

APRIL 11 1978

Docket No. 50-298

Nebraska Public Power District
ATTN: Mr. J. M. Pilant, Director
Licensing & Quality Assurance
P. O. Box 499
Columbus, Nebraska 68601

Gentlemen:

The Commission has issued the enclosed Amendment No. 43 to Facility License No. DPR-46 for the Cooper Nuclear Station. This amendment consists of changes to the Technical Specifications in response to your request dated July 18, 1977.

The amendment involves changes to the Technical Specifications dealing with Limiting Conditions of Operation and Surveillance Requirements for undervoltage protection relays and associated equipment.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Original signed by
George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:

1. Amendment No. 43 to DPR-46
2. Safety Evaluation
3. Notice

cc w/enclosures:
See page 2

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DATE	3/29/78	3/29/78	4/7/78	4/11/78	4/3/78



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

April 11, 1978

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ATTN: Mr. J. M. Pilant, Director
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P. O. Box 499
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The amendment involves changes to the Technical Specifications dealing with Limiting Conditions of Operation and Surveillance Requirements for undervoltage protection relays and associated equipment.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

A handwritten signature in black ink that reads "George Lear".

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:

1. Amendment No. 43 to DPR-46
2. Safety Evaluation
3. Notice

cc w/enclosures:
See page 2

Nebraska Public Power District

- 2 -

cc w/enclosures:

Mr. G. D. Watson, General Counsel
Nebraska Public Power District
P. O. Box 499
Columbus, Nebraska 68601

Mr. Arthur C. Gehr, Attorney
Snell & Wilmer
3100 Valley Center
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Cooper Nuclear Station
ATTN: Mr. L. Lessor
Station Superintendent
P. O. Box 98
Brownville, Nebraska 68321

Auburn Public Library
118 - 15th Street
Auburn, Nebraska 68305

Director
Nebraska Dept. of Environmental Control
P. O. Box 94877, State House Station
Lincoln, Nebraska 68509

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

Chief, Energy Systems Analyses
Branch (AW-459)
Office of Radiation Programs
U. S. Environmental Protection Agency
Room 645, East Tower
401 M Street, S. W.
Washington, D. C. 20460

U. S. Environmental Protection Agency
Region VII
ATTN: EIS COORDINATOR
1735 Baltimore Avenue
Kansas City, Missouri 64108



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. 43
License No. DPR-46

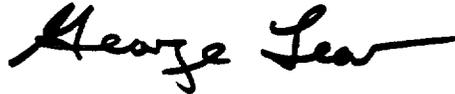
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Nebraska Public Power District (the licensee) dated July 18, 1977, as amended by letter dated December 19, 1977, complies with the standards and requirements of the Atomic Energy Act of 1954, 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 License No. DPR-46 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 43, 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 the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink that reads "George Lear". The signature is written in a cursive style with a long horizontal stroke at the end.

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 11, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 43

FACILITY OPERATING LICENSE NO. DPR-46

DOCKET NO. 50-298

Revise Appendix A as follows:

Remove the following pages and replace with identically numbered revised pages.

55
71
193
194
198
200

Marginal lines indicate revised area.

COOPER NUCLEAR STATION
TABLE 3.2.B (PAGE 3)
RESIDUAL HEAT REMOVAL SYSTEM (LPCI MODE) 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
RHR Pump Low Flow	RHR-dPIS-125 A & B	≥ 2500 gpm	1	A
Time Delays	RHR-TDR-K45, 1A&1B	$4.25 < T < 5.75$ min.	1	A
RHR Pump Start	RHR-TDR-K75A & K70B	$4.5 < T < 5.5$ sec.	1	A
Time Delay	RHR-TDR-K75B & K70A	$< .5$ sec.	1	A
RHR Heat Exchanger Bypass T.D.	RHR-TDR-K93, A & B	$1.8 < T < 2.2$ min.	1	B
RHR Crosstie Valve Position	RHR-LMS-2	Valve not closed	(3)	E
Bus 1A Low Volt. Aux. Relay	27 X 3/1A	Loss of Voltage	1	B
Bus 1B Low Volt. Aux. Relay	27 X 3/1B	Loss of Voltage	1	B
Bus 1F Low Volt. Aux. Relays	27 X 1/1F 27 X 2/1F	Loss of Voltage Loss of Voltage	1 1	B B
Bus 1G Low Volt. Aux. Relays	27 X 1/1G 27 X 2/1G	Loss of Voltage Loss of Voltage	1	B
Pump Discharge Line	CM-PS-266	≥ 5 psig	(3)	D
Emergency Buses Undervoltage Relays (degraded voltage)	27/1F-2, 27/1FA-2 27/1G-2, 27/1GB-2 27/ET-2	3600V $\pm 5\%$ 8 second ± 2 sec. time delay	2 2 1	B B B
Emergency Buses Loss of Voltage Relays	27/1F-1, 27/1FA-1, 27/1G-1, 27/1GB-1, 27/ET-1	2900V $\pm 5\%$ 5 second ± 1 sec. delay	1	B
Emergency Buses Undervoltage Relays Timers	27X7/1F, 27X7/1G, 27X10/1G	10 second ± 2 sec.	1	B

