



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 30, 2018

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

SUBJECT: CALLAWAY PLANT, UNIT NO. 1 - ISSUANCE OF AMENDMENT RE: FINAL SAFETY ANALYSIS REPORT REVISION COMPLIANCE WITH REGULATORY GUIDE 1.106 REGARDING MOTOR-OPERATED VALVES THERMAL OVERLOAD PROTECTION (CAC NO. MF9585; EPID L-2017-LLA-0210)

Dear Mr. Diya:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 218 to Renewed Facility Operating License No. NPF-30 for the Callaway Plant, Unit No. 1. The amendment consists of changes to the Final Safety Analysis Report (FSAR) in response to your application dated April 6, 2017, as supplemented by letter dated February 5, 2018.

The amendment revises the FSAR to clearly describe conformance with NRC Regulatory Guide 1.106, Revision 1, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves."

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "L. John Klos".

L. John Klos, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures:

1. Amendment No. 218 to NPF-30
2. Safety Evaluation

cc: Listserv



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UNION ELECTRIC COMPANY

CALLAWAY PLANT UNIT NO. 1

DOCKET NO. 50-483

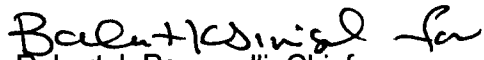
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 218
Renewed License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Union Electric Company (the licensee), dated April 6, 2017, as supplemented by letter dated February 5, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 218, Renewed Facility Operating License No. NPF-30 is hereby amended to authorize revision to Callaway Plant, Unit No. 1, Final Safety Analysis Report as set forth in the licensee's application dated April 6, 2017, as supplemented by letter dated February 5, 2018, and evaluated in the NRC staff's evaluation enclosed with this amendment.
3. This amendment is effective as of its date of issuance, and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Robert J. Pascarelli, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: May 30, 2018



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 218 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT NO. 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application dated April 6, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17097A425), as supplemented by letter dated February 5, 2018 (ADAMS Accession No. ML18036A667), Union Electric Company (the licensee) requested changes to the Final Safety Analysis Report (FSAR) of the Renewed Facility Operating License No. NPF-30 for the Callaway Plant, Unit No. 1 (Callaway).

The proposed amendment would revise the Callaway FSAR, Chapter 3, Appendix 3A, "Conformance to NRC Regulatory Guides," and Chapter 8, Section 8.3.1.1.2.e, "480-V Motor Control Center Overcurrent Relaying" (ADAMS Accession Nos. ML17067A360 and ML17076A375, respectively), to incorporate a clear description of how Callaway conforms with NRC Regulatory Guide (RG) 1.106, Revision 1, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves," dated March 1977 (ADAMS Accession No. ML003740323), in regard to the control and/or bypassing of thermal overload protection (TOP) devices for motor-operated valves (MOVs) during routine/maintenance testing of such valves. The proposed change would allow MOV TOP devices to remain bypassed during routine valve stroke surveillances (such that the TOP bypass jumpers are not removed during such testing), which is not in strict conformance with RG 1.106.

The supplemental letter dated February 5, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on July 18, 2017 (82 FR 32885).

2.0 REGULATORY EVALUATION

The proposed change revises and clarifies the FSAR description for Callaway's conformance with NRC RG 1.106, Revision 1, concerning Regulatory Position C.1.

The licensee's proposed change is to maintain the TOP devices bypassed during surveillance/periodic stroke tests of MOVs (such that the jumpers used to bypass the TOP devices are not removed), which is not in strict conformance with RG 1.106, Revision 1, Regulatory Position C.1. Text would thus be added to FSAR Appendix 3A and Section 8.3.1.1.2.e to indicate that Regulatory Position C.1 of RG 1.106, Revision 1 is followed to the extent that TOP devices are continuously bypassed except during maintenance testing/activities. The added text would make it clear that MOV TOP devices remain bypassed during valve stroke surveillances (such that the TOP bypass jumpers are not removed during such testing).

The NRC requires licensees to establish inservice testing (IST) programs in accordance with the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance (OM) of Nuclear Power Plants (ASME OM Code).

Specifically, the regulation, 10 CFR 50.55a(b)(3)(ii), "OM condition: Motor-Operated Valve (MOV) testing," states, in part:

Licensees must comply with the provisions for testing MOVs in ASME OM Code ISTC 4.2, 1995 Edition with the 1996 and 1997 Addenda, or ISTC-3500, 1998 Edition through the latest edition and addenda incorporated by reference in paragraph (a)(1)(iv) of this section, and must establish a program to ensure that MOVs continue to be capable of performing their design basis safety functions.

