RAI 3.5.2.2-1

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 1, discusses the use of ASTM Standards C227-50 and C295-54 for investigations and petrographic examinations of concrete aggregates. However, License Renewal Application (LRA) Section 3.5.2.2.2.2, "Aging Management of Inaccessible Areas – Subsection 2," states that Prairie Island Nuclear Generating Plant (PINGP) tests and petrographic examinations were performed in accordance with ASTM Standard C289. While reviewing ASTM Standard C289 for compliance with the suggested standards, the staff noted that C289 states, "when this test method is used to evaluate the potential reactivity it must be used in combination with other methods."

The staff requests that the applicant provide a discussion and basis for the determination that ASTM C289 by itself adequately verifies the aggregates are not reactive and satisfies the requirements of ASTM C227-50 and C295-54 as suggested by the GALL report.

RAI 3.5.2.2-2

GALL Report line item II.A3-2 states additional inspections may be necessary to detect aging effects in dissimilar metal welds and bellows assemblies due to stress corrosion cracking (SCC), particularly if the material is not shielded from a corrosive environment. However, LRA Section 3.5.2.2.1.7, "Cracking due to Stress Corrosion Cracking (SCC)," states that additional inspections are not necessary for the stainless steel penetration sleeves and bellows with dissimilar metal welds since the components are located in a non-corrosive environment where the temperature does not reach the threshold for SCC.

The staff requests that the applicant provide (1) the highest temperature that the stainless steel penetration sleeves, penetration bellows, and dissimilar metal welds have experienced, and (2) demonstrate that chemical elements that support SCC have been monitored or measured to ensure a non-aggressive chemical environment.

RAI 3.6-1

Increased resistance of connections due to oxidation can occur in transmission conductors and connections, and in switchyard bus and connections. NUREG-1801, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), Section 3.6.2.2.3, recommends a plant-specific AMP for the management of increase resistance of connections due to oxidation or loss of pre-load in transmission conductors and connections and in switchyard bus and connections.

LRA Section 3.6.2.2.3 states that there are no aging effects from the outdoor environment that would cause the loss of the capacity to provide electrical connections to specified sections of an electrical circuit to deliver voltage, current, or signals.

The staff requests that the applicant provide a basis for the applicant's determination that increased resistance of connections due to oxidation or loss of pre-load in transmission conductors and connections, and in switchyard bus and connections is not an aging effect requiring management.

RAI 3.6-2

Tie wraps may be taken credit for in seismic analysis and in plant design specifications primarily for separation of cables to preclude ampacity degrading. Operating experience has identified occurrences where tie wraps have become brittle, degraded, or are missing and whose failures have affected the safety functions of other system/components.

The PINGP LRA does not address tie wraps as a commodity type which has been reviewed to determine if tie wraps are within the scope of license renewal and subject to an aging management review (AMR).

The staff requests that the applicant explain the basis for determining that tie wraps are not within the scope of license renewal and not subject to an AMR. In particular, address if tie wraps are taken credit for in seismic analysis or/and design specifications in the current licensing basis. Address whether tie wraps are used in applications where they are non-safety related components, whose failure could affect safety-related intended functions. If tie wraps are taken credit for in a seismic analysis, provide a quantitative analysis of the effects of cables spacing not being maintained as original design specifications (due to tie wraps failure). The analysis should provide the worst case scenario with ampacity reduction and the maximum amperes required for motors to start and run during a design basis accident.

RAI 3.1.2-02

In the LRA 3.X.2 Tables, the applicant has assigned "Note E" to several line items for cast austenitic stainless steel components exposed to a treated water environment. The aging effect that requires management for these components is Cracking – SCC/Intergranular Attack (IGA). These components are: Piping/Fittings (Table 3.1.2-02), Pump Casings (Table 3.1.2-02), Valve Bodies (Table 3.1.2-02), Valve Bodies (Table 3.2.2-02), and Valve Bodies (Table 3.2.2-03). The GALL Report Table IV.C2, AMR item IV.C2-3 recommends monitoring and control of water chemistry in accordance with EPRI TR-105714 and material selection according to NUREG-0313, Rev 2, where reduced susceptibility to SCC is expected if carbon content is 0.035% or less and delta ferrite content is 7.5%. The GALL AMR states that if Cast Austenitic Stainless Steel (CASS) components do not meet either one of the two guidelines, then a plant specific program is to be evaluated that includes inspection methods to detect cracking and flaw evaluation of components susceptible to thermal embrittlement. The applicant credits the ASME Section XI ISI, IWB, IWC, and IWD program to manage cracking.

