

- five additional commitments, numbers 44 to 48,
- commitment 2 from Commitment List, Revision 6 moved to number 49,
- re-inserting commitment 2 from Commitment List, Revision 5,
- modifications to three commitments, numbers 3, 4, 43,
- commitment numbers 40 and 41 have been deleted and replaced with commitment 43.

Should you have any questions concerning this letter, please contact Mr. Dave Mannai at (802) 258-5422. I declare under penalty of perjury that the foregoing is true and correct, executed on March 23, 2007.

Sincerely,


Ted A. Sullivan
Site Vice President
Vermont Yankee Nuclear Power Station

cc: See next page
enc: Attachments 1-5.

A117

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List of Attachments

- Attachment 1: License Renewal Application, page B-43 changes
- Attachment 2: RAI 3.6.2.2-N-08-2 and 3.6.2.2-N-08-4 Response Clarification
- Attachment 3: VYNPS License Renewal Commitment List, Revision 7
- Attachment 4: License Renewal Application Supplement
- Attachment 5: License Renewal Application, page 2.3-71 changes

Attachment 1

Vermont Yankee Nuclear Power Station

License Renewal Application

Amendment 26

LRA Page B-43 Changes

**VERMONT YANKEE NUCLEAR POWER STATION
 LICENSE RENEWAL APPLICATION
 ATTACHMENT 1**

(Insertions = underlined, deletions = strike-through)

Vermont Yankee Power Station
 License Renewal Application
 Technical Information

Attributes Affected	Exceptions
1. Scope of Program	This program is not necessary to manage aging effects for halon fire protection system components. ¹
4. Detection of Aging Effects	The NUREG-1801 program states that 10% of each type of penetration seal should be visually inspected at least once every refueling outage. The VYNPS program specifies inspection of approximately 25% of the seals (regardless of seal type) each operating cycle, with all accessible fire barrier penetration seals being inspected at least once every four operating cycles. ²

Exception Note

1. The Halon 1301 suppression system is not subject to aging management review. Aging effects for components in the CO₂ system are managed by the System Walkdown Program and the CO₂ system is functionally tested in accordance with TRM 4.13.D Surveillance Requirements.
2. Since aging effects are typically manifested over several years, this variation in inspection frequency is insignificant.

Attachment 2

Vermont Yankee Nuclear Power Station

License Renewal Application Supplement

Amendment 26

RAI 3.6.2.2-N-08-2 and 3.6.2.2-N-08-4 Response Clarification

Vernon Hydro-Electric Station

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Changes to these RAI Responses are notated with revision bars on the left side of each page. (strike-outs = deleted, underlined = text added).

RAI 3.6.2.2-N-08-2 and 3.6.2.2-N-08-4 Response Clarification (Amendment 23)

In the VYNPS response to RAI 3.6.2.2-N-08-2 provided in LRA Amendment 17 [BVY 06-096, dated 10/20/06], Entergy made the following statements associated with managing the effects of aging on the electrical elements of the Vernon Hydroelectric Station (VHS) switchyard.

Additionally, the following ongoing activities provide additional assurance that the SBO alternate AC source remains capable of performing its license renewal intended function.

1. The VHS owner plans to replace the medium-voltage underground cable from the VHS powerhouse to the switchyard. This work is scheduled to be performed in the coming year. Only 26 years of operation remain for VYNPS between now and the end of the period of extended operation. Though not formally qualified, modern underground cables are expected to have a service life of greater than 26 years.

In the response to RAI 3.6.2.2-N-08-4 provided in Amendment 17, Entergy made the following statements associated with managing the effects of aging on the electrical elements of the VHS switchyard.

Normal operation confirms these components remain capable of performing their intended functions. In addition, because of the two independent power transmission circuits, the effects of aging will not result in loss of the intended function of the VHS. Failure of a cable due to aging will be detected and repaired during normal operation without impacting the ability of the VHS to perform its intended function. Note that the design incorporates redundancy beyond that required for alternate AC sources. The SBO rule does not require redundancy of the alternate AC source. Because of this unique configuration, the fact that the generators and associated electrical circuits are operating is verification that they remain capable of performing their license renewal intended functions under CLB conditions.

The switchyard owner utilizes thermography on a periodic basis to provide additional assurance of continued reliable switchyard performance.

The response to RAI 3.6.2.2-N-08-3 identified the medium-voltage underground cables for VYNPS, which included the cables from the VHS generators to the VHS switchyard. The license renewal application is clarified as follows to describe how aging effects on these VHS cables will be managed during the period of extended operation.

The design of the VHS underground medium-voltage cables consist of two independent power circuits, that can each supply 100% output of the VHS generators to the step-up transformers in the VHS switchyard. During normal operation, both circuits are energized and loaded. Failure of one of the circuits does not impact the ability of the VHS to perform its intended function.

As stated in LRA Section 2.5, VYNPS uses the VHS as an alternate AC source to satisfy the requirements of 10 CFR 50.63 for response to a Station Black-Out (SBO). Section 2.5 lists the

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electrical commodity groups that are subject to aging management review, and non-environmentally qualified (EQ) inaccessible medium-voltage cables are included.

Section 3.6 of the LRA provides the results of the aging management review. Moisture and voltage stress is an applicable environment, and the "Non-EQ Inaccessible Medium-Voltage Cable" program manages the aging effect "reduced insulation resistance."

