

December 29, 2008

ULNRC-05560

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

10 CFR 50.90

Ladies and Gentlemen:



**DOCKET NUMBER 50-483
CALLAWAY PLANT
UNION ELECTRIC CO.
APPLICATION FOR AMENDMENT TO
FACILITY OPERATING LICENSE NPF-30
(LDCN 08-002)**

REVISION OF TECHNICAL SPECIFICATIONS 3.8.4 and 3.8.5

AmerenUE herewith transmits an application for amendment to Facility Operating License Number NPF-30 for the Callaway Plant.

The proposed amendment will revise Technical Specification (TS) 3.8.4, "DC Sources – Operating," and TS 3.8.5, "DC Sources – Shutdown." Specifically, this amendment will revise the battery connection resistance limits in Surveillance Requirement (SR) 3.8.4.2 and SR 3.8.4.5 from 150 micro-ohms (150E-6 ohm) to 69 micro-ohms (69E-6 ohm). TS 3.8.5 is affected by virtue of SR 3.8.5.1 invoking both SR 3.8.4.2 and SR 3.8.4.5 for DC sources that are required to be operable in Modes 5 and 6.

Attachments 1 through 3 provide the Evaluation, Markup of Technical Specifications, and Retyped Technical Specifications, respectively, in support of this amendment request. There are no associated Technical Specification Bases revisions needed for this amendment request since the specific resistance limits are not discussed in the TS Bases. No commitments are contained in this amendment application.

It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

ADD
NRC

The Callaway Onsite Review Committee and a subcommittee of the Nuclear Safety Review Board have reviewed and approved the attached licensing evaluations and have approved the submittal of this amendment application.

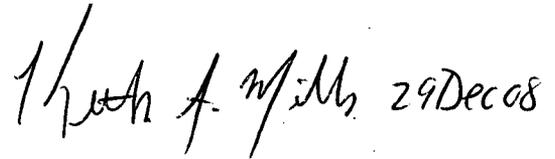
AmerenUE requests approval of this license amendment request prior to December 1, 2009. AmerenUE further requests that the license amendment be made effective upon NRC issuance, to be implemented within 90 days from the date of issuance.

In accordance with 10 CFR 50.91, a copy of this amendment application is being provided to the designated Missouri State official. If you have any questions on this amendment application, please contact me at (573) 676-8528, or Mr. Scott Maglio at (573) 676-8719.

I declare under penalty of perjury that the foregoing is true and correct.

Very truly yours,

Executed on: Dec. 29, 2008

Handwritten signature of Keith A. Mills, dated 29 Dec 08.

Keith A. Mills
Manager, Plant Engineering

GGY/nls

Attachments

- 1 - Evaluation
- 2 - Markup of Technical Specifications
- 3 - Retyped Technical Specifications

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EVALUATION

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EVALUATION

1.0 DESCRIPTION

The proposed amendment will revise Technical Specification (TS) 3.8.4, "DC Sources – Operating," and TS 3.8.5, "DC Sources – Shutdown." Specifically, this amendment will revise the battery connection resistance limits in Surveillance Requirement (SR) 3.8.4.2 and SR 3.8.4.5 from 150 micro-ohms (150E-6 ohm) to 69 micro-ohms (69E-6 ohm). TS 3.8.5 is affected by virtue of SR 3.8.5.1 invoking both SR 3.8.4.2 and SR 3.8.4.5 for DC sources that are required to be operable in Modes 5 and 6.

2.0 PROPOSED CHANGES

SR 3.8.4.2 currently requires the verification of no visible corrosion at the battery terminals and connectors OR verification of battery connection resistance $\leq 150\text{E-6}$ ohms on a 92-day specified Frequency. SR 3.8.4.5 currently requires the verification of battery connection resistance $\leq 150\text{E-6}$ ohms on an 18-month specified Frequency. The battery resistance wording in these surveillances currently reads:

"Verify battery connection resistance is $\leq 150\text{E-6}$ ohm for cell to cell connections and $\leq 150\text{E-6}$ ohm for terminal connections."

After implementation of the proposed amendment, this wording would read as follows:

"Verify battery connection resistance is $\leq 69\text{E-6}$ ohm for cell to cell connections and $\leq 69\text{E-6}$ ohm for terminal connections."

The only change is deleting 150E-6 ohm and replacing that value with 69E-6 ohm. No markups are required to TS 3.8.5 since SR 3.8.5.1 invokes surveillances from TS 3.8.4 by SR number only.

