



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

June 23, 2015

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

SUBJECT: CALLAWAY PLANT – NRC TRIENNIAL FIRE PROTECTION INSPECTION
REPORT 05000483/2015007

Dear Mr. Diya:

On May 14, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Callaway Plant and discussed the results of this inspection with Mr. T. Herrmann, Vice President, Engineering, and other members of your staff. The NRC inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the violation in this report, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Callaway Plant.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response

F. Diya

- 2 -

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Sincerely,

/RA/

Gregory A. Pick, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-483
License No. NFP-30

Enclosure:
Inspection Report No. 05000483/2015007
w/Attachment: Supplemental Information

cc: Electronic Distribution

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Letter to Fadi Diya from Gregory A. Pick, dated June 23, 2015

SUBJECT: CALLAWAY PLANT – NRC TRIENNIAL FIRE PROTECTION INSPECTION
REPORT 05000483-2015007

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DRP Deputy Director (Ryan.Lantz@nrc.gov)
DRS Director (Anton.Vegel@nrc.gov)
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Senior Resident Inspector (Thomas.Hartman@nrc.gov)
Resident Inspector (Michael.Langelier@nrc.gov)
Branch Chief, DRP/B (Andrew.Rosebrook@nrc.gov)
Senior Project Engineer, DRP/B (David.Proulx@nrc.gov)
Project Engineer, DRP/B (Fabian.Thomas@nrc.gov)
Project Engineer, DRP/B (Steven.Janicki@nrc.gov)
CWY Administrative Assistant (Dawn.Yancey@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
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Project Manager (John.Klos@nrc.gov)
Team Leader, DRS/TSS (Don.Allen@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
ACES (R4Enforcement.Resource@nrc.gov)
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RIV/ETA: OEDO (Michael.Waters@nrc.gov)
Branch Chief, RES/DRA/FRB (MarkHenry.Salley@nrc.gov)
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000483

License: NPF-30

Report Nos.: 05000483/2015007

Licensee: Union Electric Company

Facility: Callaway Plant

Location: Junction of Highway CC and Highway O
Fulton, MO

Dates: April 27 through May 14, 2015

Team Leader: J. Mateychick, Senior Reactor Inspector, Engineering Branch 2

Inspectors: S. Alferink, Reactor Inspector, Engineering Branch 2
S. Makor, Reactor Inspector, Engineering Branch 2
B. Correll, Reactor Inspector, Engineering Branch 2
J. Watkins, Reactor Inspector, Engineering Branch 2
R. Deese, Senior Reactor Analyst, Plant Support Branch 2

Accompanying Personnel: H. Barrett, Senior Fire Protection Engineer, Office of Nuclear Reactor
Regulation, Division of Risk Assessment

Others: J. Clark, Deputy Director, Division of Reactor Safety
G. Werner, Chief, Engineering Branch 2

Approved By: Gregory A. Pick, Chief
Engineering Branch 2
Division of Reactor Safety

SUMMARY

IR 05000483/2015007; 04/27/2015 – 05/14/2015; Callaway Plant; Triennial Fire Protection Team Inspection.

The report covered a two-week triennial fire protection team inspection by specialist inspectors from Region IV. One finding, which was a non-cited violation, was documented. The significance of inspection findings is indicated by their color (i.e., Green, White, Yellow, or Red) and determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50.48(c) and National Fire Protection Association Standard 805 for the licensee's failure to address the effects of fire damage to risk-significant circuits impacted by an analyzed fire scenario. Specifically, the licensee failed to identify that a target cable raceway containing circuits that could impact the ability to achieve safe and stable conditions during a fire would be impacted during a fire scenario. The licensee entered this issue into their corrective action program as Callaway Action Request 201503262.

The inspectors determined that the failure to identify a fire risk important cable raceway impacted by a fire scenario was a performance deficiency. The performance deficiency was determined to be more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external factors (i.e., fire) and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, as the finding affected post-fire safe shutdown. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," dated September 20, 2013, the finding was screened as a Green finding of very low safety significance in accordance with Step 1.3.

The finding did not have a cross-cutting aspect since it was not indicative of current licensee performance since the original ignition source and target walkdowns were performed in 2010.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (71111.05XT)

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure 71111.05XT, "Fire Protection-National Fire Protection Association (NFPA) 805 (Triennial)," issued January 31, 2013. The inspectors reviewed the licensee's fire protection program against the requirements of NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as incorporated by Title 10 of the *Code of Federal Regulation* (CFR) 50.48(c). The NFPA 805 standard establishes a comprehensive set of requirements for fire protection programs at nuclear power plants. The standard incorporates both deterministic and risk-informed performance-based concepts. The inspection team evaluated the implementation of the approved fire protection program in selected risk-significant areas with an emphasis on the procedures, equipment, fire barriers, and systems that ensure the post-fire capability to safely shutdown the plant.

Inspection Procedure 71111.05XT requires the selection of three to five fire areas and one or more mitigating strategies for review. The inspection team used the Callaway NFPA 805 Fire Probabilistic Risk Assessment (PRA) Integrated Fire Risk Report to select the following four fire areas (inspection samples) for review:

Fire Area	Description
A-21	Control Room AC and Filtration Units Room B (Room 1501)
A-27	Reactor Trip Switchgear Room (Room 1403)
C-10	Train B Engineered Safety Feature Switchgear Room (Room 3302)
C-27	Control Room

Since this was the first triennial inspection following NRC approval of the risk-informed, performance-based fire protection program, the inspection team reviewed samples of the implementation items required to have been completed in accordance with Operating License Condition 2.C.(5). The inspection team also reviewed samples of the plant modifications credited to support the approved fire protection program.

The inspection team evaluated the licensee's fire protection program using the applicable requirements, which included plant Technical Specifications, Operating License Condition 2.C.(5), NRC safety evaluations, 10 CFR 50.48, and NFPA 805. The inspection team also reviewed related documents that included the final safety analysis report, Section 9.5; the Nuclear Safety Capability Assessment; and the fire safety analyses. Specific documents reviewed by the inspection team are listed in the attachment.

Four fire area inspection samples and one mitigating strategy sample were completed.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The inspectors reviewed the Callaway fire response off-normal operating procedures and compared them to the Nuclear Safety Capability Assessment and Fire Safety Analysis for each fire area sampled, system flow diagrams, and other design basis documents to determine if equipment required to achieve post-fire safe and stable plant conditions was properly identified and adequately protected from fire damage in accordance with the requirements of 10 CFR 50.48(c) and the licensee's approved fire protection program.

