



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

September 30, 2010

Mr. Matthew W. Sunseri
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
LICENSE AMENDMENT REQUEST FOR USE OF FIRE-RESISTIVE
ELECTRICAL CABLE (TAC NO. ME2966)

Dear Mr. Sunseri:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 189 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS). The amendment consists of changes to the plant licensing basis in response to your application dated December 16, 2009, as supplemented by letter dated June 2, 2010.

The amendment revises the fire protection program as described in WCGS Updated Safety Analysis Report (USAR). Specifically, a deviation from certain technical commitments to Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G.2, as described in Appendix 9.5E of the WCGS USAR, is requested regarding the use of fire-resistive cable for certain power and control cables with two motor-operated valves on Component Cooling Water System.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink that reads "Balwant K. Singal".

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

Docket No. 50-482

Enclosures:

1. Amendment No. 189 to NPF-42
2. Safety Evaluation

cc w/encls: Distribution via Listserv



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

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 189
License No. NPF-42

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Wolf Creek Generating Station (the facility) Renewed Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated December 16, 2009, as supplemented by letter dated June 2, 2010, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the plant licensing basis as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-42 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 189, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 180 days of the date of issuance. Consistent with the requirements in 10 CFR 50.71(e), implementation shall include revision to the Updated Safety Analysis Report (USAR), including Chapters 3, 7, 8, and Appendices 9.5A and 9.5E, to include the effects of all changes made in the facility or procedures described in the USAR and all safety analyses and evaluations performed by the licensee in support of the license amendment.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and
Technical Specifications

Date of Issuance: September 30, 2010

ATTACHMENT TO LICENSE AMENDMENT NO. 189

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Replace the following pages of the Renewed Facility Operating License No. NPF-42 with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Renewed Facility Operating License

REMOVE

4

INSERT

4

- (5) The Operating Corporation, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (6) The Operating Corporation, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission, now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level
- The Operating Corporation is authorized to operate the facility at reactor core power levels not in excess of 3565 megawatts thermal (100% power) in accordance with the conditions specified herein.
- (2) Technical Specifications and Environmental Protection Plan
- The Technical Specifications contained in Appendix A, as revised through Amendment No. 189, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.
- (3) Antitrust Conditions
- Kansas Gas & Electric Company and Kansas City Power & Light Company shall comply with the antitrust conditions delineated in Appendix C to this license.
- (4) Environmental Qualification (Section 3.11, SSER #4, Section 3.11, SSER #5)*
- Deleted per Amendment No. 141.

*The parenthetical notation following the title of many license conditions denotes the section of the supporting Safety Evaluation Report and/or its supplements wherein the license condition is discussed.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 189 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By application dated December 16, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML093641067), as supplemented by letter dated June 2, 2010 (ADAMS Accession No. ML101600466), Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested changes to plant licensing basis for the fire protection program as described in Wolf Creek Generating Station (WCGS) Updated Safety Analysis Report (USAR).

The WCGS post-fire safe shutdown analysis identified that, in some fire areas, separation of redundant safe shutdown circuits is not in accordance with WCGS commitments. One of these fire areas was Fire Area A-27 (Rod Drive/MG [motor generator] Set Room), and the issues identified were related to the safe shutdown functions of the control and power cables associated with valves EGHV0016 and EGHV0054, which are, respectively, on the component cooling water (CCW) return and supply lines from the service loop.

The licensee submitted a request for deviation from its approved fire protection program for WCGS. Specifically, the licensee proposes the use of fire-resistive electrical cable produced by Meggitt Safety System, Inc., for the control and power cables associated with CCW service loop valves EGHV0016 and EGHV0054. The licensee proposes the use of these fire-resistive electrical cables in lieu of the alternatives specified in Section III.G.2 of Appendix R to Title 10 of the *Code of Federal Regulations*, Part 50 (10 CFR 50).

The supplemental letter dated June 2, 2010, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 9, 2010 (75 FR 10831).

2.0 REGULATORY EVALUATION

General Design Criterion (GDC) 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR 50 requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components 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, or coincident with, loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power.

The regulations in 10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants," require, in part, that electric equipment important to safety which is relied upon to remain functional during and following design basis events be qualified for accident (harsh) environment. This provides assurance that the equipment needed in the event of an accident will perform its intended function.

