

*Overview*  
*Ameren Missouri Callaway Plant*

*Class 1E Electrical Equipment*  
*Air-Conditioning System*

August 2012



# AMEREN MISSOURI CALLAWAY PLANT

## License Amendment Request 11-0010: Class 1E Electrical Equipment A/C



# **AMEREN MISSOURI CALLAWAY PLANT**

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## **Class 1E Electrical Equipment A/C**

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**Class 1E Electrical Equipment A/C trains (SGK05A/B) support DC Sources, Inverters, and Distribution Systems**

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**Currently governed by FSAR Section 16.7.13 (Callaway's TRM equivalent)**

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**LAR will discuss the following areas of need as well as industry interest:**

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**TS 1.1 Definition of OPERABLE-OPERABILITY**

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**Application of LCO 3.0.6**

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**Single failure criterion**

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**Room temperature rise analysis**

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**Recent Industry LERs and License Amendment Precedents**

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### Definition of OPERABLE- OPERABILITY:

"A system, subsystem, train, component, or device shall be **OPERABLE** or have **OPERABILITY** when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s)." [emphasis added]

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The DC sources, inverters, and distribution systems supported by SGK05A/B have their own TS 3.8 LCOs.

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The SGK05A/B trains do not currently have their own TS LCO, nor are they discussed in the TS 3.8 Specifications or Bases.

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**When a supported system LCO is not met solely due to an inoperable support system, LCO 3.0.6 allows the inoperability to be addressed only within the support system LCO *if the support system has a TS LCO*.**

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**LCO 3.0.6 cannot be applied to non-TS support systems. Given the requirements of TS 3.8.7 (covering only one inoperable inverter), Callaway currently enters LCO 3.0.3 for one inoperable train of Class 1E electrical equipment A/C until room doors are opened.**

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**Similarly, the rules of usage for TS Conditions stipulate that a single failure need not be postulated when operating with an inoperability covered by a TS Condition entry.**

**The single failure provision does not apply to non-TS LCOs.**

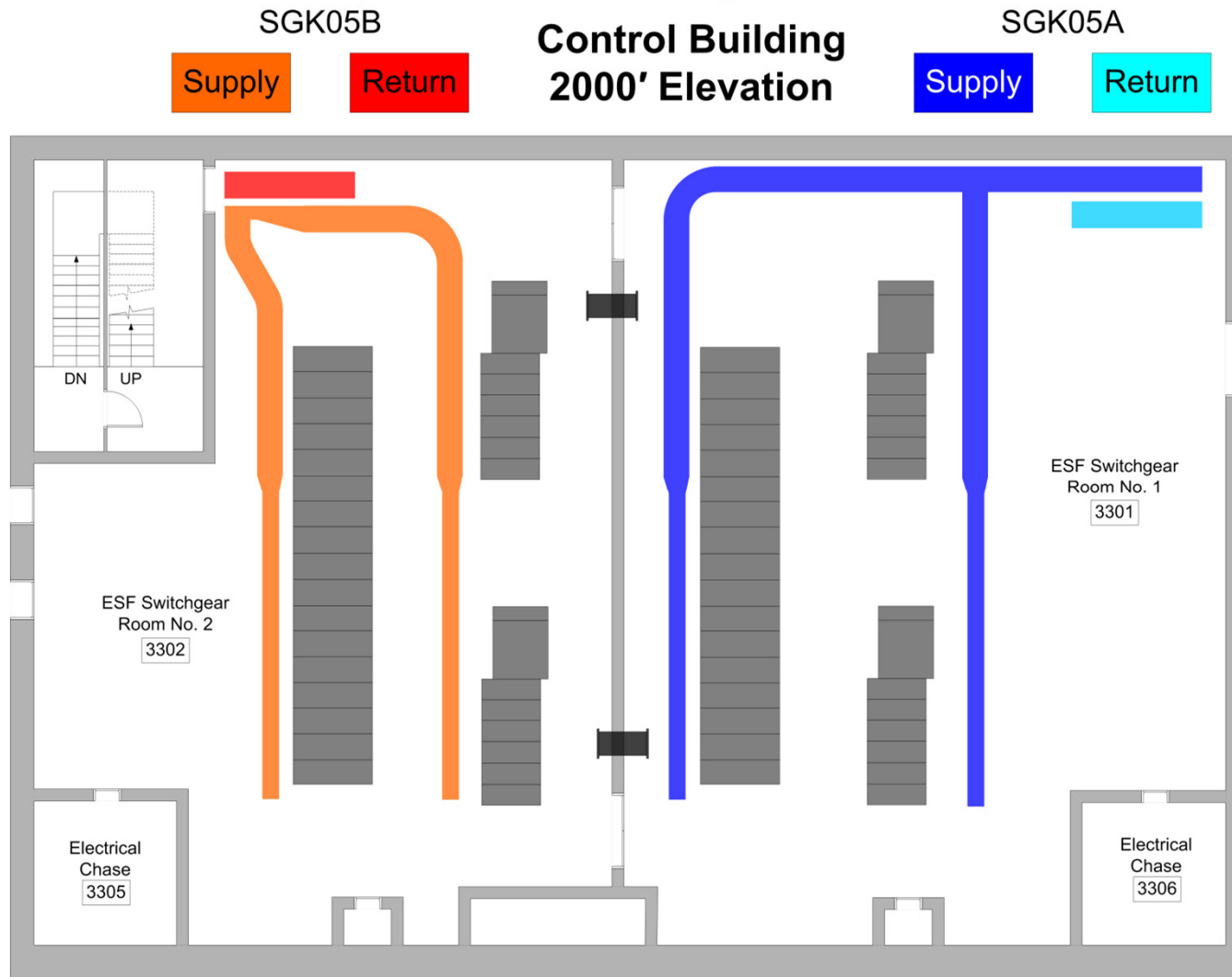
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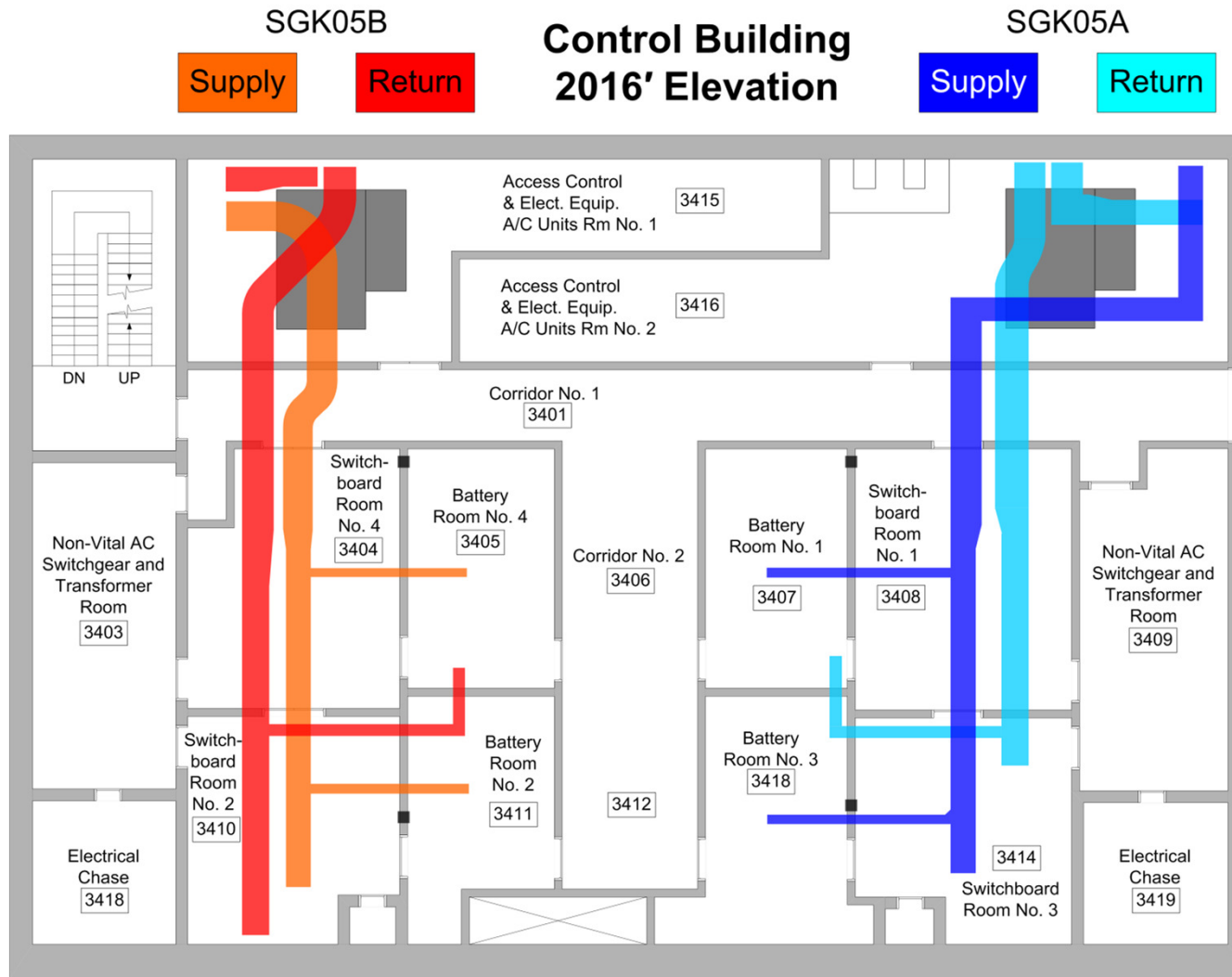
### ESF Switchgear Rooms



