

ULNRC-05877

July 2, 2012

Enclosure 1

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**CALLAWAY PLANT UNIT 1
LICENSE RENEWAL APPLICATION**

REQUEST FOR ADDITIONAL INFORMATION (RAI) Set #1 RESPONSES

RAI 2.2-1 SPDS Table 2.2-1 Scoping

The applicant's scoping criteria is described in Section 2.1 of the Callaway Plant, Unit 1 (Callaway) License Renewal Application (LRA). LRA Section 2.2, Table 2.2-1, "Scoping Results," provides the results of applying the license renewal scoping criteria to systems, structures, and components (SSCs). The following systems, as described in the Updated Final Safety Analysis Report (UFSAR), could not be located in LRA Table 2.2-1.

UFSAR Section	System
18.1.17 Plant Safety Parameter Display System	Safety Parameter Display System

The staff requests that the applicant justify its exclusion of the above system from LRA Table 2.2-1.

Callaway Response

The Plant Safety Parameter Display System is included in the Plant Computer System. Other applications in the Plant Computer System include: ERFIS (Emergency Response Facility Information System), RRIS (Radiation Release Information System), Calorimetric, Integrated Leakage, and Axial Flux Difference. The Plant Computer System has no intended functions that satisfy the criteria in 10CFR 54.4(a)(1), 10CFR 54.4(a)(2), or 10CFR 54.4(a)(3) and is not within the scope of license renewal. The Plant Computer System is listed in LRA Table 2.2-1 and has been evaluated as not within the scope of license renewal.

Corresponding Amendment Changes

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

RAI 2.3.3.5-1 Service Water Boundary Drawings

LRA Section 2.1 describes the applicant's scoping methodology, which specifies how systems or components were determined to be included in scope of license renewal. The staff confirms the inclusion of all components subject to aging management review (AMR) by reviewing the results of the screening of components within the license renewal boundary. For the drawing locations identified in the table below, the continuation of piping within the scope of license renewal could not be located.

License Renewal Boundary Drawing Number & Location	Continuation Issue
LR-CW-EA-M-22EA01, location E-8	A section of (a)(2) piping (from line 036" HBD-8" downstream of valve V160) continues to M-22KB02 location B-8, which was not submitted as part of the application.
LR-CW-EA-M-22EA01, locations C-6/7	A section of (a)(2) piping (from line 039" HBD-8" upstream of valve V159) continues to M-22KB02, location B-8, which was not submitted as part of the application.

The staff requests the applicant to provide sufficient information to locate the license renewal boundary. If the continuation cannot be shown on license renewal boundary drawings, then provide additional information describing the extent of the scoping boundary and verify whether or not there are additional AMR component types between the continuation and the termination of the scoping boundary. If the scoping classification of a section of the piping changes over the continuation, provide additional information to clarify the change in scoping classification.

Callaway Response

On license renewal boundary drawing LR-CW-EA-M-22EA01, sections piping from line 036-HBD-8" and line 039-HBD-8" continue to license renewal boundary drawing M-22KB02. License renewal boundary drawing LR-CW-KA-M-22KB02 has been created to include the continuations of 036-HBD-8" and 039-HBD-8". As a result of the continuations from 036-HBD-8" and 039-HBD-8" onto license renewal boundary drawing LR-CW-KA-M-22KB02, component type "Heat Exchanger (Breathing Air Compressor)" has been added to LRA Table 2.3.3-8 with an intended function of Structural Integrity (attached). The breathing air compressor heat exchangers (located at C-6 and F-6 on the license renewal boundary drawing) are considered base-mounted components and as such, terminate the Structural Integrity (attached) intended function. LRA Section 2.3.3.8, Table 2.3.3-8, Table 3.3.2-8, LRA Section 3.3.2.1.8 and Section B2.1.19 have been revised, as shown on LRA Amendment 4 in Enclosure 2 to include the new license renewal boundary drawing and add the breathing air compressor heat exchangers.

Corresponding Amendment Changes

- LRA Section 2.3.3.8
- Table 2.3.3-8
- Table 3.3.2-8
- Section 3.3.2.1.8
- Section B2.1.19

RAI 2.3.3.8-1 Compressed Air System Boundary Drawings

In LRA Section 2.1.2.2 the applicant indicates nonsafety-related SSCs attached to safety-related SSCs are in scope of license renewal for 10 CFR 54.4(a)(2) up to the first seismic anchor past the safety/nonsafety interface. On the following drawings the staff could not locate seismic anchors on the nonsafety related lines:

License Renewal Application Drawing Number & Location	10 CFR 54.4(a)(2) Pipe Line(s) or Identifier
LR-CW-KA-M-22KA01, location B-1	317-JDD-1" downstream of valve V277 (No license renewal boundary drawing M-22KA09 to confirm seismic endpoint)
LR-CW-KA-M-22KA04, location F-4	495-JDD- ½" downstream of valve V474
LR-CW-KA-M-22KA04, location F-4	Upstream of valve V474 and connected to the ½" line with an endpoint shown as RB2
LR-CW-KA-M-22KA04, location F-4	Downstream of valve V483 and connected to the ½" line with an endpoint shown as RB17

Provide additional information to locate the seismic anchors or anchored components between the safety/non-safety interface and the end of the 10 CFR 54.4(a)(2) scoping boundary.

Callaway Response

LR-CW-KA-M-22KA01:

Piping line 317-JDD-1" is capped immediately downstream of valve V277. Therefore, this line represents an open-ended pipe and requires no continuation. A note has been added to the license renewal boundary drawing for clarification.

LR-CW-KA-M-22KA04:

Piping line 495-JDD-1/2" is capped immediately downstream of valve 474. Therefore, this line represents an open-ended pipe and requires no continuation. A note has been added to the license renewal boundary drawing for clarification.

The piping line connected to the ½" piping upstream of valve V474 which connects to endpoint RB2 is capped immediately downstream. Therefore this line represents an open-ended pipe and requires no continuation. A note has been added to the license renewal boundary drawing for clarification.

The piping line downstream of valve V483 which connects to endpoint RB17 is capped immediately downstream. Therefore this line represents an open-ended pipe and requires no continuation. A note has been added to the license renewal boundary drawing for clarification.

Corresponding Amendment Changes

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

RAI 2.3.3.20-1 Fire Protection System Boundary Drawings

The following LRA boundary drawings shows the following fire water systems/components as out of scope (i.e., not colored in green):

<u>LRA Drawing</u>	<u>Systems/Components</u>	<u>Location</u>
LR-CW-KC-M-22KC01	Turbine Generator Bearing	A4
	North Area Below Turbine (El. 2000'-0")	C5
	North Area Below Turbine (El. 2033'-0")	C4
	Unit 1 Auxiliary Transformers XMA02, XMA01B ø B, and XMA01C ø C,	D2
	Main Transformers (3) XMA01A ø A	F2
	Station Service Transformers, XPB03 and XPB04	H5
	Condenser Pit	A6
	South Area Below Turbine (El. 2000'-0")	D7
	South Area Below Turbine (El. 2033'-0")	A7
	Hydrogen Seal Oil Unit	D2
LR-CW-KC-M-22KC02	Auxiliary Boiler Room	A2

The staff requests that the applicant verify whether the fire water systems/components listed above are in the scope of license renewal in accordance with 10 CFR 54.4(a) and whether they are subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and are not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Callaway Response

Main Transformers (3) XMA01A ø A

Station Service Transformers, XPB03 and XPB04

Unit Auxiliary Transformers XMA02, XMA01B ø B, and XMA01C ø C

Ameren response in FSAR, Appendix 9.5A SP, to APCSB 9.5-1 Appendix A item D.1.h, states *"Buildings containing safety-related systems having openings in exterior walls are not closer than 50 feet to flammable oil-filled transformers."* The Main, Station Service, and Unit Auxiliary Transformers do not require protection by the fire water suppression system to meet the requirements of 10 CFR 50.48. The fire water suppression systems for the Main, Station Service, and Unit Auxiliary Transformers are not within scope for license renewal and not subject to an AMR.