Amendment No. 43

COOPER NUCLEAR STATION
TABLE 4.2.B (Page 2)
RHR SYSTEM TEST & CALIBRATION FREQUENCIES

Item	Item I.D. No.	Functional Test Freq.	Calibration Freq.	Instrument Check
<u>Instrumentation</u>				
1. Drywell High Pressure	PC-PS-101, A,B,C & D	Once/Month (1)	Once/3 Months	None
2. Reactor Vessel Shroud Level	NBI-LITS-73, A & B #1	Once/Month (1)	Once/3 Months	Once/Day
3. Reactor Low Pressure	RR-PS-128 A & B	Once/Month (1)	Once/3 Months	None
4. Reactor Low Pressure	NBI-PS-52 A & C NBI-PIS-52 B & D	Once/Month (1)	Once/3 Months	None
5. Drywell Press.-Containment Spray	PC-PS-119, A,B,C & D	Once/Month (1)	Once/3 Months	None
6. RHR Pump Discharge Press.	RHR-PS-120, A,B,C & D	Once/Month (1)	Once/3 Months	None
7. RHR Pump Discharge Press.	RHR-PS-105, A,B,C & D	Once/Month (1)	Once/3 Months	None
8. RHR Pump Low Flow Switch	RHR-dPIS-125 A & B	Once/Month (1)	Once/3 Months	None
9. RHR Pump Start Time Delay	RHR-TDR-K70, A & B	Once/Month (1)	Once/Oper. Cycle	None
10. RHR Pump Start Time Delay	RHR-TDR-K75, A & B	Once/Month (1)	Once/Oper. Cycle	None
11. RHR Heat Exchanger Bypass T.D.	RHR-TDR-K93, A & B	Once/Month (1)	Once/Oper. Cycle	None
12. RHR Cross Tie Valve Position	RHR-LMS-2	Once/Month (1)	N.A.	
13. Low Voltage Relays	27 X 3/1A	(7)		None
14. Low Voltage Relays	27 X 3/1B	(7)		None
15. Low Voltage Relays	27 X 2/1F, 27 X 2/1G	(7)		None
16. Low Voltage Relays	27 X 1/1F, 27 X (1)/1G	(7)		None
17. Pump Disch. Line Press. Low	CM-PS-266	Once/3 Months	Once/3 Months	None
18. Emergency Buses Undervoltage Relays (Degraded Voltage)	27/1F-2, 27/1FA-2, 27/1G-2, 27/1GB-2, 27/ET-2	Once/Month	Once/18 Months	Once/12 hrs.
19. Emergency Buses Loss of Voltage Relays	27/1F-1, 17/1FA-1, 27/1G-1, 27/1GB-1, 17/ET-1	Once/Month	Once/18 Months	Once/12 hrs.
20. Emergency Buses Undervoltage Relays Timers	27X7/1F, 27X7/1G, 27X10/1G	Once/Month	Once/18 Months	None

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9 AUXILIARY ELECTRICAL SYSTEM

Applicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification:

A. Auxiliary Electrical Equipment

The reactor shall not be made critical from a Cold Shutdown Condition unless all of the following conditions are satisfied:

1. Both off-site sources (345 KV and 69 KV) and the startup transformer and emergency transformer are available and capable of automatically supplying power to the 4160 Volt emergency buses 1F and 1G.
2. Both diesel generators shall be operable and there shall be a minimum of 45,000 gal. of diesel fuel in the fuel oil storage tanks.
3. The 4160V critical buses 1F and 1G and the 480V critical buses 1F and 1G are energized.
 - a. The loss of voltage relays and their auxiliary relays are operable.
 - b. The undervoltage relays and their auxiliary relays are operable.
4. The four unit 125V/250V batteries and their chargers shall be operable.

4.9 AUXILIARY ELECTRICAL SYSTEM

Applicability:

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:

A. Auxiliary Electrical Equipment

1. Emergency Buses Undervoltage Relays

a. Loss of voltage relays

Once every 18 months, loss of voltage on emergency buses is simulated to demonstrate the load shedding from emergency buses and the automatic start of diesel generators.

b. Undervoltage relays

Once every 18 months, low voltage on emergency buses is simulated to demonstrate disconnection of the emergency buses from the offsite power source. The undervoltage relays shall be calibrated once every 18 months.

