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. Westerman 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	INSERT PAGES
8	8
10	10
20	20
28	28
50	50
52a	52a
56	56
59	59
83	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,

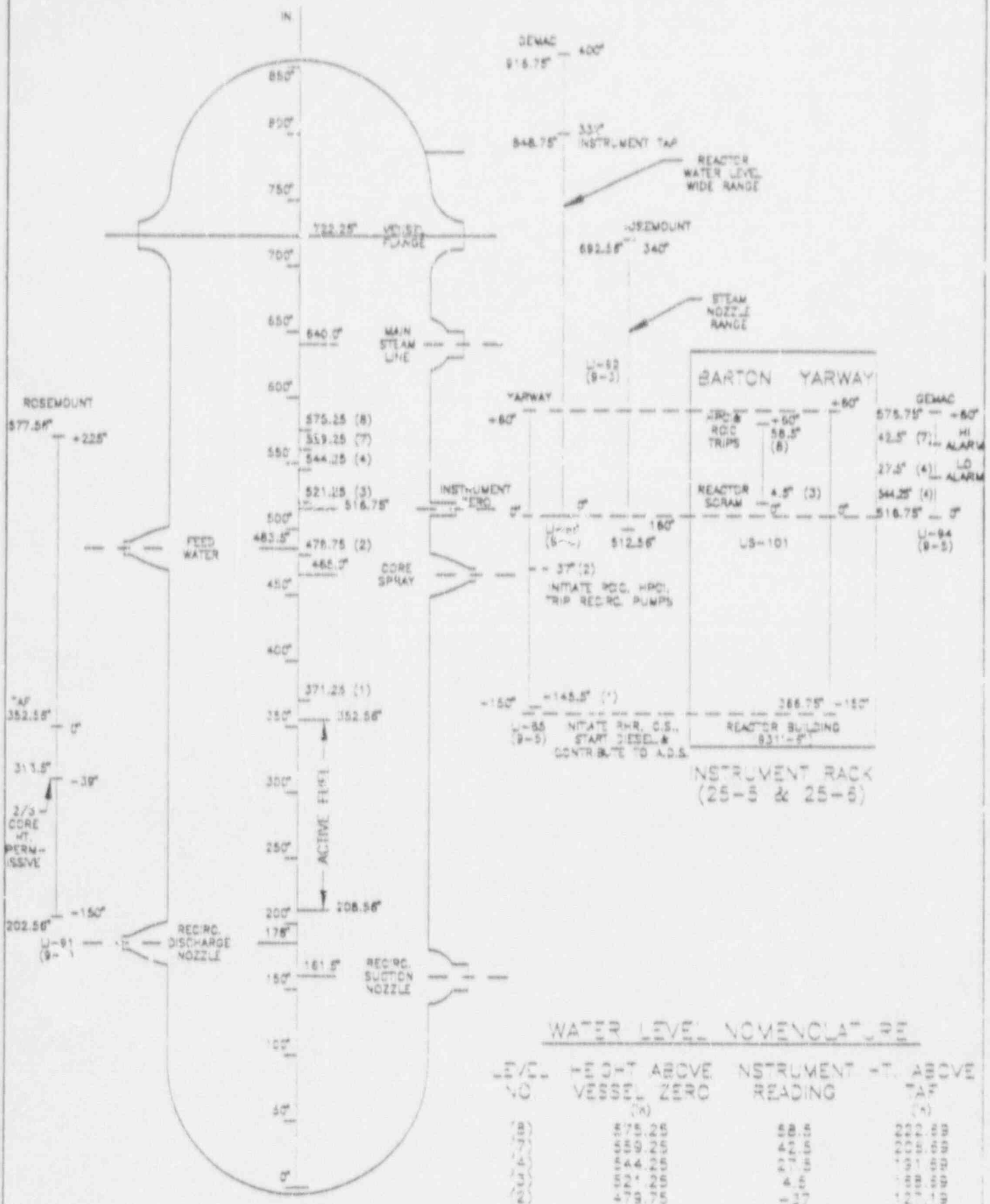
FRP = fraction of rated thermal power (2381 MWt)

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)

≥ +4.5 in. on vessel level instruments.



ELEVATION 917'-0"
VESSEL BOTTOM

INSTRUMENT RACK
(25-5 & 25-6)

WATER LEVEL NOMENCLATURE

LEVEL NO	HEIGHT ABOVE VESSEL ZERO (A)	INSTRUMENT READING	HT. ABOVE TAP (A)
(8)	575.25	58.5	232.69
(7)	559.25	42.5	216.69
(4)	544.25	27.5	191.69
(3)	521.25	4.5	168.69
(2)	478.75	-37	127.19
(1)	371.25	-145.5	19.69

FIGURE 2.1.1
REACTOR WATER LEVEL
INDICATION CORRELATION

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 would 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 Mode Switch Position: Shutdown	Startup	Refuel	Run	Trip Level Setting	Minimum Number of Operable Channels Per Trip Systems (1)	Action Required When Equipment Operability is Not Assured (1)
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)	≤ 120/125 of indicated scale	3	A
Inoperative		X	X	(5)		3	A
APRM (17) High Flux (Flow biased)				X	≤ (0.66W+54%-0.66ΔW) $\left[\frac{FRP}{MFLPD}\right]$ (14)(19)(20)	2	C
High Flux	X(7)	X(9)	X(9)	(16)	≤ 15% Rated Power	2	A
Inoperative		X(9)	X(9)	X	(13)	2	A
Downscale	(12)	(12)	(12)	X(11)	≥ 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 PC-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	≥ + 4.5 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	≤ 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 Compone. Operability i. 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 (≤200% of system flow)
3. Reactor Water Cleanup System High Area Temperature (≤ 200°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.	PC-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_2O -130 ≥S≥-210" H_2O	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_2O (10,000 gal. usable remaining)	1(2)	A

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-TIA-K5, A & B	≤ 120 sec.	1	B

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 uncovery 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.