

March 28, 2006

Mr. Charles D. Naslund  
Senior Vice President and Chief Nuclear Officer  
Union Electric Company  
Post Office Box 620  
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE:  
CONTAINMENT SPRAY AND COOLING SYSTEMS (TAC NO. MC8841)

Dear Mr. Naslund:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 171 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated October 26, 2005 (ULNRC-05174).

The amendment revises Required Action D.1, in TS 3.6.6, "Containment Spray and Cooling Systems," to require plant shutdown if both containment cooling trains are out of service, which is more conservative than the previous requirement that allowed 72 hours to restore one of the inoperable trains. There are also changes to other required actions in TS 3.6.6 to reflect the revision to Required Action D.1.

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

Sincerely,

**/RA/**

Jack Donohew, Senior Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 171 to NPF-30  
2. Safety Evaluation

cc w/encls: See next page

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NAME	JDonohew	LFeizollahi	TBoyce	Suttal (NLO)	DTerao
DATE	1/17/06	1/17/06	2/2/06	3/15/06	3/27/06

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UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 171  
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 October 26, 2005, 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-30 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 171 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

**/RA/**

David Terao, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: March 28, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 171

RENEWED FACILITY OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by an amendment number and contains marginal lines indicating the areas of change.

REMOVE

3.6-19

INSERT

3.6-19

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 171 TO FACILITY OPERATING LICENSE NO. NPF-30  
UNION ELECTRIC COMPANY  
CALLAWAY PLANT, UNIT 1  
DOCKET NO. 50-483

## 1.0 INTRODUCTION

By application dated October 26, 2005 (Agencywide Documents Access Management System Accession No. ML053110157), Union Electric Company (the licensee) requested changes to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1 (Callaway). The licensee is proposing to revise Technical Specification (TS) 3.6.6, "Containment Spray and Cooling Systems," to change Required Action D.1 that currently allows 72 hours of operation with both containment cooling trains out of service as long as both containment spray trains are operable. The required action would be revised to impose the more stringent requirement of requiring plant shutdown if both containment cooling trains are out of service instead of allowing the 72 hours to restore an inoperable train. There are also changes to other required actions in TS 3.6.6 to reflect the revision to Required Action D.1, including the required action for two containment spray trains being inoperable.

## 2.0 REGULATORY EVALUATION

For the TSs, Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.36), "Technical specifications," the Nuclear Regulatory Commission (NRC) established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TSs include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements; (4) design features; and (5) administrative controls. The rule does not specify the particular requirements to be included in a plant's TSs. As stated in 10 CFR 50.36(c)(2)(i), the "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications..."

The remedial actions in the TSs are specified in terms of conditions, required actions, and completion times (CTs) to complete the required actions. When an LCO is not being met, the CTs specified in the TSs are the amount of time allowed in the TSs for completing the specified LCO required actions. The conditions and required actions specified in the TSs must be acceptable remedial actions for the LCO not being met, and the CTs must be reasonable for completing the required actions.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Proposed Changes to the TSs

In its application, the licensee proposed the following changes to TS 3.6.6:

1. Delete the current Condition D for two containment cooling trains inoperable with the Required Action D.1 to restore one containment cooling train to operable status within the CT of 72 hours.
2. Renumber current Condition E for the required action and associated CT of current Conditions C or D not being met. Also, renumber the current Required Actions E.1 and E.2. The current Condition D is deleted from current Condition E, but the required actions and the CT are not changed.
3. Renumber the current Condition F for "Two containment spray trains inoperable OR Any combination of three or more trains inoperable."
4. Replace the second part of the current Condition F, for "Any combination of three or more trains inoperable," by "Two containment cooling trains inoperable."
5. Replace the current Required Action F.1 by the current Required Actions E.1 and E.2 and associated CTs. Keep the required actions numbered E.1 and E.2 because current Condition F would be renumbered by the deletion of current Condition D.

#### 3.2 Description of Containment Spray and Cooling Systems

The licensee described the containment spray and cooling systems in its application. It stated that both systems mitigate accident conditions in that they provide containment atmosphere cooling to limit the post-accident containment pressure and temperature to less than the design values. Also, the containment spray would remove radioiodine from containment, and this and the reduction in containment pressure would reduce the release of radioiodines from containment to the environment to within the guidelines specified in 10 CFR Part 100. Because of this safety function, the containment spray and cooling systems are classified as engineered safety features.

