

ATTACHMENT 3

**PROPOSED TS BASES
CHANGES**
(for information only)

B 3.7 PLANT SYSTEMS

B 3.7.20 Class 1E Electrical Equipment Air Conditioning (A/C) System

BASES

BACKGROUND

The Class 1E electrical equipment air conditioning (A/C) trains provide a suitable environment for the Class 1E electrical equipment. These air-conditioning trains provide temperature control for the Engineered Safety Features (ESF) switchgear room components, DC switchboard room components, and NK battery room components. The specific rooms supplied by the Class 1E electrical equipment A/C trains are:

SGK05A

SGK05B

SWBD RM No. 1	(3408)	SWBD RM No. 4	(3404)
SWBD RM No. 3	(3414)	SWBD RM No. 2	(3410)
Battery RM No. 1	(3407)	Battery RM No. 4	(3405)
Battery RM No. 3	(3413)	Battery RM No. 2	(3411)
ESF SWGR RM No. 1	(3301)	ESF SWGR RM No. 2	(3302)

The Class 1E electrical equipment A/C system consists of two independent trains such that each train provides cooling of recirculated air in the rooms normally dedicated to that train. Each train consists of a prefilter, self-contained refrigeration unit (using normal service water or essential service water (ESW) as a heat sink), centrifugal fans, instrumentation, and controls to provide for electrical equipment room temperature control.

The Class 1E electrical equipment A/C trains have emergency operation functions and also operate during normal unit operation. Each train is normally aligned to cool only the equipment associated with its emergency load group. The Class 1E electrical equipment A/C trains are operated in a continuous recirculation mode to maintain the ESF switchgear rooms, the battery rooms, and the DC switchboard rooms to a temperature of $\leq 90^{\circ}\text{F}$ (Ref. 1).

Additional recirculation capability is provided via standby fans and dampers that may be actuated via operator action. With one Class 1E electrical equipment A/C train inoperable, the additional recirculation capability may be utilized in conjunction with the remaining Class 1E electrical equipment A/C train to provide adequate area cooling for both trains of Class 1E electrical equipment during normal and accident conditions.

BASES

APPLICABLE SAFETY ANALYSES

The design basis of the Class 1E Electrical Equipment A/C System is to maintain temperatures in the Class 1E electrical equipment rooms within limits to assure OPERABILITY of the associated electrical equipment. This support function for the Class 1E electrical equipment in turn supports the Engineered Safety Feature (ESF) systems that are required to be OPERABLE consistent with the assumptions and initial conditions of the design-basis accident (DBA) and transient analyses in the FSAR (Chapters 6 and 15), including the unavailability of offsite power, as applicable. The Class 1E Electrical Equipment A/C System is designed so that the single failure of an active component coincident with a design basis accident (DBA) cannot impair the ability of the supported systems powered by the electrical equipment to fulfill their safety functions.

During normal operations each Class 1E electrical equipment A/C train maintains the temperature in its associated electrical equipment rooms at a temperature $\leq 90^{\circ}\text{F}$. For DBA conditions, a Class 1E electrical equipment A/C train is required to maintain the associated electrical equipment room temperatures $\leq 104^{\circ}\text{F}$. The Class 1E electrical equipment A/C trains are designed in accordance with Seismic Category I requirements.

The Class 1E Electrical Equipment A/C System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent Class 1E electrical equipment A/C trains are required to be OPERABLE to ensure adequate cooling to their associated electrical equipment rooms during normal operation. Each Class 1E electrical equipment A/C train is considered to be OPERABLE when the individual components necessary to maintain associated electrical equipment room temperatures within acceptable limits are OPERABLE. These components include (for each train) the refrigeration compressor, heat exchanger, cooling coils, ESW or normal service water flow, fans and associated temperature control instrumentation. In addition each Class 1E electrical equipment A/C train must be OPERABLE to the extent that air circulation can be maintained.

APPLICABILITY

In MODES 1, 2, 3, and 4, the Class 1E Electrical Equipment A/C System is a normally operating system with both trains in operation. Both trains must be OPERABLE to ensure that temperature in the protected rooms will not exceed equipment design limits.

Although the LCO for the Class 1E Electrical Equipment A/C System is not applicable in MODES 5 and 6, the capability of the Class 1E Electrical Equipment A/C System to perform its necessary related support functions may be required for OPERABILITY of supported systems.

