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

March 8, 2024

Mr. Cleveland Reasoner
Chief Executive Officer and
Chief Nuclear Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION, UNIT 1 - ISSUANCE OF AMENDMENT NO. 240 RE: REMOVAL OF THE POWER RANGE NEUTRON FLUX RATE - HIGH NEGATIVE RATE TRIP FUNCTION FROM TECHNICAL SPECIFICATIONS (EPID L-2023-LLA-0032)

Dear Cleveland Reasoner:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 240 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station, Unit 1 (Wolf Creek). The amendment consists of changes to the technical specifications (TSs) in response to your application dated March 1, 2023, as supplemented by letter dated October 16, 2023.

The amendment revises Wolf Creek TS table 3.3.1-1, “Reactor Trip System Instrumentation,” by removing Function 3.b, “Power Range Neutron Flux Rate - High Negative Rate Trip.”

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission’s monthly *Federal Register* notice.

Sincerely,

/RA/

Samson S. Lee, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures:
1. Amendment No. 240 to NPF-42
2. Safety Evaluation

cc: Listserv

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

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 240
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, Unit 1 (the facility) Renewed Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated March 1, 2023, as supplemented by letter dated October 16, 2023, 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 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 Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF42 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. 240, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No 229, 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 in Refueling Outage 26, scheduled for spring 2024.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennivine K. Rankin

Digitally signed by Jennivine K. Rankin
Date: 2024.03.08 06:36:37 -05'00'

Jennivine K. Rankin, 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: March 8, 2024

ATTACHMENT TO LICENSE AMENDMENT NO. 240 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

Replace the following pages of Renewed Facility Operating License No. NPF-42 and the Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Renewed Facility Operating License

REMOVE	INSERT
4	4

Technical Specifications

REMOVE	INSERT
3.3-16	3.3-16

(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. 240, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 229, 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

Evergy Kansas South, Inc. and Evergy Metro, Inc. 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.

Table 3.3.1-1 (page 1 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE [a]
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA
	3[b], 4[b], 5[b]	2	C	SR 3.3.1.14	NA
2. Power Range Neutron Flux					
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 112.3% RTP
b. Low	1[c], 2[f]	4	V	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 28.3% RTP
	2[h], 3[i]	4	W, X	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 28.3% RTP
3. Power Range Neutron Flux Rate – High Positive Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 6.3% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1[c], 2[d]	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 35.3% RTP

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(c) Below the P-10 (Power Range Neutron Flux) interlock.
(d) Above the P-6 (Intermediate Range Neutron Flux) interlock.
(f) With $k_eff \geq 1.0$.
(h) With $k_eff < 1.0$, and all RCS cold leg temperatures ≥ 500° F, and RCS boron concentration ≤ the rods out (ARO) critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(i) With all RCS cold leg temperatures ≥ 500° F, and RCS boron concentration ≤ the ARO critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 240 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

1.0 INTRODUCTION

By letter dated March 1, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23060A481), as supplemented by letter dated October 16, 2023 (ML23289A261), Wolf Creek Nuclear Operating Corporation (the licensee) submitted a license amendment request (LAR) for an amendment to the Technical Specifications (TSs) for the Wolf Creek Generating Station, Unit 1 (Wolf Creek).

The proposed changes would delete the requirements for the Power Range Neutron Flux Rate - High Negative Rate Trip function, which is specified in the Wolf Creek TS table 3.3.1-1, “Reactor Trip System Instrumentation,” as Function 3.b.

The supplemental letter dated October 16, 2023, 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 or the Commission) staff’s original proposed no significant hazards consideration determination as published in the *Federal Register* on May 16, 2023 (88 FR 31286).