As stated in the current Bases for TS 3.6.6, the containment spray system consists of two separate trains, each of equal capacity and capable of providing 100 percent of the required design basis containment atmosphere cooling and iodine removal. Each train includes a spray pump, spray headers, nozzles, valves, and piping. There is an injection phase of spraying water into containment where the water collects in the containment sumps, and a re-circulation phase where the water in the sumps is re-circulated from the sumps through containment spray and the residual heat removal heat exchangers to remove heat from containment. For the containment cooling system, there are also two trains, each of which is capable of providing 100 percent of the required design-basis cooling. Each train has two fan units supplied with cooling water from a separate train of essential service water and this cooling water also removes heat from containment.

The current TS LCO 3.6.6 requires that two containment spray trains and two containment cooling trains are required to be operable in reactor Modes 1, 2, 3, and 4. The current Condition D for TS LCO 3.6.6 of two containment cooling trains being operable allows 72 hours (i.e., current Required Action D.1) to restore one such train to operable status. In its application, the licensee stated that based on evaluations for Callaway this allowance to restore an inoperable containment cooling train is not conservative.

### 3.3 Evaluation of the Proposed TS Changes

#### 3.3.1 Delete Current Condition D and Revise Current Condition F

The licensee stated that if both containment cooling systems are inoperable, the design heat removal capacity required during the post-accident period cannot be met. This is because, although containment spray system complements the containment cooling systems in reducing containment pressure and temperature in an accident, the containment spray system is not redundant to the containment cooling system in removing heat from containment (i.e., one containment spray train can not remove 100 percent of the design basis required containment cooling).

The licensee stated that if both containment cooling trains are inoperable, Callaway is not within its analyzed operating conditions and the plant should be shut down and placed in a reactor mode where TS LCO 3.6.6 does not apply (i.e., Mode 5). However, the current TS LCO 3.6.6 Condition D for two inoperable cooling trains allows 72 hours for one inoperable train to be restored to operable status. This is before requiring the plant to start shutting down if an inoperable train cannot be restored to operable status. The licensee stated that, for 72 hours, the plant could be without a system that is capable of removing the design basis required heat removal from containment during an accident and keeping the containment pressure and temperature within the design values. The licensee proposed to change the required actions in the current TS LCO 3.6.6 Condition D to require the plant to be in Mode 3 within 6 hours and in Mode 5 within 36 hours.

In reviewing the application, the NRC staff had a conference call with the licensee on January 27, 2006, to find out if one containment spray train and one containment cooling train were sufficient in themselves to provide 100 percent of the required design basis containment atmosphere cooling and iodine removal. The licensee stated that the case of only one containment spray train and one containment cooling train being operable is addressed in the Callaway Final Safety Analysis Report (FSAR). FSAR Sections 6.2.1.3 and 6.2.1.4 discuss the containment response to a postulated loss-of-coolant accident (LOCA) and to a postulated secondary pipe (i.e., a steam line) rupture, respectively, inside containment. This is also addressed in FSAR Table 6.1.1-3, "Engineered Safety Features Design Parameters for Containment Analysis." The most severe single active failure is loss of one diesel generator, which is the same as loss of one containment spray train and one containment cooling train. With two containment spray and cooling trains provided, this means that for the worst single active failure there is only one containment spray train and one containment cooling train that is operable. For this case, by the FSAR, there is 100 percent of the required design basis containment atmosphere cooling and iodine removal.



The licensee's proposed required actions and CTs are the same as those specified in the current TS LCO 3.6.6 for Condition E. The current Condition E is for the case of not restoring an inoperable containment cooling train in 72 hours when both trains are inoperable.

Therefore, for two containment cooling trains inoperable, the licensee has proposed to delete the allowance of 72 hours to restore an inoperable train to operable status and to immediately enter required actions to be in Mode 3 within 6 hours and Mode 5 within 36 hours, which is appropriate for a loss of containment cooling function. These proposed required actions are more conservative than the required action and CTs for LCO 3.0.3, which provides required actions when an LCO is not met, and either the associated required actions are not met or no applicable required actions are specified.

Because the proposed containment spray system is not redundant to the containment cooling system in maintaining the containment pressure and temperature within design limits in an accident, the NRC staff concludes that the current Condition D is not sufficiently conservative to protect the containment when both containment cooling trains are inoperable. However, because the proposed required actions to be in Mode 3 within 6 hours and in Mode 5 within 36 hours are more conservative than the required actions and CTs in LCO 3.0.3, the NRC staff concludes that the proposed required actions and CTs for both containment cooling trains inoperable are acceptable.

