WOLF CREEK
NUCLEAR OPERATING CORPORATION

December 16, 2009

Terry J. Garrett
Vice President Engineering

ET 09-0030

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

Subject: Docket No. 50-482: Application To Revise Technical Specification 3.8.4, "DC Sources – Operating," Surveillance Requirements (SR) 3.8.4.2 and SR 3.8.4.5

Gentlemen:

Pursuant to 10 CFR 50.90, Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests an amendment to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS). The proposed amendment revises the battery acceptance criteria Technical Specification (TS) 3.8.4, "DC Sources – Operating," Surveillance Requirement (SR) 3.8.4.2 and SR 3.8.4.5. WCNOC is proposing to revise the battery connection resistance acceptance criteria for inter-cell connections from ≤ 150E-6 ohms to ≤ 33E-6 ohms and adds connection resistance acceptance criteria for inter-tier connections and inter-bank connection of ≤ 150E-6 ohms.

Attachment I through IV provide the evaluation, a markup of proposed changes to the TSs, retyped TS pages, and proposed TS Bases changes, respectively, in support of this amendment request. Attachment IV, proposed changes to the TS Bases, is provided for information only. Final TS Bases changes will be implemented pursuant to TS 5.5.14, "Technical Specification (TS) Bases Control Program," at the time the amendment is implemented. Attachment V provides a list of regulatory commitments made by WCNOC in this submittal.

It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment.

This amendment application was reviewed by the Plant Safety Review Committee. In accordance with 10 CFR 50.91, a copy of this amendment application, with attachments, is being provided to the designated Kansas State official.

A001
NRR

WCNOC requests approval of the proposed amendment by December 1, 2010. The changes proposed are not required to address an immediate safety concern. It is anticipated that the license amendment, as approved, will be effective upon issuance and will be implemented within 90 days from the date of issuance. Please contact me at (620) 364-4084 or Mr. Richard Flannigan at (620) 364-4117 for any questions you may have regarding this application.

Sincerely,

Terry J. Garrett

TJG/rlt

Attachments:
- I Evaluation of Proposed Change
- II Markup of Technical Specification pages
- III Retyped Technical Specification Pages
- IV Markup of Technical Specification Bases Pages (for information only)
- V List of Regulatory Commitments

cc: E. E. Collins (NRC), w/a
T. A. Conley (KDHE), w/a
G. B. Miller (NRC), w/a
B. K. Singal (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Terry J. Garrett, 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 _____
Terry J. Garrett
Vice President Engineering

SUBSCRIBED and sworn to before me this 11th day of Dec., 2009.

NOTARY PUBLIC
OFFICIAL SEAL
STATE OF KANSAS
RHONDA L. TIEMEYER
MY COMMISSION EXPIRES
January 11, 2010

Rhonda L. Tiemeyer
Notary Public

Expiration Date January 11, 2010

EVALUATION OF PROPOSED CHANGE

Subject: Revision to Technical Specification 3.8.4, "DC Sources – Operating," Surveillance Requirements (SR) 3.8.4.2 and SR 3.8.4.5

EVALUATION

1.0 SUMMARY DESCRIPTION

The amendment application proposes changes to the Wolf Creek Generating Station (WCGS) Technical Specifications (TS) that revises the TS 3.8.4, "DC Sources – Operating," Surveillance Requirements (SR) 3.8.4.2 and SR 3.8.4.5 battery connection resistance acceptance criteria. WCNOC is proposing to revise the battery connection resistance acceptance criteria for inter-cell connections from ≤ 150E-6 ohms to ≤ 33E-6 ohms and adds connection resistance acceptance criteria for inter-tier connections and inter-bank connection of ≤ 150E-6 ohms.

2.0 DETAILED DESCRIPTION

Proposed changes to the TSs are as follows:

- The acceptance limits for battery connection resistance in SR 3.8.4.2 for inter-cell connections is revised from ≤ 150E-6 ohms to ≤ 33E-6 ohms. An acceptance limit of ≤ 150E-6 ohms is added for inter-tier connection resistances and inter-bank connection resistance.

- The acceptance limits for battery connection resistance in SR 3.8.4.5 for inter-cell connections is revised from ≤ 150E-6 ohms to ≤ 33E-6 ohms. An acceptance limit of ≤ 150E-6 ohms is added for inter-tier connection resistances and inter-bank connection resistance.

In October 2007, the NRC completed a Component Design Basis Inspection at WCGS. As documented in the NRC inspection report (Reference 6.1): "The team identified a noncited violation of 10 CFR 50 Appendix B, Criterion III, "Design Control," for the failure of the licensee to ensure that the 125 Vdc safety-related batteries would remain operable if all the intercell and terminal connections were at the resistance value of 150 micro-ohms (μohm) as allowed by TS SR 3.8.4.5." As part of the corrective action associated with this noncited violation, WCNOC initiated a change to Calculation NK-E-002, "Class 1E Battery Sizing," (Reference 6.2) that establishes a battery inter-cell connection resistance value and an as-installed total battery connecton resistance value, and developed a Basic Engineering Disposition (Reference 6.3) that provides administrative/procedural control limits for the 125Vdc safety related battery connections (inter-cell, terminal, inter-tier, inter-bank, field-jumper).

