

April 20, 1987

Docket No. 50-298
TAC No. 61867

Mr. George A. Trevors, Division
Manager - Nuclear Support
Nebraska Public Power District
Post Office Box 499
Columbus, Nebraska 68601

Dear Mr. Trevors:

The Commission has issued the enclosed Amendment No.108 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. This amendment consists of changes to the Technical Specifications in response to your application dated July 2, 1986 as modified by your letter dated December 29, 1986. (Change #23)

The amendment changes the Technical Specifications to incorporate various changes to the Scram and Rod Block Instrumentation.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice

Sincerely,

WOL

William O. Long, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:

- 1. Amendment No. 108 to License No. DPR-46
- 2. Safety Evaluation

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Docket No. 50-298

Mr. George A. Trevors, Division
Manager - Nuclear Support
Nebraska Public Power District
Post Office Box 499
Columbus, Nebraska 68601

Dear Mr. Trevors:

The Commission has issued the enclosed Amendment No. to Facility
Operating License No. DPR-46 for the Cooper Nuclear Station. This
amendment consists of changes to the Technical Specifications in response
to your application dated July 2, 1986 as modified by your letter
dated December 29, 1986. (Change #23)

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changes to the Scram and Rod Block Instrumentation.

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be included in the Commission's Bi-Weekly Federal Register Notice

Sincerely,

William O. Long, Project Manager
BWR Project Directorate #2
Division of BWR Licensing

Enclosures:

1. Amendment No. to License No. DPR-46
2. Safety Evaluation

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J. Calvo
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Mr. George A. Trevors
Nebraska Public Power District

Cooper Nuclear Station

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

NEBRASKA PUBLIC POWER DISTRICT
DOCKET NO. 50-298
COOPER NUCLEAR STATION
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 108
License No. DPR-46

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Nebraska Public Power District (the licensee) dated July 2, 1986, as modified by letter dated December 29, 1986, 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, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-46 is hereby amended to read as follows:

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(2) Technical Specification

The Technical Specifications contained in Appendix A, as revised through Amendment No. 108, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jose A. Calvo

Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 20, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 108

FACILITY OPERATING LICENSE NO. DPR-46

DOCKET NO. 50-298

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Pages

28

31

61

62

62a

COOPER NUCLEAR STATION
TABLE 3.1.1
REACTOR PROTECTION SYSTEM INSTRUMENTATION REQUIREMENTS

Reactor Protection System Trip Function	Applicability Conditions				Trip Level Setting	Minimum Number of Operable Channels Per Trip Systems (1)	Action Required When Equipment Operability is Not Assured (1)
	Mode Switch Position						
	Shutdown	Startup	Refuel	Run			
Mode Switch in Shutdown	X(7)	X	X	X		1	A
Manual Scram	X(7)	X	X	X		1	A
IRM (17) High Flux	X(7)	X	X	(5)	\leq 120/125 of indicated scale	3	A
Inoperative		X	X	(5)		3	A
APRM (17) High Flux (Flow biased)					$X \leq (0.66W+54\%-0.66\Delta W)$ (14)(19)(20) $\left[\frac{FRP}{MFLPD} \right]$	2	C
High Flux	X(7)	X(9)	X(9)	(16)	\leq 15% Rated Power	2	A
Inoperative		X(9)	X(9)	X	(13)	2	A
Downscale	(12)	(12)	(12)	X(11)	\geq 2.5%	2	A
High Reactor Pressure NBI-PS-55 A,B,C, & D		X(9)	X(10)	X	\leq 1045 psig	2	A
High Drywell Pressure PC-PS-12 A,B,C, & D		X(9)(8)	X(8)	X	\leq 2 psig	2	A or D
Reactor Low Water Level NBI-LIS-101 A,B,C, & D		X	X	X	\geq + 12.5 in. indicated level	2	A or D
Scram Discharge Instrument Volume High Water Level CRD-LS-231 A & B CRD-LS-234 A & B CRD-LT-231 C & D CRD-LT-234 C & D		X	X(2)	X	\leq 92 inches	3 (18)	A