The inspectors reviewed applicable sections of the fire response off-normal operating procedures for the selected fire areas and their associated fire scenarios to verify that the shutdown methodology properly identified the components and systems necessary to achieve and maintain safe and stable plant conditions. The inspectors performed walk-throughs of procedure steps to ensure the implementation and human factors adequacy of the procedures. The inspectors verified that licensee personnel credited for procedure implementation had procedures available, were trained on implementation, and were available in the event a fire occurred. The inspectors verified that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits. The inspectors verified that all the recovery actions for the selected areas have been incorporated into a plant fire shutdown procedure. The inspectors inspected the implementation of the following items listed in the Callaway Plant NFPA 805 Transition Report, Table S-3, "Implementation Items:"

11-805-053	11-805-056	11-805-074	11-805-075
11-805-092	12-805-001	12-805-003	12-805-005

The inspectors also reviewed the implementation of the modifications listed in the Callaway Plant NFPA 805 Transition Report, Table S-1, "Plant Modifications Completed," to confirm that the modifications have been incorporated into the plant procedures for responding to fires. The modifications reviewed included MP 10-0032.

b. Findings

No findings were identified.

.02 Passive Fire Protection

a. Inspection Scope

The inspectors walked down accessible portions of the selected fire areas to observe the material condition and configuration of the installed fire area boundaries (including walls, fire doors, and fire dampers) and verify that the electrical raceway fire barriers were appropriate for the fire hazards in the area. The inspectors compared the installed configurations to the approved construction details, supporting fire tests, and applicable license commitments.

The inspectors reviewed installation, repair, and qualification records for a sample of penetration seals to ensure the fill material possessed an appropriate fire rating and that the installation met the engineering design. The inspectors also reviewed similar records for the rated fire wraps to ensure the material possessed an appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings were identified.

.03 Active Fire Protection

a. Inspection Scope

The inspectors reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected fire areas. The inspectors verified the automatic detection systems and the manual and automatic suppression systems were installed, tested, and maintained in accordance with the NFPA code of record or approved deviations, and that each suppression system was appropriate for the hazards in the selected fire areas.

The inspectors performed a walkdown of accessible portions of the detection and suppression systems in the selected fire areas. The inspectors also performed a walkdown of major system support equipment in other areas (e.g., fire pumps and Halon supply systems) to assess the material condition of these systems and components.

The inspectors reviewed the electric and diesel fire pumps' flow and pressure tests to verify that the pumps met their design requirements. The inspectors reviewed the fire main flow tests to verify that the flow loops met their design requirements. The inspectors also reviewed the Halon suppression functional tests to verify that the system capability met the design requirements.

The inspectors assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The inspectors also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the inspectors inspected fire brigade equipment to determine operational readiness for firefighting.

The inspectors observed an unannounced fire drill and subsequent drill critique on May 13, 2015, using the guidance contained in Inspection Procedure 71111.05AQ, "Fire Protection Annual/Quarterly." The inspectors observed fire brigade members fight a simulated fire in the auxiliary boiler room. The inspectors verified that the licensee identified problems, openly discussed them in a self-critical manner at the drill debrief, and identified appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus, (2) proper use and layout of fire hoses, (3) employment of appropriate firefighting techniques, (4) sufficient firefighting equipment was brought to the scene, (5) effectiveness of fire

brigade leader communications, command, and control, (6) search for victims and propagation of the fire into other areas, (7) smoke removal operations, (8) utilization of pre-planned strategies, (9) adherence to the pre-planned drill scenario, and (10) drill objectives.

b. Findings

No findings were identified.

.04 Protection from Damage From Fire Suppression Activities

a. Inspection Scope

The inspectors performed plant walkdowns and document reviews to verify that redundant success paths for achieving safe and stable plant conditions, which are located in the same fire area, would not be subject to damage from fire suppression activities, or from the rupture or inadvertent operation of fire suppression systems. Specifically, the inspectors verified:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat, or hot gases, cause activation of suppression systems that could potentially damage all redundant success paths
- A fire in one of the selected fire areas or the inadvertent actuation or rupture of a fire suppression system would not directly cause damage to all redundant success paths (e.g., sprinkler-caused flooding of other than the locally affected train)
- Adequate drainage is provided in areas protected by water suppression systems and for manual use of fire hoses by the fire brigade

b. Findings

No findings were identified.

.05 Shutdown From a Primary Control Station

a. Inspection Scope

Review of Methodology

The inspectors reviewed the Nuclear Safety Capability Assessment, procedures, piping and instrumentation drawings, electrical drawings, and other supporting documents to verify that the licensee can achieve and maintain safe and stable plant conditions from the primary control station in the event a fire required evacuation of the control room.

The inspectors verified that the Nuclear Safety Capability Assessment properly identified the components and systems necessary to meet the nuclear safety performance criteria for the fire area selected. Specifically, the inspectors determined the adequacy of the systems selected to meet the criteria for reactivity control, inventory and pressure

control, decay heat removal, vital auxiliaries, and process monitoring. For the primary control station, which was analyzed using a performance-based approach, the inspectors verified that the analysis included a consideration of all the necessary cables and equipment associated with operation and control of off-site power.

The inspectors verified that the transfer of command and control from the control room to the primary control station would be unaffected by fire-induced circuit faults (e.g., by the provision of separate fuses and power supplies for shutdown control circuits).

Review of Operational Implementation

The inspectors verified that the training program for licensed and non-licensed operators included the procedures for achieving and maintaining safe and stable plant conditions, including any necessary recovery actions. The inspectors also verified that sufficient personnel required to achieve and maintain safe and stable plant conditions were properly trained and were available at all times among the normal on-site staff, exclusive of the fire brigade.

The inspectors performed a timed walkdown of Procedure OTO-ZZ-00001, "Control Room Inaccessibility," Revision 40, with licensed and non-licensed operators to determine the adequacy of the procedure. The inspectors verified that the recovery actions taken were feasible and that operators could reasonably be expected to implement the procedure within the applicable time requirements to achieve the nuclear safety performance criteria. The inspectors evaluated the feasibility of the recovery actions using the criteria established in the licensee's approved fire protection program.

The inspectors also verified that the licensee conducted periodic operational tests of the transfer and isolation capability and instrumentation and control functions used for transferring control from the main control room to the primary control station and other locations where recovery actions would be performed. The inspectors verified that the tests were adequate to prove the functionality of the primary control stations' capability to meet performance criteria and achieve and maintain safe and stable plant conditions.

