Class 1E Electrical Equipment Air Conditioning (A/C) System Pre-Application Meeting

August 25, 2016

AGENDA

- Introductions
- Purpose
- Class 1E Electrical Equipment A/C System Description
- Background
- Proposed Technical Specification (TS)
- Evaluation Basis
- Precedent
- Planned Modifications
- Schedule

PURPOSE

- Problem statement:
  - A loss of a Class 1E electrical equipment A/C train requires the associated electrical TS LCO's to be declared not met, which requires entry into LCO 3.0.3
- Resolution
  - License amendment request to incorporate the Class 1E Electrical Equipment A/C System into the TS
  - Planned modifications developed for either (i.e., one) A/C train to cool both trains of electrical equipment
  - Will minimize challenges to plant systems and to the operators, and will facilitate preventive maintenance activities

CLASS 1E ELECTRICAL EQUIPMENT A/C SYSTEM DESCRIPTION

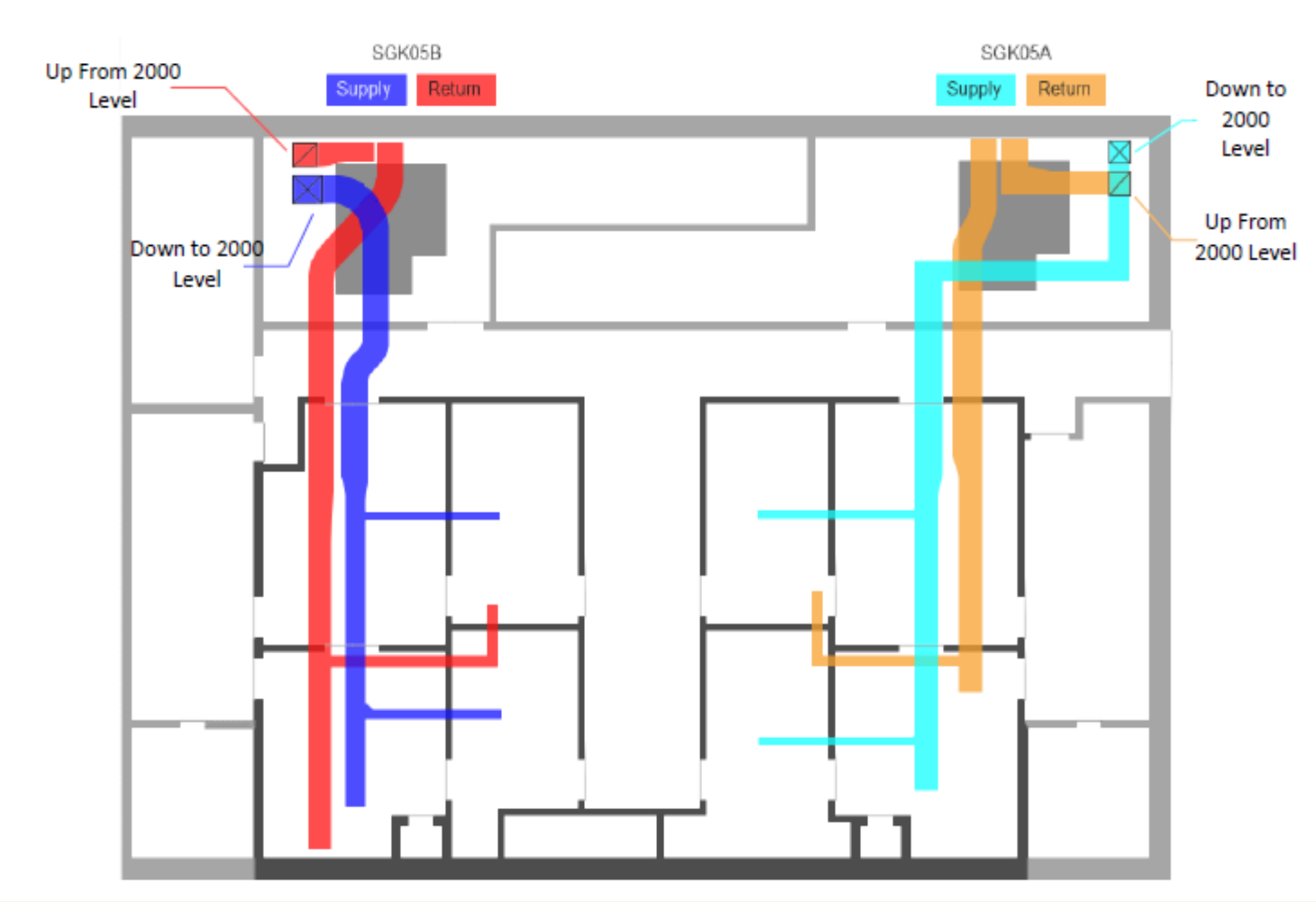
- Design/Licensing Basis
  - Design basis function is to provide a suitable atmosphere for the Class 1E electrical equipment during all modes of plant operation, including loss of preferred power and post-accident operation
  - System is safety related and required to function following a DBA to cool components required to achieve and maintain the plant in a post-accident safe shutdown condition
  - Two independent trains operated in continuous recirculation mode maintain room temperatures ≤ 90°F for normal maximum steady state environmental conditions
  - One train (with implementation of mitigating actions) will maintain room temperatures ≤ 104°F for maximum accident/faulted environmental conditions

