April 27, 1998

Mr. Otto L. Maynard
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, Kansas 66839

SUBJECT: WOLF CREEK GENERATING STATION - AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. NPF-42 (TAC NO. MA0803)

Dear Mr. Maynard:

The Commission has issued the enclosed Amendment No. 116 to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated February 4, 1998.

The amendment revises TS 3.2.4 and the associated Bases concerning quadrant power tilt ratio (QPTR) to (1) change the action for determining QPTR when QPTR is above 1.02, (2) change the completion time for resetting the power range neutron flux-high trip setpoints after QPTR is determined to be above 1.02, and (3) delete the actions requiring QPTR to be restored within 24 hours, QPTR to be verified during a return to power operation, resetting the power range neutron flux-high trip setpoint to less than 55 percent following a power reduction to 50 percent reactor thermal power, and actions for QPTR in excess of 1.09.

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

Kristine M. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

1/1

DFO1

Docket No. 50-482

Enclosures: 1. Amendment No. 116 to NPF-42
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION

Docket File	OGC, 015B18
PUBLIC	WBateman
PDIV-2 Reading	GHill (2)
EGA1	WBeckner, O11E22
WJohnson, RIV	TCollins, SRXB
KThomas	ACRS
EPeyton	TLH1 (SE)
LHurley, RIV	JKilcrease, RIV
LKopp, SRXB	

DOCUMENT NAME: WCA0803.AMD

OFFICE	PDIV-2/PM	PDIV-2/LA	SRXB/BC	OGC
NAME	KThomas KMT	EPeyton	TCollins	MYoung
DATE	4/7/98	4/6/98	4/9/98	4/16/98

OFFICIAL RECORD COPY

CP-1

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 FACILITY OPERATING LICENSE

Amendment No. 116
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 February 4, 1998, 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. 116 , 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 to be implemented within 60 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Kristine M. Thomas

Kristine M. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: April 27, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 116

FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 2-11	3/4 2-11
3/4 2-12	3/4/2-12
3/4 2-13	---
3/4 2-14*	3/4 2-14*
B 3/4 2-3	B 3/4 2-3

*No changes were made to Page 3/4 2-14. Reissued to become one-sided page.

3/4.2.4 QUADRANT POWER TILT RATIO

LIMITING CONDITION FOR OPERATION

3.2.4 The QUADRANT POWER TILT RATIO shall not exceed 1.02.

APPLICABILITY: MODE 1, above 50% of RATED THERMAL POWER*.

ACTION:

a. With the QUADRANT POWER TILT RATIO determined to exceed 1.02

1. Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1.00 within 2 hours after each QUADRANT POWER TILT RATIO determination, and

2. Determine the QUADRANT POWER TILT RATIO at least once per 12 hours, and

3. Within 24 hours after achieving equilibrium conditions from a THERMAL POWER reduction required by ACTION a.1., and once per 7 days thereafter:

a) Confirm that the Heat Flux Hot Channel Factor $F_Q(Z)$, is within its limit by performing Surveillance Requirement 4.2.2.2, and

b) Confirm that Nuclear Enthalpy Rise Hot Channel Factor, $F^N_{\Delta H}$, is within its limit by performing Surveillance Requirement 4.2.3.1, and

4. Reduce the Power Range Neutron Flux-High Trip Setpoints ≥ 3% for each 1% of QUADRANT POWER TILT RATIO > 1.00 within 72 hours after each QUADRANT POWER TILT RATIO determination, and

5. Prior to increasing THERMAL POWER and Power Range Neutron Flux-High Trip Setpoints above the limits of ACTION a.1. and a.4., reevaluate the safety analyses and confirm that the results remain valid for the duration of operation under this condition, and

6. Prior to increasing THERMAL POWER above the limit of ACTION a.1., normalize excore detectors to restore QUADRANT POWER TILT RATIO to within limit, and

*See Special Test Exception Specification 3.10.2.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

7. Within 24 hours after achieving equilibrium conditions not to exceed 48 hours after increasing THERMAL POWER above the limit of ACTION a.1.**:

   a) Confirm that the Heat Flux Hot Channel Factor $F_Q(Z)$, is within its limit by performing Surveillance Requirement 4.2.2.2, and

   b) Confirm that Nuclear Enthalpy Rise Hot Channel Factor, $F^N_{\Delta H}$, is within its limit by performing Surveillance Requirement 4.2.3.1.