1) For these components, clarify whether PINGP controls water chemistry in accordance with the guidelines in EPRI Report No. TR-105714.
2) Clarify how the CASS components in these LRA AMR items meet the SCC susceptibility considerations of having less than an 0.035% carbon alloying content or less than a 0.75% delta ferrite content.
3) If it is determined that any of these CASS components do not meet the reduced susceptibility criteria on carbon and delta ferrite alloy contents, discuss the inspection methods that will be used to monitor for cracking in these components. Discuss the flaw evaluation methodologies used by PINGP to account for a change in the critical crack size used in the analysis as a result of a drop in the fracture toughness of the CASS components.
4) Ultrasonic testing (UT) methods may be incapable of detecting flaws in CASS components because of the dense, small grain-size microstructure of CASS, which

results in significant, high amplitude UT background noise signals. If UT is proposed as the method for inspecting these components, provide your basis why the UT method selected would be capable of distinguishing between a UT signal that results from a flaw in the material as opposed to background UT signals that result from the CASS microstructure or abnormal geometries in the CASS component.

Clarify whether or not the inspection methods and flaw evaluation methods implemented for these components are within the scope of the PINGP ASME Section XI Inservice Inspection Program.

RAI 3.1.2-2-01

LRA Section: Table 3.1.2-2, page 3.1-70, page 3.1-71

Background: In LRA Table 3.1.2-2, on page 3.1-70, the AMR results for stainless steel valve bodies in a treated water environment show the aging effect of cracking managed by three AMPs: 1) ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program; 2) One-Time Inspection Program; and 3) Water Chemistry Program. The AMR result line for the Water Chemistry Program references three different GALL Report Volume 2 line items and three corresponding LRA Table 1 line items. The ASME Section XI ISI Program and the One-Time Inspection Program line items each reference one of the GALL Report Volume 2 line items and corresponding Table 1 line items.

Similarly, on page 3.1-71, the AMR results for stainless steel valve bodies in a treated water environment show aging effects of loss of material due to crevice or pitting corrosion managed by two AMPs: 1) One-Time Inspection Program; and 2) Water Chemistry Program. Again the line item for the Water Chemistry Program references multiple GALL Report Volume 2 and LRA Table 1 line items, but only one of the GALL Report Volume 2 line items is referenced by the Water Chemistry Program line item.

Issue: To compare AMR results in the LRA against recommended AMR results in the GALL Report, it is necessary to have a clear methodology to determine what AMP or combination of AMPs is proposed to manage the aging effect for each component, material, environment and aging effect (MEA) combination listed. However, the LRA provides no additional guidance on how an AMP line with multiple GALL Report Volume 2 line item references should be combined with companion AMP lines that refer to only one of those GALL Report line items, so that the AMP or AMPs proposed for each MEA combination is uniquely determined.

Request:

1) Provide additional guidance on how AMP lines referring to multiple GALL Report Volume 2 line items are to be combined with companion AMP lines to uniquely determine the AMP or combination of AMPs being proposed to manage the aging effect for a specific MEA combination.

2) Give specific examples of how this guidance is to be applied using the three AMR result lines at the bottom of LRA page 3.1-70 and the AMR result lines on LRA page 3.1-71.

RAI 3.1.2.2.7-01

LRA Section: Section 3.1.2.2.7.1, page 3.1.12; Table 3.1.1, item 3.1.1-23, page 3.1-22; Table 3.1.2-4, pages 3.1-95 and -99.

Background: SRP-LR Section 3.1.2.2.7.1 states that cracking due to SCC could occur in the PWR stainless steel reactor vessel flange leak detection lines and the bottom mounted instrument guide tubes exposed to reactor coolant. GALL Report items IV.A.2-1 (bottom-mounted guide tube) and IV.A.2-5 (vessel flange leak detection line) recommend that a plant-specific AMP be evaluated. PINGP proposes to manage the aging effect of cracking due to SCC in these components with the Water Chemistry Program, alone.

Issue: SRP-LR provides acceptance criteria for plant-specific AMPs in Appendix A.1, Aging Management Review – Generic (Branch Technical Position RLSB-1), which is referenced in SRP-SR, Section 3.1.2.2.7.1.

