

July 31, 1991

Docket No. 50-298

Mr. Guy R. Horn
Nuclear Power Group Manager
Nebraska Public Power District
Post Office Box 499
Columbus, Nebraska 68602-0499

Dear Mr. Horn:

SUBJECT: COOPER NUCLEAR STATION - AMENDMENT NO. 145 TO FACILITY
OPERATING LICENSE NO. DPR-46 (TAC NO. 80342)

The Commission has issued the enclosed Amendment No.145 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. The amendment consists of changes to the Technical Specifications in response to your application dated April 25, 1991 as supplemented by the letter dated June 28, 1991.

The amendment changes the Technical Specifications to reduce the low reactor water level scram setpoint (Level 3) from greater than or equal to 12.5 inches to greater than or equal to 4.5 inches above instrument zero. The amendment also makes administrative changes involving editorial and typographical corrections.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original signed by

Paul W. O'Connor, Project Manager
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No.145 to License No. DPR-46
2. Safety Evaluation

cc w/enclosures:
See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555

July 31, 1991

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Nuclear Power Group Manager
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A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

A handwritten signature in cursive script that reads "Paul W. O'Connor".

Paul W. O'Connor, Project Manager
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No.145 to
License No. DPR-46
2. Safety Evaluation

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See next page

Mr. Guy R. Horn
Nuclear Power Group Manager

Cooper Nuclear Station

cc:

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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. 145
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 April 25, 1991 as supplemented by the letter dated June 28, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, 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. DPR-46 is hereby amended to read as follows:

2. Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 145, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas F. Whiteman for

Theodore R. Quay, Director
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 31, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 145

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 pages are identified by Amendment number and contain vertical lines indicating the area of change.

REMOVE PAGES

8
10
20
28
50
52a
56
59
83

INSERT PAGES

8
10
20
28
50
52a
56
59
83

SAFETY LIMITS

LIMITING SAFETY SYSTEM SETTINGS

2.1.A.1 (Cont'd)

d. APRM Rod Block Trip Setting

The APRM rod block trip setting shall be:

$$S_{RB} \leq 0.66 W + 42\% - .66 \Delta W$$

where:

S_{RB} = Rod block setting in percent of rated thermal power (2381 MWt)

W and ΔW are defined in Specification 2.1.A.1.a.

In the event of operation with a maximum fraction of limiting power density (MFLPD) greater than the fraction of rated power (FRP), the setting shall be modified as follows:

