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Subject: AMP and TLAA questions for Audit
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Don,

Attached are questions for the Q&A database that the NRC staff intends to discuss with you during the upcoming audit.

Sincerely,

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Indian Point Unit 2 & 3 - Aging Managing Audit Questions

Section 3.6 -Nguyen Question # 1	Describe SBO restoration paths for IP2/IP3. Included appropriate drawings for discussion.
Section 3.6 -Nguyen Question # 2	High voltage direct burial insulated cable (>35 kV) may be exposed to condensation and wetting in inaccessible location, such as conduits, cable trenches, cable troughs, duct banks, underground vaults or direct buried installation. When an energized high voltage cable is exposed to wet conditions for which it is not designed, water tree or a decrease in dielectric strength of the conductor insulation can occur. This can potentially lead to electrical failure. Provide a manufacturer certification that 138 kV direct burial insulated transmission cable is qualified for continuous submerge condition for 60 years or provide an AMP to ensure that water tree aging effect will not degrade the cable intended function during the period of extended operation.
TLAA 4.3 -Wen Question # 1	In LRA Table 4.3-1 the applicant states that the projected 60-year reactor trips were based on an operating history from 1999 to 2005, while the other transients were based on the initial plant startup. (a) The LRA states that because plant operating practices have changed and some of the transients occur more or less often as an explanation for using the six year operating history (1999 - 2005). Please explain what plant operating practices have been changed and why these changes were not considered in the other transients' projection. (b) From February 2000 to January 2001, IP2 was shutdown because of a steam generator tube rupture (SGTR) event and subsequent steam generator replacement activities. Considering this period of shutdown, please explain the impact it has on 60-year projection for reactor trips. Also, provide reasons why it does not lessen the 60-year projection cycle number for reactor trips. (c) Page 4.3-2 of the LRA describes linear extrapolation of transients cycles. As the plant aged, the aging effects were not considered in the linear extrapolation method; please justify the validity of using linear extrapolation.

TLAA 4.3 -Wen Question # 2

FSAR Tables indicate the same design transients for both IP2 and IP3. However, LRA provides a more extensive list of transients for IP2 (Table 4.3-1) than IP3 (Table 4.3-2). Explain the basis for the differences.

TLAA 4.3 -Wen Question # 3

LRA Table 4.3-1 lists some IP2 analyzed numbers of cycles for some transient conditions that do not agree with their design cycle numbers listed in IP2 FSAR Table 4.1-8. For example:

Transient Condition	FSAR (of Cy)	LRA (of Cy)
Step load decrease of 50-percent of full power	200	150
Hydrostatic test at 2485 psig and 400 F	5	50

(a) Please explain the discrepancies and discuss the impact on the cumulative usage factors (CUFs) for various components.

(b) Indicate which number is used in the design calculation for the hydrostatic test at 2485 psig and 400 F design transient.

TLAA 4.3 -Wen Question # 4

In LRA Tables 4.3-1 and 4.3-2, a number of transient conditions for both IP2 and IP3 have 0 as the value for the 60-year projection. Please explain the conservatism behind projecting no transient conditions. Are these projected values used in any component's fatigue evaluation?

TLAA 4.3 -Wen Question # 5

In LRA Table 4.3-1, the applicant lists the steady state fluctuation cycles (781,209), as of 5/24/2005. This date contradicts to the statement made in LRA page 4.3-2, where the applicant states that this cycle number is calculated as of 10/31/1999.

(a) Please explain the discrepancy.

(b) LRA indicates that steady state fluctuations are not monitored. Are steady state fluctuations contributed to the design fatigue usage factors for any component?

TLAA 4.3 -Wen Question # 6

LRA Section 4.3.1.2 addresses the reactor vessel internals. Indicate whether the CUFs listed in Tables 4.3-5 and 4.3-6 are based only on design thermal transients used in the reactor vessel analysis.

TLAA 4.3 -Wen Question # 7	In LRA 4.3.1.3 (Pressurizer), the applicant states that the impact of steady state fluctuations on pressurizer fatigue determination is "not significant." (a) Please describe any engineering analysis that was performed to make the determination of "not significant." (b) The second paragraph on LRA 4.3.1.3 states: "The stress report analyzed the 106 steady state oscillations only for condition N-415.1(b)." Please confirm if the analysis is based on 106 steady state oscillations, and not 10E6 steady state oscillations.
TLAA 4.3 -Wen Question # 8	The first sentence of LRA page 4.3-3 states: "Feedwater cycling, a replacement steam generator design transient limited to 18,300 cycles, does not appear on Table 4.3-1. The value of 18,300 is the projected value for 40 years of steam generator operation." Feedwater cycling, however, is listed as a design transient in Table 4.3-1 with 2,000 analyzed cycles. Please clarify which number is the correct design basis.
TLAA 4.3 -Wen Question # 9	LRA Table 4.3-1 includes IP2 design transients whose 60-year projections exceed design cycles. However, LRA Section 4.3.1.1 states "the projected numbers of transient cycles used for reactor vessel fatigue analyses remain within analyzed values," and invoked the 10 CFR 54.21(c)(1)(i) for its reactor vessel TLAA. Please justify this conclusion.
TLAA 4.3 -Wen Question # 10	As described in LRA Section 4.3.1.2 through LRA Section 4.3.1.8, in light of IP2 design transients whose 60-year projections exceeding the design cycles, the applicant made same statement (refer to the previous question) for the fatigue analyses of the associated components. Please justify the conclusion for each component.

TLAA 4.3 -Wen Question # 11

LRA Table 4.3-7 lists CUFs for various subcomponents of IP2 pressurizer. The applicant concludes:

> "None of the design transients used in the analysis of the pressurizer will be exceeded as discussed in Section 4.3.1. The pressurizer fatigue analyses will thus remain valid for the period of extended operation in accordance with 10CFR54.21(c)(1)(i)."

