UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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November 20, 2012

Mr. Adam C. Heflin, Senior Vice
President and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT - NRC LICENSE RENEWAL INSPECTION REPORT 05000483/2012009

Dear Mr. Heflin:

On September 28, 2012, a U.S. Nuclear Regulatory Commission (NRC) team completed the onsite portion of an inspection of your application for license renewal of your Callaway Plant. The team discussed the inspection results with Ms. S. Kovaleski, Supervising Engineer, and other members of your staff during the exit meeting on November 7, 2012.

This inspection examined activities that supported the application for a renewed license for the Callaway Plant. The inspection addressed your processes for scoping structures, systems, and components to select equipment subject to an aging management review. Further, the inspection addressed the development and implementation of aging management programs to support continued plant operation into the period of extended operation. As part of the inspection, the NRC examined procedures and representative records, interviewed personnel, and visually examined accessible portions of various structures, systems, or components to verify license renewal scoping and to observe any effects of equipment aging. These NRC inspection activities constitute one of several inputs into the NRC review process for license renewal applications.

The team concluded that your staff appropriately implemented the scoping of nonsafety-related structures, systems, and components that could affect safety-related structures, systems and components. The team concluded that your staff conducted an appropriate review of the materials and environments and established appropriate aging management programs, as described in the license renewal application and as supplemented through your responses to requests for additional information from the NRC. The team concluded that your staff maintained the documentation supporting the application in an auditable and retrievable form. The team identified a number of issues that resulted in your staff revising your license renewal application and revising aging management processes, which are described in the report.

Based on the samples reviewed by the team, the inspection results support a conclusion of reasonable assurance that actions have been identified and have been or will be taken to manage the effects of aging in the structures, systems, and components identified in your application and that the intended functions of these structures, systems, and components will be maintained in the period of extended operation.

In accordance with 10 CFR 2.390 of the NRC's “Rules of Practice,” a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC’s document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Geoffrey Miller, Chief
Engineering Branch 2
Division of Reactor Safety

Docket: 50-483
License: NPF-30

Enclosure: Inspection Report 05000483/2012009
w/attachments

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	50-483
Licenses:	NPF-30
Report:	05000483/2012009
Applicant:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Hwy CC and Hwy O Fulton, MO
Dates:	September 10 through November 7, 2012
Inspectors:	G. Pick, Senior Reactor Inspector and Team Leader S. Alferink, Reactor Inspector J. Melfi, Reactor Engineer G. Meyer, Senior Reactor Inspector, Region I N. Okonkwo, Reactor Inspector
Accompanying Personnel:	W. Holston, Senior Mechanical Engineer, Division of License Renewal, Office of Nuclear Reactor Regulation
Approved By:	Geoffrey Miller, Chief Engineering Branch 2 Division of Reactor Safety

TABLE OF CONTENTS

SUMMARY OF FINDINGS

IR 05000483/2012009; 09/10 – 11/7/2012; Callaway Plant, Scoping of Nonsafety-Related Affecting Safety-Related Systems and Review of License Renewal Aging Management Programs

NRC inspectors from Region IV, Region I, and a reviewer from Headquarters performed onsite inspections of the applicant's license renewal activities. The team performed the evaluations in accordance with Manual Chapter 2516, “Policy and Guidance for the License Renewal Inspection Programs,” and Inspection Procedure 71002, “License Renewal Inspection.” The team did not identify any findings as defined in NRC Manual Chapter 0612.

The team concluded that the applicant adequately performed scoping of nonsafety-related structures, systems, and components as required by 10 CFR 54.4(a)(2). The team concluded that the applicant conducted an appropriate review of the materials and environments and established appropriate aging management programs, as described in the license renewal application and as supplemented through responses to requests for additional information from the NRC. The team found that the applicant provided the documentation that supported the application and inspection process in an auditable and retrievable form. The team identified a number of issues that resulted in changes to the application, aging management programs, and processes.

Based on the samples reviewed by the team, the inspection results supported a conclusion of reasonable assurance that actions have been identified and have been taken or planned to manage the effects of aging in the structures, systems, and components identified in the application and that the intended functions of these structures, systems, and components would be maintained in the period of extended operation.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified

B. Licensee-Identified Violations

None.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Other - License Renewal

a. Inspection Scope (IP 71002)

NRC inspectors performed this inspection to evaluate the thoroughness and accuracy of the applicant's scoping of nonsafety-related structures, systems, and components (SSCs), as required by 10 CFR 54.4(a)(2). The team evaluated whether aging management programs would be capable of managing identified aging effects in an appropriate manner.

In order to evaluate scoping activities, the team selected a number of SSCs for review to evaluate whether the methodology used by the applicant appropriately addressed the nonsafety-related systems with the potential to affect the safety functions of a structure, system, or component within the scope of license renewal. Scoping activities are those activities performed by the applicant to identify the population of SSCs that should be considered for aging management activities.

The team selected a sample of 23 of the 39 aging management programs developed by the applicant to verify the adequacy of the applicant's guidance, implementation activities, and documentation. The team evaluated the aging management programs to determine whether the applicant would appropriately manage the effects of aging and to verify that the applicant would maintain the component safety functions during the period of extended operation.

The team reviewed supporting documentation and interviewed personnel to confirm the accuracy of the license renewal application conclusions. The team walked down accessible portions of the in-scope systems to observe aging effects and to review the material condition of the SSCs. In-scope refers to SSCs that the applicant concluded would require aging management because they were passive or long-lived.

b.1 Evaluation of Scoping of Nonsafety-Related Structures, Systems, and Components

The team assessed the thoroughness and accuracy of the methods used to identify the SSCs required to be within the scope of the license renewal application as required by 10 CFR 54.4(a)(2). The team verified that the applicant had established procedures consistent with the NRC-endorsed guidance contained in Nuclear Energy Institute 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule," Revision 6, Appendix F, Sections 3, 4, and 5. The team assessed whether the applicant evaluated: (1) nonsafety-related SSCs within the scope of the current licensing basis, (2) nonsafety-related SSCs directly connected to safety-related SSCs, and (3) nonsafety-related SSCs not directly connected but spatially near safety-related SSCs.

The team reviewed the complete set of license renewal drawings. The applicant had color-coded the drawings to indicate in-scope systems and components required

by 10 CFR 54.4(a)(1), (a)(2), and (a)(3). The team interviewed personnel, reviewed program documents and independently walked down numerous plant areas. The team determined that the personnel involved in the process were knowledgeable and appropriately trained.

For SSCs selected because of potential spatial interactions, where failure of nonsafety-related components could adversely affect adjacent safety-related components, the team determined that the applicant accurately categorized the plant configuration within the license renewal documents. The team reviewed plant conditions in the essential service water pump house and the emergency diesel generator building. The team walked down the areas to confirm that safety-related equipment did not have any unaccounted for nonsafety-related components. The team reviewed plant areas, designated as not containing safety-related equipment. The specific areas reviewed included the condensate storage tank, valve house and tunnel, and the communications corridor to confirm that areas had no such equipment. Also, the team selected specific components to confirm that the components had been scoped properly and included accurately in the drawings and database. The team determined that the applicant accurately categorized the plant configuration for potential spatial interactions within the license renewal documents.

For SSCs selected because of potential structural interaction (seismic design of safety-related components potentially affected by nonsafety-related components), the team determined that the applicant accurately identified and categorized the structural boundaries within the program documents. The team walked down areas in the turbine and auxiliary buildings and independently sampled the seismic boundary determinations identified on the isometric drawings. The team determined that the applicant appropriately identified the seismic design boundaries and correctly included the applicable components within the license renewal scope. Further, the team confirmed the accuracy of statements in applicant responses to requests for additional information related to potential safety-related equipment in the turbine building. The team determined that the applicant accurately categorized the plant configuration for potential structural interactions within the license renewal documents.

The team concluded that the applicant had implemented an acceptable method of scoping nonsafety-related SSCs and that this method resulted in appropriate scoping determinations for the samples reviewed.

b.2 Evaluation of New Aging Management Programs

The team reviewed 7 of 9 new aging management programs to determine whether the applicant had established appropriate actions or had actions planned to manage the effects of aging. The team reviewed site-specific operating experience to determine whether there were any aging effects for the systems and components within the scope of these programs that had not been identified when considering applicable industry operating experience.

Because the applicant had developed draft implementing procedures, the team assessed the effectiveness of the planned implementation of these programs. Some of the new programs were one-time inspection programs that will involve testing of

applicable components prior to the period of extended operation to confirm the absence of significant aging effects. If the results determine aging effects have occurred, the applicant will need to establish actions to manage the identified effects.

The team selected in-scope SSCs to assess how the applicant maintained plant equipment, to visually observe examples of nonsafety-related equipment determined to be within the scope of license renewal because of the proximity to safety-related equipment, and to evaluate the potential for failure as a result of aging effects.

.1 B2.1.15 Aboveground Metallic Tanks (XI.M29)

The applicant established this new aging management program, consistent with NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 2 (GALL Report), to manage loss of material for the external surfaces, including the bottom surfaces, of aboveground, outdoor metallic tanks. Additionally, this program was credited with managing cracking, blistering, and change in color of the acrylic/urethane insulation on the condensate storage tank. The four tanks within the scope of the program included the condensate storage, the refueling water storage, and the two fire water storage tanks. For the carbon steel fire water tanks, the program relied on the application of coatings and a tank bottom edge grout as corrosion preventive measures. The applicant had cathodically protected the fire water tanks to prevent corrosion on exposed bare metal surfaces of the tanks. For the stainless steel condensate storage and refueling water tanks, the applicant used jacketed insulation with overlapping seams that prevent moisture intrusion or spray-on polyurethane foam insulation that adheres to tank surfaces as a corrosion preventive measure.

For the four tanks, the team reviewed license renewal documents, the aging management program evaluation report, corrective action documents, technical specifications and drawings, procedures, and current external inspection results. The team verified that the applicant planned to perform ultrasonic testing (volumetric) to determine thickness measurements of tank bottoms whenever the tanks are drained and at least once within five years of entering the period of extended operation for the condensate storage and refueling water storage tanks. The volumetric inspection should provide direct evidence of any loss of material that has occurred or that could result in a loss of function.

The applicant took an exception to the requirement in the GALL Report to perform ultrasonic testing (volumetric) to determine thickness measurements of tank bottoms whenever the tanks are drained and at least once within five years of entering the period of extended operation. At the time of the inspection, the applicant performed visual inspections on an alternating refueling outage frequency for each fire water storage tank. The applicant planned to perform ultrasonic thickness measurements of the bottom of each fire water storage tank within five years of entering the period of extended operation and a 10-year frequency from the initial inspection. The team determined that performing ultrasonic thickness measurements every ten years supplemented by visual inspections would provide an effective means to manage loss of material on the fire water storage tank bottoms.

The applicant established procedures to visually inspect for aging of the tank external surface paint or damage of the insulation covering. The applicant identified requirements to remove a representative sample of the stainless steel tank insulation to inspect the metal surface. Whenever the applicant finds damaged insulation that could permit water ingress, the applicant established requirements to remove the damaged insulation and perform inspections. The applicant will inspect the surfaces of the carbon steel fire water tanks for signs of coating degradation, such as flaking, cracking, and peeling, to manage loss of material of the metallic surfaces.

The team confirmed from review of the tank inspection results that the applicant had previously identified light corrosion and implemented corrective actions to clean and recoat the fire water storage tanks. The team concluded that the surface coating of corrosion had no impact on the structural integrity of the tank.

The team walked down each of the tanks and discussed the condition of the tanks with program and system engineers. During the walk downs, the team identified that eight of the ten accessible condensate storage tank anchor bolts had insufficient thread engagement on their nuts. The applicant confirmed that the bolting manual specified that these nonsafety-related anchor bolts were to have the studs flush with their nuts. The applicant documented this performance deficiency in Callaway Action Request 2012-06831. The applicant performed a prompt operability assessment and determined that all 56 anchor bolts could have the minimal amount of thread engagement identified during the walk down and still remain functional.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described with the exception, the applicant developed guidance to appropriately identify and address aging effects during the period of extended operation.

.2 B2.1.18 One-Time Inspection (XI.M32)

This was a new aging management program, consistent with the GALL Report, to manage loss of material, cracking, and reduction of heat transfer internal to plant systems. The applicant planned to conduct these one-time inspections to identify and characterize the material conditions in representative low-flow and stagnant areas of plant piping and components. The systems and components reviewed were evaluated by the Water Chemistry, the Fuel Oil Monitoring, and the Oil Analysis programs. The planned visual and volumetric inspections should provide direct evidence of the presence and extent of loss of material resulting from all types of corrosion in treated liquid environments if it had occurred. The inspection should also provide direct evidence of any cracking as a result of stress corrosion cracking.

The team reviewed the license renewal application, aging management program evaluation report, plant operating experience, and a draft program procedure. The team discussed the program evaluations and planned activities with the responsible license renewal and plant staff. The team reviewed a sampling plan based on the material/environment combinations at Callaway, which estimated that approximately 200 inspections would be performed. The team confirmed that appropriately qualified

personnel would perform the nondestructive evaluations by using procedures and processes that met regulatory requirements.

The elements of the program included: (1) determining the sample size based on 20 percent of the components in each material-environment-aging effect group up to a maximum of 25 components, (2) identifying inspection locations in each material-environment group based on the potential for the aging effect to occur, (3) identifying the most effective examination technique, including acceptance criteria, to be used, and (4) evaluating the aging effects and the need for follow-up examinations using the corrective action program.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and confirm whether aging effects had occurred prior to the period of extended operation.

.3 B2.1.19 Selective Leaching (XI.M33)

This was a new aging management program, consistent with the GALL Report with exception, credited with managing loss of material resulting from selective leaching. The selective leaching could occur in components made from gray cast iron and copper alloy with greater than 15 percent zinc or greater than 8 percent aluminum exposed to treated water, raw water, waste water, or groundwater environments. There were no copper alloy components with greater than eight percent aluminum within the scope of license renewal. The program will include a one-time visual inspection supplemented by mechanical testing methods of susceptible components to determine whether loss of material resulted from selective leaching. Inspections will commence within the five-year period prior to entering the period of extended operation. The following systems contained components susceptible to selective leaching: fire protection; chemical and volume control; service water; compressed air; essential service water; plant heating; fuel building heating, ventilation and air conditioning; auxiliary building heating, ventilation and air conditioning; containment purge; and oily waste.