In response to concerns regarding MOV performance, the NRC staff issued Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance (Generic Letter No. 89-10) – 10 CFR 50.54(f)," dated June 28, 1989 (ADAMS Accession No. ML031150300), which requested that nuclear power plant licensees and construction permit holders ensure the capability of MOVs in safety-related systems to perform their intended functions by reviewing MOV design bases, verifying MOV switch settings initially and periodically, testing MOVs under design-basis conditions where practicable, improving evaluations of MOV failures and necessary corrective actions, and trending MOV problems.

Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 18, "Inspection and testing of electric power systems," states in part, that electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing to demonstrate operability and functional performance.

3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the RG 1.106, Revision 1 and Regulatory Position C.1. The RG 1.106, Revision 1, Regulatory Position C.1 ensures that TOP devices do not needlessly prevent motors from performing their safety-related function.

The proposed changes (described in Section 2.1 of the license amendment request (LAR) dated April 6, 2017) would allow bypassing TOPs during the surveillance stroke tests when the risk of motor damage to the valve is low, which is a variation to RG 1.106, Regulatory Position C.1.

During the surveillance testing of safety-related MOVs there has been no maintenance performed on the valve and the valve is only being stroked to verify operation. A list of the safety-related MOVs subject to this variation of Regulatory Position C.1 is listed in Enclosure 3, "Safety Related MOV Surveillance List," of the licensee's supplemental letter dated February 5, 2018. In addition, the licensee stated in the supplemental letter that there have not been any stroke tests where failure to meet the surveillance acceptance criteria resulted in MOV motor degradation or motor damage in the last 5 years and that the Callaway MOV program is compliant with 10 CFR 50.55a(b)(3)(ii) and does not require dynamic MOV testing on any specified frequency.

The NRC staff noted that bypassing during the surveillance stroke tests do not present an elevated risk that the motors will overheat, and also, motor protection is based on proper operation of TOP devices and correct sizing of thermal overloads. Surveillance tests do not determine the thermal overload size and proper operation of TOP devices.

The licensee stated in Section 3, "Technical Evaluation" of the LAR dated April 6, 2017, that the MOV starter circuits at Callaway were not designed with circuit provisions for bypassing TOP devices. Thus, bypassing TOPs requires the use of jumpers. But removing thermal overload bypass jumpers for surveillance stroke tests may carry more risk with respect to ensuring that the valves can carry out their safety function of stroking as required during an accident. There is an inherent risk of removing and reinstalling thermal overload jumpers because they may not be reinstalled properly. Frequent bypassing and reinstating TOP for MOVs could lead to stripped screws, damaged terminal boards, and broken lugs as a result of the repeated loosening and tightening of connections. When loosening and tightening these lugs, stress is placed on the termination lug, which may result in failure if done repeatedly. In addition, a subsequent stroke test may be required to ensure that the jumper is landed appropriately and does not prevent valve movement. It is not possible to remove the jumper for this stroke test, which would be part of the periodic testing. So, not all periodic tests can be done with the jumper removed.

During corrective or preventive maintenance (PM) for MOVs, where the valves do not require stroking, the risk for motor damage is greater, therefore, the jumpers are removed. A list of the safety-related valves subject to this application of Regulatory Position C.1, of RG 1.106, Revision 1, is stated in the Enclosure 2, "Safety Related MOV PM List by Component," of the licensee's supplemental letter dated February 5, 2018.

The NRC staff finds the proposed change, which is a variation to RG 1.106, Revision 1, Regulatory Position C.1 of bypassing TOP devices during surveillance tests while jumpers remain is acceptable. This scenario occurs while motor damage risk is low. The staff finds that this practice continues to ensure that MOVs carry out their safety function of stroking as required during an accident. Additionally, this reduces the potential for human error when jumpers are removed and then reinstalled which then may land in the wrong location, lead to stripped screws, damage of terminal boards, and broken lugs as a result of the repeated loosening and tightening of connections. The staff also concludes that any potential problems associated with the TOP devices will be identified in the licensee's maintenance and testing activities.

Based on the technical evaluation above and Callaway's operating experience, the NRC staff finds that the licensee's proposed variation with respect to RG 1.106, Revision 1, Regulatory Position C.1, which will allow bypassing TOP devices during surveillance tests, is consistent with the requirements of Appendix A to 10 CFR Part 50; GDC 18; Quality Assurance Program to be applied to safety-related components that are described in Appendix B to 10 CFR Part 50; and 10 CFR 50.55a(b)(3)(ii). Therefore, the staff finds the proposed change is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Missouri State official was notified of the proposed issuance of the amendment on May 3, 2018. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding published in *Federal Register* on July 18, 2017 (82 FR 32885). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: H. Kodali

Date: May 30, 2018

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