UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 29, 2010

Mr. Rick A. Muench
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION – REQUEST FOR ADDITIONAL INFORMATION ON LICENSE AMENDMENT REQUEST FOR DEVIATION FROM FIRE PROTECTION PROGRAM REQUIREMENTS (TAC NO. ME0797)

Dear Mr. Muench:

By letter dated March 4, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090771269), Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested for approval to make changes to the approved fire protection program as described in the Updated Safety Analysis Report for Wolf Creek Generating Station, pursuant to the License Condition 2.C(5).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by the licensee and determined that additional information is needed in order to complete the review. A draft copy of the request for additional information (RAI) was forwarded to Ms. Diane Hooper of your staff on January 19, 2010, via e-mail. The licensee had discussions with the NRC staff on January 27, 2010, to ensure mutual understanding of the RAI. Mr. Steve Wideman of WCNOC agreed to provide the final response by March 26, 2010.

If you have any questions, please contact me at 301-415-3016 or via e-mail at balwant.singal@nrc.gov.

Sincerely,

/RA/

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure:
As stated

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

DEVIATION FROM FIRE PROTECTION PROGRAM REQUIREMENTS

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

By letter dated March 4, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090771269), Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested for approval to make changes to the approved fire protection program as described in the Updated Safety Analysis Report for Wolf Creek Generating Station (WCGS), pursuant to the License Condition 2.C(5).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by the licensee and determined that the following additional information is needed in order to complete the review. It was agreed that the licensee will provide the additional information being requested by March 26, 2010.

Please note that the licensee's submittal included interim compensatory operator manual actions (OMAs) for Fire Area A-27; however, interim compensatory measures are outside the scope of this license amendment request review. As such, these were not included in the review. The use of interim compensatory measures should be implemented in accordance with the licensee's approved fire protection program.

Request for Additional Information (RAI)

RAI-01: Ensuring That One of the Redundant Trains Is Free of Fire Damage

Section 3.0 of Attachment I of the licensee's submittal includes a description of the OMAs and provides the history of correspondence with the NRC staff. This section also states that the licensee received a green non-cited violation (NCV) for failure to ensure that redundant trains of safe shutdown systems in the same fire area were free of fire damage. It is also stated that the green NCV of License Condition 2.C.(5) existed because WCGS credited the use of manual actions to mitigate the effects of fire damage in lieu of providing the physical protection required by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix R, Section III.G.2. The NCV was later re-categorized to an Apparent Violation with enforcement discretion.

The method described in the request appears to demonstrate safe shutdown capability independent of the fire area of origin consistent with Section III.G.3 of Appendix R to 10 CFR Part 50, yet the request is for deviation from the requirements of Section III.G.2. Section III.G.2 specifically states that measures must be taken to ensure that one of the redundant trains remains free of fire damage within the fire area. Section III.G.3 addresses alternative or

dedicated shutdown capability independent of the fire area of origin and establishes a series of requirements to achieve and maintain safe shutdown capability.

RAI-01.1: Please confirm and state whether deviation from Section III.G.2 requirements is the appropriate request for all of the OMAs in the request, since safe shutdown capability is provided independent of the fire area of origin for most of the fire areas.

RAI-01.2: Please state the specific requirements of Section III.G.2 that are not met for each of the requested OMAs (e.g., a lack of fire barriers, spatial separation, automatic suppression, etc.).

RAI-01.3: Please provide a summary of the plant specific features that compensate for the lack of Section III.G.2-required features, identified in RAI-01.2, for each of the requested OMAs. For example, note any enhanced defense-in-depth measures such as a lack of ignition sources or combustibles, partial spatial separation, more robust or supplemental detection and suppression systems, and other physical or administrative controls.

RAI-01.4: Appendix R to 10 CFR Part 50 establishes the concept of defense-in-depth and Section III.G.2 requires operators be able to safely and reliably achieve and maintain hot shutdown capability from the control room. Please provide a technical explanation that justifies how the proposed methods will result in a level of protection that is commensurate with that intended by Section III.G.2.

RAI-02: Other Evaluations

Fire areas may have other evaluations that affect fire protection systems or safe shutdown capabilities. For example, Section 3.0 of Attachment I of the licensee's submittal mentions that some OMAs were eliminated based on analyses or modifications that were performed after the licensee received an Apparent Violation but does not indicate whether these efforts have been accounted for in the request.

RAI-02.1: Please provide a discussion of any other evaluation, including licensee-developed evaluations (e.g., Generic Letter 86-10 evaluations), which impact this request in any way and provide a justification for why such impact should be considered acceptable.

RAI-03: Fire Protection System and Fire Barrier Design Criteria

Section 8.0 of Attachment I of the licensee's submittal states that several areas are equipped with various fire detection and suppression systems but does not state whether the systems that are provided have been designed and installed in accordance with applicable design standards or requirements.

RAI-03.1: Where fire protection features are installed, such as detection and suppression systems and fire-rated assemblies, please describe the technical basis for such installations including the applicable codes, standards, and listings.

For example:

Section 8.1.1 of Attachment I of the licensee's submittal states that smoke detection is provided in Fire Area A-1 in areas where circuits of concern are routed. Please state whether the detectors have been installed and maintained in accordance with a particular design standard or basis (e.g., National Fire Protection Association (NFPA) 72: National Fire Alarm Code, 1985 Edition).

Section 8.1.1 of Attachment I of the licensee's submittal states that a pre-action sprinkler system is located in Fire Area A-1 in areas with a high concentration of cable trays. Please state whether this system has been installed and maintained in accordance with a particular design standard or basis (e.g., NFPA 13: "Standard for the Installation of Sprinkler Systems," 1985 Edition). Where pre-action systems or interlocks are provided, please include the design standard and basis for the associated systems.

Section 8.4.1 of Attachment I of the licensee's submittal states that a total flooding Halon system is installed in Fire Area A-18. Please state whether the Halon system was installed and maintained in accordance with a particular design standard or basis (e.g., NFPA Standard 12A, 1985 Edition).

RAI-03.2: Please provide a technical justification for any deviations from codes, standards, and listings by independent testing laboratories in the fire areas that could impact this evaluation.

RAI-03.3: Please provide a technical justification for any non-rated fire protection assemblies.

RAI-04: Ignition Sources and Combustible Fuel Load

Section 8.0 of Attachment I of the licensee's submittal states that the areas included in the request have combustible loading allowances and hot work limitations that are consistent with other areas important to safe shutdown but does not discuss what those allowances and limitations are or what the actual hazards are in each of the areas.

RAI-04.1: Please provide critical details or assumptions regarding the *in-situ* and transient fire hazards that could threaten redundant equipment for each fire area included in the request. This information may include, but is not limited to:

- The number, type, and location of potential ignition sources,
- The number and types of equipment that may exhibit high-energy arcing faults, and the relationship between this equipment and any secondary combustibles,
- The quantity of cables and other secondary combustibles and their relationship to potential ignition sources,

- The cable type (e.g., thermoplastic or thermoset); if thermoplastic cables are used, please provide a discussion of self-ignited cable fires,
- Ratings for cables (e.g., Institute of Electrical and Electronics Engineers (IEEE) 383, etc.); if not rated, please justify why fire spread would be assumed to be slow,
- Controls on hot work and transient combustibles in the area, and the proximity of secondary combustibles that could be impacted by a transient fire, and
- Dimensions of the rooms, including ceiling heights.

RAI-05: Fire Scenarios

The request identifies the OMAs needed in each fire area, but does not describe the fire scenarios that have been considered for the postulated events. For example, in the event of fire in Fire Area C-18, OMAs may be required to operate valves and breakers. However, no information is provided to describe the separation between the redundant train cables. It is also not clear where the cables are located relative to the floor, walls, and other trains or whether any spatial separation exists between the two trains.