2.0 REGULATORY EVALUATION

2.1 Systems Description

The reactor trip system (RTS) at Wolf Creek is designed to automatically keep the reactor operating within safe limits by shutting down the reactor whenever these limits are approached. There are various considerations that define a safe operating region, including mechanical limitations on safety-related equipment and variables that directly affect the heat transfer capability of the reactor. There are additional setpoints that are calculated as a part of the RTS to shut down the reactor to protect against either damage to fuel cladding or the loss of system integrity. The RTS also assists the engineered safety features systems in mitigating accidents and assists in the mitigation of anticipated operational occurrences (AOOs).

The Wolf Creek RTS consists of sensors that monitor various plant parameters. These sensors are connected to analog circuitry, consisting of two to four redundant channels, and digital circuitry, consisting of two redundant logic trains. The digital circuitry receives inputs from the analog channels to complete the logic necessary to automatically open the reactor trip breakers when needed. There are four Power Range Neutron Flux Rate – High Negative Rate Trip channels as part of the RTS, arranged in a two-out-of-four logic per unit. The Power Range Neutron Flux Rate - High Negative Rate Trip function trips the reactor when a sudden abnormal decrease in nuclear power is detected in two out of the four power range channels.

2.2 Licensee Proposed Changes

The limiting condition for operation (LCO) for TS 3.3.1, “Reactor Trip System (RTS) Instrumentation,” requires that “The RTS instrumentation for each Function of Table 3.3.1-1 shall be OPERABLE” for the stated Mode of applicability. Table 3.3.1-1 contains six columns, one each for the function, applicable modes or other conditions, number of required channels, conditions, surveillance requirements, and allowable values, respectively. The LCO for the Power Range Neutron Flux Rate - High Negative Rate Trip function requires all four channels to be operable in Modes 1 or 2, when there is the potential for a multiple rod drop accident to occur.

The LAR proposes to remove all information related to each column for Function 3b, “High Negative Rate” from the Wolf Creek TS table 3.3.1-1, Function 3, “Power Range Neutron Flux Rate.” As a result, a corresponding change is proposed to Function 3a, “High Positive Rate” to remove the “a” designation and relocate the associated description of the function to make a single row.

2.3 Reason for Proposed Changes

The licensee stated that the LAR is consistent with NRC-approved Westinghouse Electric Company (Westinghouse) topical report WCAP-11394-P-A, “Methodology for the Analysis of the Dropped Rod Event,” January 1990 (ML100040440; not publicly available, proprietary information). Topical report WCAP-11394-P-A concludes that sufficient thermal margin exists for Westinghouse plant designs and fuel types to shut the reactor down, without crediting the Power Range Neutron Flux Rate - High Negative Rate Trip function, regardless of the reactivity worth of the dropped rod cluster control assemblies (RCCAs) when confirmed on a plant-specific and a cycle-by-cycle basis.

2.4 Regulatory Requirements

Section 50.36, “Technical specifications,” of Title 10 of the *Code of Federal Regulations* (10 CFR) establishes the regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TSs for operating reactors are required to include items in the following five specific categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements; (4) design features; and (5) administrative controls.

The regulation in 10 CFR 50.36(c)(2) states, in part, that,

> Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation is not met, the licensee shall shut down the

reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

The regulation in 10 CFR 50.36(c)(2)(ii) requires an LCO for any item meeting one or more of the following criteria:

(A) *Criterion 1*. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

(B) *Criterion 2*. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(C) *Criterion 3*. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(D) *Criterion 4*. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

General Design Criterion (GDC) 10, “Reactor Design,” in Appendix A, “General Design Criteria for Nuclear Power Plant,” to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during AOOs.

The NRC staff’s criteria for evaluation of the proposed changes were based on compliance with GDC 10 requirements and the criteria specified in 10 CFR 50.36(c)(2)(ii).

2.5 Regulatory Guidance

Section 7.2, “Reactor Trip System,” Revision 6, dated August 2016 (ML16020A059), of NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition,” provides NRC staff guidance on specific review criteria for the RTS.