Pressurizer insurge/outsurge transient is a CLB transient, which needs to be considered in the license renewal application. But the Table 4.3-7 result did not consider this transient. Please explain how you reach the above conclusion.

TLAA 4.3 -Wen Question # 12

LRA Table 4.3-2 does not provide the actual cycles as of 3/21/2006 for "Plant Heatup at 100°F per hour" and "Plant Cooldown at 100°F per hour."

(a) What are the actual occurrence as of 3/31/2006?

(b) Why do these two transients use a different extrapolation method, which was projected based on the operating history (1975-1995), in determining the 60-year projection.

TLAA 4.3 -Wen Question # 13

On page 4.3-18, the LRA describes IP2 and IP3 responses to NRC Bulletin 88-11, indicating that changes were made to its operating procedures.

(a) Discuss the modified operating procedures used to mitigate the pressurizer insurge/outsurge transients.

(b) Is the mitigation strategy factored into the determination of IP3 pressurizer surge line nozzle CUF of 0.9612? How was the fatigue usage prior to the use of modified operating procedures captured in the fatigue evaluation?

TLAA 4.3 -Wen Question # 14

LRA page 4.3-13 states: "The IPEC pressurizers were evaluated for the stretch power uprates and cumulative usage factors were updated." This resulted in no change to the CUF, it remains 0.264. Explain why the stretch power uprates had no impact on the surge line CUF.

TLAA 4.3 -Wen Question # 15

LRA 4.3.1.7 discusses bounding CUFs for IP2 and IP3 Class 1 heat exchangers and the use of IP2 CUF to project the IP3 CUF.

(a) IP2 and IP3 were operated by different organizations for long time before Entegry took over in 2001 and 2000, respectively. Hence, those heat exchangers have different operating histories. Please justify why IP3 heat exchanger CUF is comparable to IP2's CUF.

(b) This LRA section discusses IP2 regenerative letdown heat exchangers, IP2 excess letdown heat exchangers, and IP3 auxiliary heat exchangers. There are , however, no discussion on IP3 regenerative letdown heat exchangers and the excess letdown heat exchangers. Are IP3 auxiliary heat exchangers same as regenerative letdown heat exchangers and the excess letdown heat exchangers? Please explain their differences.

TLAA 4.3 -Wen Question # 16

LRA Tables 4.3-13 and 4.3-14 indicate that the following components' environmentally adjusted CUFs are all projected to exceed a value of 1.0 during period of extended operation: IP-2 pressurizer surge line piping, IP2 RCS piping charging system nozzle, and IP-3 pressurizer surge line nozzles and piping. The two tables also indicate that there are no environmentally adjusted CUFs for the RCS piping SI nozzle (IP-2 and IP-3), RHR Class 1 piping (IP-2 and IP-3) and RCS piping charging system nozzle (IP-3).

On pages 4.3-22 and 4.3-23, Entergy provides its corrective action plan to address this issue. Please confirm that fatigue usage factors will be developed for these locations and that this corrective action program will be included as a commitment on the Indian Point LRA.

TLAA 4.3 -Wen Question # 17	Regarding TLAA on environmentally-assisted fatigue issues, in Section 4.3.3 of the LRA (page 4.3-22), the applicant states that it will implement one or more of the three options described on that page. Please provide information on the methodology that will be used for the chosen option or options. Specifically, please address the followings: (a) If Option (1) is chosen, describe the methodology and the process that will be used to ensure that assumptions, transients, cycles, external loadings, Fen values, and analysis methods are valid for the refined or new fatigue analyses. In the event the refined analyses performed under Option (1) result in CUFs greater than 1.0, describe the option(s) that may be used in addition to Option (1). (b) If Option (2) is chosen, describe the AMP in sufficient detail with regard to inspection scope, inspection methods, inspection frequency, and inspection qualification techniques. (c) If Option (3) is chosen, describe how the repair or replacement activity will be implemented in accordance with applicable repair or replacement requirements of the ASME Code Section XI.
AMP B.1.3 -Baig Question # 1	According to GALL, the applicant's Boraflex Monitoring Program, according to manufacture's recommendations, should assure that no unexpected degradation occurs that would compromise the criticality analysis. What are the manufacturer's recommendations for IP-2 AND IP-3?
AMP B.1.3 -Baig Question # 2	What is the justification for IPEC selection of areal density measurement over GALL specification for measuring gap formation by blackness testing.
AMP B.1.5 -Baig Question # 1	Please provide each boric acid leakage as to the leakage affecting or potentially affecting safety-related components.
AMP B.1.5 -Baig Question # 2	Explain how the vessel head is inspected for evidence of boric acid.

AMP B.1.5 -Baig Question # 3	Discuss how the applicant responded to the NRC's order and bulletins listed below; explain how these responses have been used to update the component list location and visual inspection within the scope of the Boric Acid Corrosion Program. NRC Bulletin 2002-01 dated March 29 and May 16, 2002 NRC RAI on Bulletin 2002-01 dated January 17, 2003 NRC Bulletin 2003-02 dated September 19, 2003 NRC Order EA 03 009, dated March 3, April 11 and April 18, 2003 NRC Bulletin 2004 - 01, dated May 28, 2004
AMP B.1.7 -Morante Question # 1	The applicant indicates that this AMP is consistent with GALL AMP XI.S4, without exception or enhancement. GALL Vol.2, Rev. 1, AMP XI.S4, Scope of Program, states "Leakage testing for containment isolation valves (normally performed under Type C tests), if not included under this program, is included under LRT programs for systems containing the isolation valves." Is Entergy crediting 10 CFR Part 50, Appendix J, Type C containment isolation valve leak rate testing for aging management during the license renewal period? If not, what AMPs are credited for managing aging of the containment isolation valves?
AMP B.1.8 -Morante Question # 1	The intent of the staff in writing GALL Vol. 2 Chapter XI, was to enable an applicant to take credit for an existing mandated inspection program with minimal effort (i.e., simply identify and explain exceptions and enhancements). Entergy has identified AMP B.1.8 - Containment Inservice Inspection as being plant-specific. The staff reviewed LRA Appendix B.1.8 and concluded that the 10-element evaluation does not identify any differences from GALL AMPs XI.S1 and XI.S2. Entergy is requested to document an element-by-element comparison of AMP B.1.8 to GALL AMPs XI.S1 and XI.S2, identifying and explaining all exceptions and enhancements to the GALL AMPs.