2. Diesel Generators

- a. Each diesel-generator shall be started manually and loaded to not less than 35% of rated load for no less than 2 hours once each month to demonstrate operational readiness.

3.9.A

4.9.A (cont'd.)

During the monthly generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps and fuel oil day tank level switches shall be demonstrated, and the diesel starting time to reach rated voltage and frequency shall be logged.

- b. Once every 18 months the condition under which the diesel generator is required will be simulated and a test conducted to demonstrate that it will start and accept the emergency load within the specified time sequence. The results shall be logged.
 - c. Once every 18 months, it will be demonstrated that there is no undesirable interaction between the onsite power source (diesel generators) and the off-site power source (startup transformer) by simulating interruption and subsequent reconnection of onsite power sources to their respective buses.
 - d. Once a month the quantity of diesel fuel available shall be logged.
 - e. Every three months and upon delivery a sample of diesel fuel shall be checked for quality. The quality shall be within the acceptable limits specified in Table 1 of ASTM D975-68 for Nos. 1D or 2D and logged.
 - f. Each diesel generator shall be given an annual inspection in accordance with instructions based on the manufacturer's recommendations.
3. Unit Batteries
- a. Every week the specific gravity, the voltage and temperature of the pilot

3.9 BASES

The general objective of this Specification is to assure an adequate source of electrical power to operate the auxiliaries during plant operation, to operate facilities to cool and lubricate the plant during shutdown and to operate the engineered safeguards following the accident. There are three sources of ac electrical energy available; namely, the startup transformer, the emergency transformer and two diesel generators. The dc supply is required for switch gear and engineered safety feature systems. This supply consists of two 125V DC and two 250V DC batteries and their related chargers. Specification 3.9.A states the required availability of ac and dc power; i.e., active off-site ac sources and the required amount of on-site ac and dc sources.

Auxiliary power for CNS is supplied from the startup transformer and the normal transformer. Both of these transformers are sized to carry 100% of the station auxiliary load. The emergency transformer is about one third the size of these two transformers and is equal in size to both emergency diesel generators.

The startup transformer and the emergency transformers are the offsite power sources. Their voltage is monitored by undervoltage relays which provide low voltage protection for the emergency buses. Whenever the voltage setpoint and time delay limit for the undervoltage relays have been exceeded, the emergency buses are automatically disconnected from the offsite power source.

If the startup or emergency transformer is lost, the unit can continue to operate since the unit auxiliary transformer is in service, and the emergency or startup transformer and the diesels are available.

If both the startup and emergency transformers become inoperable, the power level must be reduced to a value where by the unit can safely reject the load and continue to supply auxiliary electric power to the station.

In the normal mode of operation, the startup and emergency transformers are energized and two diesel generators are operable. One diesel generator may be allowed out of service based on the availability of power from the startup transformer and the fact that one diesel generator carries sufficient engineered safeguards equipment to cover all breakers. With the startup transformer and one diesel generator out of service, the off site transmission line corresponding to the emergency transformer must be available. Upon the loss of one on-site and one off-site power source, power would be available from the other immediate off-site power source and the two operable on-site diesels to carry sufficient engineered safeguards equipment to cover all breaks. In addition to these two power sources, removal of the Isolated Phase Bus "quick" disconnect links would allow backfeed of power through the main transformer to the unit auxiliary transformer and provide power to carry the full station auxiliary load. The time required to perform this operation is comparable to the time the reactor could remain on RCIC operation before controlled depressurization need be initiated.

A battery charger is supplied with each of the 125/250 Volt batteries. The 125 Volt battery system shall have a minimum of 105 Volts at the battery terminals to be considered operable. The 250 Volt portion of the 125/250 Volt battery system shall have a minimum of 210 Volts at the battery terminals to be considered operable.

4.9 BASES (cont'd.)

fuel could contribute to excessive damage to the diesel engine.

When it is determined that some auxiliary electrical equipment is out of service, the increased surveillance required in Section 4.5.F is deemed adequate to provide assurance that the remaining equipment will be operable.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

Introduction

By letter dated July 18, 1977, the Nebraska Public Power District (NPPD or licensee) proposed certain design modifications and changes to the Technical Specifications for the Cooper Nuclear Station. These modifications and changes were in response to a request from the NRC staff dated June 3, 1977, which addressed the susceptibility of the onsite emergency power systems and their associated redundant safety-related electrical equipment to sustained degraded grid voltage conditions at the offsite power source, and interaction between the offsite and onsite emergency power systems.

