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

June 17, 2014

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

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATION 3.7.9, "ULTIMATE HEAT SINK (UHS)" (TAC NO. MF0378)

Dear Mr. Diya:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 208 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 December 13, 2012, as supplemented by letters dated June 11, 2013, and January 16 and April 9, 2014.

The amendment revises TS 3.7.9, "Ultimate Heat Sink (UHS)," to incorporate more restrictive UHS level and pond temperature limits which are specified in Surveillance Requirements (SRs) 3.7.9.1 and 3.7.9.2, respectively. In addition, new SR 3.7.9.4 is added to verify that the UHS cooling tower fans respond appropriately to automatic start signals.

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,

Jennifer Reed for

Carl F. Lyon, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures:
1. Amendment No. 208 to NPF-30
2. Safety Evaluation

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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. 208
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 December 13, 2012, as supplemented by letters dated June 11, 2013, and January 16 and April 9, 2014, 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. 208 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 120 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating
License No. NPF-30 and
Technical Specifications

Date of Issuance: June 17, 2014

ATTACHMENT TO LICENSE AMENDMENT NO. 208

FACILITY OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Replace the following pages of the Facility Operating License No. NPF-30 and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Facility Operating License

REMOVE	INSERT
-3-	-3-

Technical Specifications

REMOVE	INSERT
3.7-27	3.7-27

(4) UE, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source of special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(5) UE, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

UE is authorized to operate the facility at reactor core power levels not in excess of 3565 megawatts thermal (100% power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan*

The Technical Specifications contained in Appendix A, as revised through Amendment No. 208 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) Environmental Qualification (Section 3.11, SSER #3)**

Deleted per Amendment No. 169.

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* Amendments 133, 134, & 135 were effective as of April 30, 2000 however these amendments were implemented on April 1, 2000.

** The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report and/or its supplements wherein the license condition is discussed.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.9.1	Verify water level of UHS is ≥ 834.0 ft mean sea level.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Verify average water temperature of UHS is ≤ 89°F.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.3	Operate each cooling tower fan for ≥ 15 minutes in both the fast and slow speed.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.4	Verify each cooling tower fan starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 208 TO

FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application dated December 13, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12349A321), as supplemented by letters dated June 11, 2013, and January 16 and April 9, 2014 (ADAMS Accession Nos. ML13163A008, ML14016A337, and ML14099A206, respectively), Union Electric Company (dba Ameren Missouri, the licensee) requested changes to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1 (Callaway). The licensee proposed to revise Technical Specification (TS) 3.7.9, "Ultimate Heat Sink (UHS)," to incorporate more restrictive UHS level and pond temperature limits which are specified in Surveillance Requirements (SRs) 3.7.9.1 and 3.7.9.2, respectively. In addition, new SR 3.7.9.4 would be added to verify that the UHS cooling tower fans respond appropriately to automatic start signals.

The supplemental letters dated June 11, 2013, and January 16 and April 9, 2014, 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* on March 4, 2013 (78 FR 14138).

The requested change is intended to address a non-conservative TS as discussed in the NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," dated December 29, 1998 (ADAMS Accession No. ML031110108). The original plant safety analysis appropriately considered the plant response to a large break loss-of-coolant accident (LBLOCA) and the single failure of one protection train, including the associated emergency service water (ESW) train. However, it did not consider an LBLOCA with both ESW trains in service and the single failure of UHS bypass valve failing to close. Both ESW trains are in operation after an LBLOCA and one of the UHS bypass valves is assumed to fail to close. As a result, a greater demand would be placed on the UHS function in terms of minimum heat transfer from the ESW-supported loads and maximum evaporative losses from the UHS. Based on the updated safety analysis, the licensee proposes to revise TS 3.7.9 with

more restrictive SRs. The proposed change corrects the TSs in order to comply with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.36(c)(3), as discussed in the safety evaluation below.

Specifically, the licensee proposes to revise SR 3.7.9.1 to increase the minimum initial UHS water level from greater than or equal to (≥) 831.25 feet (ft) mean sea level to ≥ 834.0 ft mean sea level, and revise SR 3.7.9.2 to decrease the maximum initial average water temperature in the UHS pond from less than or equal (≤) to 90 degrees Fahrenheit (°F) to ≤ 89 °F. Further, new SR 3.7.9.4 would be added to verify that each UHS cooling tower fan starts automatically on an actual or simulated actuation signal.

2.0 REGULATORY EVALUATION

The NRC staff reviewed the proposed TS changes in the application against the regulatory requirements and guidance listed below to establish reasonable assurance that the systems and components affected by the proposed TS changes will continue to perform their safety functions.

2.1 Regulatory Requirements

The NRC staff considered the following regulatory requirements in its review:

- In Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications," the Commission established its regulatory requirements related to the contents of the TS. Specifically, 10 CFR 50.36 states, in part, that

  > Each applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section."

- In addition, 10 CFR 50.36(c)(3) states,

  > Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions of operation will be met.

- Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, Criterion 19, "Control room," states, in part, that

  > A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents... Equipment at appropriate locations outside the control room shall be provided (1) with a

design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

- 10 CFR 50.120, "Training and qualification of nuclear power plant personnel"

2.2 Regulatory Guidance

The NRC staff considered the following regulatory guidance in its review:

- Regulatory Guide (RG) 1.105, "Setpoints for Safety-Related Instrumentation," Revision 3, issued December 1999 (ADAMS Accession No. ML993560062), describes a method that the NRC staff considers acceptable for complying with the agency's regulations for ensuring that setpoints for safety-related instrumentation are initially within, and remain within, the TS limits. RG 1.105 endorses Part I of Instrument Society of America (ISA) Standard 67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation," subject to NRC staff clarifications. The NRC staff used this guidance to establish the adequacy of the licensee's setpoint calculation methodologies and the related plant surveillance procedures.

- NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition." Chapter 13 addresses "Conduct of Operation." Specific subchapters considered in this review were Chapters 13.2.1, "Reactor Operator Requalification Program; Reactor Operator Training", Revision 3; and 13.5.2.1, "Operating and Emergency Operating Procedures," Revision 3. Chapter 18, Revision 2 provides review guidance for "Human Factors Engineering."

- NUREG-1764, Revision 1, "Guidance for the Review of Changes to Human Actions," September 2007 (ADAMS Accession No. ML072640413).

- NUREG-0700, Revision 2, "Human-System Interface Design Review Guidelines," May 2002 (ADAMS Accession No. ML021700373).

- NUREG-0711, Revision 2, "Human Factors Engineering Program Review Model," February 2004 (ADAMS Accession No. ML110140727).

- NRC Information Notice 97-78, "Crediting Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times," dated October 23, 1997 (ADAMS Accession No. ML031050065).

3.0 TECHNICAL EVALUATION

3.1 Proposed TS Changes

Current SR 3.7.9.1 states:

> Verify water level of UHS is ≥ 831.25 ft mean sea level.

Revised SR 3.7.9.1 would state:

> Verify water level of UHS is ≥ 834.0 ft mean sea level.

Current SR 3.7.9.2 states:

> Verify average water temperature of UHS is ≤ 90°F.

Revised SR 3.7.9.2 would state:

> Verify average water temperature of UHS is ≤ 89°F.

New SR 3.7.9.4, with a frequency of "In accordance with the Surveillance Frequency Control Program," would state:

> Verify each cooling tower fan starts automatically on an actual or simulated actuation signal.

3.2 SR 3.7.9.4 Setpoint Review

The licensee's setpoint calculation associated with the safety-related, temperature-based circuitry used to (1) automatically position the UHS cooling tower return bypass valves (EFHV0065/0066), and (2) automatically establish the speed of UHS cooling tower fans is included as Attachment 2 of the licensee's letter dated April 9, 2014. The calculation demonstrates that a 2.5 °F Channel Uncertainty must be accounted for when establishing the Nominal Trip Setpoint that protects the Safety Analysis Limit defined in Calculation EF -123 (see Enclosure pages 8-12 of the licensee's application dated December 13, 2012).

The NRC staff reviewed the licensee's setpoint calculation titled J-UEF03, Revision 2 related to automatic speed control of the UHS cooling tower fans. The licensee used the following methodologies:

- ISA-S67.04, Setpoints for Nuclear Safety-Related Instrumentation, September 1994
- ISARP67.04, Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation, September 1994

The NRC staff reviewed the assumptions and design inputs, and verified the calculation itself, and concluded that there is reasonable assurance that calculation J-UEF03, Revision 2 meets the criterion of RG 1.105, Revision 3.

During its review of calculation J-UEF03 Revision 2, Tables 12 and 13, the NRC staff noted that several of the setpoints credited for protecting analytical limits (i.e., the safety analysis limit) have very little margin between the Limiting Trip Setpoint and the Analytical Limit. Specifically, TSHH Set (fast fan start) from Table 12, Return Line Setpoint Determination, and TSHH Set (fast fan start), TSHH Reset (fast fan stop), TSH Set (slow fan start), and TSH Reset (slow fan stop) from Table 13, Supply Line Setpoint Determination, each have a 5 °F required action span and a 2.489 °F total loop uncertainty, based on a 22.5-month drift value. As a result of the small margin, the licensee proposed an initial surveillance interval of 18 months. The 25 percent allowance given in TS SR 3.0.2[1] would bring the worst case surveillance interval to 22.5 months, which has been fully accounted for in the setpoint calculation. Because the setpoint calculation considers the worst case surveillance interval, the NRC staff concluded that there is reasonable assurance the proposed changes meet the criteria of 10 CFR 50.36.

3.2.1 Conclusion

The NRC staff categorized the changes to the SRs and the addition of SR 3.7.9.4 as more restrictive, because the changes require the licensee to shut down the reactor based on a higher minimum UHS water level and a lower maximum UHS water temperature. The proposed changes also add an SR that restricts operation, which did not exist previously. The staff determined that the proposed TS requirements continue to ensure adequate safety and address the non-conservatism of the current TSs. Since the proposed changes meet the requirements of 10 CFR 50.36, the proposed changes are acceptable.

3.3 Human Factors Review

3.3.1 Description of Operator Action(s) and Assessed Safety Significance

The licensee proposes to revise SR 3.7.9.1 to increase the minimum initial UHS water level from ≥ 831.25 ft mean sea level to ≥ 834.0 ft mean sea level, and revise SR 3.7.9.2 to decrease the maximum initial average water temperature in the UHS pond from ≤ 90 °F to ≤ 89 °F. In addition, new SR 3.7.9.4 would be added to verify that the UHS cooling tower fans respond as designed to automatic start signals. In order to implement these changes to TSs, the licensee proposes to add the following operator actions to the Emergency Operating Procedures (EOPs):

1. Verification of proper UHS Cooling Tower operation and securing the affected ESW train within the first 70 minutes of a Large-Break Loss-of-Cooling-Accident (LBLOCA).

2. UHS Cooling Tower Inlet temperature switchover within the first 4 hours of a LBLOCA to ESW Pump Discharge temperature.

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[1] The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met....

3. Securing one train of ESW within the first 7 days of a LBLOCA.

These actions will assure long-term cooling following an LBLOCA, which is the bounding accident requiring a functional UHS.

In accordance with the generic risk categories established in Appendix A to NUREG-1764, these task sequences are considered "risk-important" due to the fact that their failure would jeopardize the long-term cool-down phase of a LOCA. Because of their risk importance, the NRC staff performed a "Level One" review of these actions, which is the most stringent of the graded reviews using the guidance of NUREG-1764.

3.3.2 Operating Experience Review

As part of its review, the NRC staff considered the licensee's corrective actions for Licensee Event Report (LER) 2010-004-00, "Unanalyzed Single Failure Component for Ultimate Heat Sink/Essential Service Water [UHS/ESW]," dated April 30, 2010 (ADAMS Accession No. ML101200537). The LER documented a latent design issue identified in regard to the ESW and UHS. Design basis documents and calculations for the UHS did not identify the failure of the UHS cooling tower bypass valves as a single active failure that should be considered in the UHS design. The unanalyzed single failure condition stems from the incomplete resolution of an early design-basis issue involving a question of whether the UHS cooling tower was undersized. The LER was reviewed by NRC inspectors and closed as documented in NRC Integrated Inspection Report 05000483/2010004 dated November 3, 2010 (ADAMS Accession No. ML103070165).

Corrective actions for this condition included, in part, a revision to the EOPs and modifications to system annunciators, and appropriate changes to the licensee's design procedures to prevent recurrence of the failure to perform single failure analysis. The licensee also performed an extent of condition review for non-conservative design activities and failure to perform single failure analyses. The licensee identified one additional similar instance, which was corrected. The NRC staff reviewed the LER database for the last 10 years to find whether or not any similar events have been reported from the industry. There were none that involved actions similar to those proposed in this amendment request. Therefore, the NRC staff concluded that the proposed actions are not associated with any significant operating events.

3.3.3 Functional Requirements Analysis and Function Allocation

Analysis and function allocation were not necessary, because the proposed operator actions are simple, confirmatory, functional requirements. Prior simulator validation by the licensee demonstrated that, when assigned this task, operators had sufficient time and resources available to perform it reliably. The proposed actions are guided by a licensee-controlled procedure, EOP E-1, "Loss of Reactor or Secondary Coolant."

The NRC staff concludes that new or revised functional requirements analysis and function allocation are not necessary, based on the licensee's use of automation for auto-start of tower fans, automatic speed selection, and automatic bypass, while using manual actions for confirming automatic actions, and using a switch in the control room to change from one temperature sensor location to the other. Because the proposed actions are simple and guided

by a controlled procedure (see 3.3.8 Procedure Design below), have substantial margin to established time constraints (see Section 3.3.10 below), and will be monitored for long-term feasibility and reliability (see Section 3.3.11 for discussion of long-term monitoring), the NRC staff concludes that allocating the three proposed actions to control room operators is acceptable.

3.3.4 Task Analysis

The licensee performed a re-analysis of LBLOCA assuming a single failure of one train of the cooling tower bypass valves. As a result of the analysis, setpoints for automatic and manual operator actions, and the timing of the actions, were established. Additionally, the licensee determined that ESW temperature would need to be taken at two different locations at different times during the scenario. This established an operator requirement for control room switches to allow changes to the location at which the ESW temperature is sensed. Thus, the operator requirements for the three proposed operator actions were defined during the licensee re-analysis of the LBLOCA. The licensee's approach to establishing the operator requirements is reasonable and, therefore, acceptable to the NRC staff.

3.3.5 Staffing

Staffing and qualifications are not affected by the proposed changes. No new or additional crew members are required, and there are no new or additional qualifications required to perform the action sequence within the established time constraints.

3.3.6 Probabilistic Risk and Human Reliability Analyses

The licensee did not use probabilistic arguments to justify the proposed changes. Therefore, the NRC staff did not review probabilistic risk assessment and human reliability analyses for performance or risk insights in this safety evaluation.

3.3.7 Human-System Interface Design

Required displays, annunciators, and controls associated with the credited actions were, with one exception, already in use in the Control Room. The exception was the introduction of control switches to allow operators to re-locate the ESW temperature-sensing location from the UHS Cooling Tower Inlet temperature to ESW Pump Discharge temperature. The licensee reviewed and modified the Human-System Interface design of the new control switches in accordance with NUREG-0700, which is an acceptable method to the NRC staff.

3.3.8 Procedure Design

As stated in its letter dated December 13, 2012, the licensee incorporated into the station EOPs the four proposed actions (three new and one existing action) to be credited in the licensee's application.

(1) The operators will be credited with diagnosing and mitigating postulated single failures that if left uncorrected could result in excessive UHS temperatures and UHS inventory post-LOCA. Specifically, at Step 11 in

EOP E-1, the control room staff will verify that the UHS is in its intended lineup by taking the following actions:

- Check for undervoltage / overvoltage on the NG07 and NG08 [load centers];
- Determine essential service water (ESW) return temperature (this step may include checking temperatures locally);
- Check UHS cooling tower bypass valves (actual position vs. demand position per the temperature control loops); and
- Check UHS cooling tower fan speeds (operating status and actual fan speed vs. demand speed).

If the UHS cooling tower bypass valves and fans cannot be placed in the correct operating configuration, then the affected ESW train will be secured per EOP Addendum 17 ["Securing ESW Train due to UHS Cooling Tower Trouble"].

(2) The operators will be credited with manually switching the UHS cooling tower bypass valve and fan control from the UHS cooling tower inlet to the ESW pump discharge instrumentation loops.... Specifically, at Step 19 in EOP E-1 (directing the performance of EOP Addendum 40 ["UHS Cooling Tower Fan Speed and Bypass Valve Control"] within 4 hours), the control room staff will switch controlling temperature loops for the UHS cooling tower. The following actions in EOP Addendum 40 will be taken:

- Check for undervoltage / overvoltage on NG07 and NG08;
- Transfer the temperature control to the ESW supply temperature control loops;
- Check ESW pump discharge temperature indication;
- Check UHS cooling tower bypass valves (actual position vs. demand position per the temperature control loops);
- Check UHS cooling tower fan speeds (operating status and actual fan speed vs. demand speed);
- Check UHS level; and
- Evaluate long term ESW and UHS status.

(3) The operators will be credited with checking the ESW pump discharge temperature (ESW supply temperature) against the UHS cooling tower fan speeds to ensure successful completion of credited operator action

(2) above. A continuous action "#" designator has been added to the existing EOP Addendum 40, Step 5, to ensure continuous monitoring of UHS cooling tower fan speeds, with respect to the fan control (ESW pump discharge) temperature setpoints, is maintained...

(4) The operators will be credited with isolation of a train of ESW within 7 days of an LBLOCA initiation if both trains are still running. Continued operation of both trains could result in excessive UHS inventory loss. The Technical Assessment Coordinator (TAC) checklist (EIP-ZZ-00240 Addendum B) for the Technical Support Center (TSC) has been revised to direct the that the Technical Assessment Coordinator review EDP-EF-UHS01, "UHS Cooling Tower Operational Guidance Following a LOCA," within 7 days of an LBLOCA. EDP-EF-UHS01 directs the control room staff to secure one ESW train if both trains are still running.

3.3.9 Training Program and Simulator Design

The licensee stated that it has developed training materials and implemented training on the proposed changes for all licensed personnel. The new, credited operator actions have been incorporated into licensed operator initial and continuing training programs. The simulator has also been updated and simulator training has been provided. Based on the above, the NRC staff concludes that the licensee's training is acceptable.

3.3.10 Human Factors Verification and Validation

The licensee stated that it performed time testing of the proposed actions to demonstrate the feasibility of the operator actions and sufficient margin to the established design values. The licensee found that the operator actions to diagnose and mitigate failures of the UHS cooling tower bypass valve, or the UHS cooling tower fans, by securing the affected ESW train is achievable as directed by procedure, and can be done within a range of 41 to 50 minutes. This provides a substantial margin to the 70 minutes available to perform the actions. The licensee also time tested the operators' ability to manually transfer the temperature control scheme for the UHS cooling tower bypass valves and fans to the ESW pump discharge temperature. The licensee found that operators could switch temperature sensing location to the ESW pump discharge temperature in 19 minutes, which provides substantial margin to the available 4 hours to accomplish the actions.

Based on the results of these simulator demonstrations, the NRC staff concludes that the proposed actions are feasible and can be reliably performed by Callaway Plant operators within the available time, using existing, controlled procedures, training, and human/system interfaces.

3.3.11 Human Performance Monitoring Strategy

The licensee stated that the proposed procedures and actions have been included in licensee's time-critical operator actions program, as controlled by procedure APA-ZZ-00395, "Significant Operator Response Timing." This will ensure that subsequent changes to the plant, procedures, training, or programs will not invalidate the established action times. Based on the

administrative protection against inadvertent change afforded by APA-ZZ-00395, the NRC staff concludes that the licensee's long-term monitoring strategy is acceptable.

3.3.12 Conclusion

Based on the information provided by the licensee (i.e., that time-testing results demonstrate significant margin to design, that appropriate administrative controls will be applied to procedures and training, and that the human system interface was designed using NUREG-0700), the NRC staff concludes that the proposed changes were appropriately evaluated for performance considering human factors. Therefore, the proposed changes comply with Criterion 19 and 10 CFR 50.120.

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 published in *Federal Register* on March 4, 2013 (78 FR 14138). 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: S. Wyman, NRR/DE/EICB
G. Lapinsky, NRR/DRA/ARCB
M. Hamm, NRR/DSS/STSB

Date: June 17, 2014

June 17, 2014

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

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATION 3.7.9, "ULTIMATE HEAT SINK (UHS)" (TAC NO. MF0378)

Dear Mr. Diya:

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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 by JRankin for/

Carl F. Lyon, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

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OFFICE	NRR/DORL/LPL4-1/PM	NRR/DORL/LPL4-1/LA	NRR/DSS/STSB/BC	NRR/DRA/ARCB/BC*	NRR/DE/EICB/BC*
NAME	FLyon	JBurkhardt	REIliott	UShoop	JThorp
DATE	6/2/14	6/2/14	6/16/14	3/31/14	3/11/14

OFFICE	NRR/DSS/SBPB/BC**	OGC - NLO	NRR/DORL/LPL4-1/BC	NRR/DORL/LPL4-1/PM
NAME	GCasto	BHarris	MMarkley	FLyon (JRankin for)
DATE	3/24/14	6/4/14	6/17/14	6/17/14

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