b. If the requirements of a.1., a.2., a.3., a.4., a.5., a.6., or a.7. above are not met, reduce THERMAL POWER to ≤ 50% of RTP within the next 4 hours.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE, and

b. Calculating the ratio at least once per 12 hours during steady-state operation when the alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75% of RATED THERMAL POWER with one Power Range Channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from two sets of four symmetric thimble locations or a full-core flux map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

**ACTION a.7. must be completed when ACTION a.6. is performed.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

7. Within 24 hours after achieving equilibrium conditions not to exceed 48 hours after increasing THERMAL POWER above the limit of ACTION a.1.**:

   a) Confirm that the Heat Flux Hot Channel Factor $F_Q(Z)$, is within its limit by performing Surveillance Requirement 4.2.2.2, and

   b) Confirm that Nuclear Enthalpy Rise Hot Channel Factor, $F^N_{\Delta H}$, is within its limit by performing Surveillance Requirement 4.2.3.1.

b. If the requirements of a.1., a.2., a.3., a.4., a.5., a.6., or a.7. above are not met, reduce THERMAL POWER to ≤ 50% of RTP within the next 4 hours.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE, and

b. Calculating the ratio at least once per 12 hours during steady-state operation when the alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75% of RATED THERMAL POWER with one Power Range Channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from two sets of four symmetric thimble locations or a full-core flux map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

**ACTION a.7. must be completed when ACTION a.6. is performed.

3/4.2.5 DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2-1:

a. Reactor Coolant System T_{avg},

b. Pressurizer Pressure, and

c. Reactor Coolant System (RCS) Flow Rate

APPLICABILITY: MODE 1.*

ACTION:

a. With parameter 1 or 2 of Table 3.2-1 exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

b. With the RCS total flow rate outside the region of acceptable operation shown on Table 3.2-1:

1. Within 2 hours either:

a. Restore the total flow rate to within the above limit, or

b. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER.

2. Within 6 hours either:

a. Restore the total flow rate to within the above limit, or

b. Reduce the Power Range Neutron Flux - High Trip Setpoint to less than or equal to 55% of RATED THERMAL POWER.

3. Within 72 hours of initially being outside the above limit, verify that the RCS total flow rate is restored to within the above limit, or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 2 hours; and

*See Special Test Exception Specification 3.10.4 for 3.2.5.c.

BASES

QUADRANT POWER TILT RATIO (Continued)

With QPTR exceeding 1.02, reducing THERMAL POWER to greater than or equal to 3% below RTP for each 1% by which the QPTR exceeds 1.00 is a conservative tradeoff of total core power with peak linear power. The 2-hour time allowance after each QPTR determination allows sufficient time to identify the cause and correct the tilt, or reduce power as necessary. Any additional changes in the QPTR are detected by requiring a check of the QPTR once per 12 hours therafter.

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the QUADRANT POWER TILT RATIO. The incore detector monitoring is done with a full incore flux map or two sets of four symmetric thimbles. The two sets of four symmetric thimbles is a unique set of eight detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, N-8.

3/4.2.5 DNB PARAMETERS

The limits on the Reactor Coolant System T_{avg} and the pressurizer pressure assure that each of the parameters are maintained within the normal steady-state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial USAR assumptions and have been analytically demonstrated adequate to maintain a DNBR above the safety analysis limit DNBR specified in the CORE OPERATING LIMITS REPORT (COLR) throughout each analyzed transient. The indicated T_{avg} value of 590.5°F and the indicated pressurizer pressure value of 2220 psig correspond to analytical limits of 593.0°F and 2205 psig respectively, with allowance for measurement uncertainty.

The 12-hour periodic surveillance of these parameters through instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation.

Fuel rod bowing reduces the value of DNB ratio. Credit is available to offset this reduction in the generic margin. The generic margins completely offset any rod bow penalties. This is the margin between the correlation DNBR limit and the safety analysis limit DNBR. These limits are specified in the COLR.

The applicable values of rod bow penalties are referenced in the USAR.