The inspectors reviewed the list of recovery actions contained in Table 5-3, "Recovery Actions Credited," of Calculation KC-138, "Fire Safety Analysis Main Control Room," Revision 2. The inspectors verified that these recovery actions were incorporated into the shutdown procedure.

b. Findings

No findings were identified.

.06 Circuit Analysis

a. Inspection Scope

The inspectors reviewed the Nuclear Safety Capability Assessment to verify that the licensee identified the circuits that may impact the ability to achieve and maintain safe and stable conditions. The inspectors verified, on a sample basis, that the licensee properly identified the cables for equipment required to achieve and maintain safe and

stable conditions in the event of a fire in the selected fire areas. The inspectors verified that these cables were either adequately protected from the potentially adverse effects of fire damage or were analyzed to show that fire-induced faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent achieving safe and stable conditions. The inspectors verified that the licensee's analysis considered potential spurious operations due to fire-induced cable faults.

The inspectors' evaluation focused on the cables of selected components from the reactor coolant system, the credited charging pump, the pressurizer power-operated relief valves, and the credited motor driven auxiliary feedwater pump. For the sample of components selected, the inspectors reviewed process and instrumentation drawings, electrical elementary and block diagrams and identified power, control, and instrument cables necessary to support their operation. In addition, the inspectors reviewed cable routing information to verify that fire protection features were in place as needed to satisfy the separation requirements specified in the fire protection license basis.

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR 50.48(c) and NFPA 805 for the licensee's failure to address the effects of fire damage to risk-significant circuits impacted by an analyzed fire scenario.

Description. The inspectors performed walkdowns of the selected fire areas addressed in the approved fire protection program using the performance-based approach in accordance with NFPA 805, Section 4.2.4. Circuits associated with components credited in the Nuclear Safety Capability Assessment and fire PRA were identified along with their cables. The cable raceways containing any of these cables within each fire area were identified. These cable raceways were designated as target raceways. The potential fire ignition sources in each fire area were identified and the characteristics for the potential fires were determined by performing fire modeling in accordance with NFPA 805, Section 4.2.4.1. Each resulting fire scenario was walked down to identify any target raceways within the zone of influence of the fire. The resulting information provided input to the fire PRA and the fire risk evaluation.

The inspectors used the results of the fire modeling to independently walkdown the fire scenarios in the sample fire areas and the identification of impacted target raceways. The inspectors identified that a target cable raceway, Cable Tray 6U1Y, would be impacted during Fire Scenario 1403-01 which modeled a fire in electrical panel BB01. This impact was not identified in the analysis, Calculation KC-56, "Detailed Fire Modeling Report, Fire Compartment A-27, Reactor Trip Switchgear Room, Auxiliary Building Elevation 2026." The missed target raceway in the zone of influence for the fire scenario had the potential to impact the ability to achieve safe and stable conditions during a fire. Subsequently, the inspectors determined the licensee had analyzed these same circuits for fire damage for Fire Scenario 1403-17 (480V load center PG20). However, the licensee had not included the change in risk for this target-source combination for Fire Scenario 1403-01.

Analysis. The inspectors determined that the failure to identify a fire risk important cable raceway impacted by a fire scenario was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the

reactor safety Mitigating Systems cornerstone attribute of protection against external factors (i.e., fire) and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," dated June 19, 2012. The inspectors determined that an IMC 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, review was required as the finding affected post-fire safe shutdown. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," dated September 20, 2013, the finding was screened as a Green finding of very low safety significance in accordance with Step 1.3, "Ability to Achieve Safe Shutdown," Question A, "Is the reactor able to reach and maintain safe shutdown (either hot or cold) condition?" The inspectors determined the answer to be yes based on the same circuits having been evaluated for fire damage in Fire Scenario 1403-17 (480V load center PG20). Therefore, the impact for the circuit damage on achieving safe and stable conditions had been evaluated for a fire in the same fire area. The licensee calculated that the missed ignition source-target interactions resulted in a core damage frequency increase of approximately 2.5E-12/year.

There was no cross-cutting aspect assigned to this finding because it was not indicative of current licensee performance since the original ignition source and target walkdowns were performed in 2010.

Enforcement. License Condition 2.C.5, "Fire Protection Program," states, in part, "Union Electric shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment request, dated August 29, 2011 (and supplements, dated November 9, 2011; April 17, 2012; July 12, 2012; February 19, 2013; August 5, 2013; September 24, 2013; and December 19, 2013) and as approved in the safety evaluation report, dated January 13, 2014."

The approved fire protection program is a risk-informed performance-based program in accordance with NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition" (NFPA 805), incorporated by reference into 10 CFR 50.48(c). The approved fire protection program applied the performance-based approach of NFPA 805, Section 4.2.4, to fire area A-27. Fire modeling was to be performed in accordance with the requirements of NFPA 805, Section 4.2.4.1. The fire modeling results were inputs to the fire PRA which were used to perform the fire risk evaluation in accordance with the requirements of NFPA 805, Section 4.2.4.2.

Contrary to the above, from January 13, 2014, to May 14, 2015, the licensee failed to implement all provisions of the approved fire protection program and NFPA 805, Section 4.2.4. Specifically, the licensee failed to identify that a target cable raceway would be damaged during a fire scenario and failed to include the subsequent change in risk.

Because the finding was of very low safety significance (Green) and was entered into the licensee's corrective action program as Callaway Action Request 201503262, this finding is being treated as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement policy. This finding is identified as NCV 05000483/2015007-01, Failure to Identify and Evaluate All Targets Within the Zone of Influence of Ignition Sources.

.07 Communications

a. Inspection Scope

The inspectors reviewed the contents of designated emergency storage lockers and reviewed the procedure for shutdown from outside of the control room to verify that portable radio communications and fixed emergency communications systems were available, operable, and adequate for the performance of designated activities. The inspectors verified the capability of the communication systems to support the operators in the conduct and coordination of their required actions. The inspectors also verified that the design and location of communications equipment, such as repeaters and transmitters, would not cause a loss of communications during a fire. The inspectors discussed system design, testing, and maintenance with the system engineer.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The inspectors reviewed the emergency lighting provided, both in fixed and portable form, along access routes and egress routes, at control stations, plant parameter monitoring locations, and recovery action locations. The inspectors verified that the emergency lighting was adequate for operators to perform the required recovery actions during a walkdown of the procedure for shutdown from outside of the control room.

b. Findings

No findings were identified.

