Supplements to Previous RAI Responses - RAI Set #4

ULNRC-05891 dated August 9, 2012

- RAI B2.1.29-1
- RAI B2.1.31-1

RAI B2.1.29-1

Background:

LRA Section B2.1.29 states that the 10 CFR Part 50 Appendix J AMP has implemented Option B for the 10 CFR Part 50 Appendix J leak rate tests (LRTs) and is consistent with the GALL Report, Revision 2, AMP XI.S4. The LRA further states that the 10 CFR Part 50 Appendix J program ensures that the structural integrity of the containment will be maintained to withstand the maximum calculated pressure in the event of a loss of coolant accident (LOCA). Measure of leakage rates across pressure containing or leakage limiting boundaries and inspections as implemented through the program provide for the detection of age-related pressure boundary degradation for the period of extended operation. Per the "scope of program," program element of the GALL Report AMP XI.S4, all containment boundary pressure-retaining components are subject to leak rate testing and inspections.

Issue:

Callaway Plant Unit 1 FSAR-SP, and "ESP-SM-01001, Containment Leakage Rate Testing Program," procedure indicate that a number of penetrations are excluded from local leak rate tests (LLRTs). In addition, the audited plant's operating experience database indicated that the applicant has substituted LLRTs in lieu of VT-2 inspections. It is not clear how the applicant will manage the aging effects for any components that are not included in its "scope of program," program element.

Request:

For those components (valves, penetrations, and other components) that have been excluded from the 10 CFR Part 50 Appendix J program, identify how aging effects will be managed during the period of extended operation. Indicate which AMPs will be used to manage the aging effects for each of the exempted/excluded components, or justify why an AMP is not necessary for the period of extended operation.

Callaway Response

Pressure-retaining components whose failure (loss of leak-tightness) could contribute to an increase in the overall integrated leakage rate of the containment system are subjected to Type A Integrated Leak Rate Testing (ILRT).

Containment penetrations that are provided with double seal closures and connections to allow for pressurization between the seals are subjected to Type B Local Leak Rate Testing (LLRT).

Containment isolation valves that meet the following criteria are subjected to Type C LLRT:

a. The penetrating system provides a direct connection between the inside and outside atmospheres of the containment under normal operation.

b. The system is isolated by containment isolation valves that close automatically to effect containment isolation in response to a CIS signal.

c. The system is not an engineered safety feature system consisting of a closed piping system outside of the containment.

As stated in FSAR-SP, Section 6.2.6.1.2, ILRT Test Method, "For penetrations that are exempt from Type B or C tests, the leakage testing requirement of Appendix J is accomplished by the Type A test." Therefore, the scope of the 10 CFR Part 50 Appendix J program includes all pressure-retaining components of the containment structure, and all of these components will be age-managed under this program during the period of extended operation.

Containment isolation valves that do not meet the above criteria for Type C testing are listed in RAI B2.1.29-1 Table 1. In addition to Type A leakage testing, these valves are subject to the aging management programs that are applicable to their respective systems, based on their materials and environments. All of these valves are constructed of stainless steel and are exposed to an external environment of either plant indoor air or borated water leakage, neither of which produces any aging effect for stainless steel. Therefore, no aging management is required for the external surfaces. The internal environments for these valves do have aging effects associated with stainless steel and do require aging management. The applicable aging management programs are identified in RAI B2.1.29-1 Table 1.

Corresponding Amendment Changes

No changes to the License Renewal Application (LRA) are needed as a result of this response.

