

CALLAWAY PLANT UNIT 1
LICENSE RENEWAL APPLICATION

Editorial Comments Regarding the Safety Evaluation Report (SER) with Open Items
Related to the License Renewal of Callaway Plant, Unit 1

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No.	SER Location		Comment	Suggested Resolution (use underline and/or strikethrough formatting to indicate suggested text)
	Page	Section		
1.	xv	Abbreviations	Correct abbreviation for AERM.	Revise the sentence as follows: "AERM aging effect requiring mechanism <u>management</u> "
2.	1-8	OI B2.1.3-1	Reword the phrase, "On multiple occasions,..." which indicates an ongoing and repetitive problem.	Revise the sentence as follows: "On multiple occasions <u>early in plant operation</u> ..." or "On <u>several</u> occasions <u>in the past</u> ..."
3.	2-5	2.1.3.3.1	Reword the second paragraph under Staff Evaluation which mentions training using corporate license renewal project procedures.	Revise the sentence as follows: "...personnel had been trained using corporate <u>STARS and Callaway</u> license renewal project procedures..."
4.	2-33	2.3.2.1	In the second paragraph, correct the term "spray additive educators."	Revise text as follows: <u>educators</u> eductors
5.	2-41	2.3.3.4.1	Revise the third line to use the word "convey" rather than "transmits" to be consistent with LRA Section 2.3.3.4.	Revise the sentence as follows: "...and transmits <u>conveys</u> the heat to the UHS cooling tower."
6.	2-89	2.4.7.2	Revise text in the second full paragraph to be consistent with LRA Table 2.4-12.	Revise text as follows: "These supports are included in LRA Table 2.4-12 as component types "Supports Mech Equip Class 1 [<u>2, or 3</u>]," or "Supports Mech Equip Non <u>ASME</u> ," depending..."
7.	2-95	2.5.1.1	Add bullets under insulated cable and connections and add "(includes the following)" to be consistent with the as-submitted LRA Section 2.5 (ULNRC-05830 dated 12/15/2011).	Revise the bullets as follows: "insulated cable and connections (<u>includes the following</u>): • <u>Electrical cables and connections not subject to 10 CFR 50.49 EQ requirements</u>

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				<ul style="list-style-type: none"> • <u>Electrical cables and connections not subject to 10 CFR 50.49 EQ requirements used in instrumentation circuits that are sensitive to reduction in conductor insulation resistance</u> • <u>Inaccessible power cables not subject to 10 CFR 50.49 EQ requirements</u>
8.	2-95	2.5.1.1	Revise the bulleted list for “metal enclosed bus (including the following)” to be consistent with the as-submitted LRA Section 2.5 (ULNRC-05830 dated 12/15/2011). MEQ was added to the list under Amendment 10 (September 20, 2012).	Revise the bulleted list as follows: <ul style="list-style-type: none"> • metal enclosed bus (including the following): <ul style="list-style-type: none"> ○ <u>Bus and connections</u> ○ <u>Enclosure</u> ○ <u>Insulation and insulators</u> • <u>Mechanical environmental qualification (MEQ) components</u>
9.	3-14	3.0.3.1.1	Revise the FSAR Supplement paragraph to reference the correct RAI number B2.1.5-4b (ULNRC-05957 dated 2/14/2013).	Revise the sentence as follows: The FSAR supplement was amended in response to RAI B1.4-1b <u>B2.1.5-4b</u> discussed in SER Section 3.0.3.1.4.
10.	3-17	3.0.3.1.3	Correct the typo in the last sentence of third paragraph.	Revise the sentence as follows: ...ASME Code Section <u>XI</u> ...
11.	3-18 3-19	3.0.3.1.3	Correct the numbering of the program elements at the bottom of page 3-18 and top of 3-19.	Revise the paragraph as follows: Based on its audit, and review of the applicant’s Reactor Head Closure Stud Bolting Program, the staff finds that the program elements one, <u>two</u> , three, four , and six, for which the applicant claimed consistency with the GALL Report, are consistent with the corresponding program elements of GALL Report AMP XI.M3. Program elements