.09 Cold Shutdown Repairs

a. Inspection Scope

The inspectors determined that the licensee does not credit cold shutdown repairs to meet the nuclear safety performance criteria. The inspectors reviewed the nuclear safety capability assessment and verified that the licensee had evaluated the need for cold shutdown repairs. The inspectors also interviewed licensee personnel and determined that the licensee does not require transitioning to cold shutdown to achieve a safe and stable condition.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection Scope

The inspectors verified that compensatory measures were implemented for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g., detection and suppression systems and equipment, passive fire barriers; or pumps, valves, or electrical devices providing safe shutdown functions). The inspectors also verified that the short-term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that the licensee was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings were identified.

.11 Radiological Release

a. Inspection Scope

The inspectors verified that the licensee had provided reasonable assurance that a fire would not result in a radiological release that adversely affects the public, plant personnel, or the environment in accordance with NFPA 805, Section 1.3.2. The inspectors verified that the licensee had evaluated the potential for radioactive releases to any unrestricted areas resulting from fire suppression activities were as low as reasonably achievable. The inspectors verified that the licensee had analyzed radioactive release on a fire area basis in accordance with NFPA 805, Section 2.2.4. The inspectors walked down the selected fire zones and verified that the pre-fire plan tactics and instructions were consistent with the potential radiological conditions identified in the analysis.

b. Findings

No findings were identified.

.12 Non-Power Operations

a. Inspection Scope

The plant did not enter an outage during the inspection. However, the inspectors verified that the licensee had defined specific pinch points where one or more key safety functions could be lost during non-power operations. The inspectors reviewed the actions that the licensee would take during higher-risk evolutions where those key safety functions could be lost.

b. Findings

No findings were identified.

.13 Monitoring Program

a. Inspection Scope

The inspectors verified that the licensee had established a monitoring program to ensure that the availability and reliability of the fire protection systems, structures and components credited in the performance-based analyses are maintained, and to assess the performance of the fire protection program in meeting the performance criteria as specified in NFPA 805. The items in scope were being monitored for availability, reliability, and performance based on the established maintenance rule criteria with the results input into the system health report process. The inspectors also verified that the monitoring program utilized the corrective action program to return availability, reliability, and performance of systems that fall outside of established levels.

To verify the implementation of the licensee's monitoring program, the inspectors reviewed the following items which laid out the program and were contained in NFPA 805 Transition Report, Table S-3: Item 11-805-073 and Item 11-805-089.

b. Findings

No findings were identified.

.14 Plant Change Evaluation

a. Inspection Scope

The inspectors reviewed plant change evaluations to verify that the modifications met the requirements of the fire protection license condition for self-approved changes to the fire protection program. Due to the small number of plant change evaluations performed since the implementation of NFPA 805, the inspectors reviewed a sample of engineering changes that had screened out from having to perform the fire protection plant change evaluation. Additionally, the inspectors reviewed the governing procedures related to engineering changes and the requirements for performing plant change evaluations.

The inspectors sampled the following changes:

- Attachment 6, "Fire Doors," from MP 09-0026, "Transition the Fire Protection Licensing Basis to NFPA 805," Revision 000.3
- STARS ENG-5001-8.3, Section 13, Fire Protection Review of MP 10-0001, "Install a New Integrated Head Assembly"
- STARS ENG-5001-8.3, Section 13, Fire Protection Review of MP 13-0027, "Install a New Spent Fuel Pool Instrumentation System"

b. Findings

No findings were identified.

.15 Implementation of Risk Related Implementation Items

a. Inspection Scope

The inspectors verified that the licensee had appropriately implemented risk-related items in the establishment and early operation of their NFPA 805 program. This review included changes to the licensee's configuration risk management program, the licensee's risk assessment program, and a performance-based fire protection surveillance frequency program. The inspectors also reviewed the licensee's fire PRA qualification standard used by plant personnel performing fire PRA work. Also, the quality assurance program auditing requirements were reviewed for completeness. Finally, the inspectors reviewed the licensee's PRA to ensure the basic event data in the fire PRA matched the internal events PRA basic events, which included a verification of multiple spurious operation and human reliability analysis treatment.

To verify the implementation of the licensee's risk-related implementation items, the inspectors reviewed the following items which documented the implementation and were contained in NFPA 805 Transition Report, Table S-3:

11-805-063	11-805-068	11-805-069	11-805-072	11-805-088	11-805-090
11-805-093	13-805-001	13-805-002	13-805-003	13-805-004	13-805-005
13-805-006	13-805-007				

c. Findings

No findings were identified.

.16 Alternative Mitigation Strategy Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's implementation of guidance and strategies intended to maintain or restore core, containment, and spent fuel pool cooling capabilities under the circumstances associated with the potential loss of large areas of the plant due to explosions or fire as required by 10 CFR 50.54(hh)(2).

The inspectors verified that the licensee maintained and implemented adequate procedures, maintained and tested equipment necessary to properly implement the strategies, and ensured station personnel were knowledgeable and capable of implementing the procedures. The inspectors performed a visual inspection of portable equipment used to implement the strategy to ensure the availability and material readiness of the equipment, including the adequacy of portable pump trailer hitch attachments, and verify the availability of on-site vehicles capable of towing the portable pump. The inspectors evaluated the Containment Flooding with Portable Pump strategy.

One mitigating strategy sample was completed.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The inspectors selected a sample of condition reports associated with the licensee's fire protection program to verify that the licensee had an appropriate threshold for identifying deficiencies. The inspectors reviewed the corrective actions proposed and implemented to verify that they were effective in correcting identified deficiencies. The team evaluated the quality of recent engineering evaluations through a review of condition reports, calculations, and other documents during the inspection.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The team presented the inspection results to Mr. T Herrmann, Vice President, Engineering, and other members of the licensee staff at an exit meeting on May 14, 2015. The licensee acknowledged the findings presented.