WCGS's Renewed Facility Operating License Condition 2.C(5) states, in part, that

The Operating Corporation shall maintain in effect all provisions of the approved fire protection program as described in the SNUPPs [Standardized Nuclear Unit Power Plant System] Final Safety Analysis Report for the facility through Revision 17, the Wolf Creek site addendum through Revision 15, and as approved in the SER [Safety Evaluation Report] through Supplement 5...

Although WCGS obtained its operating license after January 1, 1979, the NRC stated, in the WCGS SER (NUREG-0881) dated April 1982, that it would condition the WCGS operating license to require WCGS to meet the technical requirements of Appendix R to 10 CFR 50, or provide equivalent protection. However, that license condition did not appear in the original WCGS operating license when it was issued.

Section III.G.2 of 10 CFR Part 50, Appendix R, provides fire protection requirements for electrical cables located within the same fire area whose failure could prevent operation or cause the mal-operation of redundant trains of systems necessary to achieve and maintain hot shutdown conditions. These areas are required to have protection features such that one of the redundant trains will be free of fire damage in the event of a fire. One of the methods that ensures compliance with this requirement of Section III.G.2 of Appendix R is to enclose the cable and equipment and associated non-safety circuits of one redundant train in an electric raceway fire barrier system (ERFBS) having a 3-hour fire rating.

3.0 TECHNICAL EVALUATION

In its letter dated December 16, 2009, the licensee stated, in part, that:

The WCGS post-fire safe shutdown analysis (PFSSDA) identified that, in some fire areas, separation of redundant safe shutdown circuits is not in accordance with WCGS commitments to 10 CFR 50, Appendix R. As these issues were discovered, WCNOG entered them in the corrective action program, made the appropriate notifications, implemented compensatory measures and developed plans to correct the concern. Corrective actions so far have included installing 1-hour or 3-hour fire wrap around the applicable circuits, rerouting cables out of the affected fire areas, establishing combustible control zones, installing additional automatic fire detection, and addition of hand switches in the main control room. Over the last three years, WCNOG has implemented 14 plant modifications to improve the post-fire safe shutdown capability and bring the plant into compliance with its commitments to 10 CFR 50 Appendix R.

Based on the PFSSDA, the Train B Component Cooling Water System is the protected train of component cooling water if a fire occurs in Fire Area A-27 (Rod Drive/MG Set Room). However, the power and control cables for valves EGHV0016 and EGHV0054 are routed through Fire Area A-27. Damage to the [conventional] power and control cables will prevent operation of the valves from the Main Control Room (MCR). Therefore, WCNOG is proposing to install 3-hour rated fire-resistive electrical cable manufactured by Meggitt Safety Systems, Inc. (hereinafter referred to as Meggitt) in lieu of the existing electrical cables, to provide an equivalent level of protection specified by 10 CFR 50, Appendix R Section III.G.2.a. The cables are purchased as safety related, seismically-qualified, environmentally-qualified, Class 1E cables, which meet the 3-hour fire endurance rating when tested per the requirements of Supplement 1 to Generic Letter 86-10, "Implementation of Fire Protection Requirements" (Reference 6.1).

WCNOG is proposing to route the new fire-resistive cable from the valves to the motor control center, which would include installation of the cable in Fire Areas A-16 and A-21. This routing was chosen because it provides a direct route from the valves to the motor control center.

Currently, a postulated fire in Fire Area A-27 could affect the safe shutdown of the plant. A fire in this area could damage the control and power cables associated with CCW service loop valves EGHV0016 and EGHV0054. This could prevent operation of the valves, which could adversely impact the safe-shutdown equipment.

The licensee proposes to reroute the control and power cables outside of Fire Area A-27, and to instead run them only in Fire Areas A-16 (where the valves are located) and A-21 (where the associated Motor Control Center is located). Fire Area A-21 is located above Fire Area A-16. Additionally, the licensee proposes to use fire-resistive stainless steel jacketed electrical cables in lieu of 3-hour rated ERFBS described in Section III.G.2 of 10 CFR Part 50, Appendix R. The fire-resistive rating of the cables is only required in Fire Area A-16.