AMP B.1.8 -Morante Question # 2	The IP 2 and 3 containments have a somewhat unique design feature: thermal insulation on the steel liner plate, at the lower elevations of the cylindrical containment wall. In both UFSARs, this insulation is credited with limiting the liner temperature increase to 80 degrees F during a design basis accident. Both UFSARs state that the insulation is removable, to permit periodic inspection of the containment liner plate. (1) Identify the AMP and describe the specific inspections performed, to ensure that this insulation will continue to perform its intended function. (2) Describe the plant-specific operating experience related to removal of this insulation and inspection of the containment liner plate normally covered by the insulation. How does the condition of the normally insulated liner plate surface compare to the condition of the normally uncovered liner plate surface? Has augmented inspection, per Category E-C, been necessary?
AMP B.1.8 -Morante Question # 3	Identify all augmented inspections required by IWE or IWL that are being implemented during the current inspection intervals. For each case, describe the initial finding that necessitated augmented inspection.
AMP B.1.8 -Morante Question # 4	Entergy does not credit GALL AMP XI.S8 for license renewal. Confirm that Level I containment protective coatings are not credited for liner plate corrosion prevention/mitigation in the current design bases for IP 2 and 3.
AMP B.1.8 -Morante Question # 5	In its review of TLAA Section 4.6, the staff noted that in 1973 a significant permanent deformation of the IP Unit 2 liner plate occurred at the penetration for feedwater line #22. The operating experience element of AMP B.1.8 does not discuss this existing condition nor the results of periodic inspections conducted under the Containment ISI Program. (a) Describe in greater detail the event that resulted in the permanent liner plate deformation. When specifically did it occur? What was identified as the root cause? How was this corrected? (b) Discuss the history of ISI of the permanently deformed liner plate, from 1973 to the present.

AMP B.1.9 -Sullivan Question # 1	Provide a more detailed description of past and present fuel oil monitoring activities at the Indian Point site, including surveillance and maintenance procedures implemented to mitigate corrosion and verify the effectiveness of the Diesel Fuel Monitoring aging management program. Provide the frequency for the maintenance activities.
AMP B.1.9 -Sullivan Question # 2	The LRA is silent on the use of tank coatings. Are the internal surfaces of any of the fuel oil storage tanks within the scope of license renewal coated or lined? If so, describe how the aging of the coating or lining is managed.
AMP B.1.9 -Sullivan Question # 3	LRA AMP B.1.9 states that the program is being enhanced to include cleaning and inspection of the GT1 fuel oil storage tanks, EDG fuel oil day tanks, and SBO/Appendix R diesel generator fuel oil day tank once every ten years. Provide a more detailed description of past and present fuel oil monitoring activities related to these tanks.
AMP B.1.9 -Sullivan Question # 4	The LRA states that IPEC does not add biocides to diesel fuel oil storage tanks as recommended in GALL, to prevent biological breakdown of the diesel fuel. Rather, the existing processes for minimizing water contamination of the fuel and reviewing site and industry operating experience appear to be credited. While these processes may be effective in determining the existence of biological contamination, they do not appear to meet the intent of GALL for preventing and minimizing the accumulation of biological activity. Also, the LRA does not address an apparent exception to NUREG 1801, Element 7, regarding the addition of biocide to fuel oil when the presence of biological activity is confirmed. Please clarify.
AMP B.1.9 -Sullivan Question # 5	Describe how the quality of initial fuel oil purchases and deliveries is ensured.
AMP B.1.9 -Sullivan Question # 6	The LRA states that thickness measurements of storage tank bottom surfaces are performed to verify that significant degradation is not occurring. Provide the procedures used to perform this surveillance and describe the acceptance criteria and basis for minimum wall thickness. Also provide a technical basis for the specified 10 year surveillance frequencies.
AMP B.1.9 -Sullivan Question # 7	Provide the schedule for implementation of the enhancements to this AMP.

AMP B.1.11 -Baig Question # 1	Give details of surfaces included in the external Surface Monitoring Program accessible only when the insulation is removed.
AMP B.1.12 -Wen Question # 1	The LRA states in the Program Description: The program ensures the validity of analyses that explicitly analyzed a specified number of fatigue transients by assuring that the actual effective number of transients does not exceed the analyzed number of transients. (a) Please describe the method used to determine the actual effective number of transients. (b) Which component(s) will this methodology be applied to?
AMP B.1.12 -Wen Question # 2	The LRA states in the Exception Section that "The IPEC program updates fatigue usage calculations when the number of actual cycles approach the analyzed number of cycles." What are the action or alarm limits that will trigger the corrective action.
AMP B.1.12 -Wen Question # 3	Under Enhancement Section: For IP3, the applicant proposes to "revise appropriate procedures to include all the transients identified." (a) Please list all applicable transients. (b) Why does this enhancement not apply to IP2?
AMP B.1.12 -Wen Question # 4	The LRA states in the Operating Experience that the Fatigue Monitoring Program includes re-evaluation of usage factors as appropriate. (a) What factors/conditions would warrant a re-evaluation. (b) Under what circumstances that IP2 charging nozzles were re-evaluated? Please describe the re-evaluations process for IP2 charging nozzles.