The team verified that no proprietary information was retained by the inspectors or documented in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Bianco, Director, Nuclear Operations
H Bono, Consulting Engineer, Nuclear Oversight
D. Bonvillian, Shift Manager, Operations
G. Bradley, Director, Engineering Systems
S. Cantrell, Fire Protection System Engineer, Nuclear Engineering –
Balance of Plant Systems
M. Covey, Manager, Operations
B. Cox, Senior Director Nuclear Operations
J. Easley, Operations Technician, Operations
L. Eitel, Supervising Engineer, Nuclear Engineering – Mechanical/Civil Design
T. Elwood, Supervising Engineer, Regulatory Affairs and Licensing
D. Epperson, Supervising Engineer, Engineering Configuration Management
M. Fletcher, Fire Protection Program Engineer, Systems Engineering
T. Fugate, Director, Plant Support
D. Glover, Operating Supervisor, Operations
L. Graessle, Senior Director, Operations Support
D. Hall, Director, Engineering Programs
T. Herrmann, Vice President, Engineering
J. Hiller, Supervising Engineer, Regulatory Affairs Risk Management
T. Holland, Shift Manager, Operations
L. Kanuckel, Director, Nuclear Oversight
S. Maglio, Manager, Regulatory Affairs
P. McKenna, Manager, Emergency Planning
M. McLachlan, Senior Director Engineering
S. Miner, Reactor Operator, Operations
D. Mueller, Reactor Operator, Operations
S. Jones, Operating Supervisor, Operations
E. Olson, Manager, Security
S. Petzel, Engineer, Regulatory Affairs
T. Rush, Reactor Operator, Operations
J. Sebacher, Reactor Operator, Operations
J. Seyfert, Supervisor, Nuclear Maintenance
P. Tella, Design Engineer, Electrical Design
J. Wallendorff, Fire Marshal, Nuclear Engineering –
Balance of Plant Systems
R. Wink, Supervising Engineer, Plant Life Extension
L. Young, Operating Supervisor, Operations

NRC Personnel

T. Hartman, Senior Resident Inspector
M. Langelier, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2015007-01	NCV	Failure to Identify and Evaluate All Targets Within the Zone of Influence of Ignition Sources
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LIST OF DOCUMENTS REVIEWED

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
HPCI-10-04	National Fire Protection Association (NFPA) Standard 805 Airborne and Liquid Effluents Offsite Dose	0
KC-11	Halon Concentration in ESF Room	0
KC-26	Nuclear Safety Capability Assessment	1
KC-26, Attachment 10-2	Nuclear Safety Capability Assessment, Fire Area Assessment Reviews	March 2014
KC-26, Att. 10-6, ADD 1	Feasibility of Recovery Actions for Achieving Safe and Stable Plant Conditions	1
KC-27	NFPA Code Conformance Review	1
KC-43	NFPA 805 Code Comparison	March 2015
KC-43, Attachment A	NFPA 805 code Comparison, NEI 04-02 Table B-1 – Transition of Fundamental FP Program and Design Elements (NFPA 805 Chapter 3)	March 2015
KC-56	Detailed Fire Modeling Report, Fire Compartment: A-27, Reactor Trip Switchgear Room, Auxiliary Building Elevation 2026'	0
KC-61	Detailed Fire Modeling Report, Fire Compartment: C-10, ESF Switchgear Room South, Control Building Elevation 2000'	0
KC-79	Detailed Fire Modeling Report, Fire Compartment: A-21, Control Room AC and Filtration Unit B, Auxiliary Building Elevation 2047'	0
KC-101	Callaway Fire Safety Analysis – Fire Area A-21 Control Room AC and Filtration Unit B	1

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
KC-107	Callaway Fire Safety Analysis – Fire Area A-27 Reactor Trip Switchgear Room	1
KC-121	Callaway Fire Safety Analysis – Fire Area C-10 ESF Switchgear Room B	1
KC-138	Callaway Fire Safety Analysis – Fire Area C-27 Control Room Area	2
KC-162	Performance Based Fire Protection Surveillance Frequency Program	0
KC-163	Callaway Fire Protection Monitoring Program	0
KC-285, Addendum 1	Halon Fire Protection System	0
KC-316	Fire Protection System Hydraulic Calculations	1
M-KC-474	Halon 1301 Fire Protection System – Maximum Allowed Ceiling Openings	0
ZZ-467	Actuator Output Torque At Stall and Elevated Voltage Calculation	0
Sciencetech Calc. 17617-002b	Callaway NFPA 805 Fire PRA MSO Expert Panel	0
Sciencetech Calc. 17671-005	Callaway NFPA 805 Fire PRA Ignition Frequencies	2
Sciencetech Calc. 17671-009	Callaway NFPA 805 Fire PRA Circuit Failure Likelihood Analysis	2
Sciencetech Calc. 17671-010b	Callaway NFPA 805 Fire PRA Main Control Room Fire Analysis	3
Sciencetech Calc. 17671-011	Callaway NFPA 805 Fire PRA Post Fire Human Reliability Analysis	2
Sciencetech Calc.17671-013	Callaway NFPA 805 Fire PRA Integrated Fire Risk Report	2
Sciencetech Calc. 17671-015	Callaway NFPA 805 Fire PRA Quality Summary	3
Sciencetech Calc. 17671-FRE-C-10	Fire Evaluation of Delta Risk for Fire Area C-10	0

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
Scientech Calc. 17671-FRE-A-21	Fire Evaluation of Delta Risk for Fire Area A-21	0
Scientech Calc. 17671-FRE-A-27	Fire Evaluation of Delta Risk for Fire Area A-27	0
Scientech Calc. 17671-FRE-C-27	Fire Evaluation of Delta Risk for Fire Area C-27	0
NB-06	In-Cabinet Response Spectra for NB Switchgear NB01 & NB02	0
NK-09	125 Volt DC System Short Circuit Study	June 17, 2008
NN-01	120 Volt Class 1E Instrument AC System Short Circuit Study	0
ZZ-179	Safety Related Panel Load List	8
ZZ-225	Addendum to Address Changes due to MP 07-0151 FCN	0
ZZ-540	DC Load Calculations for Maximum Current Flow Across 14 AWG Cables to Evaluate Lower Amperage Fuses for MP 05-3029	0
ZZ-547	NFPA-805 Breaker/Fuse Coordination Study for PB, PG, PK, and PN Circuits for Safe Shutdown Equipment	0

Callaway Action Requests (CARs)

200800301	201502827	201503081*	201503036*
201005990	201502827	201503086*	201503037*
201010377	201502935*	201503086*	201503076*
201305897	201502976*	201503262*	201300098
201307250	201502976*	201503262*	201503478*
201307250	201502989*	201503420	201502084*
201405603	201502997*	201503420*	201502081*
201406297	201503037*	201503496*	201500052
201501197	201503056*	201503498*	201501466
201501761	201503078*	201503512*	
201502079*	201503080*	201503527*	

*Issued as a result of inspection activities.