11. The APRM downscale trip function is only active when the reactor mode switch is in RUN. When in RUN, this function is automatically bypassed when the companion IRM instrumentation is operable and not upscale.
12. The APRM downscale trip is automatically bypassed when the mode switch is not in RUN.
13. An APRM will be considered inoperable if there are less than 2 LPRM inputs per level or there is less than 11 operable LPRM detectors to an APRM.
14. W is the two-loop recirculation flow in percent of rated flow.
15. This note deleted.
16. The 15% APRM scram is bypassed in the RUN mode.
17. The APRM and IRM instrument channels function in both the Reactor Protection System and Reactor Manual Control System (Control Rod Withdraw Block, Section 3.2.C.). A failure of one channel will affect both of these systems.
18. The minimum number operable associated with the Scram Discharge Instrument Volume are three instruments per Scram Discharge Instrument Volume and three level devices per RPS channel.
19. ΔW is the difference between two-loop and single-loop effective drive flow and is used for single recirculation loop operation. $\Delta W=0$ for two recirculation loop operation.
20. The ratio of FRP (fraction of rated thermal power) to MFLPD (maximum fraction of limiting power density) shall be set equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used.

COOPER NUCLEAR STATION
TABLE 3.2.C
CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

Function	Trip Level Setting	Minimum Number Of Operable Instrument Channels/Trip System(5)
APRM Upscale (Flow Bias)	$\leq (0.66W + 42\% - 0.66 \Delta W) \left[\frac{FRP}{MFLPD} \right] (2)(13)(14)$	2(1)
APRM Upscale (Startup)	$\leq 12\%$	2(1)
APRM Downscale (9)	$\geq 2.5\%$	2(1)
APRM Inoperative	(10b)	2(1)
RBM Upscale (Flow Bias)	$\leq 0.66W + (N - 66) (2)$	1
RBM Downscale (9)	$\geq 2.5\%$	1
RBM Inoperative	(10c)	1
IRM Upscale (8)	$\leq 108/125$ of Full Scale	3(1)
IRM Downscale (3)(8)	$\geq 2.5/125$ of Full Scale	3(1)
IRM Detector Not Full In (8)		3(1)
IRM Inoperative (8)	(10a)	3(1)
SRM Upscale (8)	$\leq 1 \times 10^5$ Counts/Second	1(1)(6)
SRM Detector Not Full In (4)(8)	(≥ 100 cps)	1(1)(6)
SRM Inoperative (8)	(10a)	1(1)(6)
Flow Bias Comparator	$\leq 10\%$ Difference In Recirc. Flows	1
Flow Bias Upscale/Inop.	$\leq 110\%$ Recirc. Flow	1
SRM Downscale (8)(7)	≥ 3 Counts/Second (11)	1(1)(6)
SDV Water Level High CRD-231E, 234E	≤ 46 inches	1(12)

NOTES FOR TABLE 3.2.C

1. For the startup and run positions of the Reactor Mode Selector Switch, the Control Rod Withdrawal Block Instrumentation trip system shall be operable for each function. The SRM and IRM blocks need not be operable in "Run" mode, and the APRM (flow biased) and RBM rod blocks need not be operable in "Startup" mode. The Control Rod Withdrawal Block Instrumentation trip system is a one out of "n" trip system, and as such requires that only one instrument channel specified in the function column must exceed the Trip Level Setting to cause a rod block. By utilizing the RPS bypass logic (see note 5 below and note 1 of Table 3.1.1) for the Control Rod Withdrawal Block Instrumentation, a sufficient number of instrument channels will always be operable to provide redundant rod withdrawal block protection.
2. W is the two-loop recirculation flow rate in percent of rated. Trip level setting is in percent of rated power (2381 MWt). N is the RBM setpoint selected (in percent) and is calculated in accordance with the methodology of the latest NRC approved version of NEDE-24011-P-A.
3. IRM downscale is bypassed when it is on its lowest range.
4. This function is bypassed when the count is ≥ 100 cps and IRM above range 2.
5. By design one instrument channel; i.e., one APRM or IRM per RPS trip system may be bypassed. For the APRM's and IRM's, the minimum number of channels specified is that minimum number required in each RPS channel and does not refer to a minimum number required by the control rod block instrumentation trip function. By design only one of two RBM's or one of four SRM's may be bypassed. For the SRM's, the minimum number of channels specified is the minimum number required in each of the two circuit loops of the Control Rod Block Instrumentation Trip System. For the RBM's, the minimum number of channels specified is the minimum number required by the Control Rod Block Instrumentation Trip System as a whole (except when a limiting control rod pattern exists and the requirements of Specification 3.3.B.5 apply).
6. IRM channels A,E,C,G all in range 8 or higher bypasses SRM channels A&C functions. IRM channels B,F,D,H all in range 8 or higher bypasses SRM channels B&D functions.
7. This function is bypassed when IRM is above range 2.
8. This function is bypassed when the mode switch is placed in Run.
9. This function is only active when the mode switch is in Run.
10. The inoperative trips are produced by the following functions:
 - a. SRM and IRM
 - (1) Mode switch not in operate
 - (2) Power supply voltage low
 - (3) Circuit boards not in circuit

