1 **Category** Accepted

Request A-K-01
Please explain where the commitments for the various AMP enhancements to bring the particular AMP in conformance to the GALL Report recommendations are made? How are these commitments tracked to closure?

Response The LRA, Appendix B identifies the commitments for AMP enhancements. Consistent with how other NRC commitments are tracked VYs will enter the commitments associated with License Renewal into PCRS corrective action database as Work Tracking (WT) items. We will do this when requested by the LR Project Manager who has a tracking item to define how all planned actions are tracked.

2 **Category** Closed

Request B.1.1-L-01
Program Description Item - The GALL states, "Gray cast iron, which is included under the definition of steel, is also subject to a loss of material due to selective leaching, which is an aging effect managed under Chapter XI.M33, 'Selective Leaching of Materials'." The LRA states, "This program includes (a) preventive measures to mitigate corrosion and (b) inspections to manage effects of corrosion on the pressure-retaining capability of buried carbon steel, stainless steel, and gray cast iron components." Are gray cast iron components included in the VYNPS selective leaching program?

Response Yes, gray cast iron components subject to aging management review are included in the VYNPS selective leaching program. Reference LRA Section B.1.25 and Table 3.3.2-8.

3 **Category** Closed

Request B.1.1-L-02
Program Description Item - The LRA states, "A focused inspection will be performed within the first 10 years of the period of extended operation…." What is the extent of the focused inspection at the start of the period of extended operation?

Modified Question: Program Description Item -The LRA states, "A focused inspection will be performed within the first 10 years of extended operation… " On what areas will the "focused inspection" be focused?

Response If a focused inspection is required during the first 10 years of the period of extended operation, it will be conducted in accordance with the criteria of NUREG-1801, Section XI.M34, Buried Piping and Tanks Inspection.

In section 4 of XI.M34 it states that any credited inspection should be performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems. This defines the focused inspection that will be performed at VYNPS which will also include buried piping that has experienced external corrosion problems and areas that have conditions such as exposure to groundwater that could increase the likelihood of corrosion of buried piping.

4 **Category** Closed

Request B.1.1-L-03
Scope of Program Element - The GALL Report states, "The program relies on preventive measures such as coating, wrapping and periodic inspection for loss of material caused by corrosion of the external surface of buried steel piping and tanks." The LRA states, "The VYNPS program does not inspect tanks. There are no buried steel tanks subject to aging management review." What is the basis for including piping but excluding tanks?

Response The basis for exclusion of tanks from the Buried Piping Inspection Program is that none of the metal tanks subject to aging management review are buried. Therefore, aging of tanks is managed by other programs. Reference LRA Sections 3.2.2.2.9 and 3.4.2.2.5, and Section 3.3 Tables (The only buried tank in the auxiliary systems is fiberglass.) [LAP 4/12/06]

These were discussed in interview and the responses were subsequently written.

5 **Category** Closed

Request B.1.1-L-04
Parameters Monitored/Inspected Element - The GALL Report states, "Coatings and wrappings are inspected by visual techniques." The LRA states, "Guidance for performing examinations of buried piping will be enhanced to specify that coating degradation and corrosion are attributes to be evaluated." What is the VYNPS commitment number associated with this enhancement? Buried piping is visually examined for evidence of corrosion damage or coating defects." A review of PP 7030, Section 4.3, does not identify the parameters that pertain to corrosion damage or coating defects. Is this the guidance that VY intends to enhance?

This is License Renewal Commitment #1

Response Vermont Yankee will enhance PP 7030, Structures Monitoring Program Procedure, to provide additional guidelines for inspections of buried pipe and underground structures. Attributes to be considered will include:

1. improved definition of the scope of underground piping inspections
2. define the condition of coatings to be inspected, including adhesion and discontinuities.
3. define the need to inspect piping underneath failed coatings
4. provide acceptance criteria, including removal of rust and an evaluation of remaining wall thickness against the minimum wall thickness requirements
5. provide instructions to notify Engineering for an inspection of any underground structures unearthed during excavation of piping.

(Commitment #1)

6 **Category** Closed

Request B.1.1-L-05
Detection of Aging Effects Element - The GALL Report states, "Inspections substituted for inspections requiring excavation solely for the purpose of inspection. Methods such as phased array UT technology provide indication of wall thickness for buried piping without excavation. Use of such methods to identify the effects of aging is preferable to excavation for visual inspection, which could result in damage to coatings or wrappings." How are buried components that cannot be examined by UT, due to, e.g., either material or size, examined?

Response Buried components are inspected when excavated during maintenance. The exception merely states that alternate methods may be used to inspect buried components. Reference LRA Section B.1.1.

7 **Category** Closed

Request B.1.2-P-1
Exceptions granted under the current license are not assumed to apply to period of extended operation. Please confirm that the excepted weld is outside the scope of license renewal. Also, explain why it need not be inspected at least once in each inspection interval.

Response As indicated in LRA Tables 3.3.2-13-5 and 3.3.2-13-36, the excepted welded connection is subject to aging management review for potential spatial interaction in accordance with 10 CFR 50.54 (a)(2). As stated in LRA Section B.1.2, exception Note 1, the welded connection need not be inspected at least once in each inspection interval because it is in a section of piping that is Safety Class 0 and has no license renewal function in accordance with 10 CFR 54.4 (a)(1) or (a)(3).

8 **Category** Closed

Request B.1.7-H-01
BWRVIP utilities have made a commitment that the NRC will be notified by a BWRVIP licensee of their decision to not fully implement a BWRVIP report, as approved by the NRC staff, within 45 days of the reports approval. Please clarify the exceptions for not fully implementing BWRVIP report by VYNPS. Did VYNPS define any new cases of not fully implementing BWRVIP in the VYNPS LRA?

Response The BWR Vessel Internals Program includes provisions to notify the NRC if VYNPS does not implement a BWRVIP recommendation. Exceptions to the NUREG-1801 programs that invoke specific BWRVIP reports are identified in Appendix B of the LRA. Reference LRA Section B.1.7 and LRPD-02 (AMPER) Section 4.7 The IVVI program procedure is ENN-DC-135, and the current revision includes the requirements of BWRVIP 94 Revision 1. VY has prepared a technical justification to defer the jet pump beam examinations to align with the refueling outage schedule as allowed by BWRVIP-94 (Revision in place at time of deviation). The BWRVIP requirements are based on 24 month cycles while VY is on a 18 month cycle. The UT examinations of the Jet Pump beams are scheduled for the next refueling outage RFO 26 (2007). BWRVIP 94 Revision 1, Section 3.5 provides guidance on the reporting requirements. A BWRVIP letter dated 12/20/2005 requires implementation by 8/1/2006. This is also addressed in the latest revision of ENN-DC-135.

9 **Category** Accepted

Request B.1.7-H-02
In the VYNPS LRA, pages B-28 & C-5, an exception to BWRVIP-25 is taken. UT & Enhanced VT-1 examinations are used to detect cracking and verify the integrity of a critical number of rim hold-down bolts. VT-3 examination is used to detect general condition. Please provide further justification for the aging management of the cracking, since VT-3 cannot detect cracking. If EVT-1 cannot be performed, please provide alternative for review and approval.

Response This exception came from TJ-2004-01 in PP 7027. The BWR Core Plate Inspection and Flaw Evaluation Guideline (BWRVIP-25) recommended a UT or EVT-1 examinations of core plate rim hold-down bolts for all plants that have not installed core plate wedges. These bolts are the only location in the core plate requiring inspection. Utilities have determined the EVT-1 examinations are extremely difficult to perform and are of limited value. The Inspection committee of the BWRVIP has attempted to develop a UT technique, and has had limited success. However, the UT examination can only be performed on a limited number of existing bolt configurations and delivery hardware for the inspection equipment has not been developed.

VY will either install core plate wedges or complete an analysis, including TLAA, to support continued inspection in accordance with BWRVIP- 25.

This is License Renewal Commitment # 29.

10 **Category** Closed

Request B.1.7-H-03
In the VYNPS LRA, page B-29, the applicant identified a VT-3 examination as a baseline. The baseline inspection described in BWRVIP is the first inspection that satisfies the guidelines in BWRVIP. Since VT-3 does not satisfy the BWRVIP guidelines, the inspection cited does not provide a baseline. Please explain how the BWRVIP guideline will be met.

Response The response to this question is the same as above (e.g. Question 9), i.e. the UT inspection is challenging and the BWRVIP is working developing an inspection method.

11 **Category** Closed

Request B.1.7-H-04
In the VYNPS LRA, page B-27, (BWRVIP-76) Recent industry experience indicates that partial through-wall cracks from the inside diameter are possible. (They have been detected at Plant Hatch.) How will cracking initiated from the inside surface of VYNPS's core shroud welds H1, H2, and H3 be managed?

Continuous question: Does applicant plan to revise LRA? If yes, Please provide the exact wording for LRA supplement.

Response Accessible regions of the core shroud welds H1,H2 & H3 are UT examined IAW BWRVIP-76. Portions of the total accesible regions of H1,H2 & H3 are characterized as design reliant analysis performed by the shroud repair designer determined the minimum design reliant weld lengths.

LRA Section B.1.7 will be changed as follows:
1. The exception to the BWR vessel internals program related to the core shroud (page B-27) will be deleted.
2. Exception Note #1 on page B- 29 will be deleted.

12 **Category** Closed

Request B.1.7-H-05
In the VYNPS LRA, page B-28 (BWRVIP-18 and BWRVIP-41) BWRVIP-18 states that inspection technique development needed for the thermal sleeve welds is being addressed by the BWRVIP inspection committee as a high priority item (since 1996). The Final License Renewal SER for BWRVIP-41 states that aging management review of the nozzle thermal sleeve (jet pump inaccessible welds) will be provided by individual applicants. Please provide plant-specific justification/commitment to demonstrate that these inaccessible welds (BWRVIP-18,4) will be adequately managed during the period of extended operation.

Response The VYNPS hidden jet pump welds (TS-1&2) are far enough into the nozzle that failure at these welds would not result in the thermal sleeve disengaging from the nozzle. With the thermal sleeve still engaged, structural integrity of the rest of the jet pump is maintained. If the VYNPS jet pump thermal sleeve or riser piping severed, it would be detected through jet pump monitoring.
Once the technology is developed VY will inspect these welds IAW BWRVIP-41.

The VYNPS hidden core spray welds (CSTS-1,2&3) are far enough into the nozzle that failure at these welds would not result in the thermal sleeve disengaging from the nozzle. With the thermal sleeve still engaged, structural integrity of the rest of the core spray ring header is maintained. If the VYNPS core spray thermal sleeve or ring header piping is severed, it would be detected through the core spray sparger break detection monitoring system. Once the technology is developed VY will inspect these welds IAW BWRVIP-18.

13 **Category** Closed

Request B.1.7-H-06
In the VYNPS LRA, page B-28 (BWRVIP-41) The VYNPS LRA states that flaws were identified through UT examinations. Please provide detailed inspection evaluation, scope expansion and corrective action information for the staff's review.

Response TE-2003-0021 from Appendix C of PP 7027 will be provided during on-site audit. References used to prepare TE-2003-0021 will be available for on-site review upon request.
Flaw evaluations were performed for the jet pump (JP) diffuser welds, JP riser welds, and the core spray collar welds. The JP riser flaw evaluation calculation number is VYC-2400. The core spray collar weld flaw evaluation report number is VY-RPT-05-00015. 100% of the JP diffuser welds were inspected by UT in RFO 21 (1999). The flawed diffuser welds were re-inspected by UT in RFO 23 (2002) with little change in flaw sizes. 26 of 30 JP riser welds were UT inspected in RFO 20 (1998) and 4 welds were inspected by VT-1 with cleaning. The flawed riser welds were re-inspected by UT in RFO 22 (2001) with no crack growth on 2 welds and two previous indications were determined to be due to UT transducer lift-off. 100 % of the core spray collar welds were examined by UT in 1996. The flawed collar welds were re-inspected by UT in RFO 22 (2001) with no change in flaw sizes. The flawed JP diffuser/riser welds and the Core Spray collar welds are scheduled to be inspected by UT during RFO 26 (2007). Future re-inspections will be performed in accordance with BWRVIP requirements.

14 **Category** Accepted

Request B.1.7-H-07
In the VYNPS LRA, page B-31 (BWRVIP-26) The VYNPS LRA states that an inspection will be performed for the first 12 years of the period of extended operation (PEO). Please clarify what inspections (if any) will be performed for the remaining PEO.

Need commitment for the re-inspection. Need word.

Response NUREG-1801 requires inspection of 5% of the Top Guide during the first six years of the period of extended operation, and inspection of an additional 5% during the second 6 years of the period of extended operation. VYNPS has committed to these examinations in the current LRA.

In response to the discussions relative to this question, VYNPS will inspect an additional 5% of the Top Guide during the third 6 years of the period of extended operation. (Commitment #2)

15 **Category** Closed

Request B.1.8-L-01
Operating Experience Element - The LRA states, "A QA audit in 2001 revealed latent non-compliance with station administrative and Appendix J implementing procedures." Please clarify the meaning of 'latent" in this context.

Added: Scope of Program item. Are any other examinations/tests performed, in addition to the integrated leakage rate and the local leakage rate tests?

Response No additional tests or examinations are performed under the Containment Leak Rate Testing Program.
The term latent in this context means: not currently affecting program effectiveness, but with the potential for affecting program effictiveness if not corrected. While technical details were followed, administrative processes, associated with test record retention, were implemented outside the established requirements. This procedural non-compliance, if not corrected, could have diminished the effectiveness of the program. Reference Audit Report VT-2001-26.

16 **Category** Closed

Request B.1.9-K-01
Please demonstrate that the guidelines provided in D2276 are consistent with or more stringent than the guidelines provided in D6217 to justify the use of D2276

Response ASTM D2276 provides guidance on determining particulate contamination using a field monitor. It provides for rapid assessment of changes in contamination level without the time delay required for rigorous laboratory procedures. It also provides a laboratory filtration method using a 0.8 micron filter. ASTM D6217 provides guidance on determining particulate contamination by sample filtration at an off-site laboratory. The acceptance criterion of D2276 is 10 mg/liter while that of D6217 is 24 mg/liter. Therefore, D2276 is more stringent than D6217. Since ASTM D2276 is an accepted method of determining particulates and is a method recommended by ASTM D975, to which VYNPS is committed by Technical Specifications, the D2276 method is used at VYNPS.

17 **Category** Closed

Request B.1.9-K-02
Are the guidelines provided in D4057 addressed in this program? If not, please justify excluding this standard as an exception to the GALL Report

Response As stated in the program description in LRA Section B.1.9, 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). Reference LRA Section B.1.9, Program Description.

18 **Category** Closed

Request B.1.9-K-03
Please indicate what additives, if any, are provided by the fuel oil supplier. Please provide a copy of a recent fuel oil procurement specification or supplier declaration which indicates what fuel oil additives are included as well as any tests that may have been performed by the fuel oil supplier or by VYNPS.

Response Vermont Yankee purchases un-dyed, low sulfur #2 diesel fuel for use in safety-related systems. Additives are not used by Vermont Yankee or the fuel supplier. The diesel fuel currently comes from Ultramar (a Canadian refinery) to a local supplier. The refinery blends fuel to meet a given specification and may use some additives such as cetane enhancers. Refinery use of additives is not described in their specification and is outside the control of the end user. Biocides have never been added to the onsite fuel supply.

19 **Category** Closed

Request B.1.9-K-04
Please provide the technical justification for not adding fuel oil additives.

Response As stated in LRA Section B.1.9, exception note 2, plant operating experience has not indicated a need for additives. Reference LRA Section B.1.9, exception note 2.

Fuel additives are generally required for three reasons. These are to maintain the stability of the fuel oil, change the properties of the fuel oil (e.g. increase the ignition quality) or to prevent bacterial or mold growth in the fuel oil. The addition of biocides may degrade some of the other fuel oil properties such as increasing the filterable solids loading.

For the past 10 years, VYNPS has been buying high quality fuel oil from Ultramar in Canada. Our deliveries are timed to the arrival of new rail cars in Vermont from this refinery. We specify very high quality fuel oil and ensure that it and the delivery trucks do not contain any contaminants. Monthly analyses of diesel fuel oil from the top, middle and bottom of the Main Fuel Oil Storage Tank have not produced any indications of fuel oil deterioration or the presence of water or sediment. Since mold and bacteria grow in the water fuel oil interface, we have no need for biocides.

Diesel generator performance associated with the quality of the diesel fuel oil has been excellent. Thus, there is no need for fuel oil additives.

20 **Category** Closed

Request B.1.9-K-05
Please describe what parameters are monitored or inspected and indicate what guidance is used for fuel oil sampling. Please provide a copy of a representative plant procedure for fuel oil sampling.

Response The Diesel Fuel Monitoring Program monitors fuel quality and levels of water in the fuel oil. ASTM D4057-88 (or a later revision of this standard), Standard Practice for Manual Sampling of Petroleum and Petroleum Products, is used for guidance on oil sampling. Safety-related diesel fuel oil is analyzed according to ASTM D975-02 (or a later revision of this standard). ASTM D1796 is used to check for water and sediment. Determination of particulates is according to ASTM Standard D2276. Reference LRPD-02 (AMPER) Section 4.9. Exceptions to NUREG-1801 Section XI.M30 parameters monitored/inspected are described in LRA Section B.1.9. Procedure OP-4613 is available for on-site review in the program basis document.

21 **Category** Closed

Request B.1.9-K-06
Is multi-level sampling used to detect the presence of contaminants in the fuel oil and, if not, please provide the technical justification for the approach used at the plant?

Response As stated in LRA Section B.1.9, the Diesel Fuel Monitoring Program is consistent with NUREG-1801, Section XI.M30 for the detection of aging effects attribute. As described in NUREG-1801, periodic multi-level sampling is used to provide assurance that fuel oil contaminants are below unacceptable levels. Reference LRA Section B.1.9 and LRPD-02 (AMPER) Section 4.9.

22 **Category** Closed

Request B.1.9-K-07
Are the interior surfaces of the fuel oil tanks visually inspected and, if so, provide a copy of a representative plant procedure used for the tank inspection?

Response As stated in LRA Section B.1.9, the Diesel Fuel Monitoring Program is consistent with NUREG-1801, Section XI.M30 for the detection of aging effects attribute. As described in NUREG-1801, the fuel oil storage tank is periodically drained, cleaned and visually inspected to detect potential degradation. Reference LRA Section B.1.9 and LRPD-02 (AMPER) Section 4.9. PM Activity 3 of PM Basis M118 is available for on-site review in the program basis document.

The diesel day tanks are 800 gallon tanks located above ground and adjacent to the emergency diesels in separate rooms. The design of the tanks does not provide access for cleaning. The fuel oil for these tanks is supplied from the Main Fuel Oil Storage Tank. The suction for the transfer pumps is located 4" off of the bottom of the tank. Chemistry samples both the Main Tank and the Day Tanks from the bottom of the tanks. Water and/or sediment in the Main Storage Tank would be detected prior to it being transferred to the Day Tanks.

Each of the Emergency Diesel Generators is run for 4 hours monthly with each diesel using approximately 200 gallons of fuel oil per hour. This ensures that the fuel oil is turned over every month and that there are no stability issues. There have been no indications of water and sediment in the quarterly analyses from these tanks. Since VYNPS is sampling from the bottom of these tanks and has not detected problems with the fuel oil, there is no reason to drain and clean the tanks.

The John Deere Diesel Generator (JDDG) is run under load monthly for 1 hour. This diesel uses 10 gallons per hour and the surveillance requires verification of auto feed. The fire pump diesel is operated during monthly and quarterly surveillance tests. Thus, the fuel in the metal tanks associated with the JDDG and fire pump diesels is turned over frequently.

23 **Category** Closed

Request B.1.9-K-08
Are UT measurements conducted on the fuel oil tank bottoms? How often are these measurements taken and provide a copy of a representative plant procedure which governs these measurements?

Response A 1996 ultrasonic thickness measurement of the fuel oil storage tank bottom surface revealed no significant degradation. The Diesel Fuel Monitoring Program includes an enhancement to perform UT measurements of the fuel oil storage tank bottom surface every 10 years during the period of extended operation. Reference LRA Section B.1.9. WO 94-08951, with the results of the 1996 UT measurement, is available for on-site review in the program basis document.

24 **Category** Closed

Request B.1.9-K-09
How often are the fuel oil in the tanks sampled? Is this data trended and what criteria is used to initiate corrective actions?

Response The Diesel Fuel Monitoring Program is consistent with NUREG-1801, Section XI.M30 for the monitoring and trending attribute. As described in NUREG-1801, monitoring (sampling) and trending occurs at least quarterly, and in accordance with VYNPS Technical Specifications (monthly). Reference LRA Section B.1.9 and Technical Specification 4.10.C.2. Filterable solids acceptance criterion is = 10 mg/l. Water and sediment acceptance criterion is = 0.05%, UT acceptance criterion will be = 60% nominal thickness. Reference LRA Section B.1.9 and LRPD-02 (AMPER) Section 4.9.

25 **Category** Closed

Request B.1.9-K-10
Have there been any component failures related to the quality of the fuel oil which led to the loss of intended function?

Response The review of plant operating experience did not reveal any component failures related to the quality of the fuel oil that led to the loss of intended function. Reference LRA Section B.1.9 and LRPD-05 (OE Report).

26 **Category** Accepted

Request B.1.10-N-01
The results of the EQ of electrical equipment in LRA Section 4.4. indicate equipment identified in the TLAA. The important attributes of a re-analysis are the analytical methods, the data collection, the reduction methods, the underlying assumptions, the acceptance criteria, and corrective actions. Provide information on these important attributes of re-analysis of an aging evaluation of electrical equipment identified in the TLAA to extend the qualification under 10 CFR 50.49(e)

Response LRA Appendix B.1.10 will be revised to add the following:
VYNPS may perform re-analysis of an aging evaluation in order to extend the qualification of electrical components under 10 CFR 50.49 on a routine basis as part of the plant's EQ program. Important attributes for the re-analysis of an aging evaluation include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions.

VYNPS may apply this re-analysis program to EQ components now qualified for the current operating term. A re-analysis program that meets the conditions defined in the GALL report for important attributes, is an acceptable AMP for license renewal under option 10 CFR 54.21(c)(1)(iii).

EQ Component Re-analysis Attributes
The re-analysis of an aging evaluation is normally performed to extend the qualification by reducing excess conservatism incorporated in the prior evaluation. Reanalysis of an aging evaluation to extend the qualification of a component is performed on a routine basis pursuant to 10 CFR 50.49(e) as part of an EQ program. While a component life limiting condition may be due to thermal, radiation, or cyclical aging, the vast majority of component aging limits are based on thermal conditions. Conservatism may exist in aging evaluation parameters, such as the assumed ambient temperature of the component, an unrealistically low activation energy, or in the application of a component (de-energized versus energized). The re-analysis of an aging evaluation is documented according to the station's quality assurance program requirements, that requires the verification of assumptions and conclusions. As already noted, important attributes of a re-analysis include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions (if acceptance criteria are not met). These attributes are discussed below.

Analytical Methods:
The analytical models used in the re-analysis of an aging evaluation are the same as those previously applied during the prior evaluation. The Arrhenius methodology is an acceptable thermal model for performing a thermal aging evaluation. The analytical method used for a radiation aging evaluation is to demonstrate qualification for the total integrated dose (that is, normal radiation dose for the projected installed life plus accident radiation dose). For license renewal, one acceptable method of establishing the 60-year normal radiation dose is to multiply the 40-year normal radiation dose by 1.5 (that is, 60 years/40 years). The result is added to the accident radiation dose to obtain the total integrated dose for the component. For cyclical aging, a similar approach may be used. Other models may be justified on a case-by-case basis.

Data Collection and Reduction Methods:
Reducing excess conservatism in the component service conditions (for example, temperature, radiation, cycles) used in the prior aging evaluation is the chief method used for a re-analysis. Temperature data used in an aging evaluation is to be conservative and based on plant design temperatures or on actual plant temperature data. When used, plant temperature data can be obtained in several ways, including monitors used for Technical Specification compliance, other installed monitors, measurements made by plant operators during rounds, and temperature sensors on large motors (while the motor is not running). A representative number of temperature measurements are conservatively evaluated to establish the temperatures used in an aging evaluation. Plant temperature data may be used in an aging evaluation in different ways, such as (a) directly applying the plant temperature data in the evaluation, or (b) using the plant temperature data to demonstrate conservatism when using plant design temperatures for an evaluation. Any changes to material activation energy values as part of a re-analysis are to be justified on a plant-specific basis. Similar methods of reducing excess conservatism in the component service conditions used in prior aging evaluations can be used for radiation and cyclical aging.

Underlying Assumptions:
EQ component aging evaluations contain sufficient conservatism to account for most environmental changes occurring due to plant modifications and events. When unexpected adverse conditions are identified during operational or maintenance activities that affect the normal operating environment of a qualified component, the affected EQ component is evaluated and appropriate corrective actions are taken that may include changes to the qualification bases and conclusions.

Acceptance Criteria and Corrective Actions:
The re-analysis of an aging evaluation could extend the qualification of the component. If the qualification cannot be extended by re-analysis, the component is to be refurbished, replaced, or re-qualified prior to exceeding the period for which the current qualification remains valid. A re-analysis is to be performed in a timely manner (that is, sufficient time is available to refurbish, replace, or re-qualify the component if the re-analysis is unsuccessful).

27 **Category** Closed

Request B.1.10-N-02
GALL X.E1, Environment Qualification (EQ) of Electric Components, under "Parameter Monitored/Inspected" states that EQ component qualified life is not based on condition or performance monitoring. However, pursuant to Regulatory Guide 1.89, Rev. 1, such monitoring programs are an acceptable basis to modify a qualified life through analysis. Monitoring or inspection of certain environmental conditions or component parameters may be used to ensure that the component is within the bounds of its qualified basis, or as a means to modify the qualified life. Provide a detailed description of a monitoring program to modify the qualified life of EQ components through re-analysis and how the actual operating environment is determined.

Response The EQ program (10 CFR 50.49) does not require environmental monitoring, because the EQ components are qualified based on conservative bounding plant environments. The VYNPS EQ program, consistent with GALL X.E1, ensures that the components covered by the program are replaced at the end of the qualified life or the qualified life is modified by analysis in accordance with the applicable regulations governing the program.

28 **Category** Closed

Request B.1.10-N-03
Discuss operating experience of the existing EQ program. Show where an existing program has succeeded and where it has failed in identifying aging degradation in a timely manner.

Response The EQ program is a qualification program that assures SSCs are replaced prior to exceeding qualified life beyond that date when unacceptable aging degradation may occur. The review of OE identified no conditions in which the program failed to identify unacceptable aging degradation. License Event Report (LER) 97-20 notified the NRC staff of program deficiencies including non-conservative analytical methods. Supplementary and confirmatory analyses were completed because conditions in the EQ analyses were determined to be non-conservative. This OE demonstrates that the corrective action process is used to document program deficiencies and track corrective actions when necessary.

QA audits in 2000 and 2002 identified deficiencies related to maintenance and content of program documentation. A 2004 QA audit and engineering program health report determined the program is effective and being administered and maintained in a manner that meets regulatory requirements and commitments.

29 **Category** Accepted

Request B.1.11-P-1
Please clarify the basis for excluding the impact of environmental factors for critical locations during the period of extended operation.

Response The impact of environmental factors on fatigue at critical locations during the period of extended operation will be addressed as stated in the following commitment.

Prior to entering the period of extended operation, for each of the seven locations that may exceed a CUF of 1.0 when considering environmental effects, VYNPS will implement one or more of the following: (1) further refinement of the fatigue analyses to lower the predicted CUFs to less than 1.0; (2) management of fatigue at the affected locations by an inspection program that has been reviewed and approved by the NRC (e.g., periodic non-destructive examination of the affected locations at inspection intervals to be determined by a method acceptable to the NRC); (3) repair or replacement of the affected locations. Should VYNPS select the option to manage environmental-assisted fatigue during the period of extended operation, details of the aging management program such as scope, qualification, method, and frequency will be provided to the NRC prior to the period of extended operation. Reference LRA Section 4.3.
This is License Renewal Commitment No. 27.

30 **Category** Accepted

Request B.1.12.1-L-01
Program Description Item - The GALL states, "The AMP also includes periodic inspection and testing of the halon/carbon dioxide (CO2) fire suppression system." The LRA does not address the halon/carbon dioxide (CO2) fire suppression system. On what basis does the LRA not address the halon/carbon dioxide (CO2) fire suppression system?

Response The Halon 1301 suppression system provides fire suppression only for the computer room. There are no Appendix A, SER commitments or Appendix R commitments requiring the Halon 1301 suppression system. Therefore, it is not subject to aging management review. Aging effects for components in the CO2 system are managed by the System Walkdown Program. Reference LRA Section B.1.12.1, exception note 1; LRA Table 3.3.2-9; and AMRM-17 (Aging Management Review of the Fire Protection - Water System).

VY will perform CO2 system walkdowns every 6 months starting no later than the beginning of the period of extended operation.
This is License Renewal Commitment #30.

31 **Category** Closed

Request B.1.12.1-L-02
Scope of Program Element - The GALL states, "The AMP also includes management of the aging effects on the intended function of the halon/CO2 fire suppression system." The LRA states, "This program is not necessary to manage aging effects for halon fire protection system components." What program will manage aging effects on halon system components?

Response The computer room fire suppression is provided by a Halon 1301 suppression system. There are no Appendix A, SER commitments or Appendix R commitments requiring the Halon 1301 suppression system. Therefore, it is not subject to aging management review. Reference AMRM-17 (Aging Management Review of the Fire Protection - Water System).

32 **Category** Closed

Request B.1.12.1-L-03
The LRA states “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." Explain rational for why the Halon 1301 suppression system is not subject to review.

Response The computer room fire suppression is provided by a Halon 1301 suppression system. There are no Appendix A, SER commitments or Appendix R commitments requiring the Halon 1301 suppression system. Therefore, it is not subject to aging management review. Reference AMRM-17 (Aging Management Review of the Fire Protection - Water System).

33 **Category** Accepted

Request B.1.12.1-L-04
Parameters Monitored/Inspected Element - The GALL Report states, "The diesel-driven fire pump is under observation during performance tests such as flow and discharge tests, sequential starting capability tests, and controller function tests for detection of any degradation of the fuel supply line." The LRA states, "Procedures will be enhanced to state that the diesel engine sub-systems (including the fuel supply line) shall be observed while the pump is running." Is there a VYNPS commitment number associated with this enhancement?

Response Yes - License Renewal Commitment #9 addresses this enhancement

34 **Category** Closed

Request B.1.12.1-L-05
Detection of Aging Effects Element - The GALL Report states, "Visual inspection by fire protection qualified inspectors of approximately 10% of each type of seal in walkdowns is performed at least once every refueling cycle." The LRA states, "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 (4) operating cycles. Since aging effects are typically manifested over several years, this variation in inspection frequency is insignificant." How are inaccessible seals addressed?

Response The environment to which inaccessible seals are exposed is very similar, if not the same, as the environment for accessible seals such that the condition of accessible seals is representative of the condition of inaccessible seals.

35 **Category** Closed

Request B.1.12.1-L-06
Acceptance Criteria Element - The GALL states, "Inspection results are acceptable if there are no visual indications (outside those allowed by approved penetration seal configurations) of cracking, separation of seals from walls and components, separation of layers of material, or ruptures or punctures of seals; no visual indications of concrete cracking, spalling and loss of material of fire barrier walls, ceilings, and floors; no visual indications of missing parts, holes, and wear and no deficiencies in the functional tests of fire doors." The LRA states, "Acceptance criteria will be enhanced to verify no significant corrosion." How much corrosion is considered "significant?" What actions are taken, either with or without "significant corrosion"? Is there a VYNPS commitment number associated with this enhancement?

Response Licensing Commitment #8 addresses the need to revise these acceptance criteria.

Any recordable indication is entered into the Corrective Action Program for evaluation.

36 **Category** Closed

Request B.1.12.2-L-01
Program Description Item - The GALL states, "This aging management program (AMP) applies to water-based fire protection systems that consist of sprinklers, nozzles, fittings, valves, hydrants, hose stations, standpipes, water storage tanks, and aboveground and underground piping and components that are tested in accordance with the applicable National Fire Protection Association (NFPA) codes and standards." The LRA states, "This aging management program applies to water-based fire protection systems that consist of sprinklers, nozzles, fittings, valves, hydrants, hose stations, standpipes, and aboveground and underground piping and components that are tested in accordance with applicable National Fire Protection Association (NFPA) codes and standards." Does VYNPS have fire water storage tanks?

Response No, VYNPS does not have fire water storage tanks. Reference UFSAR Section 10.11.

37 **Category** Accepted

Request B.1.12.2-L-02
Program Description Item - The GALL states, "The fire protection system piping is to be subjected to required flow testing in accordance with guidance in NFPA 25 to verify design pressure or evaluated for wall thickness (e.g., non-intrusive volumetric testing or plant maintenance visual inspections) to ensure that aging effects are managed and that wall thickness is within acceptable limits. These inspections are performed before the end of the current operating term and at plant-specific intervals thereafter during the period of extended operation. The plant-specific inspection intervals are to be determined by engineering evaluation of the fire protection piping to ensure that degradation will be detected before the loss of intended function. The purpose of the full flow testing and wall thickness evaluations is to ensure that corrosion, MIC, or bio-fouling is managed such that the system function is maintained." The LRA does not address this item. How does VYNPS intend to address these NFPA and GALL recommendations?

Response This paragraph comes from NUREG-1801, Section XI.M27 program description. The recommendation for flow testing is included in the NUREG-1801 technical basis for the parameters monitored/inspected attribute. As stated in LRA Section B.1.12.2, the VYNPS Fire Water System Program is consistent with this attribute. Every fire main segment is full flow tested using the guidelines of NFPA 25 at least once every 3 years. Reference LRPD-02 (AMPER) Section 4.12.2.

The recommendation for wall thinning monitoring is included in the NUREG-1801 technical basis for the detection of aging effects attribute. As indicated in LRA Section B.1.12.2, the Fire Water System program includes an enhancement to this attribute to perform wall thickness evaluations of fire protection piping 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 at intervals thereafter. Results of the initial evaluations will be used to determine the appropriate inspection interval.

This is License Renewal Commitment # 11.

38 **Category** Accepted

Request B.1.12.2-L-03
Detection of Aging Effects Element - The GALL Report states, "Fire hydrant hose hydrostatic tests, gasket inspections, and fire hydrant flow tests, performed annually, ensure that fire hydrants can perform their intended function and provide opportunities for degradation to be detected before a loss of intended function can occur." The LRA states, "NUREG -1801 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." Provide justification for relaxing the test frequency.

Response Per NUREG-1800, Table 2.1-3, fire hoses are consumables not subject to aging management review. Therefore, the exception to the Fire Water System program related to fire hydrant hose hydrostatic tests is not necessary. (An aging management program is not required to address components that are not subject to aging management review.)

39 **Category** Closed

Request B.1.12.2-L-04
Detection of Aging Effects Element - The GALL states, "Fire hydrant hose hydrostatic tests, gasket inspections, and fire hydrant flow tests, performed annually, ensure that fire hydrants can perform their intended function and provide opportunities for degradation to be detected before a loss of intended function can occur." The LRA states, "NUREG-1801 specifies annual gasket inspections. Under the VYNPS program, visual inspection, re-racking and replacement of gaskets in couplings is to occur at least once per 18 months." Provide justification for relaxing the test frequency.

Response Since aging effects are typically manifested over several years, differences in inspection and testing frequencies are insignificant. The review of operating experience did not reveal age-related failures of fire water system components that led to loss of intended function. Reference LRA Section B.1.12.2, exception note 1 and LRPD-05 (OE Report). License Renewal Commitment 31 agrees to examine these components annually.

40 **Category** Closed

Request B.1.12.2-L-05
Detection of Aging Effects Element - The GALL states, "Fire hydrant hose hydrostatic tests, gasket inspections, and fire hydrant flow tests, performed annually, ensure that fire hydrants can perform their intended function and provide opportunities for degradation to be detected before a loss of intended function can occur." The LRA states, "NUREG-1801 specifies annual fire hydrant flow tests. Under the VYNPS program, verification of operability and no flow blockage occurs at least once every 3 years." Provide justification for relaxing the test frequency.

Response As stated in LRA Section B.1.12.2, exception note 1, since aging effects are typically manifested over several years, differences in inspection and testing frequencies are insignificant. The review of operating experience did not reveal age-related failures of fire water system components that led to loss of intended function. Reference LRPD-05 (OE Report).

License Renewal Commitment 31 agrees to examine these components annually.

41 **Category** Accepted

Request B.1.12.2-L-06
Detection of Aging Effects Element - The GALL Report states, "Fire protection system testing is performed to assure that the system functions by maintaining required operating pressures. Wall thickness evaluations of fire protection piping are performed on system components using non-intrusive techniques (e.g., volumetric testing) to identify evidence of loss of material due to corrosion. These inspections are performed before the end of the current operating term and at plant-specific intervals thereafter during the period of extended operation." The VYNPS LRA identified the following enhancement, "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 at intervals thereafter 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." What is the VYNPS commitment number associated with this enhancement?

Response License Renewal Commitment #11 is the commitment associated with this enhancement.

42 **Category** Closed

Request B.1.15.1-W-01
Provide drawings for the sand pocket region of the Drywell. Provide drawings for the refueling bellows detailing how they are stored, installed, connected and sealed. Provide procedures for how the refueling bellows are used. Provide drawings of the Drywell showing the gap and fill material between the secondary concrete shield wall from the refueling bellows/cavity seal connection down to the sand pocket region. Provide the VYNPS response to Generic Letter 87-05.

Response Portions of drawings G-191150, G-191277, & G-191481 have been provided to the NRC for the Sand pocket region of the Drywell; Refueling Bellows assemblies, and the General Arrangement of the Reactor Building including the Primary Containment.

The Refueling Bellows (to RPV) and the Drywell to Reactor Cavity Seal assemblies are permanently installed by full penetrant welds. The bellows allow the Refueling Cavity to be flooded during refueling operations to allow for spent fuel transfer to the Spent Fuel Pool for storage. No procedures are required for the operation of the bellow assemblies since they are static. Operation of the drain line isolation valves are controlled by plant operating procedures used for flood-up and drain-down of the cavity.

There is no fill material in the gap located between the Drywell Shell and the Secondary Concrete Shield.

VYNPS response to GL 87-05 has been provided to the NRC.

43 **Category** Closed

Request B.1.15.1-W-02

It is stated in the VYNPS UFSAR that all interior and exterior drywell surfaces which are exposed to the atmosphere are protected from corrosion by application of a corrosion resistant coating material. However, in the VYNPS LRA it is stated that VYNPS does not rely on protective coating to manage the effects of aging. The VYNPS LRA Appendix B does not have a Protective Coating Monitoring and Maintenance Program section. However, there is a GALL AMP XI.S8 called Protective Coating Monitoring and Maintenance Program which states the following: Proper maintenance of protective coatings inside containment (defined as Service Level I) is essential to ensure operability of post-accident safety systems that rely on water recycled through the containment sump/drain system. Explain why VYNPS does not have a Service Level I Protective Coating Monitoring and Maintenance Program to prevent coating failure that could adversely affect the operation of post-accident fluid systems and thereby impair safe shutdown. Provide a copy of the VYNPS response to GL 98-04 and discuss if VYNPS considers the maintenance programs described acceptable coatings AMPs for license renewal.

Response VYNPS has a Service Level I Coatings Program, however it is not relied on for managing the aging effects for licensing renewal.

The VYNPS UFSAR states: "No material within primary containment will fail by decomposition or corrosion and affect vital systems." The examination of the coated surfaces is performed as a part of the Containment Inservice Inspection Program (IWE) to assure that the paint and base metal has not degraded (TS Section 4.7.A). VY has an active and effective Service Level I Coatings Program to prevent degradation to the primary containment structure.

VYNPS response to GL 98-04 includes our commitment to EPRI TR-109937 "Guideline on Nuclear Safety-Related Coatings (renumbered 1003102). The GL also discusses the impact of debris loading on the ECCS strainers. These strainers were designed to accept 100% of the coatings within the LOCA zone of influence. The approach velocity of materials entrained in the torus water is extremely low due to the sizing of the ECCS strainers. Conservative design assumptions ensures VYNPS compliance with 10CFR50.46(b)(5).

A copy of VYNPS response to GL 98-04 has been provided.

44 **Category** Closed

Request B.1.15.1-W-03

Explain why the Containment Inservice Inspection Program is a plant-specific program instead of an ASME Section XI, subsection IWE program with exceptions. Explain why the scope of the Containment Inservice Inspection Program does not include containment seals, gaskets and pressure retaining bolts. Explain under what VYNPS AMPs the inspection of these components are performed. It is stated in the VYNPS LRA that the Containment Inservice Inspection Program is an existing program. Explain if this program has been in compliance with ASME Section XI, subsection IWE since the final rulemaking to require IWE inspections was made by the NRC in 1996. Provide a copy of the VYNPS notification of commitment to IWE inspections.

Response Entergy chose to describe the Inservice Inspection and Containment Inservice Inspection Programs as plant-specific programs rather than comparing to the corresponding NUREG-1801 programs because the NUREG-1801 programs contain many ASME Section XI table and section numbers that change with different versions of the code. Because of this, comparison with the NUREG-1801 programs generates many exceptions and explanations that detract from the objective of the comparison. VYNPS follows the version of ASME Section XI that is approved for use at VYNPS and accepted by 10CFR50.55(a). As this is the case, the Inservice Inspection and Containment Inservice Inspection Programs are presented as plant-specific programs so they can be judged on their own merit without the distraction of numerous explanations of code revision.

The Containment Inservice Inspection Program does not include containment seals or gaskets because they have been removed from the scope of Subsection IWE in the 1998 Edition of ASME Section XI with 2000 Addenda. These components are inspected under the Structures Monitoring Program as indicated in Table 3.5.2.1 of the LRA. Pressure retaining bolts are considered and included as integral part of the structural components.

The Containment Inspection Program does not include containment seals or gaskets because they have been removed from the scope of Subsection IWE in the 1998 Edition of ASME Section XI with 2000 Addenda. These components are seal tested under the Containment Leak Rate Program. Pressure retaining bolts are considered and included as Containment Inservice Inspection Program.

VY has been in compliance with10CFR50.55a (b)(2)(vi) and (b)(2)(ix) since at least September 9, 2001. No notification of commitment to the IWE examinations was required by 10CFR50.55a. In 2003, VY submitted a notification of the intent to use ASME Section XI -1998 Edition with 2000 Addenda as the Code of Record for all ISI programs. A copy of the submittal has been provided.

45 **Category** Closed

Request B.1.15.1-W-04
Explain how inspections are performed in the torus suppression pool above and below the waterline. Explain historically what inspection findings have lead to the need for augmented inspections. Explain if any augmented inspections are currently being performed. The LRA states that VYNPS uses inspection program B for containment inservice inspection. Provide the inspection interval dates through the current license and also through a possible license extension period.

Response Examinations are performed in accordance with the Code of Record that requires the examination of all accessible interior and exterior surfaces. In 1998, the interior surface, slightly above and fully below the water line, was stripped and coated. During RFO-24 (2004), the Suppression Pool exterior surface was General Visual examined. Though normally inaccessible, the Suppression Pool interior was made accessible and the surface above the water-line was General Visual examined. During the General Visual examination of the interior surface, the water clarity permitted observation of nearly 100% of the submerged surface area. Three small areas (at the water line) in BAY 3 were identified to have a loss of coating and primer. These areas were UT (ultrasonic tested) from the exterior, in 2" gridded areas. No result approached the minimum wall thickness of 0.533" with the lowest reading being 0.597." Based on the results, these areas were excluded from augmented examination. In RFO-27 (2008), the VT-3 of the wetted areas is presently planned to be executed by divers without dewatering the Suppression Pool. The current examination schedule is contained in Program Bases Document (4.14.2) in the PP 7024 tables. The projected schedule through the possible license extension period will be developed in accordance with the Code in effect but should be 6 inspection periods in 20 years.

46 **Category** Closed

Request B.1.15.1-W-05
VYNPS lists several Containment Inservice Inspection findings under operating experience for AMP B.1.15.1 in the LRA. Explain why the operating experience discusses the drywell moisture barrier when the inspection of it does not appear to be in the scope of the VYNPS Containment Inservice Inspection Program. Provide the documentation for any containment inspection findings from the most recent RFO if beyond 24. Explain if water leakage has ever been discovered between the drywell and concrete secondary shield wall or in the sand pocket area. Explain what VYNPS does to inspect for water leakage in these two areas or to verify that loss of material is not occurring on the backside of the Drywell. Provide the documentation for the RFO 24 issues identified by QA surveillance that are discussed in the operating experience. Provide the latest engineering system health report for the containment in-service inspection program.

Response Drywell moisture barrier is examined under the Containment Inservice Inspection Program. Table IWE-2500-1 Item E1.30 of ASME Section XI-1998 Edition with 2000 Addenda is contained in the Program Bases Document (4.14.2) in the PP 7024 tables. The Program Based Document (4.14.2) in Section B.1.15.1.10, describes the area examined and replaced during RFO-21 (2001). LRA Table 3.5.2.6 shows the drywell moisture barrier to be inspected under the structural monitoring program; this will be changed to the Containment Inservice Inspection Program. IWE examinations during RFO-25 (2005) produced no findings.

In 1991, an Auxiliary Operator (AO) observed water running from a crack in the Drywell pedestal concrete onto the Torus Room floor. The investigation revealed leakage from a steam valve was condensing on and traveling along the Primary Containment Air Conditioning piping to the Drywell shell. From the Drywell shell, the water found a crack or cold-joint that directed it to the Torus Room floor. To ensure the Drywell shell integrity, the sand-cushion drains were examined and found to be functional; the exterior drywell shell was inspected and determined to be non-corroded; and the sand-cushion was observed to be dry, compacted, with adequate ventilation to assure the sand would remain dry.

47 **Category** Accepted

Request B.1.16-P-1
Please identify the standard(s) to which instrument air is maintained, and document this commitment in Appendix A if appropriate.

Response License Renewal Commitment # 28 ensures that instrument air is maintained in accordance with ISA S7.3.

48 **Category** Accepted

Request B.1.17-N-01
GALL XI.E3 under "Detection of Aging Effects" recommends that the inspection for water collection should be performed based on actual plant experience with water accumulation in the manhole. However, the inspection frequency should be at least once every two years. VYNPS AMP B.1.17 under the same attribute requires inspection for water collection in cable manholes and conduit occurs at least once every two years. Explain how actual plant experience is considered in the manhole inspection frequency to be consistent with GALL's XI.E3.

Response LRA Appendix B.1.17 will be revised to include the following:
VYNPS inspection for water accumulation in manholes is conducted by a plant procedure. An engineering evaluation will be used per EN-LI-102 to document and determine the plant experience that is considered in manhole inspection frequency.
This requires an amendment to the LRA.

49 **Category** Closed

Request B.1.17-N-02
In AMP B.1.17 under the "Operating Experience" element, you have stated that the "Non-EQ Inaccessible Medium-Voltage Cable Program" at VYNPS is a new program for which there is no operating experience. GALL XI.E3 under the same element states that operating experience has shown that cross linked polyethylene (XLPE) or high molecular weight polyethylene (HMWPE) insulation materials are most susceptible to water tree formation. The formation and growth of water trees varies directly with operating voltage. Water treeing is much less prevalent in 4kV cables than those operated at 13 or 33kV. Also, minimizing exposure to moisture minimizes the potential for the development of water treeing. As additional operating experience is obtained, lessons learned can be used to adjust the program, as needed. NUREG-1800, Rev. 1, Appendix A, Branch Technical Position RLSB-1 states that an applicant may have to commit to providing operating experience in the future for new programs to confirm their effectiveness. Describe how operating experience is captured at VYNPS to confirm program effectiveness or how it is to be used to adjust the program as needed.

Response Operating Experience at VYNPS is controlled by procedure EN-OP-100, Operating Experience Program. The program includes the following components:
Operating Experience – Information received from various industry sources that describe events, issues, equipment failures that may represent opportunities to apply lessons learned to avoid negative consequences or to recreate positive experiences as applicable.
Internal Operating Experience – Operating Experience that originates as a condition report or request from plant personnel that warrants consideration for possible Entergy-wide distribution. Internal OE can originate from any Entergy plant or headquarters.
Impact Evaluation – Analysis of an OE event or problem that requires additional information and research to determine impact or potential impact, as it relates to plant condition and/or configuration. Impact evaluations are typically documented with a Condition Report.
Condition Report action items and corrective actions are used to confirm program effectiveness and to modify the program as needed

50 **Category** Open

Request B.1.17-N-03
As stated in FSAR Section 8.3.3 (Page 8.3-5 of 8), the underground power lines - that run from the adjacent Vernon Hydroelectric Station to station switchgear - have been designated as the Station Blackout alternate AC source. Thus; they are used to meet Station Blackout requirements 10 CFR 50.63. Are these cables included in the scope of AMP B.1.17? If not, provide an explanation.

Response Yes, the underground power lines that run from Vernon Dam Switchyard to VYNPS safety buses, are included in program B.1.17.

51 **Category** Accepted

Request B.1.18-N-01
In AMP B.1.18, you have stated that for neutron flux monitoring system cables that are disconnected during instrument calibration, testing is performed at least once every 10 years . GALL XI.E2 recommends that the test frequency shall be determined by the applicant based on engineering evaluation, but the test frequency shall be at least once every ten years. Explain how engineering evaluation is considered in the test frequency; in order to be consistent with GALL XI.E2.

Response LRA Appendix B.1.18 will be revised as follows:
The first test of neutron monitoring system cables that are disconnected during instrument calibrations shall be completed before the period of extended operation and subsequent tests will occur at least every 10 years. In accordance with the Corrective Action Program, an engineering evaluation will be performed when test acceptance criteria are not met and corrective actions, including modified inspection frequency will be implemented to ensure that the intended functions of the cables can be maintained consistent with the current licensing basis for the period of extended operation. This requires an amendment to the LRA.

52 **Category** Closed

Request B.1.18-N-02
Confirm that the test includes both cables and connections.

Response Yes, the B.1.18 program includes both cables and connections for the instrument circuits that are in scope for license renewal.

53 **Category** Accepted

Request B.1.19-N-01
In AMP B.1.19 you have stated that the a representative sample of accessible insulated cables and connections, within the scope of license renewal, will be visually inspected for cable and connection jacket surface anomalies such as embrittlement, discoloration, cracking or surface contamination. The technical basis for sampling will be determined using EPRI document TR-109619, "Guideline for the Management of Adverse Localized Equipment Environments". Explain the technical basis for cable sampling.

Response The LRA Appendix B.1.19 program description will be changed to read as follows:
This program addresses cables and connections at plants whose configuration is such that most cables and connections installed in adverse localized environments are accessible. This program can be thought of as a sampling program. Selected cables and connections from accessible areas will be inspected and represent, with reasonable assurance, all cables and connections in the adverse localized environments. If an unacceptable condition or situation is identified for a cable or connection in the inspection sample, a determination will be made as to whether the same condition or situation is applicable to other accessible cables or connections. The sample size will be increased based on an evaluation per EN-LI-102 – Corrective Action Process.
This requires an amendment to the LRA.

54 **Category** Closed

Request B1.19-N-02
In AMP B.1.19 under the "Operating Experience" element, you have stated that the Non-EQ Insulated Cables and Connection Program at VYNPS is a new program for which there is no operating experience. GALL XI.E1 under same element states that operating experience has shown that adverse localized environments caused by heat or radiation for electrical cables and connections may exist next to or above (within three feet of) steam generators, pressurizers or hot process pipes, such as feedwater lines. These adverse localized environments have been found to cause degradation of the insulating materials on electrical cables and connections that is visually observable, such as color changes or surface cracking. NUREG-1800, Rev. 1, Appendix A, Branch Technical Position RLSB-1 under operating experience states that an applicant may have to commit to providing operating experience in the future for a new program to confirm its effectiveness. Describe how operating experience will be captured by VYNPS.

Response Operating Experience at VYNPS is controlled by procedure EN-OE-100, Operating Experience Program. The program includes the following components:
•Operating Experience – Information received from various industry sources that describe events, issues, equipment failures, that may represent opportunities to apply lessons learned to avoid negative consequences or to recreate positive experiences as applicable.
•Internal Operating Experience – Operating Experience that originates as a Condition Report or request from plant personnel that warrants consideration for Entergy-wide distribution. Internal OE can originate from any Entergy plant or headquarters.
•Impact Evaluation – Analysis of an OE event or problem that requires additional information and research to determine impact or potential impact, as it relates to plant condition and/or configuration. Impact evaluations are typically documented within a Condition Report.

Condition Report action items and corrective actions are used to confirm program effectiveness and to modify the program as needed.

55 **Category** Closed

Request B.1.20-K-01
For those components that do not have regular oil changes, please provide the basis for Note 1 (not determining the flash point for the sampled oil).

Response As stated in LRA Section B.1.20, exception note 1, flash point is not determined for sampled oil because analyses of filter residue or particle count, viscosity, total acid/base (neutralization number), water content, and metals content provide sufficient information to verify the oil does not contain water or contaminants that would permit the onset of aging effects.

Added Response: Fuel dilution is measured on EDG lube oil, rather than determining the flash point.

In lieu of performing Flash point testing on the Emergency Diesel Generators, Diesel Driven Fire Pump and the John Deere Diesel Generator, a test for fuel and water by % of volume is performed. This test accomplishes the same goal as the flash point test but is more prescriptive then the flash point test. There could be two factors that affect the flash point of the oil; the addition of fuel that would lower the flash point or the addition of water that would raise the flash point. The worst case would be a combination of the two. By determining the % by volume of both fuel and water, the analysis can determine the cause of the change in flash point without having to conduct additional tests and corrective actions, if required, could be implemented on a timelier basis.

Additional tests to determine the “Health” of the diesels are; total base number (TBN), viscosity, SAE Grade, Total Soot, and Spectrometals analysis (for wear metals and additives). The results of these analyses are trended to determine the total health of the diesel and the quality of its lubricating oil. Diesel Lube Oil Analyses are performed on a quarterly basis.

56 **Category** Closed

Request B.1.20-K-02
How are the alert levels or action limits established? How is the data trended and what criteria are used to determine if the trends are unusual?

Response As indicated in LRA Section B.1.20, the Oil Analysis Program is consistent with NUREG-1801, Section XI.M39 for the acceptance criteria attribute. As recommended in NUREG-1801, action limits were established in accordance with industry standard ISO 4406 and manufacturer's recommendations. See DP 0213 (available for on-site review in the program basis document) for trending and criteria.

57 **Category** Closed

Request B.1.21-K-01
Please provide a table outlining the inspection methods used for each aging effect and parameter monitored or inspected. This should be consistent with the table provided in GALL Report AMP XI.M32. If not, provide a justification for any exceptions to this table.

Response Attachment 2 of LRPD-02 (AMPER), which is available for on-site review in the program basis document, is a table similar to the table provided in the GALL report. Attachment 2 identifies the inspection method and parameters monitored for applicable aging effects. As indicated in LRA Section B.1.21, Attachment 2 of LRPD-02 (AMPER) is consistent with the table provided in NUREG-1801, Section XI.M32.

58 **Category** Closed

Request B.1.21-K-02
The table provided in the program description in Section B.1.21 indicates that the one-time inspection activity will confirm that the loss of fracture toughness is not occurring or is so insignificant that an aging management program is not warranted. What inspection method is used to detect this aging effect and what parameter is monitored?

Please address the main steam flow restrictors in the response.

Response Combinations of non-destructive examinations including visual, ultrasonic, and surface techniques will monitor cracking of CASS valve bodies in piping <4" NPS to confirm that reduction of fracture toughness is not occurring or is so insignificant that an aging management program is not warranted. Reference Attachment 2 of LRPD-02 (AMPER).

Main steam flow restrictors:
Thermal aging embrittlement results in increased rates of crack growth that are evidenced by cracking in the material. The One-Time Inspection Program will be used to verify that reduction of fracture toughness has not progressed to the point that unacceptable cracking of the component has occurred.

59 **Category** Closed

Request B.1.21-K-03
What is Vermont Yankee's operating experience with Class 1 piping less than 4 inches NPS in terms of cracking?

Response The review of plant operating experience (1998 to 2005) did not reveal instances of cracking of Class I piping less than 4"NPS. Site to confirm and address experience prior to 1998.
In the early years of plant operation VYNPS experienced occurrences of intergranular stress corrosion cracking (IGSCC) in some stainless steel piping systems. In the period of approximately 1980 through 1986 VYNPS embarked on a major IGSCC mitigation program, replacing the susceptible stainless steel piping with IGSCC resistant materials. Since then, there have been no instances of IGSCC or other pipe cracking events at VYNPS. See report “YAEC-1247, Rev. 1” and Letter FVY 88-62.

60 **Category** Closed

Request B.1.22-M-01
As stated by the applicant, "…prior to the period of extended operation, program activity implementing documents will be enhanced as necessary to assure that the effects of aging will be managed…." The applicant is asked to provide a listing of which specific PSPM plant implementing documents will be enhanced and why such an enhancement is necessary for each implementing document.

Response This information is included in Attachment 3 of LRPD-02 (AMPER) that is available for on-site review in the program basis document.

61 **Category** Closed

Request B.1.22-M-02
In the statement for the "operating experience" element of the AMP, the applicant, notes that "…the material condition of cranes was consistent with inspection acceptance criteria..", and "…ECCS corner room recirculation units had no significant corrosion..". By the appearance of these statements in the "operating experience" of the PSPM, is the staff to understand that the applicant intends to use the applicant's PSPM AMP in lieu of the GALL-recommended programs - XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems", and XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"- during the period of extended operation?

Response Yes. Reference LRA Table B-2 and Section B.1.22 Program Description.

62 **Category** Closed

Request B.1.23-M-01
As noted in the GALL, [Section XI.M3, Element Number four (4) - "Detection of Aging Effects"]; GALL-recommended programs use visual, surface, and volumetric examinations, to indicate the presence of surface discontinuities/flaws and other discontinuities/flaws throughout the volume of material. The applicant's proposed exception states that cracking initiates on the outside surfaces of the bolts/studs, and by meeting acceptance standards of IWB-3515, this "surface-type" examination will "…provide at least the sensitivity of flaw detection that an end shot ultrasonic examination provides on bolts/studs…". The applicant is asked to provide further evidence that such a "qualified surface examination" provides the stated level of sensitivity with the thoroughness of other GALL-recommended

Response VYNPS meets the 1998 edition through 2000 addenda of the ASME Section XI Code, Sub Section IWB 2500-1 Examination Category B -G-1."Pressure Retaining Boiler Greater than 2" in Diameter" items BG.20 and .30 that specifies a surface or volumetric examination method.

63 **Category** Closed

Request B.1.23-M-02
Some replacement stud bolts use a manganese phosphate surface treatment in combination MoS2 to prevent bolt degradation due to corrosion or hydrogen embrittlement. The applicant's AMP notes that Vermont Yankee's existing program includes preventive measures, such as "appropriate materials", to mitigate cracking and loss of material. GALL Section XI.M3, [Element Number two (2) - "Preventive Actions"] states that the use of this type of surface treatment is acceptable and effective. Does the applicant use similar bolting with a similar type of surface treatment?

Response As stated in LRA Section B.1.23, the Reactor Head Closure Studs Program is consistent with NUREG-1801, XI.M3 for the preventive actions attribute. As described in NUREG-1801, threaded surfaces of studs, nuts and washers have a phosphate coating to act as a rust inhibitor and lubricant. Also, a stable lubricant compatible with the bolting and vessel materials is applied to the stud threads, the mating surfaces of the washers and the nut threads during assembly. Reference LRPD-02 (AMPER) Section 4.18.

64 **Category** Accepted

Request B.1.23-M-03
As noted in GALL, Section XI.M3, [Element Number ten (10) - "Operating Experience"]; GALL-recommended programs should have provisions regarding inspection techniques and evaluation. The applicant states, in its explanation of their existing program, that "…recent (2002 and 2004) visual and ultrasonic inspections…revealed no recordable indications..". The applicant is asked to compare examinations performed in 2002 and 2004 with the "exception-stated" examination technique proposed for future examinations and to provide to the staff the results of this comparison.

Response The 2002 examinations included visual and ultrasonic inspections. The 2004 examinations were visual only as per the stated exception. Future examination will be visual only in accordance with ASME Code Case N-652. Code Case N-652 has been endorsed by the NRC per Table 1 of Regulatory Guide 1.147. Revision 14. As this Code Case is now endorsed, this inspection is no longer an exception to GALL. The LRA Supplement Letter will revoke this GALL exception. This requires an amendment to the LRA.

65 **Category** Closed

Request B.1.26-W-01
Provide examples of VYNPS plant procedures used to implement the requirements of GL 89-13/Service Water Integrity AMP for routine inspection and maintenance of the service water systems. Include examples of actual visual and NDE testing. Explain any differences between the GL 89-13 program scope and the Service Water Integrity Program scope for license renewal.

Response Procedures OP 5265, Service Water Component Inspection and Acceptance Criteria; PP 7021, Service Water Program; and PP 7601, Service Water Chemical Treatment and Monitoring Program are available for on-site review in the program basis document.

As stated in LRA Section B.1.26, the Service Water Integrity Program is consistent with NUREG-1801, XI.M20 for the scope of program attribute. Therefore, there are no differences between the GL 89-13 program scope and the Service Water Integrity Program scope for license renewal.

66 **Category** Closed

Request B.1.26-W-02
Provide the original (or current if pipe has been replaced) material and lining specification for the buried piping which is part of the service water system, including the alternate cooling system.

Response Provided a copy of the original site piping specification QC-10 that shows the piping for the Service Water and alternate cooling water systems piping is carbon steel material and are not coated.

67 **Category** Closed

Request B.1.26-W-03
VYNPS takes exception to GALL AMP XI.M20 element 2 by stating that not all VYNPS service water system components are lined or coated. Components are lined or coated only where necessary to protect the underlying metal surfaces. Provide an itemized list of the piping in the service water system where it is lined or coated to protect the underlying metal surfaces. Provide the type of lining or coating for each item on the list.

Response Linings and coatings are not credited. Piping that is lined or coated will be inspected with the same techniques used for unlined piping. An itemized listing of which piping is lined or coated was not necessary for the aging management review.

In accordance with the piping specification QC-10 there is no coated piping in the Service Water system. The only coated components are a few valve body internals and heat exchanger heads that are currently and will continue to be inspected as part of the Service Water program.

68 **Category** Closed

Request B.1.26-W-04
Explain if there any portions of the service water system that are infrequently used and are periodically flushed. If so, describe these portions and how often they are flushed. Explain the criteria used to initiate the flushing. Explain if any other flushing of the system is done and how the strainers are cleaned. Discuss the historic inspection results of the gravity portion of the ACS piping coming from the deep water basin and if this has been a problem area with flow blockage.

Response The only sections of the Service Water (SW) system that are flushed on a regular basis are the instrumentation tubing lines (3/8" stainless steel tubing). A list of the specific lines has been provided. These lines are flushed on a 12 or 18 month basis as identified in the Preventive Maintenance program. The SW strainers are self cleaning and are not opened and cleaned on a regular basis. The suction line from the deep basin to the RHRSW pumps is opened and inspected every other outage (3 years). The results of the inspection have shown the line to be free of tuberlication and silt. The line is treated with a biocide before being closed after inspection. No issues with flow blockage have been identified in the past six years. The line was found to be fouled in the early 1990's and was subsequently cleaned and the addition of biocide was started. This appears to be very successful based on the recent inspections.

69 **Category** Closed

Request B.1.26-W-05
VYNPS takes exception to GALL AMP XI.M20 element 5 by stating that the VYNPS program requires tests and inspections each refueling outage, but not annually. Provide documentation that this frequency is in agreement with the commitments made by VYNPS under GL 89-13. Provide the frequency of heat transfer testing for each heat exchanger in the service water system. The applicant is requested to state which VYNPS group is responsible for reviewing the test data and to provide through a plant procedure an example of how this process is implemented. Explain the type of heat transfer testing which is done on the service water system heat exchangers.

Response PP7021 provides information related to VYNPS's compliance with GL89-13 requirements. A copy of this procedure was provided. GL 89-13 provides for the options of performing either thermal performance testing or periodic cleaning. VYNPS has chosen to perform cleaning for most of the SW supplied heat exchanger and coolers. The exceptions are the Stand-by Fuel Pool Cooling (SBFPC) Heat Exchangers, the Emergency Diesel Generator Coolers (3 each) and the Corner Room RRU's #7 & 8. The SBFPC heat exchangers are thermal performance tested every 18 months. Based on the satisfactory results of the tests VYNPS is preparing a change to perform cleaning instead of testing. The coolers have been internally examined and found to be very clean and free for silt, sludge and tuberculation. The frequency of cleaning has yet to be determined but is anticipated to be in the every 3 to 6 year range. The Emergency Diesel Generator Coolers are tested every month and the results are trended by System Engineering. No adverse trends have been identified. A copy of the trends for the "B" Diesel has been provided. Copies of the test data sheets for the entire year 2004 have been provided.. The RRU's are tested quarterly by measuring the DP across the units. This will detect any fouling which would decrease thermal performance. No performance issues have been identified. All performance data and Inspection results are monitored and trended by the System Engineering Department and the Service Water System Engineer.

70 **Category** Closed

Request B.1.26-W-06
Provide the NRC inspection report written in 2002 for the service water system. Characterize the 20 service water system leaks and how they were repaired under the VYNPS corrective action program. Provide the VYNPS self-assessment and independent evaluation which was completed on 12/20/2002. Provide an example of the documents which provide the protocols for the use of biocides to mitigate MIC and any other procedure changes made after the self-assessment. Provide a sampling of the different performance testing and inspection results for 2004 that are discussed in the LRA operating experience with acceptance criteria. If more recent performance testing and inspection results are available, provide a sampling of them.

Response A copy of NRC Report, NVY 02-61 and CR-VTY-2003-02344 was provided. This CR documents the investigation into the adverse trend created by approximately 20 through wall leaks in the SW system. The result of this investigation identified several causes. One of these being the use of carbon steel components which are susceptible to Microbiological Influenced Corrosion (MIC). Another cause was determined to be ineffective chemical treatment of the system. The ineffectiveness of the chemical treatment was reinforced by a follow up assessment (DR Lutey Report). This assessment was also provided. Changes were made to the sampling program and chemical treatment process. New chemical addition pumps were installed and sampling was implemented for SW components during inspections. It should be noted that the plant is limited by the NPDES permit to no more than 2 hours a day of treatment to the SW system. This reduces the effectiveness of the treatments. VYNPS also began treatment of lines which are not normally inservice, i.e. supply line to the Diesel Generator Cooler. These lines are treated when the diesels are run to ensure that the lines are full of treated water when they are secured. Copies of the inspection database detailing the results of internal inspections have been provided.

71 **Category** Closed

Request B.1.26-W-06
Provide the NRC inspection report written in 2002 for the service water system. Characterize the 20 service water system leaks and how they were repaired under the VYNPS corrective action program. Provide the VYNPS self-assessment and independent evaluation which was completed on 12/20/2002. Provide an example of the documents which provide the protocols for the use of biocides to mitigate MIC and any other procedure changes made after the self-assessment. Provide a sampling of the different performance testing and inspection results for 2004 that are discussed in the LRA operating experience with acceptance criteria. If more recent performance testing and inspection results are available, provide a sampling of them.

Response Duplicate entry. Close to # 70.

72 **Category** Closed

Request B.1.27.1-W-01
Provide a masonry wall inspection report for an un-reinforced masonry wall.

Response Inspection Report for Masonry wall G-191513-51 provided in Drawing B-191600 Sheet 96 for an un-reinforced masonry wall was provided.

73 **Category** Closed

Request B.1.27.1-W-02
Explain how often masonry walls are inspected for cracking. Explain if the inspection frequency varies from wall to wall. If the frequency does vary, explain the basis for the differences in frequency. Explain the qualification and training that is required of the inspection personnel. Explain if inspectors use crack maps during the inspections to help in the detection of changes.

Response Site procedure PP-7026 will be in the program basis document
Additional Response:
Inspection of masonry walls, in scope of license renewal, are performed each refueling outage. Upon completion of six successive surveillance intervals during a ten year period, the sequence of the inspection is reverted back to the initial sequence interval. The inspections are performed by inspection team comprised of degreed engineers having understanding of structures, materials of masonry construction and masonry wall analysis techniques. The observed instances of cracking are detailed on as-built and considered in record analysis.

74 **Category** Closed

Request B.1.27.1-W-03
Explain if Masonry Wall crack changes are turned over to engineering for evaluation and documentation by procedure. Provide the procedure for performing the Masonry Wall crack inspections. What engineering procedures are used to control and evaluate the attachment of new components to masonry walls evaluated under NRC IEB 80-11? Explain if there is a masonry wall log book or data base to track new attachments to block walls and evaluate the effects on the existing evaluations performed under 80-11?

Response PP 7026 Rev 1 requires that if during the course of inspection, a “significant finding” is encountered a Condition Report shall be generated and the Civil Structural Supervisor is notified (Section 4.4, PP 7026). PP 7026 is provided for reference. The Engineering Request process is used to control the plants configuration. Walls affected via planned modifications are identified during the design process and the analysis of record and design drawings reflecting I. E. B. 80-11 are updated accordingly. Administrative controls require that proposed new attachments are reviewed by the Civil Structural Department (Section 4.4.5, PP 7026). A log book is maintained by the Civil Structural Department with a summary findings memo and surveillance walkdown sheets (Form VYPPF 7026.01 and Section 4.4.7, PP 7026).

Attachments include the Vermont Yankee Masonry Wall Routine Surveillance for RFO 25 in which three corrective updates were performed for observed discrepancies. The CR generated for correcting the drawings is also attached along with a corrected drawing for example.

75 **Category** Closed

Request B.1.27.2-W-01

The program description in the LRA for the Structures Monitoring Program (B.1.27.2) makes no reference to GALL, Section XI.S7, RG 1.127, Inspection of Water-Control Structures Associated With Nuclear Power Plants. GALL XI.S7 states that for plants not committed to RG 1.127, Revision 1, aging management of water-control structures may be included in the Structures Monitoring Program. However, details pertaining to water-control structures are to incorporate the attributes of GALL XI.S7. Explain if VYNPS is committed to RG 1.127 Revision 1 for inspection of its water control structures (such as Intake Structure). If VYNPS is not committed to RG 1.127 Revision 1, explain how the 10 element attributes of GALL XI.S7 are incorporated into the VYNPS Structures Monitoring Program.

Response The water-control structure at VYNPS is the intake structure. There are no earthen water control structures at VYNPS. The attributes of the Water Control Structures, GALL XI.S7 aging management program applicable to the intake structure are incorporated in the VYNPS Structures Monitoring Program as described below. Attributes of the GALL XI.S7 aging management program that are not incorporated in the Structures Monitoring Program primarily apply to earthen structures.

1) Scope – The scope of the GALL XI.S7 program applicable to VYNPS is the intake structure. The intake structure is included in the scope of the Structures Monitoring Program as delineated in Table 3.5.2-3.

2) Preventive actions – The GALL XI.S7 program includes no preventive actions.

3) Parameters Monitored – The aging effect requiring management for concrete structural components of the intake structure is loss of material which is consistent with GALL Volume 2 item II.A6-7. The parameters monitored from the GALL XI.S7 program applicable to loss of material are consistent with those monitored by the Structures Monitoring Program. The guidance for inspections of concrete in Section C.2 of RG 1.127 is consistent with the guidance in ACI 349.3 used in the Structures Monitoring Program.

4) Detection of Aging – GALL XI.S7 identifies visual inspection methods as the primary method used to detect aging. The Structures Monitoring similarly uses visual inspection methods as the primary method used to detect aging in concrete structural components. GALL XI.S7 identifies inspection intervals of five years. The Structures Monitoring Program identifies similar inspection intervals of three years for accessible areas, ten years for inaccessible areas and opportunistic inspections for buried components.

5) Monitoring and Trending – Monitoring is by periodic inspection for both the GALL XI.S7 and Structures Monitoring Programs.

6) Acceptance Criteria – Acceptance criteria is not identified in RG 1.127, however appropriate guidance is provided in the Structures Monitoring Program to ensure corrective measures are identified prior to loss of intended function.

7-9) The corrective actions, confirmation process and administrative control attributes of the Structures Monitoring Program and the GALL XI.S7 program are consistent.

10) Operating Experience – The operating experience relevant to the effectiveness of the Structures Monitoring Program is presented in Appendix B of the application and is consistent with the operating experience described in GALL XI.S7.

Therefore, the attributes of the NUREG-1801 XI.S7, Water Control Structures, aging management program pertaining to the intake structure are incorporated within the VYNPS Structures Monitoring Program.

76 **Category** Accepted

Request B.1.27.2-W-02
Explain why the drywell floor liner seal and other components are not part of the ASME Section XI subsection IWE inspection program. Justify this exclusion. Explain why the inspection of crane rails and girders are not under an Inspection of Overhead Heavy Load and Light Load Handling Systems AMP. Explain if all the structures and components being added to the Scope of Program for this AMP by enhancement are currently inspected by another program, since the SMP is an existing program.

Response The drywell floor liner seal (moisture barrier) is examined under the Containment Inservice Inspection-IWE Program and will remain under the CII-IWE Program during the period of extended operation not the Structures Monitoring Program as shown in LRA Table 3.5.2-1. This approach will require the following.
1) Update LRPD-02, Section 4.14.2 Item B.4 by adding "The CII Program manages cracking and change in material properties for drywell shell to floor seal (moisture barrier) elastomers"
2) Update LRPD 02, Section 4.21.1 Items B.1.a and b "Enhancement" and Item 10.D. "Summary" to delete "drywell floor liner seal" from the discussion.
3) Update LRA Table Line Item "Drywell floor liner seal" for Table item "AMP" change "Structures Monitoring" to "CII-IWE". For clarification, change "drywell floor liner seal" to "drywell shell to floor seal (moisture barrier)" The clarification of the terminology also applies to Table 2.4-1 and Section B.1.27.2. (This change requires an amendment letter to the LRA)

The Periodic Surveillance and Preventive Maintenance and Structures Monitoring Programs adequately manage aging effects for cranes and girders. Therefore, a separate program (i.e., inspection of overhead heavy load and light load handling system) is not necessary. Not all the miscellaneous structures and components added by the enhancement to the SMP are currently inspected under another program.

77 **Category** Accepted

Request B.1.27.2-W-03
Explain if VYNPS has any porous concrete sub foundations and a site dewatering system. Explain if the Structures Monitoring Program requires periodic sampling and testing of groundwater to determine and confirm that that the below grade water chemistry/soil is non-aggressive to concrete structures below grade. Provide the results for the two most recent tests and provide the scheduled frequency of groundwater monitoring. Explain if there is any seasonal consideration for groundwater monitoring.

Response VNPS does not have porous concrete sub foundations or a site dewatering system. The inspection team was provided with the results of the two most recent reported groundwater samples as submitted to the State of Vermont. These samples are currently obtained twice yearly, primarily around the plant septic systems (some of the sampling wells are near plant structures). The results of these samples are provided to the State of Vermont in accordance with our Indirect Discharge Permit. The Structures Monitoring Program will be enhanced, (License Renewal Commitment #33) to ensure an engineering evaluation is made on a periodic basis of groundwater samples to assess for evidence of groundwater being aggressive to concrete. Historically, VYNPS groundwater samples have shown some level of seasonality in that the wells adjacent to roadways have slightly higher levels of chlorides due to salt treatment.

78 **Category** Closed

Request B.1.27.2-W-04
Will VYNPS take advantage of inspection opportunities for structures required for license renewal and identified as inaccessible? As inaccessible areas become accessible by such means as excavation or other reason, will additional inspections of those areas be performed?

Response Yes. VYNPS will and currently does take advantage of inspection opportunities for underground structures that become accessible by excavation. This inspection is already part of the program.

79 **Category** Closed

Request B.1.27.2-W-05
Explain how the frequency of inspection for the structures, buildings and components within the scope of this program are affected when aging effects are

Response Vermont Yankee's current structures monitoring program is performed by Design Structural Engineers in accordance with PP 7030, Structures Monitoring Program Procedure. Our surveillance tracking program ensures that this inspection is performed on a three year interval.

Any adverse condition discovered during inspections of buildings, structures and components would be entered into Entergy's Corrective Action Process through the initiation of a Condition Report in the PCRS tracking system. The Corrective Action Program defines further responses to the discovered condition. Attributes considered through the corrective action will include, as applicable, apparent cause evaluation, root cause evaluation, extent of condition, consideration of Operating Experience, required corrective action and follow-up verification. Frequency of future inspections will also be considered through the Corrective Action Process.

80 **Category** Open

Request B.1.27.2-W-06
Explain if the inspection acceptance criteria for the Structures Monitoring Program is based on ACI 349.3R-96, and if not, provide the industry codes, standards and guidelines that the acceptance criteria is based on. Explain the basis of the acceptance criteria for crane rail/girder inspections and drywell floor liner seal.

Response The VYNPS Structures Monitoring Program is controlled by PP 7030, Structures Monitoring Program Procedure. The standards used to develop and conduct the program are listed in Sect. 5.2 of the procedure. The specific standard used to develop inspection requirements for this procedure is NEI 96-03, "Nuclear Energy Institute, Industry Guideline for Monitoring the Condition of Structures at Nuclear Power Plants", Section 3.3 "Examination Guidance." Inspection requirements of commodities taken from NEI-96-03 are delineated in Section 4.3.3 of PP7030. A comparison of the relevant guidelines for concrete structural components in PP7030, with the guidelines of ACI 349.3 Chapter 5 "Evaluation Criteria" indicates general consistency.

1) Both documents specify visual inspection methods for the examination of structures.
2) Both documents provide guidance for the inspections for the following parameters and conditions:
Concrete components: spalling, cracking, delamination, honey combs, water in-leakage, chemical leaching, peeling paint, or discoloration
Structure Settlement: excessive total or differential settlement
Structural/seismic gap: insufficient space for structural movement during a seismic event (i.e., exclusion of foreign objects or debris); deteriorated elastomer type filler.
3) ACI 349.3R96 Chapter 5 provides acceptable limits beyond which further evaluation is required. PP7030 Section 4.8 conservatively requires evaluation of identified degradation.

Based upon this comparison, the guidance for inspections provided in PP7030 is consistent with the guidelines in ACI 349.3R96.

The acceptance criteria for crane rail/girder inspections are contained in the preventive maintenance tasks for the crane inspection. Procedure OP 2200 provides the inspection and acceptance criteria for crane rail/girders. The procedure criteria is based on the following codes and standards ANSI B30.2-83 "Overhead and Gantry Cranes" and NUREG-0612, Control of Heavy Loads at Nuclear Power Plants".

The acceptance criteria for the drywell shell to floor liner seal (moisture barrier) is covered under 4.14.2, Containment Inspection Program. See the response to Item 76 for additional discussion on this seal. For additional discussion, see Item #243 response.

81 **Category** Closed

Request B.1.27.2-W-07
VYNPS lists the following structure issues under operating experience for this AMP.

• Concrete pad above JD diesel generator day tank sinking and cracking
• Degradation of Cooling Tower structural column

Provide the documentation for these issues showing when, where and how they were discovered. Also, provide the documentation on how these issues were evaluated and resolved with a discussion on the need for any follow-up inspections.

Provide the most recent inspection results for the reactor building overhead crane rails/girders, reactor building (a few examples of areas where aging has been discovered), cooling towers, and intake structure (a few examples of areas where aging has been discovered). Provide the last three inspection reports for the drywell floor liner seal.

Response Documentation of the operating experience with structural repairs was provided to the Inspection Team in the following format:

Concrete pad above the JD diesel generator day tank
WO 99-1090-000
WO 99-9746-001

Degradation of cooling tower structural columns
WO 05-5158-000
WO 97-5357-004
WO 97-5327-00
WO 03-1243-009

Intake structure floor concrete repair
WO 04-1745-000

The concrete pad above the JD diesel generator day tank is in a high traffic area. Degradation was identified by personnel transiting the area. The cracked concrete slab was replaced. This was essentially a design issue, in that the original pad was not designed to bear the weight of the fuel oil delivery truck. The reference WO replaced the pad and added bollard columns to prevent vehicles from driving over the pad. No further follow-up inspections are required.

Degradation of cooling tower structural columns was discovered during routine fall and spring structural inspection PMs. These columns were replaced in kind. Follow-up inspections are performed during the routine fall and spring structural inspection PMs.

The most recent inspection and repair results for the Turbine Building overhead crane were provided to the Inspection Team. Included were reports of two different inspections, repair information and monitoring plans. Both the Reactor and Turbine Building overhead cranes are in scope of the Maintenance Rule and are subject to the same inspection and corrective action programs. Recent Reactor Building overhead crane inspections have identified only mechanical and electrical deficiencies (i.e. trolley motors, brakes, etc.). The results for the Turbine Building overhead crane were provided in lieu of the Reactor Building overhead crane because the recent inspection results involve structural elements and show the effectiveness of the Maintenance Rule crane inspection program. The Structures Monitoring Program will be enhanced (Project document revision) to describe how the program takes credit for the structural inspection program being performed through the Maintenance Rule crane inspection program.

Examples of inspections for cooling tower aging are included in the referenced WOs above.

As stated in other responses, LRDP-02 will be revised to indicate that the drywell floor liner seal will be covered under the containment inspection program, not the structures monitoring program. The seal was replaced two refueling outages ago, and the seal inspection report for last outage has already been provided to the inspection team.

Degradation of intake structure floor concrete was discovered during routine diver PM inspections performed every refueling outage. The small washed out area was repaired with an underwater concrete repair product. Follow-up routine diver PM inspections will be performed every refueling outage.

82 **Category** Open

Request B.1.27.3-W-01
Explain which VYNPS individual is responsible for the coordination of Vernon Dam FERC inspections. Explain the process of VYNPS interfacing with FERC with respect to the Vernon Dam and if there are any plant procedures for the interface. If there are plant procedures for dealing with FERC, provide a current copy. Explain if VYNPS has any influence on what and when repairs are made on Vernon Dam from a management or economic standpoint. Provide the most recent Vernon Dam assessment performed by FERC. Explain how VYNPS receives the report and if the report is independently reviewed by any VYNPS personnel such as in systems or design engineering.

Response There has not been any need for site to coordinate or interface with Vernon Dam's Federal Energy Regulatory Commission (FERC) inspection. VYNPS does not have an individual responsible for coordinating, interfacing, collecting and reviewing FERC inspection report. There is no site procedure for dealing with FERC and obtaining a current copy. Reports are normally received on site after each inspection. VYNPS does not have any influence on what and when repairs should be made from management or economics standpoint.

83 **Category** Open

Request B.1.27.3-W-02
The operating experience for this AMP states that daily inspections are made of Vernon Dam and periodic underwater inspections are made on the Dam. Explain what organization makes the daily inspections and the underwater inspections. Explain how often the underwater inspections are performed and what determines the frequency. Explain if VYNPS has ever independently inspected Vernon Dam. Explain if any flooding has occurred which required additional FERC inspections beyond the normal 5 year. The operating experience states that areas of degradation were found on Vernon Dam during the 2002 FERC inspection and will continue to be monitored. Explain if the continued monitoring is by FERC on a five year cycle or by VYNPS personnel on a more frequent basis. Explain the type and number of staff that work at Vernon Dam on a daily basis to maintain it. Explain if and how any personnel at Vernon Dam have the ability to communicate immediately with responsible individuals at VYNPS should a problem develop at the Dam which could affect the availability of plant cooling water.

Response As stated in LRA section 2.4.5, Vernon Dam is not part of the site structures owned by VYNPS. Dam inspections are regulated by the Federal Energy Regulatory Commission (FERC), which licenses the dam and associated power block. Daily inspections are performed by the dam owner's (e.g. Trans Canada, maintenance personnel. And, underwater inspections are performed by divers once every 5 years as required by FERC. No evidence of flooding to require additional FERC inspections beyond the normal 5 year. As stated in the inspection reports, maximum rise in stage cause by a breach will not exceed 1.7 feet under either 50 or 100 year flood condition. The areas of degradation, found on Vernon Dam during the 2002 FERC inspection, are monitored by FERC on a five year cycle. However, daily inspection by the dam owner also supplements these inspections. Number and type of staff at Vernon Dam on daily basis is not known. Although not proceduralized, any significant problem with dam is expected to be communicated to the site.

In accordance with NEI 95-10, Rev. 6, Appendix C, Reference 4 (pages C-20 through C-25), "License Renewal Issue No. 98-0100, Crediting FERC-Required Inspection and Maintenance Programs for Dam Aging Management," FERC inspections may be credited for aging management activities. The Vernon Dam is under FERC jurisdiction and that its inspection and maintenance program is in conformance with FERC requirements. The NRC guidance in the referenced section of NEI 95-10 states "It is the staff's opinion that dam inspection and maintenance programs under the jurisdiction of FERC or the Army Corps of Engineers, continued through the period of the license renewal, will be adequate for the purpose of aging management (page C-25)."

During the period of the onsite inspection Vermont Yankee Staff provided a copy of the most recent FERC inspection for the Vernon Dam to the NRC Staff.

84 **Category** Accepted

Request B.1.30.1-M-01
Since the applicant is currently and periodically sampling and analyzing the cooling water of the other systems "controlled" by VYNPS's existing program—the stator cooling water and plant heating boiler systems—is it also the intent of the applicant to periodically sample and analyze the John Deere Diesel cooling water

Response No, as stated in LRA Section B.1.30.1, rather than sampling, procedures will be (License Renewal Commitment 26) enhanced to flush the John Deere diesel cooling water system and replace the coolant and coolant conditioner every three years.

85 **Category** Accepted

Request B.1.30.2-M-01
Section XI.M2 of the GALL notes that a "water chemistry only" program may not be fully effective for verification of corrosion or SCC in slow flow or stagnant flow areas. The GALL further suggests that for some of these "susceptible locations" a one-time inspection verification program may be appropriate. Do you intend to implement a "one-time inspection (or some other program) to verify existence of corrosion or SCC in these "susceptible locations"?

Response Yes, the one-time inspection program described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

86 **Category** Accepted

Request B.1.30.2-M-02
Section XI.M2 - Element Number four (4) - of the GALL notes that the staff considers a BWR water chemistry program as a "…mitigation program and (that it) does not provide detection of any aging effects…". The GALL further states that "…inspection of select components (should) be undertaken to verify the effectiveness of the program…" The applicant's AMP does not present any other program - other than the indirect results of their existing water chemistry program - to verify effectiveness of the chemistry control program. Do you intend to perform "other" inspections, as suggested by the GALL, "…to ensure that significant degradation is not occurring and that intended functions of system components will be maintained during the extended period of operation…"?

Response Yes, the one-time inspection program described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

87 **Category** Accepted

Request B.1.30.3-M-01
The applicant's exception for this AMP states that "…monitoring pump performance parameters is of little value in managing effects of aging on long-lived, passive CCW system components..". The associated GALL for this AMP (XI.M21; Element 4) states that "…control of water chemistry does not preclude corrosion or SCC at locations of stagnant flow conditions or crevices...". How does this AMP ensure that a stagnant flow condition or crevice will not be periodically present in system piping during the period of extended operation?

Response This AMP does not ensure that a stagnant flow condition or crevice will not be periodically present in system piping during the period of extended operation. Preventing stagnant flow conditions is not a recommended preventive action in NUREG-1801, Section XI.M21. As stated in LRA Section B.1.20.3, passive intended functions of pumps, heat exchangers and other components will be adequately managed by the Water Chemistry Control - Closed Cooling Water Program through monitoring and control of water chemistry parameters. Also the one-time inspection program described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm

88 **Category** Closed

Request B.1.30.3-M-02
The applicant's exception for this AMP also states that "….in most cases, functional and performance testing verifies that the component active functions can be accomplished and as such would be included as part of the maintenance rule...". Does this AMP reference or refer to "maintenance rule activities" as part of planned aging management actions; i.e., actions which address GALL XI.M21 "parameters monitored/inspected"?

Response No, functional and performance testing are not aging management actions. They are maintenance rule activities and not part of the Water Chemistry Control - Closed Cooling Water Program. As stated in LRA Section B.1.30.3, the Water Chemistry Control - Closed Cooling Water Program takes exception to this recommendation of NUREG 1801, Section XI.M21.

89 **Category** Closed

Request A-P-01
Please clarify the rationale for the unusual numbering system used for auxiliary systems after the first 12. (Note: This question is arbitrarily linked to the first item of Table 3.3.1-13-1)

Response Section 13 includes all the systems that have intended functions that meet 10 CFR 54.4(a)(2) for physical interaction. The aging management review of these systems that have functions that met 10 CFR 54.4(a)(2) for physical interaction was done separately from the review of systems with intended functions that met 10 CFR 54.4 (a)(1) or (a)(3). The results of this review therefore needed to be presented separately so that they could be distinguished from the 10 CFR 54(a)(1) and (a)(3) review. Table 3.3.1-13 would be the next sequential table number after the remainder of the auxiliary system tables. To indicate individual systems included in the aging management review for (a)(2), Table 3.3.1-13 is subdivided by system. For example, Table 3.3.1-13-1 is for the augmented off gas system, a system which only has components included for (a)(2). For the core spray system, Table 3.3.1-13-6 shows the components included for (a)(2) but since the system is also in scope for other reasons, Table 3.2.2-2 shows the components included for 54.4(a)(1) and (a)(3). This numbering system was chosen so that these systems and the components that had intended functions unique for 54.4(a)(2) could be uniquely identified and reviewed separately. This allows a reviewer to clearly distinguish which component types in a system were included for 10 CFR 54.4(a)(2) for physical interaction. Since most of these systems are auxiliary systems they were added as part of the auxiliary systems section.

90 **Category** Closed

Request 3.1.1-14-P-01
"Support" is not listed as an intended function Please clarify which IF (SNS, SRE, and/or SSR) is intended.

Response This response assumes that the question is referring to the tables in Section 3.3.2-13 for components included for 10 CFR 54.4(a)(2). This function is described in Section 2.3.3.13 under "System Description (pg. 2.3-65) and in the definition in Table 2.0-1 for "Pressure boundary." As shown in the component type tables in Section 2.3.3-13, a footnote states “For component types included under 10 CFR54.4(a)(2), the intended function of pressure boundary includes providing structural/seismic support for components that are included for non-safety-related SSCs directly connected to safety-related SSCs” when this function is appropriate. Pressure boundary was only used because there is no difference in the aging management review regardless of whether the component intended function is pressure boundary or structural support, and if the pressure boundary intended function of the component is maintained the structural support function will be maintained. This definition of providing structural/seismic support would be equivalent to the intended function of SSR as defined in Table 2.0-1.

91 **Category** Open

Request 3.6.2.2-N-01
In LRA, Table 3.6.2-1, under Cable connections (metallic parts), you have stated that no aging effects requiring management and no AMP is required. Further, in LRA, Table 3.6.1 under discussion of cable connection metallic parts, you have stated that cable connections outside of active devices are taped or sleeved for protection and operating experience with metallic parts of electrical cable connections at VYNPS indicated no aging effects requiring management. Electrical cable connections (metallic parts) are subject to the following aging stressors: thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation. NUREG-1801, Revision 1, AMP XI.E6, "Electrical Cable Connection not Subject to 10 CFR 50.49 Environmental Qualification Requirements," specifies that connections associated with cables within the scope of license renewal are part of this program, regardless of their association with active or passive components. Also, refer to pages 107, 256, and 257 of NUREG-1833, "Technical Bases for Revision to the License Renewal Guidance Documents," for additional information regarding AMP XI.E6. Provide a basis document including an AMP with the ten elements for cable connections or provide a justification for why an AMP is not necessary.

Response VYNPS electrical AMR AMRE-01 in section 4.1.4.4 states for cable connections (metallic parts)
“An evaluation of thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation stressors for the metallic parts of electrical cable connections identified no aging effects requiring management:
•Metallic parts of electrical cable connections potentially exposed to thermal cycling and ohmic heating are those carrying significant current in power supply circuits. Typically, power cables are in a continuous run from the supply to the load. Therefore, the connections are part of an active component that is controlled by Maintenance Rule and is not subject to aging management review.
•The fast action of circuit protective devices at high currents mitigates stresses associated with electrical faults and transients. In addition, mechanical stress associated with electrical faults is not a credible aging mechanism because of the low frequency of occurrence for such faults. Therefore, electrical transients are not applicable stressors.
•Metallic parts of electrical cable connections exposed to vibration are those associated with active components that cause vibration. Since active components are controlled by Maintenance Rule, they are not subject to aging management review.
•Corrosive chemicals are not stored in most areas of the plant. Routine releases of corrosive chemicals to areas inside plant buildings do not occur during plant operation. Such a release, and its effects, would be an event, not an effect of aging. The location of electrical connections inside active components protects the metallic parts from contamination. Therefore, this stressor is not applicable.
•Oxidation and corrosion usually occur in the presence of moisture or contamination such as industrial pollutants and salt deposits. Enclosures or splice materials protect metal connections from moisture or contamination. Therefore, oxidation and corrosion are not applicable stressors.

Based on the evaluations of the stressors above, there are no aging effects requiring management for metallic components of connections and no AMP is required.

92 **Category** Closed

Request 3.6.2.2-N-02
In LRA, Table 3.6.2-1, under switchyard bus (switchyard bus for SBO) and connections you have stated no aging effects requiring management and no AMP is required. NUREG 1800, Rev. 1, Standard Review Plan for Review of License Renewal Application for Nuclear Power Plants, Section 3.6.2.2.3 identifies loss of preload is an aging effect for switchyard bus connections. Torque relaxation for bolted connection is a concern for switchyard bus connections. An electrical connection must be designed to remain tight and maintain good conductivity through a large temperature range. Meeting this design requirement is difficult if the material specified for the bolt and the conductor are different and have different rates of thermal expansion. For example, copper or aluminum bus/conductor materials expand faster than most bolting materials. If thermal stress is added to stresses inherent at assembly, the joint members or fasteners can yield. If plastic deformation occurs during thermal loading (i.e., heat-up) when the connection cools, the joint will be loose. EPRI document TR-104213, "Bolted Joint Maintenance & Application Guide," recommends inspection of bolted joints for evidence of overheating, signs of burning or discoloration, and indication of loose bolds. Provide a discussion why torque relaxation for bolted connections of switchyard bus is not a concern for VYNPS.

Response VYNPS electrical AMR Section 4.3.4 of AMRE-01.
Connection surface oxidation for aluminum switchyard bus is not applicable since all switchyard bus connections requiring AMR are welded connections. No aging effects have been identified for welded connections on switchyard bus for SBO.

93 **Category** Accepted

Request 3.6.2.2-N-03
Provide AMR line item for transmission conductor connections in Table 3.6.2-1. Address any aging effects requiring management.

Response LRA Table 3.6.1 and section 3.6.2.2.3 will be revised as shown below:
Table 3.6.1 item # 12 – Transmission conductors and connections.
Aging Effects – Section 3.6.2.2.3
Transmission conductors are un-insulated, stranded electrical cables used outside buildings in high voltage applications. The transmission conductor commodity group includes the associated fastening hardware, but excludes the high-voltage insulators. Major active equipment assemblies include their associated transmission conductor terminations.
Transmission conductors are subject to aging management review if they are necessary for recovery of offsite power following an SBO. At VYNPS, transmission conductors located between switchyard breakers K-1/K-186 and startup transformers T-3-1A/T-3-1B support recovery from an SBO event. Other transmission conductors are not subject to aging management review since they do not perform a license renewal intended function.
AMRE-01
The aging effect for transmission conductors found in industry reviews are loss of conductor strength and loss of material (wear).

The prevalent mechanism contributing to loss of conductor strength of an ACSR transmission conductor is corrosion, which includes corrosion of the steel core and aluminum strand pitting. Corrosion in ACSR conductors is a very slow acting mechanism, and the corrosion rates depend on air quality, which includes suspended particles chemistry, SO2 concentration in air, precipitation, fog chemistry and meteorological conditions. Air quality in rural areas generally contains low concentrations of suspended particles and SO2, which keeps the corrosion rate to a minimum. Tests performed by Ontario Hydroelectric showed a 30% loss of composite conductor strength of an 80 year old ACSR conductor due to corrosion.

ACAR conductors are more resistant to loss of conductor strength since the core of the conductor is an alloy of steel and corrosion resistant metals. AMR conclusions regarding ACSR conductors conservatively bound ACAR conductors.

The National Electrical Safety Code (NESC) requires that tension on installed conductors be a maximum of 60% of the ultimate conductor strength. The NESC also sets the maximum tension a conductor must be designed to withstand under heavy load requirements, which includes consideration of ice, wind and temperature. These requirements are reviewed concerning the specific conductors included in scope at VYNPS.

The 4/0 ACSR conductors have the lowest initial design margin of any transmission conductors included in the AMR. The Ontario Hydro test and the NESC requirements illustrate with reasonable assurance that transmission conductors will have ample strength through the period of extended operation.

Therefore, loss of conductor strength due to corrosion of the transmission conductors in not an aging effect requiring management for the period of extended operation.

Loss of material due to mechanical wear can be an aging effect for strain and suspension insulators that are subject to movement caused by transmission conductor vibration or sway from wind loading. Design and installation standards for transmission conductors consider sway caused by wind loading. Experience has shown that transmission conductors do not normally swing and that when they do swing because of substantial wind, they do not continue to swing for very long once the wind has subsided. Wear has not been identified during routine inspection; therefore, loss of material due to wear in not an aging effect requiring management.

This report documents a review of industry OE and NRC generic communications related to the aging of transmission conductors in order to ensure that no additional aging effects exist beyond those previously identified. This report also documents a review of plant-specific OE, which did not identify any unique aging effects for transmission conductors.

This requires an amendment to the LRA.

94 **Category** Accepted

Request 3.6.2.2-N-04

In LRA, Table 3.6.2-1, under Transmission conductors, you have stated that no aging effects requiring management and no AMP is required. NUREG 1800, Rev. 1, Standard Review Plan for Review of License Renewal Application for Nuclear Power Plants, Section 3.6.2.2.3 identifies loss of conductor strength due to corrosion is the aging effect of high voltage transmission conductor. The most prevalent mechanism contributing to loss of conductor strength of aluminum core steel reinforce (ACSR) transmission conductor is corrosion which includes corrosion of steel core and aluminum strand pitting. Degradation begins as a loss of zinc from the galvanized steel core wires. Corrosion rate depend largely on air quality, which includes suspended particles chemistry, sulfur dioxide concentration in air, precipitation, fog chemistry and meteorological conditions. Explain why loss of conductor strength due to corrosion is not an aging effect requirement management for transmission conductors at VYNPS.

Response VYNPS electrical AMR Section 4.2 in AMRE-01.

The prevalent mechanism contributing to loss of conductor strength of an ACSR transmission conductor is corrosion, which includes corrosion of the steel core and aluminum strand pitting. Corrosion in ACSR conductors is a very slow acting mechanism, and the corrosion rates depend on air quality, which includes suspended particles chemistry, SO2 concentration in air, precipitation, fog chemistry and meteorological conditions. Air quality in rural areas generally contains low concentrations of suspended particles and SO2, which keeps the corrosion rate to a minimum.
Tests performed by Ontario Hydro showed a 30% loss of composite conductor strength of an 80-year old ACSR conductor due to corrosion.
The National Electric Safety Code (NESC) requires that tension on installed conductors be a maximum of 60% of the ultimate conductor strength. The acceptance criteria for VYNPS is less than 40% loss of composite conductor strength per NESC.
Aluminum conductor alloy reinforced (ACAR) conductors are used at VYNPS as well as ACSR conductors.
ACAR conductors are more resistant to loss of conductor strength since the core of the conductor is an alloy of steel and corrosion resistant metals.
Conclusions for ACSR conductors conservatively bound ACAR conductors. The National Electric Safety Code (NESC) requires that tension on installed conductors be a maximum of 60% of the ultimate conductor strength. The acceptance criteria for VYNPS is less than 40% loss of composite conductor strength per NESC. Aluminum conductor alloy reinforced (ACAR) conductors are used at VYNPS as well as ACSR conductors.
ACAR conductors are more resistant to loss of conductor strength since the core of the conductor is an alloy of steel and corrosion resistant metals.
Conclusions for ACSR conductors conservatively bound ACAR conductors.

Therefore, corrosion of transmission conductors is not aging effect requiring management and an AMP is not required.

95 **Category** Closed

Request 3.6.2.2-N-05

In LRA, Table 3.6.2-1, under high voltage insulators, you have indicated that no aging effects requiring management and no AMP is required. In LRA, Section 3.6.2.2 .2, you have also stated that at VYNPS surface contamination build-up on insulator is not a concern. NUREG 1800, Rev. 1, Standard Review Plan for Review of License Renewal Application for Nuclear Power Plants, Section 3.6.2.2.3 identifies surface contamination is the aging effect of high voltage insulators. Various airborne materials such as dust and industrial effluent can contaminate insulator surfaces. The buildup of surface contamination is gradual and in most areas such contamination is washed away by rain; the glazed insulator surface aids this contamination removal. However, a large buildup of contamination enables the conductor voltage to track along the surface more easily and can lead to insulator flashover. Surface contamination can be a problem in areas where there are greater concentration of airborne particles such a near facilities that discharge soot. Explain why surface contamination is not a concern at VYNPS.

Response Per VYNPS electrical AMR Section 4.4 in AMRE-01:

Various airborne materials such as dust, salt and industrial effluents can contaminate insulator surfaces. The buildup of surface contamination is gradual and in most areas. Such contamination is washed away by rain; the glazed insulator surface aids this contamination removal.
VYNPS is not located near the seacoast where salt spray is prevalent, or near facilities that discharge soot.
At VYNPS, as in most areas of the New England transmission system, contamination build up on insulators is not a problem. Therefore, surface contamination is not an applicable aging mechanism for the insulators at VYNPS.

96 **Category** Closed

Request 3.6.2.2-N-06
Are all electrical and I&C containment penetrations EQ? If not, provide AMRs and AMPs for non-EQ electrical and I&C containment penetrations. The AMRs should include both organic (XLPE, XLPO, and SR internal conductor/pigtail insulation, etc.,) as well as inorganic material (such as cable fillers, epoxies, potting compounds, connector pins, plugs, and facial grommets).

Response Section 3.4.2 in AMRE-01and FSAR Section 5.2.3.4.3

At VYNPS, electrical penetration assemblies are included in the EQ program and are not subject to aging management review.

97 **Category** Accepted

Request 3.6.2.2-N-07
In LRA, Table 3.6.1 under metal enclosed bus, you have stated that an evaluation of metal enclosed bus for VYNPS determined that VYNPS does not have any phase bus that support a license renewal function. 10 CFR 54.4 (a)(3) requires, in part, that all systems, structures, and components relied on in safety analyses or plant evaluation to perform a function that demonstrates compliance with the commission's regulations for station black out (10 CFR 50.63) are within the scope of license renewal. VYNPS FSAR Section 8.3.3 states that electric power supplied from the transmission network to the on-site electric distribution system by two independent circuits, one immediate access and one delayed access. The immediate access circuit is supplied from the 345 kV transmission system through 345 kV/115 kV auto-transformer. It feeds the on-site electric distribution system through the two 115 kV to 4160 V start up transformers and is available immediately following a loss of generating capability. The delay access circuit is available by opening the generator no-load disconnect switch and establish a feed from the 345 kV switchyard through the main generator step-up transformer and unit auxiliary transformer to the 4160 V safety buses. Answer the following questions and support them with a main one line diagram:

3.6.2.2-7(a). In regard to the above, are non-segregated phase buses used to connect the start up transformers (T-3A and T-3B) (lower sides) to 4.16 kV safety buses?

3.6.2.2-7(b). In regard to the above, are iso phase buses used to connect the delay access circuit from the 345 kV switchyard through the main generator step-up transformer and unit auxiliary transformer?

3.6.2.2-7(c). In regard to the above, are non-segregated phase buses used to connect the unit auxiliary transformer (lower sides) to 4.16 kV safety buses?

If the answer to a, b, or c is yes, explain why metal enclosed buses (iso phase and/or non-segregated phase buses) are not in scope of license renewal and not require an AMP.

Response Resolution__ The VY UFSAR Section 8.3.3 describes three offsite power sources. The immediate access circuit from the 345kV yard through the 345/115kV autotransformer to the startup transformers, the alternate immediate access circuit from the 115kV yard (Keene Line) through the startup transformers. The delayed access circuit is available by opening the generator no-load disconnect switch and establishing a feed from the 345kV switchyard through the main and aux transformers.

3.6.2.2-N-07(a)
No, there is no non-segregated phase buses in the path from the startup transformers to the 4.16 safety buses.

3.6.2.2-N-07(b)
The delayed access circuit from the 345KV switchyard through the main generator step-up transformer and unit aux transformer uses the iso-phase bus for connection and is in scope for license renewal. The VYNPS Metal-Enclosed Bus program will be consistent with GALL XI.E4. The VYNPS Metal-Enclosed Bus program will perform visual inspection of the internal portions of the bus for cracks, corrosion, foreign debris, excessive dust buildup, and evidence of water intrusion. Internal bus supports will be inspected for structural integrity and signs of cracks. Enclosure assemblies will be inspected for evidence of loss of material and elastomers will be inspected to manage cracking and change in material properties.
The first inspection will be completed before the period of extended operation and every five years thereafter.

The Metal-Encased Bus Program will be added to the following LRA sections:
Section 2.5 – Electrical and I&C Systems
Section 3.6 – Electrical and Instrumentation and Controls
Table 3.6.1
Table 3.6.2-1
Appendix A
Appendix B

The Metal-Enclosed Bus Program will be added to the following AMR and AMPER.
LRPD-02- Aging Management Program Evaluation Results
AMRE-01 – Electrical Screening and AMR

This is LR commitment #32.

3.6.2.2-N-07(c)
No, there are no non-segregated phase buses in the path from the Unit Aux Transformer to the 4.16 safety buses.

Summary
The in-scope components required for recovery from a SBO do not include any non-segregated phase bus that requires aging management review.

98 **Category** Open

Request 3.6.2.2-N-08
10 CFR 54.4 (a)(3) requires, in part, that all systems, structures, and components (SSCs) relied on in safety analyses or plant evaluation to perform a function that demonstrates compliance with the commission's regulations for station black out (10 CFR 50.63) are within the scope of license renewal. Vernon Hydroelectric Station has been designated as the Station Blackout (SBO) alternate ac (AAC) source and is used to meet SBO requirements 10 CFR 50.63. Are all SSCs (including electrical components) associated with Vernon Hydroelectric Station included in the scope of licensee renewal? If they are not, explain why not. If they are, provide an AMR for long-lived, passive SSCs associated with the hydro station.

Response The long-lived, passive components from the Vernon dam switchyard to the plant are in scope and subject to AMR. The underground cables and connections are included in E2. The Vernon Dam is regulated by FERC and inspected per FERC regulations.

99 **Category** Closed

Request B.1.27.3-W-03
Are there any other license renewal intended functions other than SBO, associated with the Vernon Dam?

Response Vernon Dam is used for hydro-electric generation and is the alternate AC source of power for VYNPS. The deep basin beneath the west cooling tower is a safety-related, reinforced concrete structure constructed on bedrock. The basin acts as a reservoir to replace the evaporative and other losses occurring during alternate cooling system (ACS) operation, providing a one-week supply of makeup for the alternate cooling cell in the event of a loss of Vernon Dam. The Vernon dam has no other intended functions for (10CFR54.4(a)(1) or (a)(2). The Vernon dam is credited for station blackout (10CFR50.63), intended function.

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100 **Category** Closed

Request The NRC requested additional information on licensing renewal, specifically on how aging management applied to passive components in the Vernon Hydroelectric Station.

Response The requested information was provided to the NRC during the onsite review. In addition a FERC inspection report was provided for the dam and NPCC Document A-3, Emergency Operational Criteria. The NRC requested additional information on underground cables, buried piping and support systems.

101 **Category** Closed

Request B.1.30.3.M.04
GALL X1.M21 discusses pump and heat exchanger testing in the parameters monitored / inspected attribute. Is this testing part of the Water Chemistry Control - Closed Cooling Water Program?

Response LRA Section B.1.30.3 includes an exception to the performance and functional testing discussed in the detection of aging effects attribute. This exception and its justification are equally applicable to the parameters monitored / trended attribute.

102 **Category** Closed

Request B.1.9-K-11
Please provide a copy of QA Surveillance 99-010 and more recent QA surveillance of Diesel Fuel Monitoring Program.

Response Provided QA Surveillance 99-010, QA Audit Report QA-2-2005-VY-1 and CR-VTY-2005-00196.

103 **Category** Closed

Request B.1.9-K-12
Please identify sample point locations on John Deere diesel and diesel fire pump oil storage tanks. (Diesel Fuel Monitoring Program)

Response Provided Section 5 of OP2106 Rev. 18, App. D JD Diesel day tank sample location is at the bottom of this tank. Fire pump diesel fuel supply & sample point are 2 inches from the bottom of the diesel fire pump fuel tank.

104 **Category** Closed

Request B.1.9-K-13
Please provide 2000 and 2003 sample results spreadsheet. Also sample lab results for main storage tank and EDG day tanks are desired. (Diesel Fuel Monitoring Program)

Response This information has been provided via spreadsheet of monthly analysis data for the Main Fuel Oil Storage Tank for 2000 and 2003. Also, provided example analysis results for samples from the Walpole NH supplier tank, the John Deere diesel storage tank, the diesel fire pump storage tank, and the EDG day tanks

105 **Category** Closed

Request B.1.30.3-M-05
Please provide a copy of recent third party assessment of the water chemistry control - closed cooling water program.

Response Third party assessment of "Chemistry" on May 6, 2003 provided for review. Summary states that closed cooling water systems are monitored and treated to provide a chemical environment that minimizes corrosion rates.

106 **Category** Closed

Request B.1.2.3-M-04
The Reactor Vessel Stud Program takes exception to GALL based on relief request ISI-03. The NRC does not believe this should be an exception.

Review the relief request and ASME code. If this is not an exception, revise the program document.

Response The existing examinations for the reactor vessel closure studs (Category B-G-2) are based on ASME Code Case N-652. Code Case N-652 has been endorsed by the NRC per Table 1 of Regulatory Guide 1.147, Revision 14. As this Code Case is now endorsed, this inspection is no longer an exception to GALL. The LRA Supplement Letter will revoke this GALL exception.

107 **Category** Accepted

Request The commitment to manage locations CUF>1.0 should be on a numbered commitment list.

The commitment to analyze the limiting location for environmentally assisted fatigue should be on a numbered commitment list.

NOTE: The commitment is in section 4 (4.3.3.?) not in App. B

Response License renewal commitment #27 has been prepared, to address the above items.

108 **Category** Closed

Request Identify the site specific calculations for core plate hold down bolt preload.

Response No site specific calculation was found in the VYNPS current licensing basis for the number / preload of the core plate hold-down bolts required to prevent lateral motion of the core plate.

109 **Category** Closed

Request Accurately state / describe the information / documentation requested. Be as specific as possible. The NRC requested a copy of the Vernon hydro-drawing.
Not an NRC question. Close item.

Response This information was provided during the onsite review.

110 **Category** Closed

Request The NRC inspector had a one-line diagram and asked if bus duct was used for the immediate access source or the delayed access source. The inspector was interested if an AMR applied to either source for segregated or non-segregated bus, if used.
Not an NRC question. Close item.

Response Immediate assess: The cables are used from the startup transformers to the 4 KV buses and overhead 115 KV bare cable is used to supply the transformers with bus above the transformers.

Delayed Access: there is isophase bus duct used on the back-feed for the 22 KV system and it connects to the auxiliary transformer.

111 **Category** Closed

Request Please provide results of the last inspection of the welds between the rerouted
CRD return line and the RWCU system. (BWR CRD Return Line Nozzle Program)

Response Provided results of 1985 inspection

112 **Category** Closed

Request Please provide documentation related to resolution of vessel clad cracking.

Response Provided documentation as requested during NRC interview.

113 **Category** Closed

Request The BWR penetrations program second exception allows a smaller inspection than the code
(1/2"' vs. 1/2" vessel wall thickness). What is the basis for this?

Response The inspection of the vessel penetrations to1/2' versus 1/2T was approved via Relief Request ISI-09. This relief request is in turn based on ASME Code Case N-613-1. Code case N-613-1 has been endorsed by the NRC per Table 1 of Regulatory Guide 1.147, Revision 14, August 2005.

This is conservatively identified in the BWR Penetrations Program description as an exception to GALL because it required relief to the existing code requirements.

114 **Category** Closed

Request Do the VY penetration nozzles have a bored (cold worked) safe end extension?

If yes, they require additional inspection.

Response This question was erroneously applied to the vessel instrumentation nozzles. BWRVIP-49-A requires no additional inspection requirements for cold worked safe ends for the instrumentation nozzles.

The question should have been directed at the SLC/DP nozzle, for which the discussion of cold worked safe ends is found in the BWRVIP-27-A inspection guideline 3.4.1. Per drawing 5920-52666 R0 implementing the inspection guidelines of BWRVIP-27-A as applicable to VY, but that does not include the entire safe end extension examination required of those plants with cold worked safe ends.

115 **Category** Closed

Request Accurately state / describe the information / documentation requested. Be as specific as possible.
LRPD-05 section 4.4.1 second paragraph states that the BWR CRD Return Line Nozzle program provides reasonable assurance. Should this have been the Buried Piping Inspection Program?

Response Yes, this is a typographical error and it should have said that the Buried Piping Inspection Program provides reasonable assurance that the effects of aging will be managed such that the current licensing basis for the period of extended operation. This item has been addressed through revision of LRPD-05.

116 **Category** Closed

Request B.1.17-N-04
GALL X1.E3 under program description states, in part, that periodic actions such as inspecting for water collection in cable manholes, and draining water, as needed to prevent cables from being exposed to significant moisture. The above actions are not sufficient to assure water is not trapped elsewhere in the raceways. In addition to the above periodic actions, in scope, medium voltage cables are tested to provide an indication of the condition of the conductor insulation. VYNPS AMP B.1.17 under same element states that periodic actions will be taken to prevent cables from being exposed to significant moisture, such as inspecting for water collection in cable manholes and draining water, as needed. In-scope medium-voltage exposed to significant moisture and voltage will be tested to provide an indication of the condition of the conductor insulation. It is not clear to the NRC if you intend to use these periodic actions to preclude cable testing. If this is the case, provide a technical justification of why removing water in the cable manholes will provide assurance that water is not present elsewhere in the conduits or duct banks. If this is not the case, revise your AMP as appropriate to requires both testing and inspecting water accumulation in the

Response The intent of the VY AMP B.1.17 is to inspect for water in manholes and to test the in-scope medium-voltage cables.

117 **Category** Closed

Request B.1.17-N-05
GALL X1.E3 recommends testing all in-scope inaccessible medium-voltage cables. Are all inaccessible medium-voltage cables within the scope of license renewal tested?

Response Yes, all of the in-scope medium-voltage cables will be subject to testing per the program requirements.

118 **Category** Accepted

Request B.1.17-N-06
GALL X1.E3 under parameters monitored/inspected states that the specific type of test performed will be determined prior to the initial test and is to be a proven test for detecting deterioration of the insulation system due to wetting such as power factor, partial discharge test, or polarization index, as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time the test is performed. VYNPS B.1.17 under the same attribute only states that the specific type of test performed will be determined prior to initial test. Revise your AMP to be consistent with GALL or explain how do you ensure that the test to be performed will be in accordance with industrial guideline or that is the state-of-the-art at the time the test is performed.

Response LRA Appendix B.1.17 will be revised to state that the specific type of test to be performed will be determined prior to the initial test and is to be a proven test for detecting deterioration of the insulation system due to wetting as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time the test is performed.
This requires an amendment to the LRA.

119 **Category** Closed

Request B.1.17-N-07
Do you currently inspect water in the man holes. Are there any existing procedures for inspecting man holes. Provide a copy of these procedures.

Response Yes, the manholes are inspected on an annual basis. An example was provided during the onsite inspection

120 **Category** Accepted

Request B.1.17-N-08
GALL X1.E3 defines medium-voltage cable is the voltage level from 2kV to 35kV VYNPS AMP B.1.17 defines medium-voltage cable is the voltage level from 2kV to 15kV. Revise the scope of the inaccessible medium - voltage level to be consistent with GALL or provide a technical justification that why the water tree phenomenon is not applicable to voltage level greater than 15kV. Are there any inaccessible medium - voltage cables within the scope of licensee that are greater than 15kV. Are there any inaccessible medium - voltage cables within the scope of licensee that are

Response VY does not have any medium-voltage cable in-scope that is greater than 15KV. LRA Appendix B.1.17 will define medium-voltage cable as voltage level from 2kV to 35kV.
This requires an amendment to the LRA.

121 **Category** Closed

Request B.1.18-N-03
GALL X1.E2 under corrective actions states that such an evaluation is to consider the significance of the test results, the operability of the component, the reportability of the event, the extend of the concern, the potential root causes for not meeting the test acceptance criteria, the corrective actions required, and likelihood of recurrence in addition to 10 CFR Part 50, Appendix B. VYNPSB.1.18 under the same element only refers to 10 CFR Part 50 Appendix B to address corrective actions. Revise your AMP corrective actions to be consistent with GALL or provide a justification of why such specific corrective actions are not

Response VYNPS B.1.18 AMP under corrective actions states that "an engineering evaluation will be performed when the test acceptance criteria are not met in order to ensure that the intended functions of the electrical cables can be maintained consistent with the current licensing basis. This evaluation is performed in accordance with the Entergy corrective action process per procedure EN-LI-102. This procedure provides the stated elements to consider including the extent of the concern, the potential root causes for not meeting the test acceptance criteria, the corrective actions required, and likelihood of recurrence. See procedure details below:

Adverse Condition – An event, defect, characteristic, state or activity that prohibits or detracts from safe, efficient nuclear plant operation or a condition that could credibly impact nuclear safety, personnel safety, plant reliability or non-conformance with federal, state, or local regulations. Adverse conditions include non-conformances, conditions adverse to quality and plant reliability concerns

Operability Evaluation – A written evaluation of a Condition Report, to determine impact of the identified condition on the operability of structures, systems or components. The operability evaluation includes a determination for reportability.

Extent of Condition – An evaluation to identify the total population of items that have or may have the same problem as identified in the original CR problem statement. The intent of the Extent of Condition review focuses on a determination of any potential impact to the operability/functionality of similar components, equipment, systems, human performance traps/issues, or organizational processes/programs.

Root Cause – The most basic cause(s) for a failure or a condition that, if corrected or eliminated, will preclude repetition of the event or condition.

Corrective Action – Corrective actions include actions intended to preclude repetition of significant conditions and those intended to correct adverse conditions.

Corrective Actions to Preclude Repetition – A type of corrective action intended to correct the root cause of a condition and thereby preclude repetition.

A copy of EN-LI-102 had been provided to the onsite review team.

122 **Category** Closed

Request B.1.18-N-04
Why is the high range radiation monitor cable is not considered in scope of XI.E2.

Response VYNPS electrical AMR, AMRE-01, states that "Cables and connections in the high-range reactor building area monitoring system, support a license renewal intended function. However, the entire length of these cables are EQ and do not require aging management since they are subject to replacement based on a

123 **Category** Closed

Request B.1.19-N-03
For all new AMP provide a commitment number and the implementation period for this new program.

Response Commitments numbers are being supplied in a table for all commitments.

124 **Category** Accepted

Request B.1.19-N-04
GALL X1.E1 under scope of program states that this inspection program applies to accessible electrical cables and connections within the scope of license renewal that are installed in adverse localized environments caused by heat or radiation in the presence of oxygen. VYNPS AMP B.1.19 under the same element you have stated that this program will include accessible insulated cables and connections installed in structures within the scope of license renewal and prone to adverse localized environments. Clarify if the scope of this program include only insulated cables and connections installed in structures which (structures) are in scope of license renewal and prone to adverse localized environments or insulated cables and connections within the scope of license renewal that are installed in adverse localized environments. . Why are structures included in the scope of the AMP. Modify the scope of the program as appropriate to remove the

Response "In a structure" means inside the plant not outside. The VYNPS B.1.19 will be revised to state that the program applies to accessible electrical cables and connections within the scope of license renewal that are installed in adverse localized environments caused by heat or radiation in the presence of oxygen. This requires an amendment to the LRA.

125 **Category** Closed

Request B.1.19-N-05
Explain why the GALL X.E1, EQ, is included in the basic document for non-EQ insulated cables and connections program.

Response A revised copy of GALL for XI.E1 was provided.

126 **Category** Closed

Request 3.6.2.2-N-09
GALL XI.E5 states that the fuse holder (not part of a larger assembly) metallic portions are subject to fatigue due ohmic heating, thermal cycling, electrical transients, frequent manipulation, vibration, chemical contamination, corrosion, and oxidation. In the LRA Table 3.6.1 item 3.6.1-6, you have stated that NUREG-1801 aging effect is not applicable to VYPNS. In AMRE-01 Revision 0 Page 14 of 108, you have stated that VYNPS employs two general types of fuse holders. The first type is the bolt-mount fuse holder that uses either a lug or cap-screw to secure the fuse between the clamps. The second type of fuse holder is the metallic clamp fuse holder, which uses the spring tension. Installation data for cables and connections indicated that the only fuse holders installed at VYNPS that utilize metallic clamps to secure the fuse are either part of active assembly or are located in circuits that perform no license renewal indented functions. Are there any bolt-mount fuse holders in scope of licensee renewal that are not part an active assembly. If there are, explain why aging effects as

Response No, the two types of fuse holders are all located in active devices.

127 **Category** Closed

Request B.1.1-L-06
Program Description item. The LRA says “Buried components are inspected when excavated during maintenance”. Is maintenance performed on an as needed basis or is it on a scheduled frequency?

Response The maintenance inspections being credited are inspections that are being performed on an as needed basis since there are no routine scheduled maintenance inspections of buried piping.

128 **Category** Closed

Request B.1.1-L-07
Program Description item. The LRA says “A focused inspection will be performed within the first 10 years of the period of extended operation….” The LRA seems to address inspections that occur both before and during the period of extended operation; the Appendix A reference does not clarify this confusion. When does VY plan to perform these focused inspections?

Response The focused inspection will be performed within the first 10 years of the period of extended operation, unless an opportunistic inspection occurs within this ten-year period as stated in LRPD-02 section 4.1.B.4.b of the Buried Piping Inspection Program and in Appendix B.1.1 of the LRA. The first sentence in the third paragraph of the program description in the LRA describes a review of operating experience (if available) for examinations of buried piping for relevant information and is not a required inspection.
Inspections of buried carbon steel piping were performed in 2003 which is within the 10 years prior to the period of extended operation. These inspections revealed no coating or piping degradation.

129 **Category** Closed

Request B.1.1-L-07
Program Description item. Depending on the response to the above question, please clarify the Appendix A reference, as needed.

Response Appendix A is correct as written. The focused inspection is specified for the ten years immediately after entering the period of extended operation. This is consistent with the SER for Brunswick dated March 2006.

130 **Category** Closed

Request B.1.1-L-08
Acceptance Criteria item. The GALL Report says “Any coating and wrapping degradations are reported and evaluated according to site corrective actions procedures.” The LRA says “Coating and wrapping degradation, or loss of material due to corrosion, is evaluated in accordance with the site corrective action program.” PP 7030, Section 4.8, is very general, e.g., “signs of degradation,” “areas of degradation.” Does VY intend to enhance this guidance, as well as that addressed in question B.1.1-L-04?

Response It was the intent of the enhancement specified in B.1.1 to revise appropriate sections of procedure PP 7030 to include attributes of coating damage and evidence of corrosion. This would include updating sections 4.3 & 4.8.
This item will be captured in License Renewal Commitment 01.

131 **Category** Closed

Request B.1.1-L-09
Operating Experience item. . Why does LRDP-05, Section 4.4.1 reference the BWR CRD Return Line Nozzle Program?

Response Yes, this is a typographical error and it should have said that the Buried Piping Inspection Program provides reasonable assurance that the effects of aging will be managed such that the current licensing basis for the period of extended operation. This item was addressed in revision to LRPD-05.

132 **Category** Closed

Request B.1.30.2-M-03
An exception to BWRVIP - 130 criteria for feedwater copper was noted. Please provide related information. (Water Chemistry Control - BWR Program)

Response Provided Revision 1 of Technical Justification for Continued Operation of Entergy Northeast Vermont Yankee (ENVY) with Feedwater Copper > 0.2 ppb.

133 **Category** Closed

Request B.1.30.2-M-04
Please provide a copy of recent third party assessments of the Water Chemical Control - BWR Program.

Response Third party assessment of BWR Water Chemistry control from March 2001, May 2003 and April 2005 were provided for review.

134 **Category** Closed

Request B.1.8-L-02
Detection of Aging Effects item. PP 7006, Section 4.4.4, refers to a Type A Test, which will be developed. Please explain.

Response Type A testing) and due to the expectations of VY on maintaining operating procedures current, OP 4029 (test procedure) was retired. By retiring the procedure that is conducted once every 10 to 15 years, forces the test engineer to develop a Type A Test IAW Tech Specs 6.7.C & PP 7006, Section 4.4.4 that adopts the latest test equipment, processes, software programs, and testing philosophies into the infrequently conducted evolution (SOER 91-01), thereby ensuring that the complex Type A testing process is thoroughly understood by the test engineer. With the inception of 10CFR50 Option B, containment integrity is adequately monitored between Type A tests.

135 **Category** Closed

Request B.1.8-L-03
Monitoring and Trending item. The GALL Report says “The frequency of these tests depends on which option (A or B) is selected. With Option A, testing is performed on a regular fixed time interval as defined in 10 CFR Part 50, Appendix J.” The LRA says “The first Type A test after the April 1995 Type A test shall be performed no later than April 2010. This is a one-time extension of the NEI 94-01, 10 year Type A test interval to 15 years. NRC approved Amendment 227 to Facility Operating License DPR-28 for VYNPS to extend the primary containment integrated leak rate testing interval from 10 years to no longer than 15 years on a one-time basis.” Amendment 227 refers to its being a one-time extension, so it would not appear to extend into the period of extended operation. Please clarify.

Response Under current regulations and NEI guidance, the one time change does not affect the Type A test interval or number of tests to be conducted during the period of extended operation.

136 **Category** Closed

Request B.1.8-L-04
Monitoring and Trending item. Does VY take any exception to the testing guidance of RG 1.163 or NEI 94-01?

Response At present, VY does not take direct exception to any provision in RG 1.163. VY does take exception to NEI 94-01. Specifically, with the adoption of License Amendment 223 of the Alternative Source Term (AST), the Main Steam Line Pathways were determined to be separate radiological (consequences) release paths exclusive of the Primary-Secondary Containment System radiological (consequences) release path. This pathway is subject to the 10CFR50 Appendix J Type C testing methodologies but the calculation methods, leakage-rate summations, and acceptance criteria were determined to be independent of the Primary Containment allowable leakage rate (La). NEI 94-01 does not address the effects AST adoption on a primary containment leakage rate testing program; therefore, an exception

137 **Category** Closed

Request B.1.8-L-05
Acceptance Criteria item. LRPD-02 identifies the following as an exception that the LRA did not. The GALL Report says “Acceptance criteria for leakage rates are defined in plant Technical Specifications. These acceptance criteria meet the requirements in 10 CFR Part 50, Appendix J, and are part of each plant's current licensing basis. The current licensing basis carries forward to the period of extended operation.” The LRA says “VYNPS acceptance criteria are defined in plant technical specifications.” Please expand on why the acceptance criteria are not consistent with the GALL Report.

Response See B.1.8-L-04 exception basis for response.

138 **Category** Closed

Request B.1.8-L-06
Operating Experience item. Does VYNPS monitor industry issues/events and assess these for applicability to its own program?

Response VYNPS incorporates, as necessary, lessons learned into the Containment Leak Rate Program from operating experiences identified at VYNPS and industry operating experiences. The incorporation of the lessons learned follows a process of an understanding of the operating experience, an assessment of the current program to determine applicability, and the document development to affect the change.

139 **Category** Closed

Request B.1.14-K-01
Requested operating experience information on a sample of the heat exchangers included in the Heat Exchanger Monitoring Program if any is available.

Response Operating History search was performed on the following components:

HPCI gland Seal condenser (E-18-1A)
HPCI Lube oil coolers (E-19-1A)
RCIC lube oil coolers (E-21-1A)
CST aluminum steam reheat coil (E-HB-1)
Drywell atmospheric cooling units (RRU 1, 2, 3, 4)
Drywell equipment drain cooler (E-ESC-1A)
Reactor Recirculation pump seal water coolers (P-18-1A/B Hx-3)
Reactor Recirculation pump motor upper & lower bearings oil coolers (P-18-1A/B Hx-2)
Reactor Recirculation pump motor air coolers (P-18-1A/B Hx-1)

Keywords used in PCRS:
Fouling
Eddy Current
Tube replacement
Tube plugging
Plugging
Tube blockage

No information was found on the heat exchanger or coolers for any of the above components in PCRS.

EMPAC search on components:
WO 2001-5153 performed 10/04/2002- E-18-1A HPCI Gland Seal condenser Cleaning and inspection
WO 1997-8128 performed 04/02/1998- E-19-1A Inspect lube oil side of HPCI lube oil cooler
RRU-1 through 4 are inspected and lubricated during refueling outages-External inspections only
Attachments provided to the NRC during the onsite review:
WO 2001-5153
WO 1997-8128
NRC has these attachments.

140 **Category** Closed

Request B.1.14-K-02
What is the proposed frequency of inspection and basis of the frequency selected for the heat exchangers included in the Heat Exchanger Monitoring Program.

Response The development of the non Service Water (SW) cooled heat exchanger inspection and monitoring plan would be similar to the process which was used for the SW heat exchangers.

The scope of this plan would include, but not be limited to, the following heat exchangers and coolers:
Drywell Coolers, RRU-1 through 4
HPCI Gland Seal Condenser, E-18-1A
HPCI Lube Oil Cooler, E-19-1A
RCIC Lube Oil Cooler, E-21-1A
CST Reheat Coil, E-HB-1
Drywell Equipment Drain Cooler, E-ESC-1A
Reactor Recirculation Pump Seal Water Coolers, P-18-1A HX-3 & P-18-1B HX-3
Recirculation Pump Motor Upper & Lower Bearing Oil Coolers, P-18-1A HX-2 & P-18-1B HX-2
Recirculation Pump Motor Air Coolers, P-18-1A HX-1 & P-18-1B HX-1

The following is an example of the steps which would be used to develop the plan:

1. An initial visual inspection would be performed of the in scope heat exchangers. This inspection would document the “as-found” conditions. Additional examination methods may be used if “as-found” conditions warrant, (i.e. ultrasonic thickness measurements or radiography). The results of these inspections would be used to establish the frequency of future inspections.

2. Where physically accessible, baseline eddy current data would be obtained. The number of tubes sampled would be determined based on industry best practices and EPRI recommendations. The results of these tests would be used to determine the frequency of future inspections and the number of tubes to be sampled.

3. Future inspections and eddy current examinations would be scheduled via the Preventive Maintenance process.

4. Performance monitoring and trending would be performed in accordance with established fleet procedures.

Once developed the plan would be administered by the onsite engineering organization.

141 **Category** Closed

Request B.1.12.1-L-07
Scope of Program item. The GALL Report has requirements in numerous program elements that are on a six-month frequency. The LRA states that these are on a refueling (twenty-month) frequency. Please discuss and justify the inspection frequency differential for the CO2 .system.

Response System walkdown every 6 months, starting prior to period of extended operations.

The VY AMP B.1.17 will state that the specific type of test to be performed will be determined prior to the initial test and is to be a proven test for detecting deterioration of the insulation system due to wetting as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time the test is performed.

142 **Category** Closed

Request B.1.18-N-04
Why is high range radiation monitor cable not considered in scope of XI.E2

Response VYNPS Electrical AMR, AMRE-01 states that "Cables and connections in the high-range reactor building area monitoring system, support a license renewal intended function. However, the entire length of these cables are EQ and do not require aging management since they are subject to replacement based on a qualified life.

143 **Category** Closed

Request B.1.18-N-05
GALL XI.E2 under parameter monitored/inspected states that the parameter monitored are determined from the specific calibration, surveillance or testing performed and are based on the specific instrumentation under surveillance or being calibrated, as documented in plant procedures. VY AMP B.1.18 under same attribute states that results from the calibrations or surveillance of components within the scope of license renewal will be reviewed. The parameters reviewed will be based on the specific instrumentation circuit under surveillance or being calibrated, as document in the plant calibration or surveillance procedures.

a Why does the review of calibration results belong to parameter monitored/inspected attribute?

b. The parameter monitored/inspected for cable testing was not mentioned. What is the parameter for cable testing. Confirm that cable testing will be perform on cables in-scope of XI.E2 that are disconnected during instrumentation calibration.

Response a) B.1.18 will be revised under parameter monitored/inspected to state that the parameters monitored are determined from the specific calibration, surveillances or testing performed and are based on the specific instrumentation circuit under surveillance or being calibrated, as documented in plant procedures.
LRPD-02, Rev 2 incorporated this change.

(b) B.1.18 under parameter monitored/inspected will state that the parameters monitored are determined from the specific calibration, surveillances or testing performed. The parameter for cable testing is determined from the plant procedures. Cable testing is performed by plant procedures on cables in-scope of XI.E2 that are disconnected during instrument calibration.

144 **Category** Closed

Request B.1.18-N-06
VY B.1.18 under acceptance criteria address the acceptance criteria for calibration. However, it silences on the acceptance criteria for cable testing. What is the acceptance criteria for cable testing?

Response B.1.18 will be revised under acceptance criteria to state that calibration results or findings of surveillance and cable system testing results are to be within the acceptance criteria.
LRPD-02, Rev 2 incorporated this change.

145 **Category** Closed

Request B.1.20-K-03
Please provide QA Surveillance and self-assessment referenced in operating experience for Oil Analysis Program.

Response QA Surveillance SRVY 2002-025 and 2003 self-assessment provided during the onsite audit.

146 **Category** Closed

Request B.1.12.1-L-07
Scope of program item. The GALL Report has requirements in numerous program elements that are on a six-month frequency. The LRA states that these are on a refueling (twenty-month) frequency. Please discuss and justify the inspection frequency differential for the CO2 system.

Response The TRM frequencies are based on those that were previously in the Technical Specifications. Entergy VT will re-examine the ability to performing these surveillances at a 6 month or higher frequency, provided that they can be safely performed online. This effort will be started 6 months prior to the period of extended operation and is tracked as License Renewal Commitment #30.

147 **Category** Closed

Request B.1.12.1-L-08
Preventive Actions item. The GALL Report says “For operating plants, the fire hazard analysis assesses the fire potential and fire hazard in all plant areas….” The LRA says “The NUREG-1801 Preventive Actions do not specify any measures for preventing aging effects of fire protection structures, systems or components.” Has VY performed a fire hazard analysis?

Response The VY Fire Hazards Analysis was provided during the onsite inspection

148 **Category** Closed

Request B.1.12.1-L-09
Parameters Monitored/Inspected item. The GALL Report says “Visual inspection of the fire barrier walls, ceilings, and floors examines any sign of degradation such as cracking, spalling, and loss of material caused by freeze-thaw, chemical attack, and reaction with aggregates.” The LRA says “Procedures will be enhanced to specify that fire damper frames in fire barriers shall be inspected for corrosion.” What is the material and environment of the damper frames?

Response These dampers are in ventilation ducts; therefore, the conditions would be similar to other ambient conditions in the plant. The duct material is carbon steel. The environment is indoor air.

149 **Category** Closed

Request B.1.12.1-L-10
Parameters Monitored/Inspected item. What examination technique will be used?

Response Visual exam, consistent with ANSI 45.2.6

150 **Category** Accepted

Request B.1.12.1-L-11
Parameters Monitored/Inspected item. The GALL Report says “The diesel-driven fire pump is under observation during performance tests such as flow and discharge tests, sequential starting capability tests, and controller function tests for detection of any degradation of the fuel supply line.” The LRA says “Procedures will be enhanced to state that the diesel engine sub-systems (including the fuel supply line) shall be observed while the pump is running.” Is there a VYNPS commitment associated with this enhancement?

Response Yes. This item is being tracked by License Renewal Commitment #9.

151 **Category** Closed

Request B.1.12.1-L-12
Acceptance Criteria item. The GALL Report says “Inspection results are acceptable if there are no visual indications (outside those allowed by approved penetration seal configurations) of cracking, separation of seals from walls and components, separation of layers of material, or ruptures or punctures of seals; no visual indications of concrete cracking, spalling and loss of material of fire barrier walls, ceilings, and floors; no visual indications of missing parts, holes, and wear and no deficiencies in the functional tests of fire doors.” The LRA says “Acceptance criteria will be enhanced to verify no significant corrosion.” How much is

Response This item is being addressed by License Renewal Commitment #8

152 **Category** Closed

Request B.1.12.1-L-13
Acceptance Criteria item. What actions are taken, either with or without significant corrosion?

Response This item is being addressed by License Renewal Commitment #8

153 **Category** Closed

Request B.1.12.1-L-14
Acceptance Criteria item. Is there a VYNPS commitment associated with this enhancement?

Response This item is being addressed by License Renewal Commitment #8

154 **Category** Closed

Request B.1.12.1-L-15
Acceptance Criteria item. The GALL Report says “No corrosion is acceptable in the fuel supply line for the diesel-driven fire pump.” The LRA says “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.” Does the enhancement include corrosion in the fuel supply line of the diesel-driven fire pump?

Response Evidence of corrosion inside the fuel line would appear as corrosion products in the fuel filter. Evidence of corrosion in the fuel filter would result in a Condition Report and an evaluation. Evidence of corrosion would be an inspection criterion for fuel filters removed from service. In addition, the internals of the fuel line are managed by the diesel fuel oil monitoring program.

155 **Category** Accepted

Request B.1.12.1-L-16
Acceptance Criteria item. Is there a VYNPS commitment associated with this enhancement?

Response Yes. This item is being tracked by License Renewal Commitment # 9

156 **Category** Closed

Request B.1.12.1-L-17
Operating Experience item. Has VY experienced any fire-protection-related operating experience? Please describe.

Response During the onsite inspection, the OE Coordinator provided the requested information.

157 **Category** Closed

Request B.1.12.1-L-18
Operating Experience item. Has VY reviewed and applied the industry operating experience that relates to fire protection?

Response VY routinely reviews Industry OE in accordance with fleet procedure, EN-OE-100. The VY OE coordinator routes OE to affected line organization groups, and enters action items into the corrective action process to ensure that timely review is completed and documented.

158 **Category** Closed

Request B.1.12.1-L-19
Operating Experience item. Is any VY plant-specific operating experience not bounded by industry operating experience?

Response No

159 **Category** Closed

Request B.1.12.1-L-20
Program Description item. Does VY inspect the fire dampers?

Response Yes. Surveillance Test #7134 is the Operating Cycle Test of Fire Barrier Dampers, using procedure OP 4019. VY will add Fire Dampers to the program description.

160 **Category** Closed

Request B.1.12.1-L-21
Program Description item. Does VY have an electric fire pump?

Response Yes. The pump end is identical to the diesel fire pump. It is located in the Intake Structure. Component ID is P-40-1B. It is Managed by Fire Water Program via Test Procedure # OP 4105.

161 **Category** Closed

Request B.1.12.1-L-22
Program Description item. How does VY inspect/test Appendix R-required equipment?

Response Test Procedures for inspecting and testing Appendix R required equipment are:

PROC. #	TITLE
AP 0042	Plant Fire Prevention and Fire Protection
OP 0046	Installation and Repair of Fire Barriers, Penetration Seals, Fire Breaks and Flood Seals.
OP 2186	Fire Suppression Systems
OP 3020	Fire Emergency Response Procedure
AP 3700	Fire Training
OP 4001	Plant Fire Extinguisher Service and Issue
OP 4002	Integrity Surveillance of Fire Detectors and Fire Suppression Systems
OP 4019	Surveillance of Plant Fire Barriers and Fire Rated Assemblies
OP 4103	Fire Protection Equipment Surveillance
OP 4104	Fire Hose Hydro Test Surveillance
OP 4105	Fire Protection Systems Surveillance
OP 4221	Surveillance of Gas Fire Extinguishing Systems
OP 4339	Surveillance of Fire Protection Detectors/Instruments
OP 4392	Trip Test of Fire System Water Flow Alarms
OP 4393	Test of the Cable Vault, Switchgear Room, and Intake Structure CO2 Systems
OP 4395	Check of Computer/Heating Ventilation Air Conditioning (HVAC) Shutdown Circuits/Computer Room Halon Act. System
OP 4602	Sampling of Fire Fighting Foam for Annual Analysis
OP 4800	General Safety Surveillance
OP 5327	Calibration of Plant Fire Protection System Instruments
AP 6024	Plant Housekeeping and Foreign Material Exclusion/Cleanliness Control
PP 7011	Vermont Yankee Fire Protection and Appendix R Program

162 **Category** Accepted

Request B.1.12.1-L-23
Detection of Aging Effects item. The GALL Report says “Visual inspection by fire protection qualified inspectors….” Of what does this consist, at VY?

Response At VY, the program is being developed and will include training, acceptance criteria, and qualification as a “fire protection qualified individual" ANSI 45.2.6 The injection program, EN-MA-102, will be used.

163 **Category** Closed

Request B.1.12.1-L-24
Acceptance Criteria item. The GALL Report says “Inspection results are acceptable if there are no visual indications (outside those allowed by approved penetration seal configurations) of cracking,…” OP 4019, Appendix B, allows cracks in poured concrete barriers, fire barriers, concrete block walls, drywall, plaster, silicone foam, pyrocrete, and smoke/gas seals.

Response OP 4019 acceptance criteria will be revised to require that any recordable "outside those allowed by approved penetration seal configurations" visual indication be identified and entered into the corrective action process for evaluation.

The CA number to complete this action by 12/31/06 is CR-VTY-2006-112. CA-02; CA-03.

164 **Category** Closed

Request B.1.30.1-M-02
Is the identified enhancement to AMP B.1.30, Water Chemistry Control – Auxiliary Systems, necessary and appropriate for this program

Response The identified enhancement to AMP B.1.30, Water Chemistry Control – Auxiliary Systems is to enhance procedures to flush the John Deere diesel cooling water system and replace the coolant and coolant conditioner every three years.

A program is necessary to manage loss of material and fouling of carbon steel and copper alloy components in the John Deere diesel cooling water system for the period of extended operation. Due to the size and configuration of the system, periodic sampling of the coolant was deemed unrealistic and the decision was made to flush the cooling water and replace the coolant and coolant conditioner every three years. While this task could have been included in the Periodic Surveillance and Preventive Maintenance program, it was included in the Water Chemistry Control – Auxiliary Systems program to be consistent with other components exposed to treated water, which are managed by water chemistry control programs.
As stated in LRA Section B.1.30.1, rather than sampling, procedures will be enhanced to flush the John Deere diesel cooling water system and replace the coolant and coolant conditioner every three years. (License Renewal Commitment 26)

165 **Category** Closed

Request B.1.30.1-M-03
Confirm that there are no other in-scope systems that rely on this AMP for managing the effects of aging.

Response The following LRA tables credit the Water Chemistry Control – Auxiliary Systems Program for managing the effects of aging.

3.2.2-5, Reactor Core Isolation Cooling (RCIC) System – Summary of Aging Management Evaluation
3.3.2-10, Heating, Ventilation and Air Conditioning (HVAC) Systems – Summary of Aging Management Evaluation
3.3.2-12, John Deere Diesel (JDD) – Summary of Aging Management Evaluation
3.3.2-13-18, House Heating Boiler (HB) System, Non Safety-Related Components Affecting Safety-Related Systems – Summary of Aging Management Evaluation
3.3.2-13-39, Stator Cooling (SC) System, Non Safety-Related Components Affecting Safety-Related Systems – Summary of Aging Management Evaluation

The component in the RCIC system that credits this program is a steam heater which is supplied by the house heating boiler system. Similarly, the components in the HVAC systems that credit this program are supplied by the house heating boiler system. Thus, there are no in-scope systems (other than the house heating boiler, stator cooling, and John Deere diesel systems) that rely on this AMP for managing the effects of aging. All other in-scope treated water systems rely on either the Water Chemistry Control – BWR program or the Water Chemistry Control – Closed Cooling Water program for managing the effects of aging.

Items 3.3.1-50 and 3.3.1-51 in LRA Table 3.3.1 will be updated to reflect that the de-mineralized water system is managed by the Water Chemistry Control – BWR Program, as indicated in LRA Table 3.3.2-13-12, aging of components.

This requires an amendment to the LRA.

166 **Category** Accepted

Request B.1.21-K-04
LRA Section 3 Table 2's do not list the One-Time Inspection Program with the water chemistry control programs for components for which GALL recommends One-Time Inspection to verify effectiveness of the Water Chemistry Control Program.

Response LRA Section 3 Table 1's discussions provide the link between the One-Time Inspection and Water Chemistry Control Program for these components.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

167 **Category** Closed

Request B.1.21.-K-05
Please provide sample selection criteria for the small - bore piping one-time inspection program.

Response Inspection locations will be based on physical accessibility exposure levels, NDE techniques, and locations identified in NRC Information Notice 97-46, Un-isolable Crack in High-Pressure Injection Piping. The initial population will include all Class 1 small - bore piping.

168 **Category** Closed

Request B1.15.2-P-01
Please explain why the AMP for ISI (IWB, IWC, & IWD) is not consistent with the GALL AMP XI.M1

Response Entergy chose to describe the Inservice Inspection and Containment Inservice Inspection Programs as plant-specific programs rather than comparing to the corresponding NUREG-1801 programs because the NUREG-1801 programs contain many ASME Section XI table and section numbers which change with different versions of the code. Because of this, comparison with the NUREG-1801 programs generates many exceptions and explanations which detract from the objective of the comparison. What is really needed is that VYNPS follow the version of ASME Section XI that is approved for use at VYNPS and accepted by law in 10CFR50.55(a). As this is the case, the Inservice Inspection and Containment Inservice Inspection Programs are presented as plant-specific programs so they can be judged on their own merit without the distraction of numerous explanations of code revision.

169 **Category** Closed

Request B.1.15.2-P-02
The AMP for ISI (IWB, IWC, & IWD) makes no mention of any risk-informed program. Please confirm whether or not there are current or future plans for the implementation of risk-informed ISI.

Response Risk-informed ISI is being implemented during the Fourth Ten-Year Interval (9/1/2003 – 8/31/2013). Surface examination of ASME Section XI, Class I, Examination Categories B-F, C-F-1, and C-F-2 (4" NPS and larger) are conducted in accordance with Code Case N-663. All areas of the subject welds identified as susceptible to outside surface attack shall be surface examined during the Fourth Ten-Year Interval in accordance with Code Case N-663. Code Case N-663 incorporates lessons learned for risk-informed initiatives and industry examination experience by requiring that an evaluation be conducted to identify locations, if any, where a surface examination would be of benefit from a generic piping degradation perspective. The results of the evaluation identify where O.D. degradation is most likely to occur by reviewing plant-specific programs and practices, and operating experience. If the potential for degradation is identified, Code Case N-663 defines examination techniques, volumes, and frequencies. As such, implementing Code Case N-663 identifies appropriate locations for surface examination and eliminates unnecessary examinations.

VYNPS plans to continue surface examination of ASME Section XI, Class I, Examination Categories B-F, C-F-1, and C-F-2 (4" NPS and larger) in accordance with Code Case N-663 in subsequent inspection intervals. If Code Case N-663 is not incorporated into the ASME Section XI code edition and addendum approved by the Nuclear Regulatory Commission in 10 CFR 50.55a for the subsequent interval, a relief request will be submitted as was done for the Fourth Inspection Interval.

170 **Category** Closed

Request Provide the basis for determining the inspections required for BWRVIP-48. Particularly address whether VYNPS has any furnace sensitized material or Alloy 182 material that requires EVTI.

Response PP7027, Appendix B states clearly that these brackets are examined as if they are furnace sensitized, I A W VIP 48-A.

171 **Category** Closed

Request B.1.27.1-W-04
Provide the last two inspection reports for one un-reinforced Masonry Wall without bracing, one reinforced Masonry Wall without bracing and one steel braced Masonry Wall.

Response The following Block Wall Inspection Reports and drawings were provided during the onsite inspection:

•Masonry Wall Routine Surveillance Walkdown Sheet for Wall G-191145-9 dated 10/16/02 (un-reinforced wall)
•Drawing B-191600 Sheet 8 Rev 0 (from walkdown)
•Attachment C VYP-007 R1 Masonry Wall Routine Surveillance Walkdown Sheet for Wall G-191145-9 dated 9/1/93 (un-reinforced wall)
•Drawing B-191600 Sheet 8 Rev 0 (from walkdown)
•Attachment C VYP-007 R1 Masonry Wall Routine Surveillance Walkdown Sheet for Wall G-191145-4 dated 9/28/93 (steel braced wall)
•Attachment C VYP-007 R0 Masonry Wall Routine Surveillance Walkdown Sheet for Wall G-191145-4 dated 9/10/87 (steel braced wall)
•Drawing B-191600 Sheet 7 Rev 1 (from 1993 walkdown)
•Masonry Wall Routine Surveillance Walkdown Sheet for Wall G-191627-4 dated 10/16/02 (reinforced wall)
•Attachment C VYP-007 R1 Masonry Wall Routine Surveillance Walkdown Sheet for Wall G-191627-4 dated 9/1/93 (reinforced masonry wall)
•Drawing B-191600 Sheet 105 Rev 0 (reinforced masonry wall, from walkdown)
•Drawing B-191600 Sheet 105 Rev 1 (reinforced masonry wall)

172 **Category** Closed

Request Please provide copies of OP4339 and EN-OE-100, procedures related to the Fire Water System Program.

Response OP4339 and EN-OE-100 were provided during the onsite inspection.

173 **Category** Closed

Request In Section 2b Preventive actions of LRPD-02 and it is stated that there are no preventive actions. GALL says that monitoring of water chemistry to control pH and concentration of corrosive contaminants and treatment with hydrazine are effective in reducing selective leaching. Do any of the systems that have selective leaching as an AMP have a treated water environment that performs any of these treatments to control selective leaching?

Response Yes, The Water Chemistry Control - Closed Cooling Water and BWR programs at VYNPS control PH and corrosive contaminants and could be effective in controlling selective leaching. Therefore any system and components with both the selective leaching and the water chemistry programs as aging management programs are included measures that could be effective in controlling the aging effect of selective leaching.

174 **Category** Closed

Request What is the flaw evaluation calculation for the jet pump diffuser welds? Is this calculation considered a TLAA?

Response The jet pump diffuser welds calculations are contained in: GE-NE-B13-01935, Rev. 2, Jet Pump Assembly Welds Flaw Evaluation Handbook for Vermont Yankee, July 1999.

This is not a TLAA.

175 **Category** Closed

Request Will UT of the flawed jet pump diffuser welds continue?

Please identify any change to the exception identified in LRA.
If yes, please provide the exact wording in LRA supplement.
(Note: EVT-1 does not provide flow propagation verification.)

Response These welds are scheduled for UT examination during RFO 26.
Following RFO -26, if there are no changes to the observed indications, the inspections will revert to EVT-1 inspections IAW BWRVIP-4.

176 **Category** Closed

Request Will VYNPS continue to inspect 10% of CRD guide tubes every 12 years?

Additional question: PP-1027 stated that 2VT-3 inspections were performed. BWRVIP stated that 4 CRD Guide tube weld locations were recommended to be inspected
2 locations (VT-3)
2 locations (EVT-1)
Please describe the inspection for all 4 locations.
Does applicant inspect all 4 welds or only 2 welds?

Response VYNPS inspects guide tubes IAW BWRVIP-47-A and plans to continue to do so.

EVT-1 inspections are conducted on CRGT-2 and CRGT-3.
VT-3 inspections are conducted on CRGT-1 and FS?GT-APRIN-1

177 **Category** Closed

Request Will VYNPS continue to inspect the top guide at the rate of 10% every 12 years?

Response This question has been addressed in Question # 14. The BWR Vessel Internals Program at VYNPS is consistent with the program described in NUREG-1801, Section XI.M9, BWR Vessel Internals with the exceptions and enhancement noted in LRA Section B.1.7. As stated in NUREG-1801, the extent of the examination and its frequency will be based on a ten percent sample of the total population, which includes all grid beam and beam-to-beam crevice slots.

178 **Category** Closed

Request What is the exam history, results, schedule and current status of shroud H8 and H9 welds?

Response In RFO 19 (1996) Vermont Yankee performed an inspection of welds H8 and H9 which meets the requirements of BWRVIP-38 for a baseline examination. The following describes the rationale for this statement. The baseline strategies for welds H8 and H9 are shown in Figures 3-4 and 3-5 of BWRVIP-38. The load multiplier is determined from Figures 5-1. In Vermont Yankee's case this is a 0.41. The flaw tolerance is determined from figures 5-1 (for H8) and 5-2 (for H9) for plants with support legs. For both welds the flaw tolerance of 100 %. The minimum examination coverage for a flaw tolerance of 100% is 10% for both H8 and H9. The coverage was 25% for weld H8 and 22% for weld H9 during the RFO 19 (1996) examination. No flaws were found. Therefore an adequate baseline of welds H8 and H9 was performed.

No welds other than H8 and H9 require examination is accordance with BWRVIP-38 for a plant with Vermont Yankee's core shroud support configuration. The NRC requires inspection tooling and methodologies be developed that allow the welds in the lower plenum to be made accessible. This requirement applies to the VYNPS shroud support leg welds. This inspection remains an open item with the NRC per response to BWRVIP-38.

The re-inspection interval is established in BRWVIP-38, Paragraph 3.3.2, that states "if no flaws were found during the previous inspection, re-inspections are performed on ten-year intervals if UT techniques were used…" The RFO 19 (1996) H8 and H9 examination was an ultrasonic test augmented with eddy current and no flaws were found. Therefore the re-inspection interval is ten years if UT techniques are used, and six years if EVT-1 techniques are used (but see below). Accordingly, re-inspection of H8 and H9 were re-inspected in RFO 25(2005), by EVT-1 nine years following the baseline exam.

179 **Category** Closed

Request B.1.22-M-03
Please provide a recent third party assessment of the preventive maintenance program.

Response WANO Assessment Report will be available for on-site review during return audit (week of 5/15/06).

180 **Category** Closed

Request B.1.22.M-04
Following the proposed enhancement to the Periodic Surveillance and Preventive Maintenance Program, will it be apparent that these tasks contain an aging management element?

Response The Periodic Surveillance and Preventive Maintenance program includes two types of tasks, inspections and surveillances.

Inspections include various visual or other non-destructive examinations to manage loss of material, cracking, and fouling of components. Following the proposed enhancements, it will be apparent that these tasks contain an aging management element. To properly inspect for evidence of loss of material, cracking, or fouling, the inspector must be aware that he is looking for these aging effects and as such new guidance to identify these aging effects will be included as required.

Surveillances include the secondary containment capability check, which will confirm the absence of aging effects for reactor building exterior concrete walls during the period of extended operation; leakage testing on the equipment lock doors, which will confirm the absence of aging effects for the rubber door seals during the period of extended operation; and temperature monitoring during operability testing of diesel generators to confirm the absence of fouling of diesel heat exchangers during the period of extended operation. To perform these tests, the performer does not need to be aware that he is confirming the absence of aging effects. If the applicable acceptance criterion is not met, the performer will initiate a condition report. In accordance with the corrective action program, causes for the condition will be evaluated, including those that are due to aging of components.

181 **Category** Closed

Request B.1.22-L-01
Program Description item. The GALL Report says “The External Surfaces Monitoring program is based on system inspections and walkdowns. This program consists of periodic visual inspections of steel components such as piping, piping components, ducting, and other components within the scope of license renewal and subject to AMR in order to manage aging effects. The program manages aging effects through visual inspection of external surfaces for evidence of material loss. Loss of material due to boric acid corrosion is managed by the Boric Acid Corrosion Program.” The LRA says “This 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.” What materials are within the scope of this AMP?

Response The Walkdown program is not exclusive of any system material condition. It should be noted that the walkdown process may find signs of external piping degradation that would be evaluated for potential impact to interior piping surfaces. The walkdown program is not intended to inspect interior piping and component surface unless they have been revealed for inspection during maintenance and repairs. As indicated in the tables in Section 3 of the LRA, the System Walkdown program manages aging for external surfaces of carbon steel, stainless steel, cast iron, low alloy steel, aluminum, and copper alloy components. The program also manages loss of material from internal surfaces in situations in which internal and external material and environment combinations are the same such that external surface condition is representative of internal surface condition.

182 **Category** Closed

Request B.1.22-L-02
Program Description item. What examination methods are used?

Response For current term operation, system walkdowns use " eye contact" examination. System Engineers are not qualified in visual examination methods such as those used to qualify welding. The Entergy walkdown procedure provides a listing and a checklist of examinations to be performed during the walkdown. Plant issues ranging from standard housekeeping to equipment problems are documented and acted upon accordingly through work planning and the condition reporting system. For the License Renewal term, under the System Walkdown program, visual inspection activities are performed and associated personnel are qualified in accordance with site controlled procedures and processes.

183 **Category** Closed

Request B.1.22-L-03
Operating Experience item. . Has VY experienced any external surfaces-related operating experience? Please describe.

Response System Walkdowns , both online and during refueling outages, have found corrosion on piping and component surfaces. For instance, each refueling, the interior of the condenser hotwell and waterboxes are inspected. Repairs and or more detailed inspections are implemented as required. In Refueling Outage 24 (November 2005) examination of spring cans supporting service water piping revealed rust and the need for recoating. Corrective actions driven by condition reporting and work order planning has resulted in scheduling repair for the 2006 outage.

184 **Category** Closed

Request B.1.22-L-04
Operating Experience item: Has VY reviewed and applied the industry operating experience that relates to external surfaces?

Response Vermont Yankee System Engineers have received training in the EPRI Aging Management Field guide, which in effect is a collection of OE from many nuclear plant systems, both mechanical and electrical, as well as buildings and structures intended to provide specific details of corrosion and degradation throughout the plant. Review of OE is an ongoing activity for Vermont Yankee System Engineers intended to ensure latest issues are known and to continue to develop background related to assigned systems.

185 **Category** Closed

Request B.1.22-L-05
Operating Experience item: Is any VY plant-specific operating experience not bounded by industry operating experience?

Response Through its condition reporting system, Vermont Yankee will contribute to industry OE as its Condition Reporting Committee directs. Aging related issues with Vermont Yankee are typical of industry based OE.

186 **Category** Closed

Request B.1.22-L-06
Program Description item. Is boric acid leakage that falls/sprays on VY components managed by the Boric Acid Corrosion Program?

Response Vermont Yankee is a Boiling Water Reactor and therefore does not have a Boric Acid Corrosion Prevention program. The Standby Liquid Control system, which contains Sodium Pentaborate, and is maintained in a clean condition. Rare cases of leakage from standby liquid control system valve packing or other system components have occurred, but were promptly corrected prior to impacting the intended function of components subject to aging management review for license renewal. The external surfaces of SLC components and components in the area are managed by the System Walkdown program.

187 **Category** Closed

Request B.1.22-L-07
Scope of Program item. Please expand the explanation of the enhancement identified in LRPD-02, page 218.

Response The enhancement in LRPD-02, page 218 was identified after the LRA was submitted to NRC for review. Entergy decided that the System Walkdown program implementing procedure should be enhanced to specify that systems in scope and subject to aging management review for license renewal in accordance with 10 CFR 50.54 (a)(1) and (a)(3) shall be walked down. Guidance as to what systems are walked-down is currently included in less formal plant guidelines. Also, although the System Walkdown program implementing procedure currently provides guidance to inspect nearby systems that could impact the system being walked down, Entergy decided that this guidance should be clarified. The enhancement in LRPD-02, page 218 is commitment # 24 on the list of commitments for license renewal.

188 **Category** Closed

Request B.1.22-L-08
Scope of Program item. Enhancements will need specific commitments.

Response Vermont Yankee commits to those items related to Aging Management and will update the Entergy walkdown procedure accordingly commensurate with the License Renewal schedule. Training in the EPRI Field Guide is ongoing at this time. The enhancement in LRPD-02, page 218 is commitment # 24 on the list of commitments for license renewal.

189 **Category** Closed

Request B.1.22-L-09
Parameters Monitored/Inspected item. The LRA does not specify the same examples that the GALL Report does, e.g., material wastage, leakage, insulation condition, etc. What is the justification for not addressing these parameters?

Response These items are documented on a monthly basis, as found during walkdowns, in walkdown reports. Any material condition is assessed at the time discovered and acted upon according to its conditions. All system conditions, including those found in walkdowns, plant monitoring and daily operations are summarized in Quarterly System Health reports.

190 **Category** Closed

Request B.1.22-L-10
Parameters Monitored/Inspected item. Several of these parameters are not addressed in EN-DC-178. Should this procedure be enhanced?

Response Specifically discussed during License Renewal program reviews were insulation and the need to visually examine it for signs of leakage, corrosion beneath and missing insulation. License Renewal Commitment # 24 addresses the Walkdown procedure.

191 **Category** Closed

Request B.1.22-L-11
Detection of Aging Effects item. GALL focuses on the pertinent surfaces. LRPD-02, page 215, says that the program will manage the loss of material for internal and external surfaces by visual inspection of external surfaces. How is this accomplished?

Response Walkdowns may find signs of piping external surface degradation and will assess any potential impact on interior surfaces.

Consistent with GALL Section XI.M36, External Surfaces Monitoring, the VYNPS System Walkdown program will manage loss of material for internal surfaces exposed to the same environment as the external surfaces. External surface condition on components exposed to the same internal and external environments is indicative of internal surface condition. Components with signs of external surface degradation will be assessed for potential impact on interior surfaces impact.

192 **Category** Closed

Request B.1.22-L-12
Operating Experience item: Has VYNPS experienced any external surfaces-related operating experience? Please describe.

Response In addition to the service water piping spring cans noted in Question 183 and a few other examples are:
1. Cooling Tower wood structural member splitting (normal aging and checking of wood). VY's preventative maintenance program drives inspection and replacement as required.
2. Switchyard tower base age related cracking. Evaluated for structural impact, found satisfactory, future work to coat bases.

193 **Category** Closed

Request B.1.22-L-13
Operating Experience item. Has VYNPS reviewed and applied the industry operating experience that relates to external surfaces?

Response Yes, the OE has helped identify specific causes and "best practice" repairs. The EPRI Aging Management Field Guide has been particularly useful.

194 **Category** Closed

Request B.1.22-L-14
Operating Experience item. Is any VY plant-specific operating experience not bounded by industry operating experience?

Response Review of Aging Related OE to date has not found such OE.

195 **Category** Closed

Request B.1.22-L-15
Operating Experience item. Several findings are identified under the OE tab. Are these the total findings that were made or are they simply representative?

Response These examples are representative. VYNPS can supply others on specific systems as requested.

196 **Category** Closed

Request Regarding the UT indication at 215 degrees on the RPV cladding adjacent to a dryer support log: Does VYNPS plan to re-inspect this indication by UT?

Response VYNPS performed enhanced UT's in accordance with commitment described in BVY 92-055 and BVY 93-112. These UT's were performed from the RPV OD and determined that the cracks do not penetrate to the RPV base metal. The steam dryer lugs will be re-inspected in accordance with BWRVIP-48 by VT-1.

197 **Category** Closed

Request 3.1.1-01-P-01
On page 3.1-55, the component type 'supports stabilizer pads support skirt' is managed using TLAA - metal fatigue. In all cases where the LRA lists "Cracking - fatigue" as the AERM, change it to "Fatigue damage" (applies to multiple Table 1 items but is asked only once).

Response Cumulative fatigue damage is a generic term. However, only when fatigue damage accumulates to the point that the component cracks is the function of the component in jeopardy. VYNPS uses the aging effect of cracking due to fatigue to represent the physical result of cumulative fatigue damage. The meaning of "Cracking – fatigue" is consistent with the intent of "Cumulative Fatigue Damage".

198 **Category** Accepted

Request 3.1.1-02-P-01
On page 3.1-36, the component type 'closure flange studs, nuts, washers and bushings' and the component type 'other pressure boundary bolting, flange bolts and nuts (N6A, N6B, N7), CRD flange cap-screws and washers' are managed using TLAA - metal fatigue. Please confirm that aging of these components will be managed using the new "Bolting Integrity" AMP.

Email Edit 5/11/2006 - 3.1.1-02-P-01 Generic question 2: When bolting integrity AMP is added, many AMR Table 2 items need to be revised. Will VYNPS provide bolting integrity program to manage bolts?

Response Revised Answer to 5/11/2006 email

A Bolting Integrity Program is in development that will address the aging management of bolting in the scope of license renewal. The Bolting Integrity Program will be implemented prior to the period of extended operation in accordance with commitment number #34.

The identification of TLAA – metal fatigue in the aging management program column is provided as a convenient means to indicate that these components are susceptible to cracking due to fatigue which is addressed in Section 4.3.1 of the LRA as a TLAA. It is not implying that TLAA – metal fatigue is an aging management program. An aging management program is one of the three resolutions for the evaluation of a TLAA.

The component type closure flange studs, nuts, washers and bushings are for the reactor head and are managed by the Reactor Head Closure Studs Program described in Section B.1.23 of the LRA which is comparable with the NUREG-1801 XI.M3 program. This approach is consistent with the GALL Bolting Integrity program XI.M18 which states that the aging management of reactor head closure studs is addressed by XI.M3, and is not included in this program. A Bolting Integrity Program is in development that will address the aging management of other bolting in the scope of license renewal.

199 **Category** Closed

Request 3.1.1-02-P-02
On page 3.1-54, the component type 'internal attachments shroud support ring pad (1) shroud support feet (14) jet pump riser pads (20) core spray brackets (4) guide rod brackets (2) steam dryer brackets (4) dryer hold-down brackets (4) surveillance specimen holder brackets feedwater sparger brackets (8)' is managed using TLAA - metal fatigue. Please explain why these components are not managed in accordance with GALL v2 item IV.B1-14.

Response Many NUREG-1801, Volume 2 items are very similar in terms of materials, environment, aging effect and aging management program. Where a NUREG-1801 item lists the same component, the choice is straightforward. Where NUREG-1801 does not match the specific component, the selection of the item to compare to the aging management review results is somewhat arbitrary. Item IV.B1-14 would certainly have been an acceptable choice for the comparison. However, in this particular case, the components were considered a subset of the reactor vessel (hence the listing within the reactor vessel table) and the comparison was made to the fatigue item within the NUREG-1801 BWR reactor vessel table. The aging management review results in NUREG-1801 are the same for item IV.A1-7 as for IV.B1-14.

200 **Category** Accepted

Request 3.1.1-13-P-01
In many cases, loss of material is managed using Water chemistry control - BWR. Please confirm that the VYNPS Water Chemistry - BWR AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M2, "Water Chemistry."

Edit from 5/11/2006 email - In many cases (e.g. page 3.1-67 piping& fitting), loss of material is managed using Water chemistry control – BWR alone. Please confirm that the VYNPS Water Chemistry - BWR AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M2, "Water Chemistry."

Response As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, "One-Time Inspection."

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2's) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

201 **Category** Closed

Request 3.1.1-14-P-02
On page 3.1-53, the component type 'weld SLC nozzle to safe end weld (N10)' is managed using BWR vessel internals, Water chemistry control - BWR. The AMP applied, BWR VI, is acceptable, however, this differs from what is recommended by GALL. Please explain why Note E was not assigned.

Edit from 5/11/2006 email - On page 3.1-53, the component type 'weld SLC nozzle to safe end weld (N10)' is managed using BWR vessel internals, Water chemistry control - BWR. Please explain how the BWR Vessel Internal program manage loss of material for SLC Nozzle to SE weld (N10) and provide either document or inspection plan to support this AMR.

Response NUREG-1801 item IV.A1-8 specifies the water chemistry program for BWRs augmented to verify program effectiveness by an inspection program such as the one-time inspection (OTI) program. The OTI program will be used to verify the effectiveness of the water chemistry – BWR program wherever it is applied. Rather than list the OTI program every time the water chemistry – BWR program is listed in the 3.x.2 tables, the use of the OTI program is identified in the rollup (3.x.1) tables and in the further evaluation discussions. The use of the water chemistry – BWR program augmented by the OTI program is the basis for the use of Note A. Where another program, such as the BWR vessel internals program could also be used to verify water chemistry program effectiveness, we have conservatively included it in the list of programs; however, it is considered a supplement to and not different from the NUREG-1801 identified programs

Revised Answer to Revised Question - The BWRVIP augments the ISI Program for weld N10-SE, the SLC (N10) safe end to vessel weld. The VYNPS inspection requirements for this weld are thus in PP 7027, "Reactor Vessel Internals Management Program." The SLC nozzle to safe end weld examination schedule and history is discussed in detail in section 15.0 of Appendix B to PP 7027.

202 **Category** Open

Request 3.1.1-17-P-01
On page 3.1-39, the component type 'reactor vessel shell, intermediate beltline shell' is managed using reactor vessel surveillance and TLAA - neutron fluence. Please confirm that the neutron fluence at the LPCI and RHR injection nozzle will remain <1E17 n/cm2 (E>1MeV) through the end of the period of extended

Response As stated in LRA Section 4.2.1, there are no nozzles in the vertical section of the reactor vessel ID that will receive greater than 1E17 n/cm2 (E > 1 MeV) during the period of extended operation.

203 **Category** Accepted

Request 3.1.1-19-P-01
On page 3.1-67, the component type 'piping and fittings <4" NPS' is managed using water chemistry control - BWR, One-time inspection. The GALL suggests that a plant-specific program is appropriate for managing SCC of these components. Please identify the inspection techniques that are to be used and the basis for concluding that one-time inspection is appropriate, rather than periodic inspection.

Edit from 5/11/2006 - On page 3.1-67, the component type 'piping and fittings <4" NPS' is managed using water chemistry control - BWR, One-time inspection. Why VY does not credit ISI program?

Response All piping and fittings less than 4" NPS, except for the head seal leak detection line, are covered by NUREG-1801 item IV.C1-1, which identifies ISI, water chemistry for BWRs and one-time inspection (OTI) for small bore piping as the applicable aging management programs for cracking. The VYNPS ISI program includes piping and fittings less than 4" NPS. The LRA will be clarified to indicate that ISI in addition to water chemistry control – BWR and OTI applies to these components.

204 **Category** Open

Request 3.1.1-29-P-01
On page 3.1-62, the component type 'steam dryers' is managed using BWR vessel internals. The AMR indicates that cracking of the steam dryers will be managed using the BWR VI program, yet they are not listed in the scope of the program. Please provide a plant-specific AMP as recommended by GALL or ensure that each of the 10 attributes of an acceptable management program are to be addressed.

Response VYNPS submitted a steam dryer monitoring plan as part of the recent power uprate application. That plan was approved by the NRC. That plan will continue dryer inspections for at least three consecutive refueling outages after the power uprate.

BWRVIP-139, Steam Dryer Inspection and Flaw Evaluation Guidelines, has been submitted to the NRC for review and approval. This BWRVIP document is expected to be approved by the NRC prior to the period of extended operation and as such will become a part of the BWR Vessel Internals Program. The VYNPS vessel internals procedure directs VY to comply with every approved BWRVIP, or to notify the NRC if taking an exception. As such, VYNPS will manage cracking of the steam dryers per the BWR Vessel Internals Program during the period of extended operation.

205 **Category** Closed

Request 3.1.1-40-P-01
On page 3.1-40, the component type 'CRD stub tubes' is managed using BWR Vessel Internals, water chemistry control – BWR. For this item, GALL recommends the use of a program consistent with XI.M8, "BWR Penetrations." No exception was taken to the scope of VYNPS AMP B.1.4, "BWR Penetrations Program. It would also seem appropriate to assign Note E to this item unless the AMP assigned is changed.

Response Although Item IV.A1-5 lists the BWR Penetrations program for cracking, the program description in NUREG-1801 Chapter XI does not include the CRD stub tubes are in the program scope. The BWR Vessel Internals program does not specifically address the CRD stub tubes either, but is a more appropriate aging management program for this particular component. Note E is assigned to this line since the program does not match that listed in the NUREG-1801 item.

206 **Category** Closed

Request 3.1.1-40-P-02
On page 3.1-41, the component type 'incore housings' is managed using inservice inspection, water chemistry control - BWR. Please confirm that the correct GALL item is referenced.

Response Inservice inspection (ISI) and water chemistry – BWR are listed for the management of both loss of material and cracking. The listed NUREG-1801 item is correct for both aging effects. For loss of material, the water chemistry – BWR and one-time inspection programs (see response to question 3.1.1-14-P-02 for discussion on OTI program applicability) are the basis for the use of Note A, and the ISI program is supplemental. For cracking, Note E is used since the ISI program is different from the program (BWR Penetrations) listed in NUREG-1801.

207 **Category** Closed

Request 3.1.1-41-P-01
On page 3.1-72, the component type 'restrictors (ms)' is managed using water chemistry control - BWR, One-time inspection. Please provide the basis for excluding this component from the BWR Stress Corrosion Cracking program.

Edit from 5/11/2006 email - On page 3.1-72, the component type 'restrictors (ms)' is managed using water chemistry control - BWR, One-time inspection. Please provide the basis for excluding this component from the BWR Stress Corrosion Cracking program. Is restrictor (ms) weld inspection part of ISI also?

Response The BWR Stress Corrosion Cracking Program (GALL Section XI.M7) is designed for pressure boundary piping. The main steam flow restrictors are not pressure boundary components. As such they are not subject to ASME inspection requirements and were not a good fit for the BWRSCC program. VYNPS opted to manage them by One Time Inspection.

208 **Category** Closed

Request 3.1.1-41-P-02
On page 3.1-41, the component type 'nozzles recirc outlets (N1), recirc inlets (N2)' and on page 3.1-43, the component type 'nozzles, core spray (N5), head spray (N6A), head instrumentation (N6B), head vent (N7), jet pump instrumentation (N8)' are managed using inservice inspection, water chemistry control - BWR. The GALL item referenced in this AMR is for Stainless steel and nickel-based alloy components that may be subject to SCC. It does not appear to be appropriate for low-alloy steel. Please Identify a more suitable GALL item.

Response The material for these components is identified as low allow steel with stainless steel cladding. The material exposed to the internal environment of reactor coolant (treated water) is the stainless steel cladding. When evaluating surface aging effects such as cracking and loss of material, the stainless steel cladding is the material that must match the NUREG-1801 item. NUREG-1801 item IV.A1-1 provides the best match for the material, environment and aging effect combination within the BWR reactor vessel table.

The applicable material for the external environment (air) is low alloy steel (or “steel” in NUREG-1801 terms).

209 **Category** Closed

Request 3.1.1-41-P-03
On page 3.1-45, the component type 'nozzles flange leak-off (N13, N14)'; on page 3.1-47, the component type 'flanges, head nozzle flanges (N6, N7), blank flanges (N6)'; on page 3.1-51, the component type 'safe ends < 4” core SCL/?P (N10), instrumentation (N11, N12)'; and on page 3.1-52, the component type 'thermal sleeves , feedwater inlets (N4)' are managed using inservice inspection, water chemistry control - BWR. Please explain why these are not managed using the BWR SCC program.

Edit from 5/11/2006 email - on page 3.1-47, the component type 'flanges, head nozzle flanges (N6, N7), blank flanges (N6)'; instrumentation (N11, N12)'; and on page 3.1-52, the component type 'thermal sleeves , feedwater inlets (N4)' are managed using inservice inspection, water chemistry control - BWR. Please confirm these nozzles are less than 4 NPS. Please clarify how to manage feedwater inlets thermal sleeve with ISI program.?

Response The BWRSCC program (GALL Section XI.M7) applies to stainless steel piping >=4” in diameter. N13 and N14 are 2” nozzles. Safe ends <4” N10 is a 2” safe end. N11 and N12 are 2” nozzles.
N6 and N7 are low alloy steel and thus not susceptible to IGSCC. N6 blank flanges are 6” stainless steel flanges. These flanges were included in the ISI Program with the rest of the nozzle assembly.
The feedwater thermal sleeves (N4) are a combination of stainless steel and nickel-based alloy in a 10 inch nozzle. The BWRSCC program in NUREG-1801 does not appear to include feedwater thermal sleeves. Therefore, the feedwater thermal sleeves were included in the ISI and water chemistry control programs.

210 **Category** Closed

Request 3.1.1-43-P-01
On page 3.1-56, the component type 'control rod guide tubes, bases' is managed using BWR vessel internals, water chemistry control - BWR. The component type appears to be described by the structure and/or component column in GALL Table IV.B1. Please clarify the basis for assigning Note D.

Response The matching of component types between the plant and NUREG-1801 is not always straightforward. Minor differences in component names (as in this example) can lead to uncertainty in the intended scope of components in the NUREG-1801 item. Our approach was to err conservatively, so Notes C and D were sometimes used where Notes A and B might have been acceptable. Since the comparison is equally valid with either set of notes, this conservative approach is considered appropriate.

211 **Category** Closed

Request 3.1.1-44-P-01
On page 3.1-52, the component type 'thermal sleeves recirc inlet (N2) core spray (N5)' is managed using BWR vessel internals and water chemistry control - BWR. Please confirm that for the recirc inlet nozzle thermal sleeve, Note B would apply.

Edit from 5/11/2006 email - On page 3.1-52, the component type 'thermal sleeves recirc inlet (N2) core spray (N5)' is managed using BWR vessel internals and water chemistry control - BWR. Please confirm that for the recirc inlet nozzle thermal sleeve, Note B would apply. Please clarify how BWR Vessel Internal Program manages recirc inlet thermal sleeves?

Response The recirc inlet thermal sleeve is a match for the jet pump assembly thermal sleeve in NUREG-1801 item IV.B1-13, so Note B could be applied to that portion of this line for cracking. However, the core spray thermal sleeve does not match and Note D was selected to conservatively cover both component types. As described in the response to question 3.1.1-43-P-01, the comparison is equally valid with the selection of either Note B or D.

Revised Answer to Revised Question - The recirc inlet thermal sleeve is a match for the jet pump assembly thermal sleeve in NUREG-1801 item IV.B1-13, so Note B could be applied to that portion of this line for cracking. However, the core spray thermal sleeve does not match and Note D was selected to conservatively cover both component types. NUREG-1801 Item IV.B1-7 could also have been referenced for the core spray thermal sleeve with a Note B and credit for the same programs. As described in the response to question 3.1.1-43-P-01, the comparison is equally valid with the selection of either Note B or D.
Appendix B of the application identifies some exceptions to the NUREG-1801 description of the BWR Vessel Internals Program; however, none of these exceptions are related to the recirc inlet (jet pump assembly) thermal sleeve. The VYNPS BWR Vessel Internals Program management of cracking for the recirc inlet thermal sleeve is consistent with the NUREG-1801 program that is credited in Item IV.B1-13 for this component.

212 **Category** Closed

Request 3.1.1-47-P-01
In many cases (beginning on page 3.1-56), component types are managed using water chemistry control – BWR and not the ISI program. Please provide the basis for excluding them from the ISI program.

Edit from 5/11/2006 email - In many cases (beginning on page 3.1-56), component types are managed using water chemistry control – BWR alone for loss of material. Please provide the basis for excluding them from the ISI program.

Response Page 3.1-56 is the beginning of the reactor vessel internals (Table 3.1.2-2). In general the reactor vessel internals are not code parts and are not included in the Inservice Inspection Program. This is discussed in Item 3.1.1-47 in Table 3.1.1 of the LRA.

Even in cases like the shroud support, where the components are considered code parts, the BWRVIP provides the approved inspections for these components. Those inspections are implemented by augmenting the Inservice Inspection program, but the BWR Vessel Internals program is credited as the controlling program.

213 **Category** Closed

Request 3.1.1-48-P-02
On page 3.1-73, the component type 'tank (CRD accumulator)' is managed using water chemistry control - BWR, One-time inspection. It is not clear that the tank is <NPS4, so ISI would seem a more appropriate AMP for verification (and a different GALL item may be a more useful reference).

Response The One-Time Inspection Program as described in LRA Appendix B, Section B.1.21, includes all piping and valves <4" NPS. The CRD accumulators are included in this program. While they are slightly larger than 4", they are connected to the RCS by long runs of 1 inch piping and are therefore treated with that small bore piping.

The CRD accumulators are not reactor coolant pressure boundary parts. Each drive has two accumulators, one of which is filled with nitrogen and the other with part nitrogen and part water. These components are not subject to ISI. Consequently, Water Chemistry Control augmented by One-Time Inspection is the best option.

214 **Category** Closed

Request 3.1.1-48-P-03
On page 3.1-63, the component type 'condensing chambers' is managed using water chemistry control - BWR, One-time inspection. Please confirm that this component is <NPS4

Response The One-Time Inspection Program includes all piping and valves <4" NPS. The instrumentation condensing chambers on the main steam flow elements are included in this program. While they may be slightly larger than 4", they are connected by 1 inch instrument piping and are treated with that small bore piping.

These chambers are not subject to other inspections such as ISI.

215 **Category** Closed

Request 3.1.1-49-P-01
On page 3.1-62, the component type 'shroud support, ring, cylinder, and legs, access hole cover' is managed using BWR vessel internals, water chemistry control - BWR. For the access hole cover plate, GALL recommends ISI and water Chemistry. Please identify the specific inspection(s) for this component under the RVI program.

Response VY performed a VT in 1995 and 1996, a MVT1 in 1998, and an EVT1 in 1999 and 2002. Additional EVT1 inspections are scheduled for 2006 and 2009. [Appendix A of PP 7027] The examination coverage includes the entire weld surface, in addition to the heat-affected zones." [Sec 4.3 of NE 8067]

216 **Category** Accepted

Request 3.1.1-50-P-01
On page 3.1-36, the component type 'other pressure boundary bolting, flange bolts and nuts (N6A, N6B, N7), CRD flange cap-screws and washers' is managed using inservice inspection. Please confirm that the new Bolting Integrity AMP will be applied to this item, and identify a more appropriate GALL item.

Response The Inservice Inspection program is used to manage cracking of this Class 1 bolting since these components are required to be inspected in accordance with ASME Section XI IWB requirements. A Bolting Integrity Program is under development (commitment #34) that will address the aging management of bolting in the scope of license renewal including the bolting identified in this line item. The GALL Bolting Integrity Program XI.M18 states that the ASME Section XI Inservice Inspection Program XI.M1 supplements the Bolting Integrity Program. GALL line item (IV.A1-9) identified in the LRA for comparison is for BWR high-strength low-alloy steel closure studs and nuts exposed to air with an aging effect of cracking. A review of GALL Chapter IV identified no other BWR closure bolting line items exposed to air with cracking as an aging effect. Therefore this line item was selected as the appropriate comparison and will remain the appropriate comparison with the inclusion of the Bolting Integrity Program.

217 **Category** Closed

Request 3.1.1-51-P-01
On page 3.1-60, the component type 'jet pump castings, transition piece inlet elbow/ nozzle, mixer flange and flare, diffuser collar' is managed using thermal aging embrittlement of CASS. Please confirm that IV.B1-11 also applies

Response NUREG-1801 item IV.B1-11 also applies. The resulting note would be Note A.

218 **Category** Accepted

Request 3.1.1-52-P-01
On page 3.1-36, the component type 'incore housing bolting, flange bolts, flange nut and washer' is managed using inservice inspection. Please confirm that the new Bolting Integrity AMP will be applied to this item, and identify a more appropriate GALL item.

Response Revised answer for 5/11/2006 email - A Bolting Integrity Program is under development (commitment #34) that will address the aging management of bolting in the scope of license renewal including the bolting identified in this line item. In addition, the Inservice Inspection Program is used to manage cracking of this Class 1 bolting since these components are required to be inspected in accordance with ASME section XI IWB requirements. The GALL Bolting Integrity Program XI.M18 states that the ASME Section XI Inservice Inspection Program XI.M1 supplements the Bolting Integrity Program. The GALL line item (IV.A2-6) identified in the LRA for comparison is for stainless steel flange bolting exposed to air with an aging effect of cracking. A review of GALL Chapter IV identified no BWR stainless steel bolting line items exposed to air with cracking as an aging effect. Therefore this line item was selected as the appropriate comparison.

A Bolting Integrity Program is under development that will address the aging management of bolting in the scope of license renewal including the bolting identified in this line item. The Inservice Inspection program is used to manage cracking of this Class 1 bolting since these components are required to be inspected in accordance with ASME section XI IWB requirements. The GALL Bolting Integrity Program XI.M18 states that the ASME Section XI Inservice Inspection Program XI.M1 supplements the Bolting Integrity Program. The GALL line item (IV.A2-6) identified in the LRA for comparison is for stainless steel flange bolting exposed to air with an aging effect of cracking. A review of GALL Chapter IV identified no BWR stainless steel bolting line items exposed to air with cracking as an aging effect. Therefore this line item was selected as the appropriate comparison and will remain the appropriate comparison with the inclusion of the Bolting Integrity Program.

219 **Category** Closed

Request 3.1.1-55-P-01
On page 3.1-71, the component type 'pump casing and cover (RR)' is managed using inservice inspection. On page 3.1-75, the component type 'valve bodies <4" NPS' is managed using one-time inspection. On page 3.1-79, the component type 'valve bodies >=4" NPS' is managed using inservice inspection. Please clarify the basis, in each case, for asserting that the AMP used is different from the one suggested by GALL.

Response Pump casing and cover – The VYNPS ISI program is a plant-specific program, not compared to the GALL XI.M1 program. Therefore, Note E was applied wherever the ISI program was called for in GALL. Note that earlier on this same page, WCC and ISI are used to manage loss of material and Note A is used – that is because GALL only requires water chemistry and the use of ISI here is over and above what GALL requires.

For valve bodies <4” NPS – GALL manages reduction of fracture toughness (ROFT) using ISI, however, ISI only requires inspections of valves bodies >=4” NPS. Therefore, the OTI (small bore piping) program is used to mange ROFT for these small valves.

Valve bodies >=4” NPS - The VYNPS ISI program is a plant specific program, not compared to the GALL XI.M1 program. Therefore, VYNPS applied Note E wherever the ISI program was identified in GALL.

220 **Category** Closed

Request 3.1.1-57-P-01
On page 3.1-72, the component type 'restrictors (ms)' is managed using one-time inspection. Please describe how OTI satisfies the recommendations of GALL AMP XI.M12, Thermal Aging Embrittlement of CASS.

Response GALL program XI.M12 is applicable to "primary pressure boundary and reactor vessel internals components' and the main steam flow restrictors are neither. As the main steam flow restrictors are not ASME pressure boundary components, program XI.M12 is not applicable. Thermal aging embrittlement results in increased rates of crack growth, which are evidenced by cracking in the material. The One-Time Inspection Program will be used to verify that reduction of fracture toughness has not progressed to the point that unacceptable cracking of the component has occurred.

221 **Category** Accepted

Request 3.3.1-03-K-01
On page 3.3-91, the component type 'heat exchanger (tubes)' is managed using water chemistry control - BWR. Please confirm that the VYNPS Water Chemistry - BWR AMP addresses fouling in heat exchanger tubes.

Response As stated in LRA Section 3.3.2.2.2, reduction of heat transfer due to fouling for stainless steel heat exchanger tubes exposed to treated water is managed by the Water Chemistry Control – BWR Program. The effectiveness of the Water Chemistry Control-BWR Program will be confirmed by the One-Time Inspection Program through an inspection of a representative sample of components crediting this program including areas of stagnant flow.

222 **Category** Accepted

Request 3.3.1-05-K-01
On page 3.3-74, the component type 'heat exchanger (tubes) ' is managed using water chemistry control - BWR. GALL recommends a plant-specific program. Please clarify how each of the attributes of SRP-LR Appendix A1 is addressed by a purely preventive program.

Edit from 5/11/2006 email - On page 3.3-74, the component type 'heat exchanger (tubes) ' is managed using water chemistry control - BWR. GALL recommends a plant-specific program. Please clarify how this component is addressed by a purely preventive program.

Response SRP-LR Appendix A1 is applicable to purely preventive programs. In fact, Section A.1.2.3.3, Item 4, states, "For prevention and mitigation programs, the parameters monitored should be the specific parameters being controlled to achieve prevention or mitigation of aging effects. An example is the coolant oxygen level that is being controlled in a water chemistry program to mitigate pipe cracking."

As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, "One-Time Inspection."

The 10 attributes of SRP-LR Appendix A1 for the Water Chemistry Control – BWR Program and the One-Time Inspection Program are the same as the attributes of the NUREG-1801 programs XI.M2 and XI.M32.

Added Response to 5/11/2006 email -
Page 3.3-74 has multiple line items for heat exchanger (tubes) managed using Water Chemistry Control – BWR. The response assumes this question refers to the line item for cracking of heat exchanger (tubes) since this line item references NUREG-1801 item VII.E3-3 which recommends a plant-specific program.

As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program optimizes the primary water chemistry to minimize the potential for loss of material and cracking. This is accomplished by limiting the levels of contaminants in the RCS that could cause loss of material and cracking. Additionally, VYNPS has instituted hydrogen water chemistry (HWC) with noble metals to limit the potential for intergranular SCC (IGSCC) through the reduction of dissolved oxygen in the treated water is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

223 **Category** Accepted

Request 3.3.1-13-K-01
On page 3.3-92, the component type 'neutron absorber (boral)' is managed using water chemistry control - BWR. GALL recommends a plant-specific program. Please clarify how each of the attributes of SRP-LR Appendix A1 is addressed by a purely preventive program..

Edit from 5/11/2006 email - On page 3.3-92, the component type 'neutron absorber (boral)' is managed using water chemistry control - BWR. GALL recommends a plant-specific program. Please clarify how this component is addressed by a purely preventive program.

Response Page 3.3-92 has multiple line items for neutron absorber (boral) managed using Water Chemistry Control – BWR. The response assumes this question refers to the line item for loss of material for neutron absorber (boral) since this line item references NUREG-1801 item VII.A2-3 which recommends a plant-specific program.

SRP-LR Appendix A1 is applicable to purely preventive programs. In fact, Section A.1.2.3.3, Item 4, states, "For prevention and mitigation programs, the parameters monitored should be the specific parameters being controlled to achieve prevention or mitigation of aging effects. An example is the coolant oxygen level that is being controlled in a water chemistry program to mitigate pipe cracking."

As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, "One-Time Inspection."

The 10 attributes of SRP-LR Appendix A1 for the Water Chemistry Control – BWR Program and the One-Time Inspection Program are the same as the attributes of the NUREG-1801 programs XI.M2 and XI.M32.

Added Response per 5/11/2006 email
As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program optimizes the primary water chemistry to minimize the potential for loss of material and cracking. This is accomplished by limiting the levels of contaminants in the RCS that could cause loss of material and cracking. Additionally, VYNPS has instituted hydrogen water chemistry (HWC) with noble metals to limit the potential for intergranular SCC (IGSCC) through the reduction of dissolved oxygen in the treated water is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

224 **Category** Accepted

Request 3.3.1-14-K-01
In many cases, beginning on page 3.3-61 for auxiliary systems, component types exposed to oil are managed using the oil analysis program. Please confirm that the VYNPS Oil Analysis AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M39, "Lubricating Oil Analysis."

Response As stated in LRA Section 3.2.2.7, steel piping and components in auxiliary systems at VYNPS that are exposed to lubricating oil are managed by the Oil Analysis Program, which includes periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. As stated in LRA Section B.1.20, the Oil Analysis Program is consistent with the program described in NUREG-1801, Section XI.M39, Lubricating Oil Analysis, with a minor exception.

The Oil Analysis Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. Metals are not corroded by the hydrocarbon components of lubricants. Lubricating oils are not good electrolytes and the oil film on the wetted surfaces of components tend to minimize the potential for corrosion. Corrosion in lube oil systems only occurs as the result of the presence of impurities or moisture. Therefore, an effective oil analysis program, which maintains impurities and moisture below specified limits, precludes the need for one-time inspections. Operating experience at VYNPS has confirmed the effectiveness of the Oil Analysis Program in maintaining moisture and impurities within limits such that corrosion has not and will not affect the intended functions of these components.

In numerous past precedents (including NUREG-1828, Arkansas Nuclear One Unit 2 SER, Section 3.0.3.3.6, and NUREG-1831, Donald C. Cook SER, Section 3.0.3.3.8), the staff concluded that an effective oil analysis program, which maintains impurities and moisture below specified limits, is sufficient to demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

225 **Category** Accepted

Request 3.3.1-20-K-01
Beginning on page 3.3-166, many component types are managed using the diesel fuel monitoring program. Please confirm that the VYNPS Diesel Fuel Monitoring AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M30, "Fuel Oil Chemistry."

Response As stated in LRA Section 3.2.2.9, loss of material due to general, pitting, crevice, and MIC for carbon steel piping and components exposed to fuel oil is managed by the Diesel Fuel Monitoring Program. This program includes sampling and monitoring of fuel oil quality to ensure levels of water, particulates, and sediment remain within the specified limits. Maintaining parameters within limits ensures that significant loss of material will not occur. Ultrasonic inspection of storage tank bottoms where water and contaminants accumulate will be performed to confirm the effectiveness of the Diesel Fuel Monitoring Program. As stated in LRA Section B.1.9, the Diesel Fuel Monitoring Program is consistent with the program described in NUREG-1801, Section XI.M3, Fuel Oil Chemistry Program, with minor exceptions.

The Diesel Fuel Monitoring Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. The Diesel Fuel Monitoring Program includes periodic cleaning, visual inspection, and ultrasonic inspection of storage tank bottoms where water and contaminants accumulate to confirm the effectiveness of the oil quality monitoring activities to preserve an environment that is not conducive to corrosion

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

226 **Category** Accepted

Request 3.3.1-21-K-01
On page 3.3-106, the component type 'heat exchanger (bonnet)'; on page 3.3-141, the component type 'heat exchanger (shell)'; and on page 3.3-78, the component type 'heat exchanger (shell)' are managed using the oil analysis program. Please confirm that the VYNPS Oil Analysis AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M39, "Lubricating Oil Analysis."

Response As stated in LRA Section 3.2.2.7, steel piping and components in auxiliary systems at VYNPS that are exposed to lubricating oil are managed by the Oil Analysis Program, which includes periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. As stated in LRA Section B.1.20, the Oil Analysis Program is consistent with the program described in NUREG-1801, Section XI.M39, Lubricating Oil Analysis, with a minor exception.

The Oil Analysis Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. Metals are not corroded by the hydrocarbon components of lubricants. Lubricating oils are not good electrolytes and the oil film on the wetted surfaces of components tends to minimize the potential for corrosion. Corrosion in lube oil systems only occurs as the result of the presence of impurities or moisture. Therefore, an effective oil analysis program, which maintains impurities and moisture below specified limits, precludes the need for one-time inspections. Operating experience at VYNPS has confirmed the effectiveness of the Oil Analysis Program in maintaining moisture and impurities within limits such that corrosion has not and will not affect the intended functions of these components.

In numerous past precedents (including NUREG-1828, Arkansas Nuclear One Unit 2 SER, Section 3.0.3.3.6, and NUREG-1831, Donald C. Cook SER, Section 3.0.3.3.8), the staff concluded that an effective oil analysis program, which maintains impurities and moisture below specified limits, is sufficient to demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

227 **Category** Accepted

Request 3.3.1-23-K-01
Beginning on page 3.3-221, component types exposed to treated water are managed using water chemistry control - BWR. Please confirm that the VYNPS Water Chemistry - BWR AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M2, "Water Chemistry."

Response As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, “Water Chemistry.” The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, “One-Time Inspection.”

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2’s) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

228 **Category** Closed

Request 3.3.1-25-K-01
On page 3.3-65, the component type 'heat exchanger (tubes)' and on page 3.3-129, the component type 'heat exchanger (tubes)' are managed using service water integrity. GALL recommends a plant-specific program. Please clarify how each of the attributes of SRP-LR Appendix A1 is to be addressed for this item.

Edit from 5/11/2006 email - On page 3.3-65, the component type 'heat exchanger (tubes)' and on page 3.3-129, the component type 'heat exchanger (tubes)' are managed using service water integrity. GALL recommends a plant-specific program. Please clarify how service water integrity program manages this item..

Response Page 3.3-129 has multiple line items for heat exchanger (tubes) managed using Service Water Integrity. The response assumes this question refers to the line item for loss of material for heat exchanger (tubes) exposed to external condensation managed using Service Water Integrity since this line item matches the line item on page 3.3-65 for heat exchanger (tubes) managed using Service Water Integrity.

These line items are for reactor building recirculation unit coolers, which are enclosed housing air-handling units with copper cooling coils (tubes). Raw water flows through the copper tubes, while external surfaces of the tubes are exposed to condensation.

Consistent with NUREG-1801 line item VII.C1-3, loss of material on the internal surfaces of these copper heat exchanger tubes is managed by the Service Water Integrity Program. The Service Water Integrity Program, in accordance with NRC GL 89-13, includes a condition and performance monitoring program which inspects components for erosion, corrosion, and blockage and verifies the heat transfer capability of safety-related heat exchangers cooled by service water. Therefore, this program is equally as effective at managing loss of material on the external surfaces of the heat exchanger tubes as it is at managing loss of material on the internal surfaces of the tubes. However, the line items in question were compared with NUREG 1801 item VII.F1-16 (which recommends a plant-specific program) because NUREG 1801 Section VII.C1 does not address the external surfaces of copper alloy heat exchanger tubes containing raw water.

As stated in LRA Section B.1.26, the Service Water Integrity Program is consistent with the program described in NUREG-1801, Section XI.M20, “Open-Cycle Cooling Water System,” with minor exceptions.

The 10 attributes of SRP-LR Appendix A1 for the Service Water Integrity Program are described in the Aging Management Program Evaluation Results (AMPER) Report, which is available for on-site review.

229 **Category** Accepted

Request 3.3.1-26-K-01
Beginning on page 3.3-80, the components exposed to fuel oil are managed using the oil analysis program. Please confirm that the VYNPS Diesel Fuel Monitoring AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M30, "Fuel Oil Chemistry."

Edit from 5/11/2006 email - Beginning on page 3.3-80, the components exposed to lube oil are managed using the Oil Analysis program. Please confirm that the VYNPS Oil Analysis AMP is consistent with
GALL XI.M32, "One-Time Inspection," as well as with XI.M39, "Lube Oil Chemistry."

Response As stated in LRA Section 3.2.2.9, loss of material due to general, pitting, crevice, and MIC for carbon steel piping and components exposed to fuel oil is managed by the Diesel Fuel Monitoring Program. This program includes sampling and monitoring of fuel oil quality to ensure levels of water, particulates, and sediment remain within the specified limits. Maintaining parameters within limits ensures that significant loss of material will not occur. Ultrasonic inspection of storage tank bottoms where water and contaminants accumulate will be performed to confirm the effectiveness of the Diesel Fuel Monitoring Program. As stated in LRA Section B.1.9, the Diesel Fuel Monitoring Program is consistent with the program described in NUREG-1801, Section XI.M3, Fuel Oil Chemistry Program, with minor exceptions.

The Diesel Fuel Monitoring Program is not consistent with GALL XI.M32, "One-Time Inspection,” nor are one-time inspections necessary to verify the effectiveness of the program. The Diesel Fuel Monitoring Program includes periodic cleaning, visual inspection, and ultrasonic inspection of storage tank bottoms where water and contaminants accumulate to confirm the effectiveness of the oil quality monitoring activities to preserve an environment that is not conducive to corrosion.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

230 **Category** Closed

Request 3.3.1-27-K-01
On page 3.3-69, the component type 'suction barrel' is managed using service water integrity. GALL recommends a plant-specific program. Please clarify how each of the attributes of SRP-LR Appendix A1 is addressed for this item.

Response Page 3.3-69 has multiple line items for suction barrel managed using Service Water Integrity. The response assumes this question refers to the line item for loss of material for suction barrel with an external environment of condensation since this line item references NUREG-1801 item VII.F1-1 which recommends a plant-specific program.

These line items are for residual heat removal service water pump suction barrels which are made of AL6XN which is a type of stainless steel that is highly resistant to corrosion. The suction barrels are in contact with raw water internally and condensation externally.

As can be seen in the other suction barrel line item, consistent with NUREG-1801 line item VII.C1-15, loss of material on the internal surfaces of the suction barrel is managed by the Service Water Integrity Program. The Service Water Integrity Program, in accordance with NRC GL 89-13, includes a condition monitoring program which inspects components such as pump barrels for erosion, corrosion, and blockage. Since the external environment of condensation is much milder than the internal environment of raw water, this program is equally as effective at managing loss of material on the external surfaces of the suction barrels as it is at managing loss of material on the internal surfaces of the barrels. However, the line item in question was compared with NUREG 1801 item VII.F1-1 (which recommends a plant-specific program) because NUREG 1801 Section VII.C1 does not address the external surfaces of stainless steel components containing raw water.

As stated in LRA Section B.1.26, the Service Water Integrity Program is consistent with the program described in NUREG-1801, Section XI.M20, “Open-Cycle Cooling Water System,” with minor exceptions.

The 10 attributes of SRP-LR Appendix A1 for the Service Water Integrity Program are the same as the 10 attributes of the program described in NUREG-1801, Section XI.M20 with the exceptions described in LRA Appendix B, Section B.1.26

231 **Category** Closed

Request 3.3.1-28-K-01
On page 3.3-102, the component type 'valve body' is managed using instrument air quality. Please clarify how the effectiveness of the IAQ program is to be verified.

Response Page 3.3-102 has multiple line items for valve body managed using Instrument Air Quality. The response assumes this question refers to loss of material for both copper alloy and stainless steel valves exposed to treated air on internal surfaces.

As stated in LRA Section B.1.16, the Instrument Air Quality Program maintains humidity and particulates within acceptable limits, thereby preserving the environment of treated air that is not conducive to corrosion. Actions to verify the effectiveness of the program are not necessary. Corrosion in treated air systems only occurs as the result of the presence of impurities or moisture. Therefore, an effective instrument air quality program, which maintains impurities and moisture below specified limits, precludes the need for inspections. Operating experience at VYNPS has confirmed the effectiveness of the Instrument Air Quality Program in maintaining moisture and impurities within limits such that corrosion has not and will not affect the intended functions of these components.

In a previously approved staff position (NUREG-1831, Donald C. Cook SER, Section 3.0.3.3.7), the staff concluded that an effective instrument air quality program, which maintains impurities and moisture below specified limits, is sufficient to demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

In another precedent (Millstone SER, Section 3.3B.2.3.12 and NUREG-1839, Point Beach SER, Section 3.2.2.3.1), on the basis of its review of current industry research and operating experience, the staff concluded that air on metal will not result in aging that will be of concern during the period of extended operation. The staff considers a dried air environment benign and that its contact with carbon steel, low-alloy steel, stainless steel, and cast stainless steel surfaces will not result in aging effects.

232 **Category** Accepted

Request 3.3.1-30-K-01
Beginning on page 3.3-61, the component types exposed to treated water are managed using water chemistry control - BWR. Please confirm that the VYNPS Water Chemistry - BWR AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M2, "Water Chemistry."

Response As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, “Water Chemistry.” The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, “One-Time Inspection.”

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2’s) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

233 **Category** Accepted

Request 3.3.1-31-K-01
On page 3.2-50 in ESF and page 3.3-146 in auxiliary systems, component types exposed to treated water are managed using water chemistry control - BWR. Please confirm that the VYNPS Water Chemistry - BWR AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M2, "Water Chemistry."

Response As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, “Water Chemistry.” The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, “One-Time Inspection.”

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2’s) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

234 **Category** Closed

Request 3.3.1-51-K-01
On page 3.3-132, the component type 'piping' is managed using water chemistry control - auxiliary systems. Please confirm that GALL v2 item VII.F1-8 is intended (not VIII.F1-8). Please confirm that GALL v2 item VII.F1-8 is intended (not VIII.F1-8).

Response Partial Duplicate of next question.

235 **Category** Accepted

Request 3.3.1-51-K-01
On page 3.3-131, the component type 'humidifier housing' and on page 3.3-132, the component type 'piping' is managed using water chemistry control - auxiliary systems. Please confirm that GALL v2 item VII.F1-8 is intended (not VIII.F1-8).

Response That is correct. The NUREG-1801 Vol. 2 Item should be VII.F1-8 rather than VIII.F1-8 for these lines.

This requires an amendment to the LRA.

236 **Category** Closed

Request 3.4.1-M-01
In LRA Table 3.4.1, Item Number 3.4.1-22, the applicant states that their existing "System Walkdown Program",…"manages the loss of material for steel bolting through the use of visual inspections…". How does the applicant intend to address the potential loss of bolting material for subject bolting (normally flange bolting) that cannot be readily seen – "visually inspected" – since most such bolting is usually covered by insulation/flashing material?

Added Edit from 5/11/2006 email - Note: See generic question 2.

Response As stated in LRA Section B.1.28, the System Walkdown Program is consistent with the program described in NUREG-1801, Section XI.M36, "External Surfaces Monitoring." In accordance with this program description, surfaces that are insulated are inspected when the external surface is exposed (i.e., maintenance) at such intervals that would 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.

EPRI aging assessment field 1007933 guide was reviewed by the staff.

237 **Category** Closed

Request 3.4.1-M-02
In reference to Question 3.4.1-1 above, it is the staff's present understanding that the applicant currently intends to develop a "GALL-recommended" bolting integrity program. If such a program is eventually developed, will it include inspections of plant condensate and feedwater system bolting; i.e., specifically flange bolting?

Response A Bolting Integrity Program is under development that will address the aging management of bolting in the scope of license renewal including in scope flange bolting for the feedwater and condensate systems.
This is LR Commitment #34.

238 **Category** Closed

Request 3.4.1-M-03

The staff has recently discovered – during the April VYNPS AMP audit – that plant main condenser tubing contains an admiralty brass-type of material which contains copper & zinc. Such material – copper & zinc - has been known to leach out of condenser tubing via either by direct raw water erosion of the inside of the condenser tubes and/or by way of phenomena known as "de-zincification." Recent third-party chemistry control audits of VYNPS have presented evidence that both copper and zinc ions are currently leaching out of the main condenser tubing and have been leaching out at a measurable rate for the last five (5) years. However; as noted in VYNPS LRA Table 3.4.1, Item Number 3.4.1-35, the applicant stated that; "….there are no copper alloy components subject to selective leaching in the steam and power conversion systems…". What does the applicant intend to do to reduce and/or eliminate the apparent measurable and continued leaching out of copper and zinc ions from the main condenser tubing? What does the applicant intend to do to eliminate and/or mitigate the introduction of these ions (primarily the copper ions) into the reactor core areas of the plant?

Edit from 5/11/2006 email - The staff has recently discovered – during the April VYNPS AMP audit – that plant main condenser tubing contains an admiralty brass-type of material which contains copper & zinc. Such material – copper & zinc - has been known to leach out of condenser tubing via either by direct raw water erosion of the inside of the condenser tubes and/or by way of phenomena known as "de-zincification." Recent third-party chemistry control audits of VYNPS have presented evidence that both copper and zinc ions are currently leaching out of the main condenser tubing and have been leaching out at a measurable rate for the last five (5) years. However; as noted in VYNPS LRA Table 3.4.1, Item Number 3.4.1-35, the applicant stated that; "….there are no copper alloy components subject to selective leaching in the steam and power conversion systems…". What does the applicant intend to do to reduce and/or eliminate the apparent measurable and continued leaching out of copper and zinc ions from the main condenser tubing? What does the applicant intend to do to eliminate and/or mitigate the introduction of these ions (primarily the copper ions) into the reactor core areas of the plant?

Response LRA Table 3.4.1, Item Number 3.4.1-35 states that a Selective Leaching Program is not applicable because there are no copper alloy components subject to selective leaching in the steam and power conversion systems. This statement was intended to mean that there are no copper alloy components requiring an aging management review that are subject to selective leaching in the steam and power conversion systems.

A summary of the aging management review of the main condenser may be seen in LRA Table 3.4.2-1. As shown in this table and explained in plant-specific note 401, aging management of the main condenser is not based on analysis of materials, environments and aging effects. Condenser integrity required to perform the post-accident intended function (holdup and plate-out of MSIV leakage) is continuously confirmed by normal plant operation. This intended function does not require the condenser to be leak-tight, and the post-accident conditions in the condenser will be essentially atmospheric. Since normal plant operation assures adequate condenser pressure boundary integrity, the post-accident intended function to provide holdup volume and plate-out surface is assured. Previously approved staff positions (NUREG-1796, Dresden and Quad Cities SER, Section 3.4.2.4.4, and NUREG-1769, Peach Bottom SER, Section 3.4.2.3), concluded that main condenser integrity is continually verified during normal plant operation and no aging management program is required to assure the post-accident intended function.

Therefore, loss of material due to leaching of copper and zinc ions from the main condenser tubing is not an aging effect requiring management for the condenser tubes.

Leaching of copper and zinc ions from the main condenser tubing is also not a license renewal issue related to aging of other components managed by the Water Chemistry Control – BWR Program and exposed to the copper and zinc ions from the condenser. BWRVIP-130, BWR Vessel Internals Project BWR Water Chemistry Guidelines – 2004 Revision, states that an assessment of risk to the fuel should be completed if feedwater copper values are above 0.1 ppb based on a quarterly average, or if zinc values are above 0.4 ppb based on a quarterly average. These recommendations are followed by VYNPS and there have been no fuel failures attributed solely to elevated feedwater copper or zinc in the last 20 years. Since the fuel is periodically replaced, it is not subject to aging management review. Therefore, leaching of copper and zinc ions from the main condenser tubing is not a license renewal issue related to aging of fuel.

The leaching of zinc ions from the condenser has actually been beneficial in that it has helped to mitigate out-of-core dose rates. In fact, many BWRs are injecting zinc into the feedwater system to control out-of-core dose rates. VYNPS is planning to start zinc injection towards the end of 2006. Zinc also has a synergistic beneficial effect along with hydrogen water chemistry resulting in increased resistance of stainless steel and other alloys to intergranular stress corrosion cracking (IGSCC).

BWRVIP-130 also states that since soluble copper acts as a cathodic reactant like dissolved oxygen, copper can exacerbate corrosion phenomenon such as IGSCC. However, VYNPS injects low levels of hydrogen in a Noble metal environment to mitigate IGSCC by keeping stainless steel electrochemical potential (ECP) values less than -230 mV relative to the standard hydrogen electrode. VYNPS has made significant efforts to reduce the amount of copper entering the reactor over the past 10 years. Where cycle average feedwater copper was once around 0.8 ppb, it is now near 0.3 ppb. Feedwater copper values for the first 4 months of 2006 were <0.2 ppb.

Since VYNPS is maintaining ECP values in the desired range and has maintained feedwater copper levels as low as achievable, VYNPS is following BWRVIP

guidance for feedwater copper. No other impacts of high copper and zinc levels were identified in BWRVIP-130. Plant procedures assure that VYNPS will continue to follow BWRVIP guidance for water chemistry. Therefore, further action is not necessary to address leaching of zinc and copper from condenser tubing for the period of extended operation.

239 **Category** Accepted

Request 3.4.2-M-01

The staff has recently discovered, in the applicant's LRA, "Auxiliary Systems - Miscellaneous Systems" Tables 3.3.2-13-02 and 3.3.2-13-13, that the applicant intends to use their existing Water Chemistry Control (BWR) Program to control loss of material in their condensate and feedwater systems; i.e., loss of material in carbon steel piping subjected to steam temperatures >220 degrees F. For these systems, the GALL recommends the implementation of both a Water Chemistry Control AND a One-Time Inspection Program to identify and mitigate loss of material in system piping. Does the applicant intend to implement a One-Time Inspection Program as well as their existing Water Chemistry Control Program to both identify and mitigate the loss of material in their condensate and feedwater systems? If yes, does the applicant intend to formally produce a commitment to implement both programs? If the applicant does not intend to implement both a One-Time Inspection and Water Chemistry Control Program, why not?

Edit from 5/11/2006 email - The staff has recently discovered, in the applicant's LRA, "Auxiliary Systems - Miscellaneous Systems" Tables 3.3.2-13-02 and 3.3.2-13-13, that the applicant intends to use their existing Water Chemistry Control (BWR) Program to control loss of material in their condensate and feedwater systems; i.e., loss of material in carbon steel piping subjected to steam temperatures >220 degrees F. For these systems, the GALL recommends the implementation of both a Water Chemistry Control AND a One-Time Inspection Program to identify and mitigate loss of material in system piping. Does the applicant intend to implement a One-Time Inspection Program as well as their existing Water Chemistry Control Program to both identify and mitigate the loss of material in their condensate and feedwater systems? If yes, does the applicant intend to formally produce a commitment to implement both programs? If the VYNPS technical justification for continued operation of Entergy Northwest - Vermont Yankee (ENVY) with feedwater copper >0.2 ppb revision #1 was reviewed by applicant does not intend to implement both a One-Time Inspection and Water Chemistry Control Program, why not?
the staff.

Response LRA Table 3.3.1 indicates that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2's) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

Also, license renewal commitment 16 has been issued to implement the One-Time Inspection Program as described in LRA Section B.1.21. A commitment to implement the Water Chemistry Control – BWR Program is not necessary as this is an existing program, which does not require enhancement.

240 **Category** Accepted

Request 3.4.2-M-02

The staff has recently discovered, in the applicant's LRA, Table 3.4.2-1; "Main Condenser and MSIV Leakage Pathway – Heat Exchanger Tubes," that the applicant intends to use their existing Water Chemistry Control (BWR) Program to control any loss of material in stainless steel (SS) condenser tubes; i.e., loss of material in SS piping (tubing) subjected to steam temperatures >270 degrees F. For these systems and any future modified systems, the GALL recommends implementation of both a Water Chemistry Control AND a One-Time Inspection Program to identify and mitigate loss of material in system piping (tubing). Does the applicant intend to implement a One-Time Inspection Program as well as their existing Water Chemistry Control Program to both identify and mitigate loss of material from any future modified heat exchanger tubing that could contain stainless steel that could be subjected to steam (or high temperature and high pressure water) temperatures >270 degrees F? If yes, does the applicant intend to formally produce a commitment to implement both programs? If the applicant does not intend to implement both a One-Time Inspection and Water Chemistry Control Program for future, modified condensers, why not?

Edit from 5/11/2006 Email - The staff has recently discovered, in the applicant's LRA, Table 3.4.2-1; "Main Condenser and MSIV Leakage Pathway – Heat Exchanger Tubes," that the applicant intends to use their existing Water Chemistry Control (BWR) Program to control any loss of material in stainless steel (SS) condenser tubes; i.e., loss of material in SS piping (tubing) subjected to steam temperatures >270 degrees F. For these systems and any future modified systems, the GALL recommends implementation of both a Water Chemistry Control AND a One-Time Inspection Program to identify and mitigate loss of material in system piping (tubing). Does the applicant intend to implement a One-Time Inspection Program as well as their existing Water Chemistry Control Program to both identify and mitigate loss of material from any future modified heat exchanger tubing that could contain stainless steel that could be subjected to steam (or high temperature and high pressure water) temperatures >270 degrees F? If yes, does the applicant intend to formally produce a commitment to implement both programs? If the applicant does not intend to implement both a One-Time Inspection and Water Chemistry Control Program for future, modified condensers, why not?

Response LRA Table 3.4.1 indicates that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2's) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

Also, license renewal commitment 16 has been issued to implement the One-Time Inspection Program as described in LRA Section B.1.21. A commitment to implement the Water Chemistry Control – BWR Program is not necessary as this is an existing program, which does not require enhancement.

241 **Category** Closed

Request 3.4.2-M-03
The staff has recently discovered, in the applicant's LRA, "Table 3.3.2-13-9; "Circulating Water System," that the applicant intends to use their existing Periodic Surveillance and Periodic Maintenance (PSPM) Program to control loss of material in their circulating water condenser tubing (interior); i.e., loss of material in copper alloy material (>15% zinc) subjected to raw water conditions. For this system, the GALL recommends the implementation of an Open-Cycle Cooling Water Control Program to identify and mitigate loss of material in system piping. Does the applicant intend to implement only the PSPM Program to both identify and mitigate loss of material in the main condenser tubes rather than a "GALL-recommended" Open-Cycle Cooling Water Control Program? If yes, does the applicant intend to formally produce a commitment to modify and implement the PSPM Program for control of material loss from the main condenser tubing? If the applicant does not intend to implement both a PSPM and "GALL-recommended" Open-Cycle Cooling Water Control Program, why not?

Edit from 5/11/2006 email - The staff has recently discovered, in the applicant's LRA, "Table 3.3.2-13-9; "Circulating Water System," that the applicant intends to use their existing Periodic Surveillance and Periodic Maintenance (PSPM) Program to control loss of material in their circulating water condenser tubing (interior); i.e., loss of material in copper alloy material (>15% zinc) subjected to raw water conditions. For this system, the GALL recommends the implementation of an Open-Cycle Cooling Water Control Program to identify and mitigate loss of material in system piping. Does the applicant intend to implement only the PSPM Program to both identify and mitigate loss of material in the main condenser tubes rather than a "GALL-recommended" Open-Cycle Cooling Water Control Program? If yes, does the applicant intend to formally produce a commitment to modify and implement the PSPM Program for control of material loss from the main condenser tubing? If the applicant does not intend to implement both a PSPM and "GALL-recommended" Open-Cycle Cooling Water Control Program, why not?

Response LRA Table 3.3.2-13-9 does contain a line item for loss of material in copper alloy tubing subjected to raw water conditions. However, this line item does not represent the circulating water condenser tubing. Rather, it represents copper alloy instrument tubing in the circulating water system in cooling tower #2, cell 1 that requires aging management review due to potential spatial interaction.

A summary of the aging management review of the main condenser may be seen in LRA Table 3.4.2-1. As shown in this table and explained in plant-specific note 401, VYNPS does not intend to implement an aging management program for the main condenser.

Aging management of the main condenser is not based on analysis of materials, environments and aging effects. Condenser integrity required to perform the post-accident intended function (holdup and plate-out of MSIV leakage) is continuously confirmed by normal plant operation. This intended function does not require the condenser to be leak-tight, and the post-accident conditions in the condenser will be essentially atmospheric. Since normal plant operation assures adequate condenser pressure boundary integrity, the post-accident intended function to provide holdup volume and plate-out surface is assured. Previously approved staff positions (NUREG-1796, Dresden and Quad Cities SER, Section 3.4.2.4.4, and NUREG-1769, Peach Bottom SER, Section 3.4.2.3), concluded that main condenser integrity is continually verified during normal plant operation and no aging management program is required to assure the post-accident intended function.

242 **Category** Open

Request 3.5.1-13-W-1
In Table 3.5.2-1 on Page 3.5-50 of the LRA, for component Bellows (reactor vessel and drywell, one of the AMPs shown is CII-IWE, which is a plant-specific AMP. A Note C has been assigned to this AMR line item, component is different, but consistent with material, environment, aging effect, and aging management program for NUREG-1801 line item. AMP is consistent with NUREG-1801 AMP description. Provide drawings showing how the LRA line item bellows are different from the GALL Table 1 Line Item 3.5.1-13 bellows. Explain how the plant-specific VYNPS CII-IWE AMP is consistent with the GALL specified AMP.

Response Table 3.5.2-1 on Page 3.5-50 of the LRA, for component Bellows (reactor vessel and drywell) is not consistent with the referenced NUREG-1801 Vol. 2 item. The Table 3.5.2-1 line item "Bellows (reactor vessel and drywell)" and the corresponding line item in Table 2.4-1 should be deleted. The reactor vessel and drywell bellows perform no license renewal intended function. These components are not safety-related and are not required to demonstrate compliance with regulations identified in 10 CFR 54.4(a)(3). Failure of the bellows will not prevent satisfactory accomplishment of a safety function. Leakage, if any, through the bellows is directed to a drain system that prevents the leakage from contacting the outer surface of the drywell shell.

This requires an amendment to the LRA

243 **Category** Open

Request 3.5.1-16-W-1
In Table 3.5.2-1 on page 3.5-54 of the LRA for component Drywell floor liner seal, the AMP shown is Structures Monitoring. The applicant is asked to verify that the CII-IWE AMP will not be used instead to manage the aging of the moisture barrier.

Response The aging management activity will be the same whether included under the umbrella of the Structures Monitoring Program or under the umbrella of the CII-IWE Program, For clarification, the CII-IWE Program will manage the effects of aging on the moisture barrier through the period of extended operation. Note E remains the correct note since the CII-IWE Program is plant specific. The LRA will be amended as follows:
Table 3.5.2-1 will be updated to reflect the AMP as CII-IWE
Table line Item 3.5.1-16 will be updated to read:
"The aging effects cited in the NUREG-1801 item are loss of sealing and leakage. Loss of sealing is a consequence of the aging effects cracking and change in material properties.
For VYNPS, the Containment Leak Rate Program manages cracking and change in material properties for the primary containment seal and gaskets. The Inservice Inspection -IWE manages cracking and change in material properties for the primary containment moisture barrier."

This requires an amendment to the LRA.

Also see Response #76

244 **Category** Accepted

Request 3.5.1-44-W-1
In Table 3.5.2-6 on Page 3.5-80 of the LRA, for component seals and gaskets (doors, manways and hatches), material rubber in a protected from weather environment; the aging effects are cracking and change in material properties. One of the aging management programs shown is Structures Monitoring. The GALL line item referenced is III.A6-12 and the Table 1 reference is 3.5.1-44. The note shown is E, different AMP than shown in GALL. However, GALL Line Item III.A6-12 and Table 1 Line Item 3.5.1-44 both specify the Structures Monitoring Program. Explain why the note shown is not A instead of E for the lower half of this AMR line item.

Response Table 3.5.2-6 on Page 3.5-80 of the LRA, for component seals and gaskets (doors, manways and hatches), material rubber in a protected from weather environment; the aging effects are cracking and change in material properties. The LRA will be clarified to indicate that Note "A" applies to the line for SMP.

This requires an amendment to the LRA.

245 **Category** Open

Request 3.5.1-45-W-1
In Table 3.5.2-5 on Page 3.5-67 of the LRA, for component Vernon Dam external walls above/below grade, material concrete in an exposed to fluid environment; the AMP shown is Vernon Dam FERC Inspection. The referenced GALL line item for all three environments is III.A6-7. GALL Line Item III.A6-7 states the following under AMP: Chapter XI.S7, "Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC/US Army Corp of Engineers dam inspections and maintenance programs. Since one of the AMPs under this GALL line item is FERC dam inspections, explain why the note assigned to the LRA AMR line item is E instead of A; consistent with GALL.

Response The Vernon Dam FERC Inspection Program was described as a plant-specific program in Appendix B of the application because there is no program description in NUREG-1801. As a plant-specific program, we selected Note E. Note A would be an acceptable alternative.

246 **Category** Open

Request 3.5.1-47-W-1
In Table 3.5.2-5 on Page 3.5-66 of the LRA, for component Vernon Dam structural steel, material carbon steel in an exposed to weather, protected from weather, and exposed to fluid environment; the AMP shown is Vernon Dam FERC Inspection. The referenced GALL line item for all three environments is III.A6-11. GALL Line Item III.A6-11 states the following under AMP: Chapter XI.S7, "Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC/US Army Corp of Engineers dam inspections and maintenance programs. Since one of the AMPs under this GALL line item is FERC dam inspections, explain why the note assigned to the three LRA AMR line items is E instead of A; consistent with GALL.

Response The Vernon Dam FERC Inspection Program was described as a plant-specific program in Appendix B of the application because there is no program description in NUREG-1801. As a plant-specific program, we selected Note E. Note A would be an acceptable alternative.

247 **Category** Closed

Request 3.5.1-58-W-1
In Table 3.5.2-6 on Page 3.5-71 of the LRA, for component conduit, material galvanized steel in a protected weather environment; the aging effect is none. The GALL line item referenced is III.B2-5, which is for the following components: Support members; welds; bolted connections; support anchorage to building structure. Explain why the LRA AMR line item has a Note A shown instead of a Note C, different component with respect to the GALL line item. Or as an alternative, a letter Note A with a number note explaining that the component is different.

Response NUREG-1801 does not mention every type of component that may be subject to aging management review (e.g., conduit is not in NUREG-1801) nor does the terminology used at a specific plant always align with that used in GALL. Consequently, matching plant components to NUREG-1801 components is occasionally subjective. In this particular case, conduit, which has no specific function other than to support and protect cable, was considered a support member and Note A was applied. The use of either Note A or C has no real impact on the aging management review results.

248 **Category** Accepted

Request 3.5.1-58-W-2
In Table 3.5.2-6 on Page 3.5-72 of the LRA, for component electrical and instrument panels and enclosures, material galvanized steel in a protected from weather environment; the aging effect is none. The GALL line item referenced is III.B3-3, which is for the following components: Support members; welds; bolted connections; support anchorage to building structure. Explain why the LRA AMR line item has a Note A shown instead of a Note C, different component with respect to the GALL line item. Or as an alternative, a letter Note A with a number note explaining that the component is different.

Response NUREG-1801 does not mention every type of component that may be subject to aging management review (e.g., panel is not in NUREG-1801) nor does the terminology used at a specific plant always align with that used in GALL. Consequently, matching plant components to NUREG-1801 components is occasionally subjective. In this particular case, panels, which have no specific function other than to support and protect electrical equipment, was considered a support member and Note A was applied. The use of either Note A or C has no real impact on the aging management review results.

Note “A” will be changed to Note “C” for component electrical and instrument panels and enclosures, material galvanized steel in a protected from weather environment in Table 3.5.2-6 on Page 3.5-72 of the LRA. No change is required to the other entries for this line item.

This requires an amendment to the LRA.

249 **Category** Accepted

Request 3.5.1-58-W-3
In Table 3.5.2-6 on Page 3.5-73 of the LRA, for component flood curb, material galvanized steel in a protected from weather environment; the aging effect is none. The GALL line item referenced is III.B5-3, which is for the following components: Support members; welds; bolted connections; support anchorage to building structure. Explain why the LRA AMR line item has a Note A shown instead of a Note C, different component with respect to the GALL line item. Or as an alternative, a letter Note A with a number note explaining that the component is different.

Response Unlike the conduits and panels compared to supports in questions 3.5.1-58-W-1 and W-2, the component flood curb should not have been considered a match. Note C should be applied here; although the use of either Note A or C has no real impact on the aging management review results

Note "A" will be changed to Note "C" for component flood curb, material galvanized steel in a protected from weather environment in Table 3.5.2-6 on Page 3.5-73 of the LRA. No change is required to the other entries for this line item.

This requires an amendment to the LRA.

250 **Category** Accepted

Request 3.5.1-8-W-1
In Table 3.5.2-1 on Page 3.5-53 of the LRA for component Torus shell with the aging effect cracking-fatigue, the note assigned is E. Note E is consistent with NUREG-1801 material, environment, and aging effect but a different aging management program is credited. Explain why this note is E when the AMP shown for this line item is TLAA and the referenced GALL Line Item II.B1.1-4 also specifies a TLAA.

Response Note A should be applied here. The LRA will be amended to indicate Note A.

251 **Category** Closed

Request 3.5.2-2-W-1
In Table 3.5.2-2 on Page 3.5-57 of the LRA, for component Spent fuel pool storage racks, material stainless steel in an exposed to fluid environment; the aging effect is loss of material. Explain by what aging mechanism loss of material occurs and why the aging effect is not cracking.

Response As shown in Table 3.5.2-2, the aging effect for component spent fuel pool storage racks is loss of material. The specific aging mechanism is pitting and crevice corrosion because stainless steels are susceptible to this aging mechanism when exposed to oxygenated water in a treated water environment. Cracking is not an aging effect requiring management for stainless steel in the spent fuel pool because cracking due to stress corrosion is dependent on temperature (>140°F). The spent fuel pool treated water environment is less than 140°F.

252 **Category** Closed

Request 3.5.2-4-W-1
In Table 3.5.2-4 on Page 3.5-61 of the LRA, for component Blowout or blow-off panels, material aluminum in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material due to pitting and crevice corrosion of aluminum components in an outdoor environment is not applicable if the atmospheric environment is non-aggressive. Plant-specific Note 503 provides the basis for concluding the environment is non-aggressive. In this non-aggressive environment, the occasional wetting and drying from normal outdoor weather does not result in significant loss of material in aluminum components, hence, there are no aging effects requiring management.

253 **Category** Closed

Request 3.5.2-4-W-2
In Table 3.5.2-4 on Page 3.5-61 of the LRA, for component Steel Piles, material carbon steel in an exposed to weather environment; the aging effect is none. Note 504 discusses steel piles driven into soils (a soil environment, not a weather environment) with no significant effects due to corrosion. Explain how the soil environment relates to the weather environment to justify no aging effect.

Response As identified in Table 3.5.2-4 on Page 3.5-61 of the LRA, for steel piles, material carbon steel in an exposed to weather environment; the aging effect is none. Although a soil environment is not identified, the listed environment, exposed to weather, is intended to include both an above grade environment and a below grade environment as described in Table 3.0-2 of the application. The below grade environment applies to the steel piles. As such the statement made in Note 504 is applicable.

254 **Category** Closed

Request 3.5.2-5-W-1
In Table 3.5.2-5 on Page 3.5-65 of the LRA, for component N2 tank steel supports, material stainless steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material due to pitting and crevice corrosion of stainless steel components in an outdoor environment is not applicable if the atmospheric environment is non-aggressive. Plant-specific Note 503 provides the basis for concluding the environment is non-aggressive. In this non-aggressive environment, the occasional wetting and drying from normal outdoor weather does not result in significant loss of material in stainless steel components, hence, there are no aging effects requiring management.

255 **Category** Accepted

Request 3.5.2-5-W-2
In Table 3.5.2-5 on Page 3.5-65 of the LRA, for component Transmission towers, material galvanized steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material is the aging effect requiring management and the Structures Monitoring Program is the aging management program. This is consistent NUREG-1801 Vol. 2 Item III.B4-7, summarized in Table 1 Item 3.5.1-50, and Note C applies.

This change requires an amendment to the LRA.

256 **Category** Open

Request 3.5.2-5-W-3
In Table 3.5.2-5 on Page 3.5-67 of the LRA, for component Vernon Dam external walls, floor slabs and interior walls, material concrete in a protected from weather environment; the aging effect shown is none with the AMP shown as Vernon Dam FERC Inspection. VYNPS discusses throughout its LRA Section 3.5 further evaluations that VYNPS concrete does not have aging effects because the quality of the concrete used during construction was to the standards of ACI-318 and ACI 201.2R. Vernon Dam is a very old structure and was not built by the owners of VYNPS. Provide documentation and justification that the quality of the concrete used at Vernon Dam is also to the standards of ACI-318 and ACI 201.R such that the AMR statement None for aging effects of the Dam concrete is justified.

Response Since quality of concrete used at Vernon Dam has not been confirmed, it would have been more appropriate to show for the associated aging effects for the line items in question. However, the same aging management activity, the FERC inspection, is still appropriate to manage aging effects associated with the Vernon Dam concrete components.

257 **Category** Accepted

Request 3.5.2-6-W-1
In Table 3.5.2-6 on Page 3.5-71 of the LRA, for component conduit, material galvanized steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material is the aging effect requiring management and the Structures Monitoring Program is the aging management program. This is consistent NUREG-1801 Vol. 2 Item III.B4-7, summarized in Table 1 Item 3.5.1-50, and Note C applies.

This change requires an amendment to the LRA.

258 **Category** Accepted

Request 3.5.2-6-W-2
In Table 3.5.2-6 on Page 3.5-71 of the LRA, for component conduit support, material galvanized steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material is the aging effect requiring management and the Structures Monitoring Program is the aging management program. This is consistent NUREG-1801 Vol. 2 Item III.B4-7, summarized in Table 1 Item 3.5.1-50, and Note C applies.

This change requires an amendment to the LRA.

259 **Category** Accepted

Request 3.5.2-6-W-3
In Table 3.5.2-6 on Page 3.5-72 of the LRA, for component electrical and instrument panels and enclosures, material galvanized steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material is the aging effect requiring management and the Structures Monitoring Program is the aging management program. This is consistent NUREG-1801 Vol. 2 Item III.B4-7, summarized in Table 1 Item 3.5.1-50, and Note C applies.

This change requires an amendment to the LRA.

260 **Category** Closed

Request 3.5.2-6-W-4
In Table 3.5.2-6 on Page 3.5-75 of the LRA, for component Vents and louvers, material aluminum in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material due to pitting and crevice corrosion of aluminum components in an outdoor environment is not applicable if the atmospheric environment is non-aggressive. Plant-specific Note 503 provides the basis for concluding the environment is non-aggressive. In this non-aggressive environment, the occasional wetting and drying from normal outdoor weather does not result in significant loss of material in aluminum components, hence, there are no aging effects requiring management.

261 **Category** Closed

Request 3.5.2-6-W-5
In Table 3.5.2-6 on Page 3.5-76 of the LRA, for component Anchor bolts, material stainless steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material due to pitting and crevice corrosion of stainless steel components in an outdoor environment is not applicable if the atmospheric environment is non-aggressive. Plant-specific Note 503 provides the basis for concluding the environment is non-aggressive. In this non-aggressive environment, the occasional wetting and drying from normal outdoor weather does not result in significant loss of material in stainless steel components, hence, there are no aging effects requiring management.

262 **Category** Closed

Request 3.5.2-6-W-6
In Table 3.5.2-6 on Page 3.5-78 of the LRA, for component structural bolting, material stainless steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material due to pitting and crevice corrosion of stainless steel components in an outdoor environment is not applicable if the atmospheric environment is non-aggressive. Plant-specific Note 503 provides the basis for concluding the environment is non-aggressive. In this non-aggressive environment, the occasional wetting and drying from normal outdoor weather does not result in significant loss of material in stainless steel components, hence, there are no aging effects requiring management.

263 **Category** Accepted

Request 3.5.2-6-W-7
In Table 3.5.2-6 on Page 3.5-78 of the LRA, for component structural bolting, material galvanized steel in an exposed to weather environment; the aging effect is none. Reference question A-W-13 and explain how this component is protected from constant wetting and drying conditions.

Response As identified in the response to question A-W-13, loss of material is the aging effect requiring management and the Structures Monitoring Program is the aging management program. This is consistent NUREG-1801 Vol. 2 Item III.B4-7, summarized in Table 1 Item 3.5.1-50, and Note C applies.

This change requires an amendment to the LRA.

264 **Category** Closed

Request 3.5.2-6-W-8
In Table 3.5.2-6 on Page 3.5-80 of the LRA, for component water stops, material PVC in a protected from weather environment; the aging effect is none. By definition the component stops water, so it could be exposed to water. In LRA Table 3.5.2-4 on Page 3.5-64 for component Cooling tower fill, material PVC, environment exposed to fluid environment, the aging effects listed are cracking and change in material properties. Provide a technical basis why PVC water stops do not have any aging effects which need aging management when they could be exposed to a fluid environment also. Provide the specification that called for PVC water stops during construction instead of rubber.

Response The PVC water stops identified in Table 3.5.2-6 on Page 3.5-80 of the LRA are used in the cooling tower reinforced concrete basin and are not exposed to the same environment as the cooling tower fill material. Therefore the aging effects are not the same. The aging effects attributed to PVC water stops are evaluated based upon Section 7.0 of the Structural Tools. Exposure to water for these commodities is insignificant, since the concrete encapsulating the PVC water stop and the protection provided by the surrounding concrete, provides ample protection such that aging management is not required. USFAR Fig 12.2-33 (G-200357) "Cooling Tower No. 2 Basin Plan View" identifies the use of PVC water stops at VYNPS.

265 **Category** Closed

Request 3.5.2-6-W-9
In Table 3.5.2-6 on Page 3.5-78 of the LRA, for component Fire proofing, material Pyrocrete in a protected from weather environment; the aging effect is none. Provide a technical basis why Pyrocrete does not have any aging effects in the environment listed.

Response Pyrocrete (used for fire proofing) is cement base composite material. Pyrocrete is not identified in NUREG-1801. As such, our technical evaluation of pyrocrete in determining applicable aging effects was the same as that for concrete which is based on EPRI 1002950, Aging Effects for Structures And Structural Components (Structural Tools), Revision 1, Section 5. Accordingly, no aging effects were determined for pyrocrete protected from weather. However, as indicated In Table 3.5.2-6 on Page 3.5-78 of the LRA, the Fire Protection Program and Structures Monitoring Program will confirm the absence of significant aging effects throughout the period of extended operation.

266 **Category** Accepted

Request A-W-01
LRA Table 3.5.1, Item Number 3.5.1-5, has the following statement under the discussion column: The drywell steel where the drywell shell is embedded is inspected in accordance with the Containment Inservice Inspection (IWE) Program and Structures Monitoring Program. This is an impossible inspection. Change this discussion statement to agree with LRA Section 3.5.2.2.1.4 that states: The drywell steel shell and the moisture barrier where the drywell shell becomes embedded in the drywell concrete floor are inspected in accordance with the Containment Inservice Inspection (IWE) Program and Structures Monitoring Program.

Response For LRA Table 3.5.1, Item 3.5.1-5, the discussion column should read, "The drywell steel shell and the moisture barrier where the drywell shell becomes embedded in the drywell concrete floor are inspected in accordance with the Containment Inservice Inspection (IWE) Program. To be consistent, LRA Section 3.5.2.2.1.4, should indicate that the drywell to floor moisture barrier will be inspected under the Containment Inservice Inspection (IWE) Program. The inspection is part of the Containment Inservice Inspection (IWE) Program and will be retained as part of that program through the period of extended operation. The LRA will be amended as stated by formal correspondence.

267 **Category** Accepted

Request A-W-02
LRA Table 3.5.1, Item Number 3.5.1-9, has the following statement under the discussion column: Not applicable. See Section 3.5.2.2.1.6. However, the following statement is made in LRA Section 3.5.2.2.1.6: "Fatigue TLAAs for the steel drywell, torus, and associated penetrations are evaluated and documented in Section 4.6." The components associated with LRA Table 3.5.1, Item Number 3.5.1-9 are: penetration sleeves, penetration bellows; suppression pool shell, unbraced downcomers. Explain how Item number 3.5.1-9 is not applicable when a fatigue TLAA has been performed for the torus and penetrations. Explain why the vent line, vent header and vent line bellows are not listed in LRA Sections 3.5.2.2.1.6 and 4.6 as referenced in Table 3.5.1, Line Item 3.5.1-8.

Response The LRA will be amended to reflect the following changes. Fatigue analyses have been evaluated for the torus, drywell to torus vent system, and torus penetrations. The following line for the torus penetrations will be added to Table 3.5.2-1:

Torus mechanical penetrations PB, SSR
Carbon steel Protected from weather Cracking
(fatigue) TLAA-metal fatigue II.B4-4
(C-13) 3.5.1 9A

The evaluation of the drywell to torus vent system fatigue analysis determined that it was not a TLAA. The significant contributor to fatigue of the vent system is post-LOCA chugging, a once in plant-life event. As there will still be only one design basis LOCA for the life of the plant, including the period of extended operation, this analysis is not based on a time-limited assumption and is not a TLAA. Since fatigue for the vent system is event driven and is not an age related effect, the following line will be deleted from Table 3.5.2-1:

Drywell to torus vent system PB, SSR
Carbon steel Protected from weather Cracking
(fatigue) TLAA-metal fatigue II.B1.1-4
(C-21) 3.5.1 8 A

The discussion column entry for Table 3.5.1 item 3.5.1-8 will be changed to state:

Fatigue analysis is a TLAA for the torus shell. Fatigue of the torus to drywell vent system is event driven and the analysis is not a TLAA. See Section 3.5.2.2.1.6.

The discussion column entry for Table 3.5.1 item 3.5.1-9 will be changed to state:

Fatigue analysis is a TLAA for the torus penetrations. See Section 3.5.2.2.1.6.

Section 3.5.2.2.1.6 will be changed to read as follows:

TLAA are evaluated in accordance with 10 CFR 54.21(c) as documented in Section 4. Fatigue TLAAs for the torus and associated penetrations are evaluated and documented in Section 4.6.

Section 3.5.2.3, Time-Limited Aging Analyses, will be changed to state:

TLAA identified for structural components and commodities include fatigue analyses for the torus and torus penetrations. These topics are discussed in Section 4.6.

268 **Category** Accepted

Request A-W-03
LRA Table 3.5.1, Item Number 3.5.1-12, under the discussion column, does not make reference to LRA Section 3.5.2.2.1.8 for further evaluation. Explain why this link is not made to the further evaluation section. Explain the need for augmented ultrasonic exams to detect fine cracks since a CLB fatigue analysis does exist.

Response A link from items 3.5.1-12 and 3.5.1-13 will be added to section 3.5.2.2.1.8.

Section 3.5.2.2.1.8 should state:
Cyclic loading can lead to cracking of steel and stainless steel penetration bellows, and dissimilar metal welds of BWR containments and BWR suppression pool shell and downcomers.
Cracking due to cyclic loading is not expected to occur in the drywell, torus and associated penetration bellows, penetration sleeves, unbraced downcomers, and dissimilar metal welds. A review of plant operating experience did not identify cracking of the components, and primary containment leakage has not been identified as a concern. Nonetheless the existing Containment Leak Rate Program with augmented ultra sonic exams and Containment Inservice Inspection – IWE, will continue to be used to detect cracking. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Containment Inservice Inspection – IWE and Containment Leak Rate programs are described in Appendix B.

This will require an amendment to the LRA

269 **Category** Accepted

Request A-W-04
LRA Table 3.5.1, Item Number 3.5.1-13, under the discussion column, does not make reference to LRA Section 3.5.2.2.1.8 for further evaluation. Explain why this link is not made to the further evaluation section. Explain the need for augmented ultrasonic exams to detect fine cracks since a CLB fatigue analysis does exist.

Response This requires an amendment to the LRA.

See response to Item 268.

270 **Category** Accepted

Request A-W-05
LRA Table 3.5.1, Item Number 3.5.1-16, under the discussion column, states that seals and gaskets are not included in the Containment Inservice Inspection Program at VYNPS. One of the components for this item number is moisture barriers. Explain how VYNPS seals the joint between the containment drywell shell and drywell concrete floor if there is no moisture barrier. Explain why the inspection of this joint is not part of the Containment Inservice Inspection Program at

Response VYNPS uses a moisture barrier to seal the joint between the containment drywell shell and drywell concrete floor. Moisture barrier is listed in LRA table 3.5.2-1 as drywell floor liner seal. Aging effects on the drywell moisture barrier will be managed under the CII-IWE program (also see audit question 3.5.1-16-W-1 above).

For clarity, drywell floor liner seal will be changed to drywell shell to floor seal (moisture barrier). (Also see audit questions #76 and 243 which address changes to the LRA)

271 **Category** Open

Request A-W-06
LRA Table 3.5.1, Item Number 3.5.1-17, under the discussion column, states that locks, hinges, and closure mechanisms are active components and are therefore not subject to an aging management review. Provide any license renewal regulatory guidance document or previous LRA NRC SER that has ever stated that locks, hinges, and closure mechanisms are active components. If locks, hinges, and closure mechanisms are active components at VYNPS, provide an itemized list of these active components with their qualified life or specified time period of replacement. Explain how VYNPS tracks the active life of these components before replacement.

Response It may be a misnomer to refer to these components as active components since 10CFR54.21(a)(1)(i) does not refer to active or passive components, but rather excludes components from aging management review that perform an intended function, as described in § 54.4, with moving parts or with a change in configuration or properties. Locks, hinges, and closure mechanisms perform their functions with moving parts.
This exception is not based on a qualified life or specified time period of replacement for a component. 10CFR54.21(a)(1)(ii) provides a separate exclusion for components that are replaced based on a qualified life.
Other precedents for locks, hinges, and closure mechanisms as active components that have received approval by the NRC are found in Peach Bottom (NUREG 1769, Section 3.0.3.14.2 Pg 3-58) and Millstone (NUREG 1838, Section 3.3A.2.1.4 Pg 3-245)

272 **Category** Open

Request A-W-07
LRA Table 3.5.1, Item Number 3.5.1-21, under the discussion column, states that VYNPS plant operating experience has not identified fretting or lock up due to mechanical wear for the drywell head and downcomers. Plant operating experience does not find fretting or lock up due to mechanical wear, inspections do. Explain if VYNPS does not currently inspect for wear of the drywell head and downcomer pipes under the CLB using the Containment Inservice Inspection Program. If VYNPS does currently inspect these components for wear, justify not performing these same inspections during an extended license period. If required, provide drawings showing the spacial distance between components such that fretting cannot occur.

Response Condition reports are a primary source of operating experience documentation reviewed for license renewal. Condition reports document negative inspection results. NUREG-1801 defines neither fretting nor lockup and further confuses the subject by stating that fretting and lockup are caused by mechanical wear which is an aging mechanism resulting in the aging effect loss of material. The definition in NUREG-1801, Section IX.E, merely states that fretting and lockup is an aging effect along with a cause, but doesn't say what it is or what it looks like. As indicated in the line item for drywell head in Table 3.5.2-1, the Containment Inservice Inspection-IWE Program and the Containment Leak Rate Program manage loss of material. Loss of material is the aging effect caused by mechanical wear. VYNPS inspects the drywell head and downcomers (Torus vent system) per the requirements of ASME Section XI.

In addition, the drywell head is a stationary or fixed component and the downcomers are stationary, well-braced components and the spacial distance between connecting components makes it unlikely for fretting and lockup to occur.

273 **Category** Open

Request A-W-08
LRA Table 3.5.1, Item Number 3.5.1-11, under the discussion column, states that cracking due to stress corrosion cracking for stainless steel vent line bellows is not applicable. Explain if the VYNPS Containment Inservice Inspection Program and Containment Leak Rate Program are used currently to detect cracking of stainless steel vent line bellows by inspection and testing. Explain why it is not more appropriate to take credit for these two programs to detect cracking without the need for additional enhanced examinations then to say not applicable.

Response The NUREG-1801 referenced programs involve visual inspections and leak testing which are not optimum methods for managing SCC. Therefore, when possible, it is more appropriate to assess the conditions and identify whether the applicable aging effects require management. As stated in Section 3.5.2.2.1.7, stress corrosion cracking is not an aging effect requiring management for the penetration sleeves and bellows, since the conditions necessary for SCC do not exist.

However these components are evaluated for other aging effects requiring management, such as cracking, as shown in Table 3.5.2-1.

274 **Category** Open

Request A-W-09
LRA Table 3.5.1, Item Number 3.5.1-26, under the discussion column, states that freeze-thaw is not an applicable aging mechanism for these groups of structures at VYNPS. Provide documentation showing the weathering conditions (weathering index) for VYNPS and the specification requiring concrete to have an air content of 3% to 6% and water to cement ratio of 0.35 to 0.45.

Response VYNPS inaccessible and accessible concrete areas are designed in accordance with American Concrete Institute (ACI) specification ACI 318-63, Building Code

Requirements for Reinforced Concrete. VYNPS concrete also meets requirements of later ACI guide ACI 201.2R-77, Guide to Durable Concrete, since both documents use the same American Society for Testing and Material (ASTM) standards for selection, application and testing of concrete.
VYNPS concrete was provided with air content between 3% and 5% and a water/cement ration between 0.44 and 0.60 (Ref. VYNPS site specification EBASCO 15-65, Sections 7.0 and 12.5). VYNPS is located at severe weathering region (weathering index >100 day-inch/yr) as indicated in ASTM C33, FIG. 1.

Although the water/cement ratio falls outside the listed range of 0.35 to 0.45, given all parameters associated with concrete mix design VYNPS concrete meets the quality requirements of ACI to ensure acceptable concrete is obtained. Nonetheless concrete will be managed under the aging management programs identified in the 3.5.2 tables.

275 **Category** Open

Request A-W-10
For LRA Table 3.5.1, Item Number 3.5.1-27, provide documentation showing that inaccessible areas concrete was constructed in accordance with the recommendations in ACI 201.2R-77.

Response For construction of concrete, VYNPS site Specification EBASCO 15-65, Concrete Large Work, identifies the same ASTM standards for achieving durable concrete as those identified in ACI 201.2R77, “Guide to durable concrete.”

276 **Category** Closed

Request A-W-11
For LRA Table 3.5.1, Item Number 3.5.1-33, provide the maximum temperatures that concrete experiences in Group 1 through 5 structures.

Response The VYNPS concrete is expected to experience average general area
temperature of 150°F and local area maximum temperature less than 200°F. The drywell cooling system recirculates the drywell atmosphere through heat exchangers to maintain ambient temperature in the drywell between 135 and 165°F (average 150°F). (Ref VYNPS UFSAR 5.2.3.2 and 10.12.3) The concrete temperature around piping penetrations for high temperature lines, such as the steam lines and other reactor system lines is protected by piping insulation and air gaps. (Ref UFSAR 5.2.3.4.2).

277 **Category** Open

Request A-W-12
LRA Table 3.5.1, Item Number 3.5.1-41, under the discussion column, states that no vibration isolation elements at VYNPS are in scope and subject to aging management review. Explain the lack of vibration isolation elements for HVAC system components, the emergency diesel generator and miscellaneous mechanical equipment.

Response LRA Table 3.5.1 relates only to structures and structural supports. Thus, the statement that no vibration isolation elements are in scope and subject to aging management review applies only to structural vibration isolation elements. Vibration isolation elements for mechanical system components are subject to aging management review. For example, LRA Table 3.3.2-4 contains expansion joint in the emergency diesel generator system and LRA Table 3.3.2-10 contains duct flexible connections and expansion joints in heating, ventilation, and air conditioning systems.

278 **Category** Accepted

Request A-W-13
LRA Table 3.5.1, Item Number 3.5.1-50, under the discussion column, states that loss of material due to pitting and crevice corrosion of groups B2 and B4 galvanized steel, aluminum, and stainless steel components in an outdoor air environment is not applicable at VYNPS. NUREG-1833 on Page 93 for Item TP-6 states an approved precedent exists for adding this material, environment, aging effect, and program combination to the GALL Report. As shown in RNP SER Section 3.5.2.4.3.2, galvanized steel and stainless steel in an outdoor air environment could result in loss of material due to constant wetting and drying conditions. Aluminum would also be susceptible to a similar kind of aging effect in the outdoor environment. Provide a discussion of the actual group B2 and B4 galvanized steel, aluminum, and stainless steel VYNPS components which are within the scope of license renewal and exposed to an outdoor air environment. Discuss the location of these components at VYNPS and how they are protected from constant wetting and drying conditions.

Response Loss of material due to pitting and crevice corrosion of aluminum and stainless steel components in an outdoor environment is not applicable if the atmospheric environment is non-aggressive. The ambient environment at VYNPS is not chemically polluted by vapors of sulfur dioxide or other similar substances and the external environment does not contain saltwater or high chloride content. In this non-aggressive environment, the occasional wetting and drying from normal outdoor weather does not result in any significant loss of material in, aluminum or stainless steel components. The conclusion that no aging effects require management for these materials in an outdoor air environment is supported by operating experience and by previously approved staff positions documented in the Farley SER (NUREG-1825, page 3-314).

Components that may be considered in the B2 and B4 grouping consists of those line items in Table 3.5.2-6 including the plant specific Note 503. Note 503 provides the basis for concluding the environment is non-aggressive and the conclusion that there are no aging effects requiring management.

The aging management review results for galvanized steel components in outdoor air should indicate loss of material as an aging effect with structures monitoring as the aging management program. The following discussion applies to the discussion column entry for item 3.5.1-50.

Consistent with NUREG-1801 for galvanized steel components in outdoor air. The Structures Monitoring Program will manage loss of material.

Loss of material is not an applicable aging effect for stainless steel or aluminum components in outdoor air. The ambient environment at VYNPS is not chemically polluted by vapors of sulfur dioxide or other similar substances and the external environment does not contain saltwater or high chlorides. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for aluminum and stainless steel components exposed to the external environment.

These changes require an amendment to the LRA..

279 **Category** Open

Request A-W-14
LRA Table 3.5.1, Item Number 3.5.1-52, under the discussion column, states that loss of mechanical function due to the listed mechanisms is not an aging effect. Proper design prevents distortion, overload, and fatigue due to vibratory and cyclic thermal loads. Explain how loss of mechanical function due to corrosion is not an aging effect which needs to be managed for the period of extended operation. If proper design prevents distortion, overload, and fatigue due to vibratory and cyclic thermal loads, explain if there has never been a component failure at VYNPS due to any of these conditions. Explain if there has never been a component failure in the nuclear industry due to any of these conditions. Explain where sliding support bearing and sliding support surfaces are used in component groups B2 and B4 at VYNPS and provide the environment they are exposed to.

Response Loss of material due to corrosion is an aging effect that can cause a loss of intended function. Loss of mechanical function would be considered a loss of intended function. Loss of mechanical function is not an aging effect, but is the result of aging effects. There have been component failures in the industry due to distortion, overload, and excessive vibration. Such failures typically result from inadequate design or events rather than the effects of aging. Failures due to cyclic thermal loads are very rare for structural supports due to their relatively low temperatures.
The sliding surface material used at VYNPS is lubrite, which is a corrosion resistant material. Components are inspected under ISI-IWF for torus saddle supports and Structures Monitoring Program for the lubrite components of radial beam seats. Plant operating experience has not identified failure of lubrite components used in structural applications. No current industry experience has identified failure associated with lubrite sliding surfaces. Components associated with B2 grouping are limited to the torus radial beam seats and support saddles. There are no sliding support surfaces associated with the B4 component grouping for sliding surfaces at VYNPS.

LRA Table 3.5.1, Item 3.5.1-52 will be revised to read as follows.
"Loss of mechanical function due to the listed mechanisms is not an aging effect. Such failures typically result from inadequate design or operating events rather than from the effects of aging. Failures due to cyclic thermal loads are rare for structural supports due to their relatively low temperatures."

This requires an amendment to the LRA.

280 **Category** Open

Request A-W-15
LRA Table 3.5.1, Item Number 3.5.1-54, under the discussion column, states that loss of mechanical function due to the listed mechanisms is not an aging effect. Proper design prevents distortion, overload, and fatigue due to vibratory and cyclic thermal loads. Explain how loss of mechanical function due to corrosion is not an aging effect which needs to be managed for the period of extended operation. If proper design prevents distortion, overload, and fatigue due to vibratory and cyclic thermal loads, explain if there has never been a component failure at VYNPS due to any of these conditions. Explain if there has never been a component failure in the nuclear industry due to any of these conditions. Explain what VYNPS inspects for during VT-3 visual examinations of groups B1.1, B1.2 and B1.3 components under its Inservice Inspection Program during its current license and also anticipated VT-3 visual examinations during its possible extended license

Response The discussion for Item Number 3.5.1-54 was not saying that failures have not occurred, but that loss of mechanical function is not an aging effect. For license renewal, Entergy identifies a number of aging effects that can cause loss of intended function. Loss of intended function includes loss of mechanical function. The loss of function is not considered an aging effect. Aging effects that could cause loss of mechanical function for components in Item Number 3.5.1-54 are addressed elsewhere in the aging management reviews. For example, loss of material due to any mechanism is addressed in Table 3.5.2-6 under listings for component and piping supports ASME Class 1, 2, 3 and MC (Page 3.5-70), and component and piping supports (Page 3.5-71). Component failures at VYNPS and in the nuclear industry have certainly occurred due to overload (typically caused by an event such as water hammer) or vibratory and cyclic thermal loads. Because of the low operating temperatures, failures due to cyclic thermal loads are extremely rare for structural commodities. Failures due to distortion or vibratory loads have also occurred due to inadequate design, but rarely if ever, due to the normal effects of aging.

LRA Table 3.5.1, Item 3.5.1-54 will be revised to state:
Loss of mechanical function due to distortion, dirt, overload, fatigue due to vibratory, and cyclic thermal loads is not an aging effect requiring management. Such failures typically result from inadequate design or events rather than the effects of aging. Loss of material due to corrosion, which could cause loss of mechanical function, is addressed under Item 3.5.1-53 for Groups B1.1, B1.2, and B1.3 support members."

This requires an amendment to the LRA.

281 **Category** Open

Request A-W-16
LRA Table 3.5.1, Item Number 3.5.1-10, under the discussion column, states that cracking due to stress corrosion cracking for stainless steel penetration sleeves and penetration bellows is not applicable. Explain if the VYNPS Containment Inservice Inspection Program and Containment Leak Rate Program are used currently to detect cracking of stainless steel penetration sleeves and penetration bellows by inspection and testing. Explain why it is not more appropriate to take credit for these two programs to detect cracking without the need for additional enhanced examinations then to say not applicable.

Response The NUREG-1801 referenced programs involve visual inspections and leak testing which are not optimum methods for managing SCC. Therefore, when possible, it is more appropriate to assess the conditions and identify whether the applicable aging effects require management. As stated in section 3.5.2.2.1.7, stress corrosion cracking is not an aging effect requiring management for the penetration sleeves and bellows, since the conditions necessary for SCC do not exist.

However these components are evaluated for aging effects requiring management, such as cracking, as shown in Table 3.5.2-1 (Reference item for Drywell to torus vent line bellows).

282 **Category** Open

Request A-W-17
LRA Table 3.5.1, Item Number 3.5.1-34, under the discussion column, does not make reference to LRA Section 3.5.2.2.2.4 (1) for further evaluation. Explain why this link is not made to the further evaluation section.

Response NUREG-1800, Item Number 3.5.1-34 indicates that further evaluation is necessary only for aggressive environments. No reference was provided to further evaluation in LRA Section 3.5.2.2.2.4 (1) since the VYNPS environment is not aggressive as noted in LRA Table 3.5.1, Item Number 3.5.1-34, under the discussion column.
LRA Table 3.5.1, Line Item 3.5.1-34 discussion will be revised to add “See Section 3.5.2.2.2.4(1)”.

283 **Category** Open

Request A-W-18
LRA Table 3.5.1, Item Number 3.5.1-35, under the discussion column, does not make reference to LRA Section 3.5.2.2.2.4 (2) for further evaluation. Explain why this link is not made to the further evaluation section. Provide a copy of ACI-301 as listed under the discussion.

Response Due to an administrative error the reference to ACI should have been ACI 318 and not ACI 301. LRA Table 3.5.1, Item 3.5.1-35 discussion will be revised to refer to ACI 318. For clarification, a reference to Section 3.5.2.2.2.4(2) will also be added to the discussion.

See also Response 284

This change requires an amendment to the LRA.

284 **Category** Open

Request A-W-19
LRA Table 3.5.1, Item Number 3.5.1-36, under the discussion column, does not make reference to LRA Section 3.5.2.2.2.4 (3) for further evaluation. Explain why this link is not made to the further evaluation section. The statement: "See Section 3.5.2.2.2.1 (5) for additional discussion" needs further clarification that this section is for Groups 1-5, 7-9, however it would apply to accessible Group 6 concrete. Explain why LRA Section 3.5.2.2.2.4 (3) lists cracking of concrete due to Stress Corrosion Cracking (SCC).

Response LRA Table 3.5.1, Line item Number 3.5.1-36 discussion will be revised to read as follows.
Reaction with aggregates is not an applicable aging mechanism for VYNPS concrete components.
See Section 3.5.2.2.2.1(5) (although for Groups 1-5, 7, 9 this discussion is also applicable for Group 6).
See Section 3.5.2.2.2.4(3) additional discussion. Nonetheless, the Structures Monitoring Program will confirm the absence of aging effects requiring management for VYNPS Group 6 concrete components.

Due to an administrative oversight, the heading of LRA Section 3.5.2.2.2.4 (3) inadvertently lists cracking of concrete due to Stress Corrosion Cracking (SCC). This section heading should have begun with “Cracking Due to Expansion and Reaction with Aggregates…”. Stress corrosion cracking is not discussed in the body of this section.

These changes require an amendment to the LRA.

285 **Category** Open

Request A-W-20
LRA Table 3.5.1, Item Number 3.5.1-37, under the discussion column, states not applicable and makes reference to Section 3.5.2.2.2.4(3). Section 3.5.2.2.2.4(3) discusses inaccessible areas only. Explain why VYNPS under the discussion section for Item Number 3.5.1-37 does not state: "Nonetheless, the Structures Monitoring Program will confirm the absence of aging effects requiring management for VYNPS Group 6 concrete components." This would apply to above grade concrete, like in Line Item 3.5.1-36 for accessible concrete.

Response For clarification, LRA Table 3.5.1, Item Number 3.5.1-37, will be revised to state the following.
“Not applicable. Nonetheless the Structures Monitoring Program will confirm the absence of aging effects requiring management for VYNPS Group 6 concrete components. See Section 3.5.2.2.2.4(3)”.

This change requires an amendment to the LRA.

286 **Category** Open

Request A-W-21
LRA Table 3.5.1, Item Number 3.5.1-40, under the discussion column, states: "Plant experience has not identified reduction in concrete anchor capacity or other concrete aging mechanisms. Nonetheless, the Structures Monitoring Program will confirm absence of aging effects requiring management for VYNPS concrete components." The project team cannot find an AMR line item in Table 2 for this component (Building concrete at locations of expansion and grouted anchors; grout pads for support base plates). Provide the Table 2 number, LRA page number, and component for where this AMR line item is evaluated and shown.

Response Building concrete at locations of expansion and grouted anchors; grout pads for support base plates are shown as “foundation” and “Reactor vessel support pedestal” in LRA Table 3.5.2-1 (page 3.5-54), “foundation” in Tables 3.5.2-2 thru 3.5.2-5 (pages 3.5-58, 3.5-60, 3.5-62, and 3.5-66), and as ‘Equipment pads/foundations” in Table 3.5.2-6 (page 3.5-78). Further evaluation is provided in LRA section 3.5.2.2.2.6(1), page 3.5-14.

LRA Table 3.5.1, Item Number 3.5.1-40 discussion will be revised to add “See Section 3.5.2.2.2.6(1)”.

This requires an amendment to the LRA.

287 **Category** Closed

Request 3.1.1-19-P-02
Please clarify the basis for omitting the leak-off lines themselves from Table 3.1.2-1.

Response The head seal leak detection lines are not part of the pressure vessel but are included in Table 3.1.2-3 with other reactor coolant pressure boundary piping. They are included on page 3.1-67 with piping and fittings <4”NPS. Plant specific note 104 identifies the applicability of this aging management review result to the leak detection line.

288 **Category** Open

Request 3.1.1-25-P-01
Please clarify the basis for omitting the jet pump sensing lines from Table 3.1.2-2

Response The jet pump sensing lines do not appear in Table 3.1.2-2 (Reactor Vessel Internals Summary of Aging Management Evaluation) because the jet pump sensing lines inside the vessel are not subject to aging management review. These lines are not required to maintain pressure boundary and hence have no license renewal intended function. The jet pump sensing lines outside the vessel are included with the piping <4" in Table 3.1.2-3.

289 **Category** Closed

Request 3.1.1-40-P-02
On page 3.1-41, for the stainless incore housings, please confirm that the correct GALL item is referenced.

Response Many NUREG-1801, Volume 2 items are very similar in terms of materials, environment, aging effect and aging management program. Where a NUREG-1801 item lists the same component, the choice is straightforward. Where NUREG-1801 does not match the specific component, the selection of the item to compare to the aging management review results is somewhat arbitrary. In this case, the components were considered a subset of the reactor vessel (hence the listing within the reactor vessel table) and the comparison was made to the cracking item within the NUREG-1801 BWR reactor vessel table that best (subjectively) represented the incore housings.

290 **Category** Closed

Request 3.1.1-41-P-02
On page 3.1-41 and 3.1-43, the GALL items referenced in this AMR are for stainless steel and nickel-based alloy components that may be subject to SCC. It does not appear to be appropriate for low-alloy steel. Is there a more suitable GALL item?

Response The material for these components is identified as low allow steel with stainless steel cladding. The material exposed to the internal environment of reactor coolant (treated water) is the stainless steel cladding. When evaluating surface aging effects such as cracking and loss of material, the stainless steel cladding is the material that must match the NUREG-1801 item. NUREG-1801 item IV.A1-1 provides the best match for the material, environment and aging effect combination within the BWR reactor vessel table.

The applicable material for the external environment (air) is low alloy steel (or “steel” in NUREG-1801 terms).

291 **Category** Accepted

Request 3.1.1-41-P-04
On page 3.1-52, the component type 'thermal sleeves, feedwater inlets (N4)' is managed using inservice inspection and water chemistry control - BWR. How are the thermal sleeves to be inspected?

Response The feedwater nozzle thermal sleeves are in Table 3.1.2-1 with an intended function of pressure boundary. Cracking of the thermal sleeves is managed by Inservice Inspection and Water Chemistry Control – BWR.

Further review of the thermal sleeve design (to determine exactly how ISI inspects them) determined that the VY sleeves are not welded in place, rather they are an interference fit. As such, there is no weld to the pressure boundary piping that can be examined by ISI.

Given that there is no pressure boundary weld, these sleeves are not part of the pressure boundary. As such they have no intended function for License Renewal, and with no intended function they are not subject to aging management review1. Therefore, Vermont Yankee will amend the License Renewal Application to indicate that the feedwater thermal sleeves are not subject to aging management review.

1 The feedwater thermal sleeves have no non-safety affecting safety related (a2) function. They are completely contained within the feedwater piping and cannot spray or leak on other equipment. The feedwater thermal sleeves are a part of the feedwater piping inside the vessel, and failure of that piping does not defeat the delivery of water to the vessel annulus, as any leakage also goes to the vessel annulus.

292 **Category** Closed

Request 3.1.1-51-P-01
On page 3.1-60, the CASS jet pump castings exposed to treated water are managed. Please confirm that GALL item IV.B1-11 applies, and whether there is a cast orificed fuel support or CRD component that is also managed this way.

Response Same question on #217.

293 **Category** Accepted

Request 3.3.1-32-K-01
Beginning on page 3.3-94, many component types are managed using the diesel fuel monitoring program. Please confirm that the VYNPS Diesel Fuel Monitoring AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M30, "Fuel Oil Chemistry."

Response As stated in LRA Section 3.2.2.9, loss of material due to general, pitting, crevice, and MIC for carbon steel piping and components exposed to fuel oil is managed by the Diesel Fuel Monitoring Program. This program includes sampling and monitoring of fuel oil quality to ensure levels of water, particulates, and sediment remain within the specified limits. Maintaining parameters within limits ensures that significant loss of material will not occur. Ultrasonic inspection of storage tank bottoms where water and contaminants accumulate will be performed to confirm the effectiveness of the Diesel Fuel Monitoring Program. As stated in LRA Section B.1.9, the Diesel Fuel Monitoring Program is consistent with the program described in NUREG-1801, Section XI.M3, Fuel Oil Chemistry Program, with minor exceptions.

The Diesel Fuel Monitoring Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. The Diesel Fuel Monitoring Program includes periodic cleaning, visual inspection, and ultrasonic inspection of storage tank bottoms where water and contaminants accumulate to confirm the effectiveness of the oil quality monitoring activities to preserve an environment that is not conducive to corrosion.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

294 **Category** Accepted

Request 3.3.1-33-K-01
Beginning on page 3.3-71, several component types in a lube oil environment are managed using the VYNPS oil analysis program. Please confirm that the VYNPS Oil Analysis AMP is consistent with GALL XI.M32, "One-Time Inspection," as well as with XI.M39, "Lubricating Oil Analysis." See 3.3.1-14-K-01

Response As stated in LRA Section 3.2.2.7, steel piping and components in auxiliary systems at VYNPS that are exposed to lubricating oil are managed by the Oil Analysis Program, which includes periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. As stated in LRA Section B.1.20, the Oil Analysis Program is consistent with the program described in NUREG-1801, Section XI.M39, Lubricating Oil Analysis, with a minor exception.

The Oil Analysis Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. Metals are not corroded by the hydrocarbon components of lubricants. Lubricating oils are not good electrolytes and the oil film on the wetted surfaces of components tends to minimize the potential for corrosion. Corrosion in lube oil systems only occurs as the result of the presence of impurities or moisture. Therefore, an effective oil analysis program, which maintains impurities and moisture below specified limits, precludes the need for one-time inspections. Operating experience at VYNPS has confirmed the effectiveness of the Oil Analysis Program in maintaining moisture and impurities within limits such that corrosion has not and will not affect the intended functions of these components.

In numerous past precedents (including NUREG-1828, Arkansas Nuclear One Unit 2 SER, Section 3.0.3.3.6, and NUREG-1831, Donald C. Cook SER, Section 3.0.3.3.8), the staff concluded that an effective oil analysis program, which maintains impurities and moisture below specified limits, is sufficient to demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

295 **Category** Accepted

Request 3.3.1-38-K-01
Beginning on page 3.3-138, SCC of many stainless steel components exposed to reactor coolant above 140F is managed by the water chemistry - BWR program. Provide documentation that demonstrates that these are outside the scope of the BWR SCC program. Also, please clarify how the effectiveness of the AMP will be verified. (Since some of these components are <NPS 4, the review team understands that they are outside the scope of the BWR SCC program. However, it is not clear whether OTI for small-bore piping will be used or the OTI included in the VYNPS water chemistry programs.

Response LRA Table 3.3.2-11 includes stainless steel post-accident sampling system (PASS) sample line tubing and valves that are exposed to treated water or steam from the reactor coolant system on internal surfaces. The components are less than 4" NPS and are outside the Class I reactor coolant system (RCS) pressure boundary. They are, therefore, outside the scope of the BWR SCC program. Aging of the PASS sample line tubing and valves is managed by the Water Chemistry Control – BWR Program, which is verified by the One-Time Inspection Program. To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs. However, inspections performed under the small-bore piping activity, which applies to components within the Class-I RCS pressure boundary, will also provide data useful for evaluating the condition of these downstream components.

296 **Category** Closed

Request 3.3.1-40-K-01
On page 3.3-97, a carbon steel tank is addressed. Please describe how the system walkdown program will satisfy the recommendations of GALL AMP XI.M29, "Aboveground Steel Tanks."

Response The tanks described on page 3.3-97 are diesel fuel oil tanks with external protective coatings.

The attributes in GALL AMP XI.M29, "Aboveground Steel Tanks" include preventive measures to mitigate corrosion by protecting the external surface of steel tanks with paint or coatings in accordance with standard industry practice. This program relies on periodic system walkdowns to monitor degradation of the protective paint or coating. This program also monitors corrosion at inaccessible locations such as the tank bottom by thickness measurement.

The System Walkdown Program provides the preventive measures to protect the external accessible surfaces by visual inspection of carbon steel tanks to identify degradation of coatings, sealants, and caulking plus indications of leakage. Readily accessible tank surfaces are inspected at least once per refueling cycle and are normally performed more frequently.

Corrosion at inaccessible locations of the tank is addressed by thickness measurements conducted as part of the Diesel Fuel Monitoring Program. This program applies to the concrete (ext) environment for the tank bottom as shown on page 3.3-97.

Protective coatings on accessible external surfaces are repaired as part of the corrective action process following periodic inspection. Corrective action is taken as necessary on the tank bottom should minimum wall requirements not be maintained.

These combined actions satisfy the requirements of the GALL AMP XI.M29, "Aboveground Steel Tanks".

297 **Category** Accepted

Request 3.3.1-47-K-01
Beginning on page 3.3-72, gray cast iron and carbon steel exposed to treated water is managed using the WC-CCW program. GALL recommends performance monitoring to confirm the effectiveness of the CCCW program. Please identify an acceptable alternative method that will be used to verify the effectiveness of the WC - CCW program.

Response The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, "One-Time Inspection."

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2's) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

298 **Category** Accepted

Request 3.3.1-58-K-01
On page 3.3-121, loss of material from external surfaces of a tank is managed using the system walkdown program instead of the fire protection program. Since the tank in question is in the FP system, please confirm that the FP AMP does not manage this aging effect.

Response This tank is in the CO2 system. The system walkdown program was selected since it is the program that is the most used for managing external aging effects of components in almost all systems similar to the External Surfaces Monitoring Program in GALL. Inspections in this program must be performed at least once per refueling. The GALL AMP XI.M26, Fire Protection requires visual inspection once every six months for CO2 system components where the system walkdown frequency is once each refueling cycle. Since aging effects for this tank external surface in indoor air would be manifested over several years, it was determined that this variation in inspection frequency is not significant such that system walkdown was still appropriate. However, per license renewal commitment 30, VYNPS will perform CO2 system walkdowns every six months starting no later than the beginning of the period of extended operation.

299 **Category** Closed

Request 3.3.1-68-K-01
On page 3.3-194, loss of material from carbon steel components is managed using PS&PM. Please explain the intended function (pressure boundary) of the instrument air system and how it relates to the a(2) category to which the system has been assigned. Also, please explain how this GALL v2 item was chosen, since it invokes a fire protection AMP.

Response For components included for (a)(2) the pressure boundary function is two fold. The first is the pressure boundary of the passive component that ensures that the component cannot spatially interact through spray or leakage onto a safety related components. The second applies for non-safety components connected to safety related components where the non-safety components provide structural support for the safety related such that loss of pressure boundary would be indicative of structural integrity. For the carbon steel components containing untreated water that are managed by PSPM the pressure boundary function is only for preventing spray or leakage.
The instrument air system is an auxiliary system. This GALL item was chosen because in chapter VII for Auxiliary systems it was the best match for a material, environment, aging effect combination. A note E was selected since a different program than Fire Protection was invoked.

300 **Category** Open

Request 3.3.1-68-K-02
On page 3.3-213, loss of material from carbon steel components is managed using OTI. Please explain how this GALL v2 item was chosen, and justify the use of OTI for carbon steel exposed to raw water as opposed to a periodic inspection.

Response The environment for these components is untreated water from the radwaste system which is defined in table 3.0-1 of the LRA as water that was originally treated but now may contain contaminants. Carbon steel in treated water is not expected to experience any significant aging effects. As a result this untreated water environment is not expected to result in significant aging such as loss of material, however a one time inspection will be performed to confirm the absence of significant aging effects. If significant aging is found to be occurring the corrective action program will determine the need for future inspections including a periodic inspection or possible replacement.
This GALL line item was chosen since the radwaste system is an auxiliary system in GALL chapter VII. For the material, environment, and aging effect combination of this item, (where untreated water is equivalent to raw water) this line item was the most appropriate. A note E was selected since a different program was used.

301 **Category** Open

Request 3.3.1-68-K-03
Beginning on page 3.3-206, loss of material from carbon steel components is managed using OTI. Please justify the use of OTI for carbon steel exposed to raw water as opposed to a periodic inspection.

Response The components in question are in the potable water system. Potable water, though not treated in accordance with a GALL program such as water chemistry, is treated to an extent before used at the site such that it is acceptable for human consumption. However, since it is not monitored by the site it was identified as untreated water which is defined in table 3.0-1 of the LRA as water that was originally treated but now may contain contaminants. Carbon steel in treated water is not expected to experience any significant aging effects. As a result this untreated water environment is not expected to result in significant aging such as loss of material which could impact the intended function of the component. However a one time inspection will be performed to confirm the absence of significant aging effects. If significant aging is found to be occurring the corrective action program will determine the need for future inspections including a periodic inspection or possible replacement.

302 **Category** Open

Request 3.3.1-69-K-01
On page 3.3-104, loss of material from stainless steel components is managed using FP. Please explain why the filter and filter housing are managed with the fire protection program instead of the fire water system program.

Response The stainless steel filters and filter housings exposed to raw water on page 3.3-106 are filters that support the operation of the diesel fire pump by filtering the cooling source to the engine. The Fire Protection Program performs tests and inspections of the diesel engine and its support components and is therefore credited for management of these components.

303 **Category** Closed

Request 3.3.1-70-K-01
Beginning on page 3.3-106, loss of material from copper alloy components in raw water is managed using FP. Please explain why these components are managed with the fire protection program instead of the fire water system program.

Response The tubing exposed to raw water on page 3.3-106 supports the operation of the diesel fire pump by supplying the cooling water source to diesel engine. The Fire Protection Program performs tests and inspections of the diesel engine and its support components and therefore is credited for management of these components.

304 **Category** Open

Request 3.3.1-70-K-02
On page 3.3-213, loss of material from copper alloy components in raw water is managed using OTI. Please explain the basis for applying an OTI program instead of the fire water system program.

Response The environment for these components is untreated water from the radwaste system which is defined in table 3.0-1 of the LRA as water that was originally treated but now may contain contaminants. Since this component is not in the fire protection system the use of the fire protection program is not appropriate. Copper alloy in treated water is not expected to experience any significant aging effects. Because this untreated water began as treated water it is also not expected to result in significant aging such as loss of material which could impact the intended function of the component. However a one time inspection was chosen to confirm the absence of significant aging effects. If significant aging is found to be occurring the corrective action program will determine the need for future inspections including a periodic inspection or possible replacement.

305 **Category** Open

Request 3.3.1-83-K-01
On page 3.3-107, fouling of copper alloy heat exchanger tubes in raw water is managed using FP, where GALL suggests OCCW. Please identify the specific heat exchanger to which this AMR applies, and the basis for the choice of AMP.

Response The heat exchangers represented are the fire pump diesel jacket water heat exchanger and the gear box oil cooler. Both heat exchangers use water from the fire water system (raw water) for cooling. The Fire Protection Program performs tests and inspections of the diesel engine. Since these heat exchangers are part of the fire diesel it is appropriate to manage fouling with the Fire Protection Program which tests the engine and its auxiliaries.

306 **Category** Closed

Request 3.3.2-04-01-K-01
On page 3.3-78, fouling of aluminum heat exchanger fins in air is managed using PSM. Please provide the procedure under which fouling is monitored.

Response These fins are part of the emergency diesel generator air coolers that are reviewed in VY-AMRM-13. The diesel generators are tested periodically in procedure OP 4126 “Diesel Generators Surveillance”. This is an extensive test procedure that includes verification of local diesel operating conditions including the intercooler air temperature during diesel operation. The monitoring of this temperature within temperature limits confirms the proper operation of the intercooler which provides the indication that fouling that can impact the diesel performing its intended function is not occurring. The data is recorded in the Diesel Generator Operating Data” at the end of OP4126 and page 1 of 6 has the intercooler air temperature with normal range and acceptance criteria shown.

307 **Category** Closed

Request 3.3.2-04-03-K-01
On page 3.3-79, fouling of copper exchanger tubes in air is managed using PSM. Please provide the procedure under which fouling is monitored.

Response These tubes are part of the emergency diesel generator air coolers that are reviewed in VY-AMRM-13. The diesel generators are tested periodically in procedure OP 4126 “Diesel Generators Surveillance”. This is an extensive test procedure that includes verification of local diesel operating conditions including the intercooler air temperature during diesel operation. The monitoring of this temperature within temperature limits confirms the proper operation of the intercooler which provides the indication that fouling that can impact the diesel performing its intended function is not occurring.

308 **Category** Open

Request B.1.16-P-02
GALL recommends an AMP that is consistent with GALL AMP XI.M24, "Compressed Air Monitoring." VYNPS uses a plant specific AMP, B.1.16, Instrument Air Monitoring Program," which does not include the pressure testing that is suggested by the GALL AMP. What program will be used to perform pressure testing of the instrument air system?

Response NUREG-1801, Section XI.M24, “Compressed Air Monitoring,” states, “The American Society of Mechanical Engineers operations and maintenance standards and guides (ASME OM-S/G-1998, Part 17) provides additional guidance to the maintenance of the instrument air system by offering recommended test methods, test intervals, parameters to be measured and evaluated, acceptance criteria, corrective actions, and records requirements.” It further states that, “Guidelines in EPRI NP-7079, EPRI TR-108147, and ASME OM-S/G-1998, Part 17, ensure timely detection of degradation of the compressed air system function.”

ASME OM-S/G-1998, “Standards and Guides for Operation and Maintenance of Nuclear Power Plants,” (hereafter called ASME OM) establishes testing requirements to assess the operational readiness of safety-related pumps and valves which are required to shutdown the reactor to the safe shutdown condition, maintain the reactor in the safe shutdown condition, or mitigate the consequences of an accident. VYNPS, through its Inservice Testing, performs operability testing of instrument air system valves in accordance with ASME OM and plant technical specifications. For relief valves, the testing includes visual examination, seat tightness determination, and set pressure determination. For other valves, stroke testing is performed.

This inservice valve testing determines the condition of valve internals and does not address the ability of the valve body to maintain system pressure boundary. This testing, while necessary to ensure system function, is not necessary to manage the effects of aging on long-lived, passive instrument air system components. Therefore, the Inservice Testing has not been included as part of the Instrument Air Quality aging management program.

309 **Category** Open

Request 3.1.1-01-P-02
Generic Question 1: VY LRA identified that cracking fatigue credits TLAA – metal fatigue for almost all the components in RCS (Section 3.1). In Appendix C, BWRVIP applicant's action items (AAIs) identified that there is no plant-specific TLAAs. Please clarify the difference between AMR and AAIs.

Note: This question applied to all Sections (3.1 thru 3.6). If TLAA was credited in the LRA, the TLAA analysis should be available to support the AMR.

Response Under Entergy's approach, the Section 3 table entries listing Cracking-fatigue with TLAA – metal fatigue only indicate that the component meets the screening criteria (temperature) for fatigue, and should be reviewed to determine the existence of TLAA (metal fatigue analyses). That review is documented in Section 4 of the LRA.

Based on requirements of the license renewal rule, Section 4 includes discussion of only those entries that concluded there were associated TLAA. This resulted in numerous "TLAA – metal fatigue entries in Section 3 with no corresponding discussion in Section 4.

310 **Category** Accepted

Request B.3.2.2-H1-01
In LRA Table 3.2.2-1 on page 3.2-34, the applicant proposed to manage the loss of material of carbon steel, in a treated water environment, using Water Chemistry Control - BWR Program. NUREG-1801 recommends the Water Chemistry Control - BWR along with a One-Time Inspection Program. The staff request the applicant provide justification for only using the Water Chemistry Control - BWR Program.

Response As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, "One-Time Inspection."

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2's) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification of the Water Chemistry Control - Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control - Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

311 **Category** Closed

Request B.3.2.2-H1-02
In LRA Table 3.2.2-1 on page 3.2-33, the applicant proposed using the Water Chemistry Control - BWR Program to manage cracking in treated water environment. Please give justification why the Aging Management Program credited is not in accordance with the NUREG-1801 recommended program.

Response The component in question is assumed to be the cyclone separator with an aging effect of cracking that credits GALL line item V.D2-29. The GALL line item chosen for this component specifies the BWR SCC program in addition to Water Chemistry. The BWR SCC program is applicable to all BWR piping and piping welds made of austenitic SS and nickel alloy that is 4 in. or larger in nominal diameter and contains reactor coolant at a temperature above 93°C (200°F) during power operation, regardless of code classification. The components included in this line item are less than 4" NPS and are outside the reactor coolant system (RCS) pressure boundary. They are, therefore, outside the scope of the BWR SCC program. As a result the Water Chemistry Control – BWR program is used alone. As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

312 **Category** Accepted

Request B.3.2.2-H1-03
In LRA Table 3.2.2-1 on page 3.2-34, the applicant proposed to manage the loss of material of gray cast iron, in a treated water environment, using Water Chemistry Control - Closed Cooling Water Program. The applicant states the program is consistent with NUREG-1801 with one exception, there is not performance and functional testing. The staff request the applicant provide justification on why the Water Chemistry Control - Closed Cooling Water Program is used for this

Response As stated in LRA Section B.1.20.3, passive intended functions of pumps, heat exchangers and other components will be adequately managed by the Water Chemistry Control - Closed Cooling Water Program through monitoring and control of water chemistry parameters. Control of water chemistry ensures that loss of material will not occur in gray cast iron components in a treated water environment. Also the one-time inspection program described in LRA Section B.1.21 includes inspections to verify the effectiveness of all the water chemistry control aging management programs by confirming that unacceptable cracking, loss of material, and fouling is not occurring. In most cases, functional and performance testing verifies that component active functions can be accomplished and as such would be included as part of Maintenance Rule (10CFR50.65). Passive intended functions of pumps, heat exchangers and other components will be adequately managed by the closed cooling water chemistry program through monitoring and control of water chemistry parameters. The use of the Water Chemistry Control - Closed Cooling Water and One time inspection programs are effective programs to manage loss of material for gray cast iron in a treated water environment.

To provide further clarification of the Water Chemistry Control - Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control - Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

313 **Category** Accepted

Request B.3.2.2-H1-04
In Section 3.2 of the LRA the applicant uses Water Chemistry Control - Closed Cooling Water Program as an Aging Management Program. The program is stated to be consistent with NUREG-1801 Closed Cycle-Cooling Water System with one exception. Please provide justification why the Water Chemistry Control - Closed Cooling Water Program is used without the recommended testing and inspection to monitor the effects of corrosion and SCC on the intended function of

Response To provide further clarification of the Water Chemistry Control - Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control - Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

314 **Category** Closed

Request B.3.2.2-H1-05
In Table 3.2 in Section 3.2 of the LRA the applicant uses Water Chemistry Control - BWR Program to manage the aging effect of cracking on stainless steel material. NUREG-1801 recommends Water Chemistry and BWR Stress Corrosion Cracking Program. Please provide justification why the applicant is not in accordance with the recommended NUREG-1801.

Response It cannot be determined exactly which line items are referred to but the BWR SCC program is applicable to all BWR piping and piping welds made of austenitic SS and nickel alloy that is 4 in. or larger in nominal diameter and contains reactor coolant at a temperature above 93°C (200°F) during power operation, regardless of code classification. The piping components included in section 3.2 with temperatures above 200 this line item are less than 4" NPS and are outside the reactor coolant system (RCS) pressure boundary. They are, therefore, outside the scope of the BWR SCC program. As a result the Water Chemistry Control – BWR program is used alone. As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring.

315 **Category** Open

Request B.3.2.2-H1-06
In Table 3.2.2-4 in Section 3.2 of the LRA, the applicant uses Oil Analysis Program to manage carbon steel in a lube oil environment with loss of material as the aging effect. Please provide justification to the staff why the Table 2 line items do not have an inspection program to evaluate detection of aging effects as recommended by NUREG-1801.

Response As stated in LRA Section 3.2.2.7, steel piping and components in auxiliary systems at VYNPS that are exposed to lubricating oil are managed by the Oil Analysis Program, which includes periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. As stated in LRA Section B.1.20, the Oil Analysis Program is consistent with the program described in NUREG-1801, Section XI.M39, Lubricating Oil Analysis, with a minor exception.

The Oil Analysis Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. Metals are not corroded by the hydrocarbon components of lubricants. Lubricating oils are not good electrolytes and the oil film on the wetted surfaces of components tend to minimize the potential for corrosion. Corrosion in lube oil systems only occurs as the result of the presence of impurities or moisture. Therefore, an effective oil analysis program, which maintains impurities and moisture below specified limits, precludes the need for one-time inspections. Operating experience at VYNPS has confirmed the effectiveness of the Oil Analysis Program in maintaining moisture and impurities within limits such that corrosion has not and will not affect the intended functions of these components.

In numerous past precedents (including NUREG-1828, Arkansas Nuclear One Unit 2 SER, Section 3.0.3.3.6, and NUREG-1831, Donald C. Cook SER, Section 3.0.3.3.8), the staff concluded that an effective oil analysis program, which maintains impurities and moisture below specified limits, is sufficient to demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires and amendment to the LRA.

316 **Category** Closed

Request When Entergy Vermont Yankee (ENVY) goes to the period of extended operation, how will ENVY analyze and evaluate the equipment in the Electrical Equipment Qualification (EQ) program for 60 years per 10 CFR 54.21? Include in the response that the environmental conditions (both ambient and accident) resulting from EPU will be used as the bases for the analysis and evaluation going forward. Also confirm that the approach described in the response to this question is consistent with the ENVY LRA.

Response VYNPS will continue to use the analysis and evaluation techniques described in 10 CFR 50.49 and IEEE 323. The equipment in the EQ program is both active and passive. The EQ program documentation has recently been updated to reflect the normal and accident environments under EPU conditions. The program considers equipment degradation from EPU radiation dose, normal and accident (LOCA, HELB) temperatures as well as cycling, pressure, humidity, etc.
For the period of extended operation, the EQ program requires VYNPS to update the EQ documentation to reflect the additional service life. The environmental conditions (both ambient and accident) resulting from EPU are the basis for evaluations and analysis going forward.
This is consistent with the description of the EQ program in the VYNPS LRA.

317 **Category** Open

Request LRA-4.6 Torus Piping

a. Is VY bounded by MPR 751, Please provide a statement indicating that the estimate of the total number of 60 year SRV actuations used in the design fatigue analysis remains valid and conservative, based on the actual SRV actuations counted through 2005.

b. Is VY still bounded by MPR 751 after power uprate

Response A) Per the MPR 751 excerpt provided below, all domestic Mark 1 BWRs appear to meet MPR 751 for both current operating and license renewal terms. It should be noted that VY-SRV operation has been very low and therefore SRV valve cycling and related attached piping has been very low. VY has not had a leaking SRV's since the early 1980's. VY only functionally tests its SUVs once per cycle during reactor shutdown. Based on discussions with Operations, VY has had two SRV actuations events of note e.g.:
- Loss of Normal Power Event (1990).
- Loss of Switchyard Insulator Event (2005).

VY replaces all of its 4 installed SRVs every refueling cycle with readied spares. This refurbishment strategy has ensured that inadvertent SRV operation has been minimized.

MPR-751 - Results and Conclusions Relevant to SRV piping (To NRC by GE letter MFN—l87—82 dated 11/30/82).

3.0 RESULTS AND CONCLUSIONS

This section contains the results of the fatigue evaluations performed on over 30 torus piping systems. These systems were selected by each A/E as representative of the most highly stressed torus piping systems in their respective plants. Thirty percent of these were SRV discharge lines and the remainder were lines attached to the torus with sizes ranging from 2-inch to 24-inch. All torus piping systems had a fatigue usage less than 0.5. The fatigue evaluation results, which are tabulated in Table 3-1, are summarized as follows:

SRV Discharge Piping:
Percent less than 0.3 fatigue usage —— 72.7%
Percent less than 0.5 fatigue usage —— 100%

A very conservative methodology has been developed for fatigue analysis of Mark I Class 2 piping. The fact that the calculated fatigue usage factors are low coupled with the very conservative approach used to develop the fatigue analysis methodology shows that fatigue is not a concern for attached piping. Thus this report answers the concern expressed by the NRC regarding the effect of cyclic mechanical loads on fatigue. Accordingly, there is no need for a complete evaluation of torus piping fatigue on a plant-unique basis.

B) Yes. There are no significant changes in the function or performance of the SRVs for EPU conditions. The SRV sizes, Rx dome pressure, SRV set points remain the same as for original licensed power. Also, chocked flow conditions at the exit of the SRVs limits any significant increase in flow for the SRV discharge piping. Reference VY-RPT-05-00087, Rev.0. EPU Task Report for ER 04-1409.

318 **Category** Accepted

Request The CUF values in LRA Table 4.3-1 that are based on NUREG CR 6260 are not applicable to VY and need to be removed and the issue addressed.

Please clarify the commitment made to perform a fatigue re-analysis to be used to address environmental impact. The re-analysis needs to be made to a single code date.

Response LRA table 4.3-1 will be amended to remove the NUREG/CR-6260 values. Entries will be removed for core spray safe end, feedwater piping, RHR return piping, and RR piping tee.

VYNPS will perform a fatigue analysis that addresses the effects of reactor coolant environment on fatigue. The reanalysis will be done to an NRC-approved version (year) of the ASME code.

Commitment 27 will be revised to indicate due date of 2 years prior to the period of extended operation and to include reference to performing the analysis to an NRC-approved version of the ASME code.

This requires an amendment to the LRA.

319 **Category** Accepted

Request LRA Page 4.3-3 and 4 -

A) Discuss how VY developed the condensed list of transients provided in Table 4.3-2 from the complete list in the design spec. Also provide a copy of the design-spec(s) with the complete list of transients for NRC review.

B) LRA Pg 4.3-4 Modify the statement on the bottom of Pg 4.3-4 that the TLAA remains valid except for exceptions where CUF including EAF for 60 years exceed 1.0. Please discuss the exceptions.

Response A) The condensed list of transients in Table 4.3-2 was developed to simplify cycle tracking by the plant operations staff. The basis for reducing the number of transients tracked is contained in Calculations VYC-378 Rev.0 and Rev.1. Attachment 1 of VYC-378 Rev.1 is titled "Recommendations for Tracking/Limiting Reactor Transient Events for Vermont Yankee Nuclear Power Station, November 13,1987. The complete list of design transients is contained in Attachment 1 pgs 24 to 27 and 31 to 32. Copies of VYC-378 Rev.0 and Rev.1 were provided for review.

The updated Reactor Vessel Specification for Extended Power Uprate is GE Specification No. 26A6019 Rev.1 dated 6/2/2003. It is supplemented by the original GE Reactor Vessel Design Specification No. 21A1115 Rev.4 issued 10/21//69.
Copies of both specifications were provided for review.

B) The last paragraph of Section 4.3.1.1 will be clarified as follows.

The VYNPS Fatigue Monitoring Program will assure that the allowed number of transient cycles is not exceeded. The program requires corrective action if transient cycle limits are approached. Consequently, the TLAA (fatigue analyses) based on those transients will remain valid for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(i). However, when the effects of reactor coolant environment on fatigue are added to the existing fatigue analyses, several locations have a projected cumulative usage factor in excess of 1.0. See section 4.3.3 for further discussion of the effects of reactor water environment on fatigue.

This requires an amendment to the LRA.

320 **Category** Accepted

Request LRA Page 4.3-5

Ensure that Reference 4.3-1 is correct. If not, provide the correct reference.

Response The correct reference is letter BVY96-96, not 96-48. The originator, addressee, title and date were correct, only the letter number was wrong. The following is the correct citation for Reference 4.3-1.

4.3-1 Sojka, R. E. (VYNPS), to USNRC Document Control Desk, "Response to Request for Additional Information Regarding Vermont Yankee Core Shroud Modification," BVY 96- 96, letter dated August 7, 1996.

This requires an amendment to the LRA.

321 **Category** Accepted

Request LRA Section 4.3.1.2 - Reconcile/revise the discrepancy in Section 3 tables and Section 4.0 on whether a plant-specific analysis is performed.

Response

322 **Category** Accepted

Request LRA Section 4.3.1.3 - Table 4.3-1 stated that piping that no plant specific fatigue analysis was found/performed for RHR to RR Tee. However, Section 4.3.1.3 says that such analysis was performed. Please resolve this discrepancy.

Response The statement in Section 4.3.1.3 was taken from GE calculations 23A5569 (RR Loop A Stress Analysis) and 23A5570 (RR Loop B Stress Analysis). Upon review of the RR piping replacement project records, no such fatigue analyses were located. The statement was made as part of the GE template for these calculations as many plants were replacing the RR piping to the ASME Section III code. VYNPS replaced their piping to the original B31.1 code rather than ASME Section III and no plant specific analysis was performed for VYNPS. Unfortunately the statement was not deleted from the report and the statement was then quoted in the LR application. This requires an amendment to the LRA to achieve consistency between Section 4.3.1.3 and Table 4.3-1.

Section 4.3.1.3 should read as follows.
"VYNPS replaced reactor recirculation (RR) system piping in 1986. Also replaced were connecting portions of the residual heat removal (RHR) system piping. The new piping was designed and analyzed to ANSI B31.1 but was inspected and tested to ASME Section III requirements. Stress analyses for the reactor recirculation system were performed to B31.1 requirements. These analyses were not based on any time-limited assumptions and as such are not TLAA.

This requires an amendment to the LRA.

323 **Category** Open

Request Does VYNPS plan to perform Environmentally Assisted Fatigue (EAF) on plant specific locations or NUREG 6260 locations?

Does the revised FW nozzle analysis (Table 4.3-3) include high cycle fatigue? If not, please explain why.

Response VY plans to review the NUREG-6260 locations versus the VY plant configuration, and confirm whether the NUREG-6260 locations represent the limiting locations for VY. VY will then calculate Environmentally Assisted Fatigue (EAF) Cumulative Usage Factors (CUFs) for the plant-specific limiting locations.

The revised FW nozzle analysis does not include high cycle fatigue. The high cycle fatigue attributable to leakage around the thermal sleeve is a rapid cycling that by its very nature affects only the surface of the nozzle, not the volume of the nozzle. Consequently, VYNPS manages this aging by monitoring rapid thermal cycles and periodically inspecting to assure cracking has not initiated. The calculation of CUF is used to monitor the full wall of the nozzle and is unaffected by the rapid surface cycling. **(Reference Letter D.H. Dorman (USNRC) to D.A Reid (VYNPC), Subject: Evaluation of Request for Relief from NUREG-0619 for VYNPS dated 2/6/95, (TAC No. M88803).**

324 **Category** Closed

Request GE Spec - Clarify how code case N-415 on alternate rules for pressure relief devices relates to fatigue evaluation described in the final T0302 Vessel Integrity Report.

Response The reference in T0302 is not to an ASME Code Case; it is to paragraph N-415 of Section III of the 1965 version of the code. Section N-415 is titled "Analysis of Cyclic Operation" and is applicable as referenced.

325 **Category** Closed

Request GE Spec - Provide for review only, proprietary versions of
NEDC-32424P-A (Reference 1.1)
NEDC-32523P-A (Reference 1.2)

Response Copies of these reports have been provided.

326 **Category** Closed

Request Please provide the fatigue analysis as referenced in the EPU-FSAR:

- PUSAR Table 3.7

Response There is no reactor vessel internals fatigue analysis using the 1986 ASME Section III code as a guideline. The fatigue analysis listed in the PUSAR is Task 0303 and it references NEDC-32424P-A and NEDC-32523P-A; copies of these analyses were provided in response to question 325.

327 **Category** Open

Request Do you have any plans to use "Fatigue-Pro" other than for cycle counting? If so, explain and supplement application as appropriate.

Response Current plans for implementing FatiguePro at VY are to use Stress Based Fatigue (SBF) monitoring for the Feedwater Nozzles. Automated or manual cycle counting (CBF) are planned for the remaining components. Components identified for automated CBF were selected using the following criteria; components with a design basis usage factor greater 0.40 for 40 yrs, Emergency Core Cooling System (ECCS) components, or where field experience suggests that a fatigue concern exists.

The transient data acquisition capabilities in FatiguePro may be used for future development of SBF models and/or operational transient cycle counting for components as required to address operational changes and/or environmentally assisted fatigue concerns.

328 **Category** Accepted

Request B.1.13-M-01
The staff has discovered, as a result of previous discussions with the applicant, that the VY FAC program calculations are very specific in terms of calculations, as compared to other wall thickness applicants that we have reviewed. Please provide us with a couple of examples of these calculations.

Response Provided RFO 25 (Fall 2005) large bore inspection report evaluations for inspection nos. 2005 -01, 2005-02, 2005-09, 2005-10,2005-36, and 2005-37: and small bore evaluations 05-SB02 and 05_SB03. Also provided a copy of RFO outage inspection report VY-RPT-06-000002 Rev.0.

329 **Category** Accepted

Request B.113-M-02
The staff has also noted in their review of the LRA, that the VYNPS program operational experience appears to be above average in discovery and identification of FAC-related issues. Please provide us with a couple of examples of piping FAC discovery using the present program.

Response Provided scoping / planning worksheets for both RFO 25 and RFO 26. These list FAC industry OE evaluation for VYNPS.

330 **Category** Accepted

Request 3.1.1-19-P-03
How does Vermont Yankee do volumetric examinations of small bore piping socket welds?

Response

331 **Category** Accepted

Request 3.2.2-H1.07
In Table3.2.2-1 of Section 3.2 in the LRA System Walkdown Program is used to manage loss of material in the bolting components. Please provide justification why System Walkdown Program instead of NUREG-1801 is recommended Bolting Integrity Program.

Response The System Walkdown Program is used to manage loss of material in bolting through the use of visual inspections that are performed at least once per refueling cycle. The GALL Bolting Integrity Program XI.M18 also credits the system walkdown program for the detection of leakage in bolted joints which could lead to loss of material but does not specify an inspection frequency. The application of the System Walkdown program to manage loss of material is therefore consistent with the GALL XI.M18 program.

In addition, a Bolting Integrity Program is in development that will address the aging management of bolting in the scope of license renewal. The Bolting Integrity Program will be implemented prior to the period of extended operation in accordance with commitment number 34.

332 **Category** Closed

Request 3.2.2-H1-08
In Table 3.2.2-1 on Page 3.2-35 of the LRA, can the applicant provide justification why Service Water Integrity Program is used to manage cracking in stainless steel raw water environment? The scope of the program does not include cracking as a managed effect. What controlled techniques will be used to manage

Response The component in question is the heat exchanger tubes in the RHR heat exchanger. These tubes are cooled by service water and can be exposed to temperatures above the threshold for stress corrosion cracking on the RHR side of the tubes. Since this heat exchanger is cooled by service water it is part of the Service Water Integrity program. In LRPD-02 section 4.20.B.1.b the scope of this program includes the aging effect of cracking. As described in section 4.20.B.4.b under Detection of Aging Effects, heat exchanger tubes are eddy current tested to detect the presence of cracking. The RHR heat exchanger tubes identified by this line item are periodically eddy current tested which would detect the presence of cracking.

333 **Category** Accepted

Request 3.2.2-H1-09
In Table 3.2's of the LRA, please justify the use of System Walkdown Program on bolting components with loss of material aging effect. The NUREG-1801 recommends Bolting Integrity Program please justify your position on these Section 3.2 line items.

Response The System Walkdown Program is used to manage loss of material in bolting through the use of visual inspections that are performed at least once per refueling cycle. The GALL Bolting Integrity Program XI.M18 also credits the system walkdown program for the detection of leakage in bolted joints which could lead to loss of material but does not specify an inspection frequency. The application of the System Walkdown program to manage loss of material is therefore consistent with the GALL XI.M18 program.

In addition, a Bolting Integrity Program is in development that will address the aging management of bolting in the scope of license renewal. The Bolting Integrity Program will be implemented prior to the period of extended operation in accordance with commitment number 34.

334 **Category** Closed

Request 3.3.1-37-K-01
Please provide documentation of the material(s) used in the RWCU system, including welds.

Response This item concerns materials susceptible to IGSCC that would have been the subject of Generic Letter 88-01. A copy of the VYNPS response to G.L. 88-01 was provided for review as were drawings of the RWCU system and the Piping specification. Based on the information in the response to G.L. 88-01, none of the piping in the RWCU system is susceptible to IGSCC. Therefore, the GALL BWR Reactor Water Cleanup System Program XI.M25 is not required for aging management.

335 **Category** Open

Request 3.3.1-61-W-1
In Table 3.5.2-6 on page 3.5-80 of the LRA for component Penetration sealant, material elastomer in a protected from weather environment; the aging effects are cracking and change in material properties. Two AMPs are shown, Fire Protection and Structures Monitoring. The referenced GALL line item is VII.G-1 and the Table 1 line item is 3.3.1-61. GALL line item VII.G-1 is for component Fire barrier penetration seals. In the LRA on page 3.3-49 for table 1 line item 3.3.1-61-W-1 There is this sentence in the discussion: Cracking and the change in material properties of elastomer seals are managed by the Fire Protection Program. Explain why this AMR line item is not split into two lines: (1) penetration sealant (fire) with AMP Fire Protection, GALL reference VII.G-1, Table 1 line item 3.3.1-61 and a note B as well as (2) penetration sealant (flood, radiation) with AMP Structures Monitoring, GALL reference III.A6-12, Table 1 line item 3.5.1-44 and a note C.

Response In Table 3.5.2-6 on Page 3.5-80 of the LRA, the aging effects for component Penetration sealant, material elastomer in a protected from weather environment are cracking and change in material properties. For clarification, this component line item will be separated into two line items as follows.

Delete line item:
Penetration sealant (fire, flood, radiation)
- EN, FB, FLB, PB, SNS
- Elastomer
- Protected from weather
- Cracking

Change in material properties
- Fire protection

Structures Monitoring
- III.A6-12 (TP-7)
- 3.5.1-44
- C

Add line items:
Penetration sealant (fire)
- EN, FB, PB, SNS
- Elastomer
- Protected from weather
- Cracking

Change in material properties
- Fire Protection
- VII.G-1(A-19)
- 3.3.1-61
- B

Penetration sealant (flood, radiation)
- EN, FLB, PB, SNS
- Elastomer
- Protected from weather
- Cracking Change in material properties
- Structures Monitoring
- III.A6-12 (TP-7)
- 3.5.1-44
- C

This will require an amendment to the LRA.

336 **Category** Open

Request 3.3.1-61-W-2
"In Table 3.5.2-6 on page 3.5-80 of the LRA for component Seismic isolation joint, material elastomers in a protected from weather environment; the aging effects are cracking and change in material properties. The AMP shown is Fire Protection. The referenced GALL line item is VII.G-1 and the Table 1 line item is 3.3.1-61. GALL line item VII.G-1 is for component Fire barrier penetration seals. In the LRA on page 3.3-49 for table 1 line item 3.3.1-61 there is this sentence in the discussion: ""Cracking and the change in material properties of elastomer seals are managed by the Fire Protection Program."" There is no mention of seismic gaps.
In the LRA on page 3.5-39 for table 1 line item 3.5.1-44 there are these sentences in the discussion: ""Loss of sealing is a consequence of elastomer cracking and change in material properties. Component types include: moisture barrier, compressible joints and seals used for seismic gaps, and fire barrier seals. The Structures Monitoring Program manages cracking and change in material properties."" Since this discussion talks about seismic gaps and fire barrier seals,

Response In Table 3.5.2-6 on page 3.5-80 of the LRA, the aging effects for component Seismic isolation joint, material elastomers in a protected from weather environment are cracking and change in material properties. The AMP shown is Fire Protection. The referenced GALL line item is VII.G-1 and the Table 1 line item is 3.3.1-61. The following changes will be made.

1) Note C will be changed to Note 'E'

2) The discussion in Table line Item 3.3.1-61, Page 3.3-49 will be clarified to read as follows.

"This line item was not used in the auxiliary systems tables. Fire barrier seals are evaluated as structural components in Section 3.5. Cracking and change in material properties of elastomer seals, including seismic isolation joints located in fire barriers, are managed by the Fire Protection Program."

3) An additional line item will be added to read as follows.

Seismic isolation joint
- SSR
- Elastomer
- Protected from weather
- Cracking

Change in material properties
- Structures Monitoring
- III.A6-12 (TP-7)
- 3.5.1-44
- C

This requires an amendment to the LRA.

337 **Category** Open

Request 3.3.1-63-W-1
In Table 3.5.2-6 on page 3.5-72 of the LRA for component Fire doors, material carbon steel in a protected from weather environment; the aging effect is loss of material. The referenced GALL line item is VII.G-3 and the Table 1 line item is 3.3.1-63. GALL line item VII.G-3 is for component Fire rated doors. Explain why the note is C, (different component but consistent with GALL otherwise) for this AMR line item, instead of note B (Consistent with GALL, but AMP takes exceptions)

Response In Table 3.5.2-6 on Page 3.5-72 of the LRA, the aging effect for component Fire doors, material carbon steel in a protected from weather environment is loss of material.
'Note C' will be changed to 'Note B' since the component matches NUREG-1801 and the AMP has exceptions.

This requires an amendment to the LRA.

338 **Category** Closed

Request 3.3.1-71-K-01
Diesel system carbon steel piping, piping components, and piping elements exposed to air are to be inspected for loss of material. Please provide implementing procedures that are used to manage this aging effect.

Response It is understood that the line items being referred to are carbon steel components exposed to untreated air that credit the Periodic Surveillance and Preventive Maintenance (PSPM) program. The tasks that are proposed to perform the inspections of these components currently require enhancement to include the components and perform the inspection and are not available for review, but will be created prior to the period of extended operation. However, in Attachment 3 of LRPD-02 "Aging Management Program Evaluation Results" there is a listing of the activities included in the PSPM program. The line item in this table applicable to these components is listed under AMRM-13 Credited Activities (Emergency Diesel Generator System).. This listing provides the following information about each of the activities:

Procedure or activity to be enhanced or created,
scope of program,
parameters monitored or inspected,
detection of aging effects and
acceptance criteria.

339 **Category** Open

Request 3.2.2-H1-10
In Table 3.2.2-7 of the LRA, why is Containment Leak Program used to manage loss of material in untreated water environment? Why is the Service Water Integrity not used to manage these line items?

Response The untreated water environment in these components is in the Drywell floor drains sump and equipment drains containment penetrations and is not service water which would be called out as an environment of raw water. Therefore, the service water program would not be appropriate to manage this component. Since this is a containment penetration it is tested as part of the Containment Leak Rate Program which performs containment penetration leak rate testing. The testing of this penetration confirms the integrity of the penetration and provides evidence that there are no significant aging effects present that could impact the ability of the containment penetration to perform its intended function of isolating containment. In addition, the penetration will be visually inspected during the testing process while connecting test equipment to confirm the lack of significant aging effects. As documented in LRPD-02 the Containment Leak Rate Program is supplemented by the Containment Inservice Inspection Program which performs inspections of containment including the penetrations.

340 **Category** Closed

Request 3.3.2-H1-11
In the Standby Gas Treatment System the valve body and piping components in a raw water environment is managed by Periodic Surveillance and Preventive Maintenance Program, what procedures and following actions are used to manage this component?

Response It is understood that the line items being referred to are carbon/stainless steel components exposed to raw water that credit the Periodic Surveillance and Preventive Maintenance (PSPM) program. The tasks that are proposed to perform the inspections of these components currently require enhancement to include the components and perform the inspection and are not available for review, but will be created prior to the period of extended operation. However, in Attachment 3 of LRPD-02 "Aging Management Program Evaluation Results" there is a listing of the activities included in the PSPM program. The line item in this table applicable to these components is listed under AMRM-07 Credited Activities (Standby Gas Treatment System).. This listing provides the following information about each of the activities:

Procedure or activity to be enhanced or created,
scope of program,
parameters monitored or inspected,
detection of aging effects and
acceptance criteria.

The demister drainage system is captured in the PSPM program when it is developed. Provided copies of the following: Dwg G-191238, ME-118 (PM Basis) and various photos of the Standby Gas Treatment demister drainage system to demonstrate evidence of maintenance and inspection that is performed on the demister drainage system.

341 **Category** Closed

Request 3.3.1-72-K-01
Steel HVAC and SWS system ducting and components exposed to condensation (internal surfaces) are to be inspected. Please provide the implementing procedures that are used to manage this aging effect.

Response It is understood that the line items being referred to are steel ducting and components exposed to condensation (int) that credit the Periodic Surveillance and Preventive Maintenance (PSPM) program. The tasks that are proposed to perform the inspections of these components currently require enhancement to perform the inspection and are not available for review but will be created prior to the period of extended operation. However, in Attachment 3 of LRPD-02 "Aging Management Program Evaluation Results" there is a listing of the activities included in the PSPM program. The line items in this table applicable to these components are listed under AMRM-19 credited activities (Heating, Ventilation and Air Conditioning System) and AMRM-11 credited activities (Service Water Systems) This listing provides the following information about each of the activities:

Procedure or activity to be enhanced or created,
scope of program,
parameters monitored or inspected,
detection of aging effects and
acceptance criteria.

342 **Category** Open

Request 3.3.2-10-W-1
In Table 3.3.2-10 on page 3.3-126 of the LRA for component Duct flexible connection, material fiberglass in an Air indoor (int) environment; the aging effect is none. Provide the technical basis justifying that fiberglass material does not have any aging effects in an indoor air environment.

Response The aging effects were based on the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001. 1003056 (The Mechanical Tools). The evaluation of aging effects for non-metallics in air is included in Appendix D of the Mechanical Tools. This section concludes for non-metallics other than elastomers there are no aging effects requiring management.

343 **Category** Open

Request 3.3.2-11-W-1
In Table 3.3.2-11 on page 3.3-135 of the LRA for component Diaphragm, material stainless steel in a silicone (ext) environment; the aging effect is none. Provide the technical basis justifying that stainless steel material does not have any aging effects in a silicone environment.

Response The aging effects were based on the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001. 1003056 (The Mechanical Tools). The silicone fluid used in these instrument lines is a non-conductive and essentially inert fluid. The evaluation of aging effects for external surfaces is included in Appendix E of the Mechanical Tools. As can be seen in Appendix E Table 4-1, "Aging Effects Summary- External Surface", there are no aging effects requiring management for external stainless steel surfaces exposed to silicone due to the inherent resistance of stainless steel to aging effects when not wetted by water or exposed to aggressive chemicals..

344 **Category** Open

Request 3.3.2-13-40-W-1
In Table 3.3.2-13-40 on page 3.3-228 of the LRA for component Sight glass, material glass in a Sodium pentaborate solution (int) environment; the aging effect is none. Provide the technical basis justifying that glass material does not have any aging effects in a sodium pentaborate solution.

Response The aging effects were based on section 2.1.8 of Appendix A in the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001. 1003056 (The Mechanical Tools). This section identifies for glass that there are no aging effects requiring management in a treated water environment as long as it is not in contact with hydrofluoric acid or caustics. The sight glass in question is on the test tank in the SLC system. The Test Tank and sight glass is filled with Demineralized Water (pH ~ 6.0 to 7.0) during testing, and the main SLC tank sodium pentaborate solution is also an essentially neutral solution (pH of 7.03)such that the sight glass can only be exposed to a neutral solution of treated water and sodium pentaborate that will not affect the glass.

345 **Category** Accepted

Request 3.3.2-13-9-W-1
In Table 3.3.2-13 on page 3.3-163 of the LRA for component bolting, material stainless steel in an air - outdoor (ext) environment; the aging effect is none. NUREG-1833 on page 93 for item TP-6 provides a new MEAP for stainless steel, in an Air-outdoor environment with an aging effect of loss of material/pitting and crevice corrosion. In the precedent/technical basis column for this new MEAP it is stated that an approved precedent exists for adding this material, environment, aging effect, and program combination to the GALL Report. As shown in RNP SER Section 3.5.2.4.3.2, galvanized steel and stainless steel in an outdoor air environment could result in loss of material due to constant wetting and drying conditions. Discuss the location of the circulating water system bolting components at VYNPS and how they are protected from constant wetting and drying conditions.

Response This is an error in the LRA for this line item. Stainless steel that is exposed to outdoor air and wet/dry cycling is subject to loss of material. This correction requires an amendment to the LRA to identify loss of material as an aging effect which is managed by the system walkdown program.

346 **Category** Open

Request 3.3.2-6-W-1
In Table 3.3.2-6 on page 3.3-94 of the LRA for component flame arrestor, material aluminum in an air - outdoor (ext) environment; the aging effect is none. NUREG-1833 on page 93 for item TP-6 provides a new MEAP for aluminum, in an Air-outdoor environment with an aging effect of loss of material/pitting and crevice corrosion. In the precedent/technical basis column for this new MEAP it is stated that an approved precedent exists for adding this material, environment, aging effect, and program combination to the GALL Report. As shown in RNP SER Section 3.5.2.4.3.2, galvanized steel and stainless steel in an outdoor air environment could result in loss of material due to constant wetting and drying conditions. Aluminum would also be susceptible to a similar kind of aging effect in the outdoor environment. Discuss the location of the flame arrestor component at VYNPS and how it is protected from constant wetting and drying conditions.

Response In accordance with EPRI report 10010639 “Non Class 1 Mechanical Implementation Guideline and Mechanical Tools” aluminum is a material that is highly resistant to corrosion in atmospheric environments. The outdoor air environment at VYNPS is non aggressive due to its remote location from industrial facilities and salt water. As a result the amount of contaminants in the air do not provide an environment where wet/dry cycling from rain would concentrate contaminants to a sufficient degree that would lead to loss of material in aluminum.

347 **Category** Open

Request 3.3.2-6-W-2
In Table 3.3.2-6 on page 3.3-96 of the LRA for component Piping, material fiberglass in a Fuel oil (int) environment; the aging effect is none. Provide the technical basis justifying that fiberglass material does not have any aging effects in a Fuel oil environment.

Response The aging effects for fiberglass in fuel oil are based on the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001, 1003056 (The Mechanical Tools). Appendix C, section 2.1.6 of the guideline states

“Therefore, based on industry operating experience review and the assumption of proper design and application of the material, aging of glass (including fiberglass) and thermoplastics in lubrication and fuel oil environments is not an applicable aging effect.”

348 **Category** Open

Request 3.3.2-6-W-3
In Table 3.3.2-6 on page 3.3-97 of the LRA for component Tank, material fiberglass in an Interstitial fluid (brine) (int) environment; the aging effect is none. Provide the technical basis justifying that fiberglass material does not have any aging effects in a Interstitial fluid (brine) environment.

Response The interstitial fluid (brine) environment is colored treated water with antifreeze located between the inner and outer walls of a double-walled fiberglass fuel oil tank and can be considered a treated water environment due to its benign effects on materials. The fluid is used for leak detection and is provided by the manufacturer of the tank. The aging effects for fiberglass in interstitial fluid are based on Section 2.1.8 of the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001, 1003056 (The Mechanical Tools) which states:

“Therefore, based on industry operating experience review and the assumption of proper design and application of the material, aging of glass and thermoplastics in treated water environments is not an applicable aging effect.”

349 **Category** Closed

Request 3.3.2-6-W-4
In Table 3.3.2-6 on page 3.3-97 of the LRA for component Tank, material fiberglass in an Interstitial fluid (brine) (int) environment; the aging effect is none. Provide the technical basis justifying that fiberglass material does not have any aging effects in a Interstitial fluid (brine) environment.

Response Duplicate of #348.

350 **Category** Accepted

Request B.1.27.3-E-01
Please clarify the FERC provisions under which the Vernon Dam is inspected. The dam is now exempt from Provisions of Title 18, Part 12, Subpart D, (Inspection by Independent Consultant).

Response The Vernon Dam is inspected in accordance with the Provisions of Title 18 Parts 8 and 12. The LRA Appendix A Item A.2.1.31 states that, subpart D (Inspection by Independent Consultant) is applicable, however an exemption from this requirement for an independent consultant review has been received and this secondary review is no longer performed.

This will require the following:
1) LRPD-02 Section 4.21.3.B. "Program Description" will be revised to read;
The Vernon dam is subject to the Federal Energy Regulatory Commission (FERC) inspection program. This program consists of visual inspections in accordance with FERC guidelines and is in compliance with Title 18 of the Code of Federal Regulations, Conservation of Power and Water Resources, Part 12 (Safety of Water Power Projects and Project Works) and Division of Dam Safety and Inspections Operating Manual. The operation inspection frequency for licensed and exempt low hazard potential dams is biennially. NRC has found that mandated FERC inspection programs are acceptable for aging management.

LRPD-02 Section 4.21.3.C- "Summary" will be revised to read:
The Vernon Dam FERC Inspection (performed biennially) has been effective at managing aging effects…"

2) LRA Section A.2.1.31 Structures Monitoring-Vernon Dam FERC Program will be revised to read:
The Vernon dam is subject to the Federal Energy Regulatory Commission (FERC) inspection program. This program consists of visual inspections in accordance with FERC guidelines and is in compliance with Title 18 of the Code of Federal Regulations, Conservation of Power and Water Resources, Part 12 (Safety of Water Power Projects and Project Works) and Division of Dam Safety and Inspections Operating Manual. The operation inspection frequency for licensed and exempt low hazard potential dams is biennially. As indicated in NUREG-1801 for water control structures, NRC has found that FERC / US Army Corp of Engineers dam inspections and maintenance programs are acceptable for aging management.

This change requires an amendment to the LRA.

351 **Category** Open

Request B.1.27.3-E-02
Please provide copies of Vernon Dam biennial FERC Inspection Reports issued since 6/24/2002.

Response The requested inspection reports are not readily available for security reasons. After September 11, 2001, access to Vernon Dam inspection reports has been restricted. Entergy VY has worked with the Vermont's Department of Public Service legal staff and has located these reports (e.g. Vermont required access to these reports for the sale of Vernon Dam to TransCanada). Sarah Hofmann, Esquire and Director for Public Advocacy, Department of Public Service in Montpelier, VT (Phone # = 802-828-3088), can be contacted to view this information.

352 **Category** Closed

Request Are the VY fatigue analyses of record based on design rates of change of temperature, or on actual plant limits?

How will future analyses be done?

Response The existing VY fatigue analyses are done based on design rates of change of temperature.

Future fatigue analyses will be based on design rates of change or on actual plant operating limits, if required.

353 **Category** Closed

Request Provide a copy of SIR-01-301 showing the system design transients for VY.

Response A copy of SIR-01-301 has been provided.

354 **Category** Accepted

Request Do the analyses for internals (Section 4.7.2) include all system transients?

Do the CUF values calculated in the BWRVIPs really apply to VY? If not, should these analyses be considered TLAA?

Response The TLAA discussed in Section 4.7.2.3 (Shroud Support) and Section 4.7.2.4 (Lower Plenum) are VYNPS specific calculations that are included in Table 4.3-1 of the LRA. These analyses are based on the VYNPS design system transients.

The CUFs in Section 4.7.2.5 (Vessel ID attachment welds) and Section 4.7.2.6 (Instrument penetrations) are generic analyses performed in the BWRVIP documents. These are not VYNPS specific calculations. As such, these should not be considered TLAA for VY. This requires an amendment to the LRA to delete Sections 4.7.2.5 and 4.7.2.6.

355 **Category** Closed

Request GE report 26A6019 states that some components have fatigue analyses done to later code versions than 1965. What are those components and code versions?

Response Provided copy of PUSAR Chapter 3.2 which lists the RR nozzle safe ends and instrumentation nozzle safe ends and the code year used for each. They were done to the 1982 version of ASME Section III.

356 **Category** Closed

Request GE report 26A6019 references ASME Section XI, 1986. Where did VY invoke this code

Response Provided copy of PUSAR Chapter 3.2 which shows that the core spray safe ends repair was performed using ASME Section XI, 1986.

357 **Category** Open

Request The PUSAR (Table 3-3 of NEDC-33090P) shows no changes to the stresses of components other than the FW nozzles. Why is this correct when temperature and changed 0.6%.

Response As discussed in Section 3.2.2.2 of NEDC-33090P, the original stress evaluations were performed at conditions that bound the slight change in operating conditions for the CPPU. Only the feedwater nozzle had enough of a change in parameters to need a re-calculation of CUF.

358 **Category** Closed

Request Please provide a description or a reference to the "augmented" class 2/3 fatigue methodology that was developed to account for cycle mechanical loads.

Response For the Torus attached piping plant-specific fatigue analyses are performed for each penetration.

The calculation for the SRV vent pipe penetrations is Teledyne Engineering Services (TES) Calculation No. 5319-28, Rev.0 "SRV Vent Pipe Penetration Stress Evaluation Vermont Yankee SRV Lines A – D". The penetration analysis is performed using a finite element model of the penetration and vent pipe. Loads are taken from the attached piping model. Stress intensities and secondary stress ranges are calculated and compared with ASME allowables. The fatigue evaluation is shown on page 65. Stress concentrations from WRC Bulletin 107 are used. The maximum usage factor calculated is 0.49 for 10,000 cycles.

For torus attached piping, the calculations include an ASME stress evaluation of the torus nozzle. A local WRC Bulletin 107 type nozzle analysis is performed and the results are combined with free shell stresses from a finite element model of the torus shell. Loads are taken from the attached piping model. Stress intensities and secondary stress ranges are calculated and compared with allowables. Stress concentrations from WRC Bulletin 107 are used.

A typical torus nozzle calculation is (TES) Calculation No. 5319-X227, Rev.0 "Torus Attached Piping –X227". The fatigue evaluation is shown on page 42. The maximum usage factor calculated is 0.33 for 10,000 cycles.

359 **Category** Accepted

Request 3.4.2-M-04
Currently, in VYNPS LRA Section 3.4.2.1, the applicant identified the following programs that manage the aging effects related to the main condenser and MSIV leakage pathway components and component groups; 1) Flow-Accelerated Corrosion, 2) System Walk-Down, 3) Water Chemistry Control-BWR, and 4) Water Chemistry Control-Closed Cooling Water. Will the One-Time Inspection program be added to this listing?

Response As stated in LRA Section B.1.30.2, the Water Chemistry Control – BWR Program is consistent with the program described in NUREG-1801, Section XI.M2, "Water Chemistry." The One-Time Inspection Program, described in LRA Section B.1.21 includes inspections to verify the effectiveness of the water chemistry control aging management programs (Water Chemistry Control – Auxiliary Systems, Water Chemistry Control – BWR, and Water Chemistry Control – Closed Cooling Water) by confirming that unacceptable cracking, loss of material, and fouling is not occurring. As stated in LRA Section B.1.21, the One-Time Inspection Program is a new program which will be consistent with the program described in NUREG-1801, Section XI.M32, "One-Time Inspection."

LRA Tables 3.1.1, 3.2.1, 3.3.1, and 3.4.1 indicate that the One-Time Inspection Program is credited along with the water chemistry control programs for line items for which GALL recommends a one-time inspection to confirm water chemistry control. For simplicity, the subsequent tables (Table 2's) do not list the One-Time Inspection Program each time a water chemistry control program is listed. However, since the One-Time Inspection Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program.

To provide further clarification, the effectiveness of the Water Chemistry Control – Auxiliary Systems, BWR, and Closed Cooling Water programs is confirmed by the One-Time Inspection program. This requires an amendment to the license renewal application to change the Appendix A, SAR supplement descriptions for the Water Chemistry Control –Auxiliary Systems, BWR and Closed Cooling Water programs to explicitly state One-Time Inspection Program activities will confirm the effectiveness of these programs.

360 **Category** Closed

Request 3.4.2-M-05
In Section 3.4.2.2.2 of the LRA, the applicant stated that, "…there are no tanks or steel heat exchanger components included in the steam and power conversion systems." They also stated that, "…the condenser is included as part of the main condenser and MSIV leakage pathway but has no aging effects requiring aging management since their intended function is for holdup & plate-out of radioactive materials. Have any changes occurred since initial scoping that would change the above statement.

Response No, there have been no changes in the scope of equipment subject to aging management review since the scoping and screening results presented in the application were approved. No plant changes have been implemented that would affect the intended functions for license renewal. The statements in Section 3.4.2.2.2 of the application remain valid. There are no steel or stainless steel tanks exposed to treated water with intended functions in the steam and power conversion systems. The intended function of main condenser and MSIV leakage pathway components, for post-accident holdup and plate-out of MSIV leakage is continuously assured by normal plant operation and cannot be affected by aging effects.

361 **Category** Closed

Request 3.4.2-M-06
In Section 3.4.2.2.2.2, of the LRA, the applicant stated that (in reference to the steam and power conversion systems at VYNPS) "…they have no carbon steel components requiring aging management which are exposed to lubricating oil." Therefore, they further state that "…this specific item is not applicable to VYNPS. Have any changes occurred since initial scoping that would change the above statement.

Response No, there have been no changes in the scope of equipment subject to aging management review since the scoping and screening results presented in the application was approved. No plant changes have been implemented that would affect the intended functions for license renewal. The statement in Section 3.4.2.2.2.2 of the application remains valid. There are no steel components exposed to lubricating oil with intended functions in the steam and power conversion

362 **Category** Closed

Request 3.4.2-M-07
The applicant stated, in Section 3.4.2.2.3 of the LRA, that "…for loss of material due to general, pitting, crevice, MIC, and fouling - which could occur in steel piping, piping components, and piping elements exposed to raw water - in the steam and power conversion systems at VYNPS; they have no carbon steel components requiring aging management which are exposed to raw water." Therefore, they further state that "…this item is not applicable to VYNPS. Have any changes occurred since initial scoping that would change the above statement.

Response No, there have been no changes in the scope of equipment subject to aging management review since the scoping and screening results presented in the application were approved. No plant changes have been implemented that would affect the intended functions for license renewal. The statement in Section 3.4.2.2.3 of the application remains valid. There are no steel components exposed to raw water with intended functions in the steam and power conversion systems.

363 **Category** Closed

Request 3.4.2-M-08
The applicant stated, in Section 3.4.2.2.5.1 of the LRA, that "…for the loss of material due to general, pitting, crevice, and MIC – which could occur in carbon steel (with or without coating or wrapping) piping, piping components, piping elements and tanks exposed to soil – in the steam and power conversion systems at VYNPS; they have no carbon steel components requiring aging management that are exposed to soil." Therefore, they further state that "…this item is not applicable to VYNPS. Have any changes occurred since initial scoping that would change the above statement.

Response No, there have been no changes in the scope of equipment subject to aging management review since the scoping and screening results presented in the application were approved. No plant changes have been implemented that would affect the intended functions for license renewal. The statement in Section 3.4.2.2.5.1 of the application remains valid. There are no steel components with intended functions exposed to soil in the steam and power conversion systems.

364 **Category** Closed

Request 3.4.2-M-09
The applicant stated, in Section 3.4.2.2.7.2 of the LRA, that "…for the loss of material due to pitting and crevice corrosion – which could occur in stainless steel piping, piping components, and piping elements exposed to soil – in the steam & power conversion systems at VYNPS; they have no stainless steel components requiring aging management that are exposed to soil." Therefore, they further state that "…this item is not applicable to VYNPS. Have any changes occurred since initial scoping that would change the above statement. Have any changes occurred since initial scoping that would change the above statement.

Response No, there have been no changes in the scope of equipment subject to aging management review since the scoping and screening results presented in the application were approved. No plant changes have been implemented that would affect the intended functions for license renewal. The statement in Section 3.4.2.2.7.2 of the application remains valid. There are no stainless steel components exposed to soil with intended functions in the steam and power conversion systems.

365 **Category** Open

Request 3.2.2-H1-12
In Section 3.2 of the LRA, there are numerous line items in Table 3.2's with TLAA-metal fatigue as the Aging Management Program. Can you provide the staff with the TLAA analysis for each line item?

Response See response to Question 309

366 **Category** Accepted

Request 3.4.1-M-04
Currently, in VYNPS LRA Table 3.4.1, Item 3.4.1-23 discussion column, the applicant states, "…the cracking of stainless steel piping, piping components, and piping elements exposed to closed cycle cooling water >60 C (>140 F) due to SCC is not applicable at VYNPS." In light of statements presented in GALL VIII.E-25 (for the Condensate System), further explain how this "MEA" combination is not applicable to VYNPS.

Response The discussion column entry for item 3.4.1-23 states, "Not applicable. There are no stainless steel components exposed to closed cycle cooling water in the steam and power conversion systems." This statement is meant to imply that within the steam and power conversion systems, there are no components with an intended function for license renewal that are made of this material and exposed to this environment. This may be confirmed by an inspection of Table 3.4.2-1. While there may be such components in systems that are included in the scope of license renewal, these components have been screened out because they are not needed to complete the license renewal intended functions.

367 **Category** Accepted

Request 3.4.1-M-05
Currently, in VYNPS LRA Table 3.4.1, Item 3.4.1-35 discussion column, the applicant states, "…the loss of material of copper alloy >15% Zn piping, piping components, and piping elements exposed to closed cycle cooling water, raw water, or treated water due to selective leaching is not applicable at VYNPS." In light of statements presented in GALL VIII.E-20 (for the Condensate System – Main Condenser Outside Tube Side), further explain how this "MEA" combination is not applicable to VYNPS.

Response The discussion column entry for item 3.4.1-35 states, "Not applicable. There are no copper alloy components subject to selective leaching in the steam and power conversion systems." The only components within the steam and power conversion systems with an intended function for license renewal that are composed of copper with >15% zinc, are the condenser tubes. As identified in plant specific note 401, the intended function of condenser components is for post-accident holdup and plate-out of MSIV leakage. This function is continuously assured by normal plant operation and cannot be affected by selective leaching of the tubes. Thus, this aging effect does not require management and is not included in Table 3.5.2-1.

368 **Category** Accepted

Request 3.4.1-M-06
Currently, In VYNPS LRA Table 3.4.1, Item 3.4.1-36 discussion column, the applicant states, "…the loss of material of gray cast iron piping, piping components, and piping elements exposed to soil, treated water, or raw water due to selective leaching is not applicable at VYNPS." In light of statements presented in GALL VIII.E-22 (for the Condensate System – Main Condenser Piping), further explain how this "MEA" combination is not applicable to VYNPS.

Response The discussion column entry for item 3.4.1-23 states, "Not applicable. There are no gray cast iron components exposed to raw water with intended functions in the steam and power conversion systems." This statement is meant to imply that within the steam and power conversion systems, there are no components with an intended function for license renewal that are made of this material and exposed to this environment. This may be confirmed by an inspection of Table 3.4.2-1. While there may be such components in systems that are included in the scope of license renewal, these components have been screened out because they are not needed to complete the license renewal intended functions.

369 **Category** Open

Request 3.2.2-H1-13
On page 3.2-49 why is cracking being managed by Oil Analysis Program, when the program does not have a performance testing program to verify the effectiveness of the program.

Response As stated in LRA Table 3.2.2-4 stainless steel components in the HPCI system at VYNPS that are exposed to lubricating oil are managed by the Oil Analysis Program, which includes periodic sampling and analysis of lubricating oil to maintain the presence of water within acceptable limits, thereby preserving an environment that is not conducive to cracking. As stated in LRA Section B.1.20, the Oil Analysis Program is consistent with the program described in NUREG-1801, Section XI.M39, Lubricating Oil Analysis, with a minor exception.

The Oil Analysis Program is not consistent with GALL XI.M32, "One-Time Inspection," nor are one-time inspections necessary to verify the effectiveness of the program. Cracking in lube oil systems can only occur with the presence of water. Therefore, an effective oil analysis program, which maintains the amount of water at levels that are not conducive to cracking, precludes the need for one-time inspections. Operating experience at VYNPS has confirmed the effectiveness of the Oil Analysis Program in maintaining moisture and impurities within limits such that cracking has not and will not occur and affect the intended functions of these components.

In numerous past precedents (including NUREG-1828, Arkansas Nuclear One Unit 2 SER, Section 3.0.3.3.6, and NUREG-1831, Donald C. Cook SER, Section 3.0.3.3.8), the staff concluded that an effective oil analysis program, which maintains impurities and moisture below specified limits, is sufficient to demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

The One-Time Inspection program will be revised to include activities to confirm the effectiveness of the Oil Analysis and Diesel Fuel Monitoring programs.

This requires an amendment to the LRA.

370 **Category** Open

Request 3.2.2-H1-14
On Table 3.2.2-5 page 3.2-66, can you provide justification why cracking-fatigue aging effect does not have a TLAA-metal fatigue, Aging Management Program?

Response The component in question is a steam heater in the RCIC system. The entry says cracking-fatigue is an aging effect requiring management and it is managed by the Heat Exchanger Monitoring program.

As suggested in questions 309 and 365, a metal fatigue TLAA is not automatically associated with every component exceeding the temperature threshold for cracking-fatigue. TLAA-metal fatigue is the appropriate entry only if there is in fact a TLAA (fatigue analysis) for the component in question. In this case there is no fatigue analysis and an AMP was specified that manages cracking-fatigue.

371 **Category** Open

Request In the Table 4.3-2 of VT LRA, the design basis cycles for Design Transient 6 (Reactor startup/shutdown cycles) has to be determined based on the design analysis. Please provide LRA supplement to address this issue

Response The LRA will be amended to include the following discussion of the VYNPS transient monitoring program.

The VYNPS Fatigue Monitoring Program includes counting of the cycles incurred by the plant. Five transients are monitored by plant operations and recorded as they occur. It is projected that less than 60% of the design cycles for these five transients will be used through the first 60 years of operation, including the PEO. The remaining transients are monitored by plant engineering based on review of operating data at the end of each fuel cycle. These remaining transients are summarized in the Fatigue Monitoring Program as the sixth transient (Reactor Startups and Shutdowns). Engineering evaluates these transients and advises operations if the number of design cycles is being approached

This requires an amendment to the LRA.