The team reviewed the license renewal application, the draft NRC aging management program audit results, aging management program evaluation report, plant operating experience, and draft implementing procedures. The team discussed the program evaluations and planned activities with the responsible staff. If selective leaching is detected, deficiencies will be corrected in order to ensure that the systems will perform their intended function. Follow-up evaluations would include confirmation through metallurgical evaluation and expansion of the sample size.

The team noted that the applicant identified an exception to allow opportunistic inspections of excavated buried gray cast iron fire protection valves and will send at least one for laboratory metallurgical examination from each batch with a minimum of two tests within the five years prior to entering the period of extended operation. The team determined that opportunistic inspections with a minimum of two valves being submitted for metallurgical examination would provide adequate insight into whether selective leaching was occurring in the soil environment. The metallurgical testing

provided more accurate indication whether selective leaching occurred than simply scraping and chipping the metal.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in components and systems that have metal alloys subject to this mechanism. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.4 B2.1.21 External Surfaces Monitoring of Mechanical Components (XI.M36)

This was a new aging management program, consistent with the GALL Report, credited with managing: (1) loss of material and cracking for metallic components; (2) cracking and changes in material properties for cement board (splash panel) components; and (3) loss of material, cracking, hardening and loss of strength for polymeric components. The applicant planned to conduct periodic engineering walk downs of external surfaces to: (1) identify loss of material and leakage; (2) include manual or physical manipulation of polymeric material to verify the absence of cracking, hardening, or loss of strength; and (3) inspect stainless steel components for cracking when exposed to an air environment containing halides.

The team reviewed license renewal documents, the aging management program evaluation report, and implementing procedures. The team interviewed system engineers and license renewal personnel and performed system walk downs to evaluate the external condition of plant systems.

The applicant planned to conduct visual inspection of metallic components for (1) corrosion, corrosion stains, material wastage, evidence of insulation damage or wetting; wear, flaking or oxide-coated surfaces; and leakage onto external surfaces and (2) coating degradation (e.g. cracking, flaking, and blistering) as an indicator of possible underlying degradation of the component. The applicant planned to inspect polymeric materials for dimensional change, exposure of internal reinforcement, and hardening/loss of strength as evidenced by loss of suppleness during manual or physical manipulation. The applicant planned to evaluate stainless steel components for cracking when exposed to an aggressive air environment containing halides. The applicant planned inspection of cement board components for loss of material or cracking that results in a loss of the component's intended function.

The applicant planned to determine the inspection intervals for inaccessible components through an evaluation of aging effects and their impact on intended functions observed during external surface inspections on accessible components with the same material and environment combination. The team verified that the applicant evaluated degradation in accordance with their corrective action program.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described, the applicant

provided guidance to appropriately identify and address aging effects during the period of extended operation.

.5 B2.1.25 Buried and Underground Piping and Tanks (XI.M41)

This was a new aging management program, consistent with the GALL Report, credited with managing the aging of buried and underground steel, stainless steel, and high density polyethylene components for loss of material, cracking, and blistering. The program includes prevention, mitigation, and inspection activities, including coatings, quality of backfill, cathodic protection, periodic inspections, and monitoring of the fire protection jockey pump activity. This program included the high pressure coolant injection, fire protection, emergency diesel fuel oil storage and transfer, essential service water, service water, and auxiliary feedwater systems.

The team reviewed the aging management program evaluation report, implementing procedures and procedure markups, and corrective action documents. The team also reviewed plant specific operating experience, cathodic protection system evaluation reports, and excavation results. The team interviewed engineers responsible for the buried pipe and coatings programs and the cathodic protection system.

The team determined that the three exceptions identified by the applicant agreed with changes identified in LR-ISG-2011-03, “Changes to the Generic Aging Lessons Learned (GALL) Report Revision 2 Aging Management Program (AMP) XI.M41, ‘Buried and Underground Piping and Tanks’.” These exceptions addressed that there were no coatings on the high density polyethylene piping, external volumetric examinations would not be utilized to detect internal corrosion of underground piping because other aging management programs evaluate aging effects for each of the in-scope systems, and evaluations would be used to expand inspections once a deficient condition was identified rather than a pure doubling of the sample size.

The team reviewed the buried pipe program against the recommendations in LR-ISG-2011-03 and determined that the proposed program was consistent except for a deficiency related to cathodic protection. The team determined that the existing cathodic protection system did not provide sufficient protection of all buried in-scope piping. The applicant stated that they would either upgrade the cathodic protection system to meet the recommended availability and effectiveness requirements or perform the increased inspections required for a plant with an ineffective cathodic protection system. The team reviewed the applicant’s response to Request for Additional Information Item B2.1.25-6a in Letter ULNRC-05923, “Responses to Request for Additional Information Set #13 & #14 and Amendment 14 to the Callaway License Renewal Application,” dated October 31, 2012. The team found this response satisfactory since the applicant committed to meet the conditions in LR-ISG-2011-03 by establishing a cathodic protection system that met the availability and effectiveness criteria or by completing the specified number of inspections in each ten-year interval.

The team noted that the Close-Interval Survey and Direct Current Voltage Gradient Survey Buried Fire Water Protection Piping report, dated May 7, 2008, recommended that for locations not meeting -850 mV criterion, the station should determine whether the alternative 100 mV potential shift criterion would demonstrate acceptable cathodic

protection. The team also noted that LR-ISG-2011-03, Table 6a, "Cathodic Protection Acceptance Criteria," footnote 2, states, "[w]hen the 100 mV criterion is utilized in lieu of the -850 mV CSE criterion for steel piping, or where copper or aluminum components are protected, applicants must explain in the application why the effects of mixed potentials are minimal and why the most anodic metal in the system is adequately protected." During discussions, the applicant stated that they would only use the 100mV criterion for cast iron fire protection components because in the galvanic series, cast iron has sufficient margin in its native value (i.e., -500 mV) to allow utilization of an increase of -100 mV. The team reviewed the applicant's response to a request for additional I information for Item B2.1.25-5a. From review of the response, the team determined that the applicant concluded that they had no electrically isolated piping sections and no data to quantify that the effects of mixed potentials would be minimal. The team concluded that the applicant would only use the -850 mV criteria and found the applicant's response satisfactory.

From review of several opportunistic buried piping inspection results, the team determined that the applicant had appropriately evaluated and documented inspection findings with one exception. The team determined that the buried pipe engineer and coatings engineer were appropriately involved in each inspection. The applicant documented the results, including location, length of piping inspected, excavation site details, photographs, description of nonconforming conditions, ultrasonic inspections results, and coating repair dispositions. In one instance, the applicant had not documented a condition adverse to quality (i.e., pieces of wood found in the backfill adjacent to stainless steel piping). When questioned, the applicant agreed that the wood was, in fact, foreign material in the backfill. The applicant documented this nonconforming condition in Callaway Action Request 2012-06525.

In addition, for a buried pipe evaluation of piping considered not in-scope, the team reviewed photographs that appeared to indicate pipe wrapping that was not completely adhered. During discussions, the applicant stated that had the buried piping been safety-related or in-scope, it is likely that they would have replaced the wrapping. The applicant added a corrective action to Callaway Action Request 2012-06868 that specified the coatings engineer will perform the coatings evaluation when required.

The team reviewed several soil sample results. With the exception of one instance, the correct parameters were analyzed. During the excavation of stainless steel piping the buried piping engineer failed to preserve the samples in a manner appropriate to allow testing for bacteria content. When questioned by the team in relation to how the knowledge should be captured, the applicant initiated actions and revised Form CA2904, "As Found Buried Piping Inspection Form," to describe packing samples in ice to keep them cool during shipping.

The team reviewed Procedure MTT-ZZ-01003, "Coatings and Wrapping of Piping," Revision 6, for new and repaired coating locations. The team noted that Sections 4.10 and 4.12 stated that Holiday testing (continuity testing) "may" be conducted. The team informed the applicant that performing Holiday testing at lower voltages would confirm the correct application of coatings without damaging the coating. The applicant documented this procedure gap in Callaway Action Request 2012-06616 (i.e., enhance the procedure to conduct Holiday testing on new shop and field applied thin coatings

where Holiday testing is accessible). The team determined that Section 4.7 lists a 10°F lower limit for use of the procedure, which agreed with the information provided by the vendor. The team identified a potential conflict between Section 6.5.3 that directs the craft to apply one coat of primer and Section 5.6, which states that primer is used, if required. The team determined that the vendor recommended that a primer be used anytime the temperature is below 32°F. Because of the potential for error, the applicant added the need to correct this apparent conflict in application of primer to piping in Callaway Action Request 2012-06616.

The team concluded that the applicant had performed appropriate evaluations of the piping conditions and considered pertinent industry experience and plant operating history to determine the effects of aging on buried piping and tanks. The team concluded that, if implemented as described including the exceptions and changes described in the above paragraphs, the applicant developed guidance to appropriately identify and address aging effects during the period of extended operation.

.6 B2.1.37 Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (XI.E6)

This was a new aging management program, consistent with the GALL Report, credited with managing the increased resistance of connections to ensure that either aging of metallic cable connections was not occurring and/or that the existing preventive maintenance program was effective. This one-time test would confirm the absence of age-related degradation of cable connections resulting from thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, or oxidation of non-environmentally qualified electrical cable connections. The applicant planned to evaluate a representative sample of electrical connections for in-scope components based upon the service application, circuit loading, and environment.

The representative sample will consist of 20 percent of the population of each type of connection, with a maximum of 25 connections, which will be tested at least once prior to the period of extended operation. The applicant planned to select the samples based upon voltage level (medium and low voltage), circuit loading (high loading), connection type, and location (high temperature, high humidity, vibration, etc.). The technical basis for the sample selection will be documented. The applicant planned to establish acceptance criteria that will be based on the temperature rise above the ambient temperatures or the baseline temperature data from the same type of connections being tested.

The team reviewed license renewal documents, the aging management program evaluation report, corrective action documents, industry and plant specific operating experience, and thermography results. The team walked down selected equipment while the applicant took thermography readings. The team determined that the applicant routinely performed infrared thermography as part of the preventive maintenance program for non-environmentally qualified electrical connections. In reviewing the operating experience, the team confirmed that the preventive maintenance program identified cable connections with thermal anomalies. These anomalies were evaluated and successfully repaired using the corrective action program and work process, respectively.

The team concluded that the applicant performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging. The team concluded that, if implemented as described, including establishing an appropriate sample plan, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.7 B2.1.39 Metal-Enclosed Bus (XI.E4)

This was a new aging management program, consistent with the GALL Report, credited with managing the aging affects associated with degradation of non-segregated metal-enclosed bus ducts, including bolted bus bar connections, insulators, supports, and elastomers. The program included 4.16 kV non-segregated buses that provided power to the circulating and service water pumps. The visual inspections will be performed at least once every five years, with the first inspections to be completed prior to the period of extended operation.

The team reviewed license renewal documents, the aging management program evaluation report, implementing procedures, preventive maintenance tasks, and industry operating experience. The team walked down the in-scope non-segregated bus ducts and interviewed the license renewal project personnel and the responsible engineers.

The applicant planned to inspect: (1) internal surfaces of bus enclosure assemblies for cracks, corrosion, foreign debris, excessive dust buildup, and evidence of moisture intrusion; (2) bus insulation for signs of reduced resistance resulting from thermal degradation, radiation induced oxidation, moisture/debris intrusion, or ohmic heating, as indicated by embrittlement, cracking, chipping, melting, discoloration, or swelling; (3) internal bus insulating supports for structural integrity and signs of cracks; (4) external portions of the bus duct, including gaskets and sealants, for surface cracking, crazing, scuffing, dimensional change (e.g., "ballooning" and "necking"), shrinkage, discoloration, hardening and loss of strength caused by elastomer degradation; and (5) external surfaces for loss of material resulting from general corrosion, pitting, and crevice corrosion.

The applicant planned to inspect visually a sample (20 percent of the population with a maximum of 25) of the accessible bolted connections. During the walk down and review, the team identified that the planned preventive maintenance activity and the plant drawings for the non-segregated bus duct did not identify the presence of a gasket between each bus duct joint. Further, the applicant did not discuss evaluating the gasket material in the aging management program evaluation report. From review of the vendor manual for the non-segregated bus duct, the team determined that the bus duct joints required installation of a gasket. The applicant initiated Callaway Action Request 201206807 to resolve the discrepancy between the vendor and licensee documents. The applicant planned to inspect the non-segregated bus duct in December 2012 to establish the presence of the gaskets. If the applicant identifies no gaskets are present, the applicant will install the gaskets.

The team determined that the aging management program evaluation report did not list nor discuss managing aging effects of flexible links from the bus duct to the transformers

and to the switchgear. During walk downs and review of design information, the applicant confirmed the presence of flexible links and identified the need to monitor these connections for aging effects. The applicant initiated Procedure Change Tracking Form CW192 to include the flexible links in the bus duct preventive maintenance program and revise the aging management program evaluation report to include the inspection of flexible links for the bus duct connections.

The team determined that the applicant cleaned and visually inspected the metal-enclosed bus ducts during outages in accordance with existing preventive maintenance tasks. The applicant found no evidence of aging effects during past inspections of the metal-enclosed bus ducts and has initiated a preventive maintenance procedure to monitor and correct any aging effects in the future.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent plant and industry experience to determine the effects of aging on the metal enclosed non-segregated bus ducts. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

b.3 Evaluation of Existing Aging Management Programs

The team sampled 16 of the 30 existing aging management programs to determine whether the applicant had taken or planned to take appropriate actions to manage the effects of aging, as specified in the GALL Report.

The team reviewed site-specific operating experience to determine whether there were any aging effects for the systems and components within the scope of these programs that had not been identified from the applicant's review of industry operating experience.

The team evaluated whether the applicant implemented or planned to implement appropriate actions to manage the effects of aging. These programs have established procedures, records of past corrective actions, and previous operating experience related to applicable components. Further, some programs required the applicant to implement enhancements (i.e., new program aspects that will be implemented prior to the period of extended operation) to ensure consistency with the GALL Report.

The team walked down selected in-scope SSCs to assess how the applicant maintained plant equipment under the current operating license, to visually observe examples of nonsafety-related equipment determined to be in-scope because of the proximity to safety-related equipment, and to assess the potential for failure as a result of aging effects.

.1 B2.1.2 Water Chemistry (XI.M2)

This was an existing program, consistent with the GALL Report, credited with managing loss of material, cracking, reduction of heat transfer, and wall thinning in components exposed to a treated water environment. This mitigation program relied on monitoring and control of primary and secondary water chemistry to keep peak levels of various

contaminants below system-specific limits based on Electric Power Research Institute primary and secondary water chemistry guidelines.