Cutset Reports

<u>Number</u>	<u>Title</u>
C1501-1	Fire Area A-21, Scenario 14
C1501-1A	Fire Area A-21, Scenario 14
C1501-T2	Fire Area A-21, Transient Scenario 2
CA27-13D	Fire Area A-27, Scenario 13D
CA27-13S	Fire Area A-27, Scenario 13S
CA27-14	Fire Area A-27, Scenario 14
CA27-14O	Fire Area A-27, Scenario 14O
CA27-15	Fire Area A-27, Scenario 15
CA27-15S	Fire Area A-27, Scenario 15S
CA27-9	Fire Area A-27, Scenario 9
CA27-9H	Fire Area A-27, Scenario 9H
CC10-11S	Fire Area C-10, Scenario 11S
CC10-12S	Fire Area C-10, Scenario 12S
CC10-17	Fire Area C-10, Scenario 17
CC10-2BH	Fire Area C-10, Scenario 2BH
CC10-2BS	Fire Area C-10, Scenario 2BS
CC10-4	Fire Area C-10, Scenario 4
CC10-4H	Fire Area C-10, Scenario 4H
CC10-6	Fire Area C-10, Scenario 6
CC10-6H	Fire Area C-10, Scenario 6H
CC10-8	Fire Area C-10, Scenario 8
CC10-8S	Fire Area C-10, Scenario 8S
CC10-T9	Fire Area C-10, Transient Scenario 9

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
A-2802	Architectural Fire Delineation – Floor Plan, Elevation 2000' – 0"	13
A-2803	Architectural Fire Delineation – Floor Plan, Elevation 2026' – 0"	11
A-2804	Architectural Fire Delineation – Floor Plan, Elevation 2047' – 0"	26
E-018-00008	Motor Control Center Layout	36
E-018-00009	Motor Control Center Layout	40
E-018-00012	Motor Control Center Layout	24
E-018-00013	Motor Control Center Layout	32
E-018-00128	Motor Control Center Layout	17
E-018-00129	Motor Control Center Layout	14
E-018-00130	Motor Control Center Layout	14
E-018-00131	Motor Control Center Layout	15
E-018-00148	Motor Control Center Layout	16
E-2R1421 (Q)	Raceway Plan Auxiliary Building Area – 2 Elevation 2026' – 0"	5
E-2R1423A(Q)	Exposed Conduit Auxiliary Building Area – 2 Elevation 2026'-0"	15
E-2R1423B(Q)	Exposed Conduit Auxiliary Building Area – 2 Elevation 2026'-0"	18
E-2R1423D (Q)	Exposed Conduit Auxiliary Building Area – 2 Elevation 2026' – 0"	10
E-2R3312 (Q)	Exposed Conduit Control Building Area – 1 Elevation 2000' – 0"	18
E-2R3911 (Q)	Raceway Sections and Details Control Building	9
E-009-00132, Sequence 0, 1, & 3	Metal Clad Switchgear Connection Diagram	9

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-017-00522	52 Control Circuit	6
E-017-00526	52 Control Circuit	8
E-017-00547	Unit 201 Connection Diagram	10
E-21PK02	Non-Class IE 125V DC System Meter & Relay Diagram	19
E-21NB01(Q)	Lower Medium Voltage System, Class 1E 4.16kV Single Line Meter and Relay Diagram	8
E-21NB02(Q)	Lower Medium Voltage System, Class 1E 4.16kV Single Line Meter and Relay Diagram	13
E-21R1512A(Q)	Exposed Conduit Auxiliary Building Area – 2 Elevation 2047’-6”	3
M-22AB01 (Q)	Piping & Instrumentation Diagram Main Steam System	22
M-22BM01 (Q)	Piping & Instrumentation Diagram Steam Generator Blowdown System	10
M-22EG01 (Q)	Piping and Instrumentation Diagram Component Cooling Water System	10
E-23AB20A(Q)	Schematic Diagram Miscellaneous Circuits	4
E-23AE16(Q)	Schematic Diagram, Feedwater Isolation Valves	11
E-23AL01A(Q)	Schematic Diagram Motor Driven Auxiliary Feedwater Pump A	9
E-23AL02A(Q)	Schematic Diagram Motor Operated Valve ALHV0035	9
E-23AL03A(Q)	Schematic Diagram Auxiliary Feedwater Pumps, Discharge Control-Motor Operated Valves	6
E-23AL04A(Q)	Schematic Diagram Supply From ESS Service Water System	11
E-23AL05A(Q)	Schematic Diagram Auxiliary Feedwater Pumps, Discharge Control - Air Operated Valve	4
E-23BG01(Q)	Schematic Diagram Centrifugal Charging Pump A	6
E-23BN01(Q)	Schematic Diagram Refueling Water Storage Tank to Charging Pump MOV	7

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-23EG01A(Q)	Schematic Diagram Component Cooling Water Pump A	11
E-23EG01B(Q)	Schematic Diagram Component Cooling Water Pump C	8
E-23EG02	Schematic Diagram Demineralized Water Makeup to Component Cooling Water Surge Tank	2
E-23EG03	Schematic Diagram Component Cooling Water Surge Tank Vent	2
E-23EG04A(Q)	Schematic Diagram Essential Service Water Makeup to Component Cooling Water System	13
E-23EG05A(Q)	Schematic Diagram Component Cooling Water Return from Nuclear Auxiliary Component	14
E-23EG058(Q)	Schematic Diagram Component Cooling Water Supply to Nuclear Auxiliary Component	14
E-23EG07(Q)	Schematic Diagram Component Cooling Water Supply top RHR Heat Exchanger	16
E-23EG08(Q)	Schematic Diagram Component Cooling Water Supply Return From Radwaste Building	4
E-23EG09(Q)	Schematic Diagram Component Cooling Water Containment Isolation Valve	14
E-23EG09A(Q)	Schematic Diagram Component Cooling Water Containment Isolation Valve	5
E-23EG16(Q)	Schematic Diagram Component Cooling Water Heat Exchanger Outlet Temperature Control Valves	1
E-23EG17(Q)	Schematic Diagram Component Cooling Water Containment Isolation Valve	9
E-23EG17A(Q)	Schematic Diagram Component Cooling Water Containment Isolation Valve	4
E-23EG18(Q)	Schematic Diagram Component Cooling Water Containment Isolation Valves	13
E-23EF01(Q)	Schematic Diagram ESW To Air compressors Isolation Valves	5