Previous RAI and audit question responses stated that the VHS underground medium-voltage cables do not have aging effects that require management.

Reduced insulation resistance due to moisture and voltage stress is an aging effect for underground medium-voltage cables, but is not significant enough to cause a loss of intended function. The underground cables in the VHS switchyard are exposed to similar environments as the VYNPS underground cables. The VHS underground medium-voltage cable is scheduled to be replaced in 2007.

The cable planned for installation between the VHS generator and the VHS switchyard is similar to the VYNPS Startup Transformer to 4160 V switchgear cable.

- a. Both have ethylene-propylene rubber (EPR) insulation at a 133% insulation level.
- b. The VHS cable has specified a chloro-sulfonated polyethylene jacket. Per NEI 06-05 April 2006, "Medium Voltage Underground Cable White Paper," these jackets provide excellent moisture barriers. This jacket material is equal to or better than the VYNPS cable jacket.
- c. Both cables are installed in buried conduit, with a similar physical configuration (e.g. start at an elevated external connection, vertical conduit to the underground conduit, which is a sloped horizontal conduit that penetrates the connecting building).
- d. VHS and VYNPS are located approximately one-quarter of a mile to each other, so they experience identical environmental conditions. Even though the VHS switchyard is closer to the river and lower in elevation than VYNPS, because the VHS switchyard is located downstream of the VHS the water table is at a similar level to VYNPS.
- e. Both cables utilize red or pink EPR insulation, as black EPR production ended in the 1970's. The newer EPR insulation has treated clay fillers to preclude water absorption making the insulation less prone to water degradation than the older black EPR formulations. NEI 06-05 April 2006, "Medium Voltage Underground Cable White Paper" indicates strong performance of red EPR and notes that early red EPR failures were due to installation practices.
- f. Considering:
 - ii. VHS will install this cable next year.
 - iii. The period of extended operation ends in 25 years (March 2032)

The observed good performance of red EPR cable to date for the industry indicates at least 25 to 30 years of cable life, which will extend beyond the VYNPS license renewal period of extended operation.

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Notwithstanding the above, VYNPS will include testing of the underground medium-voltage cables at the Vernon Hydro Station in the Non-EQ inaccessible Medium Voltage Cable Program. Testing will be performed before the period of extended operation and within 10 year periods after the initial test ~~10 years after entering the period of extended operation (i.e. year 2022)~~ of the two 13.8 kV cables from the two Vernon Hydro Station 13.8 kV switchgear buses to the 13.8 kV / 69 kV step up transformers. This is License Renewal Commitment 43.

The above discussion addresses the VHS cable from an aging management perspective. However, from a “defense in depth” perspective, the VHS has multiple circuits beyond station blackout regulatory requirements. There are two circuits going out to the switchyard each capable of 100% generator capacity, that are supported by two black-start water turbines (which will be upgraded to four black-start water turbines of higher capacity). These circuits are in continuous (versus standby) operation. The VHS grid system is independent from the VYNPS grid system and has high reliability, for example; power from the VHS dam was available during the 2004 blackout. Regulatory requirements for stations blackout do not require single-failure proof alternate AC sources. NUMARC 87-00 specifies availability of 95% or greater. Only an extremely unlikely or hypothetical failure of multiple cables for an extended period would result in the VHS being unable to fulfill its intended function of providing an alternate AC source with the specified availability.

Notes for Table 3.6.2-1

Add plant-specific note, 602. Based on information obtained from the VHS owner, the medium-voltage cables from the VHS switchyard to the VHS generators have the following specifications, which are equal to or better than the equivalent VYNPS cables.

- EPR insulation at 133% insulation level
- Chloro-sulfonated polyethylene jacket
- Installed in buried conduit, with no manhole openings
- Cable is 3 years newer than equivalent VYNPS cables

Table 3.6.2-1

Add line items as shown below.

Component Type	Intended Function	Material	Environment	AERM	AMP	NUREG-1801, Vol.2 Item	Table 1 Item	Notes
Vernon Dam inaccessible medium-voltage cable	CE	Insulation material – various organic polymers	Moisture and voltage stress	Reduced Insulation Resistance (IR)	Non-EQ Inaccessible Medium-Voltage Cable	VI.A-4	3.6.1-4	B A, 602

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Appendix B.1.17

NON-EQ INACCESSIBLE MEDIUM-VOLTAGE CABLE

Exceptions to NUREG-1801

The Non-EQ Inaccessible Medium-Voltage Cable Program at VYNPS is consistent with the program described in NUREG-1801, Section XI.E3, Inaccessible Medium-voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.

Attributes Affected	Exceptions
3. Parameters Monitored/Inspected	<p>NUREG-1801 implies that all of the cables included in this program will be tested. The VYNPS program will test 100% of the applicable VYNPS cables. The program for the applicable VHS cables will use a representative sample, and the sample population will include the VYNPS cables. The similar VYNPS cables will serve as a surrogate to indicate potential degradation of the VHS cables.</p>

RAI 3.6.2.2-N-08-2 Response Clarification for Component Preventative Maintenance

As stated in the response to RAI 3.6.2.2-N-08-2 provided in VYNPS letter number BVY 06-096, LRA Amendment 17 on 10/20/2006, Entergy made the following statements associated with managing the effects of aging on the electrical elements of the Vernon Hydroelectric Station (VHS) switchyard.

