PA-LR

From: "Ellis, Douglas" <dellis1@entergy.com>
To: "James Davis" <JAD@nrc.gov>, <erachp@comcast.net>, <duh@nrc.gov>, <rxs2@nrc.gov>, <david.lewis@pillsburylaw.com>
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Subject: Questions and Answers of Pilgrim LRA Aging Management Reviews

Jim - as you requested, including cc:s. Doug Ellis, Pilgrim Licensing.

CC: "Ellis, Douglas" <dellis1@entergy.com>, "Ford, Bryan" <BFord@entergy.com>

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From: "Ellis, Douglas" <dellis1@entergy.com>

Created By: dellis1@entergy.com

Recipients
nrc.gov
OWGWPO03.HQGWDO01
JAD (James Davis)

nrc.gov
TWGWPO02.HQGWDO01
RXS2 (Ram Subbaratnam)

entergy.com
BFord CC (Bryan Ford)

pillsburylaw.com
david.lewis

nrc.gov
NRGWIA01.NRGWDO01
"duh@nrc.gov"

NRC LRA AMR Audit of PNPS

Number	Status	Request	Response	NRC	PNPS Lead
341	Accepted	In Table 4.1-1 of the LRA, the applicant did not identify a crane load cycle limit as a TLAA for the cranes within the scope of license renewal. Normally, based on the design code of the crane, a load cycle limit is specified at rated capacity over the crane's projected life. Therefore, it is generally necessary to perform a TLAA relating to crane load cycles estimated to occur up to the end of the extended period of operation. Please explain why the crane load cycle limit was not included as a TLAA.	The license renewal rule, in 10 CFR 54.3, defines a TLAA as a licensee calculation or analysis that, among other things, involves time-limited assumptions defined by the current operating term. For cranes, there is no calculation or analysis related to crane load cycles. In addition, the number of cycles is NOT based on the current operating term. CMAA-70 specifies an allowable stress range based on joint category and service class. Service class is based on load class (mean effective load factor) and number of cycles. The projected cycles for the PNPS reactor building crane are well below any of the cycle ranges given in CMAA-70. The discussion column of Item 3.3.1-1 of Table 3.3.1 will be clarified to read as follows: "No PNPS calculation or analysis related to cumulative fatigue damage for steel cranes met the definition of TLAA in 10 CFR 54.3. The projected cycles for the PNPS reactor building crane are well below the cycle ranges given in CMAA-70. Steel cranes are evaluated as structural components in Section 3.5." This requires an amendment to the LRA.	Patel, Erach	Finnin, Ron
342	Accepted	In Table 4.3-1, Maximum CUFs for Class I Components, note 2 addresses exclusion rules for ASME Code. Please explain what these rules are.	The transients on the RPV main steam, vent and instrument nozzles are mild and stresses remain below the endurance limit. The original CE (Combustion Engineering) vessel analysis demonstrates that the requirements of ASME Section III -1965 with summer 1966 Addenda (Original Construction Code), Paragraph N-415.1 Vessels Not Requiring Analysis for Cyclic Operation, were met. This was later confirmed to be the case in the Altran analysis. A mistake exists in Table 4.3-1 of the LRA. The recirculation outlet nozzle usage factor does not meet the criteria of paragraph N-415.1. LRA Table 4.3-1 will be revised to add the appropriate usage factor for the recirculation outlet nozzle. Note 2 will no longer be applied to the recirculation outlet nozzle. Note 2 will be revised to read as follows. Detailed fatigue analysis is not required since component meets the requirements of ASME Section III -1965 with summer 1966 Addenda (Original Construction Code), Paragraph N-415.1 Vessels Not Requiring Analysis for Cyclic Operation. This requires an amendment to the LRA.	Patel, Erach	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
343	Accepted	Section 4.3.1.3, Class 1 piping and components states all remaining RCS pressure boundary piping is designed and analyzed in accordance with ANSI B31.1. However, in section 4.3.3, on page 4.3-8, it implies that fatigue analysis exists for feedwater piping (which is part of the RCS pressure boundary piping designed and analyzed IAW B31.1.). Please clarify this discrepancy, since B31.1 does not require a fatigue analysis calculation.	Section 4.3.1.3 of the LRA is correct. PNPS has no site-specific fatigue analysis for the feedwater piping. Section 4.3.3 of the LRA is discussing the effects of the reactor coolant environment on fatigue. Entergy will remove the generic (NUREG-6260) values for the core spray safe end, the RR outlet nozzle and the feedwater piping from Table 4.3-3. There are no PNPS-specific analyses for these locations. See the response to Question 346A below for the PNPS commitment for performing EAF (environmentally adjusted fatigue) analyses. This requires an amendment to the LRA.	Patel, Erach	Finnin, Ron
344	Accepted	Section 4.3.1.3, Class I piping and components second paragraph states that the design transients are tracked and evaluated to ensure that cycle limits are not exceeded, thereby assuring that CUFs do not exceed 1.0. It further states that continuation of this program, therefore, will ensure that the allowed number of transient cycles is not exceeded. Consequently, the TLAA (fatigue analyses) for Class 1 piping and components will remain valid for the period of extended operation in accordance with 10 CFR 54.2 1(c)(1)(i) or the effects of aging on the intended function(s) will be adequately managed for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(iii). This by itself could be a true statement, however, cycle counting does not address the effects of environmental fatigue, which is not included here. Acknowledging that section 4.3.3 addresses environmental fatigue, please clarify how that section is tied into the conclusion made in section 4.3.1.3.	PNPS will add the following sentence at the end of Section 4.3.1.3: "The effects of the reactor coolant environment on fatigue are addressed in Section 4.3.3 of the LRA." The TLAA addressed by Section 4.3.1.3 is calculation of CUFs without accounting for the effects of reactor coolant environment. This TLAA remains valid for the period of extended operation as long as the analyzed number of transients is not exceeded. The calculation of CUFs accounting for the effects of the reactor coolant environment does not exist, as the current licensing basis does not require consideration of environmental fatigue factors. Since 10 CFR 54.3 defines TLAAs as licensee calculations and analyses, there is not a TLAA that considers environmental fatigue factors. To remove the perceived implication that exceeding the allowable number of transients would cause the CUFs to exceed 1.0, the following changes will be made to the LRA. LRA Section 4.3.1, page 4.3-4 will be modified as follows: "The PNPS Fatigue Monitoring Program ensures that the numbers of transient cycles experienced by the plant remain within the allowable numbers of cycles, and hence the component CUFs remain below their analyzed values." LRA Section 4.3.1.3, Second sentence of the second paragraph will be changed as follows: "The design transients are tracked and evaluated to ensure that cycle limits are not exceeded, thereby assuring that CUFs remain below their analyzed values." This response requires an amendment to the LRA.	Patel, Erach	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
345	Accepted	Section 4.3.1.4, Feedwater Nozzle Fatigue states that this extrapolated usage factor for the feedwater nozzles, considering both the currently analyzed system design transients and rapid cycling through the period of extended operation, is thus <0.899. This number is not correct. Please explain how this number was calculated.	The Thermal Power Optimization Task Report T0302 updated the feedwater nozzle CUF to <1.0 based on the associated (1.5%) power uprate. The extrapolation in LRA section 4.3.1.4 is thus no longer valid. PNPS will modify the LRA to delete this extrapolation. PNPS will perform a new feedwater nozzle fatigue analysis prior to the period of extended operation. This commitment is Item 35 of the PNPS commitments for license renewal. This requires an amendment to the LRA.	Patel, Erach	Finnin, Ron
346	Open – NRC	Section 4.3.3, Effects of Reactor Water Environment on Fatigue Life. Please provide more details on your implementation plan: A. How will the further refinement of the fatigue analyses be performed? Will it consider finite element analyses? B. If an aging management program is used, please include a commitment to issue for NRC approval 24 months prior to entering period of extended operation. C. Will replacement be of the same material type?	A. Further refinement of the ASME Class 1 fatigue analysis for the RPV and nozzle locations will be performed considering the predicted number of transients at each location adjusted to the end of the extended license period using refined finite element evaluation as applicable. The refined analysis will account for environmental effects as applicable using the FEN methodology described by the GALL report or other industry Codes and Standards as approved by NRC. B. License renewal Commitment 31 includes a commitment to submit the aging management program to the NRC 24 months prior to the period of extended operation if the aging management program option is chosen. C. Appropriate replacement material will be selected in accordance with PNPS design control procedures, if replacement is a chosen option.	Patel, Erach	Finnin, Ron
347	Accepted	Table 4.3-3, Note 1 states "No PNPS-specific value was available; used generic value from NUREG/CR-6220." a. Wrong NUREG identified - should it be NUREG-6260? b. The NUREG-6260 CUF is based on the specific plant used in that NUREG and is dependent on that plant's piping configuration. That value cannot be used for PNPS calculation. Please justify how this value applies to PNPS unless the PNPS piping configurations are same as the NUREG-6260 plant or provide a PNPS specific CUF value.	A. Yes, this is a typo, it should be NUREG-6260. B. The CUF values from NUREG-6260 were intended as typical values used to predict the magnitude of the effect of considering the reactor coolant environment on fatigue for PNPS. PNPS will amend the LRA to remove the CUFs from Table 4.3-3 that are taken from NUREG-6260. See Item 346 for PNPS's commitment to perform additional environmentally adjusted fatigue analyses prior to the period of extended operation. This response requires an amendment to the LRA.	Patel, Erach	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
349	Closed	[3.4.1-W-01] In numerous line items in Tables 3.4.2-2, 3.3.2-14-3, 9, 10, 11, 17 and 18 of the Steam and Power Conversion System, the applicant credits TLAA - Metal Fatigue to manage the aging effect of metal fatigue (cumulative fatigue damage), and indicates that the evaluation of this TLAA is addressed in Section 4.3 of the LRA. However, it appears that the write-up of the Section 4.3 does not cover the discussion for most components. Please explain the discrepancy.	Listing TLAA – metal fatigue in the tables in Section 3 indicates that the conditions for fatigue were present and that they needed to be evaluated. Associated components were subsequently evaluated in LRPD-06, TLAA - Metal Fatigue. If the evaluation found no TLAA, it was not listed in Section 4 of the LRA. For clarification, Entergy will revise the Section 3 tables to remove the TLAA – metal fatigue entries whenever there was no associated TLAA discussed in Section 4 of the LRA. This item is closed to item 506.	Wen, Peter	Finnin, Ron
350	Accepted	[3.4.1-W-02] Section 3.4.2.2.2 (1) of the LRA (page 3.4-4), the applicant states: "Loss of material due to general, pitting and crevice corrosion for carbon steel piping, piping components, and tanks, exposed to treated water and for carbon steel piping and components exposed to steam is an aging effect requiring management in the steam and power conversion systems at PNPS, and is managed by the Water Chemistry Control – BWR and Periodic Surveillance and Preventive Maintenance (PSPM) Programs." Please clarify the above summary, regarding the use of PSPM program. Is the use of PSPM program is in lieu of the OTI program to verify the effectiveness of the Water Chemistry Control – BWR program or some of the AEM combination will be managed by using PSPM alone.	The Section 3.4.2.2.2 (1) further evaluation discussion is referenced by Table 3.4.1 items 3.4.1-2, 3.4.1-4 and 3.4.1-6. The discussion column entry of item 3.4.1-6 indicates that the PSPM program applies to the condensate storage tanks. Although the water in these tanks would be subject to the water chemistry controls – BWR program, the PSPM program is sufficient to manage loss of material and was the only program credited for these tanks. See the response to question 3.4.1-5 (item #353) which documents that the Water Chemistry Control - BWR program should have been credited along with the PSPM program for the condensate storage tanks. This requires a supplement/amendment to the LRA.	Wen, Peter	Lingenfelter,
351	Closed	[3.4.1-W-03] Why is OTI program not credited for those line items in Tables 3.4.2-x and Table 3.3.2-14-x (corresponding to VIII.E-33, condensate system, VIII.C-6, extraction steam system. VIII.D2-7, feedwater system, and VIII.B2-6, main steam system) that reference item 3.4.1-4?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control-BWR, Water Chemistry Control- Auxiliary Systems and the Water Chemistry Control- Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
352	Closed	[3.4.1-W-04] Why is OTI program not credited for those line items in Table 3.3.2-14-x (corresponding to VIII.E-7, heat exchanger components in condensate system) that reference item 3.4.1-5?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control-BWR, Water Chemistry Control- Auxiliary Systems and the Water Chemistry Control- Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,
353	Closed	[3.4.1-W-05] The applicant references GALL item VIII.E-40 (steel tank in condensate system) for the condensate storage system carbon steel tank, as listed in LRA Table 3.4.2-1, (page 3.4-28), but takes credit of PSPM to manage the aging effect of loss of material. The GALL recommends using "Water Chemistry" and "OTI" programs for this component and AEM combination. Although the PSPM, as described in PNPS LRA B1.24, has more stringent inspection requirement than OTI, it does not include controlling water chemistry to minimize component exposure to aggressive environment. Please explain why relying on PSPM alone is sufficient for meeting the GALL's recommendations to manage the aging effect of loss of material for the condensate storage system carbon steel tank. The carbon steel tank listed in Table 3.3.2-14-10, feedwater system (page 3.3-171) and Table 3.3.2-14-11, feedwater heater drains and vents system (page 3.3-178), also reference GALL item VIII.E-40. Why is OTI program not credited for these line items that reference item 3.4.1-6.	Since the condensate storage tank contains fluid that is subject to the controls of the Water Chemistry Control - BWR Program, the program applies to the tank. The LRA will be clarified to explicitly credit the Water Chemistry Control - BWR Program in addition to PSPM with managing the effects of aging for the condensate storage tank surfaces exposed to the treated water environment. Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. As stated in LRA Table 3.4.1, the One-Time Inspection Program is credited to verify effectiveness of the water chemistry control program for line items that reference item 3.4.1-6. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control-BWR, Water Chemistry Control- Auxiliary Systems and the Water Chemistry Control- Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Orlicek, Jack

Number	Status	Request	Response	NRC	PNPS Lead
354	Closed	[3.4.1-W-06] Why is OTI program not credited for those line items in Table 3.3.2-14-35 (corresponding to VIII.A-14) that reference item 3.4.1-7?	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Wen, Peter	Fronabarger,
355	Closed	[3.4.1-W-07] Why is OTI program not credited for those line items in Table 3.2.2-4, HPCI System, (page 3.2-49) and Table 3.2.2-5, RCIC System, (page 3.2-62) (corresponding to VIII.E-10) that reference item 3.4.1-9?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control-BWR, Water Chemistry Control- Auxiliary Systems and the Water Chemistry Control- Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
356	Closed	[3.4.1-W-08] Why is OTI program not credited for those line items in Table 3.3.2-5, Station Blackout Diesel, (page 3.3-90) and Table 3.3.2-6, Security Diesel Generator System, (page 3.3-102) (corresponding to VIII.G-15) that reference item 3.4.1-10?	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Wen, Peter	Fronabarger,
357	Closed	[3.4.1-W-09] Why is OTI program not credited for those line items in Table 3.4.2-2, Main Condenser and MSIV Leakage Pathway, Table 3.3.2-14-9, Extraction Steam System, Table 3.3.2-14-16, HPCI, Table 3.3.2-14-18, Main Steam System, and Table 3.3.2-14-19, Offgas and Augmented Offgas System that reference item 3.4.1-13?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control-BWR, Water Chemistry Control- Auxiliary Systems and the Water Chemistry Control- Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
358	Closed	[3.4.1-W-10] Since notes "A" and "C" were used in various Table 3.3.2-14-x line items, which reference item 3.4.1-14, why OTI program is not credited for those lines?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,
359	Closed	[3.4.1-W-11] Since note "C" was used in Table 3.3.2-14-4, Condensate Demineralizer System line items, which reference item 3.4.1-15, why OTI program is not credited for those lines?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
360	Closed	[3.4.1-W-12] Since notes "A" and "C" were used in Table 3.4.2--14, Condensate Storage System and various Table 3.3.2-14-x line items which reference item 3.4.1-16, why OTI program is not credited for those lines?	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Fronabarger,
361	Closed	3.4.1-W-13 Why is OTI program not credited for those line items in Table 3.4.2-14-35, Turbine Generator and Auxiliary System (corresponding to VIII.A-3) that reference item 3.4.1-18?	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
362	Closed	[3.4.1-W-14] Why is OTI program not credited for those line items in Table 3.4.2-14-35, Turbine Generator and Auxiliary System (corresponding to VIII.A-9 and VIII.G-3) that reference item 3.4.1-19?	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
363	Open – NRC	[3.4.1-W-15] Table 3.4.1, item 3.4.1-20 for steel tanks exposed to air - outdoor. PNPS uses the System Walkdown Program to manage the aging effect of loss of material due to general, pitting, and crevice corrosion through the use of periodic visual inspections. The GALL Report recommends the AMP of Aboveground Steel Tanks Program (GALL XI. M29) to be used. While the System Walkdown Program may be an acceptable alternate for Aboveground Steel Tanks AMP for inspection, the Aboveground Steel Tanks AMP has some program attributes not addressed in the System Walkdown Program. For examples, the System Walkdown Program is silent on the preventive actions, but the Aboveground Steel Tanks AMP includes preventive measures to mitigate corrosion by protecting the external surface of steel tanks with paint or coatings in accordance with standard industry practice. Please explain how the preventive actions and detection of aging effects at inaccessible locations such as the tank bottom surface will be performed for the subject tanks using the System Walkdown AMP.	Preventive Actions: Protective coatings were applied during fabrication or installation of the subject tanks well before development of aging management programs for license renewal. The System Walkdown Program entails visual inspections of external surfaces of carbon steel tanks to identify degradation of coatings, sealants, and caulking plus indications of leakage. The site corrective action process would require evaluation and repair, if necessary, of degraded coatings or caulking. Detection of Aging Effects: The condensate storage tank is a non-safety related carbon steel tank that contains treated water. The tank sits on a concrete pad with a sand and oil base cushion that is designed to remove moisture from the bottom of the tank to minimize the potential for corrosion. The internals of the tank which are subjected to continuous wetting are periodically inspected for corrosion and pitting including inaccessible areas (under water) as documented in site procedure NE8.02. This same procedure also inspects exterior caulking at the base of the tank for cracking in order to prevent water accumulation under the tank. This procedure is credited in the Periodic Surveillance and Preventive Maintenance program section 4.17 and Attachment 3 of LRPD-02 for management of the external and internal surfaces of this tank. Any degradation of the internals of the tank will result in a condition report and an evaluation of the extent of the condition, which may involve ultrasonic examination to determine remaining thickness. Because the environment inside the tank is significantly harsher than the environment on the underside of the tank, internal degradation would be expected long before corrosion on the outside. If degradation occurs on the inside (including the bottom), examinations of the degraded areas would require a determination of the remaining wall thickness which ensures the integrity of the tank is maintained. However, to ensure that significant degradation on the bottom of the tank is not occurring, PNPS commits to perform a one-time ultrasonic thickness examination in accessible areas on the bottom of the condensate storage tank prior to the period of extended operation. Standard examination and sampling techniques will be utilized. This is commitment number 36. This requires an amendment to the LRA.	Wen, Peter	Ford, Bryan

Number	Status	Request	Response	NRC	PNPS Lead
364	Closed	[3.4.1-W-16] Table 3.4.1, item 3.4.1-22, for steel bolting and closure bolting exposed to air with steam or water leakage, air - outdoor (external), or air - indoor uncontrolled (external). The applicant references GALL items VIII.H-1 and H-4 for the closure bolting in various Steam and Power Conversion System, as listed in LRA Table 3.4.2-1 and 3.3.2-14-x, but takes credit for the System Walkdown Program to manage the aging effect of loss of material. The GALL Report recommends AMP XI.M18, Bolting Integrity Program, which includes a comprehensive bolting integrity program, as delineated in NUREG-1339, and industry recommendations, as delineated in the EPRI report NP-5769. Please justify how the additional attributes listed in GALL AMP XI.M18 for aging management of closure bolting are addressed in the System Walkdown Program.	A Bolting Integrity Program will be developed 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 32. This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable. This item is closed to Item 373.	Wen, Peter	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
365	Open – NRC	[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 and no AMP is required. 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 associated 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.	The PNPS electrical AMR, AMRE-01, in section 3.4.1 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 and 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. Because they are part of an active component, 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. In addition, their location inside active components protects the metallic parts of electrical cable connections 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. Since bolted connections are considered part of an active device and are maintained by the plant Maintenance Rule program, there are no aging effects requiring management for bolted connections of cable systems. Since PNPS maintains cable connections under a current maintenance program and has no indication of an aging mechanism due to loose connections, no AMP is needed in addition to the Maintenance Rule program.	Nguyen, Duc	Stroud, Mike

Number	Status	Request	Response	NRC	PNPS Lead
366	Accepted	[3.6.2.2-N-02] In LRA Table 3.6.2-1 under high voltage insulator (SBO), you have stated that no aging effects and no AMP is required. You further stated, in Section 3.6.2.2.2 of the LRA, that PNPS is located near the seacoast where salt spray is considered. However, salt spray buildup is a short-term concern based on local weather conditions (event driven). Therefore, you have concluded that surface contamination is not an applicable aging mechanism for high voltage insulators at PNPS. NUREG 1800, Rev. 1, Standard Review Plan for Review of License Renewal Application for Nuclear Power Plant, Section 3.6.2.2.2 identified degradation of high voltage insulator in presence of salt deposits or surface contamination. Various airborne materials such as dust, salt and industrial effluent can contaminate insulator surfaces. A large buildup of contamination enables the conductor voltage to track along the surface more easily and can lead to insulator flash over. Surface contamination can be problem in areas where there are greater concentration of airborne particles such as near facilities that discharge soot or near the sea coast where salt spray is prevalent. Industry operating experience identified the potential of loss of offsite power due to salt deposition to switchyard insulators. On March 17, 1993, Crystal River Unit 3 experienced a loss of the 230 kV switchyard (normal offsite power to safety-related busses) when a light rain caused arcing across salt-laden 230 kV insulators and opened breakers in switchyard. In March 1993, the Brunswick Unit 2 switchyard experienced a flash over of some high-voltage insulators. The incident was attributed to a winter storm in the area. Since 1982, Pilgrim station has also experienced several loss of offsite power events when ocean storms deposited salt on the 345 kV switchyard causing the insulator to arc to ground. In light of these industry and plant operating experiences, provide justification of why an AMP is not necessary.	As shown by the OE (Operating Experience) cited in this question, flashover due to salt contamination of insulators is caused by events, typically storms, regardless of the age of the insulators. This is clearly not an effect of aging. Therefore, surface contamination is not an applicable aging mechanism for high-voltage insulators at PNPS. Since the condition is caused by severe weather conditions unrelated to aging, an aging management program is not appropriate to address this concern. However, while salt spray buildup is a short-term concern based on local weather conditions (event-driven), such buildup can cause problems with the offsite power supply system. Because of this operating experience, PNPS has applied Sylgard (RTV silicone) coatings to some switchyard insulators to reduce flashover. The addition of Sylgard to the insulators has reduced the likelihood of insulator flashover. System walkdowns are performed at least once per refueling cycle and are normally performed more frequently to do a visual inspection of the switchyard high-voltage insulators that are in-scope of license renewal in accordance with EN-DC-178. These walkdowns will continue to be performed into the period of extended operation. LRPD-02 will be revised as follows: The System Walkdown Program will be revised to include the visual inspection of high-voltage insulators in-scope of license renewal.	Nguyen, Duc	Stroud, Mike

Number	Status	Request	Response	NRC	PNPS Lead
367	Closed	[3.6.2.2-N-03] In LRA, Table 3.6.2-1, under switchyard bus and connections, 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 Plant, 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 and transmission conductor 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., heatup) 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 for why torque relaxation for bolted connections of switchyard bus is not a concern for PNPS.	At PNPS, bus to bus connections are welded instead of bolted. Switchyard buses are connected by flexible connectors to insulators and active components. Since switchyard bus is typically under a constant load, thermal cycling that could cause torque relaxation is infrequent. With no connections to vibrating equipment, vibration is not an aging mechanism for switchyard bus. The switchyard connections to the startup transformer are part of the active assembly maintained by the plant maintenance program. Therefore, torque relaxation is not an aging effects requiring management for switchyard bus. In addition, thermography is performed at least once every 6 months to maintain the integrity of the connections. This program will continue into the period of extended operation.	Nguyen, Duc	Stroud, Mike
368	Closed	[3.6.2.2-N-04] In LRA, Section 3.6.2.2.3, you have stated that PNPS does not utilize transmission conductors in the circuits for recovery of offsite power following an SBO. Describe SBO recovery paths for PNPS. Confirm that no transmission conductors are utilized in the circuits for recovery paths. Support these answers with a main one line diagram.	The preferred source of offsite power comes from the 345kV switchyard. The feed from the switchyard breakers, 352-2 and 352-3, travels by switchyard bus to the startup transformer, X4, and then travels by underground cables to the safety buses in the plant. The alternate offsite power source comes from the 23kV switchyard and travels from breaker 252 by underground cables to the shutdown transformer, X13, and then by underground cables to bus A8. From A8 the power travels by underground cables to the safety buses in the plant. Neither PNPS recovery path for offsite power uses transmission conductors. These paths are shown on Figure 2.5-1 of the LRA.	Nguyen, Duc	Stroud, Mike

Number	Status	Request	Response	NRC	PNPS Lead
369	Closed	[3.6.2.2-N-05] 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. What is your alternate ac (AAC) source used to meet SBO requirements? Are all SSCs (including electrical components) associated with AAC sources 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 AAC sources.	At PNPS, the station blackout diesel generator provides the alternate AC power source. All SSCs associated with the AAC diesel are in scope for license renewal. The LRA provides the aging management review results for long-lived, passive SSCs associated with the AAC power source in each discipline section of the LRA.	Nguyen, Duc	Stroud, Mike
370	Accepted	[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).	The PNPS LRA Section 3.6.2.2 will be revised to read as follows: "Some of the penetration assemblies at PNPS are not EQ. The non-EQ penetration assemblies are subject to aging management review. The aging management review is provided in AMRE-01 and the AMP for penetration assembly pigtails is provided in the non-EQ insulated cables and connections program will manage the aging effects of the penetration assembly cables and connections. Table 3.6.2-1 includes the electrical penetration conductors and connections in the line item for electrical cables and connections not subject to 10 CFR 50.49 – EQ." The structural report for bulk commodities, AMRC-06, addresses the penetration assembly components, seals and sealing elements that form the radiological control barrier for containment in Table 3.5.2-1. This requires an amendment to the LRA.	Nguyen, Duc	Stroud, Mike

Number	Status	Request	Response	NRC	PNPS Lead
371	Closed	[G.3.3.1-P-01] Tables 3.3.2.14-1 through 3.3.2.14-35 address non-safety related components affecting safety related systems. However, these tables address all such systems in section 3.3, Auxiliary Systems, even though some of these systems belong to section 3.2, ESF Systems, and section 3.4, Steam and Power Conversion (S&PC) Systems. Tables 3.3.14-7, 14-16, 14-25, and 14-28 are for systems that belong to Section 3.2; and tables 3.3.14-1, 14-3, 14-5, 14-9, 14-10, 14-11, 14-17, and 14-18 are for systems that belong to Section 3.4. The Table 1 item reference also specifies Tables 3.2.1 and 3.4.1. The audit report and the SER are based on systems as defined in GALL Report sections of ESF, Auxiliary, and S&PC systems. As written in the LRA, it will make the audit report and SER confusing because the ESF systems section 3.2 write-up will include Tables from section 3.3, and the S&PC systems section 3.4 write-up will include Tables from section 3.3. Different reviewers write these sections. Please justify why the non-safety systems associated with ESF and S&PC systems were included in the Auxiliary system section.	Section 14 includes all the systems that have intended functions that meet 10 CFR 54.4(a)(2) for physical interaction. To indicate individual systems included in the aging management review for (a)(2), Table 3.3.2-14 is subdivided by system. For example, Table 3.3.2-14-1 is for the circulating water system, a system which only has components included for (a)(2). For the core spray system, Table 3.3.2-14-7 shows the components included for (a)(2) but since the system is also in scope for other reasons, Table 3.3.2-2 shows the components included for 54.4(a)(1) and (a)(3). The aging management review of the 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 were presented separately so that they could be reviewed separately on the basis of physical proximity rather than system function. 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.	Patel, Erach	Fronabarger,
372	Accepted	[G.3.3.1-P-02] Discrepancy between Table 3.3.1 line items and Tables 3.3.2-X for those line items that credit water chemistry or oil analysis program and a verification program such as one-time inspection (OTI) program. The Table 1 item is consistent with the GALL report and correctly credits the chemistry program and the OTI program or for plant-specific program also credits chemistry and OTI programs. However, the Table 2 line items that reference these Table 1 line items do not credit the OTI program. These Table 2 line items however have a footnote 'A', or 'C' which states that it is consistent with the MEAP combination in the GALL Report. Please justify why the OTI program is not credited in Table 2, even though it is credited in Table 1 and footnote 'A' implies total consistency with GALL for MEAP combination.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
373	Accepted	[G.3.3.1-P-03] PNPS does not include Bolting Integrity Program in the LRA, however credits other programs as alternate to the bolting integrity program. The GALL Report AMP XI.M18, Bolting Integrity Program provides several recommendations in the 10-element evaluation, specifically recommendations associated with preventive actions such as selection of bolting material, use of lubricants and sealants and additional recommendations of NUREG-1339. Some of the alternate programs may be acceptable for inspection, however, they do not address the preventive actions. Please clarify how PNPS meets these recommendations when using alternate programs or please credit a Bolting Integrity Program for the various Table 2 line items as appropriate. For section 3.3, this applies to Table 3.3.1, line items 3.3.1-19, 3.3.1-27, 3.3.1-42, 3.3.1-43, 3.3.1-58, and 3.3.1-78.	A Bolting Integrity Program will be developed that will address the aging management of bolting in the scope of license renewal. A copy of the aging management program basis document for the Bolting Integrity Program will be provided for review with the LRA supplement. The Bolting Integrity Program will be implemented prior to the period of extended operation in accordance with commitment number 32. This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable.	Patel, Erach	Fronabarger,
374	Accepted	[T.3.3.1-P-01] Table 3.3.1, item 3.3.1-1, for steel cranes with an aging effect of cumulative fatigue damage, the GALL recommends TLAA to be evaluated for structural girders of cranes. The discussion section states that this line item was not used in section 3.3, however steel cranes are evaluated in section 3.5. Tables 3.5.2-2 and 3.5.2-4 address cranes but for an aging effect of loss of materials. Cumulative fatigue damage of cranes is not addressed in section 3.5 or in the TLAA section 4.7 (plant specific TLAA). Also see TLAA question. Please explain where this line item is addressed in the LRA.	As defined in 10 CFR 54.3, a TLAA is a licensee calculation or analysis that, among other things, involves time-limited assumptions defined by the current operating term. There is no analysis for steel cranes at PNPS that satisfies the definition. CMAA-70 defines allowable stress range based on joint category and service class. Service class is based on load class (mean effective load factor) and number of cycles. However, the number of cycles is NOT based on 40 years of operation of this crane. The anticipated cycles for the PNPS reactor building crane are well below any of the cycle ranges given in CMAA-70. Based on realistic estimates and the historical rate of use of the cranes to date, the PNPS reactor building and turbine building cranes would take over 350 years to reach the minimum cycle range for CMAA-70. Consequently there is no TLAA associated with crane load cycles.	Patel, Erach	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
375	Closed	[T.3.3.1-P-02] Table 3.3.1, item 3.3.1-5, for heat exchanger exposed to treated water > 60C (>140F), discussion states that OTI will be used as verification program for water chemistry. However, for those line items in Table 3.3.2-3 where item 3.3.1-5 is referenced, OTI program is not credited. See question G.3.3.1.2 above.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
376	Closed	[T.3.3.1-P-03] Table 3.3.1, item 3.3.1-14 for steel components exposed to lubricating oil, GALL report recommends lubricating oil analysis program and OTI as a verification program. However, in the discussion section only the oil analysis program is credited. Section 3.3.2.2.7, item 1 states that operating experience at PNPS has confirmed the effectiveness of this program in maintaining contaminants within limits such that corrosion has not and will not affect the intended functions of these components. Please explain how PNPS can make this statement if inspection has not been performed.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
377	Closed	[T.3.3.1-P-04] Table 3.3.1, item 3.3.1-17 for steel elements exposed treated water discussion states that OTI will be used as verification program for water chemistry. Refer to question T.3.3.1.2 and G.3.3.1.2. This applies to several line items in various Table 2's that reference item 3.3.1-17.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
378	Accepted	[T.3.3.1-P-05] Table 3.3.1, item 3.3.1-18 for steel and SS diesel engine exhaust piping, in the discussion column references section 3.3.2.2.7 item 3 for further evaluation. Section 3.3.2.2.7 item 3 states that the carbon steel diesel exhaust piping and components in the fire protection system is managed by the Fire Protection Program. The Fire Protection Program uses visual inspections of diesel exhaust piping and components to manage loss of material. However, Appendix B.1.13.1 program description which identifies the system/commodities in scope for inspection does not include the inspection of the diesel exhaust piping and components. There is no enhancement identified in the program write-up to include this inspection during the period of extended operation. Please explain this discrepancy between section 3.3.2.2.7 item 3 and the AMP B.1.13.1 program description or include this inspection in the AMP as an enhancement.	Enhancements will be made to the Fire Protection program to credit existing or implement new preventive maintenance tasks for the fire pump diesel to ensure that all aging effects identified in Table 3.3.2-9 line items that apply to the fire pump diesel components are adequately managed and intended functions are maintained without crediting the detection of leakage as managing an aging effect. This requires an amendment to LRA appendices A and B.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
379	Closed	[T.3.3.1-P-06] Table 3.3.1, item 3.3.1-21 for steel components exposed to lubricating oil. This is the same issue as in question T.3.3.1.3 above, except the section is 3.3.2.2.9, item 2.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Patel, Erach	Fronabarger,
380	Closed	[T.3.3.1-P-07] Table 3.3.1, item 3.3.1-23 for SS heat exchanger components exposed to treated water. This is the same issue as in question T.3.3.1.2 above, except the section is 3.3.2.2.10, item 2.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
381	Closed	[T.3.3.1-P-08] Table 3.3.1, item 3.3.1-24 for SS and aluminum components exposed to treated water. This is the same issue as in question T.3.3.1.2 above, except the section is 3.3.2.2.10, item 2. There are over 80 line items associated with this in different table 2s.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
382	Closed	[T.3.3.1-P-09] Table 3.3.1, item 3.3.1-26 for copper alloy components exposed to lubricating oil. This is the same issue as in question T.3.3.1.3 above, except the section is 3.3.2.2.10, item 4.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
383	Closed	[T.3.3.1-P-10] Table 3.3.1, item 3.3.1-30 for SS components exposed to sodium pentaborate solution. This is the same issue as in question T.3.3.1.2 above, except the section is 3.3.2.2.10, item 8.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
384	Closed	[T.3.3.1-P-11] Table 3.3.1, item 3.3.1.33 for SS components exposed to lubricating oil. This is the same issue as in question T.3.3.1.3 above, except the section is 3.3.2.2.12, item 2.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
385	Closed	[T.3.3.1-P-12.1] Table 3.3.1, item 3.3.1-37 for SS components exposed to treated water >60C (>140F). This line item applies to RWCU system and GALL Report recommends AMP XI.M25, BWR Reactor Water Cleanup System. The applicant states "Supplement 1 to GL 88-01 states that IGSCC inspection of RWCU piping outside of the containment isolation valves is recommended only until actions associated with GL 89-10 on motor operated valves are completed. Since PNPS has satisfactorily completed all actions requested in NRC GL 89-10, the Water Chemistry Control BWR Program is used in lieu of the BWR Reactor Water Cleanup System Program to manage this potential aging effect." However, the AMP also states that in addition to meeting this criterion, piping is made of material that is resistant to IGSCC. Please confirm what grade of stainless material is used and justify that it is resistant to IGSCC.	Original Type 304 stainless steel piping and fittings between drywell penetration X-14 and the 6" x 4" reducer downstream of MO-1201-5 were replaced with type 316L stainless steel.	Patel, Erach	Taylor, Andy
386	Closed	[T.3.3.1-P-12.2] Same issue as question T.3.3.1.2 above also applies here where OTI is not credited in Table 2 line items where 3.3.1-37 is referenced.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
387	Closed	[T.3.3.1-P-13] Table 3.3.1, item 3.3.1-38 for SS components exposed to treated water >60C (>140F). This is the same issue as in question T.3.3.1.2 above.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
388	Accepted	[T.3.3.1-P-14] Table 3.3.1, item 3.3.1-40 for steel tank in diesel fuel oil system exposed to air-outdoor external environment. The GALL Report recommends AMP XI.M29 Aboveground Steel Tanks, however PNPS is crediting a different program, System Walkdown Program. This program is consistent with GALL Report AMP XI.M36, External Surfaces Monitoring. While the System Walkdown Program is an acceptable alternate for Aboveground Steel Tanks AMP for inspection, however, the Aboveground Steel Tanks AMP has some preventive actions associated with it that are not addressed in the System Walkdown Program. Furthermore, the GALL AMP specifies wall thickness measurement of tank bottom if it is supported on earthen or concrete foundations. Please clarify if the steel tanks are coated with protective paint or coating in accordance with industry practice, and whether sealant or caulking is applied at the interface edge between the tank and the foundation as per the GALL AMP XI.M29. Please state how the tank is supported.	No carbon steel tanks in the fuel oil system exposed to air – outdoor are included in scope for license renewal. The LRA will be amended to remove the line item in table 3.3.2-7 for carbon steel tanks exposed to air-outdoor . The discussion for line item 3.3.1-40 will be amended to state the line item is not used. This requires a supplement/amendment to the LRA.	Patel, Erach	Nichols, Bill

Number	Status	Request	Response	NRC	PNPS Lead
389	Closed	[T.3.3.1-P-15] Table 3.3.1, item 3.3.1-43, for steel bolting and closure bolting exposed to air – indoor uncontrolled (external) or air – outdoor (External). The GALL Report recommends AMP XI.M18,Bolting Integrity program, however PNPS is crediting a different program, System Walkdown Program. PNPS indicates that the system walkdown program is similar to XI.M36, External Surfaces Monitoring Program. However, the XI.M36 AMP does not have any preventive actions, whereas the Bolting Integrity Program considers preventive action. Please justify how the preventive actions of GALL AMP XI.M18 are addressed in the system walkdown program.	A Bolting Integrity Program will be developed 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 32. This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable. This item is closed to Item 373.	Patel, Erach	Fronabarger,
390	Accepted	[T.3.3.1-P-16] Table 3.3.1, item 3.3.1-58, for steel external surfaces exposed to air – indoor uncontrolled (external), air outdoor (external), and condensation (external). For those line items in Table 2's where this Table 1 line item is referenced for bolting, same issue as question T.15 should be addressed. In Table 3.3.2-10, LRA page 3.3.-123, for tank in Halon system, which references line item 3.3.1-58, Fire Protection Program is credited. Please justify why the Fire Protection Program was not identified in the discussion column of Table 3.3.1, item 3.3.1-58 or supplement the LRA to include this program	A Bolting Integrity Program will be developed that will address managing the effects of aging on 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 32. The LRA will be clarified to include Fire Protection Program in the discussion for Item 3.3.1-58 of Table 3.3.1. The revised discussion text will read as follows: "The System Walkdown Program manages loss of material for external surfaces of steel components. For some fire protection system components, the Fire Protection Program will manage loss of material." The Note for the related line in Table 3.3.2-10 (steel halon tank exposed to air) will be changed from "B" to "E". This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable. This first part of this item is closed to Item 373. The Fire Protection portion of this item requires an amendment to the LRA.	Patel, Erach	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead

391	Accepted	[T.3.3.1-P-17]
		
		Table 3.3..1, item 3.3.1-61, for elastomer fire barrier penetration seals exposed to air – outdoor or air indoor uncontrolled. PNPS credits Fire Protection Program and states in the discussion column that 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 the change in material properties of elastomer seals are managed by the Fire Protection Program.
		
		However, in section 3.5, Table 3.5.2-6, Bulk Commodities, on pages 3.5-82, and 3.5-83, where line item 3.3.1-61 is referenced, PNPS credits the Fire Protection Program and the Structures Monitoring program. However, line item 3.3.1-61 does not credit structures monitoring program. As a matter of fact, the Structures Monitoring Program is enhanced to add guidance for inspection of elastomer seals, etc. Please clarify if both programs are credited for managing aging effects for penetration seals as stated in Table 3.5.2-6, and if so, please supplement the LRA to include the Structures Monitoring program in Table 3.3.1, item 3.3.1-61.
			In Table 3.5.2-6 on Page 3.5-82 of the LRA, the aging effects for the elastomer components penetration sealant and seismic joint filler in a protected from weather environment are cracking and change in material properties. Depending on the specific application, the Fire Protection Program or the Structures Monitoring Program will manage the effects of aging. For clarification, these component line items will be separated into individual line items as follows.
			
			Delete the following line items:
			Penetration sealant(fire rated, 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
			
			Seismic joint filler // FB, SNS // Elastomer // Protected from weather // Cracking Change in material properties // Structures Monitoring, Fire Protection // VII.G-1 (A-19) // 3.3.1-61 // C
			
			Add the following line items:
			Penetration sealant (fire rated) // 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
			
			Seismic isolation joint // FB, SNS // Elastomer // Protected from weather // Cracking Change in material properties // Fire protection // VII.G-1 (A-19) // 3.3.1-61 // D
			
			Seismic isolation joint // SNS // 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.
				Patel, Erach	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
392	Accepted	[T.3.3.1-P-18] Table 3.3.1, item 3.3.1-64 for steel piping, piping components, and piping elements exposed to fuel oil. The intent of this line is to address the diesel-driven fire pump, which is why the Fire Protection Program is recommended by the GALL Report. PNPS states that this line item was not used. Loss of material of steel components exposed to fuel oil was addressed by other items including line Items 3.3.1 20 and 3.3.1 32. The Fire Protection program specifies that the diesel driven fire pump be periodically tested to ensure that the fuel supply line can perform its intended function. PNPS B.1.13.1 has not taken any exception to this test and is identified as being consistent with the GALL program. However, B.1.13.1, Fire Protection program is not credited in line item 3.3.1 20. Please clarify if PNPS has a diesel driven fire pump and if not, should an exception be taken to the GALL Report AMP. If PNPS does have a diesel driven fire pump, where in the LRA section 3.3 is it addressed and is the Fire Protection program credited.	PNPS has a diesel driven fire pump with components addressed in Table 3.3.2-9. The fuel oil supply to the diesel driven fire pump is included in Table 3.3.2-7. The line item of carbon steel piping with a fuel oil internal environment in Table 3.3.2-7 for the fuel supply line does not credit the Fire Protection Program. Although the programs credited in Table 3.3.2-7 for the fuel supply line provide an acceptable alternative approach to manage the effects of aging, in order to achieve consistency with NUREG-1801 the LRA will be revised to credit the Fire Protection Program. LRA Table 3.3.2-7 will be revised to add an additional line item to credit the Fire Protection Program to manage the fuel supply line in addition to the Diesel Fuel Monitoring Program. This will also require a change to line item 3.3.1-64 since the new line item will specify 3.3.1-64 as the Table 1 item. This requires an amendment to the LRA.	Patel, Erach	Fronabarger,
393	Closed	[T.3.3.1-P-19] Table 3.3.1, item 3.3.1-72 for steel HVAC ducting and components internal surfaces exposed to condensation (Internal). However, there is only line in Table 2 where this Table 1 line item is referenced. This line item is in Table 3.3.2-3, RBCCW system and the component is heat exchanger housing. PNPS states in the discussion column of line 3.3.1-72 that loss of material of steel component internal surfaces exposed to condensation is managed by the System Walkdown Program. The System Walkdown Program manages loss of material for external carbon steel components by visual inspection of external surfaces. For systems where internal carbon steel surfaces are exposed to the same environment as external surfaces, external surfaces condition will be representative of internal surfaces. Thus, loss of material on internal carbon steel surfaces is also managed by the System Walkdown Program. Please clarify how PNPS concluded that the internal surface of the heat exchanger is the same as the external surface in the RBCCW system.	The internal components of the heat exchanger housing have the potential for being exposed to a combination of low temperature closed cooling water and high dewpoint indoor drywell air which could result (though not expected) in condensation on the cooling coil that would be collected in the bottom of the housing. Condensation was also identified on the un-insulated external surfaces of the heat exchanger housing due to the potential of the housing surface temperature downstream of the cooling coil being less than or equal to the dew point of the surrounding air in the drywell. These environments were conservatively identified even though the expected environment would be indoor air with no condensation since the cooling water temperature is normally maintained at ~ 80°F. System Walkdown was credited because the expected environment for both the internal and external surfaces would be the same in either case.	Patel, Erach	Orlicek, Jack

Number	Status	Request	Response	NRC	PNPS Lead
394	Accepted	[T.3.3.2-P-01] Component types filter housing and turbo charger in Table 3.3.2-9, Fire Protection - Water system and piping in Table 3.3.2-10, Fire Protection - Halon system reference Table 3.2.1, item 3.2.1-32. This Table 1 line item addresses steel piping and ducting components and internal surfaces exposed to air-indoor uncontrolled (internal) environment. Discussion column of item 3.2.1-32 credits System Walkdown, Periodic Surveillance and Preventive Maintenance, and One-Time Inspection programs. However, the Table 3.3.2-9 and Table 3.3.2-10 components identified above credit Fire Protection Program, which is not credited in the discussion column of item 3.2.1-32. Furthermore, the program description of LRA Appendix B.1.13.1, Fire Protection Program does not include inspection of the above identified components. Please clarify the discrepancy between the credited programs in item 3.2.1-32 and the program credited for the above identified component types. Also, please justify why the Fire Protection program description does not address inspection of these component types in these two systems or enhance the program to include these inspections.	Since it manages internal and external surfaces with the same material and environments, the System Walkdown Program described in B.1.30 is a more appropriate program for the line items in Table 3.3.2-9 that have indoor air (int) as an environment and credit the Fire Protection Program. In addition, line item 3.2.1-32 should include the Fire Protection Program since Table 3.3.2-10 includes Halon system piping internal surfaces that credit the Fire Protection Program and rollup to this line item. This requires an amendment to the LRA.	Patel, Erach	Fronabarger,
395	Closed	[T.3.3.2-P-02] Component types heat exchanger tubes in Table 3.3.2-4, Emergency Diesel Generator system and Table 3.3.2-9, Fire Protection - Water system are made from copper alloy and exposed to lubricating oil environment, which reference Table 3.2.1, item 3.2.1-9. PNPS only credits the Oil Analysis program. This issue is the same as in question T.3.3.1.3.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. See response to item 376.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
396	Closed	[T.3.3.2-P-03] Component types heat exchanger tubes in Table 3.3.2-5, Station Blackout diesel Generator system, and Table 3.3.2-6, Security Diesel Generator system are made from steel and exposed to an external environment of fuel oil with an aging effect of reduction of heat transfer due to fouling, which reference Table 3.4.1, item 3.4.1-10. PNPS only credits the Oil Analysis program. This issue is the same as in question T.3.3.1.3 Also, please clarify why one of the above component type identifies footnote 'D', whereas the other identifies footnote 'E', even though they have the same MEAP combination.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Patel, Erach	Fronabarger,
397	Closed	[T.3.3.2-P-04] Steel component types thermowell, tubing and valve body in Table 3.3.2-14-19, Off-Gas system reference Table 3.4.1, item 3.4.1-13, which credits water chemistry and one-time inspection program for verification. However the table 2 line items do not credit the verification program. This is the same issue as questions G.3.3.1.2 and T.3.3.1.2.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
398	Closed	[T.3.3.2-P-05] Stainless steel component types thermowell, tubing and valve body in Table 3.3.2-14-19, Off-Gas system reference Table 3.4.1, item 3.4.1-14, which credits water chemistry and one-time inspection program for verification. However the table 2 line items do not credit the verification program. This is the same issue as questions G.3.3.1.2 and T.3.3.1.2.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
399	Closed	[T.3.3.2-P-06] Steel component types ejector, heat exchanger shell, orifice, piping, pump casing, thermowell, and valve body in Table 3.3.2-14-19, Off-Gas system reference Table 3.4.1, item 3.4.1-2, which credits water chemistry and one-time inspection program for verification. However the table 2 line items do not credit the verification program. This is the same issue as questions G.3.3.1.2 and T.3.3.1.2.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Patel, Erach	Fronabarger,
400	Accepted	[T.3.3.2-P-07] Table 3.3.2-14-27, RWCU system, steel component type heat exchanger shell, in treated water environment with an aging effect of loss of material, PNPS credits Water Chemistry Control - Closed Cooling Water program and references Table 3.3.1, line item 3.3.1-17. However, line item 3.3.1-17 addresses Water Chemistry Control - BWR program. Should line item 3.3.1-47 be referenced, which addresses the Water Chemistry Control - Closed Cooling Water for the same MEAP combination? Please supplement the LRA accordingly.	The appropriate entries for the last three columns for the line in Table 3.3.2-14-27, RWCU system, steel component type heat exchanger shell, in treated water environment with an aging effect of loss of material, are VII.C2-14 (A-25), 3.3.1-47, and D. This requires an amendment to the LRA.	Patel, Erach	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
401	Accepted	[T.3.3.2-P-08] Table 3.3.2-14-27, RWCU system, stainless steel component type orifice, in treated water environment with an aging effect of loss of material, references Table 3.3.1, line item 3.3.1-17. However, this line item is for steel components. Should line item 3.3.1-24 be referenced, which addresses stainless steel components for the same EAP? Please supplement the LRA accordingly.	The appropriate Table 1 Item entry for the line in Table 3.3.2-14-27, RWCU system, stainless steel component type orifice, in treated water environment with an aging effect of loss of material, is 3.3.1-24. This requires an amendment to the LRA.	Patel, Erach	Lingenfelter,
402	Closed	[3.5.2.2.1.4-H-01] Loss of material due to General, Pitting and Crevice Corrosion. Please, explain for your last statement in this section as it said: "Therefore, significant corrosion of the drywell shell is not expected". Does this mean you DO have some corrosion? If not, why significant?	As stated in Section 3.5.2.2.1.4, PNPS inspections of the drywell shell below floor level identified no evidence of corrosion of the drywell shell. The drywell shell steel has a coated surface and no degradation of this coating was identified. The statement in question is not addressing the current condition but rather the conditions expected in the future. It is difficult to say there will be absolutely no corrosion in the future, but there is reasonable assurance that corrosion, if any, will not be significant or meaningful with respect to degradation.	Hoang, Dan	Ahrabli, Reza
403	Closed	[3.5.2.2.1.7-H-01] Stress Corrosion Cracking (SCC) becomes significant for stainless steel if a tensile stress and a corrosion environment exist. The stress may be applied external or residual (internal). Visual VT-3 examinations may be unable to detect this aging effect. Potential susceptible components at PNPS are penetration sleeves and bellows. Please identify the "Other" method of examination to detect this style of effect?	The "other" method which may be used to detect cracking is the existing Containment Leak Rate Program with augmented ultrasonic exams. Observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. The Containment Leak Rate Program is described in Appendix B.	Hoang, Dan	Ahrabli, Reza
404	Closed	[3.5.2.2.2.1-H-01] Aging of structures not covered by Structures Monitoring Program. Do you (PNPS) have any operating experience related to this area? Please, provide the details.	As stated in Section 3.5.2.2.2.1 of the LRA, PNPS has no structures that are not covered by Structures Monitoring Program that are within the scope of license renewal and subject to aging management review.	Hoang, Dan	Ahrabli, Reza
405	Closed	[3.5.2.2.2.1.8-H-01] Lock Up due to wear for Lubrite Radial beam Seats in BWR drywell and other Sliding Support Surfaces.. As indicated in this section that "...lock-up due to wear is not an aging effect requiring management at PNPS. However, Lubrite plates are including within the Structures Monitoring Program and Inservice Inspection (ISI-IWF) Programs..." Please, provide the cross reference in between these two programs.	The lubrite plates associated with the radial beam seats are inspected under the Structures Monitoring Program. The lubrite plates associated with the torus support structure are inspected by the ISI (IWF) program.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
406	Closed	[3.5.2.2.2.6-H-01] Aging Support not covered by Structures Monitoring Program. Please provide: 1. More information is needed about bolting materials used in structural applications at PNPS including Group B1.1 applications. What are the bolting materials used? What are the nominal yield strengths and upper-bound as-received yield strengths? Describe the PNPS resolution of the bolting integrity generic issue, as it relates to structural bolting. Was any structural bolting identified as potentially susceptible to cracking due to SCC? Was any structural bolting replaced as part of the resolution? 2. Describe the scope and AMR for Class MC Pressure Retaining Bolting. How is loss of preload managed?	Need clarification. What is meant by "the bolting integrity generic issue"? 1) Bolting material at PNPS consists of A325 – Type 1 conforming to ASTM-A325 and A490 Type 1 conforming to ASTM-A490, per PNPS specification C-94-ER-Q-E3. The nominal yield strength for A325 is 92 ksi and for A490 is 130 ksi. For structural bolting applications, PNPS is consistent with NUREG 1801 in managing the effects of aging with the structures monitoring program or ISI (IWF), as applicable. No PNPS bolting has been identified that is susceptible to SCC. 2) In general, PNPS manages loss of material for bolting with visual inspections. For structural bolting, the visual inspections are part of the Structures Monitoring Program. Loss of preload due to stress relaxation (creep) would only be a concern in very high temperature applications (> 700°F) as stated in the ASME Code, Section II, Part D, Table 4. No PNPS structural bolting operates at >700°F. Therefore, loss of preload due to stress relaxation (creep) is not an applicable aging effect for structural bolting. Other causes of loss of preload include inadequate bolted joint design and ineffective maintenance practices. Loss of preload due to these causes is prevented by incorporation of industry guidance for good bolting practices into PNPS procedures for design and maintenance of bolted joints.	Hoang, Dan	Ahrabli, Reza
407	Accepted	[3.5.1-13-H-01] In Table 3.5.2-1 on Page 3.5-51 of the LRA, for component Bellows 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. This AMP is consistent with NUREG-1801 the GALL description. Table 1 line item 3.5.1-13 bellows. Explain how the plant-specific PNPS CII-IWE AMP is consistent with the GALL specified AMP.	Line item 3.5.1-13 addresses steel, stainless steel elements, dissimilar metal welds: torus; ventline; vent header; ventline bellows and downcomers. For PNPS ventline bellows and associated welds, this line item is consistent with the NUREG-1801 AMR results, but the PNPS CII-IWE program described in Appendix B is a plant-specific program. The Drywell to torus vent line bellows item on LRA Page 3.5-51 references line item 3.5.1-13 and correctly indicates Note "E". For the Bellows (reactor vessel and drywell) line item in Table 3.5.2-1 on Page 3.5-51 of the LRA, reference to line item 3.5.1-13 is not appropriate. The Table 3.5.2-1 line item "Bellows (reactor vessel and drywell)" and the corresponding line item in Table 2.4-1, Page 2.4-13, were inadvertently included in the LRA and 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. Deleting the line items discussed above requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
408	Accepted	[3.5.1-16-H-01] In Table 3.5.2-1 on page 3.5-55 of the LRA for Primary Containment Electrical Penetration seals and sealant, 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.	PNPS primary containment does not have a moisture barrier. Therefore an AMP is not required. The referenced line item on Page 3.5-55 applies only to primary containment electrical penetration seals and sealant. 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 PNPS, the Containment Leak Rate program manages cracking and change in material properties for the primary containment seals and gaskets. There is no moisture barrier where the drywell steel shell becomes embedded in the drywell concrete floor." This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
409	Accepted	[3.5.1-44-H-01] In Table 3.5.2-6 on Page 3.5-83 of the LRA, for component seals and gaskets, 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 the Structures Monitoring Program. The GALL line item referenced is III.A6-12 and the Table 1 reference is 3.5.1-44. The note shown is E, a 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.	In Table 3.5.2-6 on Page 3.5-83 of the LRA, for component seals and gaskets, material rubber in a protected from weather environment, Note "E" was used because it applies to the top half of the line item. The LRA will be clarified to indicate that Note "A" applies to the lower half of the line item. This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
410	Accepted	[3.5.1-58-H-01] In Table 3.5.2-6 on Page 3.5-73 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.	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 often subjective. In this particular case, panels, which have no specific function other than to support and protect electrical equipment, were considered support members and Note A was applied. The use of either Note A or C has no 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 3.5-73 of the LRA. No change is required to the other entries for this line item. This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
411	Accepted	[3.5.1-8-H-01] In Table 3.5.2-1 on Page 3.5-54 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.	For Table 3.5.2-1 on Page 3.5-54 of the LRA for component Torus shell with the aging effect cracking-fatigue, Note "E" will be changed to Note "A". This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
412	Accepted	[3.5.1-5-H-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 difficult 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.	For LRA Table 3.5.1, Item 3.5.1-5, the discussion in Section 3.5.2.2.1.4, Page 3.5-9, should have the reference to moisture barrier deleted, since the PNPS drywell does not contain this commodity. For LRA Table 3.5.1, Item 3.5.1-5, the discussion column should read: "The drywell steel shell and the area where the drywell shell becomes embedded in the drywell concrete floor are inspected in accordance with the Containment Inservice Inspection (IWE) Program." The last sentence of the first paragraph in LRA Section 3.5.2.2.1.4, should read: "The drywell steel shell and the area where the drywell shell becomes embedded in the drywell concrete floor are inspected in accordance with the Containment Inservice Inspection (IWE) Program." This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
413	Accepted	[3.5.1-9-H-01] 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. This should be read as 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.	Fatigue analyses have been evaluated for the torus, torus vent system, and torus penetrations. The following line will be added to Table 3.5.2-1: "Torus mechanical penetrations // PB, SSR // Carbon steel // Protected from weather // Cracking // TLAA-metal fatigue // II.B4-4(C-13) // 3.5.1-9 // A" The evaluation of the 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. Fatigue for the vent system is event-driven and is not an age-related effect. The discussion column entry for Table 3.5.1 item 3.5.1-8 will be changed to read as follows: "Fatigue analysis is a TLAA for the torus shell. Fatigue of the 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 read as follows: "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 read as follows: "TLAA identified for structural components and commodities include fatigue analyses for the torus and torus penetrations. These topics are discussed in Section 4.6." These changes require an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
414	Accepted	[3.5.1-12-H-01] LRA Table 3.5.1, Item Number 3.5.1-12 and 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.	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 Containment Leak Rate Program with augmented ultrasonic 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 requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
415	Closed	[3.5.1-16-H-01] 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 PNPS. One of the components for this item number is moisture barriers. Explain how PNPS 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.	There is no gap to seal at the joint between the containment drywell shell and the concrete floor. Concrete grout is poured directly against the drywell shell. The installation is shown as Detail 1 on Drawing C-71. The Containment Inservice Inspection Program includes inspection of this joint. (Also see audit question #408 which addresses changes to LRA)	Hoang, Dan	Ahrabli, Reza
416	Closed	[3.5.1-33-H-01] For LRA Table 3.5.1, Item Number 3.5.1-33, provide the maximum temperatures that concrete experience in Group 1-5 structures.	The maximum bulk area ambient temperatures for Groups 1-5 occurs in the drywell and is an average temperature of 148°F, reference UFSAR Table 5.2-2. For structures outside the drywell the bulk area maximum temperature is 120°F for Groups 1-5 structures as identified in Table 10.9-2 of PNPS UFSAR. Concrete within the drywell consist of the reactor pedestal, sacrificial shield wall and the drywell floor. Assurance that bulk concrete temperatures within the drywell remain below 150 degrees F is obtained through maintaining average bulk containment temperature within the limits allowed by PNPS Technical Specification Section 3.2-H (Page 3/4.2-5). Although upper elevations of the drywell may exceed 150°F, the concrete of the drywell is at lower elevations. The drywell cooling system provides cooling to ensure temperature limits are not exceeded. The highest concrete in the drywell is the sacrificial shield wall. The concrete in this wall is not load bearing.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
417	Accepted	[3.5.1-34-H-01] 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.	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 PNPS environment is not aggressive as noted in LRA Table 3.5.1, Item Number 3.5.1-34, under the discussion column. For clarification, 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)". This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
418	Accepted	[3.5.1-35-H-01] 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.	For clarification, LRA Table 3.5.1, Item 3.5.1-35 discussion will be revised to add reference to Section 3.5.2.2.2.4(2). LRA Table 3.5.1, Item 3.5.1-35 discussion will be revised to refer to ACI 318 in lieu of ACI-301, since the provided reference to ACI should have been ACI 318 and not ACI 301. This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
419	Accepted	[3.5.1-36-H-01] 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).	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 PNPS 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) and 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 PNPS 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. This change requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
420	Accepted	[3.5.1-40-H-01] 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 PNPS 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.	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 3.5-55), "foundation" in Tables 3.5.2-2 through 3.5.2-5 (pages 3.5-59, 3.5-61, 3.5-64, and 3.5-67), and as "Equipment pads/foundations" in Table 3.5.2-6 (page 3.5-80). Further evaluation is provided in LRA section 3.5.2.2.2.6(1), page 3.5-15. For clarification, 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.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
421	Accepted	[3.5.1-50-H-01] LRA Table 3.5.1, Item Number 3.5.1-50, under the discussion column, states that loss of material is not applicable to PNPS. 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 PNPS components which are within the scope of license renewal and exposed to an outdoor air environment. Discuss the location of these components at PNPS and how they are protected from constant wetting and drying conditions.	For LRA Table 3.5.1, Item Number 3.5.1-50, the discussion column should read: "This aging effect is managed by the Structures Monitoring Program." Components that may be considered in the B2 and B4 grouping consist of those line items in Table 3.5.2-6 with materials galvanized steel, aluminum, or stainless steel. This requires an amendment to the LRA.	Hoang, Dan	Ahrabli, Reza
422	Accepted	[3.5.1-52-H-01] 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 ever been a component failure at PNPS due to any of these conditions. Explain if there has ever 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 PNPS and provide the environment they are exposed to.	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 PNPS 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 PNPS. For clarification, 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.	Hoang, Dan	Ahrabli, Reza

Number	Status	Request	Response	NRC	PNPS Lead
423	Accepted	[3.5.1-54-H-01] 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 ever been a component failure at PNPS due to any of these conditions. Explain if there has ever been a component failure in the nuclear industry due to any of these conditions. Explain what PNPS 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.	The discussion for Item Number 3.5.1-54 was not implying 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 3.5-71), and component and piping supports (Page 3.5-72). Component failures at PNPS 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. PNPS inspections during VT-3 visual examinations of groups B1.1, B1.2 and B1.3 components are consistent with what is required by code. For clarification, 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.	Hoang, Dan	Ahrabli, Reza
424	Accepted	Table 3.3.2-4, Emergency Diesel Generator System, for carbon steel expansion joints in an internal environment of exhaust gases credits the TLAA – fatigue for managing cracking due to fatigue. TLAA section 4.3.2, Non-Class 1 Fatigue, assumes, in general 7000 thermal cycles for piping systems, allowing a stress reduction factor of 1.0 in the stress analysis. This is a good assumption for pipe, fittings, etc., however, may not be a good assumption for expansion joints. Please confirm if the expansion joints are included in section 4.3.2, and justify that the assumption of 7000 cycles is appropriate.	PNPS included the expansion joint with the exhaust piping in Section 4.3.2 of the LRA. PNPS documentation does not identify any design code for the expansion joint separate from the exhaust piping (B31.1). Partial cycles are not a concern for the diesel exhaust system since the exhaust temperature is assumed to reach normal operating temperature with each start of the engine. The expansion joint is exposed only to the same number of full cycles to which the rest of the piping is exposed. The expansion joint is designed specifically to accommodate movement that could result from the heating and cooling of the exhaust piping; in other words, its design intent is to have better fatigue response than the rest of the piping. Therefore, PNPS assumed the piping would be more limiting than the expansion joint for the allowable number of cycles prior to requiring management of cracking due to fatigue.	Patel, Erach	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
425	Open – NRC	As part of the Thermal Power Optimization Project, GE performed another fatigue analysis. GE issued a report, GE-NE-0000-0000-1892-02, Rev. 0, March 2002, Thermal Power Optimization, Task–302 – RPV – Stress Evaluation. This report calculated new CUFs, which in some cases are different than what is shown in the LRA, Table 4.3-1, Maximum CUFs for Class 1 Components. The GE Report, Section 3.3, Results, states that feedwater nozzle CUF recalculation indicate a CUF that went from <0.8 to <1.0. Similarly, Table 3.3.1.3 fatigue summary, last column, indicates CLTP/TLTP values. Again, specific values are provided for 3 line items, however, for feedwater nozzle, only <1.0 is specified. Please justify what <1.0 means. Please provide a specific calculated value. Also, please justify why the revised TPOP CUF values were not identified in the LRA Table 4.3-1, instead of old values calculated by ALTRAN Corporation in 1994. Are there other LRA TLAA sections affected by the TPO project, such as Section 4.2, RPV Neutron Embrittlement Analysis.	a) The Pilgrim records system had not been updated to include the changes in CUF due to the 2003 TPO program in time to support LRA preparation. TPO has a small impact on CUF as detailed in GE-NE-0000-000-1898-02, Rev. 1, 3/2002. The records system has been updated and the PNPS corrective action program requires that the information be assessed for potential impact on other LRA sections. PNPS will update LRA table 4.3-1 to include the values from the TPO. In preparing the TPO stress evaluation, GE reviewed only those RPV components whose pressure, temperature, and flow conditions were more severe due to the TPO and with fatigue usage factors greater than 0.5. These CUFs were not recalculated by traditional methods, but rather were estimated by conservatively scaling the stresses, determining the code allowable number of cycles for those stresses, then determining the incremental usage factor for a group of cycles considered in the original stress report. Before the TPO, the CUF for the feedwater nozzle (Altran Report) was listed as <0.8, for the TPO this CUF increased to <1.0. No precise value was calculated. As stated in the response to Question 345, PNPS will perform a new feedwater nozzle fatigue analysis prior to the period of extended operation. b) No other sections of the LRA are affected by the TPO. The fluence values used in Section 4.2 were based on the higher power level.	Patel, Erach	Finnin, Ron
426	Accepted	[T.3.3.2-P-09] Table 3.3.2-4, EDG System, page 3-78, for carbon steel expansion joints, in an internal environment of exhaust gas credits TLAA-fatigue to manage the aging effect of cracking due to fatigue. Please confirm if TLAA Section 4.3.2, Non-Class 1 Fatigue, includes these expansion joints. Also, see TLAA question 8.	TLAA-metal fatigue is not an aging management program. Under the standard LRA format, TLAA-metal fatigue is inserted under the aging management program as a convenience to indicate that a TLAA for metal fatigue applies to that line item. The carbon steel expansion joints are designed per the requirements of ASME B31.1 for a limited number of thermal cycles. The evaluation of fatigue for ASME B31.1 components is discussed in Section 4.3.2. The evaluation determined that the EDG components will remain below the cycle limit for 60 years such that cracking is not expected.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
427	Closed	[T.3.3.2-P-10] For aging effect of cracking due to fatigue, PNPS has credited TLAA - metal fatigue as an aging management program for components in an internal environment of exhaust gas in Table 3.3.2-4, EDG Systems; however in Table 3.3.2-5, SBDG System and Table 3.3.2-6, SDG System, the Periodic Surveillance and Preventive Maintenance (PSPM) Program is credited, which includes visual or other NDE techniques to inspect exhaust system components to manage cracking. Please justify why the PSPM program is not credited for the EDG system components for managing aging effect of cracking. It is only credited for loss of material and fouling.	TLAA-metal fatigue is not an aging management program. Under the standard LRA format, TLAA-metal fatigue is inserted under the aging management program as a convenience to indicate that a TLAA for metal fatigue applies to that line item. The EDG exhaust systems are designed per the requirements of ASME B31.1 for a limited number of thermal cycles. The evaluation of fatigue for ASME B31.1 components is discussed in Section 4.3.2. The evaluation determined that the EDG components will remain below the cycle limit for 60 years such that cracking is not expected. The exhaust systems for the station blackout diesel generator and security diesel generator are not designed to a code or standard where thermal cycles are a consideration. Therefore, the Periodic Surveillance and Preventive Maintenance (PSPM) program will manage or confirm the absence of cracking due to thermal fatigue.	Patel, Erach	Lloyd, Leland
428	Closed	[T.3.3.2-P-11] Table 3.3.2-9, Fire Protection - Water System, for piping, silencer and turbocharger in an internal exhaust gas environment with an aging effect of cracking due to fatigue, PNPS has credited the Fire Protection Program to manage this aging effect. The program element 6, Acceptance Criteria, is enhanced to verify that the diesel engine did not exhibit signs of degradation while it was running; such as exhaust gas leakage. Please justify how the aging effect of cracking is managed by verifying for exhaust gas leakage. If there is leakage, it implies a through-wall crack has occurred. Verifying for leakage is not an adequate aging management program for managing cracking.	The aging effect of fatigue cracking is conservatively identified for the fire pump diesel engine. If the exhaust components were designed per ASME B31.1 code, a limited number of cycles would be the threshold for susceptibility to cracking due to fatigue. Since the system is normally in standby and used primarily during testing, it is unlikely to reach any legitimate threshold to produce fatigue cracking. Furthermore, through monitoring and trending of performance data under the Fire Protection Program, cracking of system components will be identified and corrected through the corrective action program. As described in section B.1.13.1, observation of degraded performance produced corrective actions including engine replacement in 2002 prior to loss of intended function. Consequently, continued implementation of the Fire Protection Program provides reasonable assurance aging effects will be managed for the diesel fire pump exhaust subsystem. In addition, PNPS performs fire pump inspection, testing and maintenance in accordance with NFPA 25 which would also detect the presence of cracking in the exhaust system prior to loss of intended function. This item is closed to item 378.	Patel, Erach	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
429	Closed	[T3.3.2-P-12] In LRA Section 3.3.2.2.7.3, PNPS states that the carbon steel diesel exhaust piping and components in the fire protection system is managed by the Fire Protection Program. The Fire Protection Program uses visual inspections of diesel exhaust piping and components to manage loss of material. If Fire Protection Program (LRA B.1.13.1) is credited for managing aging of these components, please explain why these system components are not included in the program description of the Fire Protection Program. Furthermore, no enhancement is addressed that would include these components in the Fire Protection Program.	The program description listed in Section B.1.13.1 matches the description cited in GALL section XI.M26, Fire Protection which includes the diesel driven fire pump. The exhaust piping and components are part of the fire pump. Enhancements for aging management of the exhaust subsystem are described for attributes 3-parameters monitored/inspected and 6-acceptance criteria of the program. This item is closed to item 378.	Patel, Erach	Fronabarger,
430	Closed	[T.3.3.2-P-13] Subsequent to question T.3.3.2.1, the applicant has credited Fire Protection Program in lieu of GALL AMP XI.M38, Inspection of Internal Surfaces of Miscellaneous Piping and Ducting Components as recommended for GALL item V.D2-16, which is referenced by the applicant for these line items. The GALL AMP XI.M38 states that visual inspection of internal surfaces of plant components is performed during maintenance or surveillance activities for visible evidence of corrosion to indicate possible loss of material. Since PNPS is using the Fire Protection Program in lieu of GALL AMP XI.M38, please explain how the Fire Protection Program performs this visual inspection. As written in the LRA, the Fire Protection Program is not adequate to manage loss of material for these components.	See the response to Item 394 that addresses items in Table 3.3.2-9. For the piping component line item in Table 3.3.2-10 that has indoor air (int) as an environment the Fire Protection Program includes a visual inspection of the external surfaces of the Halon system piping and tanks. Since external surfaces are representative of internal surfaces that are exposed to the same environment, the Fire Protection Program is adequate for managing the aging effects of components exposed to indoor air. This item is closed to item 378.	Patel, Erach	Fronabarger,
431	Closed	[T3.2.2-P-01] Table 3.2.2, question 1 The PNPS B.1.12 Fatigue Monitoring is credited for managing the aging effect "Cracking fatigue" for components in the RHR (Table Number 3.2.2- 1), ADS (Table Number 3.2.2- 3), HPIC (Table Number 3.2.2 4), RCIC (Table Number 3.2.2 5) systems. In most cases the components have been assigned Note "A" or Note "C". However, the PNPS B.1.12 Fatigue Monitoring program has exceptions to the GALL program, X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary. Therefore, Note "C" should be Note "D" and Note "A" should be Note "B" as appropriate for these components.	NUREG-1801 does not specify X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary in the AMP column for items identifying cumulative fatigue damage. NUREG-1801 identifies fatigue as a TLAA and refers to guidance in SRP Section 4.3 which in turn describes treatment of fatigue in a variety of ways depending on the component. Since NUREG-1801 does not credit the Fatigue Monitoring Program, exceptions in this program have no bearing on the selection of notes.	Pavinich, Wayne	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
432	Closed	[T3.2.2-P-02] Table 3.2.2, question 2 The PNPS B.1.30 System Walkdown Program is used to detect LOM for carbon steel bolting instead of GALL XI.M18 Bolting Integrity. XI.M18 invokes visual VT-1 examination for bolting less than 2 inches in diameter. It is not clear if VT 1 is used for bolting that is examined in accordance with the System Walkdown Program. What standard is used for visual inspection of bolting under the System Walkdown Program.	A Bolting Integrity Program will be developed 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 32. This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable. This item is closed to Item 373.	Pavinich, Wayne	Fronabarger,
433	Closed	[T3.2.2-P-03] Table 3.2.2, question 3 Stainless steel and steel components that are exposed to treated water in Table 3.2.2 do not specify one-time inspection to detect loss of material although Table 3.2.1 indicates OTI. Add OTI as AMPs for these components for consistency with Table 3.2.1 or provide a justification for not performing OTI.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. LRA Table 3.2.1 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Pavinich, Wayne	Fronabarger,
434	Closed	[T3.2.2-P-04] Table 3.2.2, question 4 It is not clear if the System Walkdown Program provides for inspection interior surfaces of carbon steel components exposed to indoor air for LOM. Please provide details showing inspection of interior surfaces for this component.	The System Walkdown Program is not intended to inspect interior piping and component surface unless they have been exposed 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 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.	Pavinich, Wayne	Fronabarger,
435	Closed	[T3.2.2-P-05] Table 3.2.2, question 5 Item numbers 3.2.2-4, 3.2.2-5, and 3.3.2-14-16 are stainless steel piping components (e.g. orifices, strainers). Please explain why Note "C" was assigned to these components.	The various piping components in tables 3.2.2-4, 3.2.2-5, and 3.3.2-14-16, to which Note "C" was assigned, have steam as the environment. The systems represented by these tables are all ESF systems; however, NUREG-1801 does not include the combination of stainless steel in a steam environment for any ESF component (Chapter V). Consequently, comparisons were made to steam and power conversion systems components (Chapter VIII) where the stainless steel/steam combination is addressed. Since the systems do not match, a Note "C" is applied.	Pavinich, Wayne	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
436	Closed	[T3.2.2-P-06] Table 3.2.2, question 6 Item number 3.3.2-14-16, are steel piping components (e.g. orifices, strainers). Please explain why Note "C" was assigned to these components.	The various steel piping components in table 3.3.2-14-16, to which Note "C" was assigned, have steam as the environment with the aging effect of either cracking – fatigue or loss of material. The system represented by this table is an ESF system; however, the only aging effect identified in the NUREG-1801 ESF tables (Chapter V) for a combination of steel in a steam environment, is flow accelerated corrosion. Consequently, comparisons were made to steam and power conversion systems components (Chapter VIII) where the steel/steam combination includes cracking – fatigue and loss of material as aging effects. Since the systems do not match, a Note "C" is applied.	Pavinich, Wayne	Lingenfelter,
437	Closed	[T3.2.2-P-07] Table 3.2.2, question 7 SRP-LR, 3.2.2.2.8 Loss of material due General, Pitting, and Crevice Corrosion, Item 3 provides for the verification of the effectiveness of the lubricating oil program through one-time inspection of selected steel components at susceptible locations. Carbon steel components are not, specifically or through a representative component, subjected to a one-time inspection for loss of material. Add OTI as AMPs for these components for consistency with Table 3.2.1 or provide a justification for not performing OTI.	During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Pavinich, Wayne	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
439	Closed	[T3.2.2-P-09] Table 3.2.2, question 9 The GALL specifies XI.M20, Open-Cycle Cooling Water System Program for carbon steel piping and PNPS credits the plant-specific Periodic Surveillance and Preventive Maintenance Program. Although the plant-specific program provides for visual and/or UT inspection as in XI.M20, it does not provide for preventive actions. What is the justification for not implementing preventive actions?	Item 3.2.1-35 specifies the Periodic Surveillance and Preventive Maintenance Program instead of XI.M20, Open-Cycle Cooling Water System Program, because the environment indicated as raw water in tables 3.2.2-6 and 3.2.2-7 is used to identify water which is untreated but is not part of the raw cooling water system. Therefore, the preventive actions from GL 89-13 that are described in NUREG-1801 XI.M20 do not apply. The remaining preventive action specified in XI.M20 is not actually an ongoing AMP element, but is the design consideration that components are constructed of appropriate materials. The site corrective action program provides reasonable assurance that if appropriate materials were not provided in the original component design, any resulting problems would be evaluated and appropriate corrective actions would be taken to address those problems.	Pavinich, Wayne	Ivy, Ted
440	Closed	[T3.2.1-1-P-01] Table 3.2.1-1, question 1 The PNPS LRA, Section 3.2.2.2.1 indicates that cumulative fatigue damage is a TLAA evaluated in accordance with 10CFR54.21(c). However, PNPS aging management reviews do not consider cumulative fatigue damage a concern for steel or stainless steel unless system temperature exceeds 220 degrees F or 270 degrees F, respectively which is not a condition of the SRP LRA Section 3.2.2.2.1. Provide an analysis that justifies the exemption of evaluation for cumulative fatigue damage for steel or stainless steel components in systems that operate below 220 degrees F or 270 degrees F, respectively.	The use of 220 degrees (carbon steel) and 270 degrees (stainless steel) as a screening criteria below which there is no consideration of mechanical fatigue as an aging mechanism is documented in Appendix H to EPRI 1003056, "Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools," usually referred to as the Mechanical Tools. This document takes the screening limits of 220/270 degrees from the EPRI Fatigue Management Handbook, TR-104534. Fatigue is based on thermal cycles seen by the component, and if the component doesn't go above these temperatures it is not seeing thermal cycles large enough to contribute to fatigue.	Pavinich, Wayne	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
441	Closed	[T3.2.1-3-P-01] Table 3.2.1-3, -5, -6, -8, -9, -10, -14, -15, -16 -18, question 2 These item numbers specify One-Time Inspection along with another program such as Water Chemistry or Lubricating Oil Analysis. However, Table 3.2.2 components that correspond to these Table 3.2.1 items do not specify one time inspection to detect loss of material. Please change component line items to include One-Time Inspection or provide the basis for excluding OTI.	Since the One-Time Inspection (OTI) Program is applicable to each water chemistry control program, it is also applicable to each line item that credits a water chemistry control program. LRA Table 3.2.1 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. Table 2 credits the OTI program through reference to the associated Table 1 line item. During the performance of routine maintenance on components that contain lubricating oil, visual inspections of these components would identify degraded conditions that could be attributed to an ineffective Oil Analysis Program. The corrective action program at PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified as part of this program. The review of operating experience at PNPS for the last five years did not identify any condition reports that indicated an ineffective oil analysis program or that identified degraded component conditions such as corrosion or cracking in a lubricating oil environment. This review of operating experience at PNPS serves in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372. During the past five years, many visual inspections of components containing lubricating oil have been performed during corrective and preventive maintenance activities. The visual inspections of these components would identify degraded conditions such as corrosion or cracking that could be attributed to an ineffective Oil Analysis Program. PNPS has a low threshold for the identification of degraded conditions such that corrosion or cracking of components would be identified and entered into the corrective action program. No condition reports that identified degraded component conditions, such as corrosion or cracking in a lubricating oil environment, were initiated as a result of these inspections. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Oil Analysis Program. This item is closed to Item 376.	Pavinich, Wayne	Fronabarger,

Number	Status	Request	Response	NRC	PNPS Lead
442	Closed	[T3.2.1-35-P-01] Table 3.2.1-35, question 3 The GALL specifies XI.M20, Open Cycle Cooling Water System Program and PNPS credits the plant specific Periodic Surveillance and Preventative Maintenance Program. Although the plant specific program provides for visual and/or UT inspection as in XI.M20, it does not provide for preventive actions. Provide justification for not adhering to XI.M20.	Item 3.2.1-35 specifies the Periodic Surveillance and Preventive Maintenance (PSPM) Program instead of XI.M20, Open-Cycle Cooling Water System Program, because the environment indicated as raw water in tables 3.2.2-6 and 3.2.2-7 is used to identify water which is untreated but is not part of the raw cooling water system. Therefore, the preventive actions from GL 89-13 that are described in NUREG-1801 XI.M20 do not apply. The remaining preventive action specified in XI.M20 is not actually an ongoing AMP element, but is the design consideration that components are constructed of appropriate materials. The site corrective action program provides reasonable assurance that if appropriate materials were not provided in the original component design, any resulting problems would be evaluated and appropriate corrective actions would be taken to address those problems.	Pavinich, Wayne	Ivy, Ted
443	Closed	[General-P-01] In general, System Walkdown is credited for managing LOM for bolting. However, other aging effects may be active for bolting and System Walkdown does not provide for preventive actions. Aging Effects for bolting should be managed under the umbrella of a Bolting Integrity Program in accordance with GALL program XI.M18.	A Bolting Integrity Program will be developed 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 32. This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable. This item is closed to Item 373.	Pavinich, Wayne	Fronabarger,
444	Closed	[General-P-02] Components in the SGT system that are exposed to instrument air are managed with the plant-specific Instrument Air Quality Program (PNPS AMP B.1.17). This program only monitors the air quality. However, the GALL Compressed Air Monitoring Program, XI.M24, additionally requires testing for leakage rates, inspection for corrosion, and performance testing components. What program(s) provide for these additional requirements? If these additional requirement of XI.M24 are not covered by another program, please provide justification for not including them. This comment is applicable to the IA system as well.	Through monitoring of air quality, the Instrument Air Quality Program maintains instrument air free of significant contaminants and water, thereby preventing loss of material. This approach to managing loss of material is more effective than leakage monitoring and repetitive inspection for corrosion. Performance monitoring under the maintenance rule addresses active components that would be included in performance testing. No additional aging effects were identified whose management required these other attributes of the Compressed Air Monitoring Program, XI.M24. Recent internal inspections of the air receiver tanks and moisture checks of the instrument air system have not detected significant corrosion or moisture in the system. These past inspections at PNPS serve in lieu of a one-time inspection to provide confirmation of the effectiveness of the Instrument Air Quality program in managing aging effects of components exposed to instrument air without the additional program attributes recommended by GALL XI.M24.	Pavinich, Wayne	Nichols, Bill

Number	Status	Request	Response	NRC	PNPS Lead
445	Closed	[3.1.1-J-01] Some of the items that roll up to Item 3.1.1-2 are described in LRA Table 3.1.2-1 as in an environment of Treated Water > 220 deg F, and some are described as in Treated Water > 270 deg F. Please justify the use of two temperature ranges to describe the environments for the components that roll up to Item 3.1.1-2.	The actual environments for these components are all essentially the same regardless of the listed temperature. The environments specifying the two temperature ranges indicate that the system temperature is above the threshold value that can result in cracking due to fatigue for the specific component material. The nominal fatigue threshold for stainless steel is 270°F and for carbon steel, 220°F as stated in the EPRI Mechanical Tools (EPRI Report 1003056).	Jackson, Wilbur	Finnin, Ron
446	Closed	[3.1.1-J-02] In-core Housings; Nozzles - Head Seal Leak-Off (N12, N13).	Drawings were available for NRC review during the site visit.	Jackson, Wilbur	Chan, Laris
447	Closed	[3.1.1-J-03] In LRA Table 3.1.2-1, the Component Type ID Attachment Welds (core spray, dryer hold down pads, etc) are indicated as having the intended function of "pressure boundary." Please justify that these components provide a pressure boundary function.	The license renewal function of these components (pressure boundary) concerns the weld between the ID attachment and the vessel. Because these components are directly attached to the pressure boundary, they were conservatively given an intended function of pressure boundary. This is consistent with the treatment of vessel ID attachment welds in NUREG-1801 Sections IV.A1-12 and XI.M4.	Jackson, Wilbur	Finnin, Ron
448	Closed	[3.1.1-J-04] LRA Table 3.1.2-1 indicates that for ID Attachment Welds, the aging effect of "Cracking-fatigue" is managed by a TLAA. Please discuss whether these components are explicitly addressed in the TLAA or bounded by the results of the TLAA. What is the specific TLAA that manages the aging effects of "Cracking-fatigue" in these components?	These attachment welds are not specifically listed in the reactor vessel stress report; however, they are bounded by the results of that report. Any vessel stress report done per ASME Section III contains CUFs only for those locations that the designer felt could be fatigue limiting. While only these limiting areas are actually calculated, the stress report covers the entire vessel. A copy of the vessel stress report (Combustion Engineering CENC-1139) was provided to the inspector.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
449	Closed	[3.1.1-J-05] In LRA Table 3.1.2-3, carbon steel piping and fittings and valves in a treated water environment are shown as having the aging effect of loss of material. The aging management program recommended by corresponding GALL line item Volume 1, Table 1, Item 13, is Water Chemistry and One-Time Inspection . For piping and fittings and valves with diameter >= 4" NPS, the aging management program is shown as "Water Chemistry Control - BWR" and "Inservice Inspection" in LRA Table 3.1.2-3. For piping and fittings and valves with diameter < 4" NPS, the aging management program is shown as "Water Chemistry Control - BWR" in LRA Table 3.1.2-3. The note associated with the line items in LRA Table 3.1.2-3 is Note "C". Questions: For the carbon steel piping and fittings and valves with diameter >= 4" NPS, please provide justification that Note C is the correct note to apply for these components. For carbon steel piping and fittings and valves with diameter , 4" NPS, please provide justification that Note C is the correct note to apply for these components. Also, for these components please provide justification for not performing a one-time inspection as recommended by GALL line item Volume 1, Table 1, Item 13.	As identified in the discussion column entry of Table 3.1.1 Item 13 (3.1.1-13), Water Chemistry Control – BWR is augmented by the One-Time Inspection Program to assure effectiveness of the water chemistry program. This is true wherever the water chemistry program is credited. The Water Chemistry Control – BWR and One-Time Inspection Programs, by themselves, satisfy the NUREG-1801 recommendations. The ISI Program supplements the Water Chemistry and One Time Inspection Programs, but is not necessary to satisfy the NUREG-1801 recommendations. Since the Water Chemistry Control – BWR and One-Time Inspection Programs are consistent with the NUREG-1801 programs, a Note "A" or "C" is appropriate. Since the only viable comparison for these piping and valve lines is to IV.C1-6 for isolation condenser components, Note "C" must be used. For components with diameter < 4" NPS, the answer is the same. Both Water Chemistry Control – BWR and One-Time Inspection Programs apply to these components, which is consistent with the recommendations of NUREG-1801. Since the only viable comparison for these piping and valve lines is to IV.C1-6 for isolation condenser components, Note "C" must be used.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
450	Closed	[3.1.1-J-06] In LRA Table 3.1.2-1, some of the components with aging effect "Loss of Material" that roll up to LRA Table 1 line item 4.1.1-14 show that aging management is provided by "Water Chemistry Control- BWR and Inservice Inspection"; others of the components with aging effect "Loss of Material" that roll up to LRA Table 1 line item 4.1.1-14 show that aging management is provided by "Water Chemistry Control - BWR." The corresponding line item in GALL – Line 14 in Volume 1, Table 1 – shows the Aging Management Programs as "Water Chemistry" and "One-Time Inspection." LRA Note 3.1.2.2.2, paragraph 3, indicates that One-Time inspection of representative samples will be used to confirm the effectiveness of the Water Chemistry Control program. Question: Please discuss the criteria for selecting the sample points for the One-Time Inspections. Will the Thermal Sleeves that roll up to LRA Table 1 line item 4.1.1-14 be specifically inspected? Or, will they be included in the population from which components are selected for one-time inspection, but not specifically inspected? Please describe how the thermal sleeves provide the intended function of "Pressure Boundary." Does "pressure boundary" - in this context - mean RPV pressure boundary.	1) As explained in Section B.1.23 of the LRA: "The elements of the program include (a) determination of the sample size based on an assessment of materials of fabrication, environment, plausible aging effects, and operating experience; (b) identification of the inspection locations in the system or component based on the aging effect; (c) determination of the examination technique, including acceptance criteria that would be effective in managing the aging effect for which the component is examined; and (d) evaluation of the need for follow-up examinations to monitor the progression of any aging degradation." In addition, guidance of NUREG-1801 for XI.M32 and XI.M35 will be used to select sample points. 2) They will be included in the population from which the samples are selected. Which specific items will be inspected will be determined by applying the guidance from NUREG-1801, Section XI.M32 and XI.M35, when PNPS implements this program. 3) These components are welded to the reactor coolant pressure boundary. Consequently, these components were conservatively given an intended function of pressure boundary. Thermal sleeves are considered subject to aging management review in NUREG-1801 item IV.A1-7.	Jackson, Wilbur	Finnin, Ron
451	Closed	[3.1.1-J-07] Please clarify the function of the component in Table 3.1.2-3 identified as "Detector (CRD)"? Is this the rod position indicator assembly, or something else?	The detectors indicated as "Detector (CRD)" are detectors for pressure and level in the scram accumulators.	Jackson, Wilbur	Finnin, Ron
452	Closed	[3.1.1-J-08] Please make available during the site visit a copy of the BWRVIP recommendations related to aging management of the steam dryer.	A copy of BWRIP-139 was provided to the inspector.	Jackson, Wilbur	Chan, Laris

Number	Status	Request	Response	NRC	PNPS Lead
453	Accepted	[3.1.1-J-09] The GALL's recommended aging management program for the steam dryer is "A plant-specific aging management program is to be evaluated." In Table 3.1.2-2 the Aging Management Program identified for the steam dryer is "BWR Vessel Internals" and Note "E" is applied. Please explain why Note E (rather than Note A) is applied for this line item. The discussion of "Notes" on LRA pages 3.0-4 and 3.0-5 states that "letter designations are standard notes based on Appendix F of NEI 95-10 (Reference 3.0-3)." The reference is to NEI 95-10, Revision 6. However, review of the reference finds that Appendix F is about "Industry Guidance on Revised 54.4(a)(2) Scoping Criteria"; and Notes are discussed in Table 4.2-2 of that document. Please correct this administrative error in the LRA.	Note "E" is used rather than Note "A" because the NRC and NEI agreed to use Note "E" rather than Note "A" when GALL specifies a plant-specific program. This indicates the need for the staff to review the acceptability of the program, while Note "A" would indicate that the use of the program had already been accepted as documented in the GALL report. The appropriate reference for the LRA standard format is NEI 95-10, Revision 6, Appendix D rather than Appendix F. This requires an amendment to the LRA. This response requires an amendment to the LRA.	Jackson, Wilbur	Finnin, Ron
454	Closed	[3.1.1-J-10] GALL item VI.A1-5 indicates that penetrations for flux monitor and for the drain line roll up to GALL, Volume 1, Table 1, Item 40. The LRA does not indicate that penetrations for the drain line and for flux monitor roll up to LRA Table 3.1.1, Item 40. Please justify why the drain line penetrations and the flux monitor penetrations are not	A portion of this question requires clarification. Table 3.1.2-1 does not include a component type specifically named "flux monitor penetration." The incore housings, which provide vessel penetrations for flux detectors, are made of stainless steel and for the aging effect of cracking, the pointer to Table 3.3.1 is item 40. The drain nozzle in Table 3.1.2-1, which presumably is the drain line penetration indicated in the question, is composed of carbon steel, so rollup to Table 3.1.1 item 40, for stainless steel components, would be inappropriate.	Jackson, Wilbur	Finnin, Ron
455	Closed	[3.1.1-J-11] In LRA Table 3.1.2-1 the aging effect of cracking for CRD Stub Tubes and In-Core Housings is shown as managed by Water Chemistry Control and BWR Vessel Internals AMPS. In GALL the aging effect of cracking for these components is shown as managed by Water Chemistry Control and BWR Penetrations. Please discuss why PNPS has included these component in the BWR Vessel Internals program rather than in the BWR Penetrations program as recommended by GALL.	The PNPS BWR Penetrations Program is consistent with the NUREG-1801 Section XI.M8, which covers only SLC/DP nozzle and instrument penetrations as discussed in BWRVIP-27 and BWRVIP-49. PNPS includes the CRD stub tubes and instrument housings in the BWR Vessel Internals Program as they are covered by BWRVIP-47, Lower Plenum, which is included in NUREG-1801 program XI.M9. This is slightly inconsistent with NUREG-1801 Section IV, but PNPS felt it was better to be consistent with the programs in Section XI than the one line item in Section IV. At PNPS, both the BWR Penetrations Program and the BWR Vessel Internals Program are implemented by the same plant procedure.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
456	Closed	[3.1.1-J-12] In LRA Table 3.1.2-2 the Component Type "Control rod guide tubes - tube" is in an environment of "Treated water" > 270 deg-F, and the Component Type "Control rod guide tubes - base" is in an environment of "Treated water > 482 deg-F". Please clarify what is meant by "Control rod guide tubes - base" and explain why its environment is different from the "Control rod guide tubes - tube."	The CRGT base is located near the bottom of the guide tube and supports the control rod when the drive is disconnected and removed for service. The control rod guide tube is made of stainless steel. Its environment is given as >270 °F because that is the threshold for fatigue of stainless steel per the EPRI Mechanical Tools ((1003056). The guide tube base is made of CASS and consequently its environment was quoted as >482 °F as this is the threshold for thermal embrittlement in CASS. The limiting temperature was listed for each component. Both components see the same temperatures.	Jackson, Wilbur	Finnin, Ron
457	Closed	[3.1.1-J-13] In LRA Table 3.1.2-3 the only components identified as having the aging effect of Loss of Material [due to FAC] and included in the Flow Accelerated Corrosion AMP are carbon steel piping and fittings >= 4" NPS. The GALL description of the FAC AMP (XI.M17) does not limit applicability of this program based on pipe diameter. Please justify why only the large-diameter piping in Table 3.1.2-3 is included in the FAC program. Please identify the piping segments that are included in the FAC program in LRA Table 3.1.2-3.	Flow-accelerated corrosion (FAC) is not expected to be a significant aging mechanism for the majority of the reactor coolant system. (including piping and fittings <4" NPS) as the lines are either seldom used (such as, scram discharge header, core spray, HPCI, nuclear system pressure relief, PASS, RCIC, RHR, and SLC) or there is little flow while in use (CRD, NBVI, RWCU). In LRA Table 3.1.2-3, carbon steel piping segments >=4" NPS (such as feedwater piping) are included in the FAC Program. PNPS has reviewed the FAC program and determined that it includes a portion of the reactor vessel drain piping that supplies RWCU, and this is small bore - carbon steel piping. PNPS will add loss of material due to flow accelerated corrosion to the line entry for small bore piping (<4" NPS) in LRA table 3.1.2-3 (page 3.1-63). The new entry will identify Flow accelerated corrosion as a separate aging effect as done for the large bore carbon steel piping entry on page 3.1-65. The GALL comparison will be Volume 2 item IV.C1-7 which rolls up to Table 3.1.1-45. This requires an amendment to the LRA.	Jackson, Wilbur	Finnin, Ron
458	Closed	[3.1.1-J-14] In LRA Table 3.1.2-2, for components with aging effect "Loss of Material" that roll up to LRA Table 1 Item 3.1.1-47, the AMP is identified as "Water Chemistry Control - BWR." However, in the GALL the aging effect of Loss of Material for these components is managed by both Water Chemistry and Inservice Inspection (IWB, IWC, and IWD). Please justify why Water Chemistry Control - BWR with no associated inspection is adequate to manage the aging effect of Loss of Material for these components.	The items in Table 3.1.2-2 that roll up to Line Item 3.1.1-47 (GALL table IV item IV.A1-6) are for loss of material due to pitting and crevice corrosion. NUREG-1801 repeatedly credits Water Chemistry Control - BWR augmented by the One-Time Inspection program to manage loss of material due to pitting and crevice corrosion (for example IV.A1-8, IV.A1-11). This program combination is adequate to manage this aging effect in that the loss of material due to pitting and crevice corrosion for the internals is no different than the loss of material due to pitting and corrosion for other stainless steel components exposed to reactor coolant. As noted in Table 3.1.1, the One-Time Inspection Program will verify effectiveness of the Water Chemistry Control – BWR Program.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
			While ASME Code table IWB-2500-1 (Category B-N-1) does require VT-1 or VT-3 inspection of the interior attachments and core support structures, it does not require inspection of the majority of the internals. Therefore, crediting ISI for managing loss of material of the internals in general is inappropriate. The PNPS One-Time Inspection Program will incorporate the results of other inspections that are performed including ISI inspections done per ASME XI IWB-2500-1 B-N-2 and other opportunistic inspections.		
459	Accepted	[3.1.1-J-15] In LRA Table 3.1.1, Item Number 3.1.1-48 Discussion includes the statement, "Inservice inspection is not applicable to components < 4" NPS." ASME Section XI, Table IWB 2500-1, Examination Category B-J, requires Surface (but not Volumetric) examination for pressure retaining welds in Class 1 pipe that is < 4" NPS. Please reconcile the statement in Item 3.1.1-48 Discussion with the ASME Section XI requirements stated above.	Perhaps the statement that ISI does not apply is misleading. We should have said that PNPS does not credit ISI for aging management of piping <4". ISI typically only requires surface examinations of these components and the aging effects requiring management initiate on the ID, therefore we did not credit ISI for managing these effects. An LRA amendment is required. PNPS will amend the LRA to delete the statement "Inservice inspection is not applicable to components < 4" NPS." from the discussion in line item 3.1.1-4. This will require an amendment to the LRA.	Jackson, Wilbur	Finnin, Ron
460	Accepted	[3.1.1-J-16] In LRA Table 3.1.1, Item Number 3.1.1-48 Discussion includes the statement, "Cracking in steel components due to thermal and mechanical loading is not directly dependent on water chemistry, so only the One-Time Inspection Program is credited." However, there are no line items in the 3.X.2 Tables where "One-Time Inspection" by itself rolls up to Item Number 3.1.1-48. Please explain the apparent inconsistency between the LRA statement and the way that the roll-ups to Item Number 3.1.1-48 are done in the LRA.	For clarification, the statement "Cracking in steel components due to thermal and mechanical loading is not directly dependent on water chemistry, so only the One-Time Inspection Program is credited" should be deleted. An LRA amendment is required. PNPS will amend the LRA to delete the statement "Cracking in steel components due to thermal and mechanical loading is not directly dependent on water chemistry, so only the One-Time Inspection Program is credited." from the discussion in line item 3.1.1-48. This will require an amendment to the LRA.	Jackson, Wilbur	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
461	Accepted	[3.1.1-J-17] In GALL Volume 1, Table 1, Item 49, an augmented inspection using UT or other demonstrated acceptable inspection is recommended for BWRs with a crevice in the access hole covers. Does PNPS have a crevice in the access hole covers? Does PNPS perform an inspection of the access hole covers using UT or other demonstrated acceptable inspection techniques?	TIMELINE OF SHROUD ACCESS HOLE COVER EXAMINATIONS: - 1988 – GE issues SIL 462 - 1991 (RFO-8) - UT of both covers (for circ. flaws only) - 1993 (RFO-9) - UT of both covers (for circ. and radial flaws) - 1995 (RFO-10) - UT of zero degree cover only - 1995 (RFO-10) - VT-1 of both covers - 2001 – GE issues SIL 462 Rev.1 on 3/01 - 2003 (RFO-14) - EVT-1 of both covers - 2005 (RFO-15) - no exams - 2007 (RFO-16) - Plan to inspect at 180 degrees by VT-1 - 2009 (RFO-17) – Plan to inspect at 0 degrees by VT-1 Pilgrim will continue to inspect the access hole covers at 180 degrees and 0 degrees visually at 4 and 6 year intervals, respectively, during the current licensing period. If new BWRVIP guidance is issued on these components, PNPS will perform inspections in accordance with that guidance. Within the first 6 years of the period of extended operation and every 12 years thereafter, PNPS will inspect the access hole covers with UT methods. Alternatively, PNPS will inspect the access hole covers in accordance with BWRVIP guidelines should such guidance become available. This is commitment item 34.	Jackson, Wilbur	Pardee, Rich
462	Closed	[3.1.1-J-18] RA Table 3.1.2-1 lists the ISI program as the AMP used to managing the aging effect of cracking in "Other Pressure Boundary Bolting - Upper head flange bolts and nuts - CRD flange bolting. Please identify the ASME Examination Category and Requirements that are applicable for these components.	Category B-G-1 of the ASME XI code contains the requirements for all pressure-retaining bolting >2" dia. in the ISI Program. The code requires a volumetric (ultrasonic) exam for all RPV closure studs (examined in place) and a VT-1 visual exam for all RPV closure nuts every 10 years. Category B-G-2 of the ASME XI code contains the requirements for pressure-retaining bolting <=2" dia. in the ISI Program. The code requires a VT-1 visual exam every 10 years for bolting in this category (includes CRD flange bolting, RPV head N7 & N8 nozzle flange bolting).	Jackson, Wilbur	Pardee, Rich

Number	Status	Request	Response	NRC	PNPS Lead
463	Accepted	[3.1.1-J-19] LRA Table 3.1.2-2 identifies "Thermal Aging Embrittlement of CASS" as the AMP to manage the aging effect of "reduction in fracture toughness" for three component types: "Control Rod Guide Tubes - Base", "Fuel Support Pieces - Four Lobed", and "Jet Pump Assemblies [various components]." However LRA Table B-2 says that the NUREG-1801 Program "Thermal Aging Embrittlement of CASS" is "not applicable" at PNPS. Please correct or justify this apparent inconsistency in the LRA. Also, if an LRA correction is needed, please ensure that the Notes for each of the three component line items are validated or changed to be consistent with any changes made in the LRA.	NUREG-1801 program XI.M12 "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)" applies to CASS pressure boundary components in the RCS. This program is not applicable to PNPS, as we have no CASS pressure boundary components. NUREG-1801 program XI.M13, "Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)" applies to reactor vessel internals (non-pressure boundary) pieces made of CASS. The mentioned components above are all reactor vessel internals and are covered by this program. In some instances, the LRA refers to Thermal Aging Embrittlement of CASS Program as a shortened name for and with a hyperlink to the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program. For clarification, those instances will be revised to clearly indicate the appropriate program. This requires an amendment to the LRA.	Jackson, Wilbur	Finnin, Ron
464	Closed	[3.1.1-J-20] GALL Volume 1, Table 1, Line 52 identifies the aging effects for RCPB closure bolting as "Cracking due to SCC, loss of material due to wear, loss of pre load due to thermal effects, gasket creep and self-loosening." Only the aging effect of "Cracking" is identified in LRA Table 3.1.2-1 for component that roll up to LRA Line Item 3.1.1-52. The "Discussion" in the LRA for Line Item 3.1.1-52 provides discussion of why the other aging effects listed in GALL are not included applicable at PNPS. Question: Please provide PNPS' basis for the Discussion statement that "Industry operating experience indicates that loss of material due to wear is not a significant aging effect for this bolting." Please clarify what is meant by "not a significant aging effect." Please provide a copy of technical reference(s) supporting the LRA statement that "Loss of preload due to stress relaxation (creep) would only be a concern in very high temperature applications (> 700 deg-F).	To clarify the LRA discussion in line item 3.1.1-52, the phrase "not a significant aging effect" means not an aging effect requiring management. This is consistent with the EPRI Mechanical Tools that do not consider loss of material due to wear an aging effect for bolted closures. In addition, loss of material due to wear was not identified as an area of concern in the resolution of GSI-29 for bolting. The general system bolting to which this line item applies is not routinely disassembled. Occasional thread failures due to wear mechanisms such as galling, are not age related but are event-driven conditions that are resolved when they occur. Bolting at PNPS is standard grade B7 carbon steel, or similar material, except in specialized applications where stainless steel bolting is utilized. Loss of preload due to stress relaxation (creep) would only be a concern in very high temperature applications (> 700°F) as stated in the ASME Code, Section II, Part D, Table 4. No PNPS bolting operates at >700°F. Therefore, loss of preload due to stress relaxation (creep) is not an applicable aging effect for the reactor coolant system. A copy of this section of the code was available during the audit.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
465	Closed	[3.1.1-J-21] The LRA Discussion for Line Item 3.1.1-52 includes the statement, "To address these bolting operational concerns, PNPS has taken actions to address NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants." Please identify and provide a copy of any previous, docketed correspondence in which PNPS describes its actions and commitments (if any) with regard to NUREG-1339.	GL 91-17, Generic Safety Issue 29, Bolting degradation or failure in nuclear power plants is dated 10/17/91. The GL required no response and no docketed correspondence was submitted. PNPS did review GL 91-17 in 1991 and a review summary was provided to the NRC audit team during the site visit. Partly as a result of the PNPS review of GL 91-17, Station Maintenance procedure for bolting, 3.M.4-92 was developed based on EPRI NP-5067, "Good Bolting Practices".	Jackson, Wilbur	Chan, Laris
466	Closed	[3.1.1-J-22] In LRA Table 3.1.2-1 a line item identifies the aging effect of "Loss of Material" for the component type "Closure flange studs, nuts, washers, and bushings." Note "H" is applied for this line item, indicating that the aging effect is not in NUREG-1801 for this component, material and environment combination. Please identify and discuss the mechanism that creates the aging effect of "Loss of Material" in these components. Please identify and describe PNPS-specific or industry experience where the aging effect of "Loss of Material" has been observed in these components. Please include a discussion of why "Loss of Material" is an aging effect applicable for these components but not for components that roll up to LRA Table Line Item 3.1.1-52.	In the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001. 1003056 (The Mechanical Tools) Appendix E, low alloy steel exposed to indoor air containing moisture (humidity) is subject to loss of material due to the aging mechanism of general corrosion. This bolting item has this material and environment combination and therefore the aging effect is applicable. In accordance with the operating experience provided in the Reactor Head Closure Studs Program, examination of 18 reactor head closure studs and visual examination of 18 nuts and 18 washers during RFO15 found no new recordable indications of loss of material. LRA Table Line Item 3.1.1-52 is based on NUREG-1801, Volume 1, Table 1 which addresses loss of material due only to wear for carbon and stainless steel bolting. Since the NUREG-1801 line item does not address any other aging mechanisms that result in loss of material, it was deemed that the line item is not applicable for loss of material due to general corrosion.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
467	Closed	[3.1.1-J-23] LRA Table 3.1.2-3 includes a line item for Main Steamline Flow Restrictors made of CASS, in an environment of Treated Water > 482 deg-F, aging effect of Reduction in Fracture Toughness. For Class 1 piping components made of this material, in this environment and with this aging effect, the GALL recommends the AMP XI.M12, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)." In lieu of the recommended AMP, PNPS proposes to use a One-Time Inspection. Questions: The GALL-recommended AMP includes screening criteria to determine which CASS components are potentially susceptible to thermal aging embrittlement and require augmented inspection. Has PNPS applied the screening criteria to the Main Steamline Flow Restrictors? If so, what were the results? Please describe what examination requirements, methods and standards will be used in PNPS's proposed One-Time Inspection of the Main Steamline Flow Restrictors. Please justify that a One-Time Inspection provides adequate aging management of the Main Steamline Flow Restrictors during the period of extended operation.	The main steam line flow restrictors are not pressure retaining components (no pressure boundary function). They are a cast piece that is inserted inside the main steam piping. The main steam piping is the pressure boundary. Consequently, the main steam flow restrictors are not a good candidate for GALL program XI.M12. a) No, PNPS has not done the screening for the main steam line flow restrictors. b) While the inspection procedure has not yet been developed, the planned inspection is a visual examination performed by inserting a camera into the main steam line. c) Reduction of Fracture Toughness (Cracking) and Loss of Material of the main steam line flow restrictors are not considered likely effects during the period of extended operation (No aging of these restrictors is identified by NUREG-1801). Loss of material will be mitigated by BWR - Water Chemistry Control. Nonetheless, PNPS has committed to do a one-time inspection to verify that these aging effects are not occurring. Since the flow restrictors are not pressure retaining components, the One-Time Inspection Program is adequate to manage the effects of aging.	Jackson, Wilbur	Finnin, Ron
468	Closed	[3.1.1-J-24] LRA Item Number 3.1.1-53 Discussion states, "There are no steel components of the Class 1 reactor vessel, vessel internals or reactor coolant pressure boundary exposed to closed cycle cooling water." However, LRA Table 3.1.2-3 (page 3.1-68) includes line items for Pump cover - Thermal barrier (RR) made of CASS where the aging management programs are identified as "Water Chemistry Control - Closed Cooling Water" and "Inservice Inspection." These line items appear to be inconsistent with the Discussion in 3.1.1-53. Please explain why these line are not inconsistent with the Discussion in 3.1.1-53 or correct the inconsistency.	As stated in the question, item 3.1.1-53 refers to steel components. CASS is considered stainless steel. The material and environment combination of stainless steel in closed cycle cooling water does not appear in the RCS (Chapter IV) tables of NUREG-1801; therefore, the line item for the pump cover – thermal barrier is compared to the ESF tables of NUREG-1801.	Jackson, Wilbur	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
469	Closed	[3.1.1-J-25] PNPS LRA Table 3.1.2-3 includes entries for piping and fittings made of carbon steel in a environment of Air-indoor (ext). Some of these entries have an aging effect of loss of material; some of these entries have an aging effect of "none." For the entries with aging effect of "none", Note 101 is applied and states, "High component surface temperature precludes moisture accumulation that could result in corrosion." Please clarify the high temperature conditions that are mentioned in the note: What is the "high temperature" threshold? For piping that experiences significant temperature changes during operation, approximately what percentage of operation at temperature below the high temperature threshold is assumed or anticipated for those piping and fittings where the aging effect is "none"? Please discuss the methodology that PNPS uses to identify which piping is classified as having aging effect of "loss of material" and which has aging effect of "none."	The selection of the aging effect of loss of material or of no aging effect was dependent upon the temperature of the component during normal operation. Components with a temperature above the boiling point of water will preclude moisture accumulation. As a matter of convenience, the transition point was assumed at the temperature threshold of 220°F for cracking due to fatigue in steel. Although these components can be below this threshold during shutdown conditions, and some components could possibly see temperatures both above and below this threshold during normal operation, these components should rarely, if ever, be at a temperature below the local dew point. Consequently, even during shutdown conditions, moisture accumulation should be negligible. The PNPS position on loss of material on exterior surfaces of steel piping grew out of earlier license renewal application experience. Loss of material on external surfaces is normally managed by system walkdowns; however, system walkdowns don't inspect the exterior surface of insulated piping unless the insulation is removed for maintenance. There is no need to remove insulation and directly inspect pipe external surfaces as the heat that requires the insulation prevents moisture accumulation which in turn prevents loss of material. PNPS's plan is to inspect uninsulated steel piping for loss of material via system walkdowns and not remove any insulation.	Jackson, Wilbur	Lingenfelter,
470	Accepted	[3.1.1-J-26] PNPS LRA Table 3.1.2-3 contains two line items for "Bolting (flanges, valves, etc)" where the material is either low alloy steel or stainless steel, the environment is Air-indoor (external), and the aging effect is cracking. Please identify the mechanism that causes this aging effect in these components. Please justify that the inservice inspection program provides aging management of these components adequate to ensure that they continue to perform their intended function during the period of extended operation. Please clarify whether PNPS will be developing a bolting integrity program modeled on Section XI.M18 to include these components.	Table 3.1.1 Item number 3.1.1-52 specifies the aging effect of cracking due to stress corrosion cracking for carbon and stainless steel reactor coolant system pressure boundary closure bolting. Inservice inspection of bolting components is specified in GALL XI.M18, Bolting Integrity, for management of cracking and loss of material of pressure retaining bolting inspected in accordance with ASME Section XI. Therefore, inservice inspection is acceptable for managing cracking in reactor coolant pressure boundary bolting. However, a Bolting Integrity Program that credits inservice inspections will be developed that will address the aging management of bolting in the scope of license renewal. This requires an amendment to the LRA to include descriptions of the Bolting Integrity Program in Appendices A and B and to identify where the program is applicable. This item is closed to Item 373.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
471	Closed	[3.1.1-J-27] In LRA Table 3.1.2-3, MEAP combination Bolting, Stainless steel, Air-indoor, Cracking-fatigue, TLAA – the notes are "A, 105." Please explain why note 105 is applicable to this line item.	The aging effect of cracking due to fatigue depends on the thermal and mechanical loading of the component and is effectively independent of the environment at the surface of the component. The tables in NUREG-1801, Volume 2, Chapter IV (outside of Subsection A1) include components with an air environment and an aging effect of cracking due to fatigue. While one of these lines could have been used as a substitution, the choice of a line within the corresponding system table (Table IV.C1 in this case) was preferred. Plant specific Note 105 explains that the difference in environments is acceptable for the evaluation of cracking due to fatigue.	Jackson, Wilbur	Lingenfelter,
472	Closed	[3.1.1-J-28] In LRA Table 3.1.2-1, MEAP combinations "Closure flange studs" or "Other pressure boundary bolting," Low alloy steel, Air-indoor, Cracking-fatigue, TLAA – the notes are "C, 105." Please explain why note 105 is applicable to these line items.	The aging effect of cracking due to fatigue depends on the thermal and mechanical loading of the component and is effectively independent of the environment at the surface of the component. The tables in NUREG-1801, Volume 2, Chapter IV (outside of Subsection A1) include components with an air environment and an aging effect of cracking due to fatigue. While one of these lines could have been used as a substitution, the choice of a line within the corresponding system table (Table IV.A1 in this case) was preferred. Plant specific Note 105 explains that the difference in environments is acceptable for the evaluation of cracking due to fatigue.	Jackson, Wilbur	Lingenfelter,

Number	Status	Request	Response	NRC	PNPS Lead
473	Closed	[3.1.1-J-29] In LRA Table 3.1.2-1, the following components are identified as having the aging effect of "cracking," and Note H is applied: Dome (Bottom Head); Dome (Upper Closure Head); Flanges (Shell closure flange and Upper head closure flange); Vessel Shell (Beltline shell); Vessel shell (Intermediate nozzle shell, lower shell; upper shell); Nozzles (Main steam). Table 3-1 in BWRVIP-74-A (Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal) addresses various potential age related mechanisms and indicates the components to which the mechanisms apply. Except for the mechanism of "fatigue" which applies to some of the components listed in the paragraph above, there is no mechanism in Table 3-1 of BWRVIP-74-A that causes cracking and that BWRVIP-74-A identifies as applicable for the components listed above. Question: Please provide a discussion of the methodology that PNPS used to determine that the aging effect of "cracking" is applicable for the components listed in the first paragraph, above. Please identify the mechanism(s) that cause cracking in these components. Please explain how or whether PNPS incorporated the information contained in BWRVIP-74-A into its determination that cracking is an aging effect applicable for these components. Please discuss the plant-specific or industry experience reviewed by PNPS in making the determination that cracking is an aging effect applicable for these components.	The cracking referred to in these entries is stress corrosion cracking of the stainless steel cladding. This was not entered based on BWRVIP-74, but was based on the mechanical tools and industry operating experience. NUREG-1801 also specifies cracking due to SCC as an aging effect for many stainless steel material entries. Note that for entries such as Nozzle, Drain (N11) which is unclad carbon steel there is no cracking entry other than cracking-fatigue.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
474	Accepted	[3.1.1-J-30] In LRA Table 3.1.2-1, the component Stabilizer Pads (part of Supports - Stabilizer pads, support skirt) is identified as having an aging effect of "loss of material" and the AMP is Inservice Inspection. Questions: What is the mechanism that causes the aging effect of loss of material? Please describe the Inservice Inspection for the Stabilizer pads: What is the examination frequency? Examination requirement? Examination method? Acceptance standard? Are there any currently approved relief requests applicable for this component?	The entry in table 3.1.2-1 is for both the support skirt and the stabilizer pads. The support skirt was conservatively considered susceptible to loss of material as it remains below 220 °F. The stabilizer pads are located on the sides of the vessel, and are typically greater than 220 °F. Consistent with other LRA components, these pads should not be subject to loss of material. The LRA will be clarified to indicate that the loss of material entry applies only to the support skirt. This requires an amendment to the LRA. The stabilizer pads are inspected per ASME Section XI Table IWB-2500-1 category B-K. The code (footnote 7 to Table IWB-2500-1 category B-K) allows surface examination from an accessible side of the weld. At PNPS the top side of the weld is accessible and PNPS performs magnetic particle testing of the top side of each bracket weld in every 10 year interval. PNPS meets the code requirements and therefore has no relief request for these inspections.	Jackson, Wilbur	Finnin, Ron
475	Closed	[TLAA-H-01] The applicant is requested to provide the design codes for the liner plate, torus down comer/vent header and torus-attached piping, and SRV piping for review.	[1] The design code for the drywell liner plate is ASME Code, Section III. The code includes Code Case 1330-1 and Code Case 1177-5, and the latest edition as of June 9, 1967. [Reference Chicago Bridge and Iron (CB&I) document 9-8014]. For the torus shell, the design code is ASME Code, Section III. The code includes Code Case 1330-1 and Code Case 1177-5, and the latest edition as of June 9, 1967. It was later evaluated to the requirements of ASME Section III Division I with addenda through Summer 1977 and Code Case N-197 as part of the Mark 1 Torus Program. [Reference Teledyne Engineering Services (TES) document TR-5310-1]. [2] The original design code for the torus downcomer/vent header is ANSI B31.1, 1967 edition. It was later evaluated to the requirements of ASME Section III Division I with addenda through Summer 1977 and Code Case N-197 as part of the Mark 1 Torus Program. [Reference TES document TR-5310-1]. [3] The original design code for the torus attached piping is ANSI B31.1, 1967 edition. It was later evaluated to the requirements of ASME Section III, 1977 edition, with Addenda through Summer 1977 as part of the Mark 1 Torus Program. Pipe support analysis was performed to Section III Subsection NF [Reference TES document TR-5310-2]. [4] The original design code for the SRV piping is ANSI B31.1, 1967 edition. It was later evaluated to the first anchor from the torus to the requirements of ASME Section III, 1977 edition, with addenda through Summer 1977 as part of the Mark 1 Torus Program. [Reference TES document TR-5310-2]. The SRV/DL piping was analyzed for higher discharge flow as part of the Thermal Power Optimization (TPO) Program to the same design code.	Hoang, Dan	Chan, Laris

Number	Status	Request	Response	NRC	PNPS Lead
476	Closed	[TLAA-H-02] The applicant is requested to 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.	PNPS has tracked SRV actuations from 1992 to 2005. A total of 14 actuations have been recorded on valve A, and 13 each on valves B, C and D. Using the 14 actuations in this thirteen year period, the projected actuations for the rest of 60 years are 31 lifts. The number of lifts in the first 21 years of plant life (1972 – 1993) were not recorded. These lifts were more frequent in the early years, so PNPS estimated these 21 years at 5 times the recorded rate. This yields 120 lifts in the first 21 years. Combining the early period, the recorded period, and the projected period, there will be an estimated 165 lifts in 60 years. PNPS plant specific analysis (Teledyne Engineering Services document TR-5310-2) states that the SRV penetrations are qualified for 7500 cycles of maximum load Based on this, the projected CUF for 60 years is calculated as 0.022.	Hoang, Dan	Chan, Laris

Number	Status	Request	Response	NRC	PNPS Lead
477	Closed	[TLAA-H-03] Please provide Fatigue Analysis of the SRV discharge piping and Fatigue analysis of other Torus attached piping.	Teledyne Engineering Services document TR-5310-2 documents stress evaluations for the SRV piping for various load combinations, but does not include a fatigue analysis. (The fatigue analysis of the SRV piping along with all the other torus attached piping.) (TAP is bounded by MPR-751, the GE Mark 1 containment program. MPR-751 concluded that for all plants and piping systems considered, in all cases the fatigue usage factors for an assumed 40-year plant life was less than 0.5. In a worst-case scenario, extending plant life for an additional 20 years would produce usage factors below 0.75. Since this is less than 1.0, the fatigue criteria are satisfied. The MPR-751 generic fatigue analysis is thus protected for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(ii). A PNPS/plant specific analysis addresses the SRV discharge piping and its supports, as well as the main vent penetration through which the SRV discharge enters the torus. This analysis states that the SRV penetrations are qualified for 7500 cycles of maximum load while the SRVs are expected to see less than 50 cycles at maximum load and less than 4500 cycles a partial load. The report concludes "Since the 7500 cycles of maximum load bounds both of these by such a large margin and since no other significant loads are imposed on the line, the penetration was assumed acceptable for fatigue without further evaluation." Increasing the 40 year cycles by 1.5 for the period of extended operation would still be only 75 maximum load cycles and 6750 low load cycles for a total of 6850 mixed load cycles, less than the 7500 maximum load cycles permitted. The fatigue analysis for torus penetrations thus remains valid for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(i). The PNPS plant-specific analysis (TR-5310-2) references the generic GE Mark 1 Containment program for other torus attached piping. The results of the generic GE Mark 1 containment program (based on 40 years of operation) were that 92% of the TAP would have cumulative usage factors of less than 0.3, and that 100% would have usage factors less than 0.5. Conservatively multiplying the CUFs by 1.5 shows that for 60 years of operation, 92% of the TAP would have CUFs below 0.45, and 100% would have CUFs below 0.75. These calculations have thus been projected through the period of extended operation in accordance with 10 CFR 54.21(c)(1)(ii).	Hoang, Dan	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
490	Closed	What is the operating history for buried pipes in terms of the number of inspections and any leaks and their cause, (internal or external caused leaks)? Have any buried pipes been replaced due to corrosion or coating problems? If the phased array UT technique is used, how will it be qualified and how will the operators be qualified?	In the past 5 years there has been limited experience with the inspection of buried piping at PNPS. This experience has occurred mainly on the fire water underground distribution system. This system is approximately 35 years old and consists of cement lined malleable iron pipe with mechanical joints. There has been no history of significant leaks other than during two instances, one in 2001 and one in 2005. In the first event the 8" underground line down stream of 8-L-22 failed. The probable cause of failure was most likely induced by minor fabrication anomalies compounded by marginal installation techniques. When this piping was examined it was found to be overall in very good condition externally except for a small area of surface corrosion, attributed to marginal installation techniques. In the second event the 8" underground pipe failed in the area of the N2 tank adjacent to the EDG building. Due to congestion and the presence of the tank, which was installed subsequent to the installation of the piping, it was not possible to dig up the piping to examine it and determine the cause of the failure but may be related to the installation of the tank. In addition to these two instances there have been a number of valves excavated during maintenance which found the valves and piping to be in remarkably good condition. From an additional historical perspective, the salt service water (SSW) system at PNPS has experienced leaks on the buried inlet (screenhouse to auxiliary bays) piping as a result of internal corrosion. The original piping material was rubber lined carbon steel wrapped with reinforced fiberglass wrapping and coal tar saturated felt and heavy Kraft paper. The leaks were determined to be the result of the degraded rubber lining being in contact with sea water. These pipes have since been replaced with unlined Titanium wrapped with the same external coating as the original pipe. This pipe replacement occurred in 1995 and 1997. In addition, the SSW buried discharge piping (also rubber lined carbon steel with external pipe wrapping, same as inlet piping) from the auxiliary bays to the discharge canal also experienced severe internal corrosion due to failure of the rubber lining. Two 40' lengths of 22" diameter pipes (one on each loop) were replaced in 1999 as a result of the failed rubber lining and internal corrosion. These spools were replaced with carbon steel coated internally and externally with an epoxy coating. The piping that was removed was examined after its wrapping was removed and its external surface was found to be in good condition. Since that time, the entire length of both SSW buried discharge loops have been lined internally with cured-in-place pipe linings, "B" Loop in 2001 and "A" Loop in 2003. The phased array inspection technique, was provided merely as an example of a potential future examination technique. It and other remote techniques will potentially be able to assess the condition of extensive portions of buried piping without the need for excavation. This exception was taken to allow the potential use of this technique or others in lieu of excavating piping in order to provide a more effective assessment of overall piping condition while eliminating the potential for damaging the piping during excavation.	Davis, Jim	Ivy, Ted

Number	Status	Request	Response	NRC	PNPS Lead
			Since a superior inspection technique is not yet available, specifics regarding qualification of the process and technicians are not available.		
494	Closed	Five line items in Table 3.3.2-14-1 (LRA pages 3.3-134 through 137) reference Table 3.4.1 item 3.4.1-8 and credit PSPM Program to manage the aging effect of LOM for steel piping, piping components, and piping elements exposed to raw water. Please identify the specific components in the Circulating Water System that are represented by these Table 2 line items and provide procedures under which PSPM will be implemented to manage the aging effect of LOM due to general, pitting, crevice, MIC, and fouling.	The circulating water system consists primarily of two circulating water pumps and associated piping and valves as shown primarily on M211. The review to determine the 10 CFR 54.4(a)(2) components used a spaces approach that identified all component types and material combinations in the system that were in scope but did not list individual component numbers. As identified in LRA Table 2.3.3.14-B, the only areas of the turbine building that were excluded were the components inside the main condensers and the only portions of the intake structure that were excluded were the intake structure hypochlorite pump room and chlorination area. The components included bolting, circulating water pump casings, the above ground piping, tubing, thermowells, the condenser inlet outlet and cross connect valves, expansion joints and the associated vent, drain, and instrument valve bodies. The water box scavenging system shown on M211 is no longer in use, but the portions that still form a pressure boundary for the water boxes are included. As identified on M212 Sheet 1, the residual chlorine sample pump is no longer used, but portions of the system were included that still form the pressure boundary. As indicated in Attachment 3 of LRPD-02, Aging Management Program Evaluation Report (AMPER), procedures do not exist for the inspection of these components, and a complete listing of components that will be included in the procedures is not available. As stated in LRA Appendix B and Commitment 21, program activity implementing documents will be enhanced prior to the period of extended operation to incorporate the attributes of this inspection described in the AMPER. This will assure that the effects of aging will be managed such that applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.	Wen, Peter	Ivy, Ted

Number	Status	Request	Response	NRC	PNPS Lead
495	Closed	Four line items in Table 3.3.2-14-1 (LRA pages 3.3-134 and 135), PNPS claimed that Circulating Water System components of piping and tanks which are made of plastic, have no aging effect under condensation external and raw water internal environments. What kind of plastic material are they. Why are they not subject to aging effect?	Some of the circulating water system piping in scope for [Maintenance Rule 10 CFR 50.65] (a)(2) shown on the piping & instrument diagrams is piping codes JE and JF. Pipe class JE is fiberglass reinforced plastic. As identified in the PNPS Specification for Piping M300, piping code JF allows the use of PVC piping. Per Note 3 on M211, some of the piping is PVC. The 55 gallon drum shown on M212 Sheet 1 which is the tank in this line item is also PVC. Aging effects were identified for (a)(2) components included in AMRM-30 using the Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001, 1003056 (The Mechanical Tools). In accordance with the Mechanical Tools, Section 2.1.8 of Appendix A, PVC and thermoplastics are relatively unaffected by water or humidity. The components in question are installed indoors and contain raw water. Therefore, based on the Mechanical Tools and industry operating experience, this piping has no aging effects requiring management in raw water or condensation environments.	Wen, Peter	Ivy, Ted
496	Closed	Four line items in Table 3.3.2-14-1 with note F(LRA page 3.3-133), the applicant proposed to manage cracking and change in material properties of the elastomer for condenser expansion joint exposed to raw water and condensation in external environment using AMP of Periodic Surveillance and Preventive Maintenance (PSPM). Please provide technical justification as why PSPM alone is sufficient to manage the aging effects of cracking and change in a material properties.	As indicated in Attachment 3 of LRPD-02, Aging Management Program Evaluation Report (AMPER), inspections will be performed to determine the surface condition and flexibility of the circulating water expansion joints. As indicated in the AMPER, a representative sample of the expansion joints will be visually inspected and manually flexed every 5 years to verify no significant cracking or other abnormalities while flexing elastomer components. A visual inspection and physical manipulation of this component ensures that the elastomer is not cracking and that the material properties of flexibility are still adequate for the expansion joint to maintain its pressure boundary and not affect safety-related components. Industry operating experience for components of this type has shown that the frequency of inspection should be adequate to manage these aging effects.	Wen, Peter	Ivy, Ted
497	Closed	Three line items in Table 3.3.2-14-1 (LRA pages 3.3-134, 135, and 136), the applicant proposed to manage LOM of copper alloy >15% Zn for piping, strainer housing and valve body exposed to condensation external environment using AMP of System Walkdown. Please provide technical justification as why System Walkdown alone is sufficient to manage the aging effect of LOM. Do you consider the aging effect of loss of material due to selective leaching for these line items.	While these components are managed by the selective leaching program for the internal surface, the selective leaching program is not credited with the management of loss of material for external surfaces that are only wetted by condensation. If these components were to experience selective leaching, the aging effect will occur on and be identified by the Selective Leaching Program for the internal surface that is exposed to raw water before any significant selective leaching is experienced on the external surface that is wetted only by periodic condensation. This is due to the minimal amount of electrolyte that is present in a periodic condensation environment. Therefore, the System Walkdown Program alone is expected to be an adequate program for the external surfaces of these components.	Wen, Peter	Ivy, Ted

Number	Status	Request	Response	NRC	PNPS Lead
498	Closed	Eleven line items in Table 3.3.2-14-9 with note G (Extraction Steam System, the applicant proposed to manage cracking, LOM, and cracking-fatigue of nickel alloy for expansion joint exposed to treated water using water chemistry control BWR and TLAA metal fatigue. Two line items related to TLAA metal fatigue will be lumped to Question 3.4.1-W-01 for discussion. For the other 9 line items, please provide technical justification as why Water Chemistry Control BWR alone is sufficient to manage the aging effects of cracking and LOM.	As can be seen in section 4.24.2 of LRPD-02, Aging Management Program Evaluation Report (AMPER), the water chemistry control-BWR program includes periodic monitoring and control of known detrimental contaminants such as chlorides, dissolved oxygen, and sulfate concentrations below the levels known to result in loss of material or cracking. As identified in Attachment 2 of the AMPER, a One-Time Inspection Program will be completed to verify the effectiveness of the water chemistry control-BWR program to manage the aging effects of loss of material and cracking. Therefore, the combination of these two programs is sufficient to manage the aging effects of cracking and loss of material for nickel alloy components exposed to treated water. This requires an amendment to the chemistry program descriptions in LRA Appendices A and B to clearly indicate that the One-Time Inspection Program will confirm the effectiveness of the Water Chemistry Control - BWR, Water Chemistry Control - Auxiliary Systems and the Water Chemistry Control - Closed Cooling Water programs. This item is closed to Item 372.	Wen, Peter	Ivy, Ted
499	Closed	[T.3.3.2.14] In Table 3.3..2-9, Fire Protection - Water System, PNPS credits LRA AMP B.1.13.1, Fire Protection Program to manage loss of material and fouling of gray iron and copper ally >15% Zn heat exchanger shell and tubes. However, the Fire Protection program description does not include these components nor has the program been enhanced to include these components. Please clarify how the Fire Protection Program will manage these aging effects for these components.	In accordance with AMP B.1.13.1, procedures will be enhanced (attributes 3 and 6) to verify that the diesel engine does not exhibit signs of degradation while running; such as fuel oil, lube oil, coolant (jacket water), or exhaust gas leakage. Through monitoring and trending of performance data, specifically jacket cooling water, fouling and loss of material for the fire pump diesel jacket water heat exchanger will be identified and corrected through the corrective action program. As described in operating experience for AMP B.1.13.1, observation of degraded performance produced corrective actions including engine replacement in 2002 prior to loss of intended function. Consequently, continued implementation of the Fire Protection Program provides reasonable assurance aging effects will be managed for the diesel fire pump jacket water heat exchanger. In addition, PNPS performs fire pump inspection, testing and maintenance in accordance with NFPA 25 which would also detect the presence of aging effects in the jacket water system prior to loss of intended function. This item is closed to item 378.	Patel, Erach	Ivy, Ted

Number	Status	Request	Response	NRC	PNPS Lead
500	Closed	[T.3.3.2.15] In the LRA, PNPS has indicated "None-None" for AE/AMP combination in several Table 2's in section 3.3, for plastic components in various environments. Please identify what kind(s) of plastic material is (are) used at PNPS.	At PNPS piping codes JE, JF, JG and HT are plastic or fiberglass. As identified in the PNPS Specification for Piping M300, pipe class JE is fiberglass reinforced plastic, piping code JF allows the use of polyvinyl chloride (PVC) piping, and class HT piping is PVC. Per note 3 on M211, some of the pipe code JG is PVC. Some specific components are also identified as plastic in the LRA that are not included in the piping class summary sheets which required component specific reviews to identify the material. For instance some components such as the tank shown on M212 sheet 1 is identified on the drawing as a 55 gallon PVC drum and some piping like the piping on M273 sheet 3 is identified on the drawing as chlorinated polyvinyl chloride (CPVC). The fuel oil system table 3.3.2-7 also identifies a plastic filter housing used on the station blackout diesel fuel oil filter X-176. These are plastic bowls at the bottom of the filter housing that collect water and sediment. The exact type of plastic is not known but was selected for use by the original manufacturer in this application. In addition, similar to all the plastic materials described above it is not exposed to direct sunlight and was designed to be used with fuel oil. Therefore, as stated in the EPRI Mechanical Tools none of these components is expected to experience aging effects that require management in the environments to which they are exposed.	Patel, Erach	Ivy, Ted
501	Accepted	[T.3.3.2.16] In some Table 2's, PNPS has stated "None-None" for AE/AMP combination for stainless steel bolting in an air-outdoor environment, however, in Tables 3.3.2-5 and 3.3.2-9, PNPS identified loss of material as an aging effect for the same material/environment combination and credited the system walkdown program to manage this aging effect. In an outdoor environment, stainless steel material could be susceptible to loss of material. Please clarify this discrepancy.	The only table that did not identify loss of material for stainless steel bolting in an air-outdoor environment was Table 3.3.2-7 for the fuel oil system. Loss of material is an aging effect requiring management that should have been identified for the stainless steel bolting with an environment of air-outdoor. This aging effect is managed by the System Walkdown Program. This requires an amendment to the LRA.	Patel, Erach	Ivy, Ted

Number	Status	Request	Response	NRC	PNPS Lead
502	Closed	T.3.3.2.17 In Table 3.3.2-14-21, PNPS has credited the Water Chemistry Control - Auxiliary Systems program to manage the aging effect of loss of material for components in the potable and sanitary water system. However, the program description and the scope of the program only address stator cooling water chemistry. The only element where potable and sanitary water is mentioned is in the element for detection of aging effects. Please justify why potable and sanitary water is not identified in the program description and scope of work or supplement the program to include it.	The "Scope of Program" section of B.1.32.1 of the LRA states city water is taken from the Town of Plymouth water main and distributed throughout the potable and sanitary water system at town water pressure. City water is monitored and treated by the Town of Plymouth to meet the regulations of the Commonwealth of Massachusetts. As stated in the "Detection of Aging Effects" section of B.1.32.1 of the LRA, verification that the water monitoring and treatment by the Town of Plymouth is effective will occur under the One-Time Inspection Program, which entails inspections to verify the effectiveness of water chemistry control programs to ensure that significant degradation is not occurring and component intended function is maintained during the period of extended operation. Therefore potable and sanitary water is included in the program.	Patel, Erach	Ivy, Ted
503	Open – Plant	Question 4.3-1: Identify which components/commodity groups in AMR Tables 3.1.2-1, -2, and -3 were designed to ASME Section III. Clarify which components/commodity groups received an ASME Section III CUF calculation, and identify which commodity group listing in LRA Table 4.3-1 provides the applicable CUF result. If no CUF calculation was performed, justify the basis for exclusion and propose an acceptable AMP to manage the aging effect "cracking fatigue" in accordance with the criterion in 10 CFR 54.21(c)(1)(iii). If an exclusion from performing a CUF calculation is based on an ASME Section III, provide the paragraph in the Code.	This response addresses Question 504 and Question 505.	Medoff, Jim	Finnin, Ron
504	Closed	Question 4.3-2: Identify which components in AMR Tables 3.1.2-1, -2, and -3 were designed in accordance with the ASME B31.1 Code. Clarify whether the commodity groups were evaluated for an allowable stress reduction assessment based on the 7000 thermal cycles in accordance with the B31.1 Code. Identify whether: (1) the allowable stress reduction analysis remains bounded under 10 CFR 54.21(c)(1)(i), (2) the allowable stress range needs to be reduced in accordance with the stress reduction criteria in the B31.1 Code to comply with 10 CFR 54.21(c)(1)(ii), or (3) the aging effect "cracking - fatigue" needs to be managed for the period of extended (EPO) operation in accordance with 10 CFR 54.21(c)(1)(iii) and propose an acceptable AMP to manage the aging effect.	Answered in Question 503.	Medoff, Jim	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
505	Closed	Question 4.3-3: For non-piping components/commodity groups in LRA Tables 3.1.2-1, -2, and -3 that were not designed to ASME Section III or AMSE B31.1, identify which design code applies to the particular commodity group and clarify whether the design code required a metal fatigue analysis. If a metal fatigue analysis was required, summarize what type of metal fatigue calculation was required to be performed and discuss how: (1) the analysis remains bounding under 10 CFR 54.21(c)(1)(i), (2) has been projected to the expiration of the EPO and remains acceptable pursuant to 10 CFR 54.21(c)(1)(ii), or (3) whether an AMP needs to be proposed to manage the aging effect of "cracking - fatigue" for the EPO and state which AMP will be used to manage the aging effect. If a metal fatigue analysis was not performed and "cracking -fatigue" needs to be manage for the EPO, propose an acceptable AMP for the management of the aging effect in accordance with the criterion in 10 CFR 54.21(c)(1)(iii).	Answered in Question 503.	Medoff, Jim	Finnin, Ron
506	Open – Plant	Question 4.3-4: For non-piping components/commodity groups in LRA Tables 3.2.2-X, 3.3.2-X and 3.4.2-X, identify which design code applies to the particular commodity group and clarify whether the design code required a metal fatigue analysis. If a metal fatigue analysis was required, summarize what type of metal fatigue calculation was required to be performed and discuss how: (1) the analysis remains bounding under 10 CFR 54.21(c)(1)(i), (2) has been projected to the expiration of the EPO and remains acceptable pursuant to 10 CFR 54.21(c)(1)(ii), or (3) whether an AMP needs to be proposed to manage the aging effect of "cracking - fatigue" for the EPO and state which AMP will be used to manage the aging effect. If a metal fatigue analysis was not performed and "cracking -fatigue" needs to be manage for the EPO, propose an acceptable AMP for the management of the aging effect in accordance with the criterion in 10 CFR 54.21(c)(1)(iii).		Medoff, Jim	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
507	Open – NRC	Question 4.3-5: The application states that, while not mandatory, the design of the RPV internal components is in accordance with the intent of ASME Section III. Please clarify from both a regulatory and technical point of view what is meant by designed in accordance with the "intent ASME Section III." Identify which Edition of ASME Section III is being referred to with respect to the design of the RPV internals.	The statement that the reactor vessel internals were built to the intent of ASME section XI came from the FSAR. GE made this statement in many of the FSARs for BWRs of Pilgrim's vintage. This statement means that the design of the reactor internals was better than commercial grade quality. Materials, wall thickness, construction techniques (including welding) were what would have been used for an ASME component. However, analyses and testing were not performed or documented as required for a component designed "in accordance with" the ASME code. As no specific code was adhered to, no specific code year was specified; however, as the internals were designed as part of the plant design it can be assumed the same code year (1965) was used for general guidance. LRA Section 4.3.1.2 will be revised to delete the statement that the internals are designed to the intent of the ASME code as follows: "4.3.1.2 Reactor Vessel Internals A review of the design basis document reveals that the only internals component for which there is a fatigue analysis is the core shroud stabilizer (tie rods), the result of a repair to structurally replace circumferential shroud welds surrounding the core. This analysis is a TLAA. The maximum CUF identified for the shroud for 40 years of operation is 0.33. The CUF is included in Section 4.3.1. The Fatigue Monitoring Program ensures the fatigue analyses remain valid by monitoring the actual numbers of cycles and evaluating them against the design values for numbers of allowable cycles. Time-limited aging analyses (fatigue analyses) for the core shroud stabilizer will remain valid for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(i) or the effects of aging on the intended function(s) will be adequately managed for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(iii)." This requires an amendment to the LRA.	Medoff, Jim	Finnin, Ron
508	Open – NRC	Question 4.3-6: The first full paragraph on page 4.3-2 states that fracture mechanics analyses or flaw growth analyses are TLAAs for PNPS if the analyses are based on time-limited assumptions. Identify all fracture mechanics or flaw growth safety assessments that meet the criteria for TLAAs in 10 CFR 54.3. If any exist, amend Section 4.0 of the LRA to include them as TLAAs for the application and evaluate them in accordance with the requirements of 10 CFR 54.21(c)(1). Include enough technical information to justify acceptability of the fracture mechanics or flaw growth analyses. Any fracture mechanics or flaw growth analyses that meet these TLAA criteria will be evaluated by the NRC's technical staff in the Division of Component Integrity, Office of Nuclear Reactor Regulation.	PNPS identified no fracture mechanics (flaw growth) analyses that were TLAA. The results of the PNPS review of these analyses are located in Section 2.4 of PNPS document LRPD-06, -Limited Aging Analyses – Mechanical Fatigue. Three flaw growth analyses were found (the CRD nozzle to end cap weld, the Reactor Recirculation nozzle thermal sleeves, and Reactor Recirculation nozzle N2F). None of these analyses were TLAA.	Medoff, Jim	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
509	Accepted	[3.6.2.2-N-07] In LRA Section 3.6.2.2, you have stated that mechanical wear is an aging effect for strain and suspension insulators in that they are subject to movement. Wear has not been apparent during routine inspections. If left unmanaged for the period of extended operation, surface rust would not cause a loss of intended function and thus, is not a significant concern. Provide a technical justification of why loss of material due to mechanical wear caused by wind blowing of supported transmission conductors is not an aging effect requiring management for high-voltage insulators. Also, provide a technical justification of why surface rust would not cause a loss of intended function and is not a significant concern for high-voltage insulators if left unmanaged for the period of extended operation.	Loss of material due to mechanical wear is an aging effect for strain and suspension insulators if they are subject to significant movement. A possible cause for movement of the insulators is wind blowing the supported transmission conductor, allowing the conductor to swing from side to side. Although this mechanism is possible, industry experience has shown transmission conductors do not normally swing and that when they do, due to a substantial wind, they do not continue to swing for very long once the wind has subsided. PNPS has no transmission conductors supported by high-voltage insulators in-scope of license renewal and therefore loss of material due to wear of high-voltage insulators is not an aging effect requiring management for the period of extended operation. 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 washed away by rain, while the glazed and coated insulator surfaces at PNPS aids in contamination removal. PNPS applied Slygard (RTV silicone) coatings to some switchyard insulators to reduce flashover. Surface contamination can be a problem in areas where there are greater concentrations of airborne particles such as near facilities that discharge soot. PNPS is not located near any facilities that produce airborne particles such as soot. Therefore, surface contamination is not an applicable aging mechanism for high-voltage insulators at PNPS. LRA Section 3.6.2.2.2 has a typo in the fourth paragraph. The paragraph should read as follows: "Mechanical wear is an aging effect for strain and suspension insulators in that they are subject to movement. Wear has not been apparent during routine inspections. If left unmanaged for the period of extended operation, surface contamination would not cause a loss of intended function and thus, is not a significant concern." This requires an amendment to the LRA.	Nguyen, Duc	Stroud, Mike
510	Closed	[3.6.2.2-N-08] Various airborne materials such as dust and industrial effluent can contaminate insulator surfaces. A large buildup of contamination enables the conductor voltage to track along the surface more easily and can lead to insulator flashover. Explain why surface contamination such as dust and industrial effluent is not a significant aging effect requiring management for high-voltage insulators at PNPS.	Since 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 washed away by rain, while the glazed and coated insulator surfaces at PNPS aids in contamination removal. PNPS applied Slygard (RTV silicone) coatings to some switchyard insulators to reduce flashover. Surface contamination can be a problem in areas where there are greater concentrations of airborne particles such as near facilities that discharge soot. PNPS is not located near any facilities that produce airborne particles such as dust or soot. Therefore, surface contamination is not an applicable aging mechanism for high-voltage insulators at PNPS.	Nguyen, Duc	Stroud, Mike

Number	Status	Request	Response	NRC	PNPS Lead
511	Closed	[3.6.2.2-N-09] Provide a technical justification of why increased resistance of switchyard bus connections due to oxidation is not an aging effect requiring management.	A potential mechanism contributing to aging of switchyard bus connections is surface oxidation, which can lead to increased contact or connection resistance. Connection surface oxidation is not significant for switchyard bus connections at PNPS sine the switchyard bus connections are welded. Therefore, no aging effects due to surface oxidation are required to be managed for the period of extended operation. The connections to active devices are inspected under the Maintenance Rule program. In addition, thermography is performed at least once every 6 months to maintain the integrity of the connections. This program will continue into the period of extended operation.	Nguyen, Duc	Stroud, Mike
512	Accepted	[3.1.1-13] LRA Table 3.1.1, Item Number 48, is applicable for Class 1 piping, fittings and branch lines <NPS 4" exposed to reactor coolant. The GALL Report indicates that the aging effects of cracking due to thermal and mechanical loading apply for both carbon steel and stainless steel components. However, no Class 1 piping components made of carbon steel are rolled up to this line item. Please explain why no carbon steel piping components are rolled up to this line. Are there no Class 1 carbon steel piping components <NPS 4" at PNPS? If there are Class 1 carbon steel piping components <NPS 4" at PNPS, then please justify why they are not rolled up to line item 3.1.1-48.	As stated in PNPS AMRM-33, "cracking due to flaw growth is managed by the inspection requirements for Class 1 components in accordance with ASME Section XI, Subsection IWB. Because inservice inspection per ASME Section XI is required in accordance with 10 CFR 50.55a, cracking due to flaw growth is not identified on the tables in Attachment 1." Cracking due to flaw growth is considered equivalent to the NUREG-1801 entry of cracking due to thermal and mechanical loading. The ISI Program applies to Class 1 carbon steel piping components at PNPS. The LRA will be clarified to show that cracking is an aging effect requiring management for Class 1 carbon steel piping components <NPS 4" at PNPS and that the appropriate aging management programs include the ISI Program and the One-Time Inspection Program. The discussion column for Item 3.1.1-48 will be revised to be consistent with this change. The credited aging management programs will be the same as those listed for the NUREG-1801 line items corresponding to LRA Table 3.1.1, Item 48. This requires an amendment to the LRA.	Jackson, Wilbur	Finnin, Ron
513	Accepted	As a follow-up to question T3.2.1-35-P-01 (Item 442) one of the line items that rolls up to Item 3.2.1-35 only credits the Containment Leak Rate program for managing the aging effect of loss of material. In accordance with GALL XI.S4 this program by itself does not detect that aging degradation has initiated. Please explain how the use of the Containment Leak Rate program is acceptable by itself to manage aging effects.	The Periodic Surveillance and Preventive Maintenance (PSPM) Program is more appropriate to manage loss of material for piping and valve body in a raw water internal environment in Table 3.2.2-7. The LRA will be revised to credit this program instead of Containment Leak Rate Program to manage the aging effect of loss of material. In addition, the discussion in Item 3.2.1-35 of Table 3.2.1 will be revised to read as follows: "The Periodic Surveillance and Preventive Maintenance Program manages the loss of material for steel components exposed to raw water." This requires an amendment to the LRA to revise Table 3.2.2-7, 3.2.1 and Appendix B.	Pavinich, Wayne	Ivy, Ted

Number	Status	Request	Response	NRC	PNPS Lead
514	Accepted	[3.1.1-32] LRA Table Items 3.1.1-14, 3.1.1-15 and 3.1.1-47 all include discussions saying that aging of the components rolling up to those lines will be by Water Chemistry augmented by the One Time Inspection Program. Attachment 2 of LPRD-02, Revision 02, provides a list of AMRM's affected by the One-Time Inspection Activities. However, Attachment 2 does not include AMRM-31 (Reactor Pressure Vessel) or AMRM-32 (Reactor Vessel Internals) in the list of affected AMRM's. Please provide an explanation of why AMRM-31 and AMRM-32 are not included in Attachment 2 of LRPD-02, Revision 02. How will PNPS ensure that appropriate one-time inspections are performed for the RPV and RVI components where such inspections are credited for Aging Management during the period of extended operation?	Throughout the application, the One-Time Inspection (OTI) Program has been treated as a support program for the water chemistry program for the purposes of verifying water chemistry program effectiveness. The One-Time Inspection Program has not been treated as an aging management program directly applicable to the systems that credit water chemistry for aging management. This treatment was considered appropriate since the verification of water chemistry program effectiveness will be one integrated task that verifies effectiveness of the program for all systems that credit water chemistry; the water chemistry program effectiveness will not be verified separately for each system. For the cases where the One-Time Inspection Program addresses component specific inspections, it is listed in the LRA as an aging management program directly applicable to the components. The first row of Attachment 2 of LRPD-02 identifies the activities of the One-Time Inspection Program that will verify water chemistry program effectiveness for all systems that credit water chemistry. This line applies to the water chemistry programs, including Water Chemistry Control – BWR, which in turn applies to many of the systems listed in the application. The reactor pressure vessel and reactor vessel internals components credit the Water Chemistry Control – BWR program, so this line applies to AMRM-31 and AMRM-32. The remaining lines of Attachment 2 of LRPD-02 identify activities of the One-Time Inspection Program that address component specific inspections. Applicable systems are identified for these inspections.	Jackson, Wilbur	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
515	Open – Plant	LRA Table 4.3-1 provides the limiting 40-year cumulative usage factors (CUFs) for the RPV, RPV internal components, and reactor coolant pressure boundary (RCPB) piping that were designed to ASME Section III. With the exception of the CUF values for RPV feedwater nozzles, PNPS has accepted the TLAA metal fatigue CUF analyses and stated that the 40-year CUF conclusion remains valid for the period of extended operation (EPO) in accordance with 10 CFR 54.21(c)(1)(i) or that the effect of "cracking - fatigue" will be managed for the EPO. The last paragraph on Page 11 of LRPD-06 states that "more than half of the design basis transients defined in the UFSAR projections show that the allowable limit, as defined by the RPV cyclic load analysis, will be exceeded before the end of the period of extended operations." The paragraph further states that "A detailed analysis beyond the scope of this report would be required to re-evaluated the CUFs if the transient limits are in fact exceeded," and that "The existing cycle monitoring program will monitor the cycles and require corrective action upon approaching a limit." Please explain how the 40-year CUF conclusion will remain valid for the EPO when PNPS Report No. LRPD-06 implies that the CUFs should be recalculated and projected out 60 years. Please take in account the fact that Draft Commitment 31 requires corrective action when the CUFs exceed 1.0, and not when the implementation of AMP B.1.12, "Fatigue Monitoring Program" determines that the actual transient cycles will approach the number of design transient cycles that are allowed in the design basis. If the CUFs should have been projected and recalculated for 60-years, as indicated in LRPD-06, provide a commitment when the 60-year CUFs values for the RCPB components will be provided to the NRC for review and approval under either 10 CFR 54.21(c)(1)(ii) or (iii). The response to this question may require amendment of Commitment 31 and/or UFSAR Supplement Summary Description A.2.2.2.1, "Class 1 Metal Fatigue." This item goes with item 425.	LRPD-06 was not intended to imply that the CUFs should be projected out to 60 years in accordance with 10 CFR 54.21(c)(1)(ii). CUFs in Table 4.3-1 are based on assumed numbers of transient cycles, not on a number of years. These CUFs are not necessarily 40-year limiting values. As long as the cycles are not exceeded, the CUFs do not need to be recalculated. While some of the numbers of cycles projected for 60 years in Table 4.3-2 exceed the design basis assumptions for numbers of cycles, the Fatigue Monitoring Program assures that the analyses will be revised to increase the allowable number of cycles before exceeding the design basis assumptions. While LRPD-06 projects numbers that exceed the design basis assumptions, the projections are conservative and the actual numbers of cycles may not exceed the design basis assumptions on the numbers of cycles. CUFs will require recalculation if the numbers of actual transients approach the design basis values. Because the CUFs in Table 4.3-1, with the exception of the feedwater nozzle, are well below 1, the allowable numbers of cycles can be increased through reanalysis assuming higher numbers of cycles.	Medoff, Jim	Finnin, Ron
516	Open – Plant	The TPO project documented the results of reactor vessel fatigue usage factors of limiting components in table 3-2 in GE report GE-NE-0000-0000-1898-02, Rev.0 March 2002. In the summary Table, it states that for CRD nozzle – stub tube, the existing PNPS CUF value was 0.8, and is now changed to 0.870 for TPO. However, the LRA Table 4.3.1, which identifies class 1 CUF values, the CRD nozzle value of 0.8 was not identified. Please justify why this value was not included in the LRA.		Patel, Erach	Finnin, Ron

Number	Status	Request	Response	NRC	PNPS Lead
517	Open – Plant	Question 4.3-8: PNPS provided the project team with the stress analyses and cumulative usage factor calculations for the PNPS recirculation replacement piping systems and core shroud stabilizers in the following documents: • DC23A4084 & 23A4084, Rev.1, Pilgrim Recirculation Piping Replacement, June 27, 1985. • GE Report 25A5685, Revision 1, Stress Report - Shroud Stabilizers Vessel, June 19, 1995. • GE Report GENE-771-79-1194, Revision 2, Shroud Repair Hardware Stress Analysis , June 19, 1995. LRA Table 4.3-1 lists that the limiting 40-year CUF for the recirculation piping is 0.110 and that the limiting 40 year CUF for the core shroud stabilizers is 0.330. The limiting 40 year CUF values provided in these reports for these components are 0.923 and 0.008, respectively. These values do not correlate to the 40-year CUF values provided in LRA Table 4.3-1. Explain why the 40-year CUF values in these design basis documents differ from the 40-year values provided in LRA Table 4.3-1 . If these design basis document do not constitute the most current design basis CUF bases for the replacement recirculation piping system and core shroud stabilizers, clarify which documents do contain the latest design basis CUF calculations for these component commodity groups. Should this be the case, this question will remain open until the staff can review the appropriate design basis calculations for these component commodity groups.		Medoff, Jim	Finnin, Ron