The following statement from the Callaway Safety Evaluation Report, NUREG-0830, *Systems Required for Safe Shutdown*, Section 7.4, discusses the transformers relied upon for safe shutdown: *"The onsite power system is provided with preferred power from the offsite system through two independent and redundant sources of power. The Class 1E ac system loads required to maintain the plant at safe shutdown or to mitigate the consequences of an accident are separated into two load groups. These are powered from separate ESF transformers when offsite power is available or from two independent diesel generators (one per load group) when offsite power is not available."*

Auxiliary Boiler Room

FSAR, Appendix 9.5B SP - Fire Hazards Analysis (page 9.5B-197) provides the justification that there is no post-fire safe shutdown or safety-related equipment in fire area AB-1 (Auxiliary Boiler Room 4315). FSAR Table 9.5B-2 SP does not list fire area AB-1 since it contains no post-fire safe shutdown (PFSSD) equipment. Therefore, the fire water suppression system for the Auxiliary Boiler Room is not in scope for license renewal and not subject to an AMR.

According to Fire Delineation Drawing (FSAR Figure 9.5.1-2, Sheet 2) and the Fire Hazards Analysis, the auxiliary boiler room is evaluated as fire area AB-1. Fire area AB-1 is separated from adjoining safe shutdown areas by a 3-hour-rated barrier. Fire area AB-1 contains no PFSSD equipment or circuits. A fire in this area will not prevent safe shutdown.

Turbine Building

The justification provided below applies to the following turbine building locations evaluated in fire area T-2 (Turbine Building - 50 feet north of Auxiliary Building wall, general area).

Fire area T-2 is separated from the adjacent Auxiliary Building by a 3 hour fire barrier wall. All penetrations in the adjacent wall provide a level of protection that prevents the largest postulated fire from propagating from fire area T-2 to fire area A-23 (Auxiliary Building).

A fire in area T-2 could possibly affect the Turbine Stop Valves, however the MSIV's are available for isolating the secondary side to safely shutdown the plant (Reference: FSAR, Section 9.5B, T.2.7.2).

FSAR, Appendix 9.5B SP - Fire Hazards Analysis (page 9.5B-201) provides the justification that there is no post-fire safe shutdown or safety-related equipment in the Turbine Building. FSAR Table 9.5B-2 does not list fire area T-2 since it contains no PFSSD Equipment. The fire water suppression systems for the following turbine building locations are for asset protection only and not required to meet the criteria of 10 CFR 50.48. Therefore, the fire water suppression systems for the following Turbine Building areas are not in scope for license renewal and not subject to an AMR.

Turbine Generator Bearing

According to Fire Delineation Drawing (FSAR Figure 9.5.1-2, sheet 4) and the Fire Hazards Analysis FSAR 9.5B SP (page 9.5B-201), the turbine generator bearings are evaluated with fire area T-2. The combustible loading classification for all elevations not protected by a 3-hour fire barrier in fire area T-2 is low (< 80,000 btu/sq.ft.). A fire in this area will not prevent safe shutdown.

Condenser Pit

According to Fire Delineation Drawing (FSAR Figure 9.5.1-2, Sheet 2) and the Fire Hazards Analysis FSAR 9.5B SP (page 9.5B-201), the condenser pit is evaluated with fire area T-2. The combustible loading classification for all elevations not protected by a 3-hour fire barrier in fire area T-2 is low (< 80,000 btu/sq.ft.). A fire in this area will not prevent safe shutdown.

Hydrogen Seal Oil Unit

According to Fire Delineation Drawing (FSAR Figure 9.5.1-2, Sheet 3) and the Fire Hazards Analysis FSAR 9.5B SP (page 9.5B-201), the hydrogen seal oil unit is evaluated with fire area T-2. The combustible loading classification for all elevations not protected by a 3-hour fire barrier in fire area T-2 is low (< 80,000 btu/sq.ft.). A fire in this area will not prevent safe shutdown.

South Area Below Turbine (El. 2000'-0" and El. 2033'-0")

North Area Below Turbine (El. 2000'-0" and El. 2033'-0")

According to Fire Delineation Drawing (FSAR Figure 9.5.1-2, Sheets 2 and 3) and the Fire Hazards Analysis FSAR 9.5B SP (page 9.5B-201), the south and north areas below the turbine are evaluated with fire area T-2. The combustible loading classification for all elevations not protected by a 3-hour fire barrier in fire area T-2 is low (< 80,000 btu/sq.ft.). A fire in this area will not prevent safe shutdown.

Corresponding Amendment Changes

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

RAI 2.3.3.20-2 Fire Protection System

Tables 2.3.3-20 and 3.3.2-20 of the LRA do not include the following fire protection systems and components:

- fire hose connections and hose racks
- sprinklers
- diesel fire pump heat exchange (bonnet, shell, and tubes)
- lubricating oil collection system components for each reactor coolant pump
- floor drains and curbs for fire-fighting water
- dikes for oil spill confinement
- sprinkler system water curtain in the auxiliary building equipment hatchway
- filter housing
- diesel generator room roof heat vents

The staff requests that the applicant verify whether the fire protection systems and components listed above are in the scope of license renewal in accordance with 10 CFR 54.4(a) and whether they are subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and are not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Callaway Response

Fire Hose Connections and Hose Racks:

Fire hose connections and hose racks are evaluated as the component type “hose station”. LRA Table 2.3.3-20 identifies hose stations as components within the scope of license renewal and subject to an AMR. The aging management review for hose station components is provided in LRA Table 3.3.2-20.

Sprinklers:

Sprinklers are evaluated as the component type “spray nozzle”. LRA Table 2.3.3-20 identifies spray nozzles as components within the scope of license renewal and subject to an AMR. The aging management review for spray nozzle components is provided in LRA Table 3.3.2-20.

Diesel Fire Pump Heat Exchanger (bonnet, shell, and tubes):

Diesel fire pump heat exchanger is evaluated as the component type “heat exchanger (DFP jacket water)”, which includes a main and sub component representing the shell and tubes respectively. Channels, channel covers, and bonnets are included as part of the heat exchanger subcomponent type shell. LRA Table 2.3.3-20 identifies heat exchanger (DFP jacket water) as components within the scope of license renewal and subject to an AMR. The aging management review for the heat exchanger (DFP jacket water) components is provided in LRA Table 3.3.2-20.

Lubricating oil collection system components for each reactor coolant pump:

The system description in LRA section 2.3.3.27 for the floor and equipment drainage system identifies the system includes reactor coolant lubricating oil drain tanks for the reactor coolant pump lubricating oil collection system. LRA Table 2.3.3-27 identifies piping, valves, splash guards, and tanks of the reactor coolant pump lubricating oil collection system as components within the scope of license renewal and subject to an AMR. The aging management review for components associated with the reactor coolant pump lubricating oil collection system is provided in LRA Table 3.3.2-27.

Floor Drains and Curbs for Fire-Fighting Water:

Floor drains for fire-fighting water are evaluated as the component type “piping”. LRA Tables 2.3.3-26 (oily waste system) and 2.3.3-27 (floor and equipment drainage system) identify piping (floor drains) as components within the scope of license renewal and subject to an AMR. The aging management review for piping (floor drains) is provided in LRA Tables 3.3.2-26 and 3.3.2-27.