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				two <u>four</u> and five, "detection of aging effects," and "monitoring and trending," respectively, are associated with Open Item B2.1.3-1, Part (a).
12.	3-29	3.0.3.1.4	The SER indicates that Callaway revised LRA Appendix A1.1 (as part of letter ULNRC-05957, February 14, 2013). LRA Appendix B2.1.1 was also revised.	Revise the sentence in the third full paragraph as follows: "In addition, the applicant revised LRA Appendix A1.1 (FSAR supplement for the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program), <u>and LRA Appendix B2.1.1</u> , consistent with its response."
13.	3-31	3.0.3.1.5	Revise the Staff Evaluation, first paragraph, title and issue date for the NEI 03-08 document. Consider adding the ADAMS number ML101050337 for this document to the SER text.	Revise the sentence as follows: "...NEI 03-08, Revision 2 (<u>ADAMS Accession No. ML101050337</u>), "Guidelines for the Management of Materials Issues," dated <u>April 5 January</u> , 2010."
14.	3-39	3.0.3.1.5	Correct the item number in the first paragraph under the evaluation for A/LAI No. 7, last sentence to be consistent with MRP-227-A.	Revise the sentence as follows: "...include the plant-specific analysis as part of its LRA submittal or the inspection plan that would be submitted in accordance with A/LAI No. 8, Item (b2)."
15.	3-48	3.0.3.1.6	In the third full paragraph, change the reference to the Callaway FAC procedure from EDZ-01115 to EDP-ZZ-01115 to be consistent with the response to RAI B2.1.7-3 in letter dated August 21, 2012.	Revise the sentence as follows: "Although the program's implementing procedure, EDZ-01115 <u>EDP-ZZ-01115</u> ,..."
16.	3-53	3.0.3.1.7	Correct the date in the second paragraph.	Revise the date as follows: By letter dated July 5, 2013 <u>2012</u> ...
17.	3-55	3.0.3.1.7	Update the quoted information from the response to RAI B2.1.9-7 (ULNRC-05886, August 6, 2012) and add quotation marks.	Revise the paragraph as follows: <u>"The</u> [f]irst paragraph of Section 10 of [AREVA NP Inc.,]

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				document 51-9172264-00 identifies the forms of degradation detected in the Callaway Unit_ 1 replacement steam generators at <u>the</u> [RFO 18] <u>outage</u> . These mechanisms were AVB and tube support plate-TSP wears <u>wear</u> . There was no degradation associated with the secondary side findings (inner bundle or steam drum)."
18.	3-56	3.0.3.1.7	Correct the date at the bottom of the third paragraph.	Revise the date as follows: By letter dated July 5, 2013 <u>2012</u> ...
19.	3-81	3.0.3.1.18	The FSAR supplement was also revised under Amendment 1, letter dated April 25, 2012 and should be mentioned. Refer to the fourth full paragraph of the SER.	Revise the sentence as follows: The staff finds that the information in the FSAR supplement, as amended by letters dated <u>April 25, 2012</u> <u>and</u> February 28, 2013, is an adequate summary description of the program.
20.	3-82	3.0.3.1.19	Correct the date of the letter which submitted Amendment 10. Refer to the third paragraph of the SER.	Revise the date as follows: "By letter dated September 10-20 , 2012, the applicant provided LRA Amendment 10..."
21.	3-88	3.0.3.2.2	In the first paragraph of Section 3.0.3.2.2, EPRI-5769 should be EPRI NP-5769. For EPRI TR-104213, Application should be plural.	Revise the paragraph as follows: The LRA also states that the general practices established in this program are consistent with NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants," EPRI <u>NP</u> -5769, "Degradation and Failure of Bolting in Nuclear Power Plants" (with the exceptions noted in NUREG-1339 for safety-related bolting) and EPRI TR-104213, "Bolted Joint Maintenance and Applications <u>s</u> Guide," which are recommended by the GALL Report.

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22.	3-108	3.0.3.2.6	Correct the title of ANSI N45.2.6-1978 in the first paragraph.	Revise the sentence as follows: ANSI N45.2.6-1978, "Qualifications of <u>Nuclear Power Plant</u> Inspection, Examination, and Testing Personnel for Nuclear Power Plants. "
23.	3-116	3.0.3.2.7	For consistency with the response to RAI B2.1.14-5a, Part a, submitted on October 31, 2012, include text that is missing from the sixth (last) bullet. Similarly, revise the second sentence of the second full paragraph below the bulleted list to refer to the time-of-flight diffraction examination consistent with the response to RAI B2.1.14-5a.	Revise the last bullet as follows: "The joints were visually inspected, an ultrasonic time-of-flight <u>diffraction</u> examination was performed, and a hydrostatic test was conducted." Revise second sentence of second full paragraph below bulleted list as follows: "In addition, the <u>ultrasonic</u> time-of-flight ultrasonic <u>diffraction</u> examination technique is an industry-recognized means of detecting cracking in joints"
24.	3-120	3.0.3.2.7	Revise the first bullet in the list to include a missing word.	Revise the first bullet as follows: ...fire water system <u>program</u> .
25.	3-127	3.0.3.2.8	The last bullet at the bottom of the page starts with "Part (e): ..." For clarity, the applicable RAI should be noted since the preceding sentence cites several RAIs for this AMP. (Refer to ULNRC-05886 dated August 6, 2012.)	Revise the bullet as follows: " <u>RAI B2.1.15-2</u> Part (e): ... "
26.	3-130	3.0.3.2.8	The middle of the first full paragraph states, "The Callaway Addendum to FSAR Section 9.5.1.2.1 states..." Revise this statement to refer to the Site Addendum to the FSAR.	Revise the sentence as follows: "The Callaway <u>Site</u> Addendum to FSAR Section 9.5.1.2.1 states..."

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27.	3-142	3.0.3.2.11	In the first paragraph, last sentence, correct the acronym for the chemical and volume control system for consistency with Section 3.3 of the SER.	Revise the sentence as follows: "The LRA further states that the Selective Leaching Program will manage gray cast iron and copper alloy with greater than 15-percent zinc components within the fire protection, CVC controls <u>system</u> , service water,..."
28.	3-143	3.0.3.2.11	Revise the second paragraph of the Operating Experience discussion to refers to the Inspection Report from the Region IV Inspection (NRC letter dated November 20, 2012, (ML12328A053).	Revise text as follows: "As discussed in the audit <u>inspection</u> report, the staff reviewed..."
29.	3-160	3.0.3.2.15	Revise Enhancement 1 to include missing text.	Revise text as follows: "...will be enhanced before the <u>period of</u> extended operation to specify..."
30.	3-160	3.0.3.2.15	Revise the second sentence of Enhancement 1 to be consistent with LRA B2.1.26 (Enhancement to Element 2).	Revise the sentence as follows: In this enhancement, the applicant stated that the procedures will be enhanced before the extended operation to specify that whenever replaced <u>replacement of</u> bolting is required, bolting material, installation torque or tension, and use of lubricants and sealants are in accordance with the guidelines of EPRI NP-5769, EPRI TR-104213, and the additional recommendations of NUREG-1339.
31.	3-170	3.0.3.2.17	Revise the first partial paragraph, last sentence to correct the procedure reference.	Revise the sentence as follows: "as identified in procedure ESP- AAZZ -01013 Section 7.5 and the quantitative acceptance criteria described in ESP- AAZZ -01013, Appendix D."

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32.	3-180	3.0.3.2.20	Revise the first paragraph under Operating Experience to include the word "one."	Revise the sentence as follows: "The channel consists of two fission chambers in <u>one</u> detector housing..."
33.	3-184	3.0.3.2.21	Revise Enhancement 2 to match LRA with Amendment No. 1 (ULNRC-05856 dated April 25, 2012).	Revise the sentence as follows: "...(1) cables are not submerged or immersed in water, (2) cables/splices and <u>cable</u> support structures are intact, and..."
34.	3-200	3.0.3.2.23	Consider revising the first paragraph, last sentence citation of 10 CFR 50.55a to be more specific and consistent with LRA Appendix A2.3.	Revise the sentence as follows: LRA cites 10 CFR 50.55a (b)(2)(viii)(B) .
35.	3-215	3.0.5.2.4	Consider rewording the sentence in the paragraph titled, <u>Schedule for Implementing the Operating Experience Review Activities</u> , to clarify that no new enhancements were identified in the response to RAI B1.4-1b.	Revise the sentence as follows: In its response to RAI B1.4-1b dated February 14, 2013, the applicant identified no <u>additional</u> enhancements.
36.	3-242	3.1.2.1.1	In the fourth paragraph, correct the heat number for bounding ferrite content that is given as 3-3347.	Revise the sentence as follows: The applicant also stated that the calculated ferrite contents are 19.65 percent and 18.69 percent for heat Nos. 3-3325 and 3-3347 <u>3-3447</u> , respectively and that these values are below the 20 percent threshold value for static-cast CF8A material.
37.	3-246 3-255	3.1.2.1.2	Correct multiple instances where ASME Subsections contain a typo and refer to IWC twice. Refer to: <ul style="list-style-type: none"> • 3-246, paragraph (a) • 3-255, first paragraph, eleventh line 	Revise the sentence as follows: ... Subsections IWB, IWC, <u>and</u> IW <u>€</u> D Program...

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38.	3-267	3.1.2.2.6	Correct the typo in the section number for the ISI program as stated in the first full paragraph, last sentence.	Revise the sentence as follows: "The staff's evaluation of the applicant's ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program and Water Chemistry Program is documented in SER Sections 3.0.3.1. <u>1</u> and 3.0.3.1.2 respectively."
39.	3-303	3.2.2.2.4	Revise the third paragraph to refer to a single normal charging pump.	Revise the sentence as follows: The applicant also stated that normal charging is provided by the normal charging pumps <u>pump</u> and that check valves in the system prevent normal charging flow from going through the high pressure safety injection pump minimum flow recirculation orifices.
40.	3-382	Table 3.5-1	Revise title to NUREG-1800, Rev. 2 title applicable to PWR Containments: " <u>PWR Concrete (Reinforced and Prestressed) and Steel Containments</u> "	Revise as follows: BWR Concrete and Steel (Mark I, II, III) Containments <u>PWR Concrete (Reinforced and Prestressed) and Steel Containments</u>
41.	3-403	3.5.2.1.1	Correct the ASME code reference in the last sentence of the first partial paragraph of the page.	Revise the sentence as follows: "In its review of components associated with items 3.5.1-25, the staff finds the applicant's proposal to manage aging using the ASME Section IX <u>XI</u> , Subsection IWL Program acceptable"
42.	3-442	3.6.2.2.3	Revise the third paragraph, last sentence, to distinguish that the FSAR section reference is from the Site Addendum (SA).	Revise the sentence as follows: "The applicant noted that the Callaway FSAR SA <u>SA</u> Section 2.3.1.2.10 shows..."
43.	4-15	4.2.2.2	Last paragraph describes generic Cu data as reported in ORNL Report ORNL/TM-2006/530 and	Revise the paragraph as follows:

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			the best estimate copper content and standard deviation. The response to RAI 4.2.2-1a reported these values out to four significant figures. Request revision of this discussion to report the numeric values consistent with the response to RAI 4.2.2-1a (ULNRC-05918, October 15, 2012).	In its RAI response, the applicant stated that ORNL Report ORNL/TM-2006/530 provides the mean, standard deviation (σ), minimum, and maximum Cu values for the SA-508, Class 2, forging data analyzed in the report. The applicant noted that the mean value for the Cu content is 0.122 <u>0.1220</u> percent, with a σ of 0.031 <u>0.0313</u> percent, resulting in a mean + 2 σ upper bound value of 0.184 <u>0.1846</u> percent. The applicant stated that the USE and PTS calculations for the reactor vessel inlet and outlet nozzles are revised to incorporate the 0.184 <u>0.1846</u> percent Cu content for these nozzle forgings. The staff finds the applicant's response to RAI 4.2.2-1a acceptable because the applicant invoked the mean + 2 σ upper bound value for establishing the 0.184 <u>0.1846</u> percent generic Cu content for its inlet and outlet nozzle forgings. The staff noted that the generic Cu content of 0.184 <u>0.1846</u> percent is a statistically conservative value that is consistent with statistical analyses performed on industry-wide data.
44.	4-31	4.3.1.2.2	Revise the statement in the last paragraph to be consistent with the cycle count projection method discussion in LRA Section 4.3.1.2.	Revise the statement as follows: "...thus, the staff determined that it is reasonable that the 60-year projections are not solely based <u>more heavily</u> on data from the entire history of plant operation because recent operating practices <u>because they</u> are expected to be more representative of how the plant will operate in the future."
45.	4-39 4-50 4-52	4.3.2.1.2, third paragraph	Incorporate text after the statement beginning, "The staff determined that the program includes three monitoring methods..." to note that fatigue	Revise the paragraph as follows: " <u>Specifically for the</u> [RCP thermal barrier flange;

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		4.3.2.4.2, second full paragraph 4.3.3.2, second full paragraph	monitoring of the applicable component is based on cycle counting. This is consistent with the disposition of the Class 2 RHR heat exchangers and regenerative heat exchanger in SER Section 4.3.8.2.	<i>pressurizer lower head; and reactor vessel internals</i>], <u>the applicant's program ensures that the numbers of transients actually experienced during the period of extended operation remain below the assumed number in the fatigue analyses or corrective actions will be taken.</u> "
46.	4-44	4.3.2.2.2	Revise text to remove use of the abbreviation "CUF _{en} " which is inconsistent with the LRA as revised by letter ULNRC-05938 dated December 13, 2012 (ML12349A179 and ML12349A180).	Revise text as follows: CUF_{en} <u>U_{en}</u>
47.	4-54 through 4-60	4.3.4.1	Revise text to remove the use of the abbreviation "EAF CUF" which is inconsistent with the LRA as revised by letter ULNRC-05938 dated December 13, 2012 (ML12349A179 and ML12349A180).	Revise text as follows: EAF CUF <u>U_{en}</u>
48.	4-60	4.3.4.2	Revise the third full paragraph to include the word "age," which appears to be missing.	Revise the paragraph as follows: "The staff noted that this location is monitored by CBF, which is based on the premise that the incremental fatigue usage of each transient, which is based on the ASME Code fatigue analysis with an assumed number of occurrences for each transient, can be accumulated to provide a fatigue usage as the components <u>age</u> during the period of extended operation."
49.	4-60	4.3.4.2	A word appears to be missing in the statement in the last sentence of the paragraph at the top of the page.	Revise the sentence as follows: "Finally, for each screening method, if the criteria provided by the staff in RAI 4.3-21 were not considered, the applicant was requested to <u>provide</u> its justification."

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50.	4-68	4.3.8.1	To be consistent with LRA Section 4.3.8, consider changing the order of the discussion of the Fatigue Monitoring Program in the first paragraph of the Regenerative Heat Exchanger discussion.	Revise the paragraph as follows: <u>“The transients used in this fatigue analysis will be counted by the Fatigue Monitoring Program.</u> The LRA further states that the thermal analysis of the shell side nozzles, the tubeside outlet nozzle, and cross shell junction indicated these areas are not subject to fatigue. and the transients used in this analysis will be counted by the Fatigue Monitoring Program. ”
51.	4-69	4.3.8.1	Revise the SER to identify “these” transients.	Revise the sentence as follows: <u>“Residual Heat Removal Heat Exchangers.</u> The LRA states that the fatigue analysis for the RHR heat exchangers explains that a fatigue analysis is not necessary for the <u>these associated</u> transients since they are very weak.”
52.	4-121	4.7.10.3	Revise date to be consistent with Amendment 10, which was submitted September 20, 2012.	Revise the date as follows: September 20, 2013 <u>2012</u>
53.	B-4	Appendix B	Revise date to be consistent with letter dated November 29, 2012.	Revise the date as follows: November 29, 2013 <u>2012</u>