WOLF CREEK
NUCLEAR OPERATING CORPORATION

Jaime H. McCoy
Vice President Engineering

June 20, 2018

ET 18-0019

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

Reference:
1) Letter ET 17-0010, dated June 28, 2017, from J. H. McCoy, WCNOC, to USNRC
2) Letter ET 18-0007, dated February 15, 2018, from J. H. McCoy, WCNOC, to USNRC
3) Letter ET 18-0014, dated May 29, 2018, from J. H. McCoy, WCNOC, to USNRC

Subject: Docket No. 50-482: Supplement to Request for Additional Information Regarding the 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:

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). 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. Reference 2 provided requested supplemental information as a result of the regulatory audit. Reference 3 provided a Wolf Creek Nuclear Operating Corporations (WCNOC) response to a request for additional information (RAI) related to the license amendment request provided in Reference 1.

In References 1, 2, and 3, reference is made to a planned modification for the installation of recirculation fans, dampers and associated equipment for a recirculation subsystem. Installation and testing of the recirculation subsystem is complete.

A001
NRR

As dicussed in Reference 3, a revision to calculation GK-E-001, "Electrical Equipment Heat Loads in ESF SWGR, DC SWBD and Battery Rooms," was determined to be required based on the RAI. As a result of this revision, the new heat loads were utilized in a revision to 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." The results of the GOTHIC model runs for Cases 1 through 4 show an approximate +/- 1°F change from the results provided in Table 4 of Reference 1, with no rooms exceeding 104°F. Attachment I provides updated information based on the revision to calculation GK-M-016.

The additional information provided in Attachment I does not expand the scope of the application and does not impact the conclusions of the No Significant Hazards Consideration provided in Reference 1. In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," a copy of this letter is provided to the designated Kansas State official.

This letter contains no new regulatory 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,

Jaime H. McCoy

JHM/rlt

Attachment: I Supplement to Response to Request for Additional Information

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
Jamie H. McCoy
Vice President Engineering

SUBSCRIBED and sworn to before me this 20th day of June, 2018.

Gayle Shepheard
Notary Public

GAYLE SHEPHEARD
My Appointment Expires
July 24, 2019

Expiration Date 7/24/2019

Supplement to Response to Request for Additional Information

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). 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. Reference 2 provided requested supplemental information as a result of the regulatory audit. Reference 3 provided Wolf Creek Nuclear Operating Corporations (WCNOC) response to a request for additional information (RAI) related to the license amendment request provided in Reference 1. As dicussed in Reference 3, a revision to calculation GK-E-001, "Electrical Equipment Heat Loads in ESF SWGR, DC SWBD and Battery Rooms," was determined to be required based on the RAI. As a result of this revision, the new heat loads were utilized in a revision (Revision 2) to 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." The results of the GOTHIC model runs for Cases 1 through results show an approximate +/- 1°F change from the results provided in Table 4 of Reference 1, with no rooms exceeding 104°F. Provided below is updated information to Section 3.2 of Reference 1 based on the revision to calculation GK-M-016.

Section 3.2.2 of Reference 1

Calculation GK-M-016 details the ability of a single Class 1E electrical equipment A/C train to maintain the Class 1E equipment rooms below the maximum design temperature of 104°F. In order to provide this cooling capability, recirculation fans must be actuated to circulate the cool air from the operating cooling train to the rooms of the out-of-service cooling train and return the heated air to be cycled through the train to be cooled. Case 1 of the calculation evaluates SGK05A operating and SGK05B out-of-service, under normal operating conditions and Case 2 evaluates SGK05B operating and SGK05A out-of-service, under normal operating conditions. Case 3 of the calculation evaluates SGK05A operating and SGK05B out-of-service, under Post-LOCA operating conditions and Case 4 evaluates SGK05B operating and SGK05A out-of-service, under Post-LOCA operating conditions. Post-LOCA operating conditions were chosen for Cases 3 and 4 as this provides the bounding heat loading for the Class 1E electrical equipment rooms for accident conditions. All other Design Basis Accidents (DBA) result in a lower overall heat load to the Class 1E electrical equipment rooms for the duration of the event.

Section 3.2.2 of Reference 1 provided the primary inputs and assumptions that are utilized in the GOTHIC model that are shown in Table 3. Provided below is an updated Table 3 based on calculation GK-M-016, Revision 2. The "Heat loading conditions" and "Fan size / Fan start time" are the only changes to this Table.

Table 3 – Base GOTHIC Inputs/Assumptions

Input/Assumption	Normal Operation case	Post-LOCA Operation case
Heat loading conditions	GK-E-001 Rev 05, Normal Operation with NK025/NK026 energized (NK021/NK024 de-energized), chargers (heat) swapped at 3 hours	GK-E-001 Rev 05, PLOCA single unit Operation with NK025/NK026 energized (NK021/NK024 de-energized)
Fan size / Fan start time	6500 CFM (2000')/4700 CFM (2016') / T=3600s	6500 CFM (2000')/4700 CFM (2016') / T=0s
Initial temperature of rooms	72°F	95°F
Surrounding room temperatures (equip rooms, duct/cable chases)	Generally 104°F unless other calculations have a more specific value	Generally 104°F unless other calculations have a more specific value
Outdoor design temperature	97°F	97°F
Control Building Pressurization System	Off	Both trains on for 12 hours, then one train off
Non-Safety HVAC units	Operating at 75% of design flow, limited modeling in GOTHIC	Off
Minimum air flow rates (CFM)		
Room 3301	7850	7850
Room 3407	220	220
Room 3408	1090	1090
Room 3413	270	270
Room 3414	860	860
Room 3302	8430	8430
Room 3404	1060	1060
Room 3405	220	220
Room 3410	860	860
Room 3411	200	200

Section 3.2.3 of Reference 1

Section 3.2.3 of Reference 1 provided a summary of the results of calculation GK-M-016. A summary of the 30 day normal operation cases (Cases 1 and 2), post-LOCA operation cases (Cases 3 and 4), and the maximum (all four cases) temperature for each room with either SGK05A train or SGK05B train out-of-service is shown in Table 4 in Reference 1. This table considers the results for all 4 cases to report the maximum room temperature for each room. Provided below is an updated Table 4 based on calculation GK-M-016, Revision 2.

Table 4: Maximum Room Temperature Summary-All Cases

Room	Room #	30 day Normal (°F)	30 day Post-LOCA (°F)	Max Temp (°F)	Time to Max Temp
ESF Swgr Room 1	3301	93.07	92.94	98.22	0.33 hr PLOCA
ESF Swgr Room 2	3302	95.15	98.80	101.04	0.80 hr PLOCA
Battery Room 1	3407	92.70	97.39	98.02	0.63 hr PLOCA
Battery Room 2	3411	83.81	89.55	95.44	120 s PLOCA
Battery Room 3	3413	85.58	90.57	95.19	120 s PLOCA
Battery Room 4	3405	92.78	97.92	98.15	171 hr PLOCA
DC Swbd Room 1	3408	96.23	100.83	101.05	171 hr PLOCA
DC Swbd Room 2	3410	87.14	92.34	98.03	0.23 hr PLOCA
DC Swbd Room 3	3414	90.61	96.20	98.48	0.30 hr PLOCA
DC Swbd Room 4	3404	90.03	94.64	98.90	0.40 hr PLOCA
Lower Cable Sprd	3501	91.34	96.98	97.03	482 hr PLOCA
Upper Cable Sprd	3801	86.35	101.01	101.02	480 hr PLOCA

From the updated Table 4, all room temperatures remain below 104°F, which is the maximum room temperature listed in the design specifications for the Class 1E electrical equipment and is listed in EQSD-I as the maximum room temperature for the Class 1E electrical equipment rooms with a single SGK05A/B train out-of-service and accident condition heat loading.

Figures 42, 43, 53 and 54 in Reference 1 provided results from Cases 3 and 4. Updated figures from calculation GK-M-016, Revision 2, are provided below.

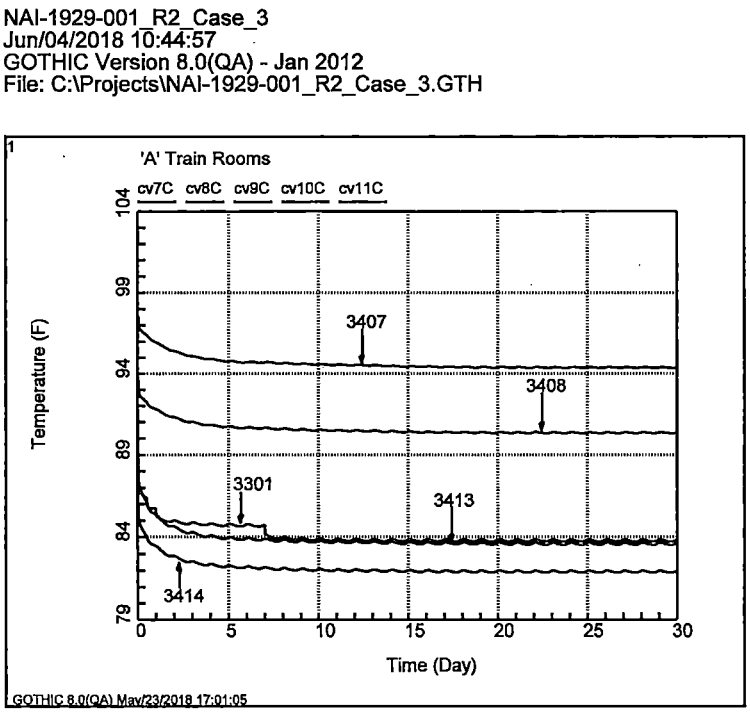

Figure 42: Case 3 - 'A' Train Room Temperatures (Air) (3301, 3407, 3408, 3413, and 3414)

NAI-1929-001_R2_Case_3
Jun/04/2018 10:44:57
GOTHIC Version 8.0(QA) - Jan 2012
File: C:\Projects\NAI-1929-001_R2_Case_3.GTH

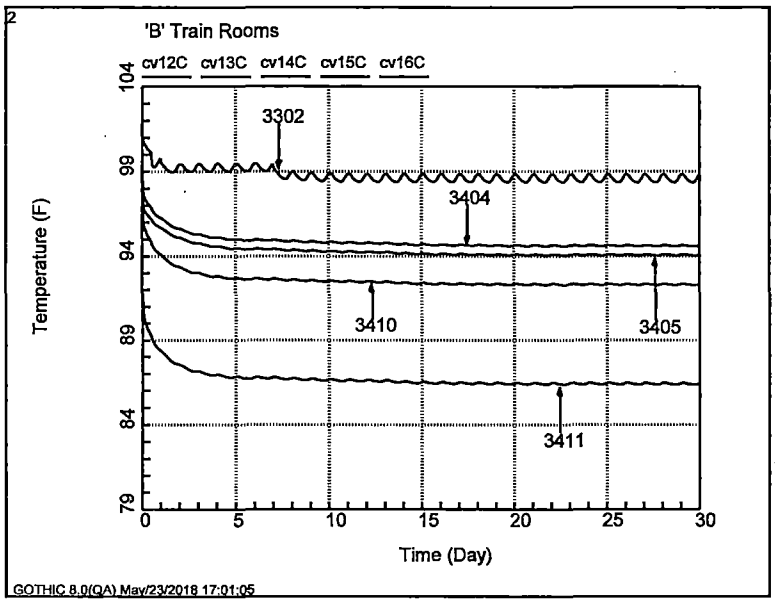

Figure 43: Case 3 - 'B' Train Room Temperature (Air) (3302, 3404, 3405, 3410 and 3411)

NAI-1929-001_R2_Case_4
Jun/04/2018 12:12:53
GOTHIC Version 8.0(QA) - Jan 2012
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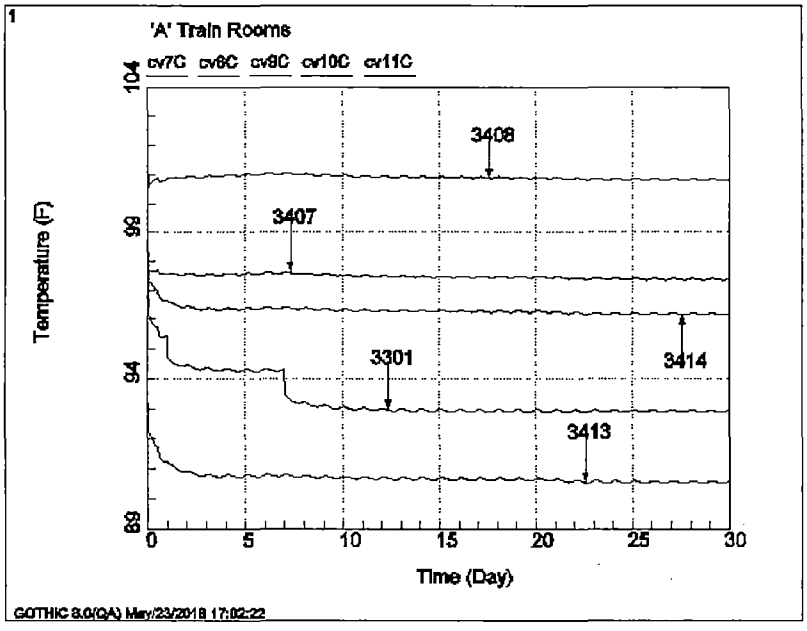

Figure 53: Case 4 - 'A' Train Room Temperatures (Air) (3301, 3407, 3408, 3413, and 3414)

NAI-1929-001_R2_Case_4
Jun/04/2018 12:12:53
GOTHIC Version 8.0(QA) - Jan 2012
File: C:\Projects\NAI-1929-001_R2_Case_4.GTH

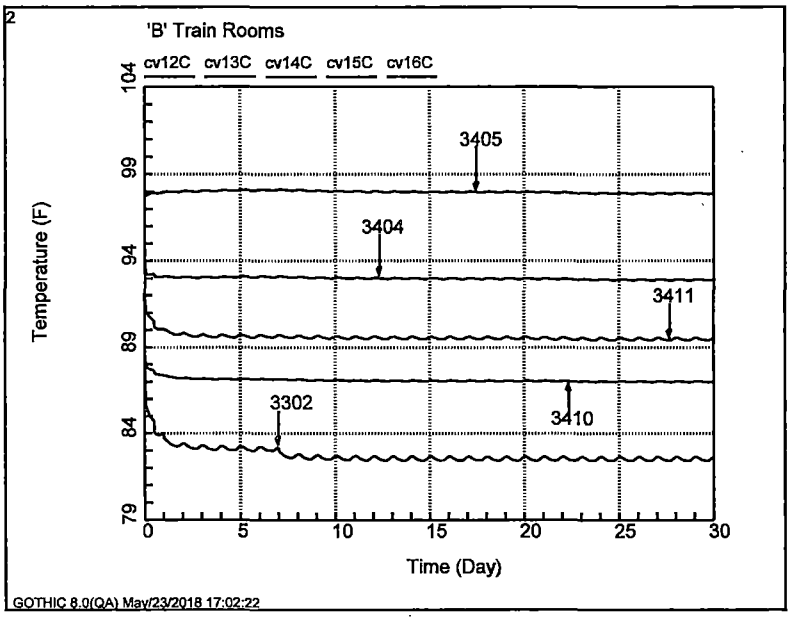

Figure 54: Case 4 - 'B' Train Room Temperature (Air) (3302, 3404, 3405, 3410 and 3411)

Section 3.2.4 of Reference 1

Calculation GK-M-016 calculates the pressures of the rooms in the GOTHIC model and uses that data to compare the differential pressure across the walls of adjacent rooms. Table 5 of Reference 1 provided the maximum differential pressure for each case and the affected rooms. Provided below is an updated Table 5 based on calculation GK-M-016, Revision 2. The maximum differential pressure across any one wall, for any case, is 4.74 psf.

Table 5 – Maximum Differential Pressure Across Walls

Case	Maximum DP (PSF)	Time (sec. - rounded up)	Rooms
1	3.74	3611	3412 – 3413
2	3.35	3611	3411 – 3412
3	4.69	11	3412 – 3413
4	4.74	11	3411 – 3412

Section 3.2.5 of Reference 1

Calculation GK-M-016 determined the amount of hydrogen that might accumulate in the rooms on the 2016' level while a recirculation subsystem train is operating. Table 6 of Reference 1 provided results of the hydrogen generation/monitoring. Table 6 has been updated based on calculation GK-M-016, Revision 2, and indicates that the hydrogen concentration in any one room does not approach the 2% lower flammability safety limit of hydrogen in oxygen.

Table 6 – Maximum Hydrogen Concentration

Case	Maximum concentration (%)	Room	Margin (%) to 2%
1	0.0031	3407	1.9969
2	0.0040	3405	1.9960
3	0.0056	3407	1.9944
4	0.0068	3405	1.9932

References:

1. WCNOC Letter ET 17-0010, from J. H. McCoy to USNRC, "License Amendment Request for Addition of New Technical Specification 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System"," June 28, 2017. ADAMS Accession No. ML17186A082.

2. WCNOC Letter ET 18-0007, from J. H. McCoy to USNRC, "Supplement to License Amendment Request for Addition of New Technical Specification 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System"," February 15, 2018. ADAMS Accession No. ML18058A743.

3. WCNOC Letter ET 18-0014, from J. H. McCoy to USNRC, "Response to Request for Additional Information Regarding the License Amendment Request for Addition of New Technical Specification 3.7.20, "Class 1E Electrical Equipment Air Conditioning (A/C) System"," May 29, 2018. ADAMS Accession No. ML18156A129.