There are no TS Bases changes associated with this amendment request.

3.0 BACKGROUND

The DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety-related equipment and preferred AC vital bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17, the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 (March 1971) and IEEE-308-1978.

The 125 VDC electrical power system consists of two independent and redundant Class 1E DC electrical power subsystems (train 'A' and train 'B'). Each DC electrical subsystem consists of two 125 VDC batteries (NK11 and NK13 for train 'A', NK12 and NK14 for train 'B'), two battery chargers, one swing battery charger, and all the associated control equipment and interconnecting cabling.

During normal operation, the 125 VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC load is automatically powered from the station batteries.

The train A and train B DC electrical power subsystems provide the control power for associated Class 1E AC power load groups, 4.16 kV switchgear, and 480 V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC vital buses.

Each battery has adequate storage capacity to carry the required load continuously for at least a 200 minute duty cycle, with margin, for LOCA with coincident loss of offsite power loads and a 240 minute duty cycle, with margin, for station blackout (SBO) loads. While the DC buses in each subsystem share a swing battery charger, there is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels. The batteries for Train A and Train B DC electrical power subsystems are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. Battery size is based on 125% of required capacity and, after selection of an available commercial battery, results in a battery capacity in excess of 150% of required capacity. The voltage limit is 2.17 V per cell, which corresponds to a total minimum voltage output of 130.2 V per battery as recommended by the battery manufacturer for a minimum float voltage. The criteria for sizing large lead storage batteries are defined in IEEE-485-1983.

FSAR Section 8.3.2 and TS Bases B 3.8.4 have further information on these DC sources.

4.0 TECHNICAL ANALYSIS

The 150 micro-ohm value dates back to a document from November 1980 that was subsequently used in the Standard Technical Specifications (STS) of that era, NUREG-0452 Revision 4 dated 11-2-81 for Westinghouse plants. Based on correspondence between the IEEE Battery Working Group and the NRC electrical branch reviewer from that period (Mr. John Knox) dated November 25, 1980, this value was intended to be treated in the same fashion as bracketed values are in today's STS, i.e., plants converting to NUREG-1431 insert their plant-specific values where the standard contains bracketed values.

Callaway was licensed in 1984 based on NUREG-0452 under the presumption that this 150 micro-ohm resistance limit was a preventive maintenance value used to identify degraded connections and that it was used with generic industry applicability. During the ITS conversion (Callaway License Amendment 133), this value was carried over as part of the current licensing basis.

During recent operating experience reviews, AmerenUE determined that the 150 micro-ohm surveillance limit was adequate for the NK12 and NK13 batteries; however, a lower limit was needed for the NK11 and NK14 batteries in order to assure that these batteries could supply their specified loads.

Voltage drop calculations were performed for each of the four battery subsystems at Callaway under both normal operating and accident load profiles. A series resistance was included to model the worst case allowable inter-cell connector resistance. The limiting series resistance from the voltage drop calculations for NK11 and NK14, combined with the battery resistance accounted for in the original manufacturer's battery discharge curves, was 86 micro-ohms. This value is reduced by 20% and conservatively applied as the surveillance limit for all four batteries, i.e., 69 micro-ohms.

5.0 REGULATORY SAFETY ANALYSIS

This section addresses the standards of 10 CFR 50.92 as well as the applicable regulatory requirements and acceptance criteria.

The proposed amendment will revise Technical Specification (TS) 3.8.4, "DC Sources – Operating," and TS 3.8.5, "DC Sources – Shutdown." Specifically, this amendment will revise the battery connection resistance limits in Surveillance Requirement (SR) 3.8.4.2 and SR 3.8.4.5 from 150 micro-ohms (150E-6 ohm) to 69 micro-ohms (69E-6 ohm). TS 3.8.5 is affected by virtue of SR 3.8.5.1 invoking both SR 3.8.4.2 and SR 3.8.4.5 for DC sources that are required to be operable in Modes 5 and 6.

5.1 No Significant Hazards Consideration (NSHC)

AmerenUE has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," Part 50.92(c), as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change replaces a battery surveillance limit with a value based on voltage drop calculations for each of the four battery subsystems at Callaway under both normal operating and accident load profiles. The new value is more conservative, as well as being more appropriate, as an acceptance criterion for verifying battery operability pursuant to SR 3.8.4.2 and SR 3.8.4.5, thus providing greater assurance that the batteries can perform their specified safety functions with regard to accident mitigation.

