June 27, 1991

Docket No. 50-482

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Mr. Bart D. Withers
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, Kansas 66839

Dear Mr. Withers:

SUBJECT: WOLF CREEK GENERATING STATION - AMENDMENT NO. 46 TO FACILITY OPERATING LICENSE NO. NPF-42 (TAC NO. 80054)

The Commission has issued the enclosed Amendment No. 46 to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment consists of changes to the Technical Specifications in response to your application dated March 20, 1991 (ET 91-0051).

The amendment revises Specification 3.1.3.2 and its associated Bases to add a new Action Statement to address the situation where more than one digital rod position indicator per control rod bank may be inoperable. In addition, the amendment revises Specification 3.1.3.1 to correct an erroneous reference.

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,

Original Signed By

Douglas V. Pickett, Project Manager
Project Directorate IV-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 46 to NPF-42
2. Safety Evaluation

cc w/enclosures:
See next page

*See Previous Sheet for Concurrence

OFC	:PDIV-2/LA*	:PDIV-2/PM*	:OGC	:PDIV-2/(A)D	: SICB/BC*	:	:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 46
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) Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated March 20, 1991, 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 Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility Operating License No. NPF-42 is hereby amended to read as follows:

   2. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No. 46 , 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.

FOR THE NUCLEAR REGULATORY COMMISSION

George F. Dick, Jr., Acting Director
Project Directorate IV-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 27, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 46

FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 1-14	3/4 1-14
3/4 1-17	3/4 1-17
	3/4 1-17a
B 3/4 1-4	B 3/4 1-4

4.1.2.6 Each required borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1) Verifying the boron concentration in the water,

2) Verifying the contained borated water volume of the water source, and

3) Verifying the Boric Acid Storage System solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when the outside air temperature is either less than 37°F or greater than 100°F.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within ± 12 steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1* and 2*.

ACTION: The ACTION to be taken is based on the cause of inoperability of control rods as follows:

CAUSE OF INOPERABILITY	ACTION	
	One Rod	More Than One Rod
a) Immovable as a result of excessive friction or mechanical interference or known to be untrippable.	(1)	(1)
b) Misaligned from its group step counter demand height or from any other rod in its group by more than ± 12 steps (indicated position).	(3)	(2)
c) Inoperable due to a rod control urgent failure alarm or other electrical problem in the rod control system, but trippable.	(4)	(4)

ACTION 1 - Determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.

ACTION 2 - Be in HOT STANDBY within 6 hours.

ACTION 3 - POWER OPERATION may continue provided that within 1 hour:

1. The rod is restored to OPERABLE status within the above alignment requirements, or
2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within ± 12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

POSITION INDICATION SYSTEMS-OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2 The Digital Rod Position Indication System and the Demand Position Indication System shall be OPERABLE and capable of determining the control rod positions within ± 12 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With a maximum of one digital rod position indicator per bank inoperable either:

1. Determine the position of the nonindicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the nonindicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

b. With more than one digital rod position indicator per bank inoperable either:

1.a) Determine the position of the nonindicating rods indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the nonindicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, and

b) Place the control rods under manual control, and

c) Monitor and record Reactor Coolant System average temperature (T_{avg}) at least once per hour, and

d) Restore the digital rod position indicators to OPERABLE status within 24 hours such that a maximum of one digital rod position indicator per bank is inoperable, or

2. Be in HOT STANDBY within the next 6 hours.

POSITION INDICATION SYSTEMS-OPERATING

LIMITING CONDITION FOR OPERATION (continued)

c. With a maximum of one demand position indicator per bank inoperable either:

1. Verify that all digital rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of 12 steps of each other at least once per 8 hours, or

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each digital rod position indicator shall be determined to be OPERABLE by verifying that the Demand Position Indication System and the Digital Rod Position Indication System agree within 12 steps at least once per 12 hours except during time intervals when the rod position deviation monitor is inoperable, then compare the Demand Position Indication System and the Digital Rod Position Indication System at least once per 4 hours.