Branch Technical Position RLSB-1 states that a plant-specific aging management program should include a “detection of aging effects” program element. PINGP’s Water Chemistry Program is a mitigation program and does not include detection of aging effects. Therefore, PINGP’s Water Chemistry Program, alone, does not meet the requirements for a plant-specific AMP under the criteria of Branch Technical Position RLSB-1.

Request:

1) Provide a plant-specific AMP or combination of existing AMPs that include a “detection of aging effect” program element for managing the aging effect of cracking due to SCC in the stainless steel reactor vessel flange leak detection line and in bottom mounted instrument guide tubes; and

2) Describe what examination techniques will be used to detect (or confirm the absence of) the aging effect of cracking due to SSC in the vessel flange leak detection line and the bottom mounted instrument guide tubes, or

3) Provide both a technical justification and a regulatory justification as to why confirmation of water chemistry effectiveness is not needed and why a “detection of aging effect” program element is not required.

RAI 3.1.2-5-01

LRA Section: Table 3.1.2-5, pages 3.1-128 and -129

Background: Table 3.1.2-5 (Steam Generator System) shows AMR results for nickel alloy U-tubes in a treated water environment with an aging effect of heat transfer degradation due to fouling. Note H is cited indicating that the aging effect is not included in the GALL Report for this component, material and environment combination. The recommended AMP is the Water Chemistry Program, alone.

Issue: The LRA does not provide any justification as to why the Water Chemistry Program, alone, is sufficient to provide management for this aging effect during the period of extended operation. Also, GALL Report Volume 2, line item V.A-16, which is for stainless steel heat exchanger tubes in a treated water environment, recommends use of Water Chemistry and One-Time Inspection to manage the aging effect of reduction of heat transfer due to fouling. Although the materials are different (nickel alloy vs stainless steel) the aging effect of reduction of heat transfer due to fouling would be expected to manifest itself in similar ways for both materials.

Request:

1) Provide an inspection activity to confirm effectiveness of the Water Chemistry Program to mitigate the aging effect of loss of heat transfer due to fouling in these components.

or

2) Provide a technical justification explaining why such a confirmation is not needed.

RAI 3.2.2.2.3.6-01

LRA Section: Section 3.2.2.2.3.6, pages 3.2-7 and 3.2-8

Background: SRP-SR Section 3.2.2.2.3.6 states that loss of material due to pitting and crevice corrosion could occur for stainless steel piping, piping components, piping elements, and tanks exposed to internal condensation. LRA Section 3.2.2.2.3.6 and Table 3.2.1, item 3.2.1-08, both state that the AMR result in the GALL Report is not applicable because PINGP does not have stainless steel piping and piping components exposed to condensation in GALL Report Chapter V [engineered safety features] systems.

Issue: The statement in LRA Section 3.2.2.2.3.6 does not address stainless steel tanks, which are included in the list of components that may be in an environment of internal condensation in SRP-SR Section 3.2.2.2.3.6. Also, it is not clear how PINGP determined that stainless steel piping in the containment spray is not exposed to internal condensation.

Request:

1) Provide the basis for the statement in the LRA that there are no stainless steel piping and piping components exposed to condensation in GALL Report Chapter V systems, specifically addressing stainless steel piping in the containment spray system (GALL Report Volume 2, item V.A-26) and stainless steel tanks in the safety injection system (GALL Report Volume 2, item V.D1-29).

RAI 3.2.2.2.4.2-01

LRA Section: Section 3.2.2.2.4.2, page 3.2-8; Table 3.2.1, item 3.2.1-10, page 3.2.13.

Background: The SRP-LR in Section 3.2.2.2.4.2 states that reduction in heat transfer due to fouling could occur for stainless steel heat exchanger tubes exposed to treated water and recommends that effectiveness of water chemistry control to mitigate this aging effect should be confirmed to ensure that reduction of heat transfer is not occurring and that the component's intended function will be maintained during the period of extended operation.

Issue: The AMR results presented in the LRA state that the Water Chemistry Program, alone, is adequate to control this aging effect and that verification of Water Chemistry Program effectiveness is not needed. The discussions in LRA Section 3.2.2.2.4.2 and item 3.2.1-10 refer to GALL Report line items 3.2.1-48 and 3.2.1-49 where the Water Chemistry Program, alone, is recommended to manage the aging effects of cracking due to SCC and loss of material due to pitting and crevice corrosion for stainless steel piping and piping components in a borated treated water environment.