Curbs for fire-fighting water are evaluated as part of the component type “concrete elements” with a “flood barrier” and/or “direct flow” function(s) assigned to them. LRA Tables 2.4-2 (Control Building), 2.4-3 (Auxiliary Building), and 2.4-5 (Diesel Generator Building) identify concrete elements (curbs for fire-fighting water) as components within the scope of license renewal and subject to an AMR. The aging management review for concrete elements associated with curbs for fire-fighting water is provided in LRA Table 3.5-1.

Dikes for Oil Spill Confinement:

Ameren response in FSAR Appendix 9.5A SA to APCS 9.5-1 Appendix A item F.18 states that the fuel oil tank for the auxiliary boiler is provided with a dike to contain its entire contents. Additionally, as described in the FSAR Appendix 9.5B SP, Fire Hazard Analysis, Section D.1.2, the dike around the base of the diesel fuel oil day tank will hold at least 110% of the tank contents.

Dikes for oil spill confinement are evaluated as part of the component type “concrete elements” with a “structural pressure boundary” function assigned to them. LRA Tables 2.4.3 (Auxiliary Building) and 2.4.5 (Diesel Generator Building) identify concrete elements (dikes for oil spill confinement) as components within the scope of license renewal and subject to an AMR. The aging management review for concrete elements associated with dikes for oil spill confinement is provided in LRA Table 3.5-1.

Sprinkler System Water Curtain in the Auxiliary Building Equipment Hatchway:

FSAR figure 9.5.1-1, Sheet 5, displays sprinkler system arrangements that represent the North and South Cable Chases in the Auxiliary Building, which also provide fire water to the water curtains for the Auxiliary Building Equipment Hatchways. FSAR figure 9.5.1-1, Sheet 3, shows the typical pre-action sprinkler system configuration with applicable components listed in the accompanying table. FSAR Section 9.5.1.2.2.3 identifies the Auxiliary Building hatchways that are protected by sprinkler system water curtains.

Sprinkler system water curtains for the Auxiliary Building Equipment Hatchways are evaluated as component types “valve”, “piping”, and “spray nozzle”. LRA Table 2.3.3-20 identifies components associated with the sprinkler system water curtain to be within the scope of license renewal and subject to an AMR. The aging management review for the components associated with the sprinkler system water curtains for the Auxiliary Building Hatchways are provided in LRA Table 3.3.2-20.

Filter Housing:

Filter housings are evaluated as the component type “Filter”. LRA Table 2.3.3-20 identifies filters as components within the scope of license renewal and subject to an AMR. The aging management review of filters is provided in LRA Table 3.3.2-20.

Diesel Generator Room Roof Heat Vents:

Ameren response in FSAR Appendix 9.5A SP to APCS 9.5-1 Appendix A item D.4.(g) identifies that heat and smoke venting for each diesel generator room is provided by utilizing the exhaust air flow path. The free area of the exhaust air flow path provides at least 1.0 square feet of venting area for each 200 square feet of floor area. Smoke exhaust fans per se are not employed. Normal ventilation exhaust systems are utilized throughout for smoke removal.

The exhaust air flow path is evaluated as part of the component types damper, ductwork, and louvers (evaluated as structural steel components). LRA Table 2.3.3-16 (diesel generator building HVAC system) identifies the fan and ductwork components associated with the exhaust air flow path as components within the scope of license renewal and subject to an AMR. LRA Table 2.4-5 (diesel generator building) identifies the louver (structural steel) components associated with the exhaust air flow path as components within the scope of license renewal and subject to an AMR. The aging management review for components associated with the exhaust air flow path is provided in LRA Table 3.3.2-16 and LRA Table 3.5.2-5.

Corresponding Amendment Changes

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

RAI 2.3.3.20-3 NFPA 805 and LRA Gap Analysis

By letter dated August 29, 2011, Union Electric Company submitted a license amendment to transition the Callaway, existing fire protection program to a risk-informed, performance-based program based on National Fire Protection Association Standard 805 (NFPA 805), "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, in accordance with 10 CFR 50.48(c).

The staff requests that the applicant provide a gap analysis of LRA Tables 2.3.3-20 and 3.3.2-20 identifying differences between the existing and NFPA 805 post-transition changes. Summarize the results and the impacts of these gaps on the fire protection program described in LRA Tables 2.3.3-20 and 3.3.2-20, as the basis for transitioning to the NFPA 805 nuclear safety capabilities. Also list the fire protection systems and components including structural fire barriers, (e.g., fire walls and slabs, fire doors, fire barrier penetration seals, fire dampers, fire barrier coatings/wraps, equipment/personnel hatchways and plugs, metal siding), that will be added or removed based on the NFPA 805 transition in the scope of license renewal in accordance with 10 CFR 54.4(a) and whether they are subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Callaway Response

Callaway's NFPA 805 License Amendment Request is presently undergoing NRC review and is subject to change as a result of those reviews. Callaway plans to perform the requested gap analysis upon issuance of the draft NFPA 805 Safety Evaluation Report. Callaway acknowledges that the staff requires the license renewal gap analysis to support development of the draft Safety Evaluation Report for License Renewal. LRA Table A4-1 has been revised as shown on LRA Amendment 4 in Enclosure 2 to add commitment number 39. Commitment 39 requires Ameren to provide a gap analysis of LRA Tables 2.3.3-20 and 3.3.2-20 identifying differences between the existing and NFPA 805 post-transition changes prior to January 11, 2013. If the draft NFPA 805 Safety Evaluation Report is not available in the Fall of 2012, Ameren will provide an alternate schedule to address this commitment.

Corresponding Amendment Changes

- LRA Table A4-1, Commitment 39

RAI 2.3.3.22-1 Standby Diesel Generator - Turbocharger Casing

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05, locations F-8 and H-8, show turbocharger casings that are in scope for 10 CFR 54.4(a)(1) which are not listed in Table 2.3.3-22 as components subject to an AMR.

The staff requests that the applicant justify why the turbocharger casing component type was not included in LRA Table 2.3.3-22.

Callaway Response

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05 show turbocharger casings which are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1). Component type "Turbocharger Casing" has been added to LRA Table 2.3.3-22 with an intended function of "Pressure Boundary". LRA Table 2.3.3-22 and Table 3.3.2-22 have been revised, as shown on LRA Amendment 4 in Enclosure 2 to add the turbocharger casings.

Corresponding Amendment Changes

- LRA Table 2.3.3-22
- Table 3.3.2-22

RAI 2.3.3.22-2 Standby Diesel Generator – Air Supply Manifold

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05, location G-7, show an air pressure supply manifold housing that is in scope for 10 CFR 54.4(a)(1) which is not listed in Table 2.3.3-22 as a component subject to an AMR.

The staff requests that the applicant justify why the air supply manifold housing component type was not included in LRA Table 2.3.3-22.

Callaway Response

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05 show air pressure supply manifolds that are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1). The air pressure supply manifolds were evaluated as component type “Piping” with an intended function of “Pressure Boundary” on LRA Table 2.3.3-22.

Corresponding Amendment Changes

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

RAI 2.3.3.22-3 Standby Diesel Generator – Pulsation Damper

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05, locations A-6 and C-6, show pulsation dampers that are in scope for 10 CFR 54.4(a)(2) which are not listed in LRA Table 2.3.3-22 as components subject to an AMR.

The staff requests that the applicant justify why the pulsation damper component type was not included in LRA Table 2.3.3-22.