Additionally, the following ongoing activities provide additional assurance that the SBO alternate AC source remains capable of performing its license renewal intended function.

2. The switchyard owner utilizes thermography on a periodic basis to ensure continued reliable switchyard performance.

To further address the electrical components from the tie breaker to VHS generators, the following describes how aging effects on the VHS switchyard electrical components will be managed during the period of extended operation.

The design of the transmission conductor and switchyard bus bolted connections precludes the aging effect increased connection resistance due to torque relaxation. The typical design of switchyard bolted connections includes Bellville washers and no-ox coating. The type of bolting plate and the use of Bellville washers is the industry standard. Combined with the proper sizing of the conductors, this virtually eliminates the need to consider this aging effect. The switchyard owner performs infrared inspection of the VHS switchyard connections at least annually. Based on this information, increased connection resistance due to torque relaxation of transmission connections is not a

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significant aging effect. Therefore, increased connection resistance of VHS switchyard connections does not require an aging management program at VYNPS.

Thermal infrared inspections were performed at the VHS substation on 10/06/06 and there were no abnormalities found. These inspections meet the intent of the one-time inspection discussed during the November 30 NRC/NEI meeting on aging management for electrical connections.

Loss of material due to corrosion of connections or surface oxidation is an applicable aging effect, but is not significant enough to cause a loss of intended function. The components in the VHS switchyard are exposed to precipitation, but these components do not experience any appreciable aging effects in this environment, except for minor oxidation, which does not impact the ability of the connections to perform their intended function. The VHS switchyard connection surfaces are coated with an anti-oxidant compound (i.e., a grease-type sealant) prior to tightening the connection to prevent the formation of oxides on the metal surface and to prevent moisture from entering the connections thus reducing the chances of corrosion. Based on industry operating experience, the method of installation has been shown to provide a corrosion resistant low electrical resistance connection. In addition, the infrared inspection of the VHS switchyard verifies that this is not a significant aging effect for VYNPS. Therefore, it is concluded that general corrosion resulting from oxidation of VHS switchyard connection surface metals is not an aging effect requiring management at VYNPS.

Notes for Table 3.6.2-1

Add plant-specific note, 601. The Vernon switchyard is subject to the following routine periodic maintenance.

- Thermal infrared inspections on all bus connections, disconnects, insulators, compression fittings, capacitive coupled voltage transformers (CCVT), circuit breakers, transformers, etc., are performed at least once a year
- Visual & operational (V&O) inspections for each transmission and distribution substation are performed at least once a year per the owner's electrical operating procedures (EOP). Typical items checked include air, hydraulic and gas pressures, operation counters, oil levels and temperatures, and visual condition.
- Equipment diagnostic, mechanism and internal inspections are performed at intervals set by the owner's electrical operating procedures based on time (e.g. months), normal operations and fault operations.

Table 3.6.2-1

Add line items as shown below.

Component Type	Intended Function	Material	Environment	AERM	AMP	NUREG-1801, Vol.2 Item	Table 1 Item	Notes
Vernon Dam high voltage insulators	IN	Porcelain, cement	Outdoor Weather	None	None			1, 601

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Vernon Dam switchyard components (bus connections, disconnects, compression fittings, capacitive coupled voltage transformers (CCVT), circuit breakers, transformers)	CE	Aluminum, steel, steel alloy, copper	Outdoor Weather	None	None			1,601
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RAI 3.6.2.2-N-08-2 and 3.6.2.2-N-08-4 Response Clarification (Amendment 24)

The VHS underground medium-voltage cable will be included in the Non-EQ Inaccessible Medium-Voltage Cable Program in accordance with License Renewal Commitment 43.

Attachment 3

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Amendment 26

VYNPS License Renewal Commitment List, Revision 7

**VERMONT YANKEE NUCLEAR POWER STATION
LICENSE RENEWAL COMMITMENT LIST
REVISION 7**

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 these license renewal commitments, along with the implementation schedule and the source of the commitment.

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
1	Guidance for performing examinations of buried piping will be enhanced to specify that coating degradation and corrosion are attributes to be evaluated.	March 21, 2012	BVY 06-009	B.1.1 Audit Items 5 & 130
2	Fifteen (15) percent of the top guide locations will be inspected using enhanced visual inspection technique, EVT-1, within the first 18 years of the period of extended operation, with at least one-third of the inspections to be completed within the first 6 years and at least two-thirds within the first 12 years of the period of extended operation. Locations selected for examination will be areas that have exceeded the neutron fluence threshold.	As stated in the commitment	BVY 06-009	B.1.7 Audit Item 14
3	The Diesel Fuel Monitoring Program will be enhanced to ensure ultrasonic thickness measurement of the fuel oil storage and fire pump diesel storage (day) tank bottom surfaces will be performed every 10 years during tank cleaning and inspection.	March 21, 2012	BVY 06-009 BVY 07-018	B.1.9 and regional inspection
4	The Diesel Fuel Monitoring Program will be enhanced to specify UT measurements of the fuel oil storage and fire pump diesel storage (day) tank bottom surfaces will have acceptance criterion $\geq 60\%$ Tnom.	March 21, 2012	BVY 06-009 BVY 07-018	B.1.9 and regional inspection