Request:

1) Identify the heat exchangers in the engineered safety features system that are the subject of this AMR.
2) State whether these heat exchangers are periodically examined under an existing plant program to the extent that indications of fouling in the heat exchanger tubes can be detected.
3) Explain why reference to AMR results where the aging effects are cracking and loss of material are used to support not monitoring for the aging effect of reduction in heat transfer due to fouling.
4) Provide a technical justification for not performing a one-time inspection to confirm Water Chemistry Program Effectiveness, as recommended in the GALL Report for this component, material, environment and aging effect combination.

<u>RAI 3.3.2.2.4.1-01</u>

LRA Section: Section 3.3.2.2.4.1, page 3.3-34; Table 3.3.1, item number 3.3.1-7, page 3.3-45.

Background: SRP-LR Section 3.3.2.2.4.1 recommends the Water Chemistry program and a plant-specific verification activity to manage the aging effect of cracking due to SSC and cyclic loading in PWR non-regenerative heat exchanger components exposed to treated borated water. The SRP-LR states that an acceptable verification program is to include temperature and radioactivity monitoring of the shell side water, and eddy current testing of the tubes.

Issue: PINGP proposes to manage the aging effect in this component with the Water Chemistry Program and the One-Time Inspection Program. PINGP cites NUREG-1785, Safety Evaluation Report Related to License Renewal of H.B. Robinson Steam Electric Plant, Unit 2, as providing a precedent for use of the One-Time Inspection Program. However, there is insufficient information in the LRA to determine whether the One-Time Inspection program is adequate to perform verification for this aging effect in these components.

Request:

1) Provide a description of the examination methodology to be used to verify effectiveness of the Water Chemistry Program to mitigate the aging effect of cracking due to SCC and cyclic loading in the components that are included in this AMR result line. Also discuss if the methodology is adequate to detect the aging effect of cracking in these components.
2) Will eddy current testing of the tubes be included in the One-Time Inspection Program? If not, then how will potential cracking in the tubes be detected or confirmed not to have occurred?

3) Are there any installed instruments that provide measurements of temperature and radioactivity on the shell side of the heat exchanger?

4) What has been the operating experience with these components? Have there been any failures due to cracking or any other adverse operating experience?

5) Has eddy current testing of the heat exchanger tubes previously been performed? If so, have results indicated evidence of cracking?

6) Address the One-Time Inspections for both LRA line item 3.3.1-7 (non-regenerative heat exchanger components) and 3.3.1-8 (regenerative heat exchanger components) in your response to this RAI.

RAI 3.3.1-51-01

LRA Section: Table 3.3.1, item number 3.3.1-51, page 3.3-54; Table 3.3.2-3; Table 3.3.2-5; Table 3.3.2-8; Table 3.3.2-9; Table 3.3.2-11; Table 3.3.2-13; Table 3.3.2-20

Background: The GALL Report indicates that the aging effect/mechanism for this Table 3.3.1, item number 3.3.1-51 is loss of material due to pitting, crevice and galvanic corrosion. The component is copper alloy piping, piping components, piping elements and heat exchanger elements exposed to closed cycle cooling water, and galvanic corrosion is normally an aging mechanism associated with copper or copper alloy components.

Issue: Review of the AMR result lines in the 3.X.2 tables that refer to item number 3.3.1-51 did not find any AMR results that list galvanic corrosion as an aging mechanism.

Request:

1) Why is the aging mechanism of galvanic corrosion not included for these copper alloy components?

RAI 3.3.1-76-01

LRA Section: Table 3.3.1, item number 3.3.1-76, page 3.3-60; and various lines referring to 3.3.1-76 in Table 3.3.2-3, Table 3.3.2-5, Table 3.3.2-6, Table 3.3.2-7, Table 3.3.2-8, Table 3.3.2-20, Table 3.3.2-21

Background: The discussion column in LRA item number 3.3.1-76 states that the AMR results are consistent with the GALL Report and that the aging effect is managed by the Open-Cycle Cooling Water System Program. Review of the 3.X.2 tables listed above finds multiple AMR result lines referring to item number 3.3.1-76 where the AMP is the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program and generic note E is cited, indicating that the line is consistent with the GALL Report for component, material, environment combination, but a different AMP is used.

Issue: The statement in the discussion column says the aging effect is managed by the Open-Cycle Cooling Water System Program. This is either incorrect or misleading since the Open-Cycle Cooling Water System Program is used to manage the aging effect for only some of the

AMR result lines, and the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect in other ARM result lines.