Callaway Response

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05 show pulsation dampers that are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(2). The pulsation dampers were evaluated as component type “Tank” with intended functions of “Leakage Boundary (spatial)” and “Structural Integrity (attached)” on LRA Table 2.3.3-22.

Corresponding Amendment Changes

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

RAI 2.3.3.22-4 Standby Diesel Generator – Ejector Casing

License renewal boundary drawings LR-CW-M-22KJ03 and LR-CW-M-22KJ06, location F-4, show lube oil ejector casings that are in scope for 10 CFR 54.4(a)(1) which are not listed in LRA Table 2.3.3-22 as component types subject to an AMR.

The staff requests that the applicant justify why the ejector casing component type was not included in LRA Table 2.3.3-22.

Callaway Response

License renewal boundary drawings LR-CW-M-22KJ03 and LR-CW-M-22KJ06 show lube oil ejector casings that are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1). The lube oil ejector casings were evaluated as component type “Pump” with an intended function of “Pressure Boundary” on LRA Table 2.3.3-22.

Corresponding Amendment Changes

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

RAI 2.3.3.22-5 Standby Diesel Generator – Oil Separator Casing

License renewal boundary drawings LR-CW-M-22KJ03 and LR-CW-M-22KJ06, location F-5, show oil separator casings that are in scope for 10 CFR 54.4 (a)(1) which are not listed in LRA Table 2.3.3-22 as components subject to an AMR.

The staff requests that the applicant justify why the oil separator casing component type was not included in LRA Table 2.3.3-22.

Callaway Response

License renewal boundary drawings LR-CW-M-22KJ03 and LR-CW-M-22KJ06 show oil separator casings that are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1). The oil separator casings were evaluated as component type “Filter” with an intended function of “Pressure Boundary” on LRA Table 2.3.3-22.

Corresponding Amendment Changes

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

RAI 2.3.3.22-6 Standby Diesel Generator – XJ components

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05, location G-3, show four “XJ” components that are in scope for 10 CFR 54.4(a)(1) that cannot be identified and reviewed. It is uncertain what these components are, what function(s) they perform, and if they are listed in LRA Table 2.3.3-22 as component types subject to an AMR.

The staff requests that the applicant clarify what the components are and their functions, and justify why the component type was not included in LRA Table 2.3.3-22.

Callaway Response

License renewal boundary drawings LR-CW-M-22KJ02 and LR-CW-M-22KJ05 show components labeled as “XJ” that are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1). The “XJ” components were evaluated as component type “Expansion Joint” with an intended function of “Pressure Boundary” on LRA Table 2.3.3-22.

Corresponding Amendment Changes

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

RAI 2.3.3.27-1 Floor and Equipment Drainage System Boundary Drawings

License renewal boundary drawing LR-CW-LF-M-22LF01, location H-4, shows A10-XND-4” piping within the scope of license renewal for 10 CFR 54.4(a)(2). However, the continuation from license renewal boundary drawing LR-CW-LF-M-22LF02, location A-4, depicts the piping within the scope of license renewal for 10 CFR 54.4(a)(3).

The staff requests the applicant to provide additional information to clarify the scoping classification of pipe section A10-XND-4”.

Callaway Response

License renewal boundary drawing LR-CW-LR-M-22LF02 correctly shows piping line A10-XND-“4” within the scope of license renewal in accordance with 10 CFR 54.4(a)(3). The continuation of piping line A10-XND-“4” onto license renewal boundary drawing LR-CW-LR-M-22LF01 incorrectly showed this pipe within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). License renewal boundary drawing LR-CW-LR-M-22LF01 has been revised to correctly show that piping line A10-XND-“4” is within the scope of license renewal in accordance with 10 CFR 54.4(a)(3).

Corresponding Amendment Changes

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

RAI 2.3.4-1 Main Steam – SPCS Boundary Drawings

LRA Section 2.1 describes the applicant’s scoping methodology, which specifies how systems or components were determined to be included in scope of license renewal. The staff confirms the inclusion of all components subject to AMR by reviewing the results of the screening of components within the license renewal boundary. For the drawing locations identified in the table below, the continuation of piping in scope for license renewal could not be located.

License Renewal Boundary Drawing Number & Location	Continuation Issue
Section 2.3.4.2 Main Steam Supply System	
LR-CW-AB-M-22AB02, location B-6	“F”-HBD-2 & I”-HBD-2, a continuation is not provided
Section 2.3.4.4 Steam Generator Blowdown System	
LR-CW-BM-M-22BM01, locations B-5, C-5, E-5 & G-5	Downstream continuation of valves V039, V028, V017 & V006 continued to drawing M- 22RM01. Drawing M- 22RM01 was not provided for review.
Section 2.3.4.5, Auxiliary Feedwater System	
LR-CW-AL-M-22FC02, location D-4	Downstream of valve V998 a continuation was not provided.

The staff requests the applicant to provide sufficient information to locate the license renewal boundary. If the continuation cannot be shown on license renewal boundary drawings, then provide additional information describing the extent of the scoping boundary and verify whether or not there are additional AMR component types between the continuation and the termination of the scoping boundary. If the scoping classification of a section of the piping changes over the continuation, provide additional information to clarify the change in scoping classification.

Callaway Response

LR-CW-AB-M-22AB02: Piping lines “I”-HBD-2” and “F”-HBD-3/4” continue and connect with their respective lines “E”-HBD-2” and “A”-HBD-1” for each of the safety valves in their loop. A note has been added to the license renewal boundary drawing for clarification.

LR-CW-BM-M-22BM01: Downstream of valves V039, V028, V017 and V006 are tubing. These valves are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(2) with an intended function of “Structural Integrity (attached)”. Tubing is considered not to have an intended function of Structural Integrity (attached). Therefore, no continuation is necessary. A note has been added to the license renewal boundary drawing for clarification.

LR-CW-AL-M-22FC02: Valve 998 is a sentinel relief valve which vents directly to the room. Therefore there is no continuation. A note has been added to the license renewal boundary drawing for clarification.

Corresponding Amendment Changes

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

RAI 2.3.4.2-1 Main Steam – NSR components in proximity to SR components

License renewal boundary drawing LR-CW-AE-M-22AB02 depicts main steam piping in the auxiliary building highlighted in green, which indicates that the piping is within scope of license renewal for 10 CFR 54.4(a)(1). However, at locations C-2, D-2, F-2, and G-2, four sections of main steam piping exit the auxiliary building and continue into the turbine building. As described by Note 1 on license renewal boundary drawing LR-CW-AE-M-22AB02, the scoping classification change and seismic portion of the main steam piping occurs at the first weld within the turbine building wall. Nonsafety-related components were not identified within scope of license renewal for 10 CFR 54.4(a)(2) inside the turbine building on the license renewal boundary drawing, as required by the applicant's scoping methodology described in LRA Section 2.1.2.2.

The staff requests the applicant to provide justification for excluding the nonsafety-related components in the turbine building, which may be in proximity of the (a)(1) main steam piping, from scope of license renewal for 10 CFR 54.4(a)(2).

Callaway Response

The license renewal scoping determination of the main steam piping in the turbine building was reviewed, and it was concluded that the main steam piping in the turbine building is not within the scope of license renewal for 10 CFR 54.4(a)(1). This section of piping is not relied upon to remain functional during or following design-basis events to ensure the following functions:

- (i) The integrity of the reactor coolant pressure boundary;
- (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; and
- (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in paragraph 10 CFR 50.34(a)(1), 50.67(b)(2), or 100.11, as applicable.