BASES

ACTIONS

A.1, A.2, and A.3

With one Class 1E electrical equipment A/C train inoperable, acceptable room temperatures for both trains of electrical equipment can be maintained if action is initiated immediately to implement mitigating actions. These include placing into service the Class 1E electrical equipment A/C supplemental cooling system to provide additional recirculation capability, as initiated via operator action. This mitigating action(s) should be preplanned and/or proceduralized for implementation upon entry into the Condition, regardless of whether entry is intentional or unintentional.

The room area temperature limit of $\leq 90^{\circ}\text{F}$ is based on the normal operating maximum steady-state environmental condition and a plant specific calculation for a single Class 1E electrical equipment A/C train maintaining both Class 1E electrical equipment train rooms at a temperature of $\leq 104^{\circ}\text{F}$ during design basis accident conditions. The plant specific calculation assumes the affected room area temperatures are $\leq 90^{\circ}\text{F}$ at the onset of the design basis accident.

With one Class 1E electrical equipment A/C train inoperable, the overall reliability of the cooling function is reduced. However, the remaining OPERABLE train can provide the required cooling function if mitigating actions are taken, including placing the Class 1E electrical equipment A/C supplemental cooling system into service, assuming the OPERABLE Class 1E electrical equipment A/C train is capable of operating at full capacity.

Verifying the room area temperatures within 1 hour and every 4 hours thereafter is adequate to ensure temperatures remain below $\leq 90^{\circ}\text{F}$. The 4 hour Completion Time is reasonable based on the minimal increase in room temperatures expected during this time period, with the mitigating actions in place.

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

The inoperable Class 1E electrical equipment A/C train must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on the capability of the remaining OPERABLE Class 1E electrical equipment A/C train to provide adequate area cooling for both trains of electrical equipment during normal and accident conditions (with mitigating actions implemented).

If the room area temperatures are not verified to be within limits as required once per 4 hours, or if the inoperable Class 1E electrical equipment A/C train cannot be restored to OPERABLE status within 30 days, Condition B must be entered.

B.1 and B.2

When the Required Actions of Condition A cannot be completed within the required Completion Times, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1

If both Class 1E electrical equipment A/C trains are inoperable in MODE 1, 2, 3 or 4, the capability to maintain acceptable temperatures for the Class 1E electrical equipment is significantly degraded. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.20.1

This SR verifies that each Class 1E electrical equipment A/C train starts and operates on an actual or simulated actuation signal. The actuation signal includes the Control Room Ventilation Isolation Signal (CRVIS). A CRVIS is generated by the inputs discussed in the Bases for LCO 3.3.7, "CREVS Actuation Instrumentation." The Surveillance Requirement also verifies that a control room ventilation isolation signal (CRVIS) will be received by the LOCA sequencer to enable an automatic start of the diesel generator loads that are associated with a CRVIS. Verification that these loads will start and operate at the appropriate step in the LOCA sequencer and that other auto-start signals for these loads will be inhibited until the LOCA sequencer is reset is accomplished under Surveillance Requirement SR 3.8.1.12. The Surveillance Frequency is based on industry operating experience, equipment reliability and plant risk, and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.7.20.2

This SR verifies that the heat removal capability of the air conditioning units is adequate to remove the heat load assumed in the Class 1E electrical equipment rooms during design basis accidents. Since testing of the Class 1E Electrical Equipment Air Conditioning (A/C) System condenser heat exchangers under design conditions is impractical, this SR consists of verifying the heat removal capability of the condenser heat exchanger (either through performance testing or inspection), ensuring the proper operation of major components in the refrigeration cycle, verification of unit air flow capacity, and water flow measurement. This SR is performed in the same manner as SR 3.7.11.1 (Reference 2).

The Surveillance Frequency is based on operating experience (which shows that significant degradation of the Class 1E Electrical Equipment A/C typically occurs gradually and in a self-revealing manner.) The surveillance frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 9.4.1
2. Letter from C.F Lyon, USNRC, to F. Diya, Union Electric Company, "Callaway Plant, Unit 1 – Interpretation of Technical Specification Surveillance Requirement 3.7.11.1, 'Verify Each CRACS Train Has The Capability to Remove The Assumed Heat Load' (TAC NO. MF3665), May 28, 2014.
3. LDCN 16-0013, Incorporate new Technical Specification 3.7.20 into OL Appendix A, and update FSAR and TSB accordingly.