CLASS 1E ELECTRICAL EQUIPMENT A/C SYSTEM DESCRIPTION

- Equipment Description
  - Cooling Capacity: 30 tons
    - One train capable of cooling both trains of electrical equipment rooms
  - Direct expansion refrigeration circuit with evaporator coils in air handling unit
  - Heat rejected through condenser to Essential Service Water System
  - Recirculation only – no outside air capabilities

CLASS 1E ELECTRICAL EQUIPMENT A/C SYSTEM DESCRIPTION

2016 Level



CLASS 1E ELECTRICAL EQUIPMENT A/C SYSTEM DESCRIPTION

~~SECURITY-RELATED INFORMATION - WITHHOLD UNDER 10 CFR 2.390~~

CLASS 1E ELECTRICAL EQUIPMENT A/C SYSTEM DESCRIPTION

2000 Level

CLASS 1E ELECTRICAL EQUIPMENT A/C SYSTEM DESCRIPTION

~~SECURITY-RELATED INFORMATION - WITHHOLD UNDER 10 CFR 2.390~~

BACKGROUND

- Operational issues identified for a loss of one train of cooling
  - TS 1.1 Definition of OPERABLE-OPERABILITY
  - Application of LCO 3.0.6
  - Single failure criterion
- Class 1E electrical equipment A/C trains support the DC Sources, Inverters, and Distribution Systems
  - Not addressed in TSs or TS Bases

BACKGROUND

- On loss of one train of cooling, the associated supported Class 1E electrical equipment is declared inoperable
  - TSs LCOs 3.8.4, 3.8.7 and 3.8.9 are declared not met due to the inoperable Class 1E electrical equipment
  - LCO 3.0.3 entered due to no Condition in TS 3.8.7 for two inoperable inverters
- The Operability Determination process is entered and compensatory measures are established for declaring Class 1E electrical equipment OPERABLE/degraded

BACKGROUND

- The Class 1E Electrical Equipment A/C System is a support system similar to Component Cooling Water (CCW) System (ISTS 3.7.7) and Service Water System (ISTS 3.7.8) [Essential Service Water System for WCGS and Callaway Plant]
  - These two systems screened in under Criterion 3 as a support system to various systems which are assumed to function to mitigate various DBAs.

BACKGROUND

- Satisfies Criterion 3 in 10 CFR 50.36(c)(2)(ii)
  - "A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a Design Basis Accident or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."
  - Discussion of Criterion 3 in NRC Final Policy Statement on TS Improvements states, in part:

    "It is the intent of this criterion to capture into Technical Specifications only those structures, systems, and components that are part of the primary success path of a safety sequence analysis. Also captured by this criterion are **those support and actuation systems that are necessary for items in the primary success path to successfully function**." [emphasis added]

PROPOSED TECHNICAL SPECIFICATION

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

LCO 3.7.20 Two Class 1E electrical equipment A/C trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One Class 1E electrical equipment A/C train inoperable.	A.1	Initiate action to implement mitigating actions and verify room area temperatures ≤ 80°F.	Immediately
	AND		
	A.2	Verify room area temperatures ≤ 80°F.	Once per 4 hours
	AND		
	A.3	Restore Class 1E electrical equipment A/C train to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours
C. Two Class 1E electrical equipment A/C trains inoperable.	C.1	Enter LCO 3.0.3.	Immediately

PROPOSED TECHNICAL SPECIFICATION

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.20.1	Verify each Class 1E electrical equipment A/C train actuates on an actual or simulated actuation signal.	18 months (WCGS) In accordance with the Surveillance Frequency Control Program (Callaway)
SR 3.7.20.2	Verify each Class 1E electrical equipment A/C train has the capability to remove the assumed heat load.	18 months (WCGS) In accordance with the Surveillance Frequency Control Program (Callaway)

PROPOSED TECHNICAL SPECIFICATION

- Approval of TS
  - Allows use of TS Conditions/Required Actions and associated Completion Times in lieu of Operability Determination (OD) Process or entry into LCO 3.0.3 for a loss of one train of cooling
  - Minimizes challenges to plant systems and to the operators, and will facilitate preventive maintenance activities

EVALUATION BASIS

- GOTHIC Calculation (Temperature Analysis)
  - GOTHIC model developed
  - Evaluates capability of one cooling train to supply adequate area cooling for both trains of electrical equipment with mitigating actions
  - Calculation assumes loss of one cooling train, LOCA heat loads, and an initial room temperature of 80ºF
  - Calculation assumes an acceptance value of 104°F room temperature based on the accident/faulted environmental conditions

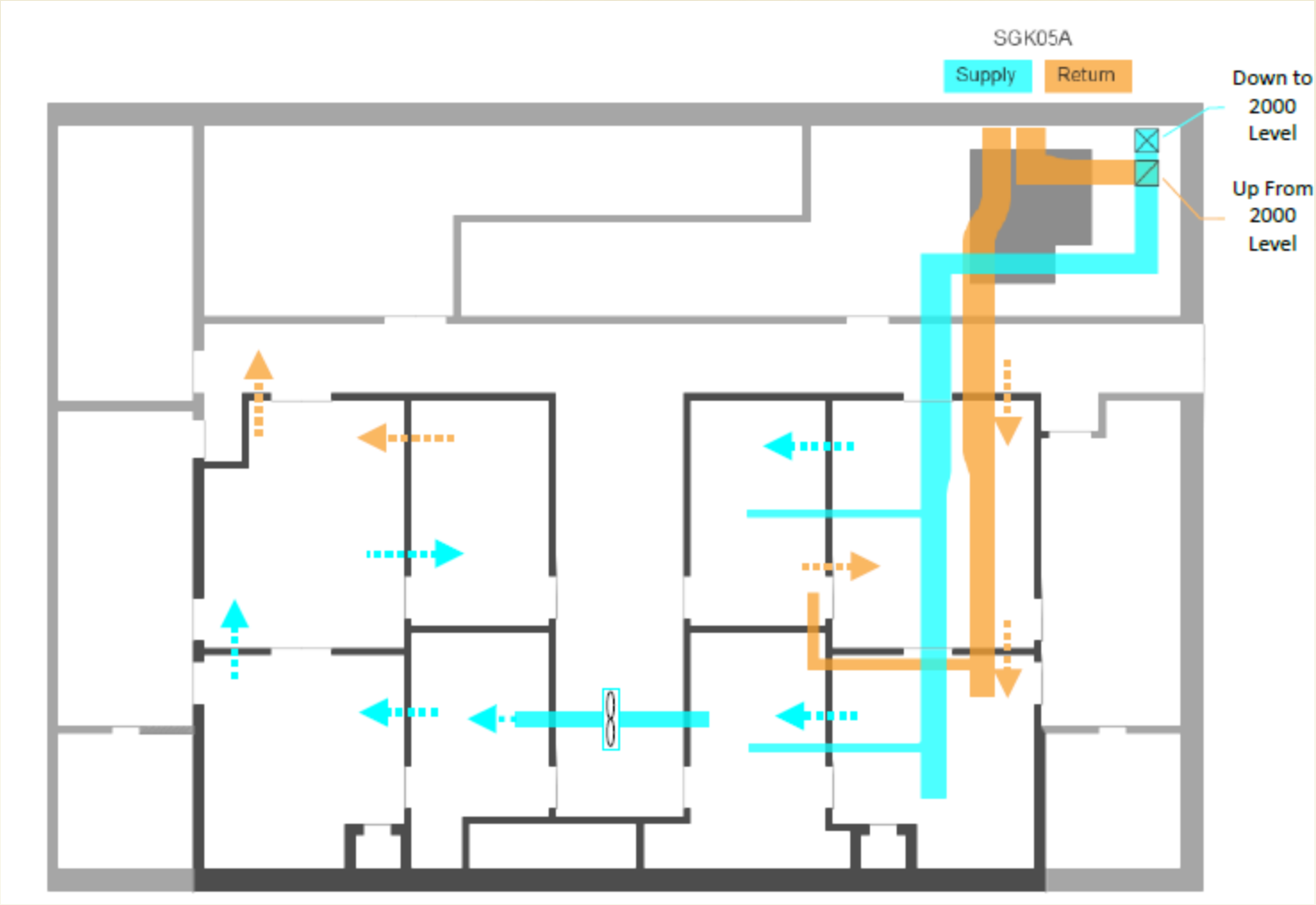
EVALUATION BASIS

- Calculation Sensitivity Case Results
  - Room temperatures remain less than 104ºF for 30-day duration
- Mitigating Actions (TS 3.7.20, Required Action A.1)
  - Start single train of recirculating fans corresponding with OPERABLE cooling train

PLANNED MODIFICATIONS

- Planned modifications - promote circulation of cool air from one OPERABLE A/C train to maintain temperatures in both trains of electrical equipment rooms
  - 2016 Level:
    - One seismically qualified recirculating fan per train powered by Class 1E power ducted across the hallway with fire and control dampers
    - Installation of fire dampers between rooms
  - 2000 Level: two seismically qualified recirculating fans per train powered by Class 1E power
  - LED lighting in Class 1E electrical equipment rooms for heat load reduction

