April 27, 1999

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. 124 TO FACILITY OPERATING LICENSE NO. NPF-42 (TAC NO. MA3942)

Dear Mr. Maynard:

The Commission has issued the enclosed Amendment No. 124 to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment changes the Technical Specifications (TS) in response to your application dated October 23, 1998.

The amendment revises TS 3/4.5.1, "Emergency Core Cooling Systems - Accumulators," by increasing the allowed outage time with one accumulator inoperable for reasons other than boron concentration deficiencies from 1 hour to 24 hours. The corresponding Bases was also changed.

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, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures: 1. Amendment No. 124 to NPF-42
2. Safety Evaluation

cc w/encls: See next page

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

April 27, 1999

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Sincerely,

Kristine M. Thomas

Kristine M. Thomas, Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-482

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cc w/encls: See next page

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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. 124
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 October 23, 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. 124 , 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 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Stephen Dembek, Chief, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: April 27, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 124

FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Revise Appendix A Technical Specifications, including the issued but not yet implemented Improved Technical Specifications (ITS), 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 areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 5-1	3/4 5-1
B 3/4 5-1	B 3/4 5-1
ITS 3.5-1	ITS 3.5-1

3/4.5 EMERGENCY CORE COOLING SYSTEMS

3/4.5.1 ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each Reactor Coolant System accumulator shall be OPERABLE with:

a. The isolation valve open and power removed,

b. A contained borated water volume of between 6122 and 6594 gallons,

c. A boron concentration of between 2300 and 2500 ppm, and

d. A nitrogen cover-pressure of between 585 and 665 psig.

APPLICABILITY: MODES 1, 2, and 3*.

ACTION:

a. With one accumulator inoperable due to boron concentration not within limits, either restore the boron concentration to within the above limits within 72 hours or be in at least HOT STANDBY within the next 6 hours and reduce RCS pressure to less than 1000 psig within the following 6 hours.

b. With one accumulator inoperable for reasons other than ACTION a., restore the inoperable accumulator to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and reduce RCS pressure to less than 1000 psig within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1) Verifying that the contained borated water volume and nitrogen cover-pressure in the tanks are within their limits, and

2) Verifying that each accumulator isolation valve is open.

---

*Pressurizer pressure above 1000 psig.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 70 gallons by verifying the boron concentration of the accumulator solution. This surveillance is not required when the volume increase makeup source is the RWST and the RWST has not been diluted since verifying that its boron concentration is within limits of Specification 3.5.5.

c. At least once per 31 days when the RCS pressure is above 1000 psig by verifying that the circuit breaker supplying power to the isolation valve operator is open.

3/4.5.1 ACCUMULATORS

The OPERABILITY of each Reactor Coolant System (RCS) accumulator ensures that a sufficient volume of borated water will be immediately forced into the core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the safety analysis are met.

The accumulator power operated isolation valves are considered to be "operating bypasses" in the context of IEEE Std. 279-1971, which requires that bypasses of a protective function be removed automatically whenever permissive conditions are not met. In addition, as these accumulator isolation valves fail to meet single failure criteria, removal of power to the valves is required.

The allowed outage time limit for operation with one accumulator inoperable due to boron concentration not within limits reflects the fact that no credit is taken in the accident analysis for boron concentration in the accumulators during the LOCA blowdown phase. Injection of borated water provides the fluid medium for heat transfer from the core and prevents excessive clad temperatures, contributing to the filling of the reactor vessel downcomer. The downcomer water elevation head provides the driving force required for the reflooding of the reactor core. Negative reactivity is initially a function of the void formation in the core. One accumulator below the minimum boron concentration limit will have no effect on available ECCS water and an insignificant effect on core subcriticality during reflood. Boiling of ECCS water in the core during reflood concentrates boron in the saturated liquid that remains in the core. Boron concentration during the sump recirculation phase is dominated by the RWST boron concentration.

The allowed outage time limit for operation with one accumulator inoperable for any reason other than boron concentration not within limits ensures that prompt action will be taken to return the inoperable accumulator to OPERABLE status. This allowed outage time limit has been determined to have an insignificant effect on core damage frequency.

Technical Specification 4.5.1.2, which required the performance of a channel calibration of each accumulator water level and pressure channel once per 18 months, was relocated to the Updated Safety Analysis Report. This was accomplished in accordance with the recommendations of Generic Letter 93-05 and NUREG-1366. These recommendations were based on the recognition that accumulator instrumentation operability is not directly related to the capability of the accumulators to perform their safety function.

3/4.5.2, 3/4.5.3, and 3/4.5.4 ECCS SUBSYSTEMS

The OPERABILITY of two independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

With the RCS temperature below 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

ECCS SUBSYSTEMS (Continued)

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirements to verify all charging pumps except the required OPERABLE charging pump to be inoperable in MODES 4 and 5 and in MODE 6 with the reactor vessel head on, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV or RHR suction relief valve. In addition, the requirement to verify all Safety Injection pumps to be inoperable in MODE 4, in MODE 5 with the water level above the top of the reactor vessel flange, and in MODE 6 with the reactor vessel head on and with water level above the top of the reactor vessel flange, provides assurance that the mass addition can be relieved by a single PORV or RHR suction relief valve.

With the water level not above the top of the reactor vessel flange and with the vessel head on, Safety Injection pumps may be available to mitigate the affects of a loss of decay heat removal during a reduced RCS inventory condition.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance Requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses. The Surveillance Requirements for leakage testing of ECCS check valves ensures that a failure of one valve will not cause an intersystem LOCA. The Surveillance Requirements to vent the RHR and SI pump casings and accessible, i.e., can be reached without personnel hazard or high radiation dose, ECCS discharge piping ensures against inoperable pumps caused by gas binding or water hammer in ECCS piping.

3/4.5.5 REFUELING WATER STORAGE TANK

The OPERABILITY of the refueling water storage tank (RWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA. The limits on RWST minimum volume and boron concentration ensure that: (1) sufficient water is available within containment to permit recirculation cooling flow to the core, and (2) the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes assuming all the control rods are out of the core. These assumptions are consistent with the LOCA analyses.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Accumulators

LCO 3.5.1 Four ECCS accumulators shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS pressure > 1000 psig.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One accumulator inoperable due to boron concentration not within limits.	A.1	Restore boron concentration to within limits.	72 hours
B. One accumulator inoperable for reasons other than Condition A.	B.1	Restore accumulator to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Reduce RCS pressure to ≤ 1000 psig.	12 hours
D. Two or more accumulators inoperable.	D.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 6122 gallons and ≤ 6594 gallons.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 585 psig and ≤ 665 psig.	12 hours
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2300 ppm and ≤ 2500 ppm.	31 days AND --------NOTE------ Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of ≥ 70 gallons that is not the result of addition from the refueling water storage tank
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is > 1000 psig.	31 days

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 124 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 October 23, 1998, Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested changes to the Technical Specifications (TS) (Appendix A to Facility Operating License No. NPF-42) for the Wolf Creek Generating Station (WCGS). The proposed changes would revise TS 3/4.5.1, "Emergency Core Cooling Systems - Accumulators," and the applicable Bases. Specifically, the allowed outage time (AOT) or completion time for ACTION b (to restore an inoperable accumulator, if inoperable for reason other than the boron concentration outside of the requirements), would be changed to 24 hours instead of the current time of one hour. This proposal is based on the methodology described in Topical Report WCAP-15049, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times," dated August 1998.

The staff has reviewed WCAP-15049 and concluded that the deterministic and probabilistic safety analysis (PSA) results and insights of WCAP-15049 supported the proposed accumulator AOT extension for all Westinghouse plants. Specifically, the staff concluded that because (1) there is no change to the LCO and consequently no change to the Chapter 15 Safety Analysis, and (2) this is an extension of an existing condition, the deterministic aspect of this change is acceptable. In addition, the staff found that Westinghouse performed a comprehensive risk analysis to support the proposed AOT extension, which indicated that the impact on risk would be small, as defined in risk-informed Regulatory Guides (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated July 1998, and RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decision Making: Technical Specifications," dated August 1998. The staff's approval of WCAP-15049 is contained in a letter dated February 19, 1999, to the Westinghouse Owners Group.

2.0 EVALUATION

2.1 Deterministic Evaluation

The purpose of the emergency core cooling system (ECCS) accumulators is to supply water to the reactor vessel during the blowdown phase of a loss-of-coolant accident (LOCA). The accumulators are large volume tanks, filled with borated water and pressurized with nitrogen.

The cover-pressure is less than that of the reactor coolant system (RCS) so that following an accident, when the RCS pressure decreases below tank pressure, the accumulators inject the borated water into the RCS cold legs.

Currently, the TS allows for one of the four accumulators to be inoperable for one hour (for reasons other than boron concentration not within limits) during MODES 1, 2, and in MODE 3 with pressurizer pressure greater than 1000 psig. With one accumulator inoperable, the remaining three accumulators will remain available to mitigate the consequences of a LOCA event. The licensee is requesting to increase the AOT for one accumulator from one hour to 24 hours. Since the duration of an allowed TS AOT is not an input into the safety analysis (i.e., the safety analysis assumes the accumulators are operable), the extension of the AOT to 24 hours has no impact on the safety analysis. Deterministically, there is no difference between a one hour and a 24 hour AOT. Based on the above, the current safety analysis remains valid, and therefore, the change is acceptable.

The difference in the current TS versus the proposed extension is the added risk due to the extension of the AOT which is reviewed in the following section of this evaluation.

2.2 Risk Evaluation

The staff review of WCAP-15049 concluded that the risk analysis performed in support of the change for "all Westinghouse plants" was comprehensive and reasonable, and that the proposed change would result in a small risk increase, as defined in risk-informed RGs 1.174 and 1.177. The risk impact includes core damage frequency and large early release frequency, and it meets the intent of the guidance in the RGs.

The licensee provided an evaluation that demonstrated the applicability of the topical report to WCGS by way of examining key comparable parameters and assumptions used in both the WCGS probabilistic safety analysis (PSA) model and the WCAP evaluation. The staff finds that the WCAP evaluation envelops, or is comparable with, the WCGS case.

Based on the above, the staff concludes that the risk insights and findings support the deterministic evaluation of the accumulator AOT extension. Therefore, the changes are acceptable.

In addition, the staff reviewed the proposed change to TS Bases 3/4.5.1, "Emergency Core Cooling Systems - Bases - Accumulators," and found it to be consistent with the proposed TS change.

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

This 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 staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 64127). 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 staff 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: S. Brewer
I. Jung
K. Thomas

Date: April 27, 1999