3.0 TECHNICAL EVALUATION

3.1 Application of WCAP-11394-P-A

The Power Range Neutron Flux Rate - High Negative Rate Trip function was designed as protection to mitigate the consequences of a multiple control rod drop event. The resulting negative reactivity insertion from a control rod drop event causes nuclear power to quickly decrease and core radial peaking factor to increase. The reduced power and continued steam supply to the turbine cause the reactor coolant temperature to decrease. In the manual control mode, the positive reactivity feedback causes the reactor power to increase to initial power level at a reduced reactor vessel inlet temperature without power overshoot. In the automatic control

mode, the plant control system detects the reduction in core power and initiates control bank withdrawal in order to restore core power. As a result, power overshoot occurs, resulting in lower calculated departure from nucleate boiling ratios (DNBR). In the event of a dropped RCCAs event at higher power levels, the RTS will detect the rapidly decreasing neutron flux due to the dropped RCCAs and trips the reactor based on the Power Range Neutron Flux Rate - High Negative Rate Trip function, thus ending the transient and assuring that the DNBR safety limit is met.

In topical report WCAP-10297-P-A, "Dropped Rod Methodology for Negative Flux Rate Trip Plants," June 1983 (ML100070244; not publicly available, proprietary information), Westinghouse documented a methodology for analysis of dropped RCCAs event. The document concluded that the Power Range Neutron Flux - High Negative Flux Rate Trip function was only required if the plant exceeded a threshold value of reactivity worth that is dependent on the plant design and fuel type being utilized. Subsequently, the NRC staff approved topical report WCAP-11394-P-A, which provides a methodology that can be used to demonstrate that the DNBR limits are met during a dropped RCCA transient. The analysis using this methodology took no credit for any direct trip due to the dropped RCCAs and assumed that no automatic power reduction features are actuated by the dropped RCCAs event. Topical report WCAP-11394-P-A concluded that sufficient reactivity margin is available in all Westinghouse core design and fuel types, such that the Power Range Neutron Flux High Negative Flux Rate Trip function was not required, regardless of the worth of the dropped RCCA (or bank), subject to a plant cycle specific analysis. In the topical report approval, the NRC staff noted that further review by the NRC staff for each cycle is not necessary, subject to licensee verification that the analysis described in WCAP-11394-P-A has been performed, and the comparison specified in WCAP-11394-P-A has been made, and favorable results were obtained.

3.2 Cycle Specific Analysis

The licensee performed the required comparisons with the WCAP-11394-P-A methodology applied for a reference cycle. The reference cycle assumed in the Wolf Creek Transitions of Method program had the methodology applied and the required comparisons made. The licensee states that the comparisons validated that the cycle specific analysis remained bounding per the requirements of the NRC staff's safety evaluation report for WCAP-11394-P-A. The licensee states that the Power Range Neutron Flux Rate – High Negative Rate Trip function was not credited in the cycle specific dropped control rod analysis, and the analysis results met the safety DNBR basis. The licensee states that fuel cycles will be assessed similarly as part of the reload safety evaluation (RSE) process for Wolf Creek.

The NRC staff reviewed the licensee required comparisons with the WCAP-11394-P-A methodology for a reference cycle and finds that the cycle specific analysis remains bounding and meets the DNBR design basis. Therefore, the NRC staff finds that the proposed deletion of the Power Range Neutron Flux Rate - High Negative Rate Trip function from the TSs, and the corresponding administrative change to rename Function 3.a to Function 3, is acceptable and in compliance with the GDC 10 requirements.

