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March 12, 2007
Docket No. 50-271
BVY 07-009
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 24

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

Attachment 1 contains two new License Renewal Commitments (numbers 2 and 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 12, 2007.

Sincerely,

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

cc: See next page
enc: List of Attachments, page 3 of 3.

A117

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List of Attachments

- Attachment 1: License Renewal Commitment List, Revision 6
  - Commitment 2 deleted per NRC request and replaced with a Commitment to address Audit Item 38.
  - Commitment 16 clarification.
  - Commitment 43 has been added to resolve RAI 3.6.2.2-N-08-2 and 3.6.2.2-N-08-4.
- Attachment 2: License Renewal Application Supplement – Amendment List, Revision 3
  - Audit Item 38 changed to provide for fire hose testing in accordance with National Fire Protection Association (NFPA) code requirements.
- Attachment 3: RAI 3.6.2.2-N-08-2 and 3.6.2.2-N-08-4 Response Clarification

Attachment 1

Vermont Yankee Nuclear Power Station

License Renewal Application Supplement

Amendment 24

VYNPS License Renewal Commitment List, Revision 6

VERMONT YANKEE NUCLEAR POWER STATION
LICENSE RENEWAL COMMITMENT LIST
REVISION 6

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	Revise station procedures to specify fire hydrant hose testing, inspection, and replacement, if necessary, in accordance with NFPA code requirements.	March 21, 2012	BVY 07-009	Audit Item 38
3	The Diesel Fuel Monitoring Program will be enhanced to ensure ultrasonic thickness measurement of the fuel oil storage tank bottom surface will be performed every 10 years during tank cleaning and inspection.	March 21, 2012	BVY 06-009	B.1.9
4	The Diesel Fuel Monitoring Program will be enhanced to specify UT measurements of the fuel oil storage tank bottom surface will have acceptance criterion ≥ 60% Tnom.	March 21, 2012	BVY 06-009	B.1.9
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

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
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
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
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

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
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
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

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
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

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
27	At least 2 years prior to entering the period of extended operation, for the locations identified inNUREG/CR-6260 for BWRs of the VY vintage, VY will implement one or more of the following: (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: 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. (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). (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.	March 21, 2012 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)	BVY-06-058	4.3.3 Audit Items 29, 107 & 318

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: 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
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

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
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
39	"If the VYNPS standby capsule is removed form 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	If the Vernon Tie ever becomes unavailable, due to unavailability of the VHS or other reasons, the reactor must be shut down within 15 days unless the Vernon Tie is returned to service or a basis for maintaining continued operation is written and approved. If the Vernon Tie cannot be returned to service within 15 days, within the next 24 hours VYNPS must submit a report to the NRC in accordance with 10CFR50.4 outlining the reason for the unavailability, corrective actions in place to provide AC power for Appendix R alternate shutdown fire scenarios, and the time required to make the Vernon Tie available.	March 21, 2012	BVY 06-096 BVY 07-003	Response to RAI 3.6.2.2-N-08-2

ITEM	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE	Related LRA Section No./ Comments
41	VYNPS will monitor the availability of the VHS to ensure continued capability to perform its license renewal intended function, that is, conformance with the availability specified in NUMARC 87-00 for meeting the requirements of the SBO Rule. If availability falls below the acceptable level, VYNPS will respond to the condition through the corrective action program. The corrective action program requires evaluation and appropriate corrective action to correct the nonconforming condition.	March 21, 2012	BVY 06-096	Response to RAI 3.6.2.2-N-08-2
42	Implement the Bolted Cable Connections Program. Details are provided in LRA Amendment 23, Attachment 7.	March 21, 2012	BVY 07-003	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	Enhance the VYNPS Non-EQ Inaccessible Medium Voltage Cable Program to include one of the following options to address Vernon Dam 13.8 kV cable integrity: 1. Qualify the cable to ensure functionality through the period of extended operation. 2. Establish and implement a program that will require testing 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 10 years after entering the period of extended operation. 3. Replace the 13.8 kV cable within 10 years after entering the period of extended operation (i.e. year 2022).	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

