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JUN 1976

Docket No. 50-298

JUN 9 1976

Nebraska Public Power District
ATTN: Mr. J. M. Pilant, Director
Licensing and Quality Assurance
Post Office Box 499
Columbus, Nebraska 68601

Gentlemen:

In response to your requests dated February 18, 1976 and March 16, 1976, the Commission has issued the enclosed Amendment No. 26 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station (CNS).

The amendment consists of changes in the Technical Specifications that clarify the reactor shutdown requirements of Specification 3.6.4, and incorporate more specific Limiting Conditions for Operation for the Average Planar Linear Heat Generation Rate, Linear Heat Generation Rate, and Minimum Critical Power Ratio specifications.

Copies of the related Safety Evaluation and the Federal Register Notice also are enclosed.

Sincerely,

Original signed by
Dennis L. Ziemann
Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosures:
1. Amendment No. 26
to License No. DPR-46
2. Safety Evaluation
3. Federal Register Notice

cc w/enclosures:
See next page

OFFICE ➤	OR:ORB #2	OR:ORB #2	OELD	OR:ORB #2		
SURNAME ➤	RMDiggs	MFletcher:ro	DSwanson	DLZiemann		
DATE ➤	5/25/76	5/27/76	6/8/76	6/9/76		

Form AEC-318 (Rev. 9-53) AECM 0240 ☆ U. S. GOVERNMENT PRINTING OFFICE: 1974-526-166

JUN 9 1976

cc w/enclosures:
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Snell & Wilmer
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Auburn Public Library
118 - 15th Street
Auburn, Nebraska 68305

Mr. William Siebert, Commissioner
Nemaha County Board of Commissioners
Nebraska County Courtroom
Auburn, Nebraska 68305

cc w/enclosures and NPPD filings
dtd. 2/18/76 & 3/16/76:
Mr. D. Drain, Director
Department of Environmental Control
Executive Building, Second Floor
Lincoln, Nebraska 68509

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 26
License No. DPR-46

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by the Nebraska Public Power District (the licensee) dated February 18, 1976 and March 16, 1976, comply 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, 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. After weighing the environmental aspects involved, 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 a change to the Technical Specifications as indicated in the attachment to this license amendment.

3. This license amendment is effective 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION
Original signed by
Dennis L. Ziemann

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

OFFICE ➔	Date of Issuance: JUN 9 1976				
SURNAME ➔					
DATE ➔					

ATTACHMENT TO LICENSE AMENDMENT NO. 26

FACILITY OPERATING LICENSE NO. DPR-46

DOCKET NO. 50-298

Replace existing pages 3, 4, 5, 134, 210 and 212 of the Appendix A portion of the Technical Specifications with the attached revised pages bearing the same numbers and add new page 5A. Changed areas on the revised pages are indicated by marginal lines.

8. Simulated Automatic Actuation - Simulated automatic actuation means applying a simulated signal to the sensor to actuate the circuit in question.

9. Trip System - A trip system means an arrangement of instrument channel trip signals and auxiliary equipment required to initiate action to accomplish a protective function. A trip system may require one or more instrument channel trip signals related to one or more plant parameters in order to initiate trip system action. Initiation of protective action may require the tripping of a single trip system or the coincident tripping of two trip systems.

J. Limiting Conditions for Operation (LCO) - The limiting conditions for operation specify the minimum acceptable levels of system performance necessary to assure safe startup and operation of the facility. When these conditions are met, the plant can be operated safely and abnormal situations can be safely controlled.

Limiting Conditions for Operation (LCO) shall be applicable during the operational conditions specified for each specification.

Adherence to the requirements of the LCO within the specified time interval shall constitute compliance with the specification. In the event the LCO is restored prior to expiration of the specified time interval, completion of the LCO action is not required.

In the event an LCO cannot be satisfied because of circumstances in excess of those addressed in the specification, the facility shall be placed in HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 hours unless corrective measures are completed that permit operation under the LCO for the specified time interval as measured from initial discovery. Exception to these requirements shall be stated in the individual specifications.