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ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
5	The Fatigue Monitoring Program will be modified to require periodic update of cumulative fatigue usage factors (CUFs), or to require update of CUFs if the number of accumulated cycles approaches the number assumed in the design calculation.	March 21, 2012	BVY 06-009	B.1.11
6	A computerized monitoring program (e.g., FatiguePro) will be used to directly determine cumulative fatigue usage factors (CUFs) for locations of interest.	March 21, 2012	BVY 06-009	B.1.11
7	The allowable number of effective transients will be established for monitored transients. This will allow quantitative projection of future margin.	March 21, 2012	BVY 06-009	B.1.11
8	Procedures will be enhanced to specify that fire damper frames in fire barriers will be inspected for corrosion. Acceptance criteria will be enhanced to verify no significant corrosion.	March 21, 2012	BVY 06-009	B.1.12.1 Audit Items 35, 151, 152, 153 and 159
9	Procedures will be enhanced to state that the diesel engine sub-systems (including the fuel supply line) will be observed while the pump is running. Acceptance criteria will be enhanced to verify that the diesel engine did not exhibit signs of degradation while it was running; such as fuel oil, lube oil, coolant, or exhaust gas leakage.	March 21, 2012	BVY 06-009	B.1.12.1 Audit Items 33, 150 & 155

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ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
10	Fire Water System Program procedures will be enhanced to specify that in accordance with NFPA 25 (2002 edition), Section 5.3.1.1.1, when sprinklers have been in place for 50 years a representative sample of sprinkler heads will be submitted to a recognized testing laboratory for field service testing. This sampling will be repeated every 10 years.	March 21, 2012	BVY 06-009	B.1.12.2
11	The Fire Water System Program will be enhanced to specify that wall thickness evaluations of fire protection piping will be performed on system components using non-intrusive techniques (e.g., volumetric testing) to identify evidence of loss of material due to corrosion. These inspections will be performed before the end of the current operating term and during the period of extended operation. Results of the initial evaluations will be used to determine the appropriate inspection interval to ensure aging effects are identified prior to loss of intended function.	March 21, 2012	BVY 06-009	B.1.12.2 Audit Items 37 & 41
12	Implement the Heat Exchanger Monitoring Program as described in LRA Section B.1.14.	March 21, 2012	BVY 06-009	B.1.14
13	Implement the Non-EQ Inaccessible Medium-Voltage Cable Program as described in LRA Section B.1.17.	March 21, 2012	BVY 06-009	B.1.17
14	Implement the Non-EQ Instrumentation Circuits Test Review Program as described in LRA Section B.1.18.	March 21, 2012	BVY 06-009	B.1.18
15	Implement the Non-EQ Insulated Cables and Connections Program as described in LRA Section B.1.19.	March 21, 2012	BVY 06-009	B.1.19

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LICENSE RENEWAL COMMITMENT LIST
REVISION 7**

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
16	Implement the One-Time Inspection Program as described in LRA Section B.1.21.	March 21, 2012	BVY 06-009 BVY 07-009	B.1.21 Audit Items 239, 240, 330, 331
17	Enhance the Periodic Surveillance and Preventive Maintenance Program to assure that the effects of aging will be managed as described in LRA Section B.1.22.	March 21, 2012	BVY 06-009	B.1.22 Audit Item 377
18	Enhance the Reactor Vessel Surveillance Program to proceduralize the data analysis, acceptance criteria, and corrective actions described in the program description in LRA Section B.1.24.	March 21, 2012	BVY 06-009	B.1.24
19	Implement the Selective Leaching Program as described in LRA Section B.1.25.	March 21, 2012	BVY 06-009	B.1.25
20	Enhance the Structures Monitoring Program to specify that process facility crane rails and girders, condensate storage tank (CST) enclosure, CO ₂ tank enclosure, N ₂ tank enclosure and restraining wall, CST pipe trench, diesel generator cable trench, fuel oil pump house, service water pipe trench, man-way seals and gaskets, and hatch seals and gaskets are included in the program.	March 21, 2012	BVY 06-009	B.1.27.2 Audit Item 377
21	Guidance for performing structural examinations of wood to identify loss of material, cracking, and change in material properties will be added to the Structures Monitoring Program.	March 21, 2012	BVY 06-009	B.1.27.2

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ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
22	Guidance for performing structural examinations of elastomers (seals and gaskets) to identify cracking and change in material properties (cracking when manually flexed) will be enhanced in the Structures Monitoring Program procedure.	March 21, 2012	BVY 06-009	B.1.27.2
23	Guidance for performing structural examinations of PVC cooling tower fill to identify cracking and change in material properties will be added to the Structures Monitoring Program procedure.	March 21, 2012	BVY 06-009	B.1.27.2
24	System walkdown guidance documents will be enhanced to perform periodic system engineer inspections of systems in scope and subject to aging management review for license renewal in accordance with 10 CFR 54.4 (a)(1) and (a)(3). Inspections shall include areas surrounding the subject systems to identify hazards to those systems. Inspections of nearby systems that could impact the subject system will include SSCs that are in scope and subject to aging management review for license renewal in accordance with 10 CFR 54.4 (a)(2).	March 21, 2012	BVY 06-009	B.1.28 Audit Items 187, 188 & 190
25	Implement the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program as described in LRA Section B.1.29.	March 21, 2012	BVY 06-009	B.1.29
26	Procedures will be enhanced to flush the John Deere Diesel Generator cooling water system and replace the coolant and coolant conditioner every three years.	March 21, 2012	BVY 06-009	B.1.30.1 Audit Items 84 & 164