The addition of acceptance limits for inter-tier connection resistance and inter-bank connection resistance is consistent with SR 3.8.4.2 and SR 3.8.4.5 of NUREG-1431, Rev. 1, "Standard Technical Specifications Westinghouse Plants" (Reference 6.5).

3.0 TECHNICAL EVALUATION

3.1 System Description

The station dc (direct current) electrical power system provides the ac (alternating current) emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred ac vital bus power (via inverters). The dc

electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure.

The 125-V dc electrical power system consists of two independent and redundant Class 1E dc electrical power subsystems (Train A and Train B). Each dc electrical subsystem consists of two 125-V dc batteries, two battery chargers, one spare battery charger, and all the associated control equipment and interconnecting cabling. The Train A batteries are NK-11 and NK-13. The Train B batteries are NK-12 and NK-14. Batteries NK-11 and NK-14 are Lucent Technologies 1600AH low specific gravity round cell batteries. Batteries NK-12 and NK-13 are Lucent Technologies 865AH low specific gravity round cell batteries.

During normal operation, the 125-V dc load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the dc load is automatically powered from the station batteries.

The Train A and Train B dc electrical power subsystems provide the control power for associated Class 1E ac power load group, 4.16 kV switchgear, and 480-V load centers. The dc electrical power subsystems also provide dc electrical power to the inverters, which in turn power the ac vital buses. Each Class 1E dc distribution circuit is capable of transmitting sufficient energy to start and operate all the required loads in that circuit. Distribution circuits to redundant equipment are independent of each other. The distribution system is monitored to the extent that it is shown to be ready to perform its intended function. Each Class 1E battery has adequate storage capacity to carry out the required load continuously for at least the 240 minute duty cycle, with margin, as discussed in the Updated Safety Analysis Report (USAR), Section 8.3.2 (Reference 6.4).

The Train A and Train B batteries are formed by strings of battery cells. These strings are comprised of a series connection of the positive and negative terminal posts of adjacent cells as shown in Figure 1. The inter-cell connections, inter-rack connections, inter-bank connections, and terminal connections contribute to the total battery connection resistance, which reduces the overall battery terminal voltage. During normal operation of the battery, corrosion can occur on the battery posts, which can also increase the connection resistances and further reduce battery terminal voltage.

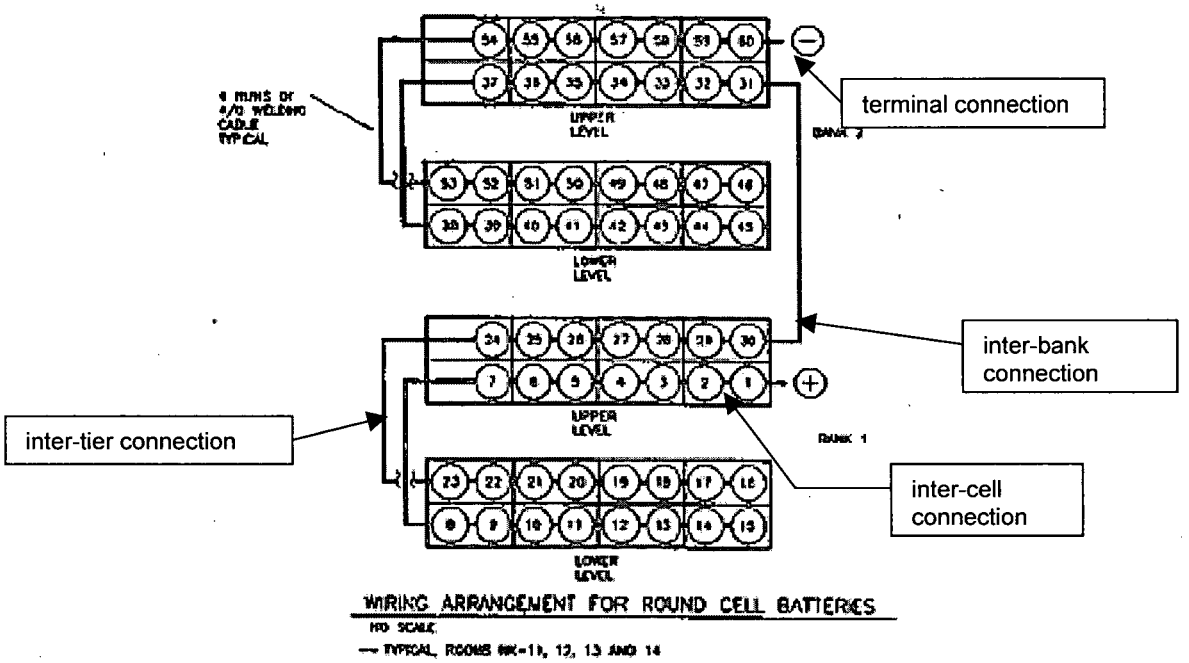


Figure 1

3.2 Justification for Proposed Change

In October 2007, the NRC completed a Component Design Basis Inspection at WCGS. As documented in the NRC inspection report (Reference 6.1): "The team identified a noncited violation of 10 CFR 50 Appendix B, Criterion III, "Design Control," for the failure of the licensee to ensure that the 125 Vdc safety-related batteries would remain operable if all the intercell and terminal connections were at the resistance value of 150 micro-ohms (μohms) as allowed by TS SR 3.8.4.5." Wolf Creek Generating Station does not have a plant-specific basis for using 150 μohm for connection resistance. This value has historically been used throughout the industry as a threshold for identifying localized degradation so that issues potentially affecting battery performance are promptly identified and corrected. An informal calculation, performed during the inspecton, determined that the battery is capable of performing as designed using a 150 μohms connection resistance, but with a significant reduction in margin.