Request:

1) Explain why the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program, rather than the Open-Cycle Cooling Water System Program, is used for some of the AMR result lines.

2) Revise the discussion in LRA Table 3.3.1, item 3.3.1-76, to clarify that two different aging management programs are used, or justify why the LRA does not need to be revised.

<u>RAI 3.3.1-77-01</u>

LRA Section: Table 3.3.1, item number 3.3.1-76, page 3.3-60; and various lines referring to 3.3.1-77 in Table 3.3.2-3, Table 3.3.2-5, Table 3.3.2-6, Table 3.3.2-8, Table 3.3.2-17, and Table 3.3.2-20

Background: The discussion column in LRA item number 3.3.1-77 states that the AMR results are consistent with the GALL Report and that the aging effect is managed by the Open-Cycle Cooling Water System Program. It also states that in some cases, the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program or the Fire water System Program is credited in lieu of the Open-Cycle Cooling Water System Program. Review of the 3.X.2 tables listed above finds multiple AMR result lines referring to item number 3.3.1-77. However, none of these AMR result lines identify the Fire Water System Program as the AMP credited to manage the aging effect in these components.

Issue: The statement in the discussion column says in some instances the Fire Water System Program is credited in lieu of the Open-Cycle Cooling Water System Program appears to be incorrect.

Request:

1) Identify the location in the LRA of AMR result lines that refer to item number 3.3.1-77 where the Fire Water System Program is credited to provide aging management, or correct the description in the discussion column for LRA Table 3.3.1, item number 3.3.1-77, saying that the Fire Water System Program is credited.

2) Explain why the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program or the Fire water System Program (if actually used) are credited in lieu of the Open-Cycle Cooling Water System Program for some of these AMR result lines.

<u>RAI 3.3.1-78-01</u>

LRA Section: Table 3.3.1, item number 3.3.1-78, page 3.3-60

Background: The discussion column in LRA item number 3.3.1-78 states that this line was not used at PINGP and says, “See LRA line item 3.3.1-79 for further discussion.”

Issue: It does appear that the AMR results for LRA item number 3.3.1-78 could be included as a subset of the AMR results in LRA item number 3.3.1-79 based on similarity of component, material, environment and aging effect. However, there is no mention of LRA line item 3.3.1-78 in the discussion column of LRA line item 3.3.1-79.

Request:

1) Revise the statement in LRA item number 3.3.1-78, or add an appropriate discussion of 3.3.1-78 into the discussion column of LRA item number 3.3.1-79

<u>RAI 3.3.2-9-01</u>

LRA Section: Table 3.3.2-9, page 3.3-206

Background: LRA Table 3.3.2-9 shows AMR results for copper alloy piping/fittings in the fire protection system in a fuel oil environment with an aging effect of cracking due to SCC/IGA. Three AMPs are shown as applicable for these components: 1) Fire Protection Program; 2) Fuel Oil Chemistry Program; and 3) One-Time Inspection Program. Note H is used for these AMR result lines, and there is no reference to GALL Report Volume 2 line items.

Issue: Because these results are not in the GALL Report, there are no GALL Report Volume 2 line item references to link the three AMPs. Consequently, there is no way for a reviewer to determine whether the aging effect is managed by all three of the AMPs together, or whether for some components it is managed by a combination of only two programs. For example, the Fuel Oil Chemistry Program and the One-Time Inspection Program might be credited for some components; while for other components the Fire Protection Program and the One-Time Inspection Program might be credited; and for still other components the Fuel Oil Chemistry Program and the Fire Protection Program might be credited.

Request:

1) For all components in these AMR result lines, is the aging effect managed by all three AMPs together?

2) If all components in these AMR result lines are not managed by all three AMPs together, then identify what combinations of AMPs are used, and for what set of components each combination of AMPs is credited.

3) Is Fuel Oil Chemistry Program credited for all components in these AMR results lines?

4) Are there any components for which Fuel Oil Chemistry Program, alone, is credited?

5) For components where the Fire Protection Program is credited, is the Fire Protection Program credited to provide both mitigation and detection of the aging effect? If credited to provide detection of the aging effect, then explain how the Fire Protection Program detects the aging effect of cracking due to SCC/IGA.

