July 16, 1993

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. 165 TO FACILITY OPERATING LICENSE NO. DPR-46 (TAC NO. M85022)

The Commission has issued the enclosed Amendment No. 165 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station (CNS). The amendment consists of revisions to the Technical Specifications (TS) in response to your application dated September 2, 1992, as supplemented by your letter dated June 23, 1993.

The amendment revises the technical specifications (TS) for the Cooper Nuclear Station (CNS) to (1) increase the minimum amount of diesel fuel oil capacity required to be available in the on-site diesel fuel oil storage tanks, (2) update the standard to which the fuel oil quality is tested to a more recent edition of the same standard, and (3) add additional testing requirements for particulates and water in the fuel.

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:
Harry Rood, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 165 to License No. DPR-46
2. Safety Evaluation

cc w/enclosures:
See next page
*See previous concurrence

DISTRIBUTION:
Docket File
H. Rood(2)
J. Gagliardo, RIV
G. Hill(2)
OPA(MS2G5)
C. Grimes(MS11E22)
NRC/Local PDR
P. Noonan
T. Chan
ACRS(10)(MSP315)
D. Hagan(MS3206)
OC/LFMB(MS4503)
Wanda Jones(MS7103)
PD4-1 Reading
PD4-1 Plant File
J. Roe
OGC(MS15B18)
E. Collins, RIV
R. Kopriva, RIV
E. Adensam

OFC	LA:PD4-1	PM:PD4-1	BC:SPLB	BC:OTSB	OGC	D(A):PD4-1
NAME	PNoonan	HRood HR	CMcCracken*	CGrimes	CBarth*	TChan HR for TC
DATE	7/14/93	7/1/93	03/22/93	7/9/93	04/01/93	7/16/93

OFFICIAL RECORD COPY Document Name: C0085022.AMD

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 16, 1993

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. 165 TO FACILITY OPERATING LICENSE NO. DPR-46 (TAC NO. M85022)

The Commission has issued the enclosed Amendment No. 165 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station (CNS). The amendment consists of revisions to the Technical Specifications (TS) in response to your application dated September 2, 1992, as supplemented by your letter dated June 23, 1993.

The amendment revises the technical specifications (TS) for the Cooper Nuclear Station (CNS) to (1) increase the minimum amount of diesel fuel oil capacity required to be available in the on-site diesel fuel oil storage tanks, (2) update the standard to which the fuel oil quality is tested to a more recent edition of the same standard, and (3) add additional testing requirements for particulates and water in the fuel.

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,

Harry Rood

Harry Rood, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 165 to License No. DPR-46
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. Guy R. Horn
Nuclear Power Group Manager

cc:

Mr. G. D. Watson, General Counsel
Nebraska Public Power District
P. O. Box 499
Columbus, Nebraska 68602-0499

Cooper Nuclear Station
ATTN: Mr. John M. Meacham
Site Manager
P. O. Box 98
Brownville, Nebraska 68321

Randolph Wood, Director
Nebraska Department of Environmental
Control
P. O. Box 98922
Lincoln, Nebraska 68509-8922

Mr. Richard Moody, Chairman
Nemaha County Board of Commissioners
Nemaha County Courthouse
1824 N Street
Auburn, Nebraska 68305

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 218
Brownville, Nebraska 68321

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

Mr. Harold Borchert, Director
Division of Radiological Health
Nebraska Department of Health
301 Centennial Mall, South
P. O. Box 95007
Lincoln, Nebraska 68509-5007

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 165
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 September 2, 1992, as supplemented by letter dated June 23, 1993, 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. 165 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective 30 days after its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

H. Rood for

Terence L. Chan, Acting Director
Project Directorate IV-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the
Technical Specifications

Date of Issuance: July 16, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 165

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
191	191
193	193
194	194
195	195
196	196
197	197
198	198
199	199
200	200
-201, 202-	201 and 202

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.9 AUXILIARY ELECTRICAL SYSTEM	4.9 AUXILIARY ELECTRICAL SYSTEM
Applicability:	Applicability:
Applies to the auxiliary electrical power system.	Applies to the periodic testing requirements of the auxiliary electrical systems.
Objective:	Objective:
To assure an adequate supply of electrical power for operation of those systems required for safety.	Verify the operability of the auxiliary electrical system.
Specification:	Specification:
A. Auxiliary Electrical Equipment	A. Auxiliary Electrical Equipment
1. The reactor shall not be made critical from a Cold Shutdown Condition unless all of the following conditions are satisfied:	1. Emergency Buses Undervoltage Relays
a. 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.	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. Both diesel generators shall be operable and there shall be a minimum of 48,000 gal. of diesel fuel in the fuel oil storage tanks.	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.
c. The 4160V critical buses 1F and 1G and the 480V critical buses 1F and 1G are energized.	
1. The loss of voltage relays and their auxiliary relays are operable.	
2. The undervoltage relays and their auxiliary relays are operable.	
d. The four unit 125V/250V batteries and their chargers shall be operable.	
e. The power monitoring system for the inservice RPS MG set or alternate source shall be operable.	

3.9.B (cont'd.)

2. Diesel Generators

a. 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.

b. 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.

c. 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.

d. From and after the date that the diesel fuel oil particulate concentration level defined in Surveillance Requirement 4.9.A.2.d cannot be met, restore the diesel fuel oil total particulate concentration to within the acceptable limits within 7 days, or declare the associated Diesel Generator inoperable.

e. From and after the date that the new diesel fuel oil properties defined in Surveillance Requirement 4.9.A.2.e.2 cannot be met, restore the stored diesel fuel oil properties to within acceptable limits within 30 days, or declare the associated Diesel Generator inoperable.

4.9.A (cont'd.)

2. Diesel Generators

a. Each diesel-generator shall be started manually and loaded to not less than 50% of rated load for no less than 2 hours once each month to demonstrate operational readiness.

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 a month the quantity of diesel fuel available shall be logged.

d. At least once per month the particulate concentration level of the Diesel Fuel Oil Storage Tanks shall be determined in accordance with ASTM-D2276-1989, Method A. The total particulate concentration in the diesel fuel oil storage tanks, shall have a limit of less than 10 mg/liter when checked in accordance with ASTM-D2276-1989, Method A.

e. New fuel oil sampling will be performed in accordance with ASTM-D4057-1989 within 30 days upon delivery. Fuel oil testing will be performed in accordance with the following:

1. By verifying in accordance with the tests specified in ASTM-D975-1989a prior to addition to the storage tanks that the sample has:

a) An API Gravity of within 0.3 degrees at 60°F, or a specific gravity of within 0.0016 at 60/60°F,

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.9.B	4