(PA) PA -LR

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Subject: The Second Set of AMR Questions

Attached are the second round of AMR Questions.

Jim

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Table 3.2.2-X questions

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.

Table 3.2.2, question 2

The PNPS B.1.30 System Walkdown Program is used to detect LOM for carbon steel bolting instead of GALL XI.M18 Bolting Integrity. XI.M18 invokes visual VT-1 examination for bolting less than 2 inches in diameter. It is not clear if VT-1 is used for bolting that is examined in accordance with the System Walkdown Program. What standard is used for visual inspection of bolting under the System Walkdown Program?

Table 3.2.2, question 4

Stainless steel and steel components that are exposed to treated water in Table 3.2.2 do not specify one-time inspection to detect loss of material although Table 3.2.1 indicates OTI. Add OTI as AMPs for these components for consistency with Table 3.2.1 or provide a justification for not performing OTI.

Table 3.2.2, question 5

It is not clear if the System Walkdown Program provides for inspection interior surfaces of carbon steel components exposed to indoor air for LOM. Please provide details showing inspection of interior surfaces for this component.

Table 3.2.2, question 6

Item Numbers 3.4.1-1, 3.2.1-3, 3.2.1-5, 3.2.1-18 is for stainless steel piping and piping components in treated water or steam. Valve bodies, orifices, etc. are piping components. Note "C" has been assigned incorrectly in Table 3.2.2 in these cases. Change Note from "C" to "A".

Table 3.2.2, question 7

Item Number 3.4.1-1, 3.4.1-14, 3.4.1-19, are for steel piping and piping components in treated water or steam. Valve bodies, orifices, thermowells, etc. are piping components. Note "C" has been assigned incorrectly in Table 3.2.2 in these cases. Change Note from "C" to "A".

Table 3.2.2, question 8

SRP-LR, 3.2.2.2.8 Loss of material due General, Pitting, and Crevice Corrosion, Item 3 provides for the verification of the effectiveness of the lubricating oil program through one-time inspection of selected steel components at susceptible locations. Carbon steel components are not, specifically or through a representative component, subjected to a one-time inspection for loss of material. Add OTI as AMPs for these components for consistency with Table 3.2.1 or provide a justification for not performing OTI.

Table 3.2.2, question 9

The GALL indicates that the AMP for elastomers should be plant-specific and PNPS credits the plant-specific Periodic Surveillance and Preventive Maintenance Program for aging management which was developed in accordance with LR-SRP A.1.2.3 "Aging Management Program Elements." Also, the component description and the environment is in accordance with the GALL. Therefore the note for elastomer components should be "A".

Table 3.2.2, question 10

The GALL specifies XI.M20, Open-Cycle Cooling Water System Program for carbon steel piping and PNPS credits the plant-specific Periodic Surveillance and Preventive Maintenance Program. Although the plant-specific program provides for visual and/or UT inspection as in XI.M20, it does not provide for preventive actions. What is the justification for not implementing preventive actions?

Table 3.2.1-X questions

Table 3.2.1-1, question 1

The PNPS LRA, Section 3.2.2.2.1 indicates that cumulative fatigue damage is a TLAA evaluated in accordance with 10CFR54.21(c). However, PNPS aging management reviews do not consider cumulative fatigue damage a concern for steel or stainless steel unless system temperature exceeds 220°F or 270°F, respectively which is not a condition of the SRP LRA Section 3.2.2.2.1. Provide an analysis that justifies the exemption of evaluation for cumulative fatigue damage for steel or stainless steel components in systems that operate below 220°F or 270°F, respectively.

Table 3.2.1-3, -5, -6, -8, -9, -10, -14, -15, -16 -18, question 2

These item numbers specify One-Time Inspection along with another program such as Water Chemistry or Lubricating Oil Analysis. However, Table 3.2.2 components that correspond to these Table 3.2.1 items do not specify one-time inspection to detect loss of material. Please change component line items to include One-Time Inspection or provide the basis for excluding OTI.

Table 3.2.1-35, question 3

The GALL specifies XI.M20, Open-Cycle Cooling Water System Program and PNPS credits the plant-specific Periodic Surveillance and Preventative Maintenance Program. Although the plant-specific program provides for visual and/or UT inspection as in XI.M20, it does not provide for preventive actions. Provide justification for not adhering to XI.M20.

General Comments

1) In general, System Walkdown is credited for managing LOM for bolting. However, other aging effects may be active for bolting and System Walkdown does not provide for preventive actions. Aging Effects for bolting should be managed under the umbrella of a Bolting Integrity Program in accordance with GALL program XI.M18.

2) Components in the SGT system that are exposed to instrument air are managed with the plant-specific Instrument Air Quality Program (PNPS AMP B.1.17). This program only monitors the air quality. However, the GALL Compressed Air Monitoring Program, XI.M24, additionally requires testing for leakage rates, inspection for corrosion, and performance testing components. What program(s) provide for these additional requirements? If these additional requirement of XI.M24 are not covered by another program, please provide justification for not including them. This comment is applicable to the IA system as well.

Questions Related to PNPS Aging Management Review Results
for LRA Section 3.1.1 (Reactor Vessel, Internals and Reactor Coolant System)
Prepared by Bob Jackson

Question Number: Question
3.1.1-01: Some of the items that roll up to Item 3.1.1-2 are described in LRA Table 3.1.2-1 as in an environment of Treated Water > 220 deg F, and some are described as in Treated Water > 270 deg F. Please justify the use of two temperature ranges to describe the environments for the components that roll up to Item 3.1.1-2.
3.1.1-02: Please provide a drawings (or drawings) showing the following components listed in LRA Table 3.1.2-1: In-core Housings; Nozzles - Head Seal Leak-Off (N12, N13)
3.1.1-03: In LRA Table 3.1.2-1, the Component Type ID Attachment Welds (core spray, dryer hold down pads, etc) are indicated as having the intended function of "pressure boundary." Please justify that these components provide a pressure boundary function.
3.1.1-04: LRA Table 3.1.2-1 indicates that for ID Attachment Welds, the aging effect of "Cracking-fatigue" is managed by a TLAA. Please discuss whether these components are explicitly addressed in the TLAA or bounded by the results of the TLAA. What is the specific TLAA that manages the aging effect of "Cracking-fatigue" in these components?

Questions Related to PNPS Aging Management Review Results
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Prepared by Bob Jackson

3.1.1-05:
In LRA Table 3.1.2-3, carbon steel piping and fittings and valves in a treated water environment are shown as having the aging effect of loss of material. The aging management program recommended by corresponding GALL line item Volume 1, Table 1, Item 13, is Water Chemistry and One-Time Inspection .

For piping and fittings and valves with diameter >= 4" NPS, the aging management program is shown as "Water Chemistry Control - BWR" and "Inservice Inspection" in LRA Table 3.1.2-3. For piping and fittings and valves with diameter < 4" NPS, the aging management program is shown as "Water Chemistry Control - BWR" in LRA Table 3.1.2-3. The note associated with the line items in LRA Table 3.1.2-3 is Note "C".

Questions:

For the carbon steel piping and fittings and valves with diameter >= 4" NPS, please provide justification that Note C is the correct note to apply for these components.

For carbon steel piping and fittings and valves with diameter , 4" NPS, please provide justification that Note C is the correct note to apply for these components. Also, for these components please provide justification for not performing a one-time inspection as recommended by GALL line item Volume 1, Table 1, Item 13.

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Prepared by Bob Jackson

3.1.1-06:
In LRA Table 3.1.2-1, some of the components with aging effect "Loss of Material" that roll up to LRA Table 1 line item 4.1.1-14 show that aging management is provided by "Water Chemistry Control- BWR and Inservice Inspection"; others of the components with aging effect "Loss of Material" that roll up to LRA Table 1 line item 4.1.1-14 show that aging management is provided by "Water Chemistry Control - BWR." The corresponding line item in GALL – Line 14 in Volume 1, Table 1 – shows the Aging Management Programs as "Water Chemistry" and "One-Time Inspection." LRA Note 3.1.2.2.2, paragraph 3, indicates that One-Time inspection of representative samples will be used to confirm the effectiveness of the Water Chemistry Control program.

Question:

Please discuss the criteria for selecting the sample points for the One-Time Inspections.

Will the Thermal Sleeves that roll up to LRA Table 1 line item 4.1.1-14 be specifically inspected? Or, will they be included in the population from which components are selected for one-time inspection, but not specifically inspected?

Please describe how the thermal sleeves provide the intended function of "Pressure Boundary." Does "pressure boundary" - in this context - mean RPV pressure boundary?

3.1.1-07:
Please clarify the function of the component in Table 3.1.2-3 identified as "Detector (CRD)"? Is this the rod position indicator assembly, or something else?

3.1.1-08:
Please make available during the site visit a copy of the BWRVIP recommendations related to aging management of the steam dryer.

3.1.1-09:
The GALL's recommended aging management program for the steam dryer is "A plant-specific aging management program is to be evaluated." In Table 3.1.2-2 the Aging Management Program identified for the steam dryer is "BWR Vessel Internals" and Note "E" is applied. Please explain why Note E (rather than Note A) is applied for this line item.

The discussion of "Notes"on LRA pages 3.0-4 and 3.0-5 states that "letter designations are standard notes based on Appendix F of NEI 95-10 (Reference 3.0-3)." The reference is to NEI 95-10, Revision 6. However, review of the reference finds that Appendix F is about "Industry Guidance on Revised 54.4(a)(2) Scoping Criteria"; and Notes are discussed in Table 4.2-2 of that document. Please correct this administrative error in the LRA.

Questions Related to PNPS Aging Management Review Results
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3.1.1-10: GALL item VI.A1-5 indicates that penetrations for flux monitor and for the drain line roll up to GALL, Volume 1, Table 1, Item 40. The LRA does not indicate that penetrations for the drain line and for flux monitor roll up to LRA Table 3.1.1, Item 40. Please justify why the drain line penetrations and the flux monitor penetrations are not included in the roll-up.
3.1.1-11: In LRA Table 3.1.2-1 the aging effect of cracking for CRD Stub Tubes and In-Core Housings is shown as managed by Water Chemistry Control and BWR Vessel Internals AMPS. In GALL the aging effect of cracking for these components is shown as managed by Water Chemistry Control and BWR Penetrations. Please discuss why PNPS has included these component in the BWR Vessel Internals program rather than in the BWR Penetrations program as recommended by GALL.
3.1.1-12: In LRA Table 3.1.2-2 the Component Type "Control rod guide tubes - tube" is in an environment of "Treated water" > 270 det-F, and the Component Type "Control rod guide tubes - base" is in an environment of "Treated water > 482 deg-F". Please clarify what is meant by "Control rod guide tubes - base" and explain why its environment is different from the "Control rod guide tubes - tube."
3.1.1-13: In LRA Table 3.1.2-3 the only components identified as having the aging effect of Loss of Material [due to FAC] and included in the Flow Accelerated Corrosion AMP are carbon steel piping and fittings >= 4" NPS. The GALL description of the FAC AMP (XI.M17) does not limit applicability of this program based on pipe diameter. Please justify why only the large-diameter piping in Table 3.1.2-3 is included in the FAC program. Please identify the piping segments that are included in the FAC program in LRA Table 3.1.2-3.
3.1.1-14: In LRA Table 3.1.2-2, for components with aging effect "Loss of Material" that roll up to LRA Table 1 Item 3.1.1-47, the AMP is identified as "Water Chemistry Control - BWR." However, in the GALL the aging effect of Loss of Material for these components is managed by both Water Chemistry and Inservice Inspection (IWB, IWC, and IWD). Please justify why Water Chemistry Control - BWR with no associated inspection is adequate to manage the aging effect of Loss of Material for these components.
3.1.1-15: In LRA Table 3.1.1, Item Number 3.1.1-48 Discussion includes the statement, "Inservice inspection is not applicable to components < 4" NPS." ASME Section XI, Table IWB 2500-1, Examination Category B-J, requires Surface (but not Volumetric) examination for pressure retaining welds in Class 1 pipe that is < 4" NPS. Please reconcile the statement in Item 3.1.1-48 Discussion with the ASME Section XI requirements stated above.

Questions Related to PNPS Aging Management Review Results
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3.1.1-16: In LRA Table 3.1.1, Item Number 3.1.1-48 Discussion includes the statement, "Cracking in steel components due to thermal and mechanical loading is not directly dependent on water chemistry, so only the One-Time Inspection Program is credited." However, there are no line items in the 3.X.2 Tables where "One-Time Inspection" by itself rolls up to Item Number 3.1.1-48. Please explain the apparent inconsistency between the LRA statement and the way that the roll-ups to Item Number 3.1.1-48 are done in the LRA.
3.1.1-17: In GALL Volume 1, Table 1, Item 49, an augmented inspection using UT or other demonstrated acceptable inspection is recommended for BWRs with a crevice in the access hole covers. Does PNPS have a crevice in the access hole covers? Does PNPS perform an inspection of the access hole covers using UT or other demonstrated acceptable inspection techniques?
3.1.1-18: RA Table 3.1.2-1 lists the ISI program as the AMP used to managing the aging effect of cracking in "Other Pressure Boundary Bolting - Upper head flange bolts and nuts - CRD flange bolting. Please identify the ASME Examination Category and Requirements that are applicable for these components.
3.1.1-19: LRA Table 3.1.2-2 identifies "Thermal Aging Embrittlement of CASS" as the AMP to manage the aging effect of "reduction in fracture toughness" for three component types: "Control Rod Guide Tubes - Base", "Fuel Support Pieces - Four Lobed", and "Jet Pump Assemblies [various components]." However LRA Table B-2 says that the NUREG-1801 Program "Thermal Aging Embrittlement of CASS" is "not applicable" at PNPS. Please correct or justify this apparent inconsistency in the LRA. Also, if an LRA correction is needed, please ensure that the Notes for each of the three component line items are validated or changed to be consistent with any changes made in the LRA.

Questions Related to PNPS Aging Management Review Results
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3.1.1-20:
GALL Volume 1, Table 1, Line 52 identifies the aging effects for RCPB closure bolting as "Cracking due to SCC, loss of material due to wear, loss of pre load due to thermal effects, gasket creep and self-loosening." Only the aging effect of "Cracking" is identified in LRA Table 3.1.2-1 for component that roll up to LRA Line Item 3.1.1-52. The "Discussion" in the LRA for Line Item 3.1.1-52 provides discussion of why the other aging effects listed in GALL are not included applicable at PNPS.

Question:

Please provide PNPS' basis for the Discussion statement that "Industry operating experience indicates that loss of material due to wear is not a significant aging effect for this bolting."
Please clarify what is meant by "not a significant aging effect."
Please provide a copy of technical reference(s) supporting the LRA statement that "Loss of preload due to stress relaxation (creep) would only be a concern in very high temperature applications (> 700 deg-F).

3.1.1-21:
The LRA Discussion for Line Item 3.1.1-52 includes the statement, "To address these bolting operational concerns, PNPS has taken actions to address NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants."

Please identify and provide a copy of any previous, docketed correspondence in which PNPS describes its actions and commitments (if any) with regard to NUREG-1339.

3.1.1-22:
In LRA Table 3.1.2-1 a line item identifies the aging effect of "Loss of Material" for the component type "Closure flange studs, nuts, washers, and bushings." Note "H" is applied for this line item, indicating that the aging effect is not in NUREG-1801 for this component, material and environment combination.

Please identify and discuss the mechanism that creates the aging effect of "Loss of Material" in these components. Please identify and describe PNPS-specific or industry experience where the aging effect of "Loss of Material" has been observed in these components.
Please include a discussion of why "Loss of Material" is an aging effect applicable for these components but not for components that roll up to LRA Table Line Item 3.1.1-52.

Questions Related to PNPS Aging Management Review Results
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3.1.1-23:
LRA Table 3.1.2-3 includes a line item for Main Steamline Flow Restrictors made of CASS, in an environment of Treated Water > 482 deg-F, aging effect of Reduction in Fracture Toughness. For Class 1 piping components made of this material, in this environment and with this aging effect, the GALL recommends the AMP XI.M12, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)." In lieu of the recommended AMP, PNPS proposes to use a One-Time Inspection.

Questions:
The GALL-recommended AMP includes screening criteria to determine which CASS components are potenially susceptible to thermal aging embrittlement and require augmented inspection. Has PNPS applied the screening criteria to the Main Steamline Flow Restrictors? If so, what were the results?

Please describe what examination requirements, methods and standards will be used in PNPS's proposed One-Time Inspection of the Main Steamline Flow Restrictors.

Please justify that a One-Time Inspection provides adequate aging management of the Main Steamline Flow Restrictors during the period of extended operation.

3.1.1-24:
LRA Item Number 3.1.1-53 Discussion states, "There are no steel components of the Class 1 reactor vessel, vessel internals or reactor coolant pressure boundary exposed to closed cycle cooling water." However, LRA Table 3.1.2-3 (page 3.1-68) includes line items for Pump cover - Thermal barrier (RR) made of CASS where the aging management programs are identified as "Water Chemistry Control - Closed Cooling Water" and "Inservice Inspection." These line items appear to be inconsistent with the Discussion in 3.1.1-53.

Please explain why these line are not inconsistent with the Discussion in 3.1.1-53 or correct the inconsistency.

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3.1.1-25: PNPS LRA Table 3.1.2-3 includes entries for piping and fittings made of carbon steel in a environment of Air-indoor (ext). Some of these entries have an aging effect of loss of material; some of these entries have an aging effect of "none." For the entries with aging effect of "none", Note 101 is applied and states, "High component surface temperature precludes moisture accumulation that could result in corrosion." Please clarify the high temperature conditions that are mentioned in the note: What is the "high temperature" threshold? For piping that experiences significant temperature changes during operation, approximately what percentage of operation at temperature below the high temperature threshold is assumed or anticipated for those piping and fittings where the aging effect is "none"? Please discuss the methodology that PNPS uses to identify which piping is classified as having aging effect of "loss of material" and which has aging effect of "none."
3.1.1-26: PNPS LRA Table 3.1.2-3 contains two line items for "Bolting (flanges, valves, etc)" where the material is either low alloy steel or stainless steel, the environment is Air-indoor (external), and the aging effect is cracking. Please identify the mechanism that causes this aging effect in these components. Please justify that the inservice inspection program provides aging management of these components adequate to ensure that they continue to perform their intended function during the period of extended operation. Please clarify whether PNPS will be developing a bolting integrity program modeled on Section XI.M18 to include these components.
3.1.1-27: In LRA Table 3.1.2-3, MEAP combination Bolting, Stainless steel, Air-indoor, Cracking-fatigue, TLAA – the notes are "A, 105." Please explain why note 105 is applicable to this line item.
3.1.1-28: In LRA Table 3.1.2-1, MEAP combinations "Closure flange studs" or "Other pressure boundary bolting," Low alloy steel, Air-indoor, Cracking-fatigue, TLAA – the notes are "C, 105." Please explain why note 105 is applicable to these line items.

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3.1.1-29:
In LRA Table 3.1.2-1, the following components are identified as having the aging effect of "cracking," and Note H is applied: Dome (Bottom Head); Dome (Upper Closure Head); Flanges (Shell closure flange and Upper head closure flange); Vessel Shell (Beltline shell); Vessel shell (Intermediate nozzle shell, lower shell, upper shell); Nozzles (Main steam).

Table 3-1 in BWRVIP-74-A (Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal) addresses various potential age related mechanisms and indicates the components to which the mechanisms apply. Except for the mechanism of "fatigue" which applies to some of the components listed in the paragraph above, there is no mechanism in Table 3-1 of BWRVIP-74-A that causes cracking and that BWRVIP-74-A identifies as applicable for the components listed above..

Question:
Please provide a discussion of the methodology that PNPS used to determine that the aging effect of "cracking" is applicable for the components listed in the first paragraph, above.
Please identify the mechanism(s) that cause cracking in these components.
Please explain how or whether PNPS incorporated the information contianed in BWRVIP-74-A into its determination that cracking is an aging effect applicable for these components.
Please discuss the plant-specific or industry experience reviewed by PNPS in making the determination that cracking is an aging effect applicable for these components.

3.1.1-30:
In LRA Table 3.1.2-1, the component Stabilizer Pads (part of Supports - Stabilizer pads, support skirt) is identified as having an aging effect of "loss of material" and the AMP is Inservice Inspection.

Questions:
What is the mechanism that causes the aging effect of loss of material?
Please describe the Inservice Inspection for the Stabilizer pads: What is the examination frequency? Examination requirement? Examination method? Acceptance standard? Are there any currently approved relief requests applicable for this component?