The FSAR defines the portion of the main steam piping from the containment penetration to outside the outboard isolation restraint as a no break zone. The outboard isolation restraint is a torsional restraint in the wall between the auxiliary building and the turbine building. FSAR Section 3.6.2.1.1e states that stresses within the no break zone will remain acceptable when subjected to the combined loadings of internal pressure, deadweight, and postulated pipe break beyond the no break zone. Similarly, the main feedwater and steam generator blowdown systems also have safety classification breaks in the turbine building. As with the main steam piping, a review of the license renewal scoping determination for these systems concluded that the components in the turbine building are not within the scope of license renewal for 10 CFR 54.4(a)(1). Consistent with the license renewal scoping determination, plant documentation associated with these sections of piping is also being revised to clarify the safety classification boundary as being at the wall between the auxiliary building and the turbine building.

License renewal boundary drawings LR-CW-AB-M-22AB02, LR-CW-AE-M22AE02, and LR-CW-BM-M22BM01 have been revised to show that the piping within the scope of license renewal for 10 CFR 54.4(a)(1) ends at the wall between the auxiliary building and turbine building for the main steam, main feedwater, and steam generator blowdown systems.

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Enclosure 1

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Corresponding Amendment Changes

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

RAI 2.3.4.3-1 Main Feedwater - NSR components in proximity to SR components

License renewal boundary drawing LR-CW-AE-M-22AE01 depicts solenoid valves, which are highlighted in green, at locations A-7, B-7, C-7, D-7, E-7, F-7, G-7, and H-7. These solenoid valves are accompanied on the license renewal boundary drawing with license renewal Note 1, which indicates that these valves are within scope of license renewal under 10 CFR 54.4(a)(1). However, there were not any nonsafety-related components, either directly attached or within spatial proximity of the solenoid valves, identified on license renewal boundary drawing LR-CW-AE-M-22AE01. The exclusion of these nonsafety-related components from scope of license renewal appears to be inconsistent with the scoping methodology described in LRA Section 2.1.2.2.

The staff requests the applicant to provide justification for excluding the nonsafety-related components near the solenoid valves from scope of license renewal for 10 CFR 54.4(a)(2) on license renewal boundary drawing LR-CW-AE-M-22AE01.

Callaway Response

As noted in FSAR section 10.4.7.2.2, the solenoid valves shown in green on boundary drawing LR-CW-AE-M-22AE01 support the function of the main feedwater control valves and main feedwater bypass control valves to act as a diverse backup when the main feedwater isolation valves receive an auto-closure signal on a feedwater isolation signal. This is not a safety-related function. Therefore, the solenoid valves do not have a safety-related function consistent with 10 CFR 54.4(a)(1), and were incorrectly identified on boundary drawing LR-CW-AE-M-22AE01 as within the scope of license renewal in accordance with 10 CFR 54.4(a)(1). They are, however within the scope of license renewal for 10 CFR 54.4(a)(2) because they support the diverse backup function of the main feedwater control valves and main feedwater bypass control valves, but are screened out because they are active. Since the solenoid valves do not have a safety-related function, the components near the solenoid valves are not within the scope of license renewal for 10 CFR 54.4(a)(2).

Boundary drawing LR-CW-AE-M-22AE01 has been revised to indicate that the solenoid valves associated with the main feedwater control valves and main feedwater bypass control valves are within the scope of license renewal 10 CFR 54.4(a)(2).

Corresponding Amendment Changes

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

RAI 2.5-1 SBO Recovery Control Circuits & Structures WSLR

In the license renewal application, the applicant described the station blackout recovery paths for license renewal. As the licensee did not specifically exclude the associated control circuits and structures for the switchyard circuit breakers, it is assumed that these components are included in the scope of license renewal. In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 54.4(a)(3) and License Renewal Sections 2.1.3.1.3 and 2.5.2.1.1 of the Standard Review Plan, the control circuits and structures associated with the circuit breaker should be in the scope of license renewal. Please confirm that these components are within the scope of license renewal.

Callaway Response

The control circuits and structures associated with the switchyard circuit breakers in the station blackout recovery path are within the scope of license renewal.

LRA Section 2.1.2.3.5, Station Blackout, identifies the station blackout recovery path and confirms that the ESF transformers, startup transformer, overhead transmission lines from the disconnects to and including the switchyard breakers and the switchyard breaker control cables and connections are within the scope of license renewal. Switchyard breaker control cables and connections are included in the 125 VDC electrical system. LRA Table 2.2-1 identifies that the 125 VDC electrical system is within the scope of license renewal.

LRA Section 2.4.8 and Table 2.4-8, Electrical Foundations and Structures, evaluates the reinforced concrete slabs (concrete elements) for the station blackout switchyard breakers (breakers 52-1 and 52-3) and transmission towers between the ESF and startup transformers. The concrete slabs for the station blackout switchyard breakers and transmission towers between the ESF and startup transformers are within the scope of license renewal and subject to aging management review.

LRA Section 2.4.6, Miscellaneous In-Scope Structures, identifies the switchyard control building as a miscellaneous structure within the scope of license renewal.

Corresponding Amendment Changes

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

Amendment 4, LRA Changes from RAI Responses

Enclosure 2 Summary Table

<u>Affected LRA Section/Table</u>	<u>AMP</u>	<u>LRA Page</u>
Section 2.3.3.8	N/A	2.3-41
Table 2.3.3-8	N/A	2.3-42
Table 2.3.3-22	N/A	2.3-70
Section 3.3.2.1.8	N/A	3.3-11
Table 3.3.2-8	N/A	3.3-113 to 3.3-116
Table 3.3.2-22	N/A	3.3-236
Table A4-1, Commitment 39	N/A	A-49
Section B2.1.19	XI.M33	B-69 to B-71

Section 2.3.3.8, Compressed Air System (Page 2.3-41), is revised as follows (new text is shown as underlined).

License Renewal Boundary Drawings

The license renewal boundary drawings for the compressed air system are listed below:

[LR-CW-KA-M-22KA01](#)

[LR-CW-KA-M-22KA02](#)

[LR-CW-KA-M-22KA04](#)

[LR-CW-KA-M-22KA05](#)

[LR-CW-KA-M-22KB02](#)

[LR-CW-KB-M-22KB01](#)

[LR-CW-KH-M-22KH01](#)

Table 2.3.3-8, Compressed Air System Function Relationship Table (Page 2.3-42), is revised as follows (new text is shown as underlined).

Table 2.3.3-8 Compressed Air System

Component Type	Intended Function
<u>Heat Exchanger (Breathing Air Compressor)</u>	<u>Structural Integrity (attached)</u>
<u>Strainer</u>	<u>Structural Integrity (attached)</u>

Table 2.3.3-22, Standby Diesel Generator Engine System Function Relationship Table (Page 2.3-70), is revised as follows (new text is shown as underlined).

Table 2.3.3-22 Standby Diesel Generator Engine System

Component Type	Intended Function
Closure Bolting	Leakage Boundary (spatial) Pressure Boundary
Compressor	Leakage Boundary (spatial)
Dryer	Structural Integrity (attached)
Expansion Joint	Pressure Boundary
Filter	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Flex Connectors	Pressure Boundary
Flow Orifice	Pressure Boundary Throttle
Heat Exchanger (DG Aftercooler)	Leakage Boundary (spatial) Structural Integrity (attached)
Heat Exchanger (DG Intercooler)	Heat Transfer Pressure Boundary
Heat Exchanger (DG Jacket Water)	Heat Transfer Pressure Boundary
Heat Exchanger (DG Lube Oil)	Heat Transfer Pressure Boundary
Heater	Pressure Boundary
Insulation	Insulate (Mechanical)
Piping	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Pump	Pressure Boundary
Sight Gauge	Leakage Boundary (spatial) Structural Integrity (attached)
Silencer	Pressure Boundary

Solenoid Valve	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Strainer	Pressure Boundary
Strainer Element	Filter
Tank	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Thermowell	Pressure Boundary
Trap	Leakage Boundary (spatial) Structural Integrity (attached)
Tubing	Pressure Boundary
<u>Turbocharger Casing</u>	<u>Pressure Boundary</u>
Valve	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Vent	Leakage Boundary (spatial)

Section 3.3.2.1.8, Compressed Air System (Page 3.3-11), is revised as follows (new text is shown as underlined).

