

November 24, 1986

Docket No. 50-298

Mr. J. M. Pilant, Technical  
Staff Manager  
Nuclear Power Group  
Nebraska Public Power District  
Post Office Box 499  
Columbus, Nebraska 68601

Dear Mr. Pilant:

The Commission has issued the enclosed Amendment No. 104 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 April 26, 1985 as modified by your letter dated July 3, 1986.

The amendment changes the Technical Specifications applicable to station battery surveillance.

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,

Original Signed by  
William O. Long

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

Enclosures:

1. Amendment No. 104 to License No. DPR-46
2. Safety Evaluation

cc w/enclosures:  
See next page

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Mr. J. M. Pilant  
Nebraska Public Power District

Cooper Nuclear Station

cc:  
Mr. G. D. Watson, General Counsel  
Nebraska Public Power District  
Post Office Box 4999  
Columbus, Nebraska 68601

Mr. Arthur C. Gehr, Attorney  
Snell & Wilmer  
3100 Valley Center  
Phoenix, Arizona 85073

Cooper Nuclear Station  
ATTN: Mr. G. Horn, Division  
Manager of Nuclear Operations  
Post Office Box 98  
Brownville, Nebraska 68321

Director  
Nebraska Department of Environmental  
Control  
Post Office Box 94877  
State House Station  
Lincoln, Nebraska 68509

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

Resident Inspector  
U.S. Nuclear Regulatory Commission  
Post Office Box 218  
Brownville, Nebraska 68321

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

H. Ellis Simmons, Director  
Division of Radiological Health  
Department of Health  
301 Centennial Mall, South  
Post Office Box 95007  
Lincoln, Nebraska 68509



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. 104  
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 26, 1985 as modified by letter dated July 3, 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:

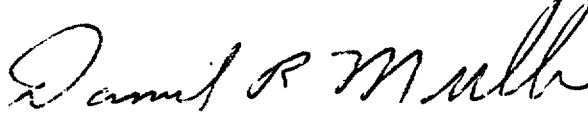
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(2) Technical Specification

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 104, 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

A handwritten signature in dark ink, appearing to read "Daniel R. Muller", is written over the typed name.

Daniel R. Muller, Director  
BWR Project Directorate #2  
Division of BWR Licensing

Attachment: Changes to the Technical  
Specifications

Date of Issuance: November 24, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 104

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

194  
195  
196  
197  
198  
199  
200  
201/202

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
<p>3.9.A</p>	<p>4.9.A.2 (cont'd)</p> <p>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.</p> <p>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.</p> <p>c. Specification 4.9.A.2.c deleted.</p> <p>d. Once a month the quantity of diesel fuel available shall be logged.</p> <p>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.</p> <p>f. Each diesel generator shall be given an annual inspection in accordance with instructions based on the manufacturer's recommendations.</p> <p>3. 125 VDC Unit Batteries</p> <p>a. Every week, the following parameters shall be verified. The actual values shall be measured and logged:</p> <ol style="list-style-type: none"> <li>1. The total battery terminal voltage on float charge is equal to or greater than 125 volts,</li> <li>2. The electrolyte level of each pilot cell is between the minimum and maximum level indication marks,</li> </ol>

## LIMITING CONDITIONS FOR OPERATION

### 3.9.A

#### B. Operation with Inoperable Equipment

1. Whenever the reactor is in Run Mode or Startup Mode with the reactor not in a Cold Condition, the availability of electric power shall be as specified in 3.9.A.1, except as specified in 3.9.B.1.

#### a. Incoming Power

1. From and after the date incoming power is not available from a startup or emergency transformer, continued reactor operation is permissible under this condition for seven days. At the end of this period, provided the second source of incoming power has not been made immediately available, the NRC must be notified of the event and the plan to restore this second source. During this period, the two diesel generators and associated critical buses must be demonstrated to be operable.
2. From and after the date that incoming power is not available from both startup and emergency transformers (i.e., both failed), continued operation is permissible, provided the two diesel generators and associated critical buses are demonstrated to be