The applicant established their primary water chemistry program consistent with Electric Power Research Institute 1014986, "PWR Primary Water Chemistry Guidelines," Revision 6, Volumes 1 and 2. The applicant established their secondary water chemistry program consistent with Electric Power Research Institute 1016555, "PWR Secondary Water Chemistry Guidelines," Revision 7. The applicant planned to supplement this program with the One-Time Inspection Program, which will utilize inspections or nondestructive evaluations of representative samples to verify the effectiveness of the Water Chemistry program in stagnant or low-flow areas.

The team reviewed license renewal documents, the aging management program evaluation report, implementing procedures, audits and self-assessments, program health reports, corrective action documents, the site strategic chemistry plan, and primary water chemistry trend data for the last five years. The team interviewed the program owners and license renewal project personnel. The team verified that the applicant maintained the primary and secondary water chemistry programs within the guidelines of Electric Power Research Institute 1014986 and Electric Power Research Institute 1016555, respectively.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation if the program is implemented as described.

.2 B2.1.3 Reactor Head Closure Stud Bolting (XI.M3)

This was an existing program, consistent with the GALL Report, credited with managing cracking and loss of material of the reactor head closure studs. The program included periodic visual and volumetric examinations of reactor vessel flange stud hole threads, reactor head closure studs, nuts, and washers and performed visual inspection of the reactor vessel flange during primary system leakage tests. The program conducted inspections in accordance with American Society of Mechanical Engineer Section XI, Subsection IWB, Table IWB 2500-1, "Examination Categories, Examination Category B-G-1, Pressure Retaining Bolting Greater Than 2 in. (50 mm) in Diameter." The program included preventive measures as recommended in Regulatory Guide 1.65, "Materials and Inspections for Reactor Vessel Closure Studs," to use stable lubricants and to use bolting material for closure studs that had an actual yield strength less than 150 kilo-pounds per square inch.

The team reviewed the aging management program evaluation report, implementing procedures, corrective action documents, and operating experience. The team reviewed certified material test reports, engineering evaluations related to a stud protection sleeve, stress calculations, and nondestructive evaluations of the reactor vessel studs. The team verified that the applicant did not use lubricants containing molybdates and verified that the material had yield strength less than 150 kilo-pounds per square inch.

From review of operating experience and discussions with NRC headquarters personnel, the team determined that the applicant had several reactor vessel stud holes that had damaged threads removed. The team determined that Stud Holes 7, 4, 5, 53, 2, and 9 had 4, 6, 7.9, 9, 13.1 and 15.1 threads removed, respectively. Four other stud holes had one or fewer threads removed. The applicant attributed the damage to foreign material that had dropped into the stud holes because of poor foreign material exclusion controls during the several outages beginning with the first refueling outage. Also, Stud 18 became stuck in the vessel flange 2.625 inches from being fully inserted during Refueling Outage 8. The team reviewed the calculations that demonstrated that sufficient threads were engaged to allow the reactor vessel to be tensioned without overstressing the threads on the stud or in the stud holes. The team concluded that the threads were not overstressed provided that the threads that were engaged did not have any damage. During discussions, the applicant described that they had no evidence to indicate the presence of additional thread damage.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging for the reactor head closure studs and other components. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and confirm whether aging effects had occurred prior to and during the period of extended operation.

.3 B2.1.7 Flow-Accelerated Corrosion (XI.M17)

This was an existing program, consistent with the GALL Report, credited with managing aging effects of wall thinning on the internal surfaces of carbon or low alloy steel piping, elbows, reducers, expanders, and valve bodies that contain high energy fluids (both single phase and two phases). This program managed aging effects by performing analyses to determine critical locations, conducting baseline and follow-up inspections at these critical locations, and taking corrective actions as necessary. The applicant used ultrasonic, visual, or other approved testing techniques capable of detecting wall thinning. The program implemented the guidelines in Electric Power Research Institute NSAC-202L, “Recommendations for an Effective Flow-Accelerated Corrosion Program,” Revision 3. Where applicable, the analyses to determine critical locations were performed using CHECWORKS™, an industry standard predictive code that used the implementation guidance of NSAC-202L.

The team reviewed license renewal documents, the aging management program evaluation report, implementing procedures, calculations, system susceptibility evaluation drawings, outage reports, program health reports, and corrective action documents. The team interviewed the program owner and license renewal project personnel. The team reviewed the flow-accelerated corrosion database for a selected sample of monitoring points.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and confirm whether aging effects had occurred prior to and during the period of extended operation.

.4 B2.1.10 Open-Cycle Cooling Water System (XI.M20)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing the aging effects related to loss of material, reduction of heat transfer, cracking, blistering, change in color, and hardening and loss of strength for components exposed to raw water. The applicant managed the aging effects through periodic inspection and surveillance tests combined with chemistry controls and cleaning to minimize fouling, loss of material, and corrosion. The program specified performance testing of the component cooling water heat exchangers, visual inspections of the other safety-related heat exchangers, and periodic inspections to monitor aging effects on other structures, systems and components. The existing program implemented the recommendations of Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," dated July 18, 1989.

This program monitored aging effects in components serviced by the essential service water system and heat exchangers and other components in other systems serviced by the essential service water system. The safety-related heat exchangers cooled by essential service water included the: component cooling water heat exchangers, containment coolers, diesel generator heat exchangers, safety injection pump room coolers, spent fuel pool pump room coolers, residual heat removal pump room coolers, containment spray pump room coolers, centrifugal charging pump room coolers, component cooling water pump room coolers, auxiliary feedwater pump room coolers, control room air conditioning condensers, Class 1E switchgear air-conditioning condensers, and electrical penetration room coolers.

The team reviewed the aging management program evaluation report, implementing procedures, and relevant corrective action documents. The team reviewed service water and ultimate heat sink chemistry data, component cooling water heat exchanger test results, essential service water flow balance test results, nondestructive testing results, room cooler and air conditioning condenser heat exchanger inspection results, tube plugging limits and tube plug maps, and corrosion coupon trend data. In addition, the team interviewed the program manager and walked down accessible portions of the essential service water system, the ultimate heat sink spray ponds, and the essential service water pump and mechanical cooling tower structures. The team determined from the data and trend graphs that the applicant monitored and maintained proper controls to minimize fouling. The team determined that the applicant maintained effective controls of the design and heat transfer capability in the heat exchangers.

In response to site-specific operating experience, the applicant had implemented corrective actions, which resulted in improving the material condition of the essential service water system. Specifically, the applicant had:

- Replaced the containment coolers that had been blocked by debris with a different design that allowed for tube cleaning,

- Replaced all 4-inch diameter and smaller carbon steel piping and components with stainless steel to correct low flow and leakage issues,

- Replaced the admiralty brass emergency diesel generator jacket water, lube oil cooler, and intercoolers with stainless steel to correct for loss of material in the tubes,

- Replaced 5 of 16 safety-related admiralty brass room coolers with stainless steel room coolers because aging issues caused poor performance. The applicant has a long term plan to replace the remaining 11 room coolers during upcoming outages with the final two room coolers replaced by 2022, and

- Replaced the buried essential service water piping with high-density polyethylene (HDPE) piping, as a result of significant leakage resulting from microbiological induced corrosion.

The team reviewed additional site specific operating experience that identified erosion from cavitation had occurred at the raised face flanges going into the safety-related room coolers. Because this was an identified aging effect caused by erosion, the team evaluated the controls that existed to evaluate additional erosion of the carbon steel flanges. The team determined that the coolers were scheduled to be replaced over the next ten years. Further, the team determined that the heat exchanger inspection form required taking measurements of the flange face. The team concluded that the applicant had implemented sufficient controls that will continue to detect erosion prior to leakage through the flange.

The applicant specified that procedures will be enhanced to include polymeric material inspection requirements, parameters monitored, and acceptance criteria. The applicant specified this examination would be consistent with the examinations performed when inspecting polymeric materials in the Internal Surfaces in Miscellaneous Piping and Ducting Components program. The team verified that the proposed changes to Procedure EDP-ZZ-01121, "Raw Water Systems Predictive Performance Program," Revision 14, provided appropriate guidance to evaluate polymeric material.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in components cooled by open-cycle cooling water. The team concluded that, if implemented as described with the enhancement, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.5 B2.1.11 Closed Treated Water Systems (XI.M21A)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing loss of material, cracking, and reduction of heat transfer for components in the closed-cycle cooling water systems. The program included monitoring and control of corrosion inhibitor and chemistry parameters consistent with the guidance of Electric Power Research Institute TR-107396, "Closed Cooling Water Chemistry Guideline," Revision 1. Also, the applicant planned to conduct periodic inspections to determine the presence or extent of corrosion, fouling, and/or cracking. The program uses four chemistry control programs: molybdate with tolyltriazole (component cooling and chilled water systems), ethylene glycol (plant heating steam),

nitrite control with tolyltriazole (diesel generator jacket water), or diesel coolant additive and ethylene glycol (fire protection diesel jacket water). The systems included in this program were diesel generator jacket water, component cooling water, chilled water, and plant heating.

The team reviewed implementing procedures, corrosion rate data, and chemistry data for the monitored systems. The team walked down the piping and components in the closed treated water systems and interviewed the system engineer. The team determined from the data and trend graphs reviewed that the applicant appropriately monitored for heat transfer and loss of material in the in-scope systems. The team verified that the heat exchangers had very few plugged tubes and determined that the applicant had replaced the admiralty brass heat exchangers for the safety-related diesel generator with stainless steel heat exchangers.

The applicant planned to enhance this program to include visual inspections of component surfaces. The visual inspections will: (1) include representative samples of each combination of material and water treatment program at least every 10 years or opportunistically when consistent with sample requirements; (2) be conducted and evaluated consistent with American Society of Mechanical Engineers Code inspections, industry standards, or a plant-specific inspection procedure by personnel qualified to detect aging; (3) include additional examinations if adverse conditions were found; and (4) determine the extent of cracking, loss of material and fouling, which would serve as a leading indicator of the condition of the interior of piping components otherwise inaccessible for visual inspection.

The team compared the draft inspection procedure to the aging management program evaluation report that specified visual inspection requirements. The team identified several statements between the documents that did not agree. Following discussions with the applicant regarding these discrepancies, the applicant reviewed the comments and made changes to both the draft inspection procedure and the aging management program evaluation report. The team verified that the changes made in each document corrected the identified discrepancies. Further, the applicant tracked these changes under Action Item RI202. The applicant documented the changes in Enclosure 3, “Regional Inspection Item Updates,” in Letter ULNRC-05923.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described with the enhancement, the applicant provided guidance to appropriately identify and address whether aging effects had occurred during the period of extended operation.

.6 B2.1.13 Fire Protection (XI.M26)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing loss of material of fire rated doors, fire dampers, and the halon system; concrete cracking, spalling, and loss of material of fire barrier walls, ceilings, and floors; and increased hardness, shrinkage, and loss of strength of fire barrier

penetration seals. This program was comprised of tests and inspections that followed the applicable National Fire Protection Association recommendations.

The team reviewed license renewal documents, the aging management program evaluation report, program enhancements, implementing procedures (including the proposed changes), program health reports, and corrective actions documents. The team interviewed fire protection personnel and license renewal project personnel. The team inspected various fire rated doors, fire barriers, fire dampers, fire penetration seals, and the halon system to observe the physical condition of the fire protection features and to assess the effectiveness of the existing program.

The fire protection program managed the effects of aging through visual inspections of fire rated doors, fire barriers (including walls, coatings, and wraps), fire dampers, fire penetration seals, and the halon system. The applicant performed visual inspections and functional tests for the fire doors at least once every 18 months. The applicant performed visual inspections of the fire barriers within the scope of license renewal every 18 months. The applicant visually inspected at least 10 percent of the fire dampers and each type of penetration seal every 18 months.

The applicant planned to enhance the program to require visual inspections every six months of the halon system to inspect for corrosion. Currently, the applicant conducted a functional test of the halon system every 18 months, in accordance with the approved fire protection program. The team identified no concerns with this enhancement.

The team identified two concerns with the fire protection program. The first concern involved a difference between the guidance in the GALL Report and the aging management program evaluation report associated with the inspection of fire penetration seals. The GALL Report stated that any sign of degradation detected in the inspection sample should lead to an increase in inspection scope. The applicant's aging management program provided a conditional statement that allowed an engineering evaluation prior to an increase in inspection scope. If the engineering evaluation concluded that the penetration seal was still capable of performing its intended function, then the inspection scope did not need to be increased. The applicant changed the aging management program evaluation report to make it fully consistent with the GALL Report. Further, the applicant tracked these changes under Action Item RI088. The applicant documented the changes in Letter ULNRC-05923, Enclosure 3.

The second concern involved the procedure for inspecting fire barriers. During the system walk down, the team noticed that several portions of the Darmat fire barrier were not easily accessible to inspectors standing on the ground, and ladders or scaffolding may be necessary for inspectors to observe the effects of aging on the fire barrier. The team discussed this issue with fire protection personnel and determined that the program inspected accessible portions of the fire barrier as prescribed by the approved fire protection program. The applicant documented the need to revise the fire procedure in Callaway Action Request 2012-07533, which documented the need to inspect the entire Darmat fire barrier for the presence of aging effects.

The team concluded that, overall, the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine

the effects of aging in the affected systems. The team concluded that, if implemented as described with the enhancement and changes, the applicant provided guidance to appropriately identify and confirm whether aging effects had occurred prior to the period of extended operation.

.7 B2.1.14 Fire Water System (XI.M27)

This program was an existing program, consistent with the GALL Report after enhancement, credited with managing loss of material for water-based fire protection systems consisting of aboveground, buried, and underground: piping, fittings, valves, fire pump casings, sprinklers, nozzles, hydrants, hose stations, standpipes, and water storage tanks. This program used periodic fire main and hydrant inspections and flushing, sprinkler inspections, function tests, and flow tests in accordance with the National Fire Protection Association standards to ensure the systems remained capable of performing their intended function. The applicant maintained and monitored the fire protection system at the required normal operating pressure such that a loss of system pressure would be immediately detected and corrective actions initiated.

The team reviewed license renewal documents, the aging management program evaluation report, program enhancements, program exceptions, implementing procedures and procedure markups, program health reports, and corrective action documents. The team interviewed fire protection personnel and license renewal project personnel. The team walked down portions of the fire water system, including the fire pumps and associated piping.