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-79	EJ 8708A	RHR Pump A Suction Relief	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-52	EJ 8708B	RHR Pump B Suction Relief	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-21	EJ 8841A	RHR Pump Disch to RCS hot Leg 2	A	Table 3.2.2-6	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-21	EJ 8841B	RHR Pump Disch to RCS Hot Leg 3	A	Table 3.2.2-6	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-21	EJ HCV-8825	RHR to SI Test Line Iso Valve	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-82	EJ HCV-8890A	RHR A to SI Pumps Test Line Iso Valve	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-27	EJ HCV-8890B	RHR B to SI Pumps Test Line Iso Valve	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-79	EJ HV-8701A	RCS Hot Leg 1 to RHR Pump A Suction	A	Table 3.2.2-6	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-52	EJ HV-8701B	RCS Hot Leg 4 to RHR Pump B Suction	A	Table 3.2.2-6	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-82	EJ HV-8809A	RHR Pump A Cold Leg Injection Iso Valve	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-27	EJ HV-8809B	RHR Pump B Cold Leg Injection Iso Valve	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-15	EJ HV-8811A	CTMT Recirc Sump to RHR Pump A Suction	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-14	EJ HV-8811B	CTMT Recirc Sump to RHR Pump B Suction	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-21	EJ HV-8840	RCS Hot Leg Recirc Iso Valve	A	Table 3.2.2-6	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-88	EM 8815	Boron Injection Header to RCS Cold Leg Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-88	EM HV-8801A	Boron Injection Header to RCS Cold Legs	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-88	EM HV-8801B	Boron Injection Header to RCS Cold Legs	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-87	EM HV-8802A	SI Pump A Disch Hot Leg Iso Valve	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-48	EM HV-8802B	SI Pump B Disch Hot Leg Iso Valve	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-49	EM HV-8823	SI/Accumulator Injection Test Line Iso Valve	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-48	EM HV-8824	Safety Injection Pump B Test Line Iso Valve	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-49	EM HV-8835	SI Pumps Disch to Cold Legs Iso Valve	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-88	EM HV-8843	Boron injection Header Test Line Iso	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-87	EM HV-8881	Safety Injection Pump Test Line Iso Valve	A	Table 3.2.2-5	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-87	EM V-001	SI Pump Hot Leg 2 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-87	EM V-002	SI Pump Hot Leg 3 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-48	EM V-003	SI Pump Hot Leg 1 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-48	EM V-004	SI Pump Hot Leg 4 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-16	EN HV-01	CTMT Recirc Sump to CTMT Spray Pump A Iso	A	Table 3.2.2-1	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-13	EN HV-07	CTMT Recirc Sump to CTMT Spray Pump B Iso	A	Table 3.2.2-1	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-66	EN HV-12	CTMT Spray Pump B Discharge Iso Valve	A	Table 3.2.2-1	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-89	EN HV-6	CTMT Spray Pump A Discharge Iso Valve	A	Table 3.2.2-1	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-89	EN V-013	CTMT Spray Pump A to CTMT Spray Nozzles	A	Table 3.2.2-1	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-66	EN V-017	CTMT Spray Pump B to CTMT Spray Nozzles	A	Table 3.2.2-1	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-82	EP 8818A	RHR Pump to Cold Leg 1 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-82	EP 8818B	RHR Pump to Cold Leg 2 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-27	EP 8818C	RHR Pump to Cold Leg 3 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-27	EP 8818D	RHR Pump to Cold Leg 4 Injection	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-49	EP V-0010	SI Pumps Disch to Cold Leg 1	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-49	EP V-0020	SI Pump Disch to Cold Leg 2	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-49	EP V-0030	SI Pump Disch to Cold Leg 3	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-49	EP V-0040	SI Pump Disch to Cold Leg 4	A	Table 3.2.2-5	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components and Water Chemistry (B2.1.2)
P-101	GS HV-12	Hydrogen Analyzer A Inlet Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-101	GS HV-13	Hydrogen Analyzer A Inlet Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-101	GS HV-14	Hydrogen Analyzer A Inlet Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-97	GS HV-17	Hydrogen Analyzer A Disch Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-97	GS HV-18	Hydrogen Analyzer A Disch Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-99	GS HV-3	Hydrogen Analyzer B Inlet Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-101	GS HV-31	Sample Line to CTMT Atmos Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-101	GS HV-32	Sample Line to CTMT Atmos Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-97	GS HV-33	Sample Return From CTMT Atmos. Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-97	GS HV-34	Sample Return From CTMT Atmos. Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-99	GS HV-36	Sample Line to CTMT Atmos Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-99	GS HV-37	Sample Line to CTMT Atmos Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-56	GS HV-38	Sample Return from CTMT Atmos Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-56	GS HV-39	Sample Return from CTMT Atmos Monitor	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-99	GS HV-4	Hydrogen Analyzer B Inlet Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-99	GS HV-5	Hydrogen Analyzer B Inlet Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)

RAI B2.1.29-1 Table 1

PENETRATION	VALVE NUMBER	FUNCTION	TYPE TEST	LRA Table	AMP
P-56	GS HV-8	Hydrogen Analyzer B Disch Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-56	GS HV-9	Hydrogen Analyzer B Disch Iso	A,C	Table 3.2.2-3	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
P-64	SJ HV-128	PZR/RCS Liquid Sample Inner CTMT Iso	A,C	Table 3.3.2-9	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-64	SJ HV-129	PZR/RCS Liquid Sample Outer CTMT Iso	A,C	Table 3.3.2-9	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)
P-64	SJ HV-130	PZR/RCS Liquid Sample Outer CTMT Iso Valve	A,C	Table 3.3.2-9	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.18)