3.3.2.1.8 Compressed Air System

Materials

The materials of construction for the compressed air system component types are:

- Carbon Steel
- Cast Iron (Gray Cast Iron)
- Copper Alloy
- Stainless Steel

Environment

The compressed air system component types are exposed to the following environments:

- Borated Water Leakage
- Condensation
- Dry Gas
- Plant Indoor Air
- Raw Water

Aging Management Programs

The following aging management programs manage the aging effects for the compressed air system component types:

- Bolting Integrity (B2.1.8)
- Boric Acid Corrosion (B2.1.4)
- External Surfaces Monitoring of Mechanical Components (B2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)
- Selective Leaching (B2.1.19)

Table 3.3.2-8, Auxiliary Systems – Summary of Aging Management Evaluation – Compressed Air System
 (pages 3.3-113 - 3.3-116), is revised as follows (new text is shown as underlined).

Table 3.3.2-8 Auxiliary Systems – Summary of Aging Management Evaluation – Compressed Air System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
<u>Heat Exchanger (Breathing Air Compressor)</u>	<u>SIA</u>	<u>Carbon Steel</u>	<u>Plant Indoor Air (Ext)</u>	<u>Loss of material</u>	<u>External Surfaces Monitoring of Mechanical Components (B2.1.21)</u>	<u>VII.D.A-80</u>	<u>3.3.1.078</u>	<u>C</u>
<u>Heat Exchanger (Breathing Air Compressor)</u>	<u>SIA</u>	<u>Carbon Steel</u>	<u>Raw Water (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VIII.G.SP-136</u>	<u>3.4.1.038</u>	<u>D</u>
<u>Heat Exchanger (Breathing Air Compressor)</u>	<u>SIA</u>	<u>Cast Iron (Gray Cast Iron)</u>	<u>Plant Indoor Air (Ext)</u>	<u>Loss of material</u>	<u>External Surfaces Monitoring of Mechanical Components (B2.1.21)</u>	<u>VII.I.A-77</u>	<u>3.3.1.078</u>	<u>A</u>
<u>Heat Exchanger (Breathing Air Compressor)</u>	<u>SIA</u>	<u>Cast Iron (Gray Cast Iron)</u>	<u>Raw Water (Int)</u>	<u>Loss of material</u>	<u>Selective Leaching (B2.1.19)</u>	<u>VII.G.A-51</u>	<u>3.3.1.072</u>	<u>B</u>
<u>Heat Exchanger (Breathing Air Compressor)</u>	<u>SIA</u>	<u>Cast Iron (Gray Cast Iron)</u>	<u>Raw Water (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VIII.G.SP-136</u>	<u>3.4.1.038</u>	<u>B</u>

Table 3.3.2-8 Auxiliary Systems – Summary of Aging Management Evaluation – Compressed Air System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
<u>Piping</u>	<u>SIA</u>	<u>Carbon Steel</u>	<u>Raw Water (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VIII.G.SP-136</u>	<u>3.4.1.038</u>	<u>B</u>
<u>Strainer</u>	<u>SIA</u>	<u>Carbon Steel</u>	<u>Plant Indoor Air (Ext)</u>	<u>Loss of material</u>	<u>External Surfaces Monitoring of Mechanical Components (B2.1.21)</u>	<u>VII.D.A-80</u>	<u>3.3.1.078</u>	<u>A</u>
<u>Strainer</u>	<u>SIA</u>	<u>Carbon Steel</u>	<u>Raw Water (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VIII.G.SP-136</u>	<u>3.4.1.038</u>	<u>B</u>
<u>Valve</u>	<u>SIA</u>	<u>Carbon Steel</u>	<u>Raw Water (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VIII.G.SP-136</u>	<u>3.4.1.038</u>	<u>B</u>

Notes for Table 3.3.2-8:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.**
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.**
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.

Plant Specific Notes:

NUREG-1801, Section XI.M24, *Compressed Air Monitoring* applies to monitoring the piping and components associated with the air compressors and dryers. Air compressor and dryer piping and components are not within the scope of license renewal for Callaway. In-scope piping and components are associated with containment penetrations and nitrogen gas piping and components for backup closure of valves. The Internal Surfaces in Miscellaneous Piping and Ducting Components requires internal inspections consistent with the NUREG-1801, Section M24, *Compressed Air Monitoring*. Therefore, for components associated with the compressed air system, the Internal Surfaces in Miscellaneous Piping and Ducting Components program (B2.1.23) is credited rather than Compressed Air Monitoring.

Table 3.3.2-22, Auxiliary Systems – Summary of Aging Management Evaluation – Standby Diesel Generator Engine System (page 3.3-236), is revised as follows (new text is shown as underlined).

Table 3.3.2-22 Auxiliary Systems – Summary of Aging Management Evaluation – Standby Diesel Generator Engine System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
<u>Turbocharger Casing</u>	<u>PB</u>	<u>Carbon Steel</u>	<u>Condensation (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VII.H2.A-23</u>	<u>3.3.1.089</u>	<u>D</u>
<u>Turbocharger Casing</u>	<u>PB</u>	<u>Carbon Steel</u>	<u>Diesel Exhaust (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VII.H2.AP-104</u>	<u>3.3.1.088</u>	<u>B</u>
<u>Turbocharger Casing</u>	<u>PB</u>	<u>Carbon Steel</u>	<u>Plant Indoor Air (Ext)</u>	<u>Loss of material</u>	<u>External Surfaces Monitoring of Mechanical Components (B2.1.21)</u>	<u>VII.I.A-77</u>	<u>3.3.1.078</u>	<u>A</u>

Table A4-1 License Renewal Commitments

Item #	Commitment	LRA Section	Implementation Schedule
<p><u>39</u></p>	<p><u>NFPA 805 and LRA GAP analysis:</u> A gap analysis of LRA Tables 2.3.3-20 and 3.3.2-20 will be provided to identify differences between the existing and NFPA 805 post-transition changes. The results and the impacts of these gaps on the fire protection program described in LRA Tables 2.3.3-20 and 3.3.2-20 will be summarized, as the basis for transitioning to the NFPA 805 nuclear safety capabilities. The summary will also list the fire protection systems and components including structural fire barriers, (e.g., fire walls and slabs, fire doors, fire barrier penetration seals, fire dampers, fire barrier coatings/wraps, equipment/personnel hatchways and plugs, metal siding), that will be added or removed based on the NFPA 805 transition in the scope of license renewal in accordance with 10 CFR 54.4(a) and whether they are subject to an AMR in accordance with 10 CFR 54.21(a)(1).</p>	<p><u>B2.1.13</u> <u>B2.1.14</u></p>	<p><u>Prior to January 11, 2013. If the Draft NFPA 805 Safety Evaluation Report is not available in the Fall of 2012, Ameren will provide an alternate schedule to address this commitment.</u></p>

Appendix B AGING MANAGEMENT PROGRAMS

B2.1.19 Selective Leaching

Program Description

The Selective Leaching program manages loss of material due to selective leaching for gray cast iron and copper alloy with greater than 15 percent zinc components exposed to treated water, raw water, waste water, or groundwater that are within the scope of license renewal. There are no copper alloy components with greater than eight percent aluminum within the scope of license renewal at Callaway. Components susceptible to selective leaching are in the fire protection system, chemical and volume control system, service water system, compressed air system, essential service water system, plant heating system, fuel building HVAC system, auxiliary building HVAC, containment purge system or oily waste system.