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LICENSE RENEWAL COMMITMENT LIST
REVISION 7**

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
27	<p>At least 2 years prior to entering the period of extended operation, for the locations identified in NUREG/CR-6260 for BWRs of the VY vintage, VY will implement one or more of the following:</p> <p>(1) Refine the fatigue analyses to determine valid CUFs less than 1 when accounting for the effects of reactor water environment. This includes applying the appropriate Fen factors to valid CUFs determined in accordance with one of the following:</p> <ol style="list-style-type: none"> 1. For locations, including NUREG/CR-6260 locations, with existing fatigue analysis valid for the period of extended operation, use the existing CUF to determine the environmentally adjusted CUF. 2. More limiting VY-specific locations with a valid CUF may be added in addition to the NUREG/CR-6260 locations. 3. Representative CUF values from other plants, adjusted to or enveloping the VY plant specific external loads may be used if demonstrated applicable to VY. 4. An analysis using an NRC-approved version of the ASME code or NRC-approved alternative (e.g., NRC-approved code case) may be performed to determine a valid CUF. <p>(2) Manage the effects of aging due to fatigue at the affected locations by an inspection program that has been reviewed and approved by the NRC (e.g., periodic nondestructive examination of the affected locations at inspection intervals to be determined by a method acceptable to the NRC).</p> <p>(3) Repair or replace the affected locations before exceeding a CUF of 1.0. Should VY select the option to manage the aging effects due to environmental-assisted fatigue during the period of extended operation, details of the aging management program such as scope, qualification, method, and frequency will be submitted to the NRC at least 2 years prior to the period of extended operation.</p>	<p>March 21, 2012</p> <p>March 21, 2010 for performing a fatigue analysis that addresses the effects of reactor coolant environment on fatigue (in accordance with an NRC approved version of the ASME Code)</p>	BVY-06-058	<p>4.3.3</p> <p>Audit Items 29, 107 & 318</p>

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LICENSE RENEWAL COMMITMENT LIST
REVISION 7**

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
28	Revise program procedures to indicate that the Instrument Air Program will maintain instrument air quality in accordance with ISA S7.3	March 21, 2012	BVY 06-009	B.1.16 Audit Item 47
29	VYNPS will perform one of the following: <ol style="list-style-type: none"> 1. Install core plate wedges, or, 2. Complete a plant-specific analysis to determine acceptance criteria for continued inspection of core plate hold down bolting in accordance with BWRVIP-25 and submit the inspection plan and analysis to the NRC two years prior to the period of extended operation for NRC review and approval. 	March 21, 2012	BVY 06-009	B.1.7 Audit Item 9
30	Revise System Walkdown Program to specify CO2 system inspections every 6 months.	March 21, 2012	BVY 06-009	B.1.28 Audit Items 30, 141, 146 & 298
31	Revise Fire Water System Program to specify annual fire hydrant gasket inspections and flow tests.	March 21, 2012	BVY 06-009	B.1.12.2 Audit Items 39 & 40
32	Implement the Metal Enclosed Bus Program. Details are provided in a LRA Amendment 16, Attachment 3-and LRA Amendment 23, 7.	March 21, 2012	BVY 06-058 BVY 07-003	Audit Item 97

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ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
33	Include within the Structures Monitoring Program provisions that will ensure an engineering evaluation is made on a periodic basis (at least once every five years) of groundwater samples to assess aggressiveness of groundwater to concrete. Samples will be monitored for sulfates, pH and chlorides.	March 21, 2012	BVY 06-009	B.1.27 Audit Item 77 RAI 3.5-7
34	Implement the Bolting Integrity Program. Details are provided in a LRA Amendment 16, Attachment 2 and LRA Amendment 23, Attachment 5.	March 21, 2012	BVY 06-058 BVY 07-003	Audit Items 198, 216, 218, 237, 331 & 333
35	Provide within the System Walkdown Training Program a process to document biennial refresher training of Engineers to demonstrate inclusion of the methodology for aging management of plant equipment as described in EPRI Aging Assessment Field Guide or comparable instructional guide.	March 21, 2012	BVY 06-058	Audit Item 384
36	If technology to inspect the hidden jet pump thermal sleeve and core spray thermal sleeve welds has not been developed and approved by the NRC at least two years prior to the period of extended operation, VYNPS will initiate plant-specific action to resolve this issue. That plant specific action may be justification that the welds do not require inspection.	March 21, 2010	BVY06-058	Audit Item 12
37	Continue inspections in accordance with the Steam Dryer Monitoring Program, Revision 3 in the event that the BWRVIP-139 is not approved prior to the period of extended operation.	March 21, 2010	BVY 06-079	Audit Item 204
38	The BWRVIP-116 report which was approved by the Staff will be implemented at VYNPS with the conditions documented in Sections 3 and 4 of the Staff's final SE dated March 1, 2006, for the BWRVIP-116 report.	March 21, 2012	BVY 06-088	Response to RAI B.1.24-1