POSITION INDICATION SYSTEM-SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.3.3 One digital rod position indicator (excluding demand position indication) shall be OPERABLE and capable of determining the control rod position within ± 12 steps for each shutdown or control rod not fully inserted.

APPLICABILITY: MODES 3*#, 4*#, and 5*#.

ACTION:

With less than the above required position indicator(s) OPERABLE, immediately open the Reactor Trip System breakers.

SURVEILLANCE REQUIREMENTS

4.1.3.3 Each of the above required digital rod position indicator(s) shall be determined to be OPERABLE by verifying that the digital rod position indicator agrees with the demand position indicator within 12 steps when exercised over the full range of rod travel at least once per 18 months.

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*With the Reactor Trip System breakers in the closed position.

#See Special Test Exception Specification 3.10.5.

BORATION SYSTEMS (Continued)

With the RCS temperature below 200°F, one Boration System is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity changes in the event the single Boron Injection System becomes inoperable.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable in MODES 4, 5, and 6 provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV or an RHR suction relief valve.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 140°F. This condition requires either 2968 gallons of 7000 ppm borated water from the boric acid storage tanks or 14,071 gallons of 2400 ppm borated water from the RWST.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. In the case of the boric acid tanks, all of the contained volume is considered usuable. The required usable volume may be contained in either or both of the boric acid tanks.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 8.5 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of one Boration System during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. Verification that the Digital Rod Position Indicator agrees with the demanded position within ± 12 steps at 24, 48, 120, and 228 steps withdrawn for the Control Banks and 18, 210 and 228 steps withdrawn for the Shutdown Banks provides assurances that the Digital Rod Position Indicator is operating correctly over the full range of indication. Since the Digital Rod Position System does not indicate the actual shutdown rod position between 18 steps and 210 steps, only points in the indicated ranges are picked for verification of agreement with demanded position.

MOVABLE CONTROL ASSEMBLIES (Continued)

For purposes of determining compliance with Specification 3.1.3.1, any immovability of a control rod invokes ACTION Statement 3.1.3.1.a. Before utilizing ACTION Statement 3.1.3.1.c, the rod control urgent failure alarm must be illuminated or an electrical problem must be detected in the rod control system. The rod is considered trippable if the rod was demonstrated OPERABLE during the last performance of Surveillance Requirement 4.1.3.1.2 and met the rod drop time criteria of Specification 3.1.3.4 during the last performance of Surveillance Requirement 4.1.3.4.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

The power reduction and shutdown time limits given in ACTION statements 3.1.3.2.a.2, 3.1.3.2.b.2, and 3.1.3.2.c.2, respectively, are initiated at the time of discovery that the compensatory actions required for POWER OPERATION can no longer be met.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 551°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a Reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 46 TO 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 March 20, 1991, Wolf Creek Nuclear Operating Corporation (the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-42) for the Wolf Creek Generating Station. The proposed changes would revise Technical Specification (TS) 3.1.3.2 and its associated Bases to add a new Action Statement to address the situation where more than one digital rod position indicator per control rod bank may be inoperable. The new Action Statement would avoid unnecessary plant shutdowns per TS 3.0.3, yet is consistent with the overall protection provided by related TS. Additionally, a proposed change to TS 3.1.3.1 corrects an erroneous reference.

2.0 BACKGROUND

The Wolf Creek Generating Station has 53 full-length rod cluster control assemblies (RCCAs). The RCCAs are designated by function as the control banks and the shutdown banks. The shutdown banks are always in the fully withdrawn position during normal power operation whereas the control rods can be manipulated for reactivity control.

The digital rod position indication (DRPI) system measures the actual position of each control rod using a detector which consists of discrete coils mounted concentrically with the rod drive pressure housing. The coils are located axially along the pressure housing and magnetically sense the entry and presence of the rod drive shaft through its centerline. For each detector, the coils are interlaced into two data channels, and are connected to the containment electronics (Data A and B) by separate multi-conductor cables.