RAI B2.1.31-2

Background:

LRA Section B2.1.31, "Structures Monitoring" program, states that the Structures Monitoring program is an existing program that, following enhancement, will be consistent with GALL Report, Revision 2, AMP XI.S6. The GALL Report XI.S6, "Structures Monitoring Program," in "parameters monitored or inspected," element states that ACI 349.3R and American National Standards Institute (ANSI)/American Society of Civil Engineers (ASCE) 11 provide an acceptable basis for selection of parameters to be monitored or inspected for concrete and steel structural elements. In addition, GALL Report XI.S6, "detection of aging effects" element states that qualifications of inspection and evaluation personnel specified in ACI 349.3R are acceptable for license renewal. The GALL Report also states that applicants who are not committed to ACI 349.3R and elect to use plant-specific criteria for concrete structures should describe the criteria and provide a technical basis for deviations from those listed in ACI 349.3R.

Issue:

In Element 3 of the LRA Structures Monitoring program basis document it states that the inspection methods, inspection frequency, and inspector qualifications at Callaway are consistent with the guidance provided in ACI 349.3R-96. However, a review of the Callaway implementing procedure ESP-ZZ-01013, "Maintenance Rule Structures Inspection," indicates that the inspection methods, including walkdown examination guidance, and qualification requirements for inspectors are not consistent with ACI 349.3R. Callaway procedure ESP-ZZ-01013, Section 4.0, states that an assigned engineer from the Civil/Structural Design Group will perform the engineering responsibilities for Maintenance Rule Structures Inspection Program. The assigned engineer will possess the experience and skills in civil/structural engineering, consistent with the requirements of the current civil/structural Position Guide and the Engineering Qualification Module. This is inconsistent with the requirements specified in ACI 349.3R which states that responsible-in-charge engineer should be a licensed professional engineer, knowledgeable in the design, evaluation, and in-service inspection of concrete structures and performance requirements of nuclear safety-related structures; or structural engineering graduate of an Accreditation Board for Engineering and Technology, Inc. accredited college or university with at least 10 years' experience in the design, construction, and inspection of concrete structures, and with knowledge of the performance requirements of nuclear safety-related structures and potential degradation processes. ACI 349.3R recommends a three tier quantitative evaluation criteria for inspection of structures. However, the walkdown guidelines in the Callaway procedure ESP-ZZ-010013 require inspection based on a qualitative acceptance criteria.

Request:

Explain the reason for inconsistency in inspection methods and inspector qualifications as described in the LRA Section B2.1.31 and implementing procedure ESP-ZZ-01013 as identified above.

Callaway Response

LRA Table A4-1 Item 2~~3~~1, documents the plant commitment to enhance the Structures Monitoring program procedures to specify inspector qualifications in accordance with ACI 349.3R-96. Basis document, XI.S6, Structures Monitoring, has been revised so that the first sentence of Element 4 reads, “Plant procedures, following enhancements, will specify that inspection methods, inspection frequency, and inspector qualifications at Callaway are consistent with the guidance provided in ACI 349.3R-96.”

LRA Appendix B2.1.31 and LRA Table A4-1 Item 2~~3~~1, have been revised as shown on Amendment 11 in Enclosure 2 ~~also documents the plant commitment~~ to enhance the Structures Monitoring program procedures to specify that ~~quantify~~ acceptance criteria and critical parameters for monitoring degradation, and ~~to provide~~ guidance for identifying unacceptable conditions requiring further technical evaluation or corrective action are in accordance with the three tier quantitative evaluation criteria recommended in ACI 349.3R. Basis document, XI.S6, Structures Monitoring, has been revised to add the following sentence to Element 6: “The Callaway SMP, following enhancement, will quantify acceptance criteria and critical parameters for monitoring degradation, and provide guidance for identifying unacceptable conditions requiring further technical evaluation or corrective action in accordance with the three tier quantitative evaluation criteria recommended in ACI 349.3R.”

Corresponding Amendment Changes

Refer to the Enclosure 2 Summary Table "Amendment 11, LRA Changes from RAI Responses”, for a description of LRA changes with this response.