Service conditions dictate that, due to physical limitations and practical considerations, battery cells be arranged in tiers and banks. The resistance value of each inter-tier and inter-bank connection may differ from the inter-cell connection resistance values of the battery cells. Each battery is physically arranged into two thirty-cell banks with the associated inter-bank connection. Each bank consists of two tiers: a sixteen-cell lower tier and a fourteen-cell upper tier. Each thirty-cell bank has 27 inter-cell connections and two inter-tier connections.

Calculation Change Notice 007 to Calculation No. NK-E-002, "Class 1E Battery Sizing," and the below Basic Engineering Disposition provides the basis for the resistance value limits in SR 3.8.4.2 and SR 3.8.4.5.

Basic Engineering Disposition (BED)

NK11, 12, 13, 14 Battery Administrative/Procedural control limits:

1.	Inter-cell Connection (bus bar) resistance (54 total):	≤ 33 μΩ [1]
2.	Terminal Connection (end lug) resistance (2 total):	≤ 150 μΩ [1, 2, 3]
3.	Inter-Tier Connection (cable) resistance (4 total):	≤ 150 μΩ [1, 2, 3]
4.	Inter-Bank Connection (cable) resistance (1 total):	≤ 150 μΩ [1, 2, 3]
5.	Battery System Total Resistance:	≤ 2,832 μΩ [1]
6.	Inter-cell Connection (bus bar) resistance (52 total):	≤ 30 μΩ [2]
7.	Battery System Total Resistance:	≤ 2,784 μΩ [2]
8.	Inter-cell Connection (bus bar) resistance (50 total):	≤ 27 μΩ [3]
9.	Battery System Total Resistance:	≤ 2,736 μΩ [3]
10.	Field-Jumper Connection (cable) resistance (1 or 2 total):	≤ 150 μΩ [4, 5]

Notes:

1. For 60-cell battery system configuration (normal)
2. For 59-cell battery system configuration (provisional)
3. For 58-cell battery system configuration (provisional)
4. For 59-cell battery system configuration: 1 total (provisional)
5. For 58-cell battery system configuration: 2 total (provisional)

Basis

Design Basis Function:

The design function of the NK Battery connections (inter-cell, terminal, inter-tier, inter-bank, and field-jumper) is to facilitate operation of the safety-related NK batteries in order to meet their design basis function (i.e., capable of supporting their design bases loads).

A. Established Design Values

1. Refer to Attachment A for a typical NK Battery System cell-connection arrangement.

2. Calculation No. NK-E-002-004-CN007 (Reference 3) established 48 μΩ as the suitable battery "Inter-cell connection resistance" design* value. For a normal 60-cell Battery System configuration, Reference 3 also established 2,832 μΩ (= 59 Inter-cell connections x 48 μΩ) as the design** value for the "Maximum Calculated Total Battery Connection Resistance" (i.e., the maximum allowable cumulative sum of the combined connection resistances).

Note: * The "Inter-cell connection resistance" design value ensures that the existing cell sizes of the safety-related NK batteries are capable of supporting their design bases loads.

** For a normal 60-cell Battery System configuration, calculation No. NK-E-002-005 (Reference 5) determined a maximum design value of 2,880 μΩ (= 60 Inter-cell connections x 48 μΩ) for the "Maximum Calculated Total Battery Connection Resistance"; however, Reference 5 was not issued as of the date of issuance of this BED.

3. Per review of Reference 3, an "as-installed total battery connection resistance" (i.e., the cumulative sum of all connection resistances of the battery system configuration) equal to or less than the "Maximum Calculated Total Battery Connection Resistance" ensures that the battery cell sizes, and thus the NK battery system configurations, are capable of supporting the NK system Class 1E 125 Vdc design bases loads.

4. Calculation No. NK-E-002-004-CN009 (Reference 4) determined, for NK12 and NK13 batteries, the adequacy of a provisional 58-cell battery system configuration (i.e., two cells "jumpered-out") due to emergent non-conservative service conditions at WCNOC recently (i.e., a simultaneous gradual voltage degradation of two battery cells).

   This BED shall consider normal (60-cell) and provisional (58-cell and 59-cell) battery system configurations in the determination of suitable administrative/procedural limits for the NK battery connections.

5. Calculation No. NK-E-002-004-CN009 (Reference 4) determined ≤ 150 μΩ as a suitable design value for the field-jumper cables; it also determined as the worst-case condition (i.e., a greater over-all battery system combined connection resistance) two non-neighboring battery cells as "jumpered-out" of service along with each cell's two (2) associated/adjacent Inter-cell (bus bar) connections also "jumpered-out" of service.

   Therefore, the worst-case scenario postulated by calculation Reference 4 is a maximum of two (2) field-jumper cables in simultaneous use and four (4) Inter-cell (bus bar) connections removed from service.

B. Administrative/Procedural Limit Values

1. Procedure STS MT-020 "125 Volt DC Battery Inspection/Charger Operational Test" (Reference 1) stipulates the performance of NK battery resistance readings (every 18 months) as follows:

   a. Fifty-four (54) Inter-Cell (bus bar) Connections: resistance between battery cell posts of vendor-provided bus bar connections (lead plated copper straps/bars).

   b. Two (2) battery terminal (end lug) connections: resistance between the positive (+) and negative (-) field cable end lugs and cell posts 1 and 60, respectively.

   c. Four (4) Inter-Tier (cable) Connections: resistance between battery cell posts of field routed unscheduled cables; applicable battery cells: 7 to 8; 23 to 24; 37 to 38; 53 to 54. Two tiers of battery cells per battery bank.

d. One (1) Inter-Bank (cable) Connection: resistance between battery cell posts of field routed unscheduled cable; applicable battery cells: 30 to 31. Two (2) battery banks total.

Review of the STS MT-020 NK battery connection resistance readings performed during three recent refueling outages via the sub-work orders (SWO's) listed in Reference 2 determined that the highest single value recorded for each of the terminal, inter-tier, and inter-bank connections is 98, 97, and 107 μΩ, respectively.

For simplicity and conservatism, an administrative/procedural limit of 150 μΩ for all three connection types, as well as for the field-jumper connection type, provides sufficient/adequate margin over the highest recorded STS MT-020 NK resistance readings by Reference 2 for non Inter-cell (bus bar) connections.

Table 1 below summarizes the Reference 2 battery connection resistance readings as well as the administrative/procedural limit designated above for the connection types (terminal, inter-tier, inter-bank, and field-jumper).

Table 1

STS MT-020 NK 11, 12, 13, & 14 Battery Connection Resistance Readings, μΩ					
Reading Type	Connection Type				
	Inter-Cell	Battery Terminal	Inter-Tier	Inter-Bank	Field-Jumper
Average combined reading (from all four batteries) [1]	17	35	85	100	N/A
Highest recorded reading (any battery) [1]	21	98	97	107	N/A
Designated Administrative/Procedural Limit	N/A [3]	≤ 150 [2]	≤ 150 [2]	≤ 150 [2]	≤ 150 [2]

Notes: 1. Per Reference 2 (STS MT-020 SWO's).
2. Per this BED (this section above).
3. Per this BED (next section below).

2. Attachments B, C and D of this BED illustrate and document the evaluations necessary to establish suitable administrative/procedural limits for the various battery system connection types, which are summarized in Table 2 below.

Table 2

Administrative/Procedural Control Limits for NK Battery Connections	**Resistance, uOhms**
Inter-cell Connector [1]	≤ 33
Terminal Connector [1,2,3]	≤ 150
Inter-tier Connector [1,2,3]	≤ 150
Inter-bank Connector [1,2,3]	≤ 150
Battery System Total Resistance [1]	≤ 2,832
Inter-cell Connector [2]	≤ 30
Battery System Total Resistance [2]	≤ 2,784
Inter-cell Connector [3]	≤ 27
Battery System Total Resistance [3]	≤ 2,736
Field-Jumper Cable Connector [2, 3]	≤ 150

Notes: 1. 60-cell Battery System Configuration (normal)
2. 59-cell Battery System Configuration (provisional)
3. 58-cell Battery System Configuration (provisional)

3. Per review of Attachment B Table B6, the total combined connection resistance of 2,832 μΩ for the normal 60-cell battery system configuration does not exceed the 59 Inter-cell connector Battery System resistance total of 2,832 μΩ in Table B1 (established at the 48 μΩ Inter-cell connection resistance design value by Reference 3), and is, therefore, acceptable.

4. Per review of Attachment C Table C6, the total combined connection resistance of 2,760 μΩ for the provisional 59-cell battery system configuration does not exceed the 58 Inter-cell connector Battery System resistance total of 2,784 μΩ in Table C1 (established at the 48 μΩ Inter-cell connection resistance design value by Reference 3), and is, therefore, acceptable.

5. Per review of Attachment D Table D6, the total combined connection resistance of 2,700 μΩ for the provisional 58-cell battery system configuration does not exceed the 57 Inter-cell connector Battery System resistance total of 2,736 μΩ in Table D1 (established at the 48 μΩ Inter-cell connection resistance design value by Reference 3), and is, therefore, acceptable.

6. Refer to paragraph A.3 in the Basis section of this BED. The "as-installed total battery connection resistance" (i.e., the cumulative sum of all connection resistances of the battery system configuration) from Reference 3 is equivalent to the total combined connection resistances in Table 6 of Attachments B, C, and D of this BED.

7. In practice, connection resistance values are not uniform and typically offset each other (to a certain extent) above and below the nominal value for the particular connection type. Provided the total combined connection resistance of the battery system configuration (Table 6 of Attachments B, C, and D) is less than or equal to the Inter-cell connector Battery System resistance total (Table 1 of Attachments B, C,

and D), an individual connection type with a resistance reading (performed in accordance with the applicable STS MT procedure) greater than the value in Table 2 above (for its connection type) is technically acceptable.

8. Consequently, a connection type with an individual resistance reading greater than the Table 2 limits may be technically acceptable (as verifiable by resistance measurement of all the connections). The likelihood of the acceptability of this condition is augmented by the performance of the applicable STS MT surveillance procedures (weekly, quarterly, and 18 month periods), which verify that the connections of the battery system configuration are maintained at or below their administrative limit.

9. Nonetheless, performance of the applicable STS MT surveillance procedures is required to ensure the applicable TS SR limits are met.

References for Basic Engineering Disposition Section

1. STS MT-020 R23 "125 Volt DC Battery Inspection/Charger Operational Test."
2. NK11 SWO Nos. 04-258886-000, 05-274809-000, and 06-291342-000; NK12 SWO Nos. 04-258887-000, 05-274810-000, and 06-291341-000; NK13 SWO Nos. 04-258888-000, 05-274700-000, and 06-291230-000; NK14 SWO Nos. 04-258889-000, 05-274811-000, and 06-291340-000.
3. Calculation No. NK-E-002-004-CN007.
4. Calculation No. NK-E-002-004-CN009.
5. Calculation No. NK-E-002-005 (Un-official (not issued) as of the date of issuance of this BED; not an input to the evaluation within this BED and is listed for info only).

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Title 10 of the Code of Federal Regulations (10 CFR) Part 50 Appendix A, General Design Criterion (GDC) 17, "Electric power systems," requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components (SSCs) that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

GDC 18, "Inspection and testing of electric power systems," requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.

10 CFR 50.36, identifies Surveillance Requirements as requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within the safety limits, and that the limiting conditions of operation (LCO) will be met.

10 CFR 50.63, "Loss of all alternating current power," requires that each light-water cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout (SBO).

The requirements of GDC 17 and GDC 18 continue to be met because the proposed change will not affect the design capability, function, operation, or method of testing of the safety related batteries.

4.2 Significant Hazards Consideration

The amendment request involves changes to the Wolf Creek Generating Station (WCGS) Technical Specifications (TS) that revises the TS 3.8.4, "DC Sources – Operating," Surveillance Requirements (SR) 3.8.4.2 and SR 3.8.4.5 battery connection resistance acceptance criteria. WCNOC is proposing to revise the battery connection resistance acceptance criteria for inter-cell connections from ≤ 150E-6 ohms to ≤ 33E-6 ohms and adds connection resistance acceptance criteria for inter-tier connections and inter-bank connection of ≤ 150E-6 ohm.

WCNOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, Issuance of Amendment:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed changes to revise the SR 3.8.4.2 and SR 3.8.4.5 acceptance criteria for battery connection resistance will not challenge the ability of the safety-related batteries to perform their safety function. Appropriate monitoring and maintenance will continue to be performed on the safety related batteries. Current TS testing and monitoring requirements will not be altered.

   The proposed change does not involve a physical change to the batteries, nor does it change the safety function of the batteries. The proposed TS revision involves no significant changes to the operation of any systems or components in normal and accident operating conditions and no changes to existing structures, systems or components.

   Therefore, this change will not increase the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any previously evaluated?

   Response: No

   The proposed changes to revise the SR 3.8.4.2 and SR 3.8.4.5 acceptance criteria for battery connection resistance is an increase in conservatism, without a change in system testing methods, operation, or control. Safety related batteries installed in the plant will be required to meet criteria more restrictive and conservative than current acceptance criteria and standards. The proposed change does not affect the manner in which the batteries are tested and maintained, thus there are no new failure mechanisms for the system.

   Therefore, this change will not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   Response: No

   The margin of safety is established through equipment design, operating parameters, and the setpoints at which automatic actions are initiated. The proposed changes will not adversely affect operation of plant equipment, as the changes being made are more restrictive. These changes will not result in a change to the setpoints at which protective actions are initiated. Sufficient DC capacity to support operation of mitigation equipment is ensured. The changes associated with the new battery maintenance and monitoring program will ensure that the station batteries are maintained in a highly reliable manner. The equipment fed by the DC electrical sources will continue to provide adequate power to safety related loads in accordance with analysis assumptions.

   Therefore, this change does not involve a significant reduction in the margin of safety.

4.3 Conclusion

Based on the considerations discussed above, 1) there is a reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 2) such activities will be conducted in compliance with the Commission's regulations, and 3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5. ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

6.1 Wolf Creek Generating Station – NRC Component Design Bases Inspection Report 05000482/2007006, October 15, 2007.

6.2 Calculation NK-E-002, "Class 1E Battery Sizing," Revision 4, Change Notice 007, October 2007.

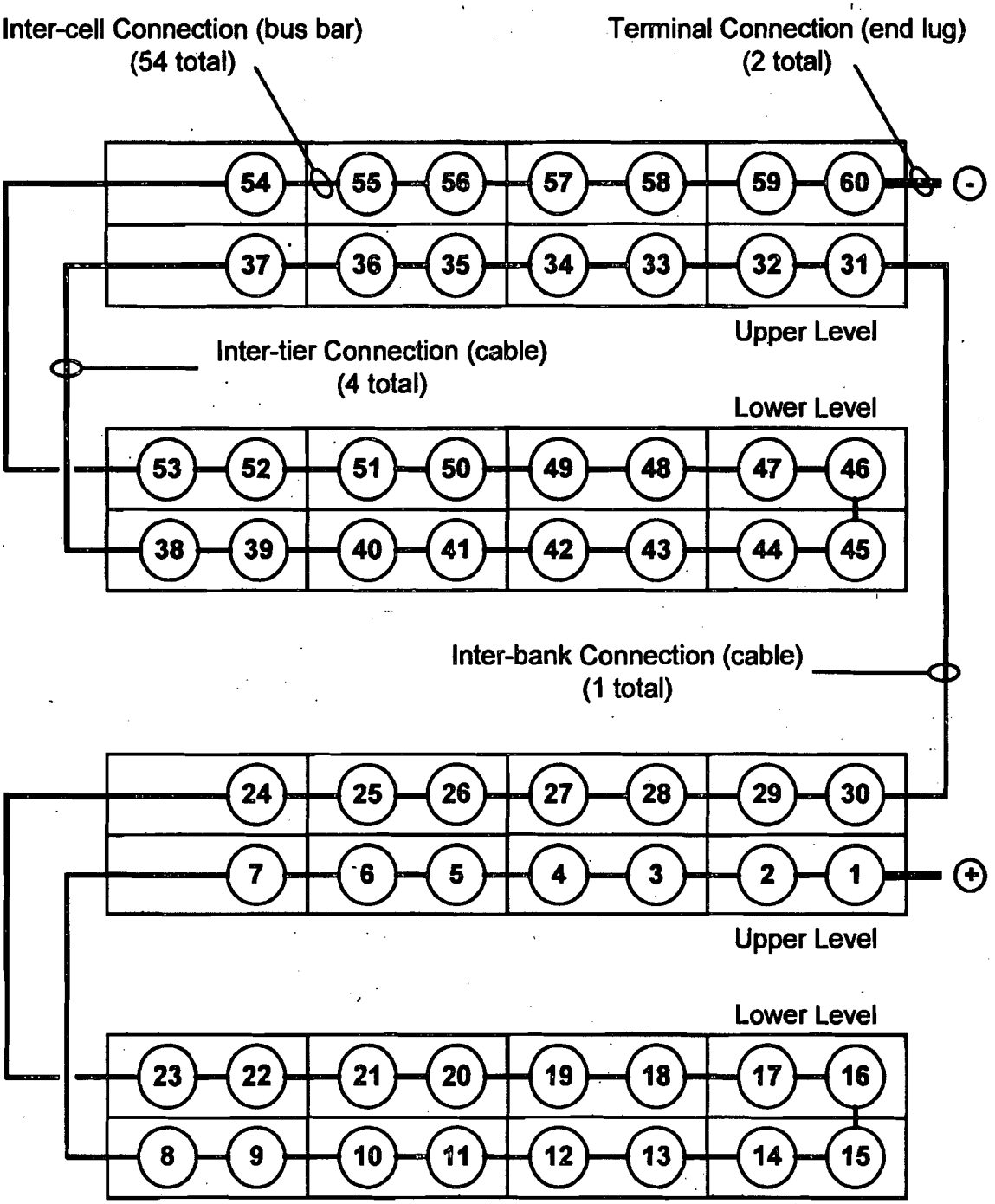
6.3 Basic Engineering Disposition, "Administrative/Procedural Control Limits for NK Battery Connections (Inter-cell, Terminal, Inter-Tier, Inter-Bank, and Field Jumper), August 2009.

6.4 Updated Safety Analysis Report (USAR), Section 8.3.2.

6.5 NUREG-1431, "Standard Technical Specifications – Westinghouse Plants," Revision 1.

Basic Engineering Disposition "Administrative/Procedural Conrol Limits for NK Battery Connections"

Initiating Document and revision: CAP 15546-02-01 (PIR 2007-2492)



NK Battery Round Cell Connection Arrangement
Typical for NK-11, -12, -13, and -14
(No scale)

Basic Engineering Disposition
"Administrative/Procedural Control Limits for NK Battery Connections"

Initiating Document and revision: CAP 15546-02-01 (PIR 2007-2492)

Table B1

60-cell Battery System Configuration (59 Vendor-provided Battery Inter-cell Connectors: each a metal plate assembly provided by battery manufacturer)	Individual Resistance Design Limit of Vendor-provided Battery Inter-cell Connector, uOhms *	59 Inter-cell Connector Battery System Resistance Total, uOhms
Vendor-provided Battery Inter-cell Connectors: 59 total *	48	2832

Note: * Per Reference 3 (NK-E-002-004-CN007)

Table B2

Administrative Control Limits for Miscellaneous Connectors (provided by field installation)	Individual Resistance Limit of Miscellaneous Connector Types, uOhms **	Combined Resistance Limit of Miscellanous Connector Types, uOhms
Inter-tier Connector (paralleled 4/0 cables): 4 total *	150	600
Inter-bank Connector (paralleled 4/0 cables): 1 total *	150	150
Terminal Connector (cable lugs at posts 1 & 60 for field cables): 2 total *	150	300
	Total =	1050

Note: * Per Reference 3 (NK-E-002-004-CN007)
** Per this BED

Table B3

Administrative Control Limit for Combined Resistance of 59 Vendor-provided Battery Inter-cell Connector (metal plate assembly provided by battery manufacturer) for 60-cell Battery System, uOhms
Battery System Resistance Design Limit (Table B1) - Combined Administrative Control Limits for Miscellaneous Connector Types (Table B2) = 2832 - 1050 = 1782

Table B4

Effective Quantity Vendor-provided Battery Inter-cell Connectors for 60-cell Battery System
Total Vendor-provided Battery Inter-cell Connectors * = 54

Note: * Per Reference 3 (NK-E-002-004-CN007)

Table B5

60-cell Battery system Administrative Control Limit for Resistance of Individual Vendor-provided Battery Inter-cell Connector, uOhms
Administrative Control Limit for Combined Resistance of Vendor-provided Inter-cell Connectors (Table B3) = 1782 Effective Design Quantity of Vendor-provided Battery Inter-cell Connectors (Table B4) 54 Administrative Control Limit = 33

Table B6

60-cell Battery System Configuration * (59 Vendor-provided Battery Inter-cell Connectors)	Individual Resistance, uOhms*	Combined Resistance, uOhms
Inter-tier Connector (4 total) *	150	600
Inter-bank Connector (1 total) *	150	150
Terminal Connector (2 total) *	150	300
Inter-cell Connector (54 total) **	33	1782
	Total =	**2832**

Notes: * Per Tables B2 and B5; ** Per Table B4

Basic Engineering Disposition
"Administrative/Procedural Control Limits for NK Battery Connections"

Initiating Document and revision: CAP 15546-02-01 (PIR 2007-2492)

Table C1

59-cell Battery System Configuration (58 Vendor-provided Battery Inter-cell Connectors: each a metal plate assembly provided by battery manufacturer)	Individual Resistance Design Limit of Vendor-provided Battery Inter-cell Connector, uOhms *	58 Inter-cell Connector Battery System Resistance Total, uOhms
Vendor-provided Battery Inter-cell Connectors: 58 total **	48	2784

Notes: * Per Reference 3 (NK-E-002-004-CN007); ** Per this BED

Table C2

Administrative Control Limits for Miscellaneous Connectors (provided by field installation)	Individual Resistance Limit of Miscellaneous Connector Types, uOhms **	Combined Resistance Limit of Miscellanous Connector Types, uOhms
Inter-tier Connector (paralleled 4/0 cables): 4 total *	150	600
Inter-bank Connector (paralleled 4/0 cables): 1 total *	150	150
Terminal Connector (cable lugs at posts 1 & 60 for field cables): 2 total *	150	300
Field-Jumper Cable Connector (jumpers out a deficient battery cell; when required/needed): 1 maximum **	150	150
	Total =	1200

Notes: * Per Reference 3 (NK-E-002-004-CN007); ** Per this BED

Table C3

Administrative Control Limit for Combined Resistance of 58 Vendor-provided Battery Inter-cell Connector (metal plate assembly provided by battery manufacturer) for 59-cell Battery System, uOhms
Battery System Resistance Design Limit (Table C1) - Combined Administrative Control Limits for Miscellaneous Connector Types (Table C2) = 2784 - 1200 = 1584

Table C4

Effective Quantity Vendor-provided Battery Inter-cell Connectors for 59-cell Battery System
Total Vendor-provided Battery Inter-cell Connectors * - No. of "Jumpered-out" Vendor-provided Battery Inter-cell Connectors (maximum of 1 Battery Cell jumpered-out along with 2 adjacent Vendor-provided Battery Inter-cell Connectors per jumpered-out Battery Cell) ** = 54 Vendor-provided Battery Inter-cell Connectors - 2 "Jumpered-out" Vendor-provided Battery Inter-cell Connectors =52

Notes: * Per Reference 3 (NK-E-002-004-CN007); ** Per this BED

Table C5

59-cell Battery system Administrative Control Limit for Resistance of Individual Vendor-provided Battery Inter-cell Connector, uOhms		
Administrative Control Limit for Combined Resistance of Vendor-provided Inter-cell Connectors (Table C3)	1584	= 30.46
Effective Design Quantity of Vendor-provided Battery Inter-cell Connectors (Table C4)	52	
Administrative Control Limit * =	30	

Notes: * Next lower whole integer is selected for simplicity and conservatism

Table C6

59-cell Battery System Configuration * (58 Vendor-provided Battery Inter-cell Connectors)	Individual Resistance, uOhms*	Combined Resistance, uOhms
Inter-tier Connector (4 total) *	150	600
Inter-bank Connector (1 total) *	150	150
Terminal Connector (2 total) *	150	300
Field Jumper Cable Connector (1 total) *	150	150
Inter-cell Connector (52 total) **	30	1560
	Total =	**2760**

Notes: * Per Tables C2 and C5; ** Per Table C4

Basic Engineering Disposition
"Administrative/Procedural Control Limits for NK Battery Connections"

Initiating Document and revision: CAP 15546-02-01 (PIR 2007-2492)

Table D1

58-cell Battery System Configuration (57 Vendor-provided Battery Inter-cell Connectors: each a metal plate assembly provided by battery manufacturer)	Individual Resistance Design Limit of Vendor-provided Battery Inter-cell Connector, uOhms *	57 Inter-cell Connector Battery System Resistance Total, uOhms
Vendor-provided Battery Inter-cell Connectors: 57 total **	48	2736

Notes: * Per Reference 3 (NK-E-002-004-CN007); ** Per Reference 4 (NK-E-002-004-CN009)

Table D2

Administrative Control Limits for Miscellaneous Connectors (provided by field installation)	Individual Resistance Limit of Miscellaneous Connector Types, uOhms ***	Combined Resistance Limit of Miscellanous Connector Types, uOhms
Inter-tier Connector (paralleled 4/0 cables): 4 total *	150	600
Inter-bank Connector (paralleled 4/0 cables): 1 total *	150	150
Terminal Connector (cable lugs at posts 1 & 60 for field cables): 2 total *	150	300
Field-Jumper Cable Connector (jumpers out a deficient battery cell; when required/needed): 2 maximum **	150	300
	Total =	1350

Notes: * Per Reference 3 (NK-E-002-004-CN007); ** Per Reference 4 (NK-E-002-004-CN009)
*** Per this BED

Table D3

Administrative Control Limit for Combined Resistance of 57 Vendor-provided Battery Inter-cell Connector (metal plate assembly provided by battery manufacturer) for 58-cell Battery System, uOhms
Battery System Resistance Design Limit (Table C1) - Combined Administrative Control Limits for Miscellaneous Connector Types (Table C2) = 2736 - 1350 = 1386

Table D4

Effective Quantity Vendor-provided Battery Inter-cell Connectors for 58-cell Battery System
Total Vendor-provided Battery Inter-cell Connectors * - No. of "Jumpered-out" Vendor-provided Battery Inter-cell Connectors (maximum of 2 Battery Cells jumpered-out along with 2 adjacent Vendor-provided Battery Inter-cell Connectors per 54 Vendor-provided Battery Inter-cell Connectors - 4 "Jumpered-out" Vendor-provided Battery Inter-cell Connectors =50

Notes: * Per Reference 3 (NK-E-002-004-CN007); ** Per Reference 4 (NK-E-002-004-CN009)

Table D5

58-cell Battery system Administrative Control Limit for Resistance of Individual Vendor-provided Battery Inter-cell Connector, uOhms			
Administrative Control Limit for Combined Resistance of Vendor-provided Inter-cell Connectors (Table D3) =	1386	=	27.72
Effective Design Quantity of Vendor-provided Battery Inter-cell Connectors (Table D4)	50		
Administrative Control Limit * =	27		

Note: * Next lower whole integer is selected for simplicity and conservatism

Table D6

58-cell Battery System Configuration * (57 Vendor-provided Battery Inter-cell Connectors)	Individual Resistance, uOhms*	Combined Resistance, uOhms
Inter-tier Connector (4 total) *	150	600
Inter-bank Connector (1 total) *	150	150
Terminal Connector (2 total) *	150	300
Field Jumper Cable Connector (2 total) *	150	300
Inter-cell Connector (50 total) **	27	1350
	Total =	**2700**

Notes: * Per Tables D2 and D5; ** Per Table D4

ATTACHMENT II

MARKUP OF TECHNICAL SPECIFICATION PAGES

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 150E-6 ohm for inter-cell connections and ≤ 150E-6 ohm for terminal connections.	92 days
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	18 months
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	18 months
SR 3.8.4.5	Verify battery connection resistance is ≤ 150E-6 ohm for inter-cell connections and ≤ 150E-6 ohm for terminal connections.	18 months
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 128.4 V for ≥ 1 hour.	18 months

(continued)

≤ 33 E-6 ohms for inter-cell connections,
≤ 150 E-6 ohms for inter-tier connections,
≤ 150 E-6 ohms for inter-bank connection, and
≤ 150 E-6 ohms for terminal connections.

ATTACHMENT III

RETYPED TECHNICAL SPECIFICATION PAGES

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 33 E-6 ohms for intercell connections, ≤ 150 E-6 ohms for inter-tier connections, ≤ 150 E-6 ohms for inter-bank connection, and ≤ 150 E-6 ohms for terminal connections.	92 days
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	18 months
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	18 months
SR 3.8.4.5	Verify battery connection resistance is ≤ 33 E-6 ohms for intercell connections, ≤ 150 E-6 ohms for inter-tier connections, ≤ 150 E-6 ohms for inter-bank connection, and ≤ 150 E-6 ohms for terminal connections.	18 months
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 128.4 V for ≥ 1 hour.	18 months

(continued)

ATTACHMENT IV

MARKUP OF TECHNICAL SPECIFICATION BASES PAGES (FOR INFORMATION ONLY)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.4 and SR 3.8.4.5 (continued)

anticorrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.4.

INSERT B 3.8.4-6

The Surveillance Frequencies of 18 months are based on operational experience.

SR 3.8.4.6

This SR requires that each battery charger be capable of supplying 300 amps and 128.4 V for ≥ 1 hour. These requirements are based on the design rating of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 10), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.7

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 10) and Regulatory Guide 1.129 (Ref. 11), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests, not to exceed 18 months.

INSERT B 3.8.4-6

The limits for battery connection resistance for a 60-cell normal battery configuration are:

≤ 33 E-6 ohms for inter-cell connections,
≤ 150 E-6 ohms for inter-tier connections,
≤ 150 E-6 ohms for inter-bank connection, and
≤ 150 E-6 ohms for terminal connections.

ATTACHMENT V

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by WCNOC in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Richard Flannigan at (620) 364-4117.

Regulatory Commitments	Due Date / Event
The proposed changes to the WCGS Technical Specifications will be implemented within 90 days of NRC approval.	Within 90 days of NRC approval.