Attachment 2

Vermont Yankee Nuclear Power Station

License Renewal Application Supplement

Amendment 24

VYNPS LRA Amendment List, Revision 3

Audit Item 38 Changes

ATTACHMENT 2
LICENSE RENEWAL APPLICATION SUPPLEMENT
AMENDMENT LIST CHANGE, Revision 3

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

Audit item 38:

The first paragraph for the detection of aging effects exception in LRA Section B.1.12.2 is hereby revised as follows (strike-outs deleted, underlined words added). License Renewal Commitment 2 specifies that fire hydrant hoses will be tested, inspected and replaced if necessary, in accordance with NFPA standards.

> NUREG-1801 Program XI.M27 specifies annual fire hydrant hose hydrostatic tests. ~~Under the VYNPS program, hydrostatic test of outside hoses occurs once per 24 months; and hydrostatic test of inside hoses occurs once per 3 years.~~ Fire hydrant hoses are consumables and therefore, not subject to aging management review. Since they are not subject to aging management review, fire hydrant hoses are not included in the VYNPS Fire Water System Program. ~~hydrostatic tests are currently performed in accordance with requirements provided in the VYNPS Technical Requirements Manual. License Renewal Commitment 2 has been added to ensure that fire hose testing will be performed in accordance NFPA standards for performance testing during the period of extended operation. Per note 2, this program is not part of a VYNPS aging management program.~~[2]

Also, the following exception note is added.

> 2. Per NUREG-1800, Table 2.1-3, fire hydrant hoses are consumables not subject to aging management review. During the period of extended operation, fire hydrant hoses will be tested, inspected and replaced, if necessary, in accordance with NFPA standards.~~An aging management program is not required to address components that are not subject to aging management review.~~

Attachment 3

Vermont Yankee Nuclear Power Station

License Renewal Application Supplement

Amendment 24

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

Vernon Hydro-Electric Station

Switchyard Electrical Components

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

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 ~~by National Grid (TransCanada)~~ 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.

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 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.

~~Based on the similarities of the cables, VYNPS proposed to credit testing of startup transformer cables (which are already in-scope) as an alternate method for verifying the VHS cable will continue to perform its intended function during the period of extended operation. This is considered equal or more stringent because of the following:~~

~~a.The VYNPS cable will have been installed for 3 years longer than the VHS cable providing a leading indicator for the VHS cable.~~

~~b.The startup transformer cable is loaded intermittently, and the VHS cable is continuously loaded. As such, the VHS cable insulation heating is more even and changes slowly, and therefore dries the cable insulation with fewer electrical transients. Therefore the startup transformer environment is more severe from this perspective.~~

~~c.NEI 06-05, April 2006, "Medium Voltage Underground Cable White Paper," Page 1 noted that ethylene-propylene rubber tends to have a long service life (> 25 years) in wet applications and an even longer service life in dry environments.~~

~~d.If an issue is found during testing of the VYNPS cables, VYNPS will document and address the condition through the Entergy Corrective Action Program. Corrective actions will include an evaluation to determine the appropriate actions to ensure the VHS cables remain capable of performing their intended function.~~

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.

~~The VYNPS aging management program for the underground medium-voltage from the VHS generators to the VHS switchyard will be similar to the NUREG-1801, XI.E3 program, but will have an exception. The XI.E3 program provides for 100% testing of all cables included in the program. The exception for the VHS cables will use a representative sample, and the sample population will include the VYNPS cables. The VYNPS cables will act as a surrogate to indicate the condition of the VHS cables. The cables in the two circuits will be included in the XI.E3 program, but the program will use the test results of similar VYNPS cables installed between the startup transformer and the station 4160 kV switchgear to indicate any potential degradation of the VHS cables.~~

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, 602

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~~, with the following exceptions~~.

Attributes Affected	Exceptions
3. Parameters Monitored/Inspected	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.

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 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 preformed 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			I, 601
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			I, 601

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.