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ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
39	If the VYNPS standby capsule is removed from the reactor vessel without the intent to test it, the capsule will be stored in a manner which maintains it in a condition which would permit its future use, including during the period of extended operation, if necessary.	March 21, 2012	BVY 06-088	Response to RAI B.1.24-2
40	This Commitment has been deleted and replaced with Commitment 43.	N/A	BVY 07-018	N/A
41	This Commitment has been deleted and replaced with Commitment 43.	N/A	BVY 07-018	N/A
42	Implement the Bolted Cable Connections Program. Details are provided in LRA Amendment 23, attachment 7.	March 21, 2012	BVY 07-003 BVY 07-018	Response to: RAI 3.6.2.2-N-01 LRA Sections: 3.6.2.1 A.2.1.39 B.1.33 Table 3.6.1 Table 3.6.2-1
43	Establish and implement a program that will require testing of the two 13.8 kV cables from the two Vernon Hydro Station 13.8 kV switchgear buses to the 13.8 kV / 69 kV step up transformers before the period of extended operation and at least once every 10 years after the initial test.	March 21, 2012	BVY 07-009	Am. 24 Response to: RAIs 3.6.2.2-N-08-2 3.6.2.2-N-08-4

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ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
44	Guidance for performing examinations of buried piping will be revised to include the following. "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."	March 21, 2012	BVY 07-018	Regional inspection
45	Enhance the Service Water Integrity Program to require a periodic visual inspection of the RHRSW pump motor cooling coil internal surface for loss of material.	March 21, 2012	BVY 07-018	Regional inspection
46	Enhance the Diesel Fuel Monitoring Program to specify that fuel oil in the fire pump diesel storage (day) tank will be analyzed according to ASTM D975-02 and for particulates per ASTM D2276. Also, fuel oil in the John Deere diesel storage tank will be analyzed for particulates per ASTM D2276.	March 21, 2012	BVY 07-018	Regional inspection
47	Enhance the Diesel Fuel Monitoring Program to specify that fuel oil in the common portable fuel oil storage tank will be analyzed according to ASTM D975-02, per ASTM D2276 for particulates, and ASTM D1796 for water and sediment.	March 21, 2012	BVY 07-018	Regional inspection
48	Perform an internal inspection of the underground Service Water piping before entering the period of extended operation.	March 21, 2012	BVY 07-018	Regional inspection
49	Revise station procedures to specify fire hydrant hose testing, inspection, and replacement, if necessary, in accordance with NFPA code specifications for fire hydrant hoses.	March 21, 2012	BVY 07-009	Audit Item 38

Attachment 4

Vermont Yankee Nuclear Power Station

License Renewal Application

Amendment 26

License Renewal Application Supplement

**VERMONT YANKEE NUCLEAR POWER STATION
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ATTACHMENT 4**

License Renewal Application Supplement

The following information is provided as a supplement to the previously submitted License Renewal Application. The need for this information was identified as a result of interactions with the NRC Region I staff during the License Renewal Regional Inspection conducted during the month of March 2007 at VYNPS.

Note: Insertions = underlined, deletions = strike-through

Inspection Item: LRA Appendix B.1.14, Heat Exchanger Monitoring Program

VYNPS identified the need to provide the following clarification for the sample selection for heat exchangers in the Heat Exchanger Monitoring Program.

- Appendix B.1.14, Attribute 4 discussion is revised as follows:

An appropriate sample population of heat exchangers will be determined based on operating experience prior to inspections. The sample population of heat exchangers will be determined based on materials of construction of the heat exchanger tubes and the associated environments as well as the type of heat exchanger (for example, shell and tube type). At least one heat exchanger of each type, material and environmental combination will be included in the sample population. Inspection can reveal loss of material that could result in degradation of the heat exchangers. Fouling is not addressed by this program.

Testing frequency will be established using baseline eddy current testing in accordance with industry best practices and EPRI recommendations. The results of these baseline tests will be used to determine the frequency of future inspections and the number of tubes to be sampled. Additional examination methods (e.g., ultrasonic thickness measurements or radiography) may be used if "as-found" conditions warrant. The results of these inspections will be used to establish the frequency of future inspections.

- Appendix B.1.14, Attribute 6 discussion is revised as follows:

The minimum acceptable tube wall thickness for each heat exchanger to be eddy current inspected will be established based upon a component-specific engineering evaluation that considers industry best practices and EPRI recommendations. Wall thickness will be acceptable if greater than the minimum wall thickness for the component.

The acceptance criterion for visual inspections of heat exchanger heads, covers and tube-sheets will be no evidence of degradation that could lead to loss of function. If degradation that could lead to loss of intended function is detected, a condition report will be written and the issue resolved in accordance with the site corrective action program.

Inspection Item: LRA B.1.1, Buried Piping Inspection [see Commitment 44]

The following changes are provided to clarify the scheduling of inspections for the program.

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- “NUREG-1801 Consistency” section is revised as follows:

The Buried Piping Inspection Program at VYNPS is consistent with the program described in NUREG-1801, Section XI.M34, Buried Piping and Tanks Inspection, with exceptions and an enhancements.

- “Exceptions to NUREG-1801” section is revised as follows:

The Buried Piping Inspection Program at VYNPS is consistent with the program described in NUREG-1801, Section XI.M34, Buried Piping and Tanks Inspection, with the following exceptions and enhancement.