Overall protection system performance will remain within the bounds of the previously performed accident analyses since there are no design changes. All design, material, and construction standards that were applicable prior to this amendment request will be maintained. There will be no changes to any design or operating limits.

The proposed change will not adversely affect accident initiators or precursors, nor adversely alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed change will not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended functions to mitigate the consequences of an initiating event within the assumed acceptance limits.

The proposed change does not physically alter safety-related systems nor affect the way in which safety-related systems perform their functions.

All accident analysis acceptance criteria will continue to be met with the proposed change. The proposed change will not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of any accident previously evaluated. The applicable radiological dose criteria will continue to be met.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

There are no proposed design changes nor are there any changes in the method by which any safety-related plant structure, system, or component (SSC) performs its specified safety function. The proposed changes will not affect the normal method of plant operation or change any operating parameters. Equipment performance necessary to fulfill safety analysis missions will be unaffected. The proposed change will not alter any assumptions required to meet the safety analysis acceptance criteria.

No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety-related system as a result of this amendment.

The proposed amendment will not alter the design or performance of the 7300 Process Protection System, Nuclear Instrumentation System, or Solid State Protection System used in the plant protection systems.

The proposed change does not, therefore, create the possibility of a new or different accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

There will be no effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling ratio (DNBR) limits, heat flux hot channel factor (F_Q), nuclear enthalpy rise hot channel factor ($F_{\Delta H}$), loss of coolant accident peak cladding temperature (LOCA PCT), peak local power density, or any other margin of safety. The applicable radiological dose consequence acceptance criteria will continue to be met.

The proposed change does not eliminate any surveillances or alter the frequency of surveillances required by the Technical Specifications; however, the acceptance criterion for the specified battery resistance surveillances will be more restrictive. None of the acceptance criteria for any accident analysis will be changed.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Conclusion:

Based on the above evaluation, AmerenUE concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements / Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The TSs ensure the operational capability of structures, systems, and components that are required to protect the health and safety of the public. The U.S. Nuclear Regulatory Commission's (NRC's) requirements related to the content of the TSs are contained in Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.36) which requires that the TSs include

items in the following specific categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements per 10 CFR 50.36(c)(3); (4) design features; and (5) administrative controls.

This amendment is related to the third category above and is a more restrictive change.

The following regulatory requirements and guidance documents also apply to the affected DC sources:

- GDC 2 requires that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without the loss of the capability to perform their safety functions.
- GDC 4 requires that structures, systems, and components important to safety be designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with the normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, discharging fluids that may result from equipment failures, and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.
- GDC 17 and GDC 18 require that the design of the electrical power systems contain sufficient independence, redundancy, inspection readiness and testability to ensure an available source of power to permit the functioning of structures, systems, and components important to safety.

There will be no changes to the DC sources such that compliance with any of the regulatory requirements and guidance documents above would be changed or challenged. The NSHC evaluation and supporting voltage drop calculations confirm that the plant will continue to comply with all applicable regulatory requirements.

In conclusion, based on the considerations discussed above, (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) issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

AmerenUE has evaluated the proposed amendment and has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

ATTACHMENT 2

MARKUP OF TECHNICAL SPECIFICATIONS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.2	<p>Verify no visible corrosion at battery terminals and connectors.</p> <p><u>OR</u></p> <p>Verify battery connection resistance is $\leq 150 \text{E-6}$ ohm for cell to cell connections and $\leq 150 \text{E-6}$ ohm for terminal connections.</p>	92 days 69
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	18 months
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	18 months 69
SR 3.8.4.5	Verify battery connection resistance is $\leq 150 \text{E-6}$ ohm for cell to cell connections and $\leq 150 \text{E-6}$ ohm for terminal connections.	18 months
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 130.2 V for ≥ 1 hour.	18 months

(continued)

ATTACHMENT 3

RETYPE TECHNICAL SPECIFICATIONS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.2	<p>Verify no visible corrosion at battery terminals and connectors.</p> <p><u>OR</u></p> <p>Verify battery connection resistance is $\leq 69E-6$ ohm for cell to cell connections and $\leq 69E-6$ ohm for terminal connections.</p>	92 days
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	18 months
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	18 months
SR 3.8.4.5	Verify battery connection resistance is $\leq 69E-6$ ohm for cell to cell connections and $\leq 69E-6$ ohm for terminal connections.	18 months
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 130.2 V for ≥ 1 hour.	18 months

(continued)