3.3 Criteria for LCOs

The regulations in 10 CFR 50.36(c)(2)(ii) require an LCO for any item meeting one or more of the criteria specified in the 10 CFR 50.36(c)(2)(ii)(A) - (D). Based on the licensee's analysis of the dropped RCCA event discussed above in Sections 3.1 and 3.2 of this safety evaluation, the

Power Range Neutron Flux - High Negative Flux Rate Trip function no longer meets the criteria specified in 10 CFR 50.36(c)(2)(ii)(A) - (D) for the TS LCO since the subject trip function is:

(A) Not an installed instrumentation used to detect and indicate a significant abnormal degradation of the reactor coolant pressure boundary (Criterion 1),

(B) Not a process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis (Criterion 2),

(C) Not a structure, system, or component that is part of the primary success path, which functions or actuates to mitigate a design-basis accident or transient (Criterion 3), and

(D) Not a structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety (Criterion 4).

Therefore, the NRC staff finds the licensee's evaluation acceptable and finds that the Power Range Neutron Flux - High Negative Flux Rate Trip function does not require an LCO.

3.4 Technical Evaluation Conclusion

The NRC staff concludes that the deletion of the Power Range Neutron Flux Rate - High Negative Rate Trip function from the Wolf Creek TSs, and the corresponding administrative change to rename Function 3.a to Function 3, are acceptable because:

(A) The analysis of the dropped RCCAs event was performed at Wolf Creek using the NRC-approved methodology in WCAP 11394-P-A without crediting the Power Range Neutron Flux Rate - High Negative Rate Trip function and results met the required safety DNBR limits.

(B) The proposed TS changes would not impact the safety analyses of other events.

(C) The licensee will verify that the dropped RCCA analysis using the WCAP-11394-P-A methodology without crediting Power Range Neutron Flux Rate - High Negative Rate Trip function meets the safety DNBR limits for each cycle through its RSE process.

The NRC staff concludes that the licensee demonstrated that safety limits will continue to meet the specified requirements even after the deletion of the Power Range Neutron Flux Rate - High Negative Rate Trip function. Based on this, the NRC staff concludes that the proposed change meets the requirements of 10 CFR Part 50, Appendix A, GDC 10. The NRC staff also finds that the Power Range Neutron Flux Rate - High Negative Rate Trip function does not require an LCO since it no longer meets the criteria specified in 10 CFR 50.36(c)(2)(ii) for the TS LCOs.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Kansas State official was notified of the proposed issuance of the amendment on August 18, 2023. 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 change in the types or significant increase in the amounts 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, published in the *Federal Register* on May 16, 2023 (88 FR 31286), and there has been no public comment on such finding. 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) there is reasonable assurance that 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 Contributor: S. Bhatt, NRR

Date: March 8, 2024

SUBJECT: WOLF CREEK GENERATING STATION, UNIT 1 - ISSUANCE OF AMENDMENT NO. 240 RE: REMOVAL OF THE POWER RANGE NEUTRON FLUX RATE - HIGH NEGATIVE RATE TRIP FUNCTION FROM TECHNICAL SPECIFICATIONS (EPID L-2023-LLA-0032) DATED MARCH 8, 2024

DISTRIBUTION:

PUBLIC	RidsNrrDssStsb Resource	SBhatt, NRR
RidsACRS_MailCTR Resource	RidsNrrLAPBlechman Resource	TSweat, NRR
RidsNrrDorlLpl4 Resource	RidsNrrPMWolfCreek Resource	CHenderson, RGN IV
RidsNrrDssSnsb Resource	RidsRgn4MailCenter Resource	

ADAMS Accession No.: ML24016A070 ***by email** **NRR-058**

OFFICE	NRR/DORL/LPL4/PM*	NRR/DORL/LPL4/LA*	NRR/DSS/SNSB/BC*	NRR/DSS/STSB/BC (A)*
NAME	SLee	PBlechman	PSahd	SMehta
DATE	1/16/2024	1/17/2024	11/14/2023	1/8/2024
OFFICE	OGC – NLO*	NRR/DORL/LPL4/BC*	NRR/DORL/LPL4/PM*	
NAME	MWright	JRankin	SLee	
DATE	1/29/2024	3/8/2024	3/8/2024	

OFFICIAL RECORD COPY