Entry into an operational condition shall not be made unless the conditions of the LCO are met without reliance on the actions specified in the LCO unless otherwise excepted. This provision shall not prevent passage through operational conditions required to comply with the specified actions of an LCO.

K. Limiting Safety System Setting (LSSS) - The limiting safety system settings are settings on instrumentation which initiate the automatic protective action at a level such that the safety limits will not be exceeded. The region between the safety limit and these settings represent a margin with normal operation lying below these settings. The margin has been established so that with proper operation of the instrumentation the safety limits will never be exceeded.

L. Mode - The reactor mode is established by the mode selector-switch. The modes include refuel, run, shutdown and startup/hot standby which are defined as follows:

1. Refuel Mode - The reactor is in the refuel mode when the mode switch is in the refuel mode position. When the mode switch is in the refuel position, the refueling interlocks are in service.

2. Run Mode - In this mode the reactor system pressure is at or above 850 psig and the reactor protection system is energized with APRM protection (excluding the 15% high flux trip) and RSM interlocks in service.

3. Shutdown Mode - The reactor is in the shutdown mode when the reactor mode switch is in the shutdown mode position.

4. Startup/Hot Standby - In this mode the reactor protection scram trips initiated by the main steam line isolation valve closure are bypassed when reactor pressure is less than 1000 psig, the low pressure main steam line isolation valve closure trip is bypassed, the reactor protection system is energized with APRM (15% SCRAM) and IRM neutron monitoring system trips and control rod withdrawal interlocks in service.

M. Operable - A system or component shall be considered operable when it is capable of performing its intended function in its required manner.

N. Operating - Operating means that a system or component is performing its intended functions in its required manner.

O. Operating Cycle - Interval between the end of one refueling outage and the end of the next subsequent refueling outage.

P. Primary Containment Integrity - Primary containment integrity means that the drywell and pressure suppression chamber are intact and all of the following conditions are satisfied:

1. All manual containment isolation valves on lines connected to the reactor coolant system or containment which are not required to be open during accident conditions are closed.

2. At least one door in each airlock is closed and sealed.

3. All automatic containment isolation valves are operable or de-activated in the isolated position.

4. All blind flanges and manways are closed.

Q. Rated Power - Rated power refers to operation at a reactor power of 2381 megawatts thermal. This is also termed 100% power and is the maximum power level authorized by the operating license. Rated steam flow, rated coolant flow, rated neutron flux, and rated nuclear system pressure refer to the values of these parameters when the reactor is at rated power. Design power, the power to which the safety analysis applies, is 105% of rated power, which corresponds to 2486 megawatts thermal.

R. Reactor Power Operation - Reactor power operation is any operation with the mode switch in the "Startup/Hot Standby" or "Run" position with the reactor critical and above 1% rated power.

S. Reactor Vessel Pressure - Unless otherwise indicated, reactor vessel pressures listed in the Technical Specifications are those measured by the reactor vessel steam space detectors.

T. Refueling Outage - Refueling outage is the period of time between the shutdown of the unit prior to a refueling and the startup of the plant after that refueling.

U. Safety Limits - The safety limits are limits within which the reasonable maintenance of the fuel cladding integrity and the reactor coolant system integrity are assured. Violation of such a limit is cause for unit shutdown and review by the Atomic Energy Commission before resumption of unit operation. Operation beyond such a limit may not in itself result in serious consequences but it indicates an operational deficiency subject to regulatory review.

V. Secondary Containment Integrity - Secondary containment integrity means that the reactor building is intact and the following conditions are met:

1. At least one door in each access opening is closed.

2. The standby gas treatment system is operable.

3. All automatic ventilation system isolation valves are operable or secured in the isolated position.

W. Shutdown - The reactor is in a shutdown condition when the mode switch is in the "Shutdown" or "Refuel" position.

1. Hot Shutdown means conditions as above with reactor coolant temperature greater than 212°F.

2. Cold Shutdown means conditions as above with reactor coolant temperature equal to or less than 212°F and the reactor vessel vented.