PLANNED MODIFICATIONS

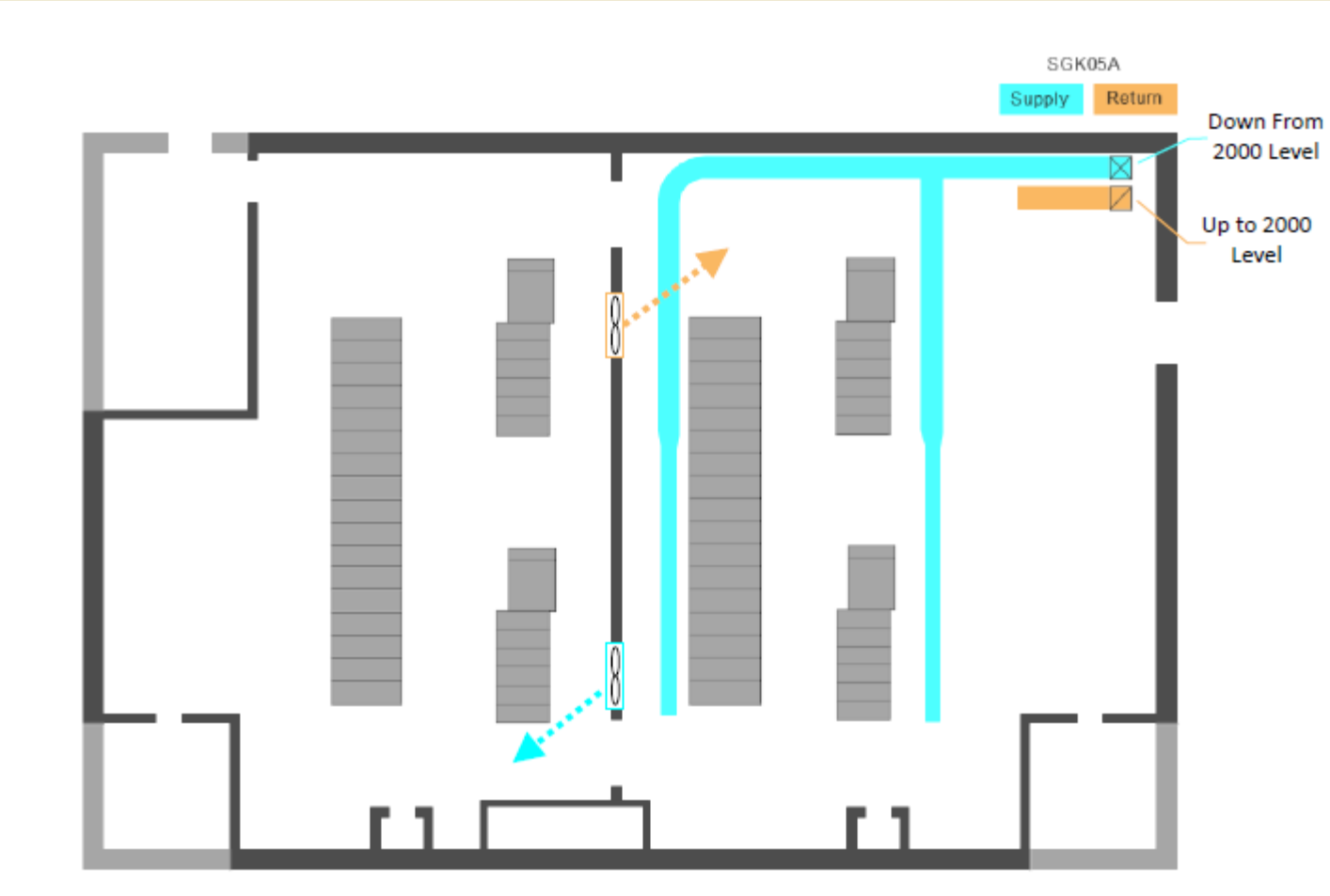


SGK05A Single Unit Operation – 2016 Level

PLANNED MODIFICATIONS

~~SECURITY-RELATED INFORMATION - WITHHOLD UNDER 10 CFR 2.390~~

PLANNED MODIFICATIONS



SGK05A System Operation – 2000 Level

PLANNED MODIFICATIONS

~~SECURITY-RELATED INFORMATION - WITHHOLD UNDER 10 CFR 2.390~~

PLANNED MODIFICATIONS

- Operator Actions
  - Operator Actions would be taken in the Emergency Operating Procedures (EMGs) to shed specified loads **IF** a DBA (LOCA) were to occur during single A/C train mode of operation
  - **IF** an A/C train were to fail subsequent to a DBA (LOCA), then plant operators would continue plant shutdown/cooldown utilizing the OPERABLE A/C train

PRECEDENT

- Farley Nuclear Plant Amendment 176/169 dated June 27, 2008: The NRC approved non-STS LCO 3.7.19, "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."
  - The NRC acknowledged in the Safety Evaluation (Section 3.0) the use of procedural actions taken upon declaring the LCO not met and entry into the applicable Condition/Required Action to assure the compensatory measure is taken

PLANNED SCHEDULE

- Submit simultaneous License Amendment Requests before end of December 2016
- Planned modifications will be implemented online and during refueling outages – Spring 2018 (WCGS) and Fall 2017 (Callaway Plant)
- Approval of LARs requested by March 2018

SUMMARY

- Planned modifications ensure one Class 1E electrical equipment A/C train is capable of providing area cooling for both trains of Class 1E electrical equipment with minimal mitigating actions
- Proposed TS results in use of TS Conditions/Required Actions and associated Completion Times in lieu of Operability Determination (OD) Process or entry into LCO 3.0.3 for a loss of one train of cooling
- Proposed TS and planned modifications will minimize challenges to plant systems and to the operators, and will facilitate preventive maintenance activities

QUESTIONS

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