The WCGS USAR, Appendix 9.5E, provides a comparison of the WCGS Fire Protection Program against the requirements of Section III of Appendix R to 10 CFR 50. Since the WCGS comparison to 10 CFR 50 Appendix R does not mention use of fire-resistant cable, WCNOG determined that the use of the Meggitt cable represents a deviation from the approved WCGS fire protection program, and is requesting approval from the NRC pursuant to License Condition 2.C(5).

The NRC staff reviewed whether the fire-resistive electrical cables would be capable of providing equivalent level of protection as would be provided by 3-hour rated ERFBS, based on the following:

3.1 Cable Fire Resistance Testing

The licensee stated that the fire-resistive electrical cables have been tested in accordance with American Society for Testing Materials (ASTM) E-119, "Standard Test Methods for Fire Tests of Building Construction Materials," for a 3-hour fire resistance. The licensee further stated that the testing was conducted in accordance with Supplement 1 to NRC Generic Letter 1986-10, "Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Trains within the Same Fire Area." In its letter dated December 16, 2009, the licensee provided copies of the fire test reports 14980-117047 (Revision 1) dated July 7, 2004, and 14980-121039 dated February 23, 2005.

In its letter dated December 16, 2009, the licensee submitted information demonstrating that the physical installation characteristics of the tested fire-resistive cable configurations bound the proposed installation. Additionally, in its letter dated June 2, 2010, the licensee submitted information demonstrating that the electrical properties of the tested fire-resistive cable configurations bound the proposed installation.

Based on the above, the NRC staff concludes that the tested configuration bounds the proposed installation.

3.2 Control and Power Circuit Environmental Qualification

The NRC staff reviewed the environmental qualification aspect of the license amendment request (LAR). Based on its review, in a request for additional information (RAI) dated May 6, 2010 (ADAMS Accession No. ML101100628), the NRC staff requested the licensee to explain an apparent discrepancy with Table 3.11 (B)-3 of Section 3.11 of the WCGS USAR. Specifically, the NRC staff requested the licensee to explain the designation of the Meggitt Si2400 cable as required to function during a high-energy line break accident (denoted by the letter 'A' in the Category column of the Table). In its letter dated June 2, 2010, in response to the NRC staff's RAI, the licensee stated that while the fire-resistive power and control cables are being purchased as safety-related, seismically qualified, environmentally qualified, Class 1E, the specific installation of the cable is not in a harsh environment. The licensee further stated that the proper category for the Meggitt Si2400 cable for a high-energy line break is category D since the item is located in a mild environment post accident. The licensee

provided the proposed mark-up of this Table to reflect the appropriate designation for these cables in its letter dated June 2, 2010.

Based on the above, the NRC staff finds that the cable that is proposed to be installed in Fire Areas A-16 and A-21 is not required to be environmentally qualified in accordance with 10 CFR 50.49.

3.3 Circuit Separation

Separation of safety-related circuits is required to be maintained in accordance with NRC Regulatory Guide 1.75, "Physical Independence of Electric Systems." Separation is required to maintain independence of Class 1E circuits and equipment so that the protective functions required during any design basis event can be accomplished.

During the fire testing, approximately 1.5 inches of cable jacket separation distance was maintained between the four cable samples tested. At the end of the 3-hour fire test, there was no adverse interaction identified between cable samples or between cables and support structure. The fire tests demonstrated that the electrical continuity of the cables was maintained during and after the fire test.

Based on the above, the NRC staff concludes that the composition of the fire-resistive cable can provide the requisite physical separation between redundant Class 1E circuits for protection against fire when installed in accordance with the tested configurations.

3.4 Mechanical Damage Protection

Three-hour rated ERFBS that are tested in accordance with ASTM E-119, and NRC Generic Letter 1986-10, Supplement 1, are subject to a hose stream test that ensures the raceway and the barriers will stay in place following a fire exposure. The licensee stated that the fire-resistive electrical cables and the associated supports were successfully tested as described above. The licensee also described successful seismic testing of the fire-resistive cable and supports. The fire-resistive electrical cables will be routed in a safety-related structure.

Based on the information provided by the licensee regarding the fire tests meeting the requirements of ASTM E-119 and Generic Letter 1986-10, Supplement 1, and successful seismic tests, the NRC staff concludes that there will be adequate protection from mechanical damage to the fire-resistive cable for the specific application at WCGS.