## SURVEILLANCE REQUIREMENTS

### 4.9.A (cont'd.)

3. The pilot cell voltage is 2.0V minimum and specific gravity 1190 minimum, corrected for 77°F and electrolyte level.
- b. Every quarter, the following parameters shall be verified. The actual values shall be measured and logged:
  1. The electrolyte level of each connected cell is between the minimum and maximum level indication marks.
  2. For each connected cell, the voltage is 2.0V minimum and specific gravity is 1190 minimum, corrected for 77°F and electrolyte level,
  3. The electrolyte temperatures in a representative sample of cells, consisting of at least every sixth cell, are within  $\pm 5^\circ\text{F}$ .
- c. Once each operating cycle the 125V battery charger will be tested to verify that the charger can supply 150 Amperes at 125V for four hours.
- d. Once each operating cycle, the battery capacity shall be verified to be at least 85% of the manufacturer's rating when subjected to a performance discharge test.

## 3.9.B (cont'd.)

operable, all core and containment cooling systems are operable, reactor power level is reduced to 25% of the rated and NRC is notified within 24 hours of the situation, the precautions to be taken during this period and the plans for prompt restoration of incoming power.

b. Diesel Generators

1. From and after the date that one of the diesel generators or an associated critical bus is made or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specification 3.5.F.1 if Specification 3.9.A.1 is satisfied.
2. From and after the date that both diesel generators are made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 24 hours in accordance with Specification 3.5.F.2 if Specification 3.9.A.1 is satisfied.
3. From and after the date that one of the diesel generators or associated critical buses and either the emergency or startup transformer power source are made or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specification 3.5.F.1, provided the other off-site source, startup transformer or emergency transformer is available and capable of automatically supplying power to the 4160V critical buses and the NRC is notified within 24 hours of the occurrence and the plans for restoration of the inoperable components.

## 4.9.A.4 250 VDC Unit Batteries

- a. Every week, the following parameters shall be verified. The actual values shall be measured and logged:
  1. The total battery terminal voltage on float charge shall be equal to or greater than 250 volts,
  2. The electrolyte level of each pilot cell is between the minimum and maximum level indication marks,
  3. The pilot cell voltage is 2.0V minimum and specific gravity 1190 minimum, corrected to 77°F and electrolyte level,
- b. Every quarter, the following parameters shall be verified. The actual values shall be measured and logged:
  1. The electrolyte level of each connected cell is between the minimum and maximum level indication marks.
  2. For each connected cell, the voltage is 2.0V minimum and specific gravity is 1190 minimum, corrected for 77°F and electrolyte level,
  3. The electrolyte temperatures in a representative sample of cells, consisting of at least every sixth cell, are within  $\pm 5^\circ\text{F}$ .
- c. Once each operating cycle, the 250V battery charger will be tested to verify that the charger can supply 200 amperes at 250 volts for four hours.



## LIMITING CONDITIONS FOR OPERATION

### 3.9.B.5 (cont'd.)

#### c. DC Power

1. From and after the date that one of the 125 or 250 volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding ten days within electrical safety considerations, provided repair work is initiated in the most expeditious manner to return the failed component to an operable state, and Specifications 3.5.A.5 and 3.5.F are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed components to an operable state.

#### d. RPS/MG Sets

1. With one RPS electric power monitoring channel for an inservice RPS MG set or alternate power supply inoperable, restore the inoperable channel to operable status within 72 hours or remove the associated RPS MG set or alternate power supply from service.
2. With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one to operable status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

## SURVEILLANCE REQUIREMENTS

### 4.9.A.4 (cont'd)

- d. Once each operating cycle, the battery capacity shall be verified to be at least 85% of the manufacturer's rating when subjected to a performance discharge test.

#### 5. Power Monitoring System for RPS System

The above specified RPS power monitoring system instrumentation shall be determined operable:

- a. At least once per operating cycle by demonstrating the operability of over-voltage, under-voltage and under-frequency protective instrumentation by performance of a channel calibration including simulated automatic actuation of the protective relays, tripping logic and output circuit breakers and verifying the following set-points.
  1. Over-voltage  $\leq 132$  VAC, with time delay  $\leq 2$  sec.
  2. Under-voltage  $\geq 108$  VAC, with time delay  $\leq 2$  sec.
  3. Under-frequency  $\geq 57$  Hz. with time delay  $\leq 2$  sec.