A one-time inspection of a selected representative sample of components that are most susceptible to selective leaching will be performed. A sample of 20 percent of the population, up to a maximum of 25 component inspections, is established for each material and environment combination.

Visual and mechanical methods are used to determine whether loss of material due to selective leaching is occurring. Identification of selective leaching may be accomplished by attempting to scrape or chip through the surface being inspected. If these inspections detect dezincification or graphitization, which are the types of selective leaching expected to occur in copper alloy and gray cast iron, a follow-up evaluation will be performed. The evaluation may require confirmation of selective leaching through a metallurgical evaluation (which may include microstructure examination). The sample size for each material and environment combination may be expanded, based upon the results of the evaluation and confirmatory testing. If indications of selective leaching are confirmed, follow-up examinations will be performed. Deficiencies are corrected through replacement, to ensure that systems will continue to perform their intended function for the period of extended operation.

The Selective Leaching program is a new program and visual inspections and associated evaluations will be implemented within the 5-year period prior to the period of extended operation.

NUREG-1801 Consistency

The Selective Leaching program is a new program that, when implemented, will be consistent, with exception to NUREG-1801, Section XI.M33, *Selective Leaching*.

**Appendix B
AGING MANAGEMENT PROGRAMS**

Exceptions to NUREG-1801

Program Elements Affected:

Parameters Monitored or Inspected (Element 3), and Monitoring and Trending (Element 5)

NUREG-1801, Section XI.M33 requires inspection of buried gray cast iron components exposed to raw water or ground water. Selective leaching inspections do not need to be provided if the components are within the scope of the fire protection system, have been installed in accordance with NFPA Standard 24, and the activity of the fire protection system jockey pump is required to be monitored on an interval not to exceed one month. At a minimum, a flow test is conducted by the end of the following refueling outage, when unexplained changes in fire protection system jockey pump activity are observed. This exception is consistent with the fire protection aging management requirements of NUREG-1801, Section XI.M41, *Buried and Underground Piping and Tanks*.

Enhancements

None

Operating Experience

The following discussion of operating experience provides objective evidence that the Selective Leaching program will be effective in ensuring that intended functions are maintained consistent with the current licensing basis for the period of extended operation:

1. The Selective Leaching program is a new program for Callaway. Industry operating experience that forms the basis for this program is included in the operating experience element of the corresponding NUREG-1801 aging management program. Plant-specific operating experience was reviewed to ensure that the operating experience discussed in the corresponding NUREG-1801 aging management program is bounding, i.e., that there is no unique plant-specific operating experience in addition to that described in NUREG-1801. The Callaway Corrective Action Program was searched to determine if selective leaching has been identified for components with the applicable material and environment combinations. In addition, there are no copper alloy components with greater than eight percent aluminum within the scope of license renewal at Callaway.

**Appendix B
AGING MANAGEMENT PROGRAMS**

No occurrences of selective leaching were found in a search of Callaway historical information. Occurrences that would be identified under the Selective Leaching program will be evaluated to ensure there is no significant impact to safe operation of the plant and corrective actions will be taken to prevent recurrence. Guidance for re-evaluation, repair,

or replacement is provided for locations where aging is found. There is confidence that the implementation of the Selective Leaching program will effectively identify aging prior to loss of intended function.

Industry and plant-specific operating experience will be evaluated in the development and implementation of this program.

Conclusion

The implementation of the Selective Leaching program will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Amendment 4, Miscellaneous Updates to the Callaway LRA

Enclosure 3 Contents

<u>Affected LRA Section/Table</u>	<u>LRA Page</u>
Section 2.3.3.26	2.3-75 to 2.3-76
Table 2.3.3-26	2.3-76
Table 3.3.2-20	3.3-209 to 3.3-211
Table 3.3.2-26	3.3-258
Section 3.4.2.1.4	3.4-5
Table 3.4.2-2	3.4-34 and 3.4-37 to 3.4-40
Table 3.4.2-4	3.4-49 to 3.4-50

Enclosure 3 Summary

Oily Waste System

Affected LRA Sections

Section 2.3.3.26

Table 2.3.3-26

Table 3.3.2-26

Reason for Change

Revised oily waste system scoping, screening, and AMR to identify drain piping that prevents flooding which could prevent satisfactory accomplishment of criterion (a)(1) intended functions.

Fire Protection System

Affected LRA Section

Table 3.3.2-20

Reason for Change

Removed the spray intended function from the piping component that represents copper alloy piping, piping components, and piping elements exposed to borated water leakage and add a copper alloy spray nozzle exposed to borated water leakage with a spray intended function.

Main Steam System

Affected LRA Section

Table 3.4.2-2

Reason for Change

The internal environment of selected main steam system components was changed from dry gas to condensation for piping exposed to instrument air portions of the compressed gas system.

Steam Generator Blowdown System

Affected LRA Sections

Section 3.4.2.1.4

Table 3.4.2-4

Reason for Change

The internal environment of selected main steam system components was changed from dry gas to condensation for piping exposed to instrument air portions of the compressed gas system

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Amendment 4**

Revision to add flood control to the intended functions, 3B.4.2.3 SP to the FSAR references, LR-CW-LE-M-22LE03 to the list of license renewal boundary drawings, and Direct Flow to the list of piping functions in Table 2.3.3-26.

Section 2.3.3.26 (pages 2.3-75 and 2.3-76) is revised as follows (new text shown underlined):

2.3.3.26 Oily Waste System

System Description

The purpose of the oily waste system is to collect nonradioactive waste water from areas where oil may be present for processing and disposal and collect waste water that may contain oil and/or trace amounts of radioactive contaminants for processing and recycling. The mechanical portions of the oily waste system are nonsafety and perform no safety-related functions.

The portions of the oily waste system within the scope of license renewal consist of sumps, sump pumps, piping, valves, and control and instrumentation equipment located in the diesel generator building, auxiliary building, control building and the tendon access gallery.

The safety-related portion of the oily waste system for leak detection in the diesel generator rooms is evaluated as part of the electrical and instrumentation and control evaluation in [Section 2.5, Scoping and Screening Results: Electrical and Instrumentation and Control Systems](#).

System Intended Functions

Portions of the oily waste system are within the scope of license renewal as nonsafety-related affecting safety-related components based on the criterion of 10 CFR 54.4(a)(2) for spatial interaction and flood control.

Portions of the oily waste system are within the scope of license renewal to support fire protection requirements based upon the criteria of 10 CFR 54.4(a)(3).

Callaway FSAR References

Additional details of the oily waste system are included in [FSAR Sections 3B.4.2.3 SP, 9.3.3 SP, 9.5.1 SP](#), and [Appendices 9.5A SP and 9.5B SP](#).