AMP B.1.15 -Arora Question # 1	The LRA states that the incidents of wall thinning were detected in the vent chamber drain and high pressure turbine drain components during 3R13 in March 2005 and in a steam trap pipe during 2R17 in May 2006. These incidents resulted in replacements of the affected components during the respective outages. Describe if the piping and the affected components were included in the FAC program prior to these inspections and if the affected components were replaced with the like for like materials or with a FAC resistant material such as chrome-moly. Also substantiate the response with actual thickness data, i.e., the nominal thickness, minimum acceptable thickness and the measured thickness at these affected locations.
AMP B.1.15 -Arora Question # 2	The LRA states that operating experience for IP2 and IP3 was accounted for in the most recent updates of the respective CHECWORKS FAC models. The LRA further states that the CHECWORKS models were updated using the inspection data from the outage inspections and the FAC wear rate changes due to the recent power uprates. Provide a time line when these models were updated and inspection data from which outages was utilized in the updates. Has IP ever experienced situations in which the model predicted wear rates may have been lower than the actual wear rates measured during FAC inspections? If yes, describe how were these nonconservative wear rate predictions handled and what has been done to correct the model?
AMP B.1.15 -Arora Question # 3	Provide a few examples of modifications and/or improvements to the FAC program at Indian Point in the past five years. What were the specific reasons (e.g., lessons learned, plant operating experience, industry experience or other (define)) for those changes and how have the changes made the FAC program more effective with respect to the management of aging?
AMP B.1.15 -Arora Question # 4	If the thickness measurements during FAC inspection indicate degradation or wall thinning beyond the predicted minimum wall thickness, how would the sample size be adjusted under Indian Point's FAC Program to address the detected degradation? Include actual inspection data and examples to substantiate the response.

AMP B.1.15 -Arora Question # 5	How is the industry experience utilized in the FAC Program at Indian Point? How does IP gets feedback from other plants? Are there any unique differences between the FAC Programs of IP2 and IP3? If wall thinning or degradation is observed during FAC inspection of one unit, are the corresponding components on the other unit inspected for similar degradations?
AMP B.1.15 -Arora Question # 6	The LRA states that the FAC Program for IP2 was audited in 2004 and that the audit team determined that the program was effective and in compliance with ASME code, EPRI standards, and INPO guidelines and NRC regulations. (a) Which organization performed this audit and what was the purpose of this audit? Was a similar audit performed on IP3 FAC Program? (b) Explain which specific documents of the stated organizations were used in the audit to establish program compliance. (c) Which specific elements of the Indian Point FAC Program and what specific documentation pertaining to the program was reviewed by the audit team to establish that the program was effective?
AMP B.1.15 -Arora Question # 7	The LRA includes operating experience items which pertain to inspections during 3R13 and 2R17 outages for IP3 and IP2 respectively. Both items are recent (March 2005 and May 2006 respectively) items. Provide more examples of inspection results to demonstrate that the FAC program at Indian Point is effective in managing the aging effect.
AMP B.1.16-Subudhi Question # 1	LRA AMP B.1.16, “Program Description” states: “An NDE methodology, such as eddy current testing (ECT), or other similar inspection method is used to monitor for wear of the flux thimble tubes. This program implements the recommendations of NRC Bulletin 88 09, Thimble Tube Thinning in Westinghouse Reactors.” Discuss what other similar inspection method is used for monitoring the wear of flux thimble tubes for IP2 and IP3. How does this method compare with the ECT, as recommended in GALL?

AMP B.1.16-Subudhi
Question # 2

LRA AMP B.1.6 includes three enhancements to be implemented prior to the period of extended operation for GALL consistency in program elements “Monitoring and Trending,” “Acceptance Criteria,” and “Corrective Actions.”

a. GALL “Monitoring and Trending” recommends: “The wall thickness measurements will be trended and wear rates will be calculated. Examination frequency will be based upon wear predictions that have been technically justified as providing conservative estimates of flux thimble tube wear. The interval between inspections will be established such that no flux thimble tube is predicted to incur wear that exceeds the established acceptance criteria before the next inspection. The examination frequency may be adjusted based on plant specific wear projections. Re baselining of the examination frequency should be justified using plant-specific wear rate data unless prior plant specific NRC acceptance for the re baselining was received. If design changes are made to use more wear resistant thimble tube materials (e.g., chrome plated stainless steel) sufficient inspections will be conducted at an adequate inspection frequency, as described above, for the new materials.” Discuss how the stated enhancement in the LRA satisfies the GALL for both IP2 and IP3.

b. GALL “Accptance Criteria” recommends: “Appropriate acceptance criteria such as percent through wall wear will be established. The acceptance criteria will be technically justified to provide an adequate margin of safety to ensure that the integrity of the reactor coolant system pressure boundary is maintained. The acceptance criteria will include allowances for factors such as instrument uncertainty, uncertainties in wear scar geometry, and other potential inaccuracies, as applicable, to the inspection methodology chosen for use in the program. Acceptance criteria different from those previously documented in NRC acceptance letters for the applicant=s response to Bulletin 88 09 and amendments thereto should be justified.” Discuss how the stated enhancement in the LRA satisfies the GALL for both IP2 and IP3.