### 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 battery system shall have a minimum of 212 Volts at the battery terminals to be considered operable. These values are based on a minimum of 1.75 Volts per cell (each 250 Volt battery has 121 cells and each 125 Volt battery has 60 cells).

### 3.9 BASES (cont'd)

Replacement criteria for 125V and 250V station batteries is  $\leq 85\%$  capacity factor and the maximum time for replacement should be one (1) year. This will assure that the remaining battery capacity is adequate to meet load requirements.

### 4.9 BASES

The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 50% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for at least two hours. Diesel generator experience at other generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required.

Each diesel generator has two air compressors and two air receivers for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel generator, each receiver in each set of receivers will be drawn down below the point at which the corresponding compressor automatically starts to check operation and the ability of the compressors to recharge the receivers.

The diesel generator fuel consumption rate at full load is approximately 275 gallons per hour. Thus, the monthly load test of the diesel generators will test the operation and the ability of the fuel oil transfer pumps to refill the day tank and will check the operation of these pumps from the emergency source.

The test of the diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e., it will check diesel generator starting and closure of diesel generator breaker and sequencing of load on the diesel generator. The diesel generator will be started by simulation of a loss-of-coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power.

Periodic tests between refueling outages verify the ability of the diesel generator to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components, plus a functional test once-a-cycle, is sufficient to maintain adequate reliability.

Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure. In addition, the checks described also provide adequate indication that the batteries have the specified ampere-hour capability.

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine.

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#### 4.9 BASES (cont'd)

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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.

The Reactor Protection System (RPS) is equipped with a seismically qualified, Class 1E power monitoring system. This system consists of eight Electrical Protection Assemblies (EPA) which isolate the power sources from the RPS if the input voltage and frequency are not within limits specified for safe system operation. Isolation of RPS power causes that RPS division to fail safe.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 104 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 26, 1985, as modified July 3, 1986, Nebraska Public Power District (NPPD) submitted a request for amendment of the Technical Specifications, Appendix A to Operating License DPR-46, for the Cooper Nuclear Station. The proposed amendment would revise the 125/250 volt DC station battery surveillance requirements.

2.0 DISCUSSION

During inspection (84-26) the NRC observed that NPPD had apparently failed to demonstrate the operability of the Cooper Nuclear Station 125/250 volt DC station batteries.

NPPD proposed the revisions, to the Cooper Nuclear Station Technical Specifications, contained in their July 3, 1986 letter, in order to: 1) improve the demonstration of the unit battery system operability, 2) incorporate appropriate guidance from applicable industry standards, regulatory guides, standard technical specifications and the battery manufacturer's recommendations.

NPPD has proposed changes to the Cooper Nuclear Station Technical Specifications for both the 125 volt DC batteries and the 250 volt DC batteries to provide for:

1. Weekly measuring and recording of the absolute value for the total battery terminal voltage on float charge.
2. Weekly measuring and recording of the electrolyte level for each pilot cell.
3. Weekly measuring and recording of the voltage and specific gravity for each pilot cell corrected for temperature and electrolyte level.

4. Quarterly measuring and recording of the electrolyte level for each connected cell.
5. Quarterly measuring and recording of the voltage and specific gravity for each connected cell corrected for temperature and electrolyte level.
6. Quarterly measuring and recording of the electrolyte temperature of a representative sample of cells.
7. Once per operating cycle testing of the battery charger.
8. Once per operating cycle performance discharge testing of battery capacity.

The staff has found that the above proposed changes are consistent with the guidelines contained in IEEE Standard 450, "Recommended Practice for Installation Design and Installation of Large Storage Batteries for Generating Stations," as augmented by Regulatory Guide 1.129, Rev. 1, "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants."

Based on the above, the staff has concluded that the proposed changes to the Cooper Nuclear Station Technical Specifications for 125/250 volt DC station battery surveillance are consistent with the SRP Section 8.3.2 acceptance criteria and, therefore, the proposed changes are 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

- 3 -

inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: B. Marcus

Date: November 24, 1986