When RCS flow rate and $F_{\Delta H}(X,Y)$, per Specification 3.2.3, are measured, no additional allowances are necessary prior to comparison with the limits in the COLR. Measurement uncertainties of 2.5% for RCS total flow rate and 4% for $F_{\Delta H}(X,Y)$ have been allowed for in determination of the design DNBR value.

BASES

DNB PARAMETERS (Continued)

The measurement uncertainty for RCS total flow rate is based upon performing a precision heat balance and using the result to calibrate the RCS flow rate indicators. Potential fouling of the feedwater venturi which might not be detected could bias the result from the precision heat balance in a nonconservative manner. Therefore, an inspection is performed of the feedwater venturi each refueling outage.

The 12-hour periodic surveillance of indicated RCS flow is sufficient to detect only flow degradation which could lead to operation outside the acceptable region of operation specified in Table 3.2-1. This surveillance also provides adequate monitoring to detect any core crud buildup.

BASES

DNB PARAMETERS (Continued)

The measurement uncertainty for RCS total flow rate is based upon performing a precision heat balance and using the result to calibrate the RCS flow rate indicators. Potential fouling of the feedwater venturi which might not be detected could bias the result from the precision heat balance in a nonconservative manner. Therefore, an inspection is performed of the feedwater venturi each refueling outage.

The 12-hour periodic surveillance of indicated RCS flow is sufficient to detect only flow degradation which could lead to operation outside the acceptable region of operation specified in Table 3.2-1. This surveillance also provides adequate monitoring to detect any core crud buildup.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By letter dated February 4, 1998, Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-42) for the Wolf Creek Generating Station (WCGS). The proposed changes would revise TS 3.2.4 and the associated Bases concerning quadrant power tilt ratio (QPTR) to (1) change the action for determining QPTR when QPTR is above 1.02, (2) change the completion time for resetting the power range neutron flux-high trip setpoints after QPTR is determined to be above 1.02, and (3) delete the actions requiring QPTR to be restored within 24 hours, QPTR to be verified during a return to power operation, resetting the power range neutron flux-high trip setpoint to less than 55 percent following a power reduction to 50 percent reactor thermal power, and actions for QPTR in excess of 1.09.

2.0 EVALUATION

The QPTR is defined as the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater. The QPTR limit ensures that the gross radial power distribution remains consistent with the values used in the plant safety analyses. WCNOC has proposed the following changes to the QPTR TS for the WCGS.

1. The required action for determining QPTR would be increased to at least once per 12 hours instead of once per hour until QPTR is reduced to within limit or thermal power is reduced to less than 50 percent. This action would be performed after reducing thermal power by at least 3 percent from rated thermal power for each 1 percent that the QPTR exceeds 1.00.

   Once thermal power has been reduced by at least 3 percent for each 1 percent that the QPTR exceeds 1.00, any additional change in the QPTR would be expected to be relatively slow. Therefore, the staff concludes that a 12 hour interval for

recalculating QPTR provides an adequate level of protection and is acceptable. The change is consistent with the QPTR specification in the Standard TS for Westinghouse Plants (NUREG-1431, Rev. 1).

2. The completion time for resetting the power range neutron flux-high trip setpoints would be increased from 4 hours after the power reduction following QPTR measurements to 72 hours after QPTR is determined to be outside the limit.

   The 72-hour completion time would allow time to reduce reactor power, perform the required QPTR determination, and permit orderly resetting of the trip channel setpoints. The likelihood of a severe transient during this time period is small. In addition, the reduction in reactor power within 2 hours, if required, would provide additional margin to fuel design limits while the setpoint changes were being made. Therefore, the staff concludes that this proposed change is acceptable.

3. The actions for verifying QPTR to be restored within 24 hours and for identifying and correcting the cause of the out-of-limit condition prior to increasing thermal power would be deleted. These would be replaced by new actions to confirm that the heat flux hot channel factor, $F_Q(z)$, and the nuclear enthalpy rise hot channel factor, $F^N_{\Delta H}$, are within their limits within 24 hours after achieving equilibrium conditions. In addition, actions to reevaluate the safety analyses and normalize excore detectors prior to increasing thermal power above the limits in TS 3.2.4.a.1 would be added.