$$S_{RB} \leq (0.66 W + 42\% - 0.66 \Delta W) \frac{FRP}{MFLPD}$$

where,

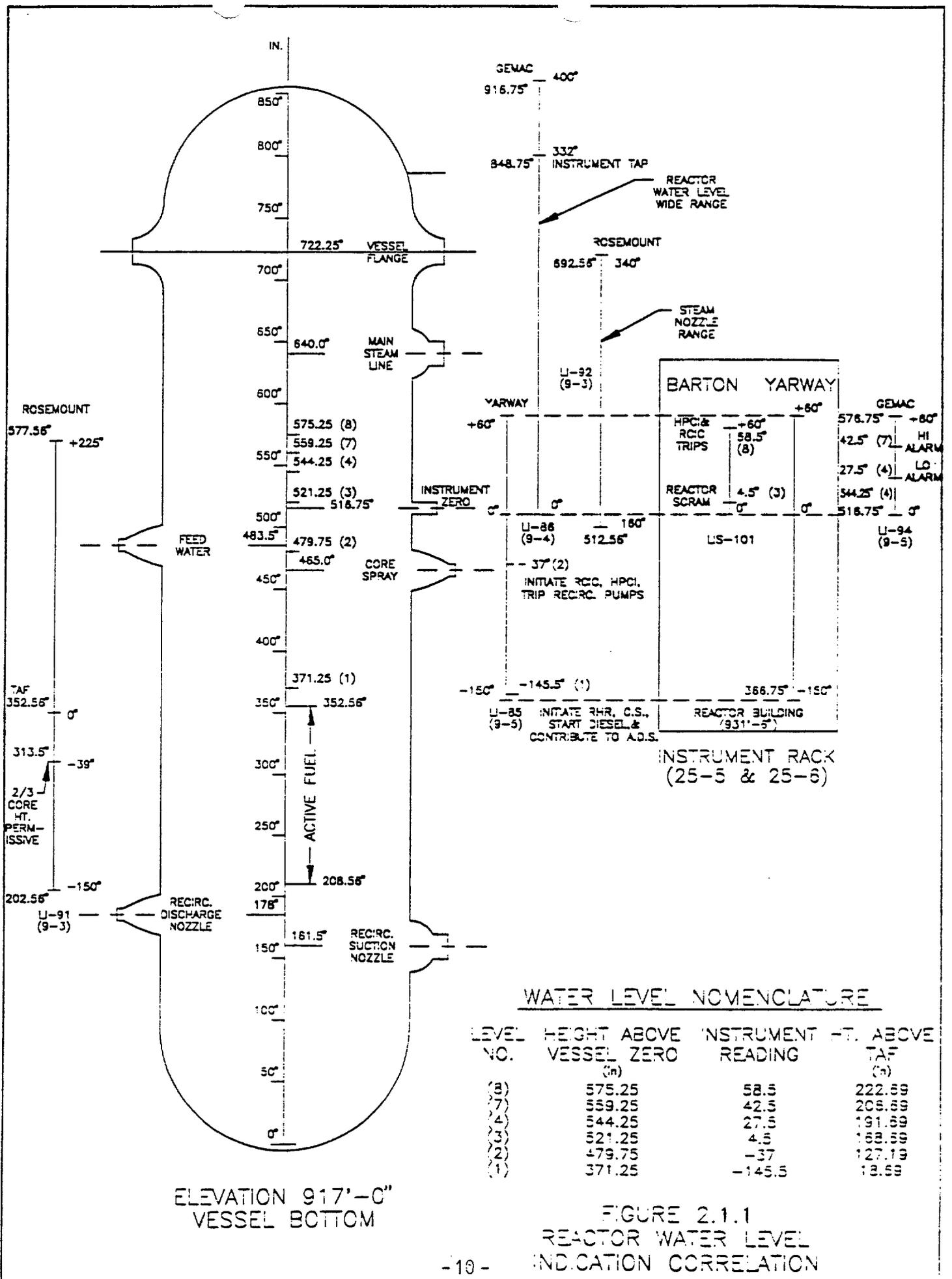
FRP = fraction of rated thermal power (2381 MWt)

MFLPD - maximum fraction of limiting power density where the limiting power density for each type of fuel bundle is specified in the Core Operating Limits Report.

The ratio of FRP to MFLPD 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.

2. Reactor Water Low Level Scram and Isolation Trip Setting (except MSIV)

$\geq +4.5$ in. on vessel level instruments.



2.1 Bases: (Cont'd)

2. Reactor Water Low Level Scram and Isolation Trip Setting (except MSIV)

The setpoint for low reactor water level scram is established at Level 3 to ensure that during normal power operation the bottom of the separator skirt is not uncovered (this protects available reactor recirculation pump NPSH from carryunder). This level has been used in transient and accident analyses dealing with coolant inventory decrease. The results reported in USAR sections XIV-5 and XIV-6 show that when scram is initiated at Level 3, the fuel and process barrier are adequately protected because MCPR remains well above the MCPR fuel cladding integrity limit in all cases, and reactor coolant system pressure does not reach the safety valve settings. The scram setting is approximately 30 inches below the normal operating range and is thus adequate to avoid spurious scrams.

3. Turbine Stop Valve Closure Scram Trip Setting

The turbine stop valve closure scram trip anticipates the pressure, neutron flux and heat flux increase that could result from rapid closure of the turbine stop valves. With a scram trip setting of ≤ 10 percent of valve closure from full open, the resultant increase in surface heat flux is limited such that MCPR remains above the MCPR fuel cladding integrity limit even during the worst case transient that assumes the turbine bypass is closed. This scram is bypassed when turbine steam flow is below 30% of rated, as measured by turbine first stage pressure.

4. Turbine Control Valve Fast Closure Scram Trip Setting

The turbine control valve fast closure scram anticipates the pressure, neutron flux, and heat flux increase that could result from fast closure of the turbine control valves due to load rejection exceeding the capability of the bypass valves. The reactor protection system initiates a scram when fast closure of the control valves is initiated by the loss of turbine control oil pressure as sensed by pressure switches. This setting and the fact that control valve closure time is approximately twice as long as that for the stop valves means that resulting transients, while similar, are less severe than for stop valve closure. No significant change in MCPR occurs. Relevant transient analyses are presented in Section XIV - 5.1.1 of the USAR.

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 in- dicated 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	≤ 1045 psig	2	A
High Drywell Pressure PG-PS-12 A,B,C, & D		X(9)(8)	X(8)	X	≤ 2 psig	2	A or D
Reactor Low Water Level NBI-LIS-101 A,B,C, & D		X	X	X	$\geq + 4.5$ in. indi- cated level	2	A or D
Scram Discharge Instrument Volume High Water Level GRD-IS-231 A & B GRD-IS-234 A & B GRD-LT-231 C & D GRD-LT-234 C & D		X	X(2)	X	≤ 92 inches	3 (18)	A

COOPER NUCLEAR STATION
TABLE 3.2.A (Page 1)
PRIMARY CONTAINMENT AND REACTOR VESSEL ISOLATION INSTRUMENTATION

Instrument	Instrument I.D. No.	Setting Limit	Minimum Number of Operable Components Per Trip System (1)	Action Required When Component Operability is Not Assured (2)
Main Steam Line High Rad.	RMP-RM-251, A,B,C,&D	≤ 3 Times Full Power	2	A or B
Reactor Low Water Level	NBI-LIS-101, A,B,C,&D #1	≥+4.5 in. Indicated Level	2(4)	A or B
Reactor Low Low Low Water Level	NBI-LIS-57 A & B #1 NBI-LIS-58 A & B #1	≥-145.5 in. Indicated Level	2	A or B
Main Steam Line Leak Detection	MS-TS-121, A,B,C,&D 122, 123, 124, 143, 144, 145, 146, 147, 148, 149, 150	≤ 200°F	2(6)	B
Main Steam Line High Flow	MS-dPIS-116 A,B,C,&D 117, 118, 119	≤ 150% of Rated Steam Flow	2(3)	B
Main Steam Line Low Pressure	MS-PS-134, A,B,C,&D	≥ 825 psig	2(5)	B
High Drywell Pressure	PC-PS-12, A,B,C,&D	≤ 2 psig	2(4)	A or B
High Reactor Pressure	RR-PS-128 A & B	≤ 75 psig	1	D
Main Condenser Low Vacuum	MS-PS-103, A,B,C,&D	≥ 7" Hg (7)	2	A or B
Reactor Water Cleanup System High Flow	RWCU-dPIS-170 A & B	≤ 200% of System Flow	1	C

NOTES FOR TABLE 3.2.A (cont'd.)

Group 2

Isolation Signals:

1. Reactor Low Water Level (≥ 4.5 inches)
2. High Dry Well Pressure (≤ 2 psig)

Isolations:

1. RHR Shutdown Cooling System
2. Drywell floor and equipment drain sump discharge lines.
3. TIP ball valves
4. Group 6 isolation relays

Group 3

Isolation Signals:

1. Reactor Low Water Level (≥ 4.5 inches)
2. Reactor Water Cleanup System High Flow ($\leq 200\%$ of system flow)
3. Reactor Water Cleanup System High Area Temperature ($\leq 200^\circ\text{F}$)

Isolations:

1. Reactor Water Cleanup System

Group 4

Isolation Signals:

Provided by instruments on Table 3.2.B (HPCI)

Isolations:

Isolates the HPCI steam line

Group 5

Isolation Signals:

Provided by instruments on Table 3.2.B (RCIC)

Isolations:

Isolates the RCIC steam line.

Group 6

Isolation Signals:

1. Group 2 Isolation Signal
2. Reactor Building H&V Exhaust Plenum High Radiation (< 100 mr/hr)

COOPER NUCLEAR STATION
TABLE 3.2.B (Page 4)
HPCI SYSTEM CIRCUITRY REQUIREMENTS

Instrument	Instrument I.D. No.	Setting Limit	Minimum Number of Operable Components Per Trip System (1)	Action Required When Component Operability Is Not Assured
Reactor Low Low Water Level	NBI-LIS-72, A,B,C, & D #3	≥-37 in. Indicated Level	2	A
Reactor High Water Level	NBI-LIS-101, B & D #2	≤+58.5 in. Indicated Level	2(2)	A
High Drywell Press.	PG-PS-101 A,B,C, & D	≤2 psig	2(2)	A
HPCI Turbine High Exhaust Pressure	HPCI-PS-97, A & B	≤150 psig	1(2)	A
HPCI Pump Low Suction Press.	HPCI-PS-84-1	≤15" Hg Vacuum	1(2)	A
HPCI Pump Low Discharge Flow	HPCI-FS-78	≥400 gpm	1(2)	A
HPCI Low Steam Supply Pressure	HPCI-PS-68, A,B,C & D	≥100 psig	2(2)	A
HPCI Steam Line High ΔP	HPCI-dPIS-76 HPCI-dPIS-77	130 ≤S≤210" H ₂ O -130 ≥S≥-210" H ₂ O	1	A
HPCI Steam Line Space Hi Temp.	HPCI-TS-101, A,B,C & D -102, 103, 104, HPCI-TS-125,126,127,128 RHR-TS-150,151,152,153 154,155,156,157,158,159 160,161	≤200°F	2(4)	A
Emerg. Cond. Storage Tank Low Level	HPCI-LS-74 A & B HPCI-LS-75 A & B	≥0" H ₂ O (10,000 gal. usable remaining)	1(2)	A

Amendment No. 14, 121, 145

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COOPER NUCLEAR STATION
 TABLE 3.2.B (Page 7)
 AUTOMATIC DEPRESSURIZATION SYSTEM (ADS) CIRCUITRY REQUIREMENTS

Instrument	Instrument I.D. No.	Setting Limit	Minimum Number of Operable Components Per Trip System (1)	Action Required When Component Operability Is Not Assured
Reactor Low Water Level	NBI-LIS-83, A & B	≥ +4.5 in. Indicated Level	1	B
Reactor Low Low Low Water Level	NBI-LIS-72, A,B,C & D	≥ -145.5 in. Indicated Level	2	A
ADS Timer	MS-TDR-K5, A & B	≤ 120 sec.	1	B

Amendment No. 38, 83, 99, 141, 145

3.2 BASES

In addition to reactor protection instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operator's ability to control, or terminates operator errors before they result in serious consequences. This set of specifications provides the limiting conditions of operation for the primary system isolation function, initiation of the core cooling systems, control rod block and standby gas treatment systems. The objectives of the specifications are (1) to assure the effectiveness of the protective instrumentation when required even during periods when portions of such systems are out of service for maintenance, and (2) to prescribe the trip settings required to assure adequate performance. When necessary, one channel may be made inoperable for brief intervals to conduct required functional tests and calibrations.

Some of the settings on the instrumentation that initiate or control core and containment cooling have tolerances explicitly stated where the high and low values are both critical and may have a substantial effect on safety. The set points of other instrumentation, where only the high or low end of the setting has a direct bearing on safety, are chosen at a level away from the normal operating range to prevent inadvertent actuation of the safety system involved and exposure to abnormal situations.

A. Primary Containment Isolation Functions

Actuation of primary containment valves is initiated by protective instrumentation shown in Table 3.2.A which senses the conditions for which isolation is required. Such instrumentation must be available whenever primary containment integrity is required.

The instrumentation which initiates primary system isolation is connected in a dual bus arrangement.

The low water level instrumentation, set to trip at 168.5 inches (+4.5 inches) above the top of the active fuel, closes all isolation valves except those in Groups 1, 4, 5, and 7. Details of valve grouping and required closing times are given in Specification 3.7. For valves which isolate at this level this trip setting is adequate to prevent core uncover in the case of a break in the largest line assuming a 60 second valve closing time. Required closing times are less than this.

The low low low reactor water level instrumentation is set to trip when the water level is 19 inches (-145.5 inches) above the top of the active fuel. This trip closes Groups 1 and 7 Isolation Valves (Reference 1), activates the remainder of the CSCS subsystems, and starts the emergency diesel generators. These trip level settings were chosen to be high enough to prevent spurious actuation but low enough to initiate CSCS operation and primary system isolation so that post accident cooling can be accomplished,



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 145 TO FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated April 25, 1991 as supplemented by letter dated June 28, 1991, Nebraska Public Power District (the licensee) submitted a request for changes to the Cooper Nuclear Station, Technical Specifications (TS). The requested changes would reduce the low reactor water level scram setpoint (Level 3) from greater than or equal 12.5 inches above instrument zero to greater than or equal to 4.5 inches above instrument zero. The amendment also makes administrative changes involving editorial and typographical corrections. The June 28, 1991, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The reactor low water level instrumentation is used to initiate a reactor scram and Primary Containment Isolation System (PCIS) Groups 2, 3, and 6 isolations above the Level 3 setpoint. The existing setpoint of greater than or equal to 176.69 inches above top of active fuel has resulted in PCIS actuations as a result of the expected drop in water level following the manual scrams initiated during normal plant shutdowns. The PCIS isolations are undesirable because they require operator response and may interfere with the shutdown evolution. To avoid the PCIS isolations, the licensee increases actual reactor level prior to the manual scram and requested the proposed amendment to decrease the Level 3 setpoint from greater than or equal to 12.5 inches to greater than or equal to 4.5 inches above instrument zero. The decrease in Level 3 may also prevent inadvertent reactor scrams during events involving minor reactor level perturbations.

To support the proposed amendment, the licensee evaluated the impact of the setpoint reduction on the analysis of plant abnormal operational transients and design basis accidents. The delay in the scram actuation which results from the decreased setpoint was determined to have minor impact on the analyzed transients and accidents and in all cases the analytical results remained within acceptable limits. The proposed change was also evaluated with respect to the PCIS and was determined to not impact the ability of the isolations to perform their safety function.

The setpoint of 4.5 inches above instrument zero which was evaluated and provided in the proposed TS changes is an analytical limit justified by the

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analysis and evaluations performed by the licensee and GE. The actual trip point for the Level 3 instrumentation will be set above the analytical limit in accordance with licensee procedures for instrument setpoint control to allow sufficient margin for instrument accuracy and setpoint drift.

The editorial changes consist of minor abbreviation and USAR reference revisions to improve consistency and correction of a typographical error in Table 3.2.B associated with the HPCI Reactor Low Low Water Level Setting (addition of missing negative sign).

Based upon the review of the proposed TS changes and supporting analyses and evaluations, the staff has determined that the TS changes are acceptable.

3.0 STATE CONSULATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment. The State official had no comment.

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 and changes in surveillance requirements. 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 (FR citation). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 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: W. D. Reckley

Date: July 31, 1991