- Revise and/or add the following to “Enhancements” section:

The following enhancements will be initiated prior to the period of extended operation.

Attributes Affected	Enhancement
4. <u>Detection of Aging Effects</u>	<u>Program guidance will be revised to include the following. “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.”</u>

Inspection Item: LRA Section 2.3.3.7, Instrument Air

The following change is provided to clarify that the SA system is in scope for 10 CFR 54.4(a)(2).

- Section 2.3.3.7 is revised as follows:

~~The SA system has no intended functions for 10 CFR 54.4(a)(2) or (a)(3).~~
The SA system has the following intended function for 10 CFR 54.4(a)(2).

- Maintain integrity of nonsafety-related components such that no physical interaction with safety-related components could prevent satisfactory accomplishment of a safety function.

The SA system has no intended function for 10 CFR 54.4(a)(3).

**Inspection Items: LRA Table 3.2.2-1, Residual Heat Removal System
LRA Appendix B.1.26, Service Water Integrity [see Commitment 45]**

The RHR pump seal coolers, RHR pump seal cyclone separators, and RHRSW pump motor coolers were evaluated during the aging management review. The following changes are provided in response to questions on the aging management of the above components during the license renewal regional inspection.

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- The design of the RHR pump seal coolers precludes loss of material due to wear such that it is not an aging effect requiring management. Therefore, LRA Table 3.2.2-1 is revised as follows:

Heat exchanger (tubes)	Pressure boundary	Stainless steel	Treated water > 270°F (ext)	Loss of material-wear	Service Water Integrity			H
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- LRA Appendix B.1.26, "NUREG-1801 Consistency" section is revised as follows:

The Service Water Integrity Program at VYNPS is consistent with the program described in NUREG-1801, Section XI.M20, Open-Cycle Cooling Water System with exceptions and enhancements.

- The service water integrity program requires an enhancement to periodically inspect the motor cooling coil for loss of material. Therefore, "Enhancements" section is revised as follows:

None

The following enhancement will be implemented prior to the period of extended operation.

<u>Attributes Affected</u>	<u>Enhancement</u>
1. Scope	<u>Enhance the Service Water Integrity Program to require a periodic visual inspection of the RHRSW pump motor cooling coil internal surface for loss of material.</u>

Inspection Item: LRA Table 2.3.3.13-B, AOG System

The following is provided to clarify the description of AOG system components subject to aging management review which are to be included in aging management programs during the period of extended operation.

- Table 2.3.3.13-B is revised as follows:

System Code	Nonsafety-Related Components Subject to AMR
AOG	Portion of the system <u>inside</u> associated with the plant stack loop seal <u>structure</u>

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Inspection Item: LRA Table 3.3.2-6, Fuel Oil System

The following changes revise the fuel oil system aging management review results to include a short section of stainless steel tubing associated with the John Deere diesel generator and affirm that the John Deere diesel generator fuel storage tank, day tank and interconnecting tubing and flexible hose are included in the fuel oil system aging management review.

➤ Table 3.3.2-6, Fuel Oil System is revised as follows:

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flex hose	Pressure boundary	Stainless steel	Air - indoor (ext)	None	None	VII.J-15 (AP-17)	3.3.1-94	A
Flex hose	Pressure boundary	Stainless steel	Fuel oil (int)	Cracking	Diesel Fuel Monitoring			H
Flex hose	Pressure boundary	Stainless steel	Fuel oil (int)	Loss of material	Diesel Fuel Monitoring	VII.H1-6 (AP-54)	3.3.1-32	E
Tank	Pressure boundary	Carbon steel	Air - indoor (ext)	Loss of material	System Walkdown	VII.I-8 (A-77)	3.3.1-58	A
Tank	Pressure boundary	Carbon steel	Fuel oil (int)	Loss of material	Diesel Fuel Monitoring	VII.H1-10 (A-30)	3.3.1-20	E
Tank	Pressure boundary	Fiberglass	Fuel oil (int)	None	None			F
Tank	Pressure boundary	Fiberglass	Interstitial fluid (brine) (ext)	None	None			F
Tank	Pressure boundary	Fiberglass	Interstitial fluid (brine) (int)	None	None			F
Tank	Pressure boundary	Fiberglass	Soil (ext)	None	None			F
Tubing	Pressure boundary	Copper alloy < 15% Zn	Air - indoor (ext)	None	None	V.F-3 (EP-10)	3.2.1-53	C
<u>Tubing</u>	<u>Pressure boundary</u>	<u>Copper alloy < 15% Zn</u>	<u>Air - outdoor (ext)</u>	<u>Loss of material</u>	<u>System Walkdown</u>			<u>G</u>
Tubing	Pressure boundary	Copper alloy < 15% Zn	Fuel oil (int)	Loss of material	Diesel Fuel Monitoring	VII.H1-3 (AP-44)	3.3.1-32	E

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<u>Tubing</u>	<u>Pressure boundary</u>	<u>Stainless steel</u>	<u>Air - indoor (ext)</u>	<u>None</u>	<u>None</u>	<u>VII.J-15 (AP-17)</u>	<u>3.3.1-94</u>	<u>A</u>
<u>Tubing</u>	<u>Pressure boundary</u>	<u>Stainless steel</u>	<u>Fuel oil (int)</u>	<u>Loss of material</u>	<u>Diesel Fuel Monitoring</u>	<u>VII.G-17 (AP-54)</u>	<u>3.3.1-32</u>	<u>A</u>

Inspection Item: LRA Appendix B.1.9, Diesel Fuel Monitoring [see Commitment 46]

The following changes are made to specify the standards for sampling the fire pump diesel fuel oil storage (day) tank and the John Deere diesel fuel oil storage tank.