   Depending on the scenario which caused the QPTR to exceed it limit, the time required to (a) achieve equilibrium conditions for flux mapping, (b) perform the flux map, and (c) analyze the flux map, could well exceed 24 hours. Therefore, the proposed delay for verifying QPTR (by confirming peaking factors) allows time for achieving equilibrium conditions. Since a thermal power reduction to at least 3 percent for each 1 percent of indicated QPTR greater than 1.00 is required within 2 hours, additional margin to fuel design limits would be provided. The proposed revision in the time required to verify QPTR is, therefore, acceptable.

   QPTR is a monitored parameter that could indicate peaking factor problems. The QPTR limit ensures that $F_Q(z)$ and $F^N_{\Delta H}$ remain below their limiting values by preventing an undetected change in the gross radial power distribution. The new Actions requiring verification that these peaking factors are within limits within 24 hours after achieving equilibrium conditions will ensure that the power distribution remains consistent with the initial conditions assumed in the plant safety analyses. If $F_Q(z)$ and $F^N_{\Delta H}$ are not within limits, the separate peaking factor TS (3.2.2 and 3.2.3) will specify additional required actions. Therefore, these proposed changes are acceptable.

   When the QPTR exceeds its limit, it does not necessarily mean a safety concern exists. If the QPTR remains above the 1.02 limit and a reevaluation of the safety analyses shows that safety requirements are met, the excore detectors may be normalized to restore the QPTR to within limit prior to increasing thermal power.

cc w/encls:
Jay Silberg, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N Street, NW
Washington, D.C. 20037

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 311
Burlington, Kansas 66839

Chief Engineer
Utilities Division
Kansas Corporation Commission
1500 SW Arrowhead Road
Topeka, Kansas 66604-4027

Office of the Governor
State of Kansas
Topeka, Kansas 66612

Attorney General
Judicial Center
301 S.W. 10th
2nd Floor
Topeka, Kansas 66612

County Clerk
Coffey County Courthouse
Burlington, Kansas 66839

Vick L. Cooper, Chief
Radiation Control Program
Kansas Department of Health
and Environment
Bureau of Air and Radiation
Forbes Field Building 283
Topeka, Kansas 66620

Chief Operating Officer
Wolf Creek Nuclear Operating Corporation
P. O. Box 411
Burlington, Kansas 66839

Supervisor Licensing
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, Kansas 66839

U.S. Nuclear Regulatory Commission
Resident Inspectors Office
8201 NRC Road
Steedman, Missouri 65077-1032

Therefore, the addition of action statements to reevaluate the safety analyses and normalize excore detectors prior to increasing thermal power above the limits of TS 3.2.4.a.1 is acceptable.

4. The Actions for QPTR in excess of 1.09 would be deleted.

The actions required when QPTR exceeds 1.09 due to misalignment of control rods are not necessary to be contained in the QPTR specification because it is addressed by the requirements of TS 3.1.3.2 for rod group alignment limits. The required actions for QPTR in excess of 1.09 due to causes other than control rod misalignment would be replaced by the actions required when QPTR exceeds 1.02, i.e., reducing power by at least 3 percent for each 1 percent that QPTR exceeds 1.00. Although this is a less restrictive action, the required reduction in power should provide adequate margin for fuel design limits. Therefore, the proposed deletion is acceptable. The change is consistent with the QPTR specification in the Standard TS for Westinghouse Plants.

In addition, the licensee proposed to revise the TS Bases regarding QPTR to reflect the changes described above. Based on the above, the staff concludes that the proposed changes to TS 3.2.4 and the associated Bases concerning the QPTR for WCGS are acceptable. These changes would:

(a) Revise the action for determining QPTR when QPTR is above 1.02.

(b) Revise the completion time for resetting the power range neutron flux-high trip setpoints after QPTR is determined to be above 1.02.

(c) Delete the actions requiring QPTR to be restored within 24 hours, QPTR to be verified during a return to power operation, resetting the power range neutron flux-high trip setpoint to less than 55 percent following a power reduction to 50% RTP or below, and actions for QPTR in excess of 1.09.

3.0 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.

4.0 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

(63 FR 14489). 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.

5.0 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: L. Kopp

Date: April 27, 1998