In proposing to delete the current TS LCO 3.6.6 Condition D for two containment cooling trains inoperable, the licensee has proposed to replace the second actions condition in current TS LCO 3.6.6 Condition F for any combination of three or more trains of the containment spray and cooling systems by the condition of two containment cooling trains inoperable. With current Condition D deleted, then the plant will not be operated with two containment cooling trains being inoperable and there is no need for the condition of any combination of three or more trains being inoperable. The NRC staff agrees with this conclusion. Therefore, the licensee has proposed to replace the second condition in the current LCO 3.6.6 Condition F with the condition of two containment cooling trains being inoperable. In doing this and proposing the required actions stated above of being in Mode 3 within 6 hours and Mode 5 within 36 hours, the licensee is also proposing to have the same required actions for the condition of two containment spray trains inoperable. These required actions and CTs are more conservative than the current required action of entering LCO 3.0.3 for two containment spray trains inoperable. Based on this, the NRC staff concludes that (1) the proposed replacement of "Any combination of three or more trains inoperable" by "Two containment cooling trains inoperable" and (2) the change in the required action and CT for the condition of "Two containment spray trains inoperable" are acceptable.

### 3.3.2 Renumber LCO 3.6.6 Conditions E and F

By deleting current LCO 3.6.6 Condition D, the other LCO 3.6.6 conditions need to be renumbered. Current Condition E would become new Condition D and the reference to Condition D in the condition would also be deleted because that Condition D has been deleted. The current Required Actions E.1 and E.2 would be renumbered Required Actions D.1 and D.2, but the required actions and the CTs would not be changed. Also, the current LCO 3.6.6 Condition F would then be renumbered new Condition E and its required actions would be numbered Required Actions E.1 and E.2. The new required actions for the current Condition F were addressed in Section 3.3.1 of this safety evaluation.

### 3.3.3 Conclusion

Because the revision to the conditions, required actions, and CTs for LCO 3.6.6 are acceptable as discussed above, the NRC staff concludes that they meet 10 CFR 50.36 and, therefore, the proposed amendment 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. 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 (71 FR 2597; published January 17, 2006). 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) 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: Jack Donohew

Date: March 28, 2006

Callaway Plant, Unit 1

cc:

Professional Nuclear Consulting, Inc.  
19041 Raines Drive  
Derwood, MD 20855

John O'Neill, Esq.  
Shaw, Pittman, Potts & Trowbridge  
2300 N. Street, N.W.  
Washington, D.C. 20037

Mr. Mark A. Reidmeyer, Regional  
Regulatory Affairs Supervisor  
Regulatory Affairs  
AmerenUE  
P.O. Box 620  
Fulton, MO 65251

U.S. Nuclear Regulatory Commission  
Resident Inspector Office  
8201 NRC Road  
Steedman, MO 65077-1302

Mr. Les H. Kanuckel  
Manager, Quality Assurance  
AmerenUE  
P.O. Box 620  
Fulton, MO 65251

Missouri Public Service Commission  
Governor Office Building  
200 Madison Street  
Jefferson City, MO 65102-0360

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011-4005

Mr. H. Floyd Gilzow  
Deputy Director for Policy  
Missouri Department of Natural Resources  
P. O. Box 176  
Jefferson City, MO 65102-0176

Mr. Rick A. Muench  
President and Chief Executive Officer  
Wolf Creek Nuclear Operating Corporation  
P.O. Box 411  
Burlington, KA 66839

Mr. Dan I. Bolef, President  
Kay Drey, Representative  
Board of Directors Coalition for the  
Environment  
6267 Delmar Boulevard  
University City, MO 63130

Mr. Lee Fritz, Presiding Commissioner  
Callaway County Court House  
10 East Fifth Street  
Fulton, MO 65151

Mr. David E. Shafer  
Superintendent, Licensing  
Regulatory Affairs  
AmerenUE  
P.O. Box 66149, MC 470  
St. Louis, MO 63166-6149

Mr. Keith D. Young  
Manager, Regulatory Affairs  
AmerenUE  
P.O. Box 620  
Fulton, MO 65251

Mr. Keith G. Henke, Planner  
Division of Community and Public Health  
Office of Emergency Coordination  
930 Wildwood P.O. Box 570  
Jefferson City, MO 65102

Certrec Corporation  
4200 South Hulen, Suite 630  
Fort Worth, TX 76109

Director, Missouri State Emergency  
Management Agency  
P.O. Box 116  
Jefferson City, MO 65102-0116