WOLF CREEK
NUCLEAR OPERATING CORPORATION

Matthew W. Sunseri
Vice President Oversight

August 8, 2007

WM 07-0068

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

Reference:
1) Letter ET 06-0038, dated September 27, 2006, from T. J. Garrett, WCNOC, to USNRC
2) Letter ET 07-0014, dated May 9, 2007 from T. J. Garrett, WCNOC, to USNRC
3) Telephone Conference Summary dated July 9, 2007, from V. Rodriguez, USNRC (ML071780563)

Subject: Docket No. 50-482: Follow-up Response to NRC Requests for Additional Information Related to Wolf Creek Generating Station License Renewal Application

Gentlemen:

Reference 1 provided Wolf Creek Nuclear Operating Corporation's (WCNOC) License Renewal Application for the Wolf Creek Generating Station (WCGS). Reference 2 provided WCNOC responses to NRC requests for additional information (RAIs) regarding the License Renewal Application (LRA). Reference 3 documented a telephone conference call conducted on June 13, 2007 to discuss the WCNOC responses. Attachment I provides follow-up responses to the RAIs discussed on the conference call. To facilitate NRC Staff review, RAI questions and responses 2.5-1 and 2.5-3 as provided in Reference 2 are included.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4008, or Mr. Kevin Moles at (620) 364-4126.

Sincerely,

M W Sunseri

Matthew W. Sunseri

MWS/rlt

Attachment I: - WCNOC Followup Response to NRC Requests for Additional Information

cc: J. N. Donohew (NRC), w/a
V. G. Gaddy (NRC), w/a
B. S. Mallett (NRC), w/a
V. Rodriguez (NRC), w/a
Senior Resident Inspector (NRC), w/a

A121

NRR

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Matthew W. Sunseri, of lawful age, being first duly sworn upon oath says that he is Vice President Oversight 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 M W Sunseri
Matthew W. Sunseri
Vice President Oversight

SUBSCRIBED and sworn to before me this 7th day of Aug., 2007.

Cindy Novinger
Notary Public

NOTARY PUBLIC STATE OF KANSAS
CINDY NOVINGER
My Appt. Exp. 7/8/2010

Expiration Date 7/8/2010

Attachment I

WCNOC Followup Response to NRC Requests for Additional Information

RAI 2.5-1
RAI 2.5-3

This Attachment provides Wolf Creek Nuclear Operating Corporation's (WCNOC) response to additional follow-up information concerning the Wolf Creek Generating Station (WCGS) License Renewal Application (LRA). In response to the request for additional information (RAI), reference is made to specific RAIs. These references are referring to Attachment III of Letter ET 07-0014, which provided WCNOC response to certain NRC RAIs concerning the WCGS LRA. To facilitate NRC Staff review, the referenced RAIs are provided as previously submitted and followed by the supplemental question and response.

Previously Submitted Information

RAI 2.5-1

LRA Section 2.5 does not explicitly describe the offsite recovery paths (from the switchyard to the onsite distribution system) for a station blackout (SBO).

The General Design Criterion 17 described in Title 10 Code of *Federal Regulations* Part 50 (10 CFR Part 50), Appendix A, requires that electric power from the transmission network to the onsite electric distribution system be supplied by two physically independent circuits to minimize the likelihood of their simultaneous failure.

In addition, the guidance provided by letter dated April 1, 2002, "Staff Guidance on Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout Rule (10 CFR 50.63) for License Renewal (10 CFR 54.4(a)(3))," states:

> For purposes of the license renewal rule, the staff has determined that the plant system portion of the offsite power system that is used to connect the plant to the offsite power source should be included within the scope of the rule. This path typically includes switchyard circuit breakers that connect to the offsite system power transformers (startup transformers), the transformers themselves, the intervening overhead or underground circuits between circuit breaker and transformer and transformer and onsite electrical system, and the associated control circuits and structures. Ensuring that the appropriate offsite power system long-lived passive structures and components that are part of this circuit path are subject to an aging management review will assure that the bases underlying the SBO requirements are maintained over the period of extended license.