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-23EF02(Q)	Schematic Diagram ESW To Service Water Isolation Valve EFHV23	18
E-23EF02C(Q)	Schematic Diagram ESW To Service Water Isolation Valve EFHV24	2
E-23EF03B(Q)	Schematic Diagram ESW To Service Water Isolation Valve EFHV39	1
E-23EF03C(Q)	Schematic Diagram ESW To Service Water Isolation Valve EFHV41	11
E-23EF04(Q)	Schematic Diagram ESW From Component Cooling Water Heat Exchanger Isolation Valve EFHV59	15
E-23EF05(Q)	Schematic Diagram ESW To Component Cooling Water Heat Exchanger Isolation Valves	13
E-23EF06(Q)	Schematic Diagram ESW To Ultimate Heat Sink Isolation Valves	11
E-23EF07(Q)	Schematic Diagram ESW To Containment Air Coolers Isolation Valves	14
E-23EF08(Q)	Schematic Diagram ESW From Containment Air Coolers Isolation Valve	13
E-23EF09(Q)	Schematic Diagram ESW To/From Containment Air Coolers Isolation Valves	12
E-23EF09A(Q)	Schematic Diagram ESW To/From Containment Air Coolers Isolation Valves	7
E-23EF10(Q)	Schematic Diagram ESW From Containment Air Cooler Isolation Valve Bypass	16
E-23EJ06A (Q)	Schematic Diagram Sump to No. 1 Residual Heat Removal Pump	14
E-23EJ06B (Q)	Schematic Diagram Sump to No. 2 Residual Heat Removal Pump	16
E-23GNO2A(Q)	Schematic Diagram Containment Cooler Fans B and D	18
E-23KJ01A(Q)	Schematic Diagram Diesel Generator KKJ01A Engine Control (Start/Stop Circuit)	16

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-23KJ01B(Q)	Schematic Diagram Diesel Generator KKJ01A Engine Control (D/G Trips)	3
E-23KJ02(Q)	Schematic Diagram Diesel Generator KKJ01A Annunciator and Miscellaneous Circuits	12
E-23KJ06(Q)	Schematic Diagram Diesel Generator KKJ01A Governor Control	4
E-23NE12 (Q)	Schematic Diagram Diesel Generator KKJ01A Exciter/Voltage Control	11
E-23NK11(Q)	125 Volt DC Class 1E Power System Schematic	3
E-23NE01(Q)	Standby Generation System Three Line Meter and Relay Diagram	13
E-23NE02(Q)	Standby Generation System Three Line Meter and Relay Diagram	12
E-23NK10 (Q)	125 Volt DC Class 1E Power System Schematic	21
E-23PG13	Schematic Diagram 480V L.C. Main Feeder Breakers 52PG1101, 1201, 1301, 1401, 1501, 1601, 1901, 2001	11
E-23QN71	Schematic Diagram; Antennas for Radio and Cell, Telephone Systems; Control Building, Communications Corridor and Turbine Building	5
E-23QN70	Schematic Diagram; Antennas for Radio Systems; Auxiliary Building, Radwaste Building, and Reactor Building	5
E-U3EF03(Q)	Schematic Diagram Essential Service Water "A" Self Cleaning Strainer	15
E-U3EF03A(Q)	Schematic Diagram Essential Service Water "B" Self Cleaning Strainer	0
E-018-00938	FVNR Schematic Diagram NG06EDF4	0
E-U3GD02A(Q)	Schematic Diagram Essential Service Water Electrical Room Supply Fan	5
E-018-00852	Size 5 2SP-1WD Schematic	14
E-018-00852	Wiring Diagram 2SP-1WD (Size 5)	15

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-048-00023	Test and Distribution Cabinet Wiring Diagram Equipment Number QF076	21
M-22AB01(Q)	Piping and Instrumentation Diagram, Main Steam System	22
M-22AB02(Q)	Piping and Instrumentation Diagram, Main Steam System	17
M-22AE02(Q)	Piping and Instrumentation Diagram, Feedwater System	32
M-22AL01(Q)	Piping and Instrumentation Diagram, Auxiliary Feedwater System	44
M-22AP01	Piping and Instrumentation Diagram, Condensate Storage and Transfer System	29
M-22BB01(Q)	Piping and Instrumentation Diagram, Reactor Coolant System	31
M-22BB02(Q)	Piping and Instrumentation Diagram, Reactor Coolant System	33
M-22BG03(Q)	Piping and Instrumentation Diagram, Chemical and Volume Control System	55
M-22BL01(Q)	Piping and Instrumentation Diagram, Reactor Make-up Water System	26
M-22BN01(Q)	Piping and Instrumentation Diagram, Borated Refueling Water Storage System	26
M-22EF01(Q)	Piping and Instrumentation Diagram, Essential Service Water System	79
M-22EF02(Q)	Piping and Instrumentation Diagram, Essential Service Water System	74
M-22EG01(Q)	Piping and Instrumentation Diagram, Component Cooling Water System	10
M-22EG02(Q)	Piping and Instrumentation Diagram, Component Cooling Water System	21
M-22EG03(Q)	Piping and Instrumentation Diagram, Component Cooling Water System	24

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22EM02(Q)	Piping and Instrumentation Diagram, High Pressure Coolant Injection System	21
M-22EM03	Piping and Instrumentation Diagram, High Pressure Coolant Injection System Test Line	13
M-22FC02(Q)	Piping and Instrumentation Diagram, Auxiliary Turbines, Auxiliary Feedwater Pump Turbine	24
M-22FC03	Piping and Instrumentation Diagram, Auxiliary Turbines, S.G.F.P. Turbine A	22
M-22EN01	Piping and Instrumentation Diagram, Containment Spray System	16
M-22KC01	Piping & Instrumentation Diagram, Fire Protection Turbine Building	23
8600-X-89634	Piping & Instrumentation Diagram, Diesel Driven Fire Pump PKC1002A Fire Protection System (KC1)	7
8600-X-89635	Piping & Instrumentation Diagram, Diesel Driven Fire Pump PKC1002B Fire Protection System (KC1)	7
8600-X-89636	Piping & Instrumentation Diagram, Fire Pump PKC1001A & Freeze Protection Pumps PKC1005A & B Fire Protection System (KC1)	9
8600-X-89637	Piping & Instrumentation Diagram, Pump PKC1003 & Air Compressor CKC1001 & Accumulator TKC1002 Fire Protection System (KC1)	10
8600-X-89638	Piping & Instrumentation Diagram, Yard Fire Loop Fire Protection System	6
8600-X-89639	Piping & Instrumentation Diagram, Yard Fire Loop Fire Protection System	17
8600-X-89641	Piping & Instrumentation Diagram, Yard Fire Loop Fire Protection System	22