AMP B.1.16-Subudhi Question # 2 (cont.)	c.	GALL “Corrective Actions” recommends: “Flux thimble tube wall thickness which do not meet the established acceptance criteria must be isolated, capped, plugged, withdrawn, replaced, or otherwise removed from service in a manner that ensures the integrity of the reactor coolant system pressure boundary is maintained. Analyses may allow repositioning of flux thimble tubes that are approaching the acceptance criteria limit. Repositioning of a tube exposes a different portion of the tube to the discontinuity that is causing the wear.” Discuss how the stated enhancement in the LRA satisfies the GALL for both IP2 and IP3.

AMP B.1.17-Morante Question # 1

The staff compared the enhancements to the Scope of Program with the specific AMR line items in LRA Sections 3.2 and 3.3 that credit AMP B.1.17 - Heat Exchanger Monitoring. A total of 14 AMR line item entries were located, all identified only as “Heat Exchanger - Tubes”. These occurred under the following systems:

Table 3.2.2-1-IP2 RHR (1 line item)
Table 3.2.2-1-IP3 RHR (1 line item)
Table 3.2.2-4-IP2 Safety Injection (1 line item)
Table 3.2.2-4-IP3 Safety Injection (1 line item)
Table 3.3.2-2-IP3 Service Water (1 line item)
Table 3.3.2-3-IP2 Component Cooling Water (2 line items)
Table 3.3.2-3-IP3 Component Cooling Water (2 line items)
Table 3.3.2-6-IP2 Chemical & Volume Control (2 line items)
Table 3.3.2-6-IP3 Chemical & Volume Control (2 line items)
Table 3.3.2-16-IP2 SBO/App. R Diesel Generator (1 line item)

The staff could not correlate the scope of program, including the enhancements, with the AMR table entries; and requests the following clarifications:

(a) Identify the specific component inspections currently included in the existing program that are credited for license renewal.

(b) Correlate the 14 AMR table entries identified above with the specific component inspections included in the enhanced program.

AMP B.1.17-Morante Question # 2	The staff noted that all AMR table entries identify “Loss of Material - Wear” as the aging effect being managed. Is this wear induced by flow through and/or over the heat exchanger tubes? Does the wear result from abrasive fluid at high velocity or from flow-induced vibration of the tubes?
AMP B.1.17-Morante Question # 3	Under “Parameters Monitored or Inspected”, an “enhancement” to the existing program is to specify visual inspection where non-destructive examination, such as eddy current testing, is not possible. In the existing program, what is currently done if eddy current testing is not possible?
AMP B.1.17-Morante Question # 4	Describe the details of the visual inspection techniques to be employed. Does this include remote visual inspection of the inside of the tubes? What specific acceptance criteria are applied to visual inspection? Compare this to the acceptance criteria applied to eddy current testing.
AMP B.1.17-Morante Question # 5	Do any of the heat exchangers included in the scope of this AMP come under the jurisdiction of ASME Code Section III and Section XI? If yes, identify the specific heat exchangers and discuss how the Section XI requirements for inspection are satisfied by this AMP.

AMP B.1.18-Subudhi Question # 1	LRA AMP B.1.18, AProgram Description@ states: AThe Inservice Inspection (ISI) Program is an existing program that encompasses ASME Section XI, Subsections IWA, IWB, IWC, IWD and IWF requirements.@ GALL AMP XI.M1 imposes requirements for Subsections IWB, IWC, and IWD for Class 1, 2, and 3 pressure retaining components and their integral attachments. Subsection IWA describes general requirements associated with Subsections IWB, IWC, and IWD. GALL AMP XI.S3 covers Inservice inspection of Class 1, 2, 3 and MC component supports for ASME piping and components addressed in Section XI, Subsection IWF. The staff notes that the 10-element evaluation for the Subsection IWF inspection is not explicitly addressed in LRA AMP B.1.18. (a) Provide a detailed 10-element evaluation of the Subsection IWF inspection for Class 1, 2, 3 and MC component supports and discuss any exceptions or enhancements when assessed against the recommendations in GALL AMP XI.S3, AASME Section XI, Subsection IWF.@ Specifically, discuss the inspection methods, their frequencies, sampling methods for each class of supports, acceptance criteria, and operating experience findings and their corrective measures. (b) The attributes of AMP B.1.18 and GALL AMP XI. M1 are mostly identical and consistent, except AMP B.1.18 also includes the GALL AMP XI.S3 for supports. Explain why Entergy categorizes AMP B.1.18 to be plant-specific.
AMP B.1.18-Subudhi Question # 2	LRA AMP B.1.18, “Scope of Program” states: “The ISI Program also manages reduction of fracture toughness for valve bodies and pump casing made of cast austenitic stainless steel. Both IP2 and IP3 use ASME Code Case N 481 as approved in Regulatory Guide 1.147 for managing the effects of loss of fracture toughness due to thermal aging embrittlement of CASS pump casing pressure retaining welds. ASME Code Case N 481 has been incorporated in later editions of the code and IP2 will not reference Code Case N 481 in the 4th interval.” Explain why a discussion of this specific code case is included.

AMP B.1.18-Subudhi Question # 3	LRA AMP B.1.18, “Detection of Aging Effects” states: “The ISI Program will be revised to provide periodic inspections to confirm the absence of aging effects for lubrite sliding supports used in the steam generator and reactor coolant pump supports.” What has been the plant-specific operating experience with the degradation of the lubrite plates?
AMP B.1.18-Subudhi Question # 4	LRA AMP B.1.18, “Detection of Aging Effects” states: “Both IP2 and IP3 have adopted risk-informed inservice inspection (RI-ISI) as an alternative to current ASME Section XI inspection requirements for Class 1, Category B-F and B-J welds pursuant to 10 CFR 50.55a(a)(3)(i). The RI-ISI was developed in accordance with the EPRI methodology contained in EPRI TR-112657, Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure." The risk informed inspection locations are identified as Category R-A.” During the license renewal period, will the ISI program be implemented in full compliance with the requirements of 10 CFR 50.55a in effect at the beginning of each new 10-year inspection interval?
AMP B.1.18-Subudhi Question # 5	LRA AMP B.1.18, “Monitoring and Trending” states: “ISI results are recorded every operating cycle and provided to the NRC after each refueling outage via Owner's Activity Reports. These reports include scope of inspection and significant inspection results. They are prepared and submitted in accordance with NRC accepted ASME Section XI Code Case N 532 1 as approved by RG 1.147.” During the license renewal period, will the ISI program be implemented in full compliance with the requirements of 10 CFR 50.55a in effect at the beginning of each new 10-year inspection interval?