The proposed design modifications and Technical Specification changes are:

- (1) The installation of a second level undervoltage relay with a higher undervoltage setpoint (3600v) and a time delay (8 seconds) to detect sustained degradation of voltage on the safety related 4160 volt buses;
- (2) A design change to prevent load shedding from the emergency buses once the onsite power source is supplying power to the emergency buses;
- (3) Limiting Conditions of Operation and Surveillance Requirements for the undervoltage protection relays and associated equipment.

Evaluation

For each of the two 4160 volt safety-related buses, the licensee proposes to install a second level of protection from a sustained degradation of grid voltage which exceeds the design value for the equipment. The second level of undervoltage protection consists of an undervoltage relay and a timer. This undervoltage monitor will have a trip setpoint at about 3600 volts coupled with an eight-second time delay. This will be configured in a two-out-of-four coincidence logic per bus.

The licensee also proposes to automatically prevent the load shedding of the emergency buses once the onsite sources (diesel generators) are supplying power to all sequenced loads on the emergency buses. The load shedding feature will be automatically reinstated when the onsite power source supply breakers are tripped.

The design modifications associated with the second level of undervoltage protection satisfy the following criteria:

- (1) The undervoltage setpoint and the allowable time duration for a degraded voltage condition shall not result in failure of safety related systems and/or equipment;
- (2) The time delay shall minimize the effect of short duration disturbances which could reduce the availability of power to the safety related systems and equipment;
- (3) The time delay shall not exceed the maximum time delay considered in the FSAR accident analyses;
- (4) The undervoltage protection shall include coincidence logic to preclude spurious tripping of the offsite or onsite power source;
- (5) The time delay shall override voltage dips on emergency buses due to the sequenced pick-up of load by a diesel generator;
- (6) The voltage sensors shall be designed to satisfy the applicable requirements of IEEE Std 279-1971.

In addition to the existing first level undervoltage protection which has a setpoint at a value of about 2900 volts for the loss-of-offsite power, the proposed change will provide a means for monitoring an unacceptable sustained degradation of the offsite power voltage that could adversely affect safety related equipment. Moreover, the design change will not reduce the availability of the offsite power system below an acceptable level and will increase the capability of the onsite power system to provide power to safety related equipment.

The proposed design modifications to prohibit load shedding, whenever the onsite power sources (diesel generators) have been started and have energized their respective 4160 volt emergency buses, meet the requirements of: (1) General Design Criterion 17, "Electrical Power System," and (2) IEEE Std 308-1974, "Class IE Power Systems for Nuclear Power Generating Stations." General Design Criterion 17 states that "provisions to minimize the probability of losing electrical power from any of the remaining supplies as a result of or coincident with the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or loss of power from the onsite electric power supplies." Following the loss of the preferred offsite power

supply, IEEE Std 308-1974 requires availability of the standby power supply within a time consistent with the requirements of the engineered safety features and the shutdown systems under both normal and accident conditions.

The proposed design modifications will be implemented by the licensee in accordance with the requirements of IDDD Std. 279-1971, "Criteria for Protection System for Nuclear Power Generating Stations"; IEEE Std. 308-1974, "Class IE Power Systems for Nuclear Power Generating Stations"; and 10 CFR Part 50, Appendix A, General Design Criteria 17, "Electric Power Systems."

The proposed Technical Specifications include Limiting Conditions for Operation specifying setpoint settings and operability requirements for the undervoltage protection sensors and associated time delay devices.

The proposed changes to the Surveillance Requirements satisfy the staff's requirements with respect to tests, which require: (1) simulating the loss of offsite power; (2) simulating the loss of offsite power in conjunction with an engineered safety feature actuation signal; and (3) simulating interruption and subsequent reconnection of the onsite power source to their respective buses.

Based on our evaluation of the information provided by the licensee, we conclude that the proposed design modifications are in conformance with the Commission's requirements with regard to: (1) sustained degraded grid voltage condition; and (2) interaction between the offsite and onsite emergency power systems, and are therefore acceptable.

We find that the proposed changes to the 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 impact statement or negative declaration and 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 amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does 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.

Dated: April 11, 1978

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-298NEBRASKA PUBLIC POWER DISTRICTNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 43 to Facility Operating License No. DPR-46, issued to the Nebraska Public Power District (the Licensee), which revised the Technical Specifications for operation of the Cooper Nuclear Station (the facility) located in Nemaha County, Nebraska. The amendment is effective as of the date of issuance.

The amendment involves changes to the Technical Specifications dealing with Limiting Conditions of Operation and Surveillance Requirements for undervoltage protection relays and associated equipment.

The application for the amendment complies 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 impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated July 18, 1977, (2) Amendment No. 43 to License No. DPR-46, and (3) the Commission's related 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 single copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland this 11th day of April 1978.

FOR THE NUCLEAR REGULATORY COMMISSION



George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors