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Date: 06/30/2006 1:44:57 PM
Subject: Questions and Answers of Pilgrim LRA Aging Management Reviews

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

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Mail Envelope Properties (44A5630F.CE2 : 18 : 64738)

Subject: Questions and Answers of Pilgrim LRA Aging Management Reviews
Creation Date 06/30/2006 1:44:24 PM
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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,