- The following enhancements are added to Appendix B.1.9:

Attributes Affected	Enhancement
<u>3. Parameters Monitored / Inspected</u>	<u>Fuel oil in the fire pump diesel storage (day) tank will be analyzed according to ASTM D975-02 and for particulates per ASTM D2276.</u>
<u>3. Parameters Monitored / Inspected</u>	<u>Fuel oil in the John Deere diesel storage tank will be analyzed for particulates per ASTM D2276.</u>

Inspection Item: LRA Appendix B.1.9, Diesel Fuel Monitoring [see Commitments 3 and 4]

The following change is provided to specify ultrasonic thickness measurements for the fuel oil storage and fire pump diesel storage (day) tank bottoms.

- Existing enhancement in Appendix B.1.9 is revised as follows:

Attributes Affected	Enhancement
<u>4. Detection of Aging Effects</u>	<u>Ultrasonic thickness measurement of the fuel oil storage and fire pump diesel storage (day) tank bottom surfaces will be performed every 10 years during tank cleaning and inspection.</u>
<u>6. Acceptance Criteria</u>	<u>UT measurements of the fuel oil storage and fire pump diesel storage (day) tank bottom surfaces will have acceptance criterion $\geq 60\%$ Tnom.</u>

Inspection Item: LRA Appendix B.1.9, Diesel Fuel Monitoring [see Commitment 47]

The following change is provided to specify sampling of the portable fuel oil storage tank.

- The following enhancement is added to Appendix B.1.9:

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Attributes Affected	Enhancement
3. <u>Parameters Monitored / Inspected</u>	<u>Fuel oil in the common portable fuel oil storage tank will be analyzed according to ASTM D975-02, per ASTM D2276 for particulates, and ASTM D1796 for water and sediment.</u>

Inspection Item: LRA Appendix B.1.9, Diesel Fuel Monitoring

The following change clarifies that due to tank configuration not all tanks within the program are cleaned and inspected.

- Appendix B.1.9, Program description section, 2nd paragraph is revised as follows:

The program entails sampling to ensure that adequate diesel fuel quality is maintained to prevent corrosion of fuel systems. Exposure to fuel oil contaminants such as water and microbiological organisms is minimized by periodic draining and cleaning of selected tanks and by verifying the quality of new oil before its introduction into storage tanks. Sampling and analysis activities are in accordance with technical specifications on fuel oil purity and the guidelines of ASTM standards D4057-88 and D975-02 (or later revisions of these standards).

Inspection Item: LRA Appendix B.1.8, Containment Leak Rate

The following change incorporates a second exception to the program to reconcile LRA Section B.1.8 to the VYNPS program basis document.

- The following is added as an exception including Exception Note 2 to Appendix B, Section B.1.8:

Attributes Affected	Exceptions
6. <u>Acceptance Criteria</u>	<u>Main steam leakage pathway contributions (leakage through all four main steam lines and the main steam drain line) are excluded 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.²</u>

- 2. NRC approved Amendment 223 to Facility Operating License DPR-28 allowing this exemption from the requirements of Sections III.A and III.B of 10 CFR 50 Appendix J, Option B because a separate radiological consequence term has been provided for these pathways. The revised design basis radiological consequences analyses address leakage through these pathways as individual factors, exclusive of the primary containment leakage. (Ref. **NVY 05-040 and NVY 05-045**)

Attachment 5

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LRA Page 2.3-71 Changes

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(Insertions = underlined, deletions = strike-through)

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Technical Information

UFSAR References

The following table lists the UFSAR references for systems in this section.

System Code	System Name	UFSAR Section
CD	Condensate Demineralizer	Section 11.7
CUFD	RWCU Filter Demineralizer	Section 4.9
CW	Circulating Water	Sections 10.8, 11.6, 11.9
DW	Demineralized Water	None <u>Section 10.13</u> ¹
FDW	Feedwater	Section 11.8
MGLO	MG Lube Oil	None <u>Section 7.9.4.4.1</u>
NM	Neutron Monitoring	Sections 1.6.2.2, 1.6.4.1.3, and 7.5
PW	Potable Water	Section 10.15 (potable and sanitary water system)
RDW	Radwaste, Liquid and Solid	Sections 9.2 and 9.3
RIP	Equipment Retired in Place	None
RWCU	Reactor Water Clean-Up	Section 4.9
SC	Stator Cooling	None <u>Sections 8.2.3, 11.2</u>

1. Section 10.13 describes the "station makeup water treatment system." However, the components described in Section 10.13 are in the MUD system, not the DW system.

Components Subject to AMR

The following table summarizes the components subject to aging management review for each system within the scope of license renewal based on the criterion of 10 CFR 54.4(a)(2) for potential physical interactions with safety-related equipment. Components are subject to aging management review if their location is such that safety-related equipment could be impacted by component failure.