By employing two separate channels of information, the DRPI system can continue to function (at reduced accuracy) when one channel fails. The current technical specifications address the situation when one DRPI per bank is inoperable. In this case, continued plant operation is permitted provided that increased surveillance is performed using the movable incore detectors to verify rod position. However, the existing TS 3.1.3.2 does not address loss of both DRPI channels in one bank. Consequently, the licensee must initiate the actions prescribed by TS 3.0.3, which, in this case, would require the

operators to begin reducing reactor power within 1 hour after losing both channels of the control rod position monitoring capability. That is, the operators would be challenged to use the control rod control system with degraded control rod monitoring capabilities.

2.0 EVALUATION

2.1 Digital Rod Position Indication System

The licensee proposed modifying TS 3.1.3.2 to include a 24-hour allowed outage time to facilitate repairs when both DRPI channels in a bank become inoperable. This will allow time to repair at least one inoperable DRPI channel before entering TS 3.0.3.

The licensee justifies this request based upon the assumptions it used in its safety analyses. In these analyses, the postulated worst case reactivity transient assumes the operators ignore the RCCA position indication. The licensee contends that whether the operator ignores the RCCA position indication or is not aware of the RCCA position is irrelevant with regard to the results of the bounding safety analyses. Additionally, the reactivity insertion rates used in the licensee's safety analyses are based on conservative, worst-case scenarios, independent of whether they are caused by operator error or equipment malfunction. Consequently, the safety analyses bound DRPI failure modes. The staff agrees with this justification.

The existing limiting condition for operation for loss of a single DRPI channel is justified because the operators can continue to assess the position of the control rod group with the remaining DRPI channel and the movable incore detector. With the loss of both DRPI channels in a bank, however, the operator's primary method of monitoring control rod group position becomes degraded. The licensee contends that a 24-hour allowed outage time provides sufficient time to troubleshoot and restore the DRPI system to operation while avoiding challenges associated with a plant shutdown. The licensee further states that overall plant safety would be enhanced by maintaining steady state operation, as compared with the large control rod movements required during the plant shutdown process in conjunction with the loss of DRPI. The staff agrees with this justification.

The TS Bases states that TS 3.1.3.2 ensures that:

a. Acceptable power distribution limits are maintained,

b. The minimum SHUTDOWN MARGIN is maintained, and

c. The potential effects of rod misalignment in associated accident analyses are limited.

The licensee's compensatory actions require that rod position be determined indirectly via the movable incore flux detectors and that reactor coolant system temperatures be monitored and recorded. Also, rod control is placed in

manual and rod motion is limited. Since the licensee's FSAR analyses for this class of events do not assume a dependence on the operator for monitoring the position of the rods, the staff agrees that these actions will sufficiently ensure the FSAR minimum departure from nucleate boiling ratio will not be decreased.

The licensee's requested modifications were evaluated in accordance with the Standard Review Plan guidelines. The requested modifications correct an oversight in the licensee's existing TS that would require operation of a system important to safety without availability of the preferred monitoring capability. The staff concludes that the requested modifications are acceptable.

2.2 Movable Control Assemblies

Specification 3.1.3.1 requires that all full length shutdown and control rods be operable and positioned within 12 steps (indicated position) of their group step counter demand position in Modes 1 and 2. Action 3 of this TS contains a reference to Figures 3.1-1 and 3.1-2. However, the Wolf Creek TS have never contained a Figure 3.1-2. This discrepancy has existed since the technical specifications were originally issued by the NRC. The licensee has proposed deleting the reference to this figure.

Since the proposed modification deletes an incorrect reference, the staff finds this change 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 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 (56 FR 20047). 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 Contributor: Douglas V. Pickett

Date: June 27, 1991