NOTES FOR TABLE 3.2.C (Continued)

b. APRM

- (1) Mode switch not in operate
- (2) Less than 11 LPRM inputs
- (3) Circuit boards not in circuit

c. RBM

- (1) Mode switch not in operate
- (2) Circuit boards not in circuit
- (3) RBM fails to null
- (4) Less than required number of LPRM inputs for rod selected

11. During spiral unloading/reloading, the SRM count rate will be below 3 cps for some period of time. See Specification 3.10.B.
12. With the number of OPERABLE channels less than required by the Minimum Number of Operable Instrument Channels/Trip System requirements, place the inoperable channel in the tripped condition within one hour.
13. ΔW is the difference between two-loop and single-loop effective drive flow and is used for single recirculation loop operation. $\Delta W=0$ for two recirculation loop operation.
14. The ratio of FRP (fraction of rated thermal power) to MFLPD (maximum fraction of limiting power density) shall be set equal to 1.0 unless the actual value is less than the design value of 1.0, in which case the actual operating value will be used.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 108 TO FACILITY OPERATING LICENSE NO. DPR-46
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
DOCKET NO. 50-298

1.0 INTRODUCTION

By letters dated July 2, 1986 and December 29, 1986 (Change #23), the Nebraska Public Power District (the licensee) requested an amendment to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. The proposed amendment would change the Appendix A Technical Specifications relating to average power range monitor (APRM) reactor trip and rod block instrumentation.

The amendment would modify Table 3.1.1 "Reactor Protection System Instrumentation Requirements" to:

- (1) Indicate that the APRM Downscale reactor trip function is automatically bypassed in the RUN mode when the companion Intermediate Range Monitor (IRM) instrumentation is operable and not upscale.
- (2) Indicate that the APRM downscale reactor trip function is automatically bypassed when in the SHUTDOWN, REFUEL or STARTUP condition.
- (3) Specify that the ratio of Fraction of Rated Thermal Power to Maximum Fraction of Limiting Power Density (FRP/MFLPD) for the APRM flow-biased high flux reactor trip setpoint shall be set equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used.
- (4) Eliminate one of two action statements applicable when the minimum number of operable APRM channels cannot be met for the high flux (15% power), inoperative, and downscale reactor trip functions. "Reduce power level to IRM range and place mode switch in the Startup position within 8 hours and depressurize to less than 1000 psig" would be eliminated as an indicated action. The statement "Initiate insertion of operable rods and complete insertion of all operable rods within four hours" would be retained as the sole applicable indicated action.
- (5) Eliminate one of two indicated action statements applicable

when the minimum number of APRM channels cannot be met for the high flux (flow-biased) reactor trip function. "Initiate insertion of operable rods and complete insertion of all operable rods within four hours" would be eliminated as an applicable action. The action statement "Reduce power level to IRM range and place mode switch in the Startup position within 8 hours and depressurize to less than 1000 psig" would be retained as the sole required action.

(6) Change the APRM downscale reactor trip minimum setpoint from 2.5% of indicated scale to 2.5% of rated thermal power.

The amendment would modify Table 3.2.C "Control Rod Withdrawal Block Instrumentation" of the Technical Specifications to:

(7) Specify that the value of FRP/MFLPD used for the APRM flow-biased upscale rod block setpoint shall be equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used.

(8) Change the minimum IRM downscale rod block setpoint from 2.5% of rated thermal power to 2.5/125 of full scale.

(9) Delete statements that the APRM and rod block monitor (RBM) downscale rod block functions are automatically bypassed during RUN if the companion IRM instrumentation is not upscale or inoperative.