The applicant identified six enhancements needed to ensure this program was consistent with the GALL Report. The applicant planned to enhance the implementing procedures to: (1) include non-intrusive pipe wall thickness examinations on fire water piping or, as an alternative, perform internal inspections on accessible exposed portions of fire water piping during plant maintenance activities; (2) replace sprinkler heads prior to 50 years in service or have a recognized testing laboratory field-service test a representative sample in accordance with National Fire Protection Association 25, “Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems”; (3) review and evaluate trends in flow parameters recorded during flow tests; (4) perform annual hydrant flow testing in accordance with National Fire Protection Association 25; (5) perform annual hydrostatic testing of the fire brigade hoses; and (6) recoat the internal surfaces of the fire water storage tanks. The team reviewed the procedure markups and confirmed that the applicant had included each of the enhancements in the procedures.

The applicant took two exceptions to the GALL Report. First, the applicant performed power block hose station gasket inspections at least every 18 months as specified in the approved fire protection program, rather than annually as specified in the GALL Report and National Fire Protection Association 25. Second, the GALL Report required annual testing of fire hydrant hoses. However, the applicant hydrostatically tested fire hoses at interior fire hose stations five years from installation and every three years thereafter, as specified in the approved fire protection program. The team identified no concerns with these exceptions because this meets the industry standard surveillance frequency and meets the requirements in the approved fire protection program.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described with the enhancements and exceptions, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.8 B2.1.16 Fuel Oil Chemistry (XI.M30)

This was an existing program, consistent with the GALL Report after enhancement, credited for managing the loss of material on the internal surface of diesel fuel oil storage tanks through monitoring and control of fuel oil quality. The fuel oil tanks included the emergency fuel oil storage and fuel oil day tanks for the emergency diesel generators, the diesel-driven fire pumps fuel oil day tanks and the security system diesel generator fuel oil day tank.

The team reviewed the aging management program evaluation report, implementing procedures and procedure mark-ups, and relevant corrective action documents. The team interviewed plant personnel and walked down accessible portions of the diesel generators, diesel generator day tanks, diesel-driven fire pump day tanks, and the security system diesel day tank. From a review of plant operating experience, the team determined that no additional aging effects had occurred that would require modifying this aging management program. The team noted that the applicant utilizes other onsite fuel oil storage tanks as a holding tank for fuel used to refill the diesel-driven fire pump and security system diesel tanks.

The applicant identified numerous enhancements to procedures to ensure consistency with the GALL Report. Specifically, the applicant developed draft procedures that included requirements to:

- Periodically drain water from the emergency fuel oil storage tank, the two diesel fire pump fuel oil day tanks, and the security diesel generator fuel oil day tank;
- Add biocide to the two diesel fire pump fuel oil day tanks and the security diesel generator fuel oil day tank, if required from sample results;
- Include draining, cleaning, and inspection of the emergency fuel oil day tanks;
- Sample periodically for water and sediment in the emergency fuel oil day tanks and security diesel generator fuel oil day tank;
- Evaluate particulate concentrations during the periodic sampling of the emergency fuel oil storage tanks, the two diesel fire pump fuel oil day tanks, and the security diesel generator fuel oil day tank;
- Determine microbial activity concentrations during the periodic sampling of the emergency fuel oil storage tanks, emergency fuel oil day tanks, two diesel fire pump fuel oil day tanks, and security diesel generator fuel oil day tank;

- Sample new fuel oil for water and sediment prior to introduction into the security diesel generator fuel oil day tank and diesel fire pump fuel oil day tanks;

- Perform periodic volumetric examination of the emergency fuel oil storage tanks and day tanks if evidence of tank degradation is observed during the visual inspection;

- Perform periodic volumetric examinations on the external surface of the diesel fire pump fuel oil day tanks and security diesel generator fuel oil day;

- Trend at least quarterly the water, biological activity, and particulate concentrations for the emergency fuel oil day tanks, diesel fire pump fuel oil day tanks, and security diesel generator fuel oil day tank; and

- Remove immediately accumulated water when discovered in the emergency fuel oil day tanks, diesel fire pump fuel oil day tanks, and security diesel generator fuel oil day tank.

The team reviewed the four procedure markups that included the requirements described in the previous paragraph. The team determined that the applicant had not included all the enhancements, as described. During discussions with the applicant, the applicant agreed with the identified discrepancies in the procedure markups and initiated corrections. The team verified that the applicant had made appropriate changes to include the missing requirements in the draft procedures prior to the end of the inspection.

From review of site-specific operating experience, the team identified that blisters inside the Train A emergency fuel oil storage tank could have resulted from an aging mechanism, which would require volumetric examination of the tank. Specifically, the team questioned the applicant about the cause, location and number of dime-to-nickel sized blisters inside the Train A emergency fuel oil storage tank. The applicant could not identify the number or location of the dime-to-nickel sized blisters inside the Train A emergency fuel oil storage tank. From anecdotal stories, the applicant indicated that the number and size of the blisters had not changed. However, the inspections indicated that the coating had good adhesion around the blisters. The team reviewed the documented inspections of the tank and determined that insufficient information was recorded other than the existence of the dime-to-nickel sized blisters.

The blisters had been present in the tank since at least 1990 as documented in an inspection. Because of the lack of information related to the cause of the blisters, the number of blisters and whether the blisters had increased over time, the team requested that the applicant remove all the blisters, evaluate the condition of the underlying metal, remediate the blisters, and implement the appropriate aging management actions. If the blisters resulted from an adhesion problem without any evidence of aging effects, then a visual inspection every 10 years would continue to be appropriate. However, if an aging effect were to be identified, then the applicant would need to volumetrically examine the tank. The applicant changed the aging management program evaluation report to make

it fully consistent with the GALL Report. Further, the applicant tracked these changes under Action Item RI178. The applicant documented the changes in Letter ULNRC-05923, Enclosure 3. Also, the applicant revised the license renewal application to indicate they would inspect and repair the blisters prior to entering the period of extended operation. The team confirmed the applicant would perform the next 10-year inspection prior to entering the period of extended operation.

The team concluded that the applicant had, generally, performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging on internal surfaces in those systems containing diesel fuel oil. The team concluded that, if implemented as described including the enhancements and corrective actions, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.9 B2.1.24 Lubricating Oil Analysis (XI.M39)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing oil environments in order to prevent loss of material and reduction of heat transfer. The program maintained lubricating oil contaminants (primarily water and particulates) within acceptable limits, thereby preserving an environment that was not conducive to loss of material or reduction of heat transfer. The applicant sampled, analyzed, and trended results for numerous systems, as listed in this program, to provide an early indication of adverse equipment condition.

The team reviewed the license renewal application, aging management program evaluation report, plant operating experience, program and implementing procedures, and relevant condition reports. The team interviewed license renewal and plant personnel, and walked down the accessible lubricating oil components of the Train A emergency diesel generator and diesel-driven fire pumps. The team sampled oil measurement results and trending within the lubricating oil database and reviewed oil analysis program reports.

The applicant identified numerous enhancements to procedures to ensure consistency with the GALL Report. Specifically, the applicant described that procedures would be enhanced to: (1) indicate that lubricating oil contaminants were maintained within acceptable limits, thereby preserving an environment that was not conducive to loss of material or reduction of heat transfer; (2) state the testing standards for water content and particle count; and (3) state that phase separated water in any amount was not acceptable. The team confirmed that the markup for Procedure EDP-ZZ-01126, “Lubrication Predictive Maintenance Program,” Revision 11, incorporated each of these enhancements.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging on piping and component surfaces in lubricating and hydraulic oil systems. The team concluded that, if implemented as described including enhancements, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.10 B2.1.30 Masonry Walls (XI.S5)

This was an existing program, consistent with the GALL Report, credited with managing cracking of masonry walls through visual inspections. This program was integrated into and administered as part of the structures monitoring program, which implements the maintenance rule structures inspections. The applicant had based this program on guidance provided in Inspection and Enforcement Bulletin 80-11, "Masonry Wall Design," and Information Notice 87-67, "Lessons Learned from Regional Inspections of Licensee Actions in Response to NRC IE Bulletin 80-11." The team confirmed that the applicant had masonry walls in the turbine building, auxiliary building, control building, and essential service water pump house. The applicant performed the masonry wall inspections at intervals of no more than five years.

The team reviewed license renewal documents, the aging management program evaluation report, program procedures, corrective action documents, and masonry wall drawings. The team discussed the program with civil engineers and visually examined accessible masonry block walls to assess their condition. The team determined that the applicant used the guidance for masonry walls from the maintenance rule structures monitoring program to perform the visual inspections. The team verified that the applicant had safety-related masonry block walls. The team concluded that the masonry walls were in good condition and had been constructed in accordance with the design drawings.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.11 B2.1.31 Structures Monitoring (XI.S6)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing loss of material, cracking, and change in material properties of structures and structural components, including structural bolting, through visual inspections. The applicant implemented the structures monitoring requirements of 10 CFR 50.65, "Maintenance Rule," and used guidance provided in the American Concrete Institute Standards 201.1R, "Guide for Conducting a Visual Inspection of Concrete in Service," and 349.3R, "Evaluation of Existing Nuclear Safety-Related Concrete Structures." This program provided inspection guidelines for concrete elements, structural steel, roof systems, masonry walls and metal siding, including all masonry walls and water control structures within the scope of license renewal. The program monitored settlement for each major structure and inspects non-code mechanical and electrical supports. The inspection of all structural components, including masonry walls and water-control structures, were performed at intervals of no more than five years.

The team reviewed license renewal documents, the aging management program evaluation report, procedures, corrective action documents, work orders, and engineering requests. The team interviewed the program engineers and discussed

program enhancements, existing program procedures, and qualifications of inspection personnel. The team performed walk downs with civil engineers involved with performing the inspections and visually examined a sample of structures and structural components in the control and auxiliary buildings. The team independently walked down areas in the auxiliary and control buildings. The team verified that the applicant maintained records and recorded structural indications and deficiencies in a manner such that future inspectors could compare the inspection results.

This program required numerous enhancements to be consistent with the GALL Report. Specifically, the applicant identified enhancements to:

- Inspect penetrations, transmission towers, electrical conduits, raceways, cable trays, electrical cabinets/enclosures, and associated anchorages, and to complete a baseline inspection of these components prior to December 31, 2017;

- Include the main access facility into the program scope;

- Monitor groundwater for pH, chlorides and sulfates, and every five years test at least two samples and evaluate the results to assess the impact on below grade structures;

- Specify, for replacement bolts, that the bolt material, installation torque/tension, and use of lubricants and sealants met required industry guidelines;

- Specify preventive actions for storage, lubrication, and stress corrosion cracking potential discussed in specified industry standards;

- Specify inspections of penetrations;

- Require that inspectors meet the qualifications listed in American Concrete Institute 349.3R-96;

- Quantify acceptance criteria and critical parameters for monitoring degradation, including guidance for unacceptable conditions;

- Incorporate applicable industry codes, standards and guidelines for acceptance criteria; and

- Require an engineer familiar with the seismic design of the plant, including the evaluation of the seismic isolation function, to evaluate degradation, obstruction or questionable material and determine the corrective actions.

The team confirmed that the mark-up for Procedure ESP-ZZ-01013, “Maintenance Rule Structures Inspection,” Revision 6 included the enhancements.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as

described with enhancements, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.12 B2.1.32 RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (XI.S7)

This was an existing program, consistent with the GALL Report, credited with managing loss of bond, loss of material (spalling), cracking, increase in porosity and permeability, loss of strength, change in material properties, and loss of form in water-control structures through visual inspections. The existing program was developed based on guidance provided in Regulatory Guide 1.127, "Inspection of Water-Control Structures Associated with Nuclear Power Plants," Revision 1. This program also included structural steel and structural bolting associated with water-control structures. The applicant included these program requirements in their structures monitoring program, which implements the maintenance rule structures inspections. Water-control structures within the scope of the program included the essential service water pump house, the essential service water supply lines yard vault, the ultimate heat sink cooling tower and retention pond, and the submerged discharge structure.

The team reviewed license renewal documents, the aging management program evaluation report, program procedures, corrective action documents, and engineering requests. The team interviewed the program engineers and discussed the results of the most recent inspection, existing program procedures, and qualifications of inspection personnel. The team performed walk downs with engineers involved with performing the inspections and visually examined a sample of structures and structural components including the essential service water system pump house, the ultimate heat sink cooling tower, and the ultimate heat sink retention pond.

The applicant performed in-service and structural inspections of the ultimate heat sink retention pond and its associated structures to evaluate their structural safety and operational adequacy at five year intervals. The applicant performed algae treatment and riprap inspections along the ultimate heat sink retention pond and monitored underwater benchmarks for settlement of the Category 1 structures. During walk downs, the team did not see any algae, misplaced riprap, or problems with the structures.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.13 B2.1.33 Protective Coating Monitoring and Maintenance Program (XI.S8)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing loss of coating integrity of Service Level I coatings inside containment. The program included visual inspections of accessible coatings that covered steel and concrete surfaces inside containment (e.g., steel liner, steel shell, supports, concrete surfaces, and penetrations).

The team reviewed license renewal documents, the aging management program evaluation report, implementing procedures and procedure mark-ups, corrective action documents, plant operating experience, and inspection results. The team searched the corrective action program database for relevant corrective action requests. The team interviewed the program owner and license renewal project personnel.

The program will be enhanced to revise program documents prior to entering the period of extended operation to specify: (1) monitoring or inspecting for visible defects, such as blistering, cracking, flaking, peeling, rusting, and physical damage; (2) meeting the requirements of American Society of Testing Materials Standard D5163-08, "Establishing a Program for Condition Assessment of Coating Service Level I Coating Systems in Nuclear Power Plants," for inspection frequencies, plans and methods, personnel qualifications, and inspection equipment; (3) reviewing the previous two monitoring reports to prioritize areas for repair or to allow postponing to a future outage with surveillance in the interim period; (4) characterizing, documenting, and testing consistent with American Society of Testing Materials Standard D5163-08, Sections 10.2 through 10.4; (5) evaluating inspection results by a coating specialist who summarizes the findings and recommendations for future surveillance or repair; and (6) requiring that inspection reports prioritize repair areas as either needing repair during the same outage or postponing to future outages with surveillance in the interim period.