AMP B.1.19-Morante Question # 1	The applicant has identified an enhancement to the Scope of Program, as follows: “Revise applicable procedures to specify that the IP1 intake structure is included in the program.” The LR intended function of the IP1 intake structure relates to protection of Appendix R equipment, in accordance with 10 CFR 54.4(a)(3). The intent of the GALL Masonry Wall AMP (XI.S5) is to ensure that a previously documented seismic qualification basis, in accordance with IE Bulletin 80-11, remains valid through implementation of the guidance provided in IN 87-67. Has a documented seismic qualification basis, in accordance with IE Bulletin 80-11, been developed for the masonry components of the IP1 intake structure? If so, provide the documentation at the audit. If not, then this AMP cannot be credited to manage aging for the extended period of operation.
AMP B.1.22 -Nguyen Question # 1	GALL AMP XI.E6 states that testing may include thermography, contact resistance testing, and other appropriate testing methods. In AMP B.1.22, under Detection of Aging Effect element, you have stated that inspection methods may include thermography, contact resistance testing, or other appropriate methods including visual based on plant configuration and industry guidance. Explain how visual inspection can detect loosening of bolted cable connections.
AMP B.1.24 -Nguyen Question # 1	GALL AMP XI.E2 states that this program applies to high-range-radiation and neutron flux monitoring instrumentation cables in addition to other cables used in high voltage, low level signal application that are sensitive to reduction IR. In AMP B.1.24, you only mention about neutron monitoring system cables. (a) Explain why high range monitoring cables are not included in the AMP B.1.24. (b) List other cables used in high voltage, low level signal application. Explain why these cables were not included in the scope of AMP B.1.24.
AMP B.1.25 -Nguyen Question # 1	You have stated that a representative sample of accessible insulated cables and connections within the scope of license renewal will be visually inspected. Describe the technical basis for sampling and action taken if a degradation was found on a representative sample.

AMP B.1.26 -Sullivan Question # 1	LRA references a June 2006 evaluation of oil analysis practices among Entergy Northeast sites. Provide documentation describing this evaluation (e.g., report) and describe how the evaluation impacted oil analysis practices at Indian Point.
AMP B.1.26 -Sullivan Question # 2	Describe the process for reviewing oil analysis test results and how these reviews ensure that unusual trends are identified and alert levels have not been reached or exceeded.
AMP B.1.26 -Sullivan Question # 3	The LRA states that the lubricating oil analysis program is consistent with the program described in GALL, but also identifies six elements as requiring enhancement to achieve this consistency. Provide a more detailed description of past and present lubricating oil monitoring activities at the Indian Point site and the schedule for implementation of enhancements to this AMP.
AMP B.1.26 -Sullivan Question # 4	In its description of the exception to NUREG 1801 Element 3, Parameters Monitored or Inspected, the LRA states that flash point has little significance with respect to the effects of aging. Because flash point identifies the presence of volatile and flammable materials, an abnormally low flash point can be indicative of fuel contamination. Provide a technical justification for this exception.
AMP B.1.27 -Arora Question # 1	GALL recommends that the applicant should schedule the inspection no earlier than ten years prior to the period of extended operation. The LRA states that the inspection will be performed prior to the period of extended operation. The statement should be revised to imply that the inspection will be performed with in the 10 years period prior to the period of extended operation.
AMP B.1.27 -Arora Question # 2	The LRA states that the representative sample size will be based on Chapter 4 of EPRI document 107514, which outlines a method to determine the number of inspections required for 90% confidence that 90% of the population does not experience degradation. Justify how this sampling technique with 90% confidence level provides an effective aging management program with adequate assurance that the applicable components will continue to perform their intended functions through the period of extended operation.
AMP B.1.27 -Arora Question # 3	What is the specific scope of AMP B.1.27 - One Time Inspection that will be implemented to verify the effectiveness of each the following AMPs: B.1.9, B.1.26, B.1.39, and B.1.40?

AMP B.1.28 -Arora Question # 1	According to GALL, AMP XI.M35, this program is applicable only to plants that have not experienced cracking of ASME Code Class 1 small-bore piping resulting from stress corrosion or thermal and mechanical loading. Justify that both IP2 and IP3 meet this criteria.
AMP B.1.28 -Arora Question # 2	In the Scope section of XI.M35, GALL states that the One-Time Inspection program for ASME Code Class 1 small-bore piping includes locations that are susceptible to cracking. The GALL also states that guidelines for identifying piping susceptible to potential effects of thermal stratification or turbulent penetration are provided in EPRI Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)," January 2001. (a) Will this new program to be implemented by Indian Point follow the guidelines of EPRI Report 100071 for identifying the susceptible locations for inspection? (b) If Indian Point One-Time Inspection Program will not utilize the guidelines of the above EPRI Report, what criteria will be used for identification of susceptible locations? Also justify that this criteria will be equivalent to the EPRI guidelines.
AMP B.1.29 -Arora Question # 1	What codes and standards are used to implement the Periodic Surveillance and Preventive Maintenance Program? What acceptance criteria are used during the implementation of this program and where are the acceptance criteria defined?
AMP B.1.29 -Arora Question # 2	The program description for the Periodic Surveillance and preventive Maintenance program implies that this AMP will be used to manage loss of material for carbon steel components of the cranes, crane rails, and girders. GALL includes AMP XI.M23, Inspection of Heavy Load and Light Load Handling Systems, to manage these components. Describe if the activities of the Indian Point AMP B.1.29 are consistent with the recommendations of the GALL AMP XI.M23. Provide a justification for the activities that are not consistent.