Fire Impairments

24413	25131
24685	25240
25064	25256

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
Ameren Missouri Letter ULNRC- 05781	Request for License Amendment to Adopt NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition)"	August 29, 2011
Ameren Missouri Letter ULNRC- 06031	Table S-3 Implementation Items: 07-805-004, 07-805-005, 07-805-006, 07-805-009, 07-805-013, 07-805-014, 07-805-017, 11-805-048, 11-805-053, 11-805-056, 11-805-059, 11-805-061, 11-805-063, 11-805-068, 11-805-069, 11-805-072, 11-805-073, 11-805-074, 11-805-075, 11-805-076, 11-805-077, 11-805-078, 11-805-079, 11-805-086, 11-805-087, 11-805-088, 11-805-089, 11-805-090, 11-805-092, 11-805-093, 12-805-001, 12-805-002, 12-805-003, 12-805-004, 12-805-005, 13-805-001, 13-805-002, 13-805-003, 13-805-004, 13-805-005, 13-805-006, 13-805-007	September 24, 2013
A210.0098	Fire Preplan Manual	38
CA2112	Fire Brigade Equipment Inventory and Condition Checklists	January 13, 2014
CS-04KC02	Fire Protection System Halon Discharge Concentration Data	0
E-21013	Installation, Inspection, and Testing Details for Electrical Equipment and Cable	0
	Fire PRA Level 1 Failure Report for Complete Compartment Fire Damage	April 27, 2015
FSAR Standard Plant, Section 9.5.1	Fire Protection System	OL-20b
NRC Letter ML13274A596	Callaway Plant, Unit 1 -Issuance Of Amendment Regarding Transition To A Risk-Informed, Performance- Based Fire Protection Program In Accordance With 10 CFR 50.48(C) (Amendment No. 206)	January 13, 2014
PRAER 14-384	PRA Evaluation Request Revised Baseline CDF and LERF Values	2
Report FAI/10- 504	Callaway Plant MAAP 4.0.7 Fire PRA Sequences	0

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
Report Number R1984-001-002	Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA Applications	3
T62.7647Q	Callaway Engineering Qualification Standard – Apply Fire Probabilistic Risk Assessment Techniques and Insights	
	Spreadsheet of Internal Events and Fire Events Probabilistic Risk Assessment Basic Event Data	

Modifications

<u>Number</u>	<u>Title</u>	<u>Revision</u>
MP 05-3029	Evaluate Lower Amperage Fuses for Various 14 AWG Control Circuits in the Main Control Room	000.10
MP 07-0151	Plant Modifications to Support NFPA 805 Transition – Redundant Fuses and Isolation Switches	8
MP 09-0025	Evaluate New Conduit Support Location and Update Drawings	000.50
MP 10-0032	Installation of Non-Safety Auxiliary Feedwater Pump	2
MP 10-0032 FCN's 1 through 4	Various Titles	N/A
MP 10-0038	Alternate Emergency Power System	000.1
MP 10-0038 FCN's 1 through 28	Various Titles	N/A

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
A210.0012	Operating Quality Assurance Manual	31
APA-ZZ-00315	Configuration Risk Management Program	14
APA-ZZ-00700	Fire Protection Program	20
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	24
APA-ZZ-00741	Control of Combustible Materials	27

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00742	Control of Ignition Sources	27
APA-ZZ-00743	Fire Team Organization and Duties	26
APA-ZZ-00750	Hazard Barrier Program	32
APA-ZZ-01000	Callaway Energy Center Radiation Protection Program	40
APA-ZZ-01000, Appendix A	Control of Radioactive Material	16
EDP-ZZ-01101	Fire Protection Monitoring Program	0
EDP-ZZ-01129	Callaway Energy Center Risk Assessment	43
EIP-ZZ-00226	Fire Response Procedure for Callaway Plant	20
FPP-ZZ-0009	Fire Protection Training Program	30
FPP-ZZ-0009, Appendix 1	Initial Training Course Agenda	9
FPP-ZZ-0009, Appendix 2	Retraining Courses and Activities	13
HPT-ZZ-02005	Handling of Radioactive Material	44
HPT-ZZ-05006	RP Support of Emergency Entry Into The Radiological Controlled Area	11
MSE-KC-FW001	Fire Detection Functional and Supervisory Operability Test	35
MSE-KC-FW007	Hydrant Inspection, Lubrication and Flush	19
ODP-ZZ-00002	Equipment Status Control	76
ODP-ZZ-00002, Appendix 2	Risk Management Action for Planned Risk Significant Activities	10
ODP-ZZ-00002, Appendix 3	Risk Management Actions For Fire Risk Systems and Components	2
OSP-KC-00001	Fire Pump Starting and Fire Water Storage Tank Inspection	29
OSP-KC-03003	Fire Main Flow Test	8

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OSP-KC-03004	Fire Pump Performance Test	15
OTN-KC-00001	Fire Protection System	22
OTO-BB-00002	RCP Off-Normal	31
OTO-KC-00001	Fire Response	13
OTO-KC-00001, ADD A-21	Auxiliary Building 2047' – Control Room A/C and Filtration Units Room 'B'	0
OTO-KC-00001, ADD A-27	Auxiliary Building 2026' – Rod Drive MG Set Room	0
OTO-KC-00001, ADD C-10	Control Building 2000' South ESF Switchgear Room	0
OTO-KC-00001, ADD C-27	Control Building 2047' Main Control Room	0
OTO-ZZ-00001	Control Room Inaccessibility	40
OTO-ZZ-00002	Control Room Operations with Fire	7
OTN-AE-00001 Addendum 1	S/U MFP (PAE02) Operations	4
OTO-KC-00001 Addendum A-27	Auxiliary Building 2026' – Rod Drive MG Set Room	0
OTO-KC-00001 Addendum C-10	Control Building 2000' – South ESF Switchgear Room	0
QSP-ZZ-65046	Fire Barrier Inspection	15
RTN-HC-01000	Preparation of Radwaste / Radioactive Material For Shipment	24
SDP-KC-00001	Requirements For and Duties of Compensatory Fire Watches	10
Emergency Coordinator Supplemental Guideline, Att. CC	Containment Flooding Using Pumper Truck	16

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
Emergency Coordinator Supplemental Guideline, Att. DD	Containment Flooding Using Pumper Truck – Direct Method	16
EIP-ZZ-00101 Add. 2, Att. 1	Emergency Action Level Technical Bases Document	9

Work Orders

13508507	15500579	11508471	11001584.500
14504532	15501435	07513585.500	11001586.500
14509893	15501563	09505032.500	
14514021	13503355	11502630.500	
15500578	14514279	11001581.550	