RAI-05.1: Please provide a description of the proximity of the redundant train equipment to in-situ hazards and the spatial relationship between the redundant trains in the fire area such that if they are damaged, manual actions would be necessary. Note, that this question is distinct from the RAI addressing Ignition Sources and Combustible Loading, which is generally focused on the combustibles in an area, whereas this RAI addresses the specific relationship between ignition sources and combustibles and the redundant trains.

RAI-05.2: Please provide a discussion of the suppression, detection, and any other systems that are present and capable of mitigating the postulated events for the fire areas included in this request.

RAI-06: Required Operator Stations

The request does not specify what has been assumed for the location from which operators are dispatched to perform the OMAs or whether scenarios were evaluated where operators were not at their assumed locations at the beginning of an event. The location or activities of required plant personnel when the fire starts could delay their participation in executing the OMAs (e.g., they may be in a location that is on the opposite side of the plant from the main control room or may need to restore certain equipment before being able to participate or both).

RAI-06.1: Please provide a justification for the assumption that operators will be located at an assumed location when the OMA procedure begins. If there is no assurance that the operators will be at the assumed locations, provide the times required for them to reach the locations and indicate how these times are reflected in the analysis.

RAI-07: Pressure Interface

Section 8.1 of Attachment 1 of the licensee's submittal states that either valve BGLCV0459 or BGLCV0460 must be closed *"to ensure adequate charging flow."* This section also states that if "letdown is the only flow diversion event," both valves "can remain open for one hundred eighty (180) minutes without any adverse consequence to reactor performance." However, for cases where fire causes a single atmospheric relief valve (ARV) to spuriously open, the time both valves can remain open decreases significantly to 50 minutes. The actions to close BGLCV0459 and BGLCV0460 are identified as being "reactive actions" which are only implemented in response to indications of changing equipment conditions caused by the fire. Thus, action to close BGLCV0459 and BGLCV0460 would not be initiated until the "relevant indications" are observed by operators.

Additionally, the request states that closure of KAV0201 will fail air to all air-operated components within the Reactor Building and the historical performance of Integrated D/G [diesel generator] and Safeguards Actuation Test, STS KJ-001A, shows that BGLCV0459 and BGLCV0460 will fail closed within 3 minutes following isolation of instrument air.

RAI-07.1: Please confirm that the evaluation of time available to close the letdown valves in the event of a single spurious ARV, bounds all potentially adverse fire damage impacts, including multiple spurious actuations, that could occur in any fire area which credits an OMA to close letdown isolation valves BGLCV0459 and BGLCV0460.

RAI-07.2: Please describe how, in the absence of other key parameters such as valve position indication or alarm annunciators, these indications are sufficient to ensure that operators will quickly and reliably identify the need to close BGLCV0459 and BGLCV0460.

RAI-08: Diagnosis Time for Reactive OMAs

Section 5.1.14 of Attachment 1 of the licensee's submittal states that "based on procedure structure and observed Control Room operator performance during fire brigade drill activities, it is conservatively concluded that Control Room personnel will consistently diagnose the need to perform a reactive OMA within seven (7) minutes of a confirmed fire alarm condition."

RAI-08.1 Please provide a technical justification to support the position that Control Room personnel will consistently diagnose the need to perform a reactive OMA within 7 minutes of a confirmed fire alarm condition or how procedure structure and Control Room observations support this position.

RAI-09: Staffing

Section 8.1.13 of Attachment 1 of the licensee's submittal states that the operator assigned OFN KC-016 (Fire Response Procedure) OMA duty for the shift is responsible for performing the OMA.

RAI-09.1 Please confirm that individuals that might be needed to perform the OMAs do not have collateral duties, such as firefighting, security duties, or control room operation, during a postulated fire event.

January 29, 2010

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Sincerely,

/RA by Mohan C. Thadani for/

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure:
As stated

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