<u>RAI 3.3.2-13-01</u>

LRA Section: Table 3.3.2-13, pages 3.3-259, -263, -265, -266, and -269.

Background: On the pages listed above, there are AMR result lines for various carbon steel piping components in a treated water environment where the aging effect is identified as cracking due to stress corrosion cracking and the AMP proposed to manage the aging effect is the Closed-Cycle Cooling Water Program, alone. These AMR result lines cite generic note H, (Aging effect not in NUREG-1801 for this component, material, and environment combination not applicable.)

Issue: Cracking due to SCC is not normally associated with carbon steel components. In addition, the Closed-Cycle Cooling Water System Program (B2.1.9) does not include any examination techniques applicable for carbon steel components that are capable of detecting cracks due to SCC. However, the "detection of aging effects" program element for GALL AMP XI.M21, Closed-Cycle Cooling Water System, states that inspection and testing should assure the detection of corrosion or SCC before the loss of intended function.

Request:

1) What is the basis for expecting that cracks due to SCC may occur in the carbon steel piping components (pipe, valves, pumps, tanks, heat exchanger components) exposed to treated water in the plant sample system? Cite any plant-specific or industry operating experience or information that supports occurrence of this aging effect in carbon steel piping components.

2) Provide an examination technique for these components that is capable of detecting cracks due to SCC, or provide a justification as to why examination for cracks is not needed to ensure adequate aging management for these components.

<u>RAI 3.3.2-20-01</u>

In LRA Table 3.3.2-20, several AMR Line Items reference the following:

- Table 1 item 3.3.1-77 and GALL Report Volume 2 line item VII.C1-5
- Table 1 item 3.4.1-33 and GALL Report Volume 2 line item VIII.E-3
- Table 1 item 3.3.1-82 and GALL Report Volume 2 line item VII.C1-3

These AMR line items credit the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program. The staff noted that the environment for some of these line items as described above is raw water on the external surface. Please clarify how a visual inspection of the internal surfaces of the heat exchanger components and/or tubes will be capable of determining the condition of the surfaces exposed to the raw water on the external surface of these heat exchanger components and/or tubes.

RAI 3.3.2-08-01

In LRA Table 3.3.2-08, 3.3.2-09, 3.4.2-03, 3.4.2-04, flex connections and expansion joints that are fabricated from rubber and natural rubber, exposed to an internal environment of treated or raw water and subject to the aging effects of change in material properties and cracking referenced the applicable plant-specific note 323 or 423 which states in part, that the external environment is the same as the internal environment. Please clarify if the internal environment for these AMR line items is identical to the external environment or if the external environment is more aggressive. If the latter is the case, identify the external environment for these components. Please consider in your response the impact RAI B2.1.14 may have, and if the appropriate program to manage the effects of aging for non-metallic components will be capable of being credited so that the external surface may be representative of the internal surfaces. If not, provide an appropriate program that is capable of managing the aging of the internal surfaces for non-metallic components.

RAI 3.3.2-20-02

In LRA Table 3.3.2-20 and 3.4.2-08, several AMR line items reference the following:

- Table 1 item 3.3.1-77 and GALL Report Volume 2 line item VII.C1-5
- Table 1 item 3.4.1-33 and GALL Report Volume 2 line item VIII.E-3
- Table 1 item 3.4.1-8 and GALL Report Volume 2 line item VIII.G-36
- Table 1 item 3.4.1-32 and GALL Report Volume 2 line item VIII.A-4

These AMR line items credit the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program, which performs a periodic visual inspection of the components. Please justify how a visual inspection alone, is capable of detecting the aging effect of loss of material in heat exchanger components and tubes in those regions that are not directly visible (e.x. the bend of a heat exchanger tube) or provide an appropriate inspection technique or program that will be capable of detecting the aging effect of loss of material for those regions that are not directly accessible for a visual inspection.

RAI – 3.1.1-1

In LRA Table 3.1.2-03, two AMR line items references the following:

- Table 1 item 3.1.1-80 and GALL Report Volume 2 line item IV.B2-21

  For these line items, the GALL Report recommends that AMP XI.M13, “Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS),” be used for managing the aging effects of loss of fracture toughness due to thermal aging and neutron irradiation embrittlement. However Table 1 item 3.1.1-80 credits the PINGP B2.1.32, “PWR Vessels Internal Program.” Please justify the basis for using the PINGP AMP B2.1.32, “PWR Vessels Internal Program,” in lieu of the GALL Report recommended program.