AMP B.1.29 -Arora Question # 3	The program description for the Periodic Surveillance and preventive Maintenance program implies that this AMP will be used to manage loss of material for internal surfaces of piping, valves, ducting and other piping components. GALL includes AMP XI.M38, Inspection of Internal surfaces in miscellaneous Piping and Ducting Components, to manage these components. Describe if the activities of the Indian Point AMP B.1.29 are consistent with the recommendations of the GALL AMP XI.M38. Provide a justification for the activities that are not consistent.
AMP B.1.29 -Arora Question # 4	In the "Evaluation" section of the AMP, the LRA states that the representative sample size will be based on Chapter 4 of EPRI document 107514, which outlines a method to determine the number of inspections required for 90% confidence that 90% of the population does not experience degradation. Justify how this sampling technique with 90% confidence level provides an effective aging management program with adequate assurance that the applicable components will continue to perform their intended functions through the period of extended operation.
AMP B.1.29 -Arora Question # 5	The program description for the Periodic Surveillance and preventive Maintenance program implies that this AMP will be used to manage loss of material for external surfaces of steel components. GALL includes AMP XI.M36, Inspection of Internal surfaces in miscellaneous Piping and Ducting Components, to manage these components. Describe if the activities of the Indian Point AMP B.1.29 are consistent with the recommendations of the GALL AMP XI.M36. Provide a justification for the activities that are not consistent.
AMP B.1.29 -Arora Question # 6	Explain how is the "Monitoring and Trending" (element 5 of Evaluation Basis) accomplished in implementing Indian Point AMP B.1.29.
AMP B.1.30-Subudhi Question # 1	Discuss additional information (e.g., results of testing on the actual stud and nut material) to substantiate that the maximum tensile strength of the reactor closure studs and nuts is less than 170 ksi.

AMP B.1.30-Subudhi Question # 2	LRA AMP B.1.30, "Program Description" states: "The NUREG 1801 program, Section XI.M3, Reactor Head Closure Studs is based on ASME Code Edition 2001 including the 2002 and 2003 Addenda. The IPEC ISI program is based on ASME Code Edition 1989, no Addenda with inspection of reactor head closure studs based on the 1998 Edition through the 2000 Addenda. The 1998 Edition through the 2000 Addenda allows surface or volumetric examination when closure studs are removed which is consistent with the requirements of NUREG 1801, Section XI.M3." The staff notes that the GALL AMP XI.M3 program element "Detection of Aging Effects" requires both surface and volumetric examination of studs when removed. Provide an explanation why this is not considered as an exception to the GALL program.
AMP B.1.31-Subudhi Question # 1	LRA AMP B.1.31, "Program Description" states: "This program was developed in response to NRC Order EA 03 009. The ASME Section XI, Subsection IWB Inservice Inspection and Water Chemistry Control Programs are used in conjunction with this program to manage cracking of the reactor vessel head penetrations. Detection of cracking is accomplished through implementation of a combination of bare metal visual examination (external surface of head) and non visual examination (underside of head) techniques. Procedures are developed to perform reactor vessel head bare metal inspections and calculations of the susceptibility ranking of the plant." (a) What are the susceptibility ranks [or the effective degradation years (EDY)] for both IP2 and IP3? (b) Has Entergy requested relaxation of the requirements in the revised Order EA-03-009 for either IP unit? If yes, discuss the technical bases for the relaxation requests. (c) Discuss in detail the implementation of NRC Order EA-03-009 for both IP2 and IP3, with respect to detection of aging effects. (d) How is this AMP coordinated with the Boric Acid Corrosion Prevention Program (AMP B.1.5)?
AMP B.1.34 -Sullivan Question # 1	Since this aging management program (AMP) may include non safety-related components, such as piping, it typically has a broader scope than the GL 89-13 program. Describe the difference in scope between the Indian Point site GL 89-13 program and this (AMP) and, if applicable, describe how the implementation of GL 89-13 recommendations was extended to bound systems and components within the scope of this AMP.

AMP B.1.36-Morante Question # 1

From the applicant's description of the B.1.36 AMP "Structures Monitoring" in LRA Appendix B, the staff cannot identify the complete scope of the program. Very significant enhancements to the "Scope of Program" are identified. However, there is no description of the scope of the existing structures monitoring program, and there is no explanation why such major enhancements to the program scope are needed for license renewal. The staff reviewed Section 2.4 of the LRA, to better understand the intended functions of the structures that are being added to the scope. While almost all of the added structures serve a license renewal intended function for 10 CFR 54.4(a)(3), about half (11) of these structures also serve license renewal intended functions for 10 CFR 54.4(a)(1) and/or 10 CFR 54.4(a)(2). In accordance with NRC guidance (RG 1.160) and industry guidance (NEI 93-01) these structures would be expected to be included in the current existing program.

(a) Describe the structures and structural components inspected as part of the existing structures monitoring program.

(b) Explain why eleven (11) structures listed in the "Scope of Program" enhancement have intended functions for 10 CFR 54.4(a)(1) and/or 10 CFR 54.4(a)(2).