License Renewal Boundary Drawings

The license renewal drawings for the oily waste system are listed below:

[LR-CW-LE-M-22LE01](#)

[LR-CW-LE-M-22LE02](#)

[LR-CW-LE-M-22LE03](#)

[LR-CW-LE-M-22LE04](#)

Component-Function Relationship Table

The component types subject to aging management review are indicated in [Table 2.3.3-26 – Oily Waste System](#). (Page 2.3-76)

Table 2.3.3-26 Oily Waste System

Component Type	Intended Function
Closure Bolting	Leakage Boundary (spatial)
Piping	<u>Direct Flow</u> Leakage Boundary (spatial) Pressure Boundary
Pump	Leakage Boundary (spatial) Pressure Boundary
Tank	Leakage Boundary (spatial)
Valve	Leakage Boundary (spatial) Pressure Boundary

The AMR results for these component types are provided in [Table 3.3.2-26, Auxiliary Systems – Summary of Aging Management Evaluation – Oily Waste System](#).

Removed intended function of spray from copper alloy piping and added a new component, spray nozzle, with a function of spray. No changes were made to the plant notes.

Table 3.3.2-20, Fire Protection System (pages 3.3-209 and 3.3-211), is revised as follows (deleted text with strikethrough and new text is underlined).

Table 3.3.2-20 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
Piping	PB, SIA, SP	Copper Alloy	Borated Water Leakage (Ext)	None	None	VII.J.AP-11	3.3.1.115	A
Piping	PB, SP	Copper Alloy	Condensation (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VII.G.AP-143	<u>3.3.1.089</u>	B
<u>Spray Nozzle</u>	<u>SP</u>	<u>Copper Alloy</u>	<u>Borated Water Leakage (Ext)</u>	<u>None</u>	<u>None</u>	<u>VII.J.AP-11</u>	<u>3.3.1.115</u>	<u>A</u>

Added a new line item to account for carbon steel piping in a plant indoor air (ext) environment with Direct Flow as an intended function, and added Direct Flow to an existing line item for carbon steel piping in waste water (int). No new Plant Notes are added.

Table 3.3.2-26, Oily Waste System, (Page 3.3-258) is revised as follows (new text shown underlined):

Table 3.3.2-26 *Auxiliary Systems – Summary of Aging Management Evaluation – Oily Waste System*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
<u>Piping</u>	<u>DF, LBS</u>	<u>Carbon Steel</u>	<u>Plant Indoor Air (Ext)</u>	<u>Loss of material</u>	<u>External Surfaces Monitoring of Mechanical Components (B2.1.21)</u>	<u>VII.1.A-77</u>	<u>3.3.1.078</u>	<u>A</u>
Piping	<u>DF, LBS, PB</u>	Carbon Steel	Waste Water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VII.E5.AP-281	3.3.1.091	B

Revised to delete dry gas as an internal environment of instrument air components in the Blowdown System.

Section 3.4.2.1.4 (page 3.4-5) is revised as follows (deleted text with strikethrough).

3.4.2.1.4 Steam Generator Blowdown System

Environment

The steam generator blowdown system components are exposed to the following environments:

- Borated Water Leakage
- Condensation
- ~~Dry Gas~~
- Plant Indoor Air
- Secondary Water
- Steam

Changed the internal environment of components using instrument air from dry gas to condensation. Added a new line item to account for carbon steel valves with an internal environment of condensation in a plant indoor air (ext) environment with pressure boundary as an intended function. Added a pressure boundary function to carbon steel piping with an internal environment of condensation. Standard Plant Note E and Plant Specific Note 2 were added regarding use of aging management program XI.M38 instead of XI.M24 to manage these components.

Table 3.4.2-2, Main Steam Supply System (pages 3.4-34 and 3.4-37 through 3.4-40), is revised as follows (deleted text with strikethrough and new text is underlined).

Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam Supply System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
Insulation	INS	Insulation Calcium Silicate	Plant Indoor Air (Ext)	None	None	None	None	J, 4 2
Piping	LBS, <u>PB</u> , SIA	Carbon Steel	Condensation (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VIII.B1.SP-60	3.4.1.037	B
Tubing	PB	Stainless Steel	<u>Dry-Gas Condensation</u> (Int)	<u>None-Loss of material</u>	<u>None Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	VIII.SP-15 <u>VIII.B1.SP-110</u>	3.4.1.058 <u>3.4.1.039</u>	A B

<u>Valve</u>	<u>PB</u>	<u>Carbon Steel</u>	<u>Condensation (Int)</u>	<u>Loss of material</u>	<u>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)</u>	<u>VIII.B1.SP-60</u>	<u>3.4.1.037</u>	<u>B</u>
Valve	FIL, PB	Copper Alloy	Dry-Gas (Int) <u>Condensation (Int)</u>	None Loss of material	None Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VIII.SP-5 <u>VII.D.AP-240</u>	3.4.1.054 <u>3.3.1.054</u>	<u>A E, 1</u>
Valve	PB	Stainless Steel	Dry-Gas (Int) <u>Condensation (Int)</u>	None Loss of material	None Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VIII.SP-15 <u>VIII.B1.SP-110</u>	3.4.1.058 <u>3.4.1.039</u>	<u>A B</u>

Notes for Table 3.4.2-2:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

- 1 NUREG-1801, Section XI.M24 Compressed Air Monitoring applies to monitoring the piping and components associated with the air compressors and dryers. Air compressor and dryer piping and components are not within the scope of license renewal for Callaway. In-scope piping and components are associated with containment penetrations and nitrogen gas piping and components for backup closure of valves. The AMP M38 Internal Surfaces in Miscellaneous Piping and Ducting Components requires internal inspections consistent with the AMP M24 Compressed Air Monitoring. Therefore, for components associated with the compressed air system, the AMP M38 Internal Surfaces in Miscellaneous Piping and Ducting Components is credited rather than M24 Compressed Air Monitoring.
- 42 Based on plant operating experience, there are no aging effects requiring management for calcium silicate insulation in a metal jacket in a plant indoor air environment. The insulation does not experience aging effects unless exposed to temperatures, radiation, or chemicals capable of attacking the specific chemical composition of the insulation. The insulation is contained in metal jacket with a vapor barrier to prevent moisture intrusion and is in a non-aggressive air environment that does not experience significant aging effects.

Changed the internal environment of components using instrument air from dry gas to condensation. Standard Plant Note E and Plant Specific Note 1 were added regarding use of aging management program XI.M38 instead of XI.M24 to manage these components.

Table 3.4.2-4, Steam Generator Blowdown System (pages 3.4-49 and 3.4-50), is revised as follows (deleted text with strikethrough and new text is underlined).

Table 3.4.2-4 Steam and Power Conversion System – Summary of Aging Management Evaluation – Steam Generator Blowdown System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Item	Table 1 Item	Notes
Valve	PB, SS	Carbon Steel	Dry-Gas (Int) <u>Condensation (Int)</u>	None-Loss of material	None-Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VIII.SP-4 <u>VIII.B1.SP-60</u>	3.4.1.059 <u>3.4.1.037</u>	A-B
Valve	PB	Copper Alloy	Dry-Gas (Int) <u>Condensation (Int)</u>	None-Loss of material	None-Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.23)	VIII.SP-6 <u>VII.D.AP-240</u>	3.4.1.054 <u>3.3.1.054</u>	A-E, 1

Notes for Table 3.4.2-4:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.

Plant Specific Notes:

None

- 1 NUREG-1801, Section XI.M24 Compressed Air Monitoring applies to monitoring the piping and components associated with the air compressors and dryers. Air compressor and dryer piping and components are not within the scope of license renewal for Callaway. In-scope piping and components are associated with containment penetrations and nitrogen gas piping and components for backup closure of valves. The AMP M38 Internal Surfaces in Miscellaneous Piping and Ducting Components requires internal inspections consistent with the AMP M24 Compressed Air Monitoring. Therefore, for components associated with the compressed air system, the AMP M38 Internal Surfaces in Miscellaneous Piping and Ducting Components is credited rather than M24 Compressed Air Monitoring.