X. Surveillance Frequency -

Surveillance requirements shall be applicable during the operational conditions associated with individual LCO's unless otherwise stated in an individual Surveillance Requirement.

Each Surveillance Requirement shall be performed within the specified time interval with:

a. A maximum allowable extension not to exceed 25% of the surveillance interval.

b. A total maximum combined interval time for any 3 consecutive surveillance intervals not to exceed 3.25 times the specified interval.

Performance of a Surveillance Requirement within the specified time interval shall constitute compliance with operability requirements for an LCO unless otherwise required by the specification.

Y. Surveillance Interval - The surveillance interval is the calendar time between surveillance tests, checks, calibrations and examinations to be performed upon an instrument or component when it is required to be operable. These tests may be waived when the instrument, component or system is not required to be operable, but the instrument, component or system shall be tested prior to being declared operable or as practicable following its return to service.

3.6.B (cont'd)

2. Prior to startup and during the operation of the reactor up to 10% of rated power, and during hot standby, the reactor coolant shall not exceed the following limits:

a. Conductivity <5 μmho/cm at 25°C

b. Chloride 0.1 ppm

The reactor shall be shut down if pH is <5.6 or >8.6 for a 24-hour period.

3. During reactor operation in excess of 10% of rated power, the reactor coolant shall not exceed the following limits:

a. Conductivity 1 μmho/cm at 25°C

b. Chloride 0.2 ppm

4. During the reactor operation in excess of 10% of rated power, the reactor coolant may exceed the limits of Paragraph 3.6.B.3 only for the time limits specified below. If these time limits or the following maximum limits are exceeded, the reactor shall be shutdown and placed in the Cold Shutdown Condition.

a. Conductivity Time above 1 μmho/cm at 25°C, 2 weeks/year
Maximum limit-10 μmho/cm at 25°C

b. Chloride Time above 0.2 ppm, 2 weeks/year
Maximum limit-0.5 ppm

The reactor shall be shut down if pH is <5.6 or >8.6 for a 24-hour period.

5. When the reactor is not pressurized (i.e. at or below 212°F), reactor coolant shall be maintained below the following limits:

a. Conductivity 10 μmho/cm at 25°C

b. Chloride 0.5 ppm

4.6 (cont'd)

b. If the gross activity counts of a sample indicate an activity concentration above 3.1 uCi/gm of dose equivalent I-131, an isotopic analysis shall be performed and quantitative measurements made to determine the dose equivalent I-131 concentration.

c. An isotopic analysis of a reactor coolant sample shall be made at least once per month.

2. Reactor coolant shall be continuously monitored for conductivity.

3. Prior to startup, during the operation of the reactor and during hot standby, a sample of the reactor coolant shall be analyzed.

a. At least every 80 hours for conductivity and chloride ion content when the continuous conductivity monitor reading is ≤0.7 μmho/cm 25°C.

b. At least every 24 hours for conductivity and chloride ion content when the continuous conductivity monitor reading is >0.7 ≤2.0 μmho/cm at 25°C.

c. At least every 8 hours for conductivity and chloride ion content when the continuous conductivity monitor reading is >2 but ≤3.5 μmho/cm at 25°C.

d. At least every 4 hours for conductivity, chloride ion content, and pH, when the continuous conductivity monitor reading is >3.5 μmho/cm at 25°C or when the continuous conductivity monitor is inoperable.