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### DC Switchgear and Battery Rooms



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**Proposed resolution is to add new TS LCO 3.7.20.**

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**Conditions and Required Actions to be structured similarly to TS 3.7.10 (Control Room Emergency Ventilation System) and TS 3.7.11 (Control Room Air Conditioning System) with respect to Applicability and corresponding actions.**

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**With one train (SGK05A or SGK05B) inoperable, recurring Required Action to verify room temperatures are within limits.**

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**Directed cascade Note to enter LCO 3.8.4, 3.8.7, or 3.8.9 if room temperatures are not within limits. The limits will be based on manufacturer design/purchase specification requirements, EQ test results, and the EQ discussions in FSAR Sections 3.11(B).2.3 and 3.11(B).5.7 on control building electrical equipment and mild environments.**

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**7-day A/C train restoration Completion Time (much less than 30-day CT for CRACS in TS 3.7.11).**

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**GOTHIC 7.2(b) room temperature rise calculation for various door opening times and HVAC air delivery temperatures. Updated since 11/3/11 LAR to reflect current design heat loads and HVAC parameters. Final update prior to submittal.**

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**This is not a loss of safety function issue. Opening room doors will allow the operable Class 1E electrical equipment A/C train to serve both trains of supported electrical equipment.**

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**HVAC design temperature for delivered air flow is 60°F. Calculation assumes a conservative initial temperature for all air and concrete. Additional equipment modeling still ongoing.**

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**Room temperatures will stay below values that would challenge equipment operability for 30-day ESFAS loading if compensatory measures are implemented (e.g., opening room doors). Specified safety functions will be accomplished.**

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**New structure of proposed TS 3.7.20 Condition A will address several NRC concerns on the 11/3/11 LAR. The rest of new TS 3.7.20 will remain the same.**

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**Instead of specifying Required Actions to implement mitigating measures within 8 hours, the revised Condition A will specify Required Action A.1 to periodically verify room temperatures are within limits.**

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**The room temperature limits will be located in FSAR Table 16.7-2 (consistent with their relocation under Callaway License Amendment 103 dated 10/20/95). The verification is accelerated from once per 12 hours under normal plant operation.**

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**Prior to LA103 the Area Temperature Monitoring specification allowed a room to exceed the listed temperature limit by up to 30<sup>0</sup>F for 8 hours while invoking a Special Report. If the limit was exceeded by more than 30<sup>0</sup>F, room temperature had to be restored within 4 hours otherwise affected equipment was declared inoperable.**

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**Callaway LER 2010-010-00 (ULNRC-05760 dated 3-31-11). LAR dated 11/3/11 withdrawn on 4/30/12.**

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**We are aware of at least 3 other utilities that have filed LERs in 2012 and one other utility that has withdrawn an amendment request this year.**

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### **Precedents include:**

**Joseph M. Farley Nuclear Plant Amendment 176/169 dated June 27, 2008: The NRC approved a non-STS LCO 3.7.19 entitled “Engineered Safety Feature (ESF) Room Coolers.” The NRC Safety Evaluation cited Vogtle Electric Generating Plant TS 3.7.14, “Engineered Safety Features (ESF) Room Cooler and Safety Related Chiller System.”**

**Kewaunee Power Station ITS Conversion Amendment 207 dated February 2, 2011: The NRC approved non-STS ACTIONS Notes in TSs 3.8.4, 3.8.7, and 3.8.9 that allow a 24-hour delay time prior to ACTION entry when the supported electrical equipment is inoperable solely due to non-functional room cooling.**

**TSTF-477-A Revision 3, “Add Actions for Two Inoperable Control Room AC Subsystems,” which revised the BWR STS to allow all control room A/C to be lost for 72 hours as long as temperature was verified to be within limits every 4 hours. Approved for Hope Creek in Amendment 191 dated February 8, 2012.**

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Questions?