2.0 EVALUATION

Change (1) would expand Note 11 of the table to state that the APRM downscale reactor trip function is automatically bypassed when the companion IRM instrument is operable and not upscale with the mode switch in RUN. This change reflects design features of the Cooper APRM system that permit the APRM channels to extend their effectiveness into the startup range as described in the staff Safety Evaluation dated February 14, 1973. The proposed change provides clarification and is acceptable.

Change (2) would change the table to indicate applicability of Note 12 to the APRM Downscale trip function. This change would state that the APRM downscale reactor trip function is automatically bypassed when in the SHUTDOWN, REFUEL or STARTUP condition. This clarification is consistent with the design basis for the APRM system in that the APRM downscale protective function is required only during operation in the RUN mode or, as noted above, in the STARTUP mode when the companion IRM instrumentation is inoperable or upscale. During operation in STARTUP with the Companion IRM channel operable and not upscale, SHUTDOWN, or REFUEL, an APRM channel will likely be downscale due to the low flux level and an operative downscale trip function would provide a normal startup. The proposed change provides clarifying descriptive information to reflect an approved design feature of the system and is acceptable.

Change (3) would change the Limiting Conditions for Operation (LCO)

section of the Technical Specifications to specify that FRP/MFLPD for the APRM flow-biased high flux reactor trip setting shall be 1.0 unless the actual operating value is less than the design value of 1.0 in which case the actual operating value shall be used. This change would make the LCO consistent with Limiting Safety System Setting 2.1.A.1.a as amended in Amendment No. 46 and is acceptable.

Change (4) would eliminate one of two action statements specified for use when the minimum number of operable APRM channels cannot be met for the high flux (15% power), inoperative, and downscale reactor trip functions. "Reduce power level to IRM range and place mode switch in the Startup position within 8 hours and depressurize to less than 1000 psig" would be eliminated as an indicated action. The statement "Initiate insertion of operable rods and complete insertion of all operable rods within four hours" would be retained as the sole applicable indicated action. The existing Technical Specifications require the licensee to make a determination as to which of the two statements is appropriate to a situation. With the proposed change, the choice is eliminated and the applicable action clarified. This change provides clarification and facilitates compliance with the Technical Specifications and is acceptable.

Change (5) would eliminate one of two indicated action statements applicable when the minimum number of APRM channels cannot be met for the high flux (flow-biased) reactor trip function. "Initiate insertion of operable rods and complete insertion of all operable rods within four hours" would be eliminated as an applicable action. The action statement "Reduce power level to IRM range and place mode switch in the Startup position within 8 hours and depressurize to less than 1000 psig" would be retained as the sole required action. This change is being made in conjunction with Change (4) above. It would clarify the appropriate action, eliminating the need for the licensee to make such a determination in event of instrument failure. The change would facilitate compliance with the Technical Specifications and is acceptable.

Change (6) would change the APRM downscale reactor trip minimum setpoint from 2.5% of indicated scale to 2.5% of rated thermal power. This change would eliminate the confusion that results from the fact that the APRM instrument scale reads up to 125% power and 2.5% scale is thus 3.125% power. This change also makes the reactor trip setting units consistent with the related rod block setting units. The change has no safety significance and is acceptable.

Change (7) would specify that the value of FRP/MFLPD used for the APRM flow-biased upscale rod block setpoint shall be equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used. This change is similar to Change (3) above for the reactor trip function and is acceptable on the same basis.

Change (8) would change the minimum IRM downscale rod block setpoint from 2.5% of rated thermal power to 2.5/125 of full scale. This change is desirable because the IRM scales read in "percent scale," not in "percent power." This change facilitates compliance with the

Technical Specifications, has no safety significance, and is acceptable.

Change (9) would delete statements that the APRM and rod block monitor (RBM) downscale rod block functions are automatically bypassed during RUN if the companion IRM instrumentation is not upscale or inoperative. This change would correct an error. There is no interface between the rod block monitor circuitry and the IRM instruments. Such an automatic bypass has never been provided and is not a design basis requirement, and would provide no useful protective function. The proposed change is therefore acceptable.

3.0 ENVIRONMENTAL CONSIDERATIONS

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 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. 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.

4.0 CONCLUSION

We have 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, and
- (2) such activities will be conducted in compliance with the Commission's regulations and 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: W. Long

Dated: April 20, 1987