4. When the reactor is not pressurized, a sample of the reactor coolant shall be analyzed at least every 80 hours for conductivity and chloride ion content.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11 FUEL RODS	4.11 FUEL RODS
Applicability	Applicability
The Limiting Conditions for Operation associated with the fuel rods apply to those parameters which monitor the fuel rod operating conditions.	The Surveillance Requirements apply to the parameters which monitor the fuel rod operating conditions.
Objective	Objective
The Objective of the Limiting Conditions for Operation is to assure the performance of the fuel rods.	The Objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to the fuel rods.
Specifications	Specifications
A. Average Planar Linear Heat Generation Rate (APLHGR)	A. Average Planar Linear Heat Generation Rate (APLHGR)
During steady state power operation, the APLHGR for each type of fuel as a function of average planar exposure shall not exceed the limiting value shown in Figure 3.11-1. If at any time during steady state operation it is determined by normal surveillance that the limiting value for APLHGR is being exceeded action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until the prescribed limits are again being met.	The APLHGR for each type of fuel as a function of average planar exposure shall be determined daily during reactor operation at $\geq$ 25% rated thermal power.
B. Linear Heat Generation Rate (LHGR)	B. Linear Heat Generation Rate (LHGR)
During steady state power operation, the linear heat generation rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed the maximum allowable LHGR as calculated by the following equation:	The LHGR as a function of core height shall be checked daily during reactor operation at $\geq$ 25% rated thermal power.
$LHGR_{max} \leq LHGR_d \left\{1 - \{(\Delta P/P)_{max} (L/LT)\}\right\}$	
$LHGR_d$ = Design LHGR = G KW/ft.	
$(\Delta P/P)_{max}$ = Maximum power spiking penalty = N	

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
LT = Total core length = 12 feet L = Axial position above bottom of core G = 18.5 kW/ft for 7x7 fuel bundles = TBS kW/ft for 8x8 fuel bundles N = 0.038 for 7x7 fuel bundles = TBS for 8x8 fuel bundles If at any time during steady state operation it is determined by normal surveillance that the limiting value for LHGR is being exceeded action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the LHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until the prescribed limits are again being met.	
C. Minimum Critical Power Ratio (MCPR) During steady state power operation MCPR shall be $\geq$ 1.29 for 7x7 fuel and $\geq$ (TBS) for 8x8 fuel at rated power and flow. If, at any time during steady state operation it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall then be initiated within 15 minutes to restore operation to within the prescribed limits. If the steady state MCPR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until the prescribed limits are again being met. For core flows other than rated the MCPR shall be >1.29 for 7x7 fuel and > (TBS) for 8x8 fuel times K_f, where K_f is as shown in Figure 3.11-2.	C. Minimum Critical Power Ratio (MCPR) MCPR shall be determined daily during reactor power operation at $\geq$ 25% rated thermal power and following any change in power level or distribution that would cause operation with a limiting control rod pattern as described in the bases for Specification 3.3.B.5.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 26 TO DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

INTRODUCTION

By letters dated February 18 and March 16, 1976, Nebraska Public Power District (NPPD) requested amendments to Facility Operating License No. DPR-46 for the Cooper Nuclear Station (CNS). The amendment involves changes to the Technical Specification which clarify the reactor shutdown requirements of the reactor coolant conductivity specification and incorporate more specific Limiting Conditions for Operation for the Average Planar Linear Heat Generation Rate, Linear Heat Generation Rate, and Minimum Critical Power Ratio.

DISCUSSION AND EVALUATION

On July 12, 1975, NPPD submitted reportable occurrence report 50-298-75-22. This report describes an incident at CNS during which reactor coolant conductivity exceeded the Technical Specification limit of 10 umho/cm for a period of approximately four hours. Technical Specification 3.6.4.a requires that the reactor be shutdown "immediately" if a conductivity of 10 umho/cm is exceeded. However, "immediately" is defined in the CNS Technical Specifications as "Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action." Since, at the time of the incident, NPPD did not consider a reactor shutdown to be practicable, the reactor was not shutdown. To remove the subjective determination of "practicability" from Specification 3.6.4, the NRC, by letter dated December 4, 1975, requested that NPPD propose a technical specification which would delete the word "immediately" from Specification 3.6.4.a and incorporate additional specifications similar to Sections 3.0 and 4.0 of the model technical specifications currently being issued for new

facilities. Section 3.0 deals with the applicability of Limiting Conditions for Operation (LCO) and includes specific reactor shutdown requirements in the event the LCO is exceeded. Section 3.0 requires placing the reactor in HOT SHUTDOWN within six hours and in COLD SHUTDOWN within the following thirty hours in the event an LCO is exceeded. Section 4.0 deals with the surveillance requirements of LCO's and defines maximum surveillance intervals. NPPD's letter of February 18, 1976, proposes such specifications.