The applicant took an exception to the GALL Report so that they only implemented those activities associated with Service Level I coatings specified in Regulatory Guide 1.54, "Service Level I, II, and III Protective Coatings Applied to Nuclear Power Plants," Revision 2. The team confirmed that the applicant implemented their program consistent with the requirements of American Society of Testing Materials Standard D5163-08. Further, the team confirmed that the applicant had included these inspection requirements, as well as the enhancements in the mark-up of Procedure EDP-ZZ-03000, "Containment Building Coatings," Revision 17.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in the affected systems. The team concluded that, if implemented as described with the enhancements and exceptions, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.14 B2.1.34 Insulation Materials for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (XI.E1)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing reduced insulation resistance in non-environmentally qualified electrical cables, connections and terminal blocks in adverse localized environments. Visual inspections would look for embrittlement, melting, cracking, swelling, surface contamination, or discoloration that could indicate incipient conductor insulation aging from temperature, radiation, or moisture. The applicant will complete the first inspection prior to entering the period of extended operation and at least once every ten years thereafter.

The team reviewed license renewal documents, the aging management program

evaluation report, corrective action documents, plant operating experience and draft Procedure EDP-ZZ-07001, “Cable Management Program,” Revision 0. The applicant defined adverse localized environments as a limited plant area that had conditions where temperature, radiation, or moisture may exceed the design conditions. The team walked down selected plant areas and looked for adverse localized environments. The team interviewed design engineers and project personnel to determine their plans for conducting these aging effects evaluations. The applicant identified the plant areas for evaluation of adverse localized environments in the aging management program evaluation report for this program and draft Procedure EDP-ZZ-07001.

The program required two enhancements to be consistent with the GALL Report. The applicant included information in their draft procedure that specified (1) including all accessible in-scope cables in any adverse localized environment and (2) conducting an engineering evaluation for any visual indications of cable insulation surface anomalies. The applicant used technical information contained within SAND 96-0344, “Aging Management Guideline for Commercial Nuclear Projects – Electrical Cable and Terminations,” and Electric Power Research Institute TR-1013475, “Plant Support Engineering: License Renewal Electrical Handbook,” to determine the service limitations of the cable, connection and terminal block insulating materials. The applicant used SAND 96-0344 and Electric Power Research Institute TR-109619, “Guideline for the Management of Adverse Localized Equipment Environments,” to develop guidance for visual inspection techniques of cables, connections and terminal blocks for aging.

The team concluded that the applicant performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging in cables exposed to adverse localized environments. The team concluded that, if implemented as described including the enhancements, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.15 B2.1.35 Insulation Materials for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (XI.E2)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing reduced insulation resistance for cables and connections used in sensitive instrumentation circuits within the ex-core neutron monitoring system. This program would provide reasonable assurance that the intended function of instrumentation circuit cables and connections exposed to adverse localized environments caused by temperature, radiation, or moisture were maintained consistent with the current licensing basis. When instruments were found out of calibration, the applicant performed troubleshooting on the loop, including the instrumentation cable and connections. The applicant committed to complete a review of surveillance results prior to the period of extended operation and every ten years thereafter.

The team reviewed license renewal documents, the aging management program evaluation report, corrective action documents, industry operating experience, and surveillance test results. The team walked down accessible in-scope cables and interviewed the responsible system engineer and license renewal personnel. The

program required three enhancements to be consistent with the GALL Report. The applicant planned to: (1) identify the scope of cables requiring aging management, (2) require engineering review of surveillance results every ten years, and (3) ensure corrective actions were initiated when surveillance results did not meet acceptance criteria, which included performing an engineering evaluation and assessing whether the cable testing frequency needed to be increased. The team verified that draft Procedure EDP-ZZ-07001 included each of these enhancements. However, the team determined the procedure was difficult to follow and discern the requirements specifically related to each of the electrical aging management programs. The applicant indicated that the planned revisions to the cable management procedure included clarifying the requirements associated with each of the aging management programs.

The team concluded that the applicant performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging. The team concluded that, if implemented as described with the enhancements, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

.16 B2.1.36 Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (XI.E3)

This was an existing program, consistent with the GALL Report after enhancement, credited with managing aging caused by reduced insulation resistance. This reduced insulation resistance could lead to electrical failure of in-scope inaccessible power cables (greater than or equal to 400 volts) exposed to wetting or submergence caused by significant moisture. Significant moisture was defined as periodic exposures to moisture that lasted more than a few days. The applicant planned to manage the aging effects by periodically inspecting for water in cable manholes and conduits and by testing the inaccessible medium-voltage electrical cables. The applicant would test the cables prior to the period of extended operations and once every 6 years.

The team reviewed license renewal documents, the aging management program evaluation report, the draft implementing procedure, corrective action documents, plant operating experience, and work orders. The team interviewed plant personnel and walked down several underground cable manholes. The team also reviewed the dewatering program for performing annual inspection of the in-scope cables and duct banks for water intrusion. During the review of draft Procedure EDP-ZZ-07001, the team identified an apparent conflict in the cables identified as underground and the assigned aging management program. The applicant included this apparent conflict in their list of improvements required for this draft aging management program procedure. The team concluded this was an appropriate planned corrective action.

The applicant identified numerous enhancements required to ensure consistency with the GALL Report. Specifically, the applicant developed draft procedures that included requirements to: (1) identify the inaccessible medium voltage power cables (greater than or equal to 400 volts); (2) inspect periodically manholes, pits, and duct banks to confirm cables were not submerged, cables/splices and cable support structures were intact, and dewatering/drainage systems and alarms operated properly; (3) inspect at least annually based on water accumulation and after event driven occurrences (e.g.,

heavy rain or flooding); (4) test in-scope power cables at least once every six years and adjust based on test results and operating experience; (5) require comparing test results to previous test results to identify the rate of cable degradation; (6) define acceptance criteria for cable testing prior to each test; and (7) require an engineering evaluation when the acceptance criteria were not met.

The team verified that the applicant incorporated these enhancements into draft Procedure EDP-ZZ-07001. The team determined that the applicant conducted the inspections using preventive maintenance activities. Whenever plant personnel found water in manholes, they measured and sampled the water prior to pumping the water from the manhole. The applicant described that testing could be a mix of proven testing methods such as dielectric loss (dissipation factor/power factor), AC voltage withstand, partial discharge, step voltage, time domain reflectometry, insulation resistance and polarization index, line resonance analysis, or other state-of-the-art testing. If the applicant identified anomalies during the testing, they would take actions in accordance with the corrective action program to correct the condition and adjust the frequency of testing.

The applicant had determined that safety-related cables in Manhole MH-01 were submerged while completing inspections in response to Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," dated February 7, 2007. The applicant had had no failures of medium-voltage cables because of water treeing; however, the applicant increased the frequency of inspection of Manhole MH-01 for water intrusion from 36 to 6 months after the repairs and modification of the manhole, as specified in Callaway Action Request 201101616. The applicant was establishing a dewatering program that would install sump pumps in the manholes. The applicant had developed preventive maintenance requirements to monitor, inspect and repair the dewatering systems. The team did not identify any water in the manholes that had been identified as susceptible to water intrusion.

The team concluded that the applicant had performed appropriate evaluations and considered pertinent industry experience and plant operating history to determine the effects of aging for inaccessible cables. The team concluded that, if implemented as described with enhancements, the applicant provided guidance to appropriately identify and address aging effects during the period of extended operation.

b.4 System Reviews

The team performed a vertical slice review of selected in-scope systems to assess the applicant's scoping, screening, and aging management reviews of selected components to confirm whether the applicant accurately determined the appropriate material and environment and correctly assigned the appropriate aging management programs.

The team selected the following systems for review:

- Auxiliary feedwater
- Compressed air
- Emergency diesel generator subsystems

The team interviewed the license renewal staff members and the responsible system engineers. The team: (1) selected components and verified material specifications; (2) walked down the systems to confirm that the applicant had properly identified scoping boundaries (including structural and spatial interactions); (3) identified the environments affecting the systems and had properly identified aging management programs to manage the effects of aging for these systems; and (4) evaluated the physical condition of the sampled systems. The team met with license renewal staff to determine how the applicant identified the applicable aging effects and assigned the applicable aging management program for each structure, system, or component.

The aging effects requiring management for the auxiliary feedwater system included cracking, hardening and loss of strength, loss of material, loss of preload, reduction of heat transfer, and wall thinning. The applicant credited the following aging management programs for managing the identified aging effects: Bolting Integrity, Buried and Underground Piping and Tanks, External Surfaces Monitoring of Mechanical Components, Flow-Accelerated Corrosion, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, Lubricating Oil Analysis, One-Time Inspection, and Water Chemistry programs. The team identified no concerns related to the boundaries, materials, environments, or aging management programs assigned for this system.

The compressed air system provides air to the main feedwater valves, atmospheric dump valves, and auxiliary feedwater injection valves. The aging effects requiring management for the compressed air system include loss of material and loss of preload. The applicant credited the following aging management programs for managing the identified aging effects: External Surfaces Monitoring, Bolting Integrity, and Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components programs. The team identified no concerns related to the boundaries, materials, environments, or aging management programs assigned for this system.

The emergency diesel generator engine system contains the following subsystems: cooling water, starting, lubrication, and combustion air intake and exhaust. The aging effects requiring management for the emergency diesel generator subsystems included cracking, hardening and loss of strength, loss of material, loss of preload, and reduction of heat transfer. The applicant credited the following aging management programs for managing the identified aging effects: Bolting Integrity, Closed Treated Water Systems, External Surfaces Monitoring of Mechanical Components, Fuel Oil Chemistry, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, Lubricating Oil Analysis, One-Time Inspection, and Open-Cycle Cooling Water System programs. The team identified no concerns related to the boundaries, materials, environments, or aging management programs assigned for this system.

For these systems, the team concluded that the physical condition of the system and the results of tests and inspections of the various existing aging management programs demonstrated that materials, environments, and aging effects on the selected systems had been appropriately identified and addressed. The team concluded that the applicant appropriately addressed the aging effects for these systems with the identified aging management programs.

c. Overall Conclusion

Overall based on the samples reviewed by the team, the inspection results supported a conclusion that there is reasonable assurance that actions have been identified and have been taken or will be taken to manage the effects of aging in the SSCs identified in the application and that the intended functions of these SSCs will be maintained in the period of extended operation.

40A6 Meetings, Including Exit

The team presented inspection results to Mr. C. Reasoner, Vice President Engineering, and other members of the applicant's staff during a preliminary exit meeting conducted on September 28, 2012. The applicant acknowledged the NRC inspection observations. The team returned all proprietary information reviewed during this inspection.

The team presented inspection results to Ms. S. Kovaleski, Supervising Engineer, and other members of the applicant's staff during a telephonic exit meeting conducted on November 7, 2012. The applicant acknowledged the NRC inspection observations.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant

S. Abraham, NSSS Systems Engineer
A. Alley, Civil Design Engineer
R. Andreasen, Civil Design Engineer
A. Burgess, Lead Mechanical Engineer
S. Cantrell, Balance of Plant Systems Engineer
E. Dorge, Chemistry Engineer
N. Fisher, Electrical Systems Engineer
G. Forster, Engineering Programs Engineer
J. Howard, Chemistry Supervisor
J. Imhoff, NSSS Systems Engineer
L. Kanuckel, Manager Engineering Design
B. Kelley, Chemistry Supervisor
S. Kovaleski, Supervising Engineer
G. Kremer, Manager Engineering Programs
D. Martin, Electrical Engineer
D. Maschler, Chemistry Engineer
J. McLaughlin, NSSS Systems Engineer
S. Merciel, Site License Renewal Project Manager
S. Morris, Engineering Programs Engineer
W. Muskopf, Mechanical Engineering Projects
T. Parashar, NSSS Systems Engineer
L. Ptasznik, Engineering Programs Engineer
C. Reasoner, Vice President Engineering
B. Richardson, Safety Analysis Engineer
J. Small, Chemistry Superintendent
C. Stundebeck, Civil Design Engineer
E. Vaughn, Civil Design Engineer

STARS Center of Business

E. Blocher, License Renewal Project Manager
K. Bryant, Mechanical Lead
R. Davis, Utility Representative
J. Johnson, Structural Lead
J. Knust, Mechanical Lead
A. Saunders, Utility Representative

Division of License Renewal

J. Gavula, Senior Mechanical Engineer
R. Kalikian, Materials Engineer
E. Wong, Chemical Engineer

DOCUMENTS REVIEWED

General

Callaway Action Requests:

201205800*	201206520*	201206557*	201206824*

*identified as a result of the inspection

Letters:

NUMBER	TITLE	DATE
	Scoping and Screening Methodology Report Regarding the Callaway Plant, Unit 1, License Renewal Application	08/06/2012
	Aging Management Programs Audit Report Regarding the Callaway Plant, Unit 1, License Renewal Application	08/09/2012
ULNRC-05877	Responses to RAI Set #1 and Amendment 4 to the Callaway License Renewal Application	07/12/2012
ULNRC-05891	Responses to RAI Set #4 and Amendment 6 to the Callaway License Renewal Application	08/09/2012
ULNRC-05892	Responses to RAI Set #5 and Amendment 7 to the Callaway License Renewal Application (with Updates to Previous RAI Responses)	08/21/2012
ULNRC-05903	Responses to RAI Set #6 and Amendment 8 to the Callaway License Renewal Application	08/21/2012
ULNRC-5903	Responses To RAI Set #13 & #14 and Amendment 14 to the Callaway License Renewal Application	10/31/2012

Scoping

Callaway Action Requests:

200306363	200404991	200607446	201102830
201202922	201204288		

Drawings:

NUMBER	TITLE	REVISION

Drawings:

NUMBER	TITLE	REVISION
M-25AE01	Hanger Location Drawing – Main Feedwater – Turbine Building	4
M-25AE03	Hanger Location Drawing – Main Feedwater – Turbine Building	1
M-25AE06	Hanger Location Drawing – Feedwater Minimum Flow to Condenser – Turbine Building	4
M-25KA01	Hanger Location Drawing – Compressed Air – Auxiliary Building	0
M-29KA21	Hanger Location Drawing – Small Pipe Instrument Air System – Auxiliary Building El. 2000'	14
M-29KA46	Hanger Location Drawing – Small Pipe N2 Backup Gas Supply – Auxiliary & Turbine Buildings	12
	Complete set of license renewal drawings	

License Renewal:

NUMBER	TITLE	REVISION
Topical Report TR-6CW	Criterion 54.4 (a)(2)	3
Topical Report TR-9CW	Plant Systems and Aging Management Programs	3

New Aging Management Programs

B2.1.15 Aboveground Metallic Tanks (XI.M29)

Drawings:

NUMBER	TITLE	REVISION
C-2C0901	Condensate Storage & Demineralized Water Tanks. Concrete Line & Reinforcing Sections and Details	0
C-2C0241	Condensate Storage & Demineralized Water Tanks. Concrete Line & Reinforcing Sections and Details, Sheet 1	0

