

August 13, 1996

Mr. Donald Schnell
Senior Vice President - Nuclear
Union Electric Company
Post Office Box 149
St. Louis, Missouri 63166

SUBJECT: AMENDMENT NO. 115 TO FACILITY OPERATING LICENSE NO. NPF-30 -
CALLAWAY PLANT, UNIT 1 (TAC NO. M95514)

Dear Mr. Schnell:

The Commission has issued the enclosed Amendment No. 115 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment authorizes revision of the Final Safety Analysis Report (FSAR) for the Callaway Plant, Unit 1 to incorporate a modification to the facility that will reduce the single failure trip potential for the main feedwater and bypass valves. This amendment is in response to your application dated May 29, 1996.

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

Sincerely,

Original Signed By

Kristine M. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 115 to NPF-30
2. Safety Evaluation

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NAME	E ^{edd} Peyton	K ^{KMT} Thomas	T ^{mm} Marsh		W ^W Bateman
DATE	7/26/96	7/26/96	7/11/96	8/7/96	8/1/96

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

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 115
License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Union Electric Company (UE, the licensee) dated May 29, 1996, 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. 115, the license is amended to authorize revision of the Final Safety Analysis Report (FSAR) as set forth in the application for amendment by Union Electric Company dated May 29, 1996. Union Electric Company shall update the FSAR to reflect the revised description authorized by this amendment in accordance with 10 CFR 50.71(e).

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3. This amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Kristine M. Thomas

Kristine M. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Date of Issuance: August 13, 1996



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 115 TO FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By letter dated May 29, 1996 Union Electric Company, the licensee, requested an amendment to Facility Operating License NPF-30 for the Callaway Plant. The requested amendment involves an unreviewed safety question as defined in 10 CFR 50.59 "Changes, tests and experiments." The unreviewed safety question involves a plant modification that will reduce the single failure trip potential for the main feedwater control and bypass valves (MFC&BVs). The purpose of the proposed modification is to reduce the number of inadvertent plant trips caused by inadvertent closure of the MFC&BVs due to a single failure. Reducing the single failure trip potential for these valves increases the probability that the valves will not perform their safety function (safety function is to close) and, thus, increases the probability of occurrence of a malfunction of equipment important to safety. Therefore, pursuant to 10 CFR 50.59, staff approval of the modification is required prior to implementation.

Each of four steam generator (S/G) main feedwater lines contains a main feedwater isolation valve (MFIV) and a main feedwater control valve (MFCV) in series. Each MFCV has a main feedwater bypass valve (MFBV) in parallel with it. The MFCVs are air-operated angle valves that control feedwater flow to the S/Gs between 20 percent and full power. The MFBVs are air-operated globe valves used to control flow to the S/Gs up to approximately 25 percent power.

The safety function of the MFC&BVs credited in the accident analysis is to provide a backup to the MFIVs for the potential failure of the MFIV to close. This safety function is accomplished on receipt of a feedwater isolation signal (FWIS) via an emergency closure signal from the engineered safety feature actuation system (ESFAS). For emergency closure, solenoid valves on each MFC&BV de-energize to release air pressure which results in valve closure.

The existing pneumatic valve control configuration for the MFC&BVs consists of two normally-closed ASCO three-way solenoid valves energized from separate Class 1E sources. A FWIS causes solid state protection system (SSPS) slave relays to energize and open normally-closed contacts. This interrupts power to the two normally-energized solenoid valves in the MFC&BV pneumatic control system. The solenoid valves are connected in series so that de-energizing

either valve (1 out of 2 logic) opens a vent path from the booster relay (for the MFCVs) or valve actuator (for the MFBVs) to atmosphere. This results in depressurizing the associated reverse-acting actuator, which allows a spring to force the valve to a closed position. Valve closure time is less than or equal to 5 seconds.

The proposed modified pneumatic control configuration for the MFC&BVs will consist of two ASCO universal solenoid valves connected in parallel. Either valve must be energized to align the air source to the booster relay or the valve actuator. De-energization of both solenoid valves (2 out of 2 logic) will be required to vent the booster relay or the valve actuator to atmosphere, which in turn will allow spring pressure to close the valve. This configuration will prevent a single solenoid or power supply failure from causing a plant trip due to loss of feedwater.

2.0 EVALUATION

With the modified design, if one of the ASCO universal solenoid valves fails to operate when required, the respective MFCV or MFBV would not close as designed on a FWIS. However, no other single failures would be postulated and the MFIVs would be assumed to operate as designed. Therefore, the safety function to isolate main feedwater flow to the S/Gs would still occur. Each MFIV is a 14-inch gate valve with a dual redundant hydraulic actuator. Two separate pneumatic/hydraulic power trains are provided for each MFIV, each receiving a signal from a separate ESFAS channel. Either of the dual-redundant power trains is capable of closing the MFIV. The assumed single failure of one of the redundant MFIV actuation trains will not prevent the MFIV from closing. Thus, there is no single component failure, other than the valve itself (such as a stuck MFIV), that will prevent the MFIV from closing. Therefore, there is also no single failure that could simultaneously affect the safety function of both a MFIV and a MFC&BV, and S/G feedwater isolation is assured given any single active failure.

While the proposed modification reduces the probability of a reactor trip, it slightly increases the probability that the feedwater isolation function will fail. This is because the current design requires actuation of only one FWIS train to close the MFC&BVs, whereas the proposed design will require actuation of both trains. However, this increased probability in loss of isolation function is minimized by the redundancy designed into the actuation system for the MFIVs. It is also minimized by the fact that the loss of power and loss of air failure modes still result in valve closure upon receipt of an FWIS. Any associated increase in risk caused by the increased probability that the feedwater isolation function will fail tends to be offset by a corresponding decrease in risk associated with the reduction in inadvertent reactor trips. In fact, the licensee stated that the requantified (requantified to account for the new as modified failure rate) feed and steam line break event trees from the Callaway Probabilistic Risk Analysis (PRA), showed no discernible increase in core damage frequency (CDF).

The safety related function of the main feedwater system is to provide containment isolation and S/G isolation. The containment isolation function is provided by the MFIV outside containment and a check valve inside containment. The proposed modification will not affect the containment isolation function. The design basis for the S/G isolation function is to isolate feedwater flow in ≤ 5 seconds upon receipt of a FWIS assuming any single active failure. The proposed modification will continue to meet the single failure criterion for the feedwater isolation function and will not affect the ability of either the MFC&BVs or the MFIVs to close in ≤ 5 seconds. Therefore, the proposed modification will be in accordance with the original (and current) licensing design basis.

Based on its review as described above, the staff concludes that the proposed modification is in accordance with the original licensing design basis and will reduce the potential for loss of feedwater initiated reactor trips without a significant increase in risk as shown by the licensee's revised PRA. The staff, therefore, concludes that the proposed modification is acceptable.

In its submittal, the licensee stated that because of the redundancy provided in the MFIV actuation system, the MFC&BVs are non-primary success path functions in the context of Criterion 3 of the NRC Policy Statement on Technical Specifications. Although the staff does not agree with the licensee's conclusion that the MFC&BVs do not meet Criterion 3 of the Policy Statement (Criterion 3 of 10 CFR 50.36) it does not affect the conclusion that the proposed modification is acceptable for the reasons described above.

3.0 STATE CONSULTATION

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

4.0 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 (61 FR 34900). 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.

5.0 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) 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: W. Lefave

Date: August 13, 1996