AMP B.1.36-Morante Question # 2

The second enhancement to AMP B.1.36 under "Scope of Program" indicates that "procedures will be revised to clarify that in addition to structural steel and concrete", 13 commodities "are inspected for each structure, as applicable." The staff notes that the specific commodities listed would be expected to be included in the current existing program if they are safety-related or important to safety. The staff is unclear what commodities are currently being inspected in the existing program.

(a) Describe the structural commodities inspected as part of the existing structures monitoring program.

(b) Explain why the 13 commodities are identified as an enhancement to the "Scope of Program."

AMP B.1.36-Morante Question # 3	An enhancement to AMP B.1.36 under "Detection of Aging Effects" is to monitor groundwater for aggressiveness to concrete. Sulfates, pH and chlorides will be monitored. Ground water testing is to be conducted at least every five (5) years, by taking samples from a well that is representative of groundwater surrounding below-grade site structures (a) Describe past and present groundwater monitoring activities at the Indian Point site, including the sulfates, pH and chlorides readings obtained; and the location(s) where test samples were/are taken relative to the safety-related and important-to-safety embedded concrete foundations. (b) Explain the technical basis for concluding that testing a single well every five (5) years is sufficient to ensure that safety-related and important-to-safety embedded concrete foundations are not exposed to aggressive groundwater.
AMP B.1.36-Morante Question # 4	In LRA Appendix B, Table B-2, the applicant indicates that "This program [GALL AMP XI.S7] is not credited for aging management. The Structures Monitoring Program manages the effects of aging on the water control structures at IPEC." GALL AMP XI.S7 offers this option, provided all the attributes of GALL AMP XI.S7 are incorporated in the applicant's Structures Monitoring Program. (a) Identify the specific water control structures that have an intended function for license renewal, and are included in the scope of AMP B.1.36. (b) Describe the attributes of AMP B.1.36 that pertain to aging management of water control structures. (c) Explain how these attributes of AMP B.1.36 encompass the attributes of GALL AMP XI.S7, without exception.
AMP B.1.36-Morante Question # 5	What is Entergy's schedule for implementing the enhancements to AMP B.1.36?
AMP B.1.39 -Sullivan Question # 1	Describe past and present surveillance tests, sampling, and analysis activities for managing the effects of aging on components within the scope of this AMP.

AMP B.1.39 -Sullivan Question # 2	Describe the procedures used to perform surveillance activities and the basis for acceptance criteria and sample / test frequencies.
AMP B.1.40 -Sullivan Question # 1	The LRA takes an exception to the GALL recommendation for detection of aging effects through performance and functional testing. As a result, this program credits preventive measures to manage the effects of aging. Provide objective evidence (e.g., plant-specific operating experience) which demonstrates that the existing preventive measures will adequately manage the effects of aging in the closed cooling water system components that are within the scope of license renewal.
AMP B.1.40 -Sullivan Question # 2	The LRA states that in June 2003, CCW corrosion inhibitor (molybdate concentration) was found to be out of specification and that corrective actions were taken to restore the molybdate concentration to specification. However, the LRA does not indicate if surveillance practices (e.g., sampling) were also modified as a result of this occurrence. Provide a description of past and present surveillance activities and, if applicable, provide a justification if the surveillance practices or frequencies were not revised as a result of this event.
AMP B.1.40 -Sullivan Question # 3	The LRA states: "Continuous program improvement provides assurance that the program will remain effective for managing loss of material of components." However, the LRA only cites one QA audit observation to support this conclusion. Provide additional information to support this conclusion.
AMP B.1.40 -Sullivan Question # 4	The exception to GALL, Element 5, Monitoring and Trending, states that visual inspections are not performed. Provide a technical justification for not performing visual inspections recommended in GALL.
AMP B.1.40 -Sullivan Question # 5	GALL, Element 2, preventive actions, states that system corrosion inhibitor concentrations should be maintained within limits specified in EPRI TR-107396. Since this element is not identified in the exception, it is assumed that the IP program is consistent with NUREG 1801. Describe the basis for specified corrosion inhibitor concentration limits.

AMP B.1.40 -Sullivan Question # 6	For each program attribute having an exception to GALL, provide a detailed, line-by-line, comparison of the criteria recommended in GALL (e.g., EPRI TR-107396) against the criteria / industry standard (e.g., EPRI TR-1007820) that have been implemented.
AMP B.1.41 -Arora Question # 1	It is noted that Indian Point AMP B.1.41, Water Chemistry Control - Primary and Secondary, is based on the guidelines provided in EPRI TR-105714, Revision 5 and EPRI TR-102134, Revision 6. The corresponding GALL AMP XI.M2, Water Chemistry, is based on the guidelines provided in Revision 3 of EPRI TR-105714 and TR-102134. Provide details of the specific changes to these documents after Revision 3. Include a justification as to how the adoption of the later revisions impact the effectiveness of the AMP to manage aging effects.
AMP B.1.41 -Arora Question # 2	The LRA Section B.1.41 lists an enhancement to Attribute 3, Parameters Monitored or Inspected and Attribute 6, Acceptance Criteria, which requires revision of appropriate IP2 procedures to test sulfates monthly in the RWST with a limit of < 150 ppb. Why is this enhancement only applicable to IP2 and does not apply to IP3?
AMP B.1.41 -Arora Question # 3	The LRA Section B.1.41, under Operating Experience, states that a QA audit of the primary and secondary plant chemistry program was conducted in August 2003 and this audit noted that monitoring and processing requirements for primary and secondary water chemistry complied with both IP2 and IP3 technical specifications, implementing procedures, and the IP3 Technical Requirements Manual (TRM). (a) Why is there no statement about compliance with IP2 Technical Requirements Manual? (b) The specific QA audit described above was in August 2003. How frequently are these QA audits performed?