According to the above, both paths that are used to control the offsite circuits to the plant should be age managed. According to LRA drawing LR-WCGS-ELEC-KD-7496, the high voltage switchyard circuit breakers, underground cables, and its associated components and structures are not presently included within the scope of license renewal. The staff requests that the applicant justify why these components are not within the scope of license renewal. In addition the staff requests that the applicant explain in detail which high voltage breakers and other components in the switchyard will be connected to startup transformer XMR01 and ESF No. 1 transformer XNB01 for the purpose of SBO recovery."

RAI 2.5-1 Response

The entire WCGS plant system portion of the SBO restoration power system is within the scope of license renewal. This is consistent with ISG-2 Staff Position which states, "Consistent with the requirements specified in 10 CFR 54.4(a)(3) and 10 CFR 50.63(a)(1),

the plant system portion of the offsite power system should be included within the scope of license renewal."

The WCGS is connected to the switchyard using disconnects not circuit breakers. The 345-kV switchyard system equipment beyond disconnect 345-163 and the 13.8-kV switchyard system equipment beyond disconnects 13-21 and 13-23 are not within the scope of license renewal because they are part of the transmission system grid and not part of the plant system.

This arrangement is similar to other applicants where the boundary from the station power system and the switchyard is the last active component that connects the plant to the transmission system grid. The following two recent SERs provide examples of where the Staff accepted disconnects as boundary from the station to the switchyard.

The Palisades SER (ML062710074) states, "Upstream of the motor operating disconnects are the 345kV buses, switchyard components, and the incoming lines, all parts of the transmission (grid) system, not the plant system. As part of the staff's scoping methodology review, the Electrical Engineering Branch (EEEB) evaluated the switchyard components and the license renewal boundaries established by the applicant. EEEB concluded that the switchyard configuration provides a reliable source of power to the preferred and alternate offsite circuits. In addition, EEEB concluded that the established boundaries are adequate for switchyard equipment within the scope of license renewal."

The Oyster Creek SER (ML070890637) states, "In accordance with ISG-02, the applicant identified SSCs required to recover from the SBO event and included within the scope of the license renewal. For OCGS, this portion of the plant electrical system connects safety-related buses to onsite emergency power and offsite power to recover from SBO events. Disconnection switches on the supply side of switch yard circuit breakers connecting the 34.5 kV OCGS substation to the plant and continuing through the startup transformers to the switchgear breakers of the plant 4160 alternating current (AC) breakers were included within the scope of license renewal."

The Kansas Gas and Electric (KG&E) and Kansas City Power and Light (KCPL) transmission systems serve as the main source of offsite power for 345-kV switchyard. Primary offsite power feeds the WCGS startup transformer No 1 XMR01 through disconnect 345-163 which is connected to the switchyard West 345-kV bus. The West switchyard bus can receive power from three transmission lines. The Benton 345-kV transmission line is connected to the West bus through switchyard circuit breaker 345-70, the LaCygne 345-kV transmission line is connected to the West bus through switchyard circuit breaker 345-110 and the Rose Hill 345-kV transmission line is connected to the West bus through switchyard circuit breaker 345-40.

A second offsite power feeds the WCGS transformer ESF No 01 XNB01 through disconnects 13-21 or 13-23. Disconnect 13-23 is connected to the secondary side of switchyard transformer No 7 through switchyard circuit breaker 13-48. The primary side of switchyard transformer No 7 connects to the switchyard East 345-kV bus through disconnect 345-167. Disconnect 13-21 is connected to switchyard 13.8-kV switchgear No 1 through switchyard circuit breaker 13-8. Switchyard 13.8-kV switchgear No 1 is connected to the secondary sides of switchyard transformer No 4 and No 5 through switchyard disconnects 13-9, 13-11, 13-13 and 13-15. The primary side of switchyard

transformers No 4 and No 5 connects to the secondary side of switchyard transformer No 6 through switchyard breaker 69-16. The primary side of switchyard transformer No 6 connects to the East bus through switchyard disconnect 345-165. The East bus can receive power from the same three transmission lines as the West bus. The Benton 345-kV transmission line is connected to the East bus through switchyard circuit breakers 345-80 and 345-90, the LaCygne 345-kV transmission line is connected to the East bus through switchyard circuit breaker 345-120 and the Rose Hill 345-kV transmission line is connected to the East bus through switchyard circuit breaker 345-50 and 345-60.

The primary path of SBO restoration power is from disconnect 345-163 via overhead transmission lines to the primary side of station start-up transformer No 1 XMR01, then from the secondary side (x-winding) of station start-up transformer No 1 XMR01 via above ground cable to circuit breaker PA00201. The second path of SBO restoration power is from disconnects 13-21 or 13-23 via underground cable to secondary side of station transformer ESF No 01 XNB01, then from the secondary side of station transformer ESF No 01 XNB01 via above ground cable to circuit breakers NB00212 and NB00112. This configuration conforms to the requirement of Criterion 17 that states, "the onsite electrical distribution system shall be supplied by two physically independent circuits 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."

Additional Information

RAI 2.5-1 Followup Discussion

Based on the discussion with the applicant, the staff indicated that the response to this RAI requires clarification. The staff reiterated its position regarding the scoping of equipment relied on to meet the requirements of SBO established by letter dated April 1, 2002. The staff noted that for SBO recovery, the path should include the first breaker from the offsite lines in the switchyard to the startup transformers up to the safety-related 4.16kV buses. The staff clarified that the guidance does not specify that the switchyard is not part of the plant systems, nor does it specify that the switchyard does not need to be included within the scope of license renewal. Thus, the staff noted that the first switchyard circuit breaker (from the grid, i.e., offsite transmission line), startup transformer, intervening overhead or underground circuits between the breaker and transformer as well as between the transformers and onsite electrical distribution system, and associated control circuits and structures for the two SBO recovery paths should be included within the scope of license renewal. The staff indicated that for each SBO recovery path, the scope of license renewal should cover up to and including the first circuit breaker from any one of the three offsite transmission lines (i.e., grid).

RAI 2.5-1 Followup Response

Wolk Creek Nuclear Operating Corporation (WCNOC) has performed scoping of the Station Blackout (SBO) equipment in accordance with Interim Staff Guidance (ISG)-2 and has based the scoping boundary on the Wolf Creek Generating Station (WCGS) current licensing basis (CLB) and design configuration.

In NRC letter to NEI dated April 1, 2002, "Staff Guidance on Scoping of Equipment Relied On To Meet The Requirements Of The Station Blackout (SBO) Rule (10 CFR 50.63) for

License Renewal (10 CFR 54.4(a)(3))", the NRC provided guidance on scoping of equipment for SBO. This letter became Interim Staff Guidance (ISG-2). The letter stated, "The offsite power systems of U.S. nuclear power plants consist of a transmission system (grid) component that provides a source of power and a plant system component that connects that power source to a plant's onsite electrical distribution system which powers safety equipment."

The WCGS plant system that connects that (offsite) power source to the WCGS onsite electrical distribution system is described in RAI 2.5-1 as follows: "The primary path of SBO restoration power is from disconnect 345-163 via overhead transmission lines to the primary side of station start-up transformer No 1 XMR01, then from the secondary side (x-winding) of station start-up transformer No 1 XMR01 via above ground cable to circuit breaker PA00201. The second path of SBO restoration power is from disconnects 13-21 or 13-23 via underground cable to secondary side of station transformer ESF No 01 XNB01, then from the secondary side of station transformer ESF No 01 XNB01 via above ground cable to circuit breakers NB00212 and NB00112."

This description of the plant system connection to the transmission system is consistent with the description provided in USAR Section 8.2 "Offsite Power System":

> **"Two physically independent sources of offsite power are brought to the onsite power system. One circuit is fed from ESF transformer XNB01 and supplies power normally to its associated 4.16-kV Class 1E bus. The other circuit is fed from one secondary winding of the startup transformer, through ESF transformer XNB02, and supplies power normally to its associated 4.16-kV Class IE bus."**

ISG-2 goes on to state the following, "This path typically includes the switchyard circuit breakers that connect to the offsite system power transformers (startup transformers), the transformers themselves, the intervening overhead or undergroud circuits between circuit breaker and transformer and transformer [sic] and onsite electrical distribution system, and the associated control circuits and structures." The scoping guidance provided in ISG-2 does not constitute a requirement to include switchyard breakers or other specific components in the offsite power system within the scope of license renewal.

At WCGS the devices that connect to both offsite power sources are disconnects. These are the WCGS isolation devices between the plant system and the transmission system. The disconnects are normally closed. The boundary of the SBO recovery source is not determined by the ability to isolate the conductor, or to interrupt current, but is based on plant design and configuration to reconnect to offsite power. Switchyard air break switch 345-163, supplies power to the startup transformer and is capable of de-energizing and energizing the transformer with the secondary side breakers used to connect and disconnect loads. The reason primary side breakers are not used is economics; single transformer faults are cleared by the secondary transformer breakers and the three bus breakers. A single transformer fault will result in a de-energized transformer and a bus, with all three transmission lines still in service to the other bus, which is typical of a breaker and a half scheme.

It should be noted that the device used to reconnect to the grid after an SBO event is not necessarily the same device that is the boundary with the grid. Plant electrical systems

are designed to switch or interrupt the power supply to safety buses at load using switchgear on the secondary side of the startup transformers. Circuit breakers used for this purpose are included within the scope of license renewal. Typically, the circuit breakers on the secondary side of the start-up transformers will automatically open when their protective relaying senses low voltage on the incoming power supply from the grid. These circuit breakers will be manually closed after the grid (i.e. Switchyard buses) is restored. This is not the same device as the device that defines the boundary between the grid and the plant electrical systems. Therefore, the capability to switch buses at load or provide fault protection is not necessarily a requirement for the device used to connect the plant to the grid.

In conclusion, the WCGS scoping of SBO equipment for license renewal is consistent with the direction provided in ISG-2. The SBO scoping boundary starts at the disconnects 345-163 and 13-21 and 13-23, which are the preferred offsite power source and alternate offsite power source connection points, respectively and include the disconnects, the offsite transformers (startup transformer), overhead and buried cables, station transformers, buses, and isolation breakers. Upstream of the disconnects are the 345 kV buses, switchyard components, and the incoming lines, all parts of the transmission (grid) system, not the plant system.

Previously Submitted Information

RAI 2.5-3

There has been operating experience regarding the failure of cable tie-wraps caused by the brittleness of the plastic material. The cable tie-wraps are long-lived passive components. Its intended functions include to maintain spacing for power cable ampacity, maintain stiffness in unsupported lengths of wire bundles to ensure minimum bending radius, and maintain cables within vertical raceways, among others. Most recently, at Point Beach, the regional inspectors identified an unresolved item after noticing that the current configuration of the plant may not be consistent with plant design documents due to the age related breakage of a large number of plastic tie-wraps used to fasten wires and cables. At Point Beach, cable tie-wraps are part of the cable design in order to maintain cable ampacity or are credited in the licensee's Seismic Qualifications Utility Group to seismically qualify the cable tray system. The staff requests that the applicant explain how WCGS manages the aging of cable tie-wraps. In addition, the staff requests that the applicant justify why the cable tie-wraps are not included within the scope of license renewal in accordance with the requirements of 10 CFR 54.4.

RAI 2.5-3 Response

Cable tie wraps at the WCGS are not within the scope of license renewal and therefore aging management is not required. Cable tie wraps perform no license renewal intended functions. The functions stated by the Staff "maintain spacing for power cable ampacity, maintain stiffness in unsupported lengths of wire bundles to ensure minimum bending radius, and maintain cables within vertical raceways, among others" are not intended function at the WCGS as defined by 10 CFR 54.4. WCGS has no current licensing basis (CLB) requirements that cable tie wraps remain functional during and following design-basis events. Cable tie wraps provide no license renewal intended

functions and do not meet any criteria found in 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2) or 10 CFR 54.4(a)(3).

Tie wraps are used as an aid during cable installation to establish power cable spacing in cable trays. WGCS design drawing "Installation, Inspection and Testing Details for Electrical Equipment and Cable" directs the use of tie wraps when maintained spacing is required per the construction documents. Once the cables have been installed and in place, the cables own weight in the tray and the inherent rigidity of the Class B copper stranding will continue to maintain the spacing. This spacing provides a path for natural circulation of air through the cables in the tray. The power cables are sized to carry currents well in excess of load requirements with margin considering worst case routing. Where cable ties are used during installation care is exercised to prevent excessive tightening of the tie wrap, which could result in the deformation of the cable jacket material. Tie wraps are not credited in WCGS seismic qualification of the cable tray support system.

Additional Information

RAI 2.5-3 Followup Discussion

Based on the discussion with the applicant, the staff indicated that the response to this RAI requires clarification. The staff understands that the cable tie wraps are not credited in the WCGS seismic qualification of the cable tray support system. However, the staff noted that there is operating experience showing instances in which degraded cable tie-wraps has failed and lodged in components preventing the performance of their intended functions. The staff requested that the applicant clarify if WCGS considered the potential effect on safety-related equipment caused by the failure of plastic cable tie-wraps due to age-related degradation.

RAI 2.5-3 Followup Response

WCGS considered the potential effect on safety-related equipment caused by the failure of plastic cable tie-wraps due to age-related degradation and concluded that the failure of tie wraps that could prevent satisfactory accomplishment of the applicable functions of the structure, systems and components (SSC)s identified under 10 CFR 54.4(a)(1) is not credible because;

- **WCGS uses nylon tie wraps that are resistant to heat related aging. Nylon has a 60 year service environment of 119 °F. Most areas at WCGS have a maximum operating temperature of 104 °F with a few rooms with maximum operating temperature of 120 °F. No areas will see temperatures continuously above 119 °F for 60 years.**
- **WCGS uses tefzel tie wraps in radiation areas and within the containment. Tefzel has a 60 year service environment of 228 °F and $3x10^7$ Rads. The maximum operating temperature for the containment is 120 °F with a 60 year normal dose of $5.25x10^3$ Rads.**
- **Tie wraps are lightweight and nonconductive.**
- **Sensitive components that could be impacted by a loose tie wrap are installed within protective enclosures.**

- **WCGS has experienced no equipment failures due to tie wrap failures.**
- **WCGS employs good housekeeping and foreign material exclusion (FME) practices.**

In addition, "License Renewal Issue: Guidance on the Identification and Treatment of Structures, Systems, and Components Which Meet 10 CFR 54.4(a)(2)," March 15, 2002, described the staff's recommendations for the evaluation of non-piping SSCs to determine which additional non-safety related (NSR) SSCs are within scope. The position states that the applicants should not consider hypothetical failures, but rather should base their evaluation on the plant's CLB, engineering judgment and analyses, and relevant operating experience. A review of the WCGS operating experience determined that Wolf Creek has had no equipment failures due to tie wrap failures. A review of the industry experience identified only two occurrences of component failures due to tie wraps (LER 03-004-00 for Braidwood, Unit 2 ML040420592 and December 2003 Monthly Operating Report for Braidwood Station Units 1 and 2 ML040210741). Both of these occurred within active equipment. No information on how the cable tie wrap became lodged in the active component was provided in the LER or Operating Report. Additionally, it was not determined if the failures were age related or due to maintenance activities where a piece of tie wrap that had been cut became lodged in the components.

The majority of the 224 ADAMS documents involving tie wraps are housekeeping and FME issues unrelated to aging. The one case of Operating Experience (OE) involving failure of a valve (Edwin I. Hatch Nuclear Plant - Unit 2 Licensee Event Report, Excessive Leakage Identified on Secondary Containment Bypass Valves ML003707365) was caused by foreign material intrusion. A nylon tie wrap and a piece of paper were found on the valve seat upon disassembly.

Tie wraps are used for various applications within a power plant to secure all types of equipment, tags, signage and barriers. They are not solely used for cable installation. There is no operating experience that has shown that tie wraps installed in the general plant areas (not within active components), with good housekeeping and FME practices, are causing failures that could prevent satisfactory accomplishment of the applicable functions of the SSCs identified under 10 CFR 54.4(a)(1). Therefore, loose tie wraps should continue to be treated as a FME issue and they are not subject to aging management review.