3.5 Galvanized Supports

When in contact with galvanized supports, fire-resistive electrical cable produced by Meggitt Safety Systems, Inc. experienced degradation due to liquid metal embrittlement as reported in fire test report 14980-117047 dated July 7, 2004. This degradation occurred at the positions where the galvanized supports came in direct contact with the stainless steel cable jacket. The licensee stated that the later test (Report 14980-121039 dated February 23, 2005) successfully used stainless steel support materials. The licensee stated that Meggitt cable is required to be installed in such a manner that it does not come in direct contact with any galvanized materials,

consistent with NRC Information Notice 2006-02, "Use of Galvanized Supports and Cable Trays with Meggitt Si 2400 Stainless-Steel-Jacketed Electrical Cables," dated January 16, 2006. The licensee also included in its submittal the specific installation requirements that Meggitt cable jacket not be allowed to come in contact with galvanized materials specifically, the Fire Rated Cable Notes, Appendix A to WCN drawing WIP-E-1R8900-022-C-1.

Based on the above information regarding the successful fire test report (14980-121039 dated February 23, 2005), and the "Cable Installation and Notes" document provided in the licensee's submittal, the NRC staff concludes that the concern with galvanized supports for the fire-resistive cable is adequately addressed.

3.6 Defense-in-Depth

Section II, "General Requirements," of Appendix R to 10 CFR 50 states, in part, that the fire protection program shall extend the concept of defense-in-depth to fire protection in fire areas important to safety including providing protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The licensee has demonstrated by test and analyses that the Meggitt Safety fire-resistive electrical cables are a suitable alternative to the 3-hour rated ERFBS. The fire-resistive electrical cables being suitable substitute for 3-hour rated ERFBS, the NRC staff concludes that defense-in-depth per Appendix R is maintained. The NRC staff concludes that the licensee has adequately demonstrated that the protection provided by the fire-resistive electrical cable, in the specific application of Meggitt Safety cables for control and power cables associated with CCW service loop valves EGHV0016 and EGHV0054 is equivalent to the protection provided by a 3-hour rated ERFBS.

Therefore, the NRC staff concludes that the deviation from the license condition commitments to 10 CFR Part 50, Appendix R, Section III.G.2, in this specific application is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Kansas State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding published in the *Federal Register* on March 9, 2010 (75 FR 10831). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in

10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is 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.

Principal Contributors: Charles Moulton, NRR/DRA/AFPB
Matthew McConnell, NRR/DE/EEEB

Date: September 30, 2010

September 30, 2010

Mr. Matthew W. Sunseri
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
LICENSE AMENDMENT REQUEST FOR USE OF FIRE-RESISTIVE
ELECTRICAL CABLE (TAC NO. ME2966)

Dear Mr. Sunseri:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 189 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS). The amendment consists of changes to the plant licensing basis in response to your application dated December 16, 2009, as supplemented by letter dated June 2, 2010.

The amendment revises the fire protection program as described in WCGS Updated Safety Analysis Report (USAR). Specifically, a deviation from certain technical commitments to Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G.2, as described in Appendix 9.5E of the WCGS USAR, is requested regarding the use of fire-resistive cable for certain power and control cables with two motor-operated valves on Component Cooling Water System.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

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

Enclosures:

1. Amendment No. 189 to NPF-42
2. Safety Evaluation

cc w/encls: Distribution via Listserv

DISTRIBUTION:

PUBLIC RidsNrrDorLpl4 Resource CMoulton, NRR/DRA/AFP
LPLIV r/f RidsNrrPMWolfCreek Resource
RidsAcrsAcnw_MailCTR Resource RidsNrrLAJBurkhardt Resource
RidsNrrDeEeeb Resource RidsOgcRp Resource
RidsNrrDraAfpb Resource RidsRgn4MailCenter Resource
RidsNrrDorLDpr Resource MMcConnell, NRR/DE/EEEE

OGC: NLO with Comments

ADAMS Accession No. ML102560498

*SE memo dated 8/20/10 **SE Memo dated 9/9/10

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	DRA/AFP/BC	DE/EEEE/BC (A)	OGC	NRR/LPL4/BC	NRR/LPLR/PM
NAME	BSingal	JBurkhardt	AKlein*	RMathew**	LSubin	MMarkley	BSingal
DATE	9/14/10	9/14/10	8/20/10	9/9/10	9/16/20	9/30/10	9/30/10

OFFICIAL RECORD COPY