The NRC staff has evaluated this proposed change and concluded that it would remove the ambiguity from the existing reactor shutdown requirements of 3.6.4.a. The proposed changes would better define the applicability of LCO's and time intervals of surveillance requirements. The impact of the proposed change on the shutdown requirements of other CNS technical specifications was reviewed. We concluded that no present reactor shutdown requirements would be relaxed by operating in accordance with the proposed change. Furthermore, the proposed specifications would better define shutdown requirements for exceeding the following specifications:

(1) 3.6.F.3 Single recirculation loop operation

(2) 3.7.A.1.a,b Suppression pool volume

(3) 3.7.A.1.d Suppression pool temperature

(4) 3.7.A.2 Primary containment integrity

(5) 3.7.A.3.b Reactor building vacuum breakers

(6) 3.7.C Secondary containment integrity

(7) 3.13.B High river level

By letter dated March 1, 1976, the NRC requested NPPD to include, in its current CNS Technical Specifications for Average Planar Linear Heat Generation Rate (APLHGR), Linear Heat Generation Rate (LHGR), and Minimum Critical Power Ratio (MCPR), explicit remedial actions to be taken if the specifications are exceeded. The revised specifications would require, upon exceeding a limit, the initiation of remedial action within 15 minutes to restore conditions to within the prescribed limit. If operation was not within the specified limits within two (2) hours, the proposed specifications would require that the reactor be placed in Cold Shutdown within 36 hours. Current CNS Technical Specifications for APLHGR, LHGR, and MCPR do not specify time limits for remedial action.

The NRC staff has reviewed the proposed technical specifications regarding remedial action for APLHGR, LHGR, and MCPR limits. We conclude that the revised specifications are in accordance with the provisions of 10 CFR Part 50 §50.36(c)(2), which permits a limited period of time for operator action to be taken to restore plant parameters within operating limits rather than requiring that the plant be immediately shut down. In addition, the revision would improve the APLHGR, LHGR, and MCPR specifications by placing more specific requirements on the operator. On this basis, the proposed technical specifications are acceptable.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental statement, negative declaration, or environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION:

We have concluded, based on the considerations discussed above, that: (1) because the changes do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the changes do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: June 9, 1976

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-298

NEBRASKA PUBLIC POWER DISTRICT

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY LICENSE

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 26 to Facility Operating License No. DPR-46, issued to the Nebraska Public Power District (the licensee), which revised Technical Specifications for operation of the Cooper Nuclear Station (the facility) located in Nemaha County, Nebraska. The amendment is effective 30 days from the date of issuance.

This amendment revised the Technical Specifications for the facility to clarify the reactor shutdown requirements for high reactor water conductivity and to incorporate more specific Limiting Conditions for Operation with regard to Average Planar Linear Heat Generation Rate, Linear Heat Generation Rate, and Minimum Critical Power Ratio.

The applications for the amendment comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental statement, negative declaration or environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

For further details with respect to this action, see (1) the applications for amendment dated February 18 and March 16, 1976, (2) Amendment No. 26 to License No. DPR-46, and (3) the Commission's concurrently issued Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Auburn Public Library, 118 - 15th Street, Auburn, Nebraska 68305. A copy of items (2) and (3) may be obtained upon request addressed to the United States Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 9th day of June, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION

Dennis L. Ziemann

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Division of Operating Reactors