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.M29, "Aboveground Metallic Tanks"	
	Operating Experience Summary Report, AMP XI.M29, "Aboveground Metallic Tanks"	
CW-AMP-B2.1.15	Aboveground Metallic Tanks Aging Management Program Evaluation Report	3

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
	Maintenance Rule Walk Down Report Structure – Condensate Storage Tank Foundation and Building Enclosure	08/10/2009
MS-25C	Small Pipe Standard Support	0
Procedure EDP-ZZ-XXXXX	Inspections of Aboveground Metallic Tanks	0

B2.1.18 One-Time Inspection (XI.M32)

License Renewal:

NUMBER	TITLE	REVISION
	Draft list of Callaway Material/Environment Combinations in the Scope of One Time Inspection	
	License Renewal Component List for AMP XI.M32, "One-Time Inspection"	
	Operating Experience Summary Report, AMP XI.M32, "One-Time Inspection"	
CW-AMP-B2.1.18	One-Time Inspection Aging Management Program Evaluation Report	2

B2.1.19 Selective Leaching (XI.M33)

Callaway Action Requests:

200909091 201009835

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.M33, "Selective Leaching"	
	Operating Experience Summary Report, AMP XI.M33, "Selective Leaching"	
CW-AMP-B2.1.19	Selective Leaching Aging Management Program Evaluation Report	5

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	20
TBD	Draft One-Time Inspection for Selective Leaching Degradation of Components Program	Draft

B2.1.21 External Surfaces Monitoring of Mechanical Components (XI.M36)

Callaway Action Requests:

200803465 200803472 200810025

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	
	Operating Experience Summary Report, AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	

License Renewal:

NUMBER	TITLE	REVISION
CW-AMP-B2.1.21	External Surfaces Monitoring of Mechanical Components Aging Management Program Evaluation Report	2

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-01131	Plant Health and Performance Monitoring Program	21
EDP-ZZ-01131, Appendix K	Engineering System Walkdowns	1

B2.1.25 Buried and Underground Piping and Tanks (XI.M41)

Callaway Action Requests:

200207386	200605969	200606030	200607749	200608647
200702384	200702484	200703899	200704465	200707760
200711546	200800871	200803345	200808781	200904086
200909892	201000931	201006741	201010950	201204441
201206525	201206616	201206868		

Drawings:

NUMBER	TITLE	REVISION
CU2C1	Essential Service Water System – Unit 1 yard Pipelines & Electrical Duct Banks Plan & Schedule	10
C-U206	Essential Service Water System Replacement Yard Piping Plan	0

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.M41, “Buried and Underground Piping and Tanks”	
	Callaway Action Request Operating Experience Report for AMP XI.M41, “Buried and Underground Piping and Tanks”	

License Renewal:

NUMBER	TITLE	REVISION
CW-AMP-B2.1.25	Buried and Underground Piping and Tanks Aging Management Program Evaluation Report	5

Miscellaneous:

NUMBER	TITLE	DATE
	Request for Additional Information for the Review of the Callaway Plant, Unit 1, License Renewal Application, Set 13	10/01/2012
	Soil Sample Request	07/27/2009
	Soil Lab Results - Near Discharge Monitoring Tanks in the Radioactive Waste Yard	07/23/2012
	Soil Lab Results – Intake Lube Water, Next to Pipe	04/02/2010
	Draft Cathodic Protection Monitoring Procedure	
E-1026-00012	Cathodic Protection Design Report – Harco	08/02/1992
410049	2005 Cathodic Protection Survey and Assessment Report	05/05/2006
83470351	CC Technologies Final Report – Indirect Inspections ESW Supply, Return, Discharge and Strainer Backwash Pipelines	05/02/2007
83475171	Close-Interval Survey and Direct Current Voltage Gradient (Survey Buried Fire Water Protection Piping	05/07/2008
10513410-500	Annual Cathodic Protection System Survey	08/29/2011

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Results (markup)	20
EDP-ZZ-01011	Buried and Underground Piping and Tanks Inspection Program	3

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-02002	Backfill/Material Selection, Preparation, Placement , & Compaction	4
MTT-ZZ-1003	Coatings and Wrapping of Piping	6

Specifications:

NUMBER	TITLE	REVISION/DATE
4645-23A	Technical Specification for Fire Protection System	20
4645-P23-6	Procurement Specification for Pipe and Fittings Fire Protection System	3
4645-P23-7	Procurement Specification for Post Indicator Valves Fire Protection System	3
4645-P23-16	Procurement Specification for Shutoff Valves, Valve Bodies and Wrenches Fire Protection System	1
S-1080	Technical Specification for the Installation of Replacement ASME Section III Buried Essential Service Water System Piping	10/02/2008

Excavations and Pipe Evaluation:

NUMBER	TITLE	DATE
Job Order 09003490	As Found Buried Piping Visual Inspection Form,– Water Treatment Bypass Line	08/04/2009
Job Order 09000264-535	Ultrasonic Thickness Report,	05/05/2010
Job Order 10000810	As Found Buried Piping Visual Inspection Form, Near CW/SW Near Intake Deep Well	05/06/2010
Job Order 11000318.460	As Found Buried Piping Inspection Form, Fire Protection Piping	02/10/2011
Job Order 11002092.460	As Found Buried Piping Inspection Form, Fire Protection Piping	09/19/2011

Excavations and Pipe Evaluation:

NUMBER	TITLE	DATE
Job Order 12000962-500	As Found Buried Piping Inspection Form, – Near Discharge Monitoring Tanks in the Radioactive Waste Yard	06/11/2012
Job Order 12000962-510	Ultrasonic Thickness Report	06/21/2012

B2.1.37 Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (XI.E6)

Callaway Action Requests:

200000569	200102076	200506953	200507313	200708150
200709539	200810789	200900024	201104380	

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.E6, “Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements”	
	Callaway Action Request Operating Experience Report for AMP XI.E6, “Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements”	
CW-AMP-B2.1.37	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Aging Management Program Evaluation Report	4

Miscellaneous:

NUMBER	TITLE	DATE
Information Notice 2010-25	Inadequate Electrical Connection	11/17/2010
NG02BAF2	Preventive Maintenance Inspection Report for NG02BAF2	02/01/2012
PG13QER5	Thermography Preventive Maintenance Inspection Report	02/01/2012

Miscellaneous:

NUMBER	TITLE	DATE
PG14RFF2	Thermography Preventive Maintenance Inspection Report for FDR Bkr to QA01 TB Lighting PNL VIA XFMR XQA01	06/25/2012

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-07001	Cable Management Program	0
EDP-ZZ-01113	Electrical Equipment Predictive Performance Manual	7
MTT-ZZ-01004	General Guidelines for Cable Terminations	14
MTT-ZZ-01004B	Taping Instructions for Cables	7
MTT-ZZ-01013	Motor Program Guide	1

Work Orders:

09512582-500	09512582-510	11500083-501	11500083-510

B2.1.39 Metal-Enclosed Bus Program (XI.E4)

Callaway Action Requests:

200508906	200909297	201008436	201010873
201109870	201206491*	201206807*	

Drawings:

NUMBER	TITLE	REVISION
8600-X-88554	Schematic Diagram Main Circuit Breaker 152PB12101, Transformer XPB121, Circ. & Serv. Water Pumphouse	8
8600-X-88555	Schematic Diagram Main Circuit Breaker 152PB122101, Transformer XPB122, Circ. & Serv. Water Pumphouse	9
8600-X-88556	Schematic Diagram Main Circuit Breaker 152PB12301, Transformer XPB123, Circ. & Serv. Water Pumphouse	8

Drawings:

NUMBER	TITLE	REVISION
Elec-E-21001 (E-21001(Q))	Main Single line Diagram	17
C1515-6	Unit 3 Bus Duct 5KV Metal Switchgear Circ & Service Water Pumphouse	2
C1515-7	Unit 11 Bus Duct 5KV Metal Switchgear Circ & Service Water Pumphouse	2
C1515-8	Unit 7 Bus Duct 5KV Metal Switchgear Circ & Service Water Pumphouse	2

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.E4, “Metal-Enclosed Bus Program”	
	Operating Experience Report for AMP XI.E4, “Metal-Enclosed Bus Program”	
CW-AMP-B2.1.39	Metal-Enclosed Bus Program Aging Management Program Evaluation Report	3

Miscellaneous:

NUMBER	TITLE	REVISION
097739	General Electric Company Instruction Manual Metal-Clad Switchgear	
RFR-19619	Termination Instruction for XMA01A, B, C	D

Operating Experience:

NUMBER	TITLE	DATE
Information Notice 1989-64	Electrical Bus Bar Failure	09/07/1989

Operating Experience:

NUMBER	TITLE	DATE
Information Notice 2010-25	Inadequate Electrical Connection	09/17/2010

Procedures:

NUMBER	TITLE	REVISION
EDP-XX-NNNNN	Metal Enclosed Bus Clean and Inspect	D
MPE-ZZ-QS004	General Electric 13.8KV Switchgear PM	17
MPE-ZZ-QS014	General Electric 4.16KV Switchgear PM	10

Existing Aging Management Programs

B2.1.2 Water Chemistry (XI.M2)

Audits/Self Assessments:

NUMBER	TITLE	DATE
AP09-002	Quality Assurance Audit of Plant Operations and Chemistry	04/23/2009
SA08-CH-S01	Raw Water Self-Assessment	09/22/2008
SA10-CH-S01	Chemistry Fundamentals and Conduct of Operation	02/12/2010
SA10-CH-S04	SGFW Iron Transport	10/18/2010
SA10-CH-S05	Demineralizer Water System	12/15/2010

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.M2, "Water Chemistry"	
	Operating Experience Summary Report XI.M2, "Water Chemistry"	

License Renewal:

NUMBER	TITLE	REVISION
CW-AMP-B2.1.32	Water Chemistry Aging Management Program Evaluation Report	3

Miscellaneous:

TITLE
Callaway Action Request 201109890
Chemistry Department Health Report – December 2011
Chemistry Department Health Report – June 2012
Chemistry Department Health Report – August 2012
Primary Chemistry Trend Data

Miscellaneous:

NUMBER	TITLE	REVISION
EPRI 1016555	Pressurized Water Reactor Secondary Water Chemistry Guidelines	7
EPRI 1014986	Pressurized Water Reactor Primary Water Chemistry Guidelines	6

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-01020	Primary Chemistry Program	21
APA-ZZ-01021	Secondary Chemistry Program	30
CDP-ZZ-00110	Chemistry Data Trending Program	4
CDP-ZZ-00200	Chemistry Schedule and Water Specs	92
CTO-ZZ-01020	Off Normal Primary Chemistry Corrective Actions	7

Procedures:

NUMBER	TITLE	REVISION
CTO-ZZ-01021	Off Normal Secondary Chemistry Corrective Actions	13

B2.1.3 Reactor Head Closure Stud Bolting (XI.M3)

Callaway Action Requests:

199601632

Calculations:

NUMBER	TITLE	REVISION
BB-131	Review of Decreased Thread Engagement For Reactor Vessel Head Stud #18	0
DEI-260	Flange Thread Degradation – Callaway Unit 1 Reactor Vessel	0

Drawings:

NUMBER	TITLE	REVISION
E-11173-121-005	Upper Vessel Machining – Westinghouse Electric Corporation 173” ID PWR	3
E-11173-179-001	Stud, Nut, and Washer – Westinghouse Electric Corporation 173” ID PWR	2

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.M3, “Reactor Head Closure Stud Bolting”	
	Operating Experience Summary Report XI.M3, “Reactor Head Closure Stud Bolting”	
CW-AMP-B2.1.3	Reactor Head Closure Stud Bolting Aging Management Program Evaluation Report	2

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
	Certified material test report for reactor vessel head studs for Callaway Plant	
	Photographs of Stud 18 protective can and reactor vessel head with secured with stuck stud	
M-706-00068	Westinghouse Instruction Manual for Reactor Vessel Assembly for SNUPPS Callaway Nuclear Power Plant Unit 1	10
NMR 92-I00263	Thread Damage in Stud Holes 9, 13, 25, 39, and 54	04/28/1992
NUREG-1339	Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants	06/1990
Procedure AE-UT-98-5	Ultrasonic Examination of Bolts/Studs Greater than 2" in Diameter	0
Procedure ETP-BB-03165	Reactor Vessel Head Stud Removal	12
Regulatory Guide 1.65	Materials and Inspections for Reactor Vessel Closure Studs	1
RFR 18432A	Evaluating Leaving Stuck Stud in Place During Refueling 9	01/27/1998
RFR 18432B	Update for Stud Can Change – Refueling Outage 12	09/09/2002
Table IWB-2500-1	Examination Categories, Examination Category B-G-1, Pressure Retaining Bolting Greater Than 2 in. (50 mm) in Diameter	1998

Stud Repair Plans:

NUMBER	TITLE	DATE
NMR89-I00145	Stud Hole No. 4 Repair Plan	04/18/1989
NMR89-I00164	Stud Hole No. 5 Repair Plan	04/19/1989
NMR89-I00165	Stud Hole No. 9 Repair Plan	04/18/1989

Stud Repair Plans:

NUMBER	TITLE	DATE
NMR89-I00171	Stud Hole No. 7 Repair Plan	04/18/1989
NMR89-I00173	Stud Hole No. 53 Repair Plan	04/21/1989
NMR89-I00176	Stud Hole No. 1 Repair Plan	04/20/1989

Work Orders:

08511749-550 10506686-550 10508687-550

B2.1.7 Flow-Accelerated Corrosion (XI.M17)

Callaway Action Requests:

200604618 200711756 200811208 200811225
201109374 201206822*

Calculations:

NUMBER	TITLE	REVISION
4501-01	Callaway Nuclear Plant FAC System Susceptibility Evaluation (SSE)	0
4501-02	Callaway Nuclear Plant FAC Susceptible Non-Modeled (SNM) Program	0
4501.101-01	Callaway Energy Center CHECWORKS SFA Verification & Validation	0

Drawings:

NUMBER	TITLE	REVISION
M-22AB01(Q)	Main Steam System	16
M-22AB02(Q)	Main Steam System	15
M-22AB03	Main Steam System	20
M-22AC01	Main Turbine	14

Drawings:

NUMBER	TITLE	REVISION
M-22AC02	Main Turbine	17
M-22AC03	Main Turbine	22
M-22AC04	Main Turbine	14
M-22AD01	Condensate System	17
M-22AD02	Condensate System	31
M-22AD06	Condensate System	16
M-22AE01(Q)	Feedwater System	44
M-22AE02(Q)	Feedwater System	28
M-22AF01	Feedwater Heater Extraction Drains and Vents	33
M-22AF02	Feedwater Heater Extraction Drains and Vents	41
M-22AF03	Feedwater Heater Extraction Drains and Vents	20
M-22AF04	Feedwater Heater Extraction Drains and Vents	10
M-22AN01	Demineralized Water Storage and Transfer System	36
M-22AP01	Condensate Storage and Transfer System	25
M-22BL01(Q)	Reactor Make-up Water System	22
M-22BM01(Q)	Steam Generator Blowdown System	34
M-22BM02	Steam Generator Blowdown System	16
M-22BN01(Q)	Borated Refueling Water Storage System	25
M-22CA01	Steam Seal System	5
M-22FA01	Auxiliary Boiler System	16
M-22FB01	Auxiliary Steam System	19
M-22FB02	Auxiliary Steam System	11

Drawings:

NUMBER	TITLE	REVISION
M-22FC02(Q)	Auxiliary Feedwater Pump Turbine	20
M-22FC03	SGFP Turbine “A”	17
M-22FC04	SGFP Turbine “B”	19
M-22GA01	Plant Heating System	9
M-22HC01	Solid Radwaste System	32
M-22HD01	Decontamination System	9

Miscellaneous:

TITLE	DATE
Flow-Accelerated Corrosion Health Report – December 2011	12/02/2011
Flow-Accelerated Corrosion Health Report – January 2012	01/25/2012
Flow-Accelerated Corrosion Health Report – April 2012	04/27/2012
Flow-Accelerated Corrosion Health Report – July 2012	07/25/2012

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
	Specification for Evaluation and Acceptance of Local Areas of Material, Parts, and Components that are Less than the Specified Thickness	07/28/1993
	Component List for Aging Management Program XI.M17, “Flow-Accelerated Corrosion”	
	Operating Experience Summary Report XI.M17, “Flow-Accelerated Corrosion”	
CW-AMP-B2.1.7	Flow-Accelerated Corrosion Aging Management Program Evaluation Report	4

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
NSAC-202L-R3	Recommendations for an Effective Flow-Accelerated Corrosion Program	05/2006

Outage Reports:

NUMBER	TITLE	DATE
NET 08-0070	Refuel 16 Flow Accelerated Corrosion Report	11/07/2008
NET 10-0026	Refuel 17 Flow Accelerated Corrosion Report	05/15/2010
NET 11-0104	Refuel 18 Flow Accelerated Corrosion Report	11/21/2011

Procedures:

NUMBER	TITLE	REVISION
DTI-E-00004	Flow-Accelerated Corrosion Program Desktop Instruction	1
EDP-ZZ-01115	Flow-Accelerated Corrosion of Piping and Components Predictive Performance Manual	23
ME-004	Engineering Design Guide – Material Selection	1
ME-013	Engineering Design Guide – Pipewall Thickness	1
QCP-ZZ-05019	Ultrasonic Thickness Measurement	13

B2.1.10 Open-Cycle Cooling Water Systems (XI.M20)

Callaway Action Requests:

200608992	200703776	200811088	200902969	200903703
200909455	201011236	201011505	201103465	201205800
201206831				

Drawings:

NUMBER	TITLE	REVISION
	Elevation Drawings for Piping from the Cooling Tower to the Power Block	
C-U206	Essential Service Water System Replacement Yard Piping Plan	1
CAD-0576	Essential Service Water System – FSAR Figure 9.2-2, Sheet 1	
CAD-0577	Essential Service Water System – FSAR Figure 9.2-2, Sheet 2	
CAD-0578	Essential Service Water System – FSAR Figure 9.2-2, Sheet 3	
M-22GK02 (Q)	Control Building Heating, Ventilation, and Air Conditioning	17
M-072-00001	Setting Plan for Component Cooling Water Heat Exchangers 76” ID X 37’0” Tube Length	18
M-1089-00097A	Type “R” Coil 31 Tube Face – Carrier Replacement 6 Row – 4 Pass (1½ Circuit) Right & Left Hand	1
8600-X-88195	Piping Plan – Circulating Water System	5
8600-X-88202	Piping Plans – Circulating Water Trifurcation & Service Water Manifold, Circulating and Service Water Pumphouse	4
8600-X-88726	Piping Installation Details – Water Plan, Profile & Sections Service Water System	2

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.M20, “Open-Cycle Cooling Water System”	
	Operating Experience Summary Report XI.M20, “Open-Cycle Cooling Water System”	
CW-AMP-B2.1.10	Open-Cycle Cooling Water System Aging Management Program Evaluation Report	2

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
	Chemistry data for service water system and the ultimate heat sink	
	Generic Letter 89-13 Room Coolers Long Term Asset Management Plan	05/2012
	Tube plugging limits for heat exchangers serviced by essential service water system	
CA-1259	Aerofin Corporation Instruction Manual for R. P. Adams 26”/30” HDWS-80 Essential Service Water Strainer	0
Letter ULNRC-05425	Cycle 15 Commitment Change Summary Report	07/16/2007
M-1180-00001	Manual for Adams HWS and VWS Single Backwash Automatic Poro-Edge Strainers	0
NPS-Proc 007	Examination for the Detection and Sizing of Pitting, Corrosion, and Wall Loss Using Low Frequency Electromagnetic Techniques	4
PD041150.02	Record of Eddy Current Inspection of Component Cooling Water (CCW) Heat Exchanger – B at Callaway Nuclear Plant	04/2010
PM 0818570	Clean and Inspect EKJ03A Intercooler Heat Exchanger and Expansion Joints	6
RP0502-2002	National Society of Corrosion Engineers (NACE) Pipeline External Corrosion Direct Assessment Methodology	2002
RFR 022364B	Document Generic Letter 89-13 Compliance	0
T-11231-LF	Low Frequency Electromagnetic Technique Inspection Report of the Essential Service Water Containment Piping at Callaway	12/20/2011

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-01025	Raw Water Systems Control Program	0
CDP-ZZ-00200	Chemistry Schedule and Water Specs	92
CDP-ZZ-00940	Auxiliary Water Systems Chemistry Optimization Plan	6
EDP-ZZ-01112	Heat Exchanger Predictive Performance Manual	17
EDP-ZZ-01112	Heat Exchanger Predictive Performance Manual	17
EDP-ZZ-01121, Appendix 2	Non-Trended Monitored Locations for Raw Water Program	2
EDP-ZZ-01128	Maintenance Rule Program	17
EDP-ZZ-01131	Plant Health and Performance Monitoring Program	21
EDP-ZZ-01131, Appendix K	Engineering System Walkdowns	1
ESP-EF-0002A	Essential Service Water Train A Flow Verification	12
ESP-EF-0002B	Essential Service Water Train B Flow Verification	16
ETP-EG-00003	Thermal Performance Test of the 'A' CCW Heat Exchanger	0
ETP-EG-00004	Thermal Performance Test of the 'B' CCW Heat Exchanger	0
ETP-ZZ-03001	GL 89-13 Heat Exchanger Inspection	9
QCP-ZZ-05047	Nondestructive Examination Procedure Using Low Frequency Electromagnetic Techniques	0
OTS-AL-00001	ESW Train "A" to TDAFP Flush (High Flow)	21
OTS-AL-00002	ESW Train "B" to TDAFP Flush (High Flow)	21
OTS-AL-00003	"A" MDAFP Flush (High Flow)	19
OTS-AL-00004	"B" MDAFP Flush (High Flow)	19

Work Orders:

08512698-500	08512900-500	08512901-500	08513322-500	08513323-520
09500848-500	09510848-580	09512842-500	10510385-500	10511510-580
10511630-500	10512857-500	10513220-580	10513276-580	

B2.1.11 Closed Treated Water Systems (XI.M21A)

Callaway Action Requests:

200000281 200700441 200805013

Drawings:

NUMBER	TITLE	REVISION
M-22GB01	Central Chilled Water System	18
M-22GK02 (Q)	Control Building Heating, Ventilation, and Air Conditioning	17
M-072-00001	Setting Plan for Component Cooling Water Heat Exchangers 76” ID X 37’0” Tube Length	18
M-612-00006	Room Coolers	9

Lesson Plans:

NUMBER	TITLE	REVISION
T61.016D.6	Component Cooling Water	
T61.016C.6	Central Chilled Water	

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.M21A, “Closed Treated Water Systems”	
	Operating Experience Summary Report XI.M21A, “Closed Treated Water Systems”	

License Renewal:

NUMBER	TITLE	REVISION
CW-AMP-B2.1.21A	Closed Treated Water Systems Aging Management Program Evaluation Report	2 and 3

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
	Chemistry Parameter Trend Graphs for Component Cooling Water, Diesel Generator Jacket Water, Closed Cooling Water, and Central Chilled Water	
EPRI 1007820	Closed Cooling Water Chemistry Guideline	1
Health Report	Component Cooling Water	
Letter ULNRC-2146	Response to Generic Letter 89-13, “Service Water Problems Affecting Safety- Related Equipment	01/29/1990
Procedure EDP-ZZ-XXXXX	Non-Chemistry Inspections of Closed Treated Water Systems Markup	0

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-01025	Raw Water Systems Control Program	0
CDP-ZZ-00110	Chemistry Data Trending Program	4
CDP-ZZ-00200	Chemistry Schedule and Water Specs	92
CDP-ZZ-00200, Appendix D	Closed Cooling Systems Tables	11
CDP-ZZ-00940	Auxiliary Water Systems Chemistry Optimization Plan	6
EDP-ZZ-01112	Heat Exchanger Predictive Performance Manual	17
EDP-ZZ-01128	Maintenance Rule Program	17
EDP-ZZ-01131	Plant Health and Performance Monitoring Program	21

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-01131, Appendix K	Engineering System Walkdowns	1
ETP-EG-00002	Component Cooling Water System Flow Verification	14
ETP-EG-00003	Thermal Performance Test of the 'A' CCW Heat Exchanger	0
ETP-EG-00004	Thermal Performance Test of the 'B' CCW Heat Exchanger	0
OTN-EG-00001	Component Cooling Water System	50

B2.1.13 Fire Protection (XI.M26)

Callaway Action Requests:

200401401	200402661	201202582	201203013

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.M26, “Fire Protection”	
	Operating Experience Summary Report XI.M26, “Fire Protection”	
CW-AMP-B2.1.13	Fire Protection Aging Management Program Evaluation Report	4

Miscellaneous:

TITLE
Fire Protection (Appendix R) Health Report – December 2011
Fire Protection (Appendix R) Health Report – January 2012
Fire Protection (Appendix R) Health Report – April 2012
Fire Protection (Appendix R) Health Report – July 2012

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	20
MSM-KC-FQ001	Function Test – Halon Systems Protecting Safety Related Areas	27
MSM-KC-FT001	Halon Fire Protection Cylinder Inspection	27
MSM-ZZ-FG002	Fire Damper Inspection and Drop Test	12
OSP-KC-00015	Fire Door Inspections	13
QSP-ZZ-65045	Fire Barrier Seal Visual Inspection	8
QSP-ZZ-65046	Fire Barrier Inspection	13

B2.1.14 Fire Water Systems (XI.M27)

Callaway Action Requests:

200711546 201102974 201206538*

Miscellaneous:

TITLE
Fire Main Flow Test, dated November 17, 2009
Fire Main Flow Test, dated December 3, 2009
Fire Main Flow Test, dated April 11, 2011
Fire Main Flow Test, dated April 12, 2011
Fire Water System Health Report – December 2011
Fire Water System Health Report – January 2012
Fire Water System Health Report – April 2012
Fire Water System Health Report – July 2012
Work Order 12000569

Procedures:

NUMBER	TITLE	REVISION
CTP-ZZ-02038	Microbiologically Influenced Corrosion Monitoring Program	16
EDP-ZZ-01121	Raw Water Systems Predictive Performance Program	15
MSM-KC-FW002	Water Spray Flow Test for Turbine Driven Aux Feedpump	15
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	20
CTP-KC-06001	Fire Protection System Chemical Addition	6
MPM-KC-FW004	Fire Hose Station Inspection Outside Areas	9
MSM-KC-FW003	Fire Hose Station Inspection Inside RCA	19
MSM-KC-FW004	Fire Hose Hydrostatic Testing	19
MSM-KC-FW007	Yard Loop Flush	18
MSM-KC-FW008	Fire Hose Hydrostatic Testing in Potentially Contaminated Areas	11
MSM-KC-FW009	Fire Hose Station Inspection Outside RCA	7
OSP-KC-00008	Sprinkler System Discharge Head Inspection	10
OSP-KC-03003	Fire Main Flow Test	5

B2.1.16 Fuel Oil Chemistry (XI.M30)

Callaway Action Requests:

201004307

Drawings:

NUMBER	TITLE	REVISION
8600-X-89634	Diesel Driven Fire Pump PKC1002A Fire Protection System (KC1)	6

Drawings:

NUMBER	TITLE	REVISION
8600-X-89888	Security Diesel Generator System – Security Diesel Generator Building	17
95645	Tank – Diesel Fuel 250 Gallon TKC100B, Fire Protection System	2
104283	275A SFT (*Security Fuel Tank*) Assembly	4
FEG-8600-X-89642	Auxiliary Fuel Oil Unloading Station Storage & Transfer (JA1) – Auxiliary Fuel Oil Storage & Transfer System	B
FEG-8600-X-89643	Auxiliary Fuel Oil Unloading Station Storage & Transfer (JA1) – Auxiliary Fuel Oil Storage & Transfer System	A
M-105A-00015	Emergency Fuel Oil Day Tank TJE01A/TJE01B	10
M-109-00013	Emergency Fuel Oil Storage Tank – SNUPPS	8

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.M30, “Fuel Oil Chemistry”	
	Callaway Action Request Operating Experience Report for AMP XI.M30, “Fuel Oil Chemistry”	
CW-AMP-B2.1.16	Fuel Oil Chemistry Aging Management Program Evaluation Report	2

Miscellaneous:

NUMBER	TITLE	DATE
D 1796 – 83	Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)	
D 2276 – 73	Standard Test Method for Particulate Contamination in Aviation Turbine Fuels	
04503148-500	2008 Train B Emergency Fuel Oil Storage Tank Inspection	

Miscellaneous:

NUMBER	TITLE	DATE
RFR 09606A	Diesel Generator Oil Equivalent Tank Cleaning	09/30/1991
Specification 10466 -M-109-049-02	Coating Repair Procedure	04/30/1979
Table 9.5.4.3	Comparison of The Design to Regulatory Positions of Regulatory Guide 1.137, Revision 0, “Fuel-Oil Systems for Standby Diesel Generators”	
Technical Specification 3.8.3	Diesel Fuel Oil, Lube Oil, and Starting Air	
Technical Specification Bases 3.8.3	Diesel Fuel Oil, Lube Oil, and Starting Air	

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	20
CTP-ZZ-02135	Specific Gravity Determination	14
CTP-ZZ-02145	Flash Point Determination	10
CTP-ZZ-02233	Biodiesel Determination	0
CTP-ZZ-02350	Viscosity Determination	9
CTP-ZZ-02360	Water and Sediment Determination	8
OTS-JE-00002	Filtration of Emergency Diesel Generator Fuel Oil	9

Procedure Markups:

NUMBER	TITLE	REVISION
MSM-KJ-QT001	10 Year Emergency Diesel Generator Fuel Oil Storage Tank Cleaning	11

Procedure Markups:

NUMBER	TITLE	REVISION
CSP-ZZ-07350	Diesel Fuel Oil Testing Program	23
CTP-JE-01230	Diesel Fuel Oil Water Removal and Sampling	43
CTP-JE-01235	Diesel Fuel Oil Skid Sampling and Chemical Addition	5

Work Orders:

S503345	W129881	04503148-500

B2.1.24 Lubricating Oil Analysis (XI.M39)

Callaway Action Requests:

200906391	200907931	201004714	201101042

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
CW-AMP-B2.1.24	Lubricating Oil Analysis Aging Management Program Evaluation Report	2
NET 12-0019	Vibration/Oil Analysis Report - February 2012	03/06/2012
NET 12-0024	Vibration/Oil Analysis Report – March 2012	04/10/2012
R&G Laboratories	Oil Analysis Data Sheet Reports	

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-01126	Lubrication Predictive Maintenance Program	11
EDP-ZZ-01131	Plant Health and Performance Monitoring Program	21
MDP-ZZ-L0001	Lubrication Program	17

B2.1.30 Masonry Walls (XI.S5)

Drawings:

NUMBER	TITLE	REVISION
A-2301	Auxiliary and Reactor Building Floor Plan, El. 1974'-0"	5
A-2325	Control & Diesel Gen. Buildings & Communication Corridor Floor Plans @ El. 2000'-0" & El 2016'-0"	3
A-2326	Control & Diesel Gen. Buildings & Communication Corridor Floor Plans @ El. 2032'-0" & El 2047'-6"	9
A-2337	Computer Room & Control Room Detailed Floor Plans @ El 2047'-6"	12
A-2341	CMU Wall Penetrations Control Bldg.& Communication Corridor	1
A-2342	CMU Wall Penetrations Control Bldg.& Communication Corridor	0
A-2905	Architectural General Masonry Details	0
A-2904	General Masonry Details	0
C-2031	Civil Structural Standard Details Sheet No. 20	0

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.S5, "Masonry Walls"	
	Callaway Action Request Operating Experience Report for AMP XI.S5, "Masonry Walls"	
CW-AMP-B2.1.30	Masonry Walls Aging Management Program Evaluation Report	2

B2.1.31 Structures Monitoring (XI.S6)

Callaway Action Requests:

200105924 200200983 200403475

Drawings:

NUMBER	TITLE	REVISION
C-2C1910	Auxiliary Building Conc. Neat Lines & Reinforcing Wall Elevation Sheet-10	5
C-2L2902	Reactor Building Liner Plate Developed Elevations	0
C-2L2908	Reactor Building Liner Plate Floor and Wall Details	0
M-2G026	Equipment Location Reactor and Auxiliary Building Section A	10
M-2G027	Equipment Location Reactor and Auxiliary Building Section B	4
M-2G028	Equipment Location Reactor and Auxiliary Building Section C	7
M-2G029	Equipment Location Reactor and Auxiliary Building Section D	7
M-2G030	Equipment Location Reactor and Auxiliary Building Sections E, F, & G	7
M-2G040	Equipment Location Fuel Building Plan Elevation 2000'-0", 2026'-0", 2047'-6"	30
M-2G041	Equipment Location Fuel Building Sections A, B, & C	2
M-2G042	Equipment Location Fuel Building Sections D, E, & F	2
M-2G050	Equipment Location Control Building & Communication Corridor Plan Elevation 1974'-0" & 1984'-0"	29
M-2G051	Equipment Location Control Diesel Generator Buildings & Communication Corridor Plan Elevation 2000'-0" & 2016'-0"	35
M-2G052	Equipment Location Control Diesel Generator Buildings & Communication Corridor Plan Elevation 2032'-0" & 2047'-6"	30
M-2G053	Equipment Location Control Diesel Generator Buildings & Corridor Plan Elevation 2061'-6", 2066'-0" & 2073'-6" & Section D	15
M-2G054	Equipment Location Control Diesel Generator Building & Communication Corridor Section A	7
M-2G055	Equipment Location Control Diesel Generator Building Sections B & C	5

Drawings:

NUMBER	TITLE	REVISION
M-2GO21	Equipment Location Auxiliary Building Partial Plan El. 1988'-0" & 2013'-6"	10
M-2GO22	Equipment Location Reactor and Auxiliary Building Plan Ground Floor Elevation 2000'-0"	56
M-2X1902	Auxiliary Building Penetration Closure Wall Elevations Sheet -2	3
M-2Y1902C	Penetration Closure Schedule Aux Bldg	5

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.S6, “Structures Monitoring”	
	Operating Experience Summary Report, AMP XI.S6, “Structures Monitoring”	
CW-AMP-B2.1.31	Structures Monitoring Aging Management Program Evaluation Report	5

Miscellaneous:

NUMBER	TITLE	DATE
	Maintenance Rule Walkdown Report Structure Reactor Building	05/02/2001
	Maintenance Rule Walkdown Report Structure Control Building	10/05/2004
	Maintenance Rule Walkdown Report Structure Reactor Building Interior	09/2005
	Maintenance Rule Walkdown Report Structure Control Building	03/25/2009
	Maintenance Rule Walkdown Report Structure Reactor Building Interior	04/26/2010
	Maintenance Rule Structures Walkdown Schedule	

Miscellaneous:

NUMBER	TITLE	DATE
ACI 349.3R-96	Evaluation of Existing Nuclear Safety-Related Concrete Structures	1996
ACI 201.1R-08	Guide for Conducting a Visual Inspection of Concrete in Service	1996
Calculation C-03-134-F(2)	Auxiliary Building Shielding Block Walls	2003

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-01128	Maintenance Rule Program	18
ESP-ZZ-01013	Maintenance Rule Structures Inspection (markup)	6

B2.1.32 RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (XI.S7)

Callaway Action Requests:

200609956 200900096 201206557

Drawings:

NUMBER	TITLE	REVISION
M-UGO80	Essential Service Water Pumphouse Equipment Locations - Plans	14
M-UGO81	Essential Service Water Pumphouse Equipment Locations - Sections	5
M-UGO82	Ultimate Heat Sink Cooling Tower Arrangement	7

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.S7, “Inspection of Water-Control Structures Associated with Nuclear Power Plants”	

License Renewal:

NUMBER	TITLE	REVISION
	Operating Experience Summary Report, AMP XI.S7, “Inspection of Water-Control Structures Associated with Nuclear Power Plants”	
CW-AMP-B2.1.32	Inspection of Water-Control Structures Associated with Nuclear Power Plants Aging Management Program Evaluation Report	2

Miscellaneous:

NUMBER	TITLE	REVISION
Design Input Report	Train A Essential Service Water Support Modification and Penetrations Seal Change	C

Procedures:

NUMBER	TITLE	REVISION
ESP-EF-03002	Ultimate Heat Sink Retention Pond Inservice Inspection	6
ESP-ZZ-03907	Settlement Monitoring Program	5

B2.1.33 Protective Coating Monitoring and Maintenance (XI.S8)

License Renewal:

NUMBER	TITLE	REVISION
	License Renewal Component List for AMP XI.S8, “Protective Coating Monitoring and Maintenance”	
	Operating Experience Summary Report, AMP XI.S8, “Protective Coating Monitoring and Maintenance”	
CW-AMP-B2.1.33	Protective Coating Monitoring and Maintenance Aging Management Program Evaluation Report	1

Miscellaneous:

NUMBER	TITLE	REVISION
ASTM D5163-08	Establishing a Program for Condition Assessment of Coating Service Level I Coating Systems in Nuclear Power Plants	
Procedure EDP-ZZ-3000	Containment Building Coatings (markup)	17

B2.1.34 Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (XI.E1)

Callaway Action Requests:

200708150 201206824*

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.E1, "Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements"	
	Operating Experience Summary Report XI.E1, "Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements"	
CW-AMP-B2.1.34	Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Aging Management Program Evaluation Report	3

Miscellaneous:

NUMBER	TITLE	REVISION/DATE
EPRI TR-109619	Guideline for Management of Adverse Localized Environments	09/1999
Procedure EDP-ZZ-07001	Cable Management program	0
SAND 96-0344	Aging Management Guidelines for Commercial Nuclear Projects- Electrical Cables and terminations	09/1996

Operating Experience:

NUMBER	TITLE	DATE
Generic Letter 1984-24	Certificate of Compliance to 10CFR50.49: EQ of Electrical Equipment Importance to Safety for NPPs	12/27/1984
Information Notice 1988-89	Degradation of Kapton Electrical Insulation	11/21/1988
Information Notice 1989-30	High Temperature Environment at Nuclear Power Plants	03/15/1989

B2.1.35 Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (XI.E2)

Callaway Action Request:

200404746

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.E2, "Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements"	
	Operating Experience Summary Report XI.E2, "Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements"	
CW-AMP-B2.1.34	Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Aging Management Program Evaluation Report	3

Miscellaneous:

NUMBER	TITLE	DATE
ISES01BA	Cable Routing data Sheet for Power block Electrical Cable	

Miscellaneous:

NUMBER	TITLE	DATE
ISES01BE	Cable Routing data Sheet for Power block Electrical Cable	
M-762-00412-03 (NY-10044)	Imaging and Sensing Technology Corporation Document for Qualified Class 1E BF3 Proportional Counter Assembly	09/1990
M-762-00412-03 (NY-10043)	Imaging and Sensing Technology Corporation Document for Qualified Class 1E Compensated Ionization Chamber	09/1990
M-762-00412-03 (NY-10338)	Imaging and Sensing Technology Corporation Document for Qualified Class 1E Uncompensated Ionization Chamber	05/1993
	Minutes of EPRI Kapton Information Meeting	11/18/1988

Operating Experience:

NUMBER	TITLE	DATE
Information Notice 1989-30	High Temperature Environment at Nuclear Power Plant	05/26/1989
Information Notice 1997-45	Environmental Qualification Deficiency for Cables and Containment Penetration Pigtails	07/02/1997
Licensee Event Report 05000206-87-008	SONGS Kapton Insulation Damage on Containment Penetration Cables	06/02/1987

Procedures:

NUMBER	TITLE	REVISION
EDP-ZZ-07001	Cable Management Program	0
ISL-SE-00N31	Source Range N31 Channel Calibration	30
ISL-SE-00N32	Source Range N32 Channel Calibration	35
ISL-SE-OON35	INTMD RNG N35 “A” Train Loop Cal	27
ISL-SE-OON36	INTMD RNG N36 “B” Train Loop Cal	29
ISL-SE-ON41A	Loop-NU; PR N41 Detector Plateau	11

Procedures:

NUMBER	TITLE	REVISION
ISL-SE-ON42A	Loop-NU; PR N42 Detector Plateau	11
ISL-SE-ON43A	Loop-NU; PR N43 Detector Plateau	11
ISL-SE-ON44A	Loop-NU; PR N44 Detector Plateau	13
RFR 06770A	Field Installation NIS Triaxial Cables	7
ITM-ZZ-00009	Triax Cable Maintenance and Testing	9

B2.1.36 Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (XI.E3)

Callaway Action Requests:

200701041	200708150	200905490	201008000	201008001
201011217	201101616	201107892		

Drawings:

NUMBER	TITLE	REVISION
8600-X-88859	Duct banks and Manholes Site Plan-Key, On site Elec. Power Distribution, Comm. Signal and Control System	24
8600-X-89139	Duct banks and Manholes MH59-8 On site Elec. Power Distribution	3

License Renewal:

NUMBER	TITLE	REVISION
	Component List for Aging Management Program XI.E3, "Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements"	
	Operating Experience Summary Report XI.E3, "Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements"	
CW-AMP-B2.1.36	Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Aging	5

License Renewal:

NUMBER	TITLE	REVISION
	Management Program Evaluation Report	

Miscellaneous:

NUMBER	TITLE	REVISION
Design Change MP-11-0011	Change package for design of sump pumps in Man Holes MH 59-04. MH 59-05, MH 59-08A&B, MH 59-10	2
Procedure EDP-ZZ-07001	Cable Management Program	0
White paper	Man Hole Pump MP 11-0011	
Vendor Manual 0813	BJM submersible Pumps Technical Data Model JXA00SS	
Vendor Manual FM0493-1109	Zoeller Pump Product Information	

Operating Experience:

NUMBER	TITLE	DATE
Generic Letter 2007-01	Inaccessible or Underground Power Cable Failure That Disable Accident Mitigation Systems Or Cause Plant Transients	02/07/2007
Information Notice 2010-26	Submerged Electrical Cables	02/02/2010

SYSTEM REVIEWS

License Renewal:

NUMBER	TITLE	REVISION
CW-AER-AL	Callaway Plant License Renewal Aging Evaluation Report – Auxiliary Feedwater System	3

License Renewal:

NUMBER	TITLE	REVISION
CW-SCO-AL	Callaway Plant License Renewal System and Structure Scoping Report – Auxiliary Feedwater System	1
CW-SCR-AL	Callaway Plant License Renewal Component Summary Screening Report – Auxiliary Feedwater System	4

Drawings:

NUMBER	TITLE	REVISION
LR-CW-AL-M-22AL01	Auxiliary Feedwater System	0B
LR-CW-AL-M-22FC02	Auxiliary Feedwater Pump Turbine	0A
LR-CW-KJ-M-22KJ01	Standby Diesel Generator A – Cooling Water System	21
LR-CW-KJ-M-22KJ02	Standby Diesel Generator A – Intake Exhaust. F.O & Starting Air System	20
LR-CW-KJ-M-22KJ04	Standby Diesel Generator B – Cooling Water System	19
LR-CW-KJ-M-22KJ05	Standby Diesel Generator B – Intake Exhaust, F.O & Starting Air System	24