

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Jaime H. McCoy
Vice President Engineering

February 15, 2018
ET 18-0007

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Reference: Letter ET 17-0010, dated June 28, 2017, from J. H. McCoy, WCNOC, to USNRC

Subject: Docket No. 50-482: Supplement to License Amendment Request for Addition of New Technical Specification 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System"

To Whom It May Concern:

The Reference provided a license amendment request that proposed to add new TS 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System," to the Wolf Creek Generating Station (WCGS) Technical Specifications (TS). Planned modifications would allow one 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 while minimizing mitigating actions. During the week of November 7, 2017, the Nuclear Regulatory Commission (NRC) staff performed a regulatory audit at the WCGS site in support of the review of the proposed TS 3.7.20. Subsequent to the onsite portion of the audit, teleconferences were held with the NRC audit team to address a number of follow-up items. This letter provides requested supplemental information as a result of the regulatory audit.

The supplemental information provided in Attachment I does not impact the conclusions of the No Significant Hazards Consideration provided in the Reference. In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," a copy of this supplement is provided to the designated Kansas State official.

A001
NRR

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4156, or Cynthia R. Hafenstine at (620) 364-4204.

Sincerely,

A handwritten signature in cursive script that reads "Jaime H McCoy".

Jaime H. McCoy

JHM/rlt

Attachments: 1 Supplement to License Amendment Request

cc: K. M. Kennedy, (NRC), w/a
B. K. Singal (NRC), w/a
K. S. Steves (KDHE), w/a
N. H. Taylor (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Jaime H. McCoy, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Jaime H McCoy
Jaime H. McCoy
Vice President Engineering

SUBSCRIBED and sworn to before me this 15th day of February, 2018.



Gayle Shephard
Notary Public

Expiration Date 7/24/2019

Supplement to License Amendment Request

Reference 1 provided a license amendment request that proposed to add new TS 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System," to the Wolf Creek Generating Station (WCGS) Technical Specifications (TS). Planned modifications would allow one 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 while minimizing mitigating actions. Reference 2 provided Wolf Creek Nuclear Operating Corporation (WCNOC) the Nuclear Regulatory Commission (NRC) regulatory audit plan for an audit to be conducted at WCGS site in support of the review of the proposed TS 3.7.20. During the week of November 7, 2017, the NRC staff performed the regulatory audit at the WCGS site. Subsequent to the onsite portion of the audit, teleconferences were held with the NRC audit team to address a number of follow-up items. This Attachment provides the NRC staff requested supplemental information as a result of the regulatory audit. The NRC concern is provided in italics.

5. *NRC concern: Several class 1E rooms have simple glass thermometers, some have temp sensors with input to the plant computer. It appears this is Non Safety Related power. How does the plant computer indicate loss of power? Are there procedures in place and actions to otherwise monitor locally, every 8 hours or shift?*

Response: The proposed TS 3.7.20 requires temperature monitoring of the Class 1E electrical equipment rooms once per 4 hours when in Condition A (Required Action A.2). If the plant computer is not available then the plant computer output monitors in the control room will not show available output. Local monitoring of the temperatures using the thermometers is an option and would certainly be utilized if the plant computer is not available. It is likely that local monitoring would be utilized anyway, as the plant computer points are not available for every room to be monitored.

7. *NRC concern:*

- a. Should room temp <90F be part of the LCO.*
- b. Should the 10 room numbers be part of the LCO.*
- c. Should mitigating actions be part of the LCO.*

TS Bases has actions which maybe appropriate in the spec. <90 F Room temperature monitor is in the required actions, move to SR or at all times?

NRC staff did a spot review and found there are plants that has a SR for MCR temperature (STP – SR 4.7.7.a) < 78F and McGuire SR 3.7.10.1 <90F.

16. *NRC concern: Calc NAI-1929-001, Page 115 shows temps > 95F for Case 1 and 2. Is the new proposed SR of 90F too restrictive and would require a station shutdown?*

Response: Since Item 16 was a follow-up question to Item 7, a single response is provided.

Item 7.a. The TSs proposed by WCNOC are intended to be consistent with the GOTHIC model and the normal operation temperature (see below excerpt from Reference 1) identified in the Updated Safety Analysis Report (USAR). Required Action A.2 is to verify room temperature ≤ 90°F within 1 hour. If a room temperature is > 90°F, Required Action A.2 would not be met and Condition B would have to be entered. The NRC recommended the LCO include the

temperature limit of 90°F with a new Condition that would allow 8 hours to restore the temperature. This Condition could potentially allow temperature to go above 95°F during the 8 hour Completion Time and thus not meet the assumptions of the analysis.

A similar example is WCGS TS 3.7.9, "Ultimate Heat Sink," in which Required Action A.2 is to verify plant inlet water temperature $\leq 94^\circ\text{F}$. A similar condition is in the ISTS (NUREG-1431). If temperature was 94°F or higher then Condition A is not met and Condition B would be entered. The Limiting Condition for Operation (LCO) does not specify the temperature limit.

(Attachment 1 page 19 of Reference 1) A 95°F temperature is utilized as the initial condition starting Class 1E electrical equipment room temperature for the post-LOCA cases. The proposed Technical Specification Required Action A.2 requires verifying room area temperatures are $\leq 90^\circ\text{F}$. The 90°F is the normal operation maximum temperature identified in the USAR for the Class 1E electrical equipment rooms. WCNOG has elected to use an initial condition temperature of 95°F based on the normal operation cases of the GOTHIC model. The normal operation cases show that some rooms could see an average room temperature of 95°F with a single SGK05A/B train operating and maximum heat loading conditions. This elevated temperature for the post-LOCA model cases is utilized to provide additional conservatism and margin in the calculation.

Item 7.b. This level of detail is inconsistent with the format and content of the Improved Standard Technical Specifications (ISTS, NUREG-1431 for Westinghouse Plants) and the WCGS ITS. This detail is specified in the TS Bases and provides the room names and numbers and the associated train.

Item 7.c. The WCNOG proposed TS 3.7.20 was developed with support from Callaway personnel and took into consideration the format and content of the ISTS and the WCGS Improved Technical Specification (ITS). In that regard, WCGS TS 3.7.10, "Control Room Emergency Ventilation System (CREVS)," and ISTS 3.7.10, "Control Room Emergency Filtration System (CREFS)," include a Required Action to implement mitigating actions. This specification does not include in the TS the specific mitigating action(s) to be implemented. As such, WCNOG believed it prudent to be consistent with the existing WCGS ITS and the ISTS precedent and identifies the specific mitigating actions in the TS Bases. This is discussed in Attachment I page 35 of Reference 1 (see below). WCNOG would incorporate these mitigating actions into SYS GK-201, "Class 1E Compensatory Cooling," and the procedure provides the guidance for implementing the mitigating actions.

(Attachment I page 35) Proposed TS 3.7.20 provides Conditions and Required Actions for one Class 1E electrical equipment A/C train inoperable. Required Action A.1 of Condition A requires the initiation of [ef] action to implement mitigating actions with a Completion Time of immediately. The proposed Required Action A.1 is similar to TS 3.7.10 Required Action B.2 that requires the initiation of action to implement mitigating actions. Required Action A.2 requires verifying room area temperatures are $\leq 90^\circ\text{F}$ within 1 hour. The actions of Required Actions A.1 and A.2 assure that the initial conditions of Calculation GK-M-016 are met. The mitigating actions to be taken include opening the associated single train recirculating fans discharge damper and starting the fans corresponding with the OPERABLE Class 1E electrical equipment A/C train and placing in service the spare battery chargers. Additionally, if the Control Building Pressurization System actuates (while in the single A/C train configuration) resulting in two trains of pressurization in operation, one train of pressurization is secured within 12 hours.

NRC Item 7 makes reference to two plants (South Texas Project and McGuire Nuclear Station) that have a Surveillance Requirement (SR) that verifies main control room temperature. Prior to implementing the ITS, the WCGS TSs included SR 4.7.6.a that verified control room air temperature less than or equal to 84°F once per 12 hours. As part of the conversion and consistent with the ISTS, SR 4.7.6.a was relocated from the TSs to the Technical Requirements Manual (TRM) and is currently in TR 3.7.22, "Area Temperature Monitoring." In lieu of a SR to verify temperature, WCNOG adopted the ISTS SR to verify each Control Room Air Conditioning System (CRACS) train is capable of removing the assumed heat load. A number of pre-ITS plants contained a similar SR. South Texas Project has not converted to ITS and their current TSs include a SR to verify control room temperature. A review of the McGuire Nuclear Station TSs identified that a SR exists to verify control room temperature and their TSs did not contain a SR to verify each train capable of removing the assumed heat load. As such, it would appear that during the McGuire Nuclear Station conversion process, they maintained the current TS SR for verifying control room temperature.

During a November 16, 2017 conference call, the NRC identified that WCNOG should consider the addition of a new TS SR for monitoring temperature. As a result of the conference call, WCNOG provided on November 21, 2017 a recommended SR to verify the Class 1E electrical equipment A/C room temperatures are $\leq 90^{\circ}\text{F}$ with a Frequency of 12 hours. Upon further review of this item and the recommended SR, the OPERABILITY of the Class 1E electrical equipment is not affected unless room temperature is $\geq 104^{\circ}\text{F}$. The proposed LCO specifies that two cooling trains are required to be OPERABLE. The recommended SR does not verify the OPERABILITY of the cooling trains but would verify the capability of the Class 1E electrical equipment to perform its specified function. As discussed in Reference 1 (Attachment I page 12) WCNOG currently has in the TRM a Technical Surveillance Requirement (TSR 3.7.22.1) that verifies the area room temperatures are within limits ($87^{\circ}\text{F} \pm 3^{\circ}\text{F}$) with a specified Frequency of 12 hours. TR 3.7.22, "Area Temperature Monitoring," specifies that if the area temperature limit is exceeded, a determination of the OPERABILITY/FUNCTIONALITY of equipment in the affected area(s) be performed and restoration of the temperature to within limit within 8 hours. Specifying a TS SR to verify temperatures $\leq 90^{\circ}\text{F}$ could unnecessarily result in declaring the TS LCO 3.7.20 not met and result in an unnecessary plant transient. Procedure STS CR-001, "Shift Log for MODES 1, 2 & 3," and STS CR-002, "Shift Log for MODES 4, 5, and 6," satisfies the monitoring requirements of TSR 3.7.22.1 by verifying the area room temperatures every 8 hours. Given that the TRM currently requires verifying a more restrictive room temperature limit and that the associated alarm setpoints are being lowered to 83°F to provide early indication of a degraded condition, WCNOG contends that a specific TS SR to verify area room temperature is not necessary. Additionally, if a room temperature were to be $\geq 90^{\circ}\text{F}$ and a Class 1E electrical equipment A/C train were to become inoperable, Condition B of TS 3.7.20 would have to be entered (and a unit shutdown commenced) as Required Action A.2 would not be met.

Calculation GK-M-016, "Wolf Creek Control Building Loss of Class 1E A/C GOTHIC Room Heat Up Analysis With Installed Crosstie Fans and Louvers," (NAI-1929-001 is the vendor calculation number) uses multiple conservative assumptions regarding room temperatures and heat loading. All rooms surrounding the Class 1E equipment rooms (i.e. corridors, stairwells, chases, non-class 1E equipment rooms, etc.) are assumed to remain at a constant 104°F during the duration of the event. This is conservative because many of these rooms have little or no heat source to maintain a temperature this high. The heat loading within the Class 1E equipment rooms is evaluated to be conservatively high, with additional margin for future equipment addition. Airflow from the operating SGK05 unit is assumed to be at the minimum required flow

rate, though testing of airflow rates from the SGK05 units is typically higher than the minimum required flow rate. As stated in Calculation GK-M-016, the external boundary conditions regarding outdoor temperature, solar heat load to the building, etc. are modeled as to be conservative for the heat load into the Control Building through the walls and roof. The calculation conservatively uses June as the month with the highest solar heat load, although the outdoor air temperatures is typically higher in late July and early August.

A temperature of 90°F is utilized as the maximum room temperature to align with the normal maximum room temperatures allowed by the HVAC system design specifications. Due to the conservatism built into the heat loads and Calculation GK-M-016, WCNOG expects that the room temperatures will not exceed 90°F while in this condition, even at maximum outside design temperature conditions. WCNOG has many years of experience with a single SGK05A/B unit in operation where room temperatures were maintained near "normal" temperatures by utilizing open doors and fans to move air between rooms. WCNOG is working to more accurately model the expected conditions of room temperature and heat loads in the Control Building rooms that surround the Class 1E equipment rooms, rather than assume these rooms are continually at some assumed maximum temperature. When this is factored into the GOTHIC model, it is expected this will result in a further reduction in maximum Class 1E room temperatures in the GOTHIC model.

The following discussion is from (Attachment I page 19 of Reference 1):

A 95°F temperature is utilized as the initial condition starting Class 1E electrical equipment room temperature for the post-LOCA cases. The proposed Technical Specification Required Action A.2 requires verifying room area temperatures are $\leq 90^\circ\text{F}$. The 90°F is the normal operation maximum temperature identified in the USAR for the Class 1E electrical equipment rooms. WCNOG has elected to use an initial condition temperature of 95°F based on the normal operation cases of the GOTHIC model. The normal operation cases show that some rooms could see an average room temperature of 95°F with a single SGK05A/B train operating and maximum heat loading conditions. This elevated temperature for the post-LOCA model cases is utilized to provide additional conservatism and margin in the calculation.

8. *NRC concern: Completion time of 30 days may be too long. Stronger justification is needed that 30 days is needed for normal maintenance to the chiller/HVAC system.*

Stations with 'Chiller' 72 hour TS CT – Palo Verde, Waterford, Comanche Peak, S. Harris, and Vogtle (Vogtle added 'or risk informed CT').

Stations with 'Chiller' 7 days TS CT – Surry and South Texas.

Stations with 'Chiller' 14 days TS CT – Salem.

Station with 'Chiller' 30 days TS CT – Oconee, D. Arnold, Catawba, McGuire, North Anna, and Prairie Island.

ESF Room Coolers TS 3.7.19 CT – Farley 72 hours

*Other 30 days CT in WCGS =
3.3.3 PAM I&C*

3.3.4 RSS

3.7.4 ARVs leakage

3.7.11 CRACS AC (WCGS Bases for 30 days)

3.8.3 EDG fuel oil properties

Other 7 day CT is WCGS =

3.1.2 Core reactivity

3.3.7 MCR I&C

3.3.8 EES I&C

3.6.6 Containment cooling

3.7.2 MSIV

3.7.3 MFRVs

3.7.4 ARVs

3.7.5 AFW

3.7.6 CST

3.7.10 CREVS (boundary)

3.7.13 EES

3.8.3 EDG Fuel oil particulates

Duration of planned maintenance should be the driving reason for this time. EDGs are good industry bench mark which are 7 days at WC. Some plants are 10-14 days.

Response: The GOTHIC model was run for 30 days because after a design basis accident, the Essential Service Water System is required to be available/OPERABLE (i.e., in operation) for 30 days. Most normal corrective or preventive maintenance activities would not require a 30 day equipment out of service time. Standard WCNOG practice is to schedule Technical Specification Equipment Outages (TSEO) for 50% or less of the Completion Time allowed per TS. Therefore, for this equipment, WCNOG would normally schedule maintenance that could be performed in 15 days or less. This is discussed on page 35 of Attachment I of Reference 1. Major maintenance, such as a compressor replacement could take up to 15 days, possibly more if problems develop during implementation. Major equipment replacement, such as replacement of the entire unit (condenser, compressor, control cabinetry, etc.) would likely take 30 days or more, and would probably be scheduled during a refueling outage. In addition to the activities and down times discussed in Attachment I of Reference 1, a compressor replacement on SGK05A, Class 1E Electrical Air Conditioning Unit, which required modification to the suction and discharge tubing took approximately 20 days 21 hours. A similar replacement on SGK04B, Control Room Air Conditioning Unit, took 11 days 21 hours.

Amendment No. 163, dated April 26, 2006 (ADAMS Accession No. ML053490174) approved a change to WCGS TSs that incorporated a 7 day Completion Time for an inoperable DG in addition to maintaining the 72 hour Completion Time. The 7 day Completion Time has a number of restrictions associated with its use (e.g., can only be used once per operating cycle per DG for pre-planned maintenance during certain times of the year). The amendment was based on a probabilistic risk assessment and meeting the acceptance criteria in Regulatory Guide 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and Regulatory Guide 1.177 "An Approach for Plant-Specific, Risk-Informed Decision making: Technical Specifications." As such, the driving reason for the 7 day Completion Time was primarily based on the risk associated with an inoperable DG and not the time necessary to perform maintenance. However, the reason for pursuing the change was to allow for performing more pre-planned maintenance on line. It

should also be noted that in late 2010 the 'A' DG was taken out of service for planned maintenance utilizing the 7 day Completion Time. A number of delays occurred and a high number of emergent work activities impacted the schedule such that the DG could not be restored within the 7 day Completion Time and the unit was shutdown in accordance with TSs. This event is described in Licensee Event Report 2010-014-00 (ADAMS Accession No. ML110460684).

9. *NRC concern: Regulatory commitment lack details. Missing safety class, 1E Power, Seismic? Testing?*

Response: In discussion with the NRC on January 11, 2018, it was determined that the Regulatory Commitments specified in Attachment VI of Reference 1 did not require changes and that WCNOG would provide additional details on the planned modifications and post modification testing. Section 3.5 of the LAR is updated to include the following information:

The planned modification includes the installation of the following safety related components: 6 recirculation fans (4 on the 2000' level and 2 on the 2016' level), 8 isolation dampers, 14 fire dampers, 20 transition grills, HVAC ductwork, and associated power supplies, power and control cables. Since the installation of the recirculation subsystem is considered a safety related modification, the appropriate Class 1E power is being utilized, appropriate qualification of equipment is being performed, power and control cables meet the applicable separation and sizing requirements.

The recirculation fans for the planned modification will provide sufficient air flow on both elevation 2000' and 2016'. The two operating flow data points are specified in Specification M-622.1B "Compensatory Fans and Motors for the Class 1E Air Conditioning System," and were nominally 6500 CFM @ 0.85 in-wg static pressure (elevation 2000') and 4700 CFM @ 2.3 in-wg static pressure (elevation 2016').

A post modification test plan has been developed and is part of the design change for the installation of the recirculation fans and associated equipment. During a conference call on December 20, 2017, the NRC asked as part of audit Item 9 as to whether field testing will be performed to benchmark the GOTHIC calculation. The post modification test plan includes testing of both trains of the Class 1E Electrical Equipment A/C System with a recirculation subsystem in service. This testing will verify air flows meet the acceptance criteria in Calculation GK-M-016 in the OPERABLE cooling train and air flows from the recirculation fans in service for the inoperable cooling train for the normal operation lineup and the accident condition lineup. Other testing identified in the post modification test plan includes but is not limited to:

- Verify proper operation of the new dampers and controls related to the recirculation fan and air flow control circuits upon the initiation of a Halon trip signal
- The recirculation fan motors are to be bump tested to confirm that the motor and fan rotate in the correct direction and baseline vibration test data taken for each motor
- Isolation dampers are to be tested for cycle time, limit switch indication, and smooth operation
- Fire dampers shall be drop tested for proper operation

- Actuation of each control damper and fan shall be verified when the applicable START button is pressed. Verify damper position and recirculation fan running indication is received at the Motor Control Center and airflow is as expected.

In the cover letter of Reference 1, WCNOC indicated that it is anticipated that the planned modification would be completed during the Spring 2018 refueling outage and that the license amendment, as approved, will be effective upon issuance and will be implemented within 90 days. This information is further clarified such that the implementation of an approved license amendment will occur subsequent to the completion of the planned modification.

12. *NRC concern: Any internal flooding concerns between Electrical rooms. Flooding of the battery rooms from the cable spreading rooms with the new floor and ceiling openings?*

Response: There are no flooding concerns between the Class 1E electrical equipment rooms. The ductwork between the 2016' and 2032' levels will be sealed, due to these being separate fire areas. The duct/dampers between Class 1E electrical equipment rooms will be located on the walls higher than any flooding in the rooms. The Class 1E electrical equipment rooms on 2016' do not have any water-bearing piping in the rooms. On 2000', the Engineered Safety Features (ESF) Switchgear Room No. 2 only contains water-bearing pipes, and the maximum flood level in that room is 1.26", which is below the level of the fan/duct/dampers in that room.

17. *NRC concern: The new 6 SR fans and damper are not clearly address in the SR 3.7.20.*

Response: The proposed TS 3.7.20 LCO requires two Class 1E electrical equipment A/C trains to be OPERABLE. The installation of the recirculation subsystem does not necessarily impact the OPERABILITY of the cooling trains. If an SR were specified, for example, to verify the actuation of the recirculation fan and associated damper and it failed; this could result in declaring a cooling train inoperable when the cooling train is still capable of performing its specified safety function. If a component in the recirculation subsystem failed (while not in use), the OPERABILITY determination process (plant procedure AP 26C-004) would make a determination if the component impacted the OPERABILITY of the cooling train. WCNOC is proposing to develop a new TRM specification associated with the recirculation subsystem and include associated TSRs in the TRM.

References:

1. WCNOC Letter ET 17-0010 from J. H. McCoy to USNRC, "License Amendment Request for Addition New Technical Specification 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System", June 28, 2017. ADAMS Accession No. ML17186A082.
2. Letter from B. K. Singal, USNRC, to A. C. Heflin, WCNOC, "Wolf Creek Generating Station – Regulatory Audit Plan for November 7-8, 2017, Site Audit in Support of the License Amendment Request to Incorporate New Technical Specification 3.7.20 (CAC NO. MF9961; EPID L-2017-LLA-0262)," October 23, 2017. (ADAMS Accession Number ML17291A008)