From: "Hamer, Mike" <mhamer@entergy.com>
To: <jgr@nrc.gov>
Date: 6/6/2006 2:10:35 PM
Subject: VY LR D-Base 301-371

Mail Envelope Properties (4485C507.925 : 20 : 10533)

Subject: VY LR D-Base 301-371
Creation Date 6/6/2006 2:09:53 PM
From: "Hamer, Mike" <mhamer@entergy.com>

Created By: mhamer@entergy.com

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VY LR D-Base 301-371 on 06-06-2006.pdf	1546038	
Mime.822	2117289	

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Junk Mail Handling Evaluation Results
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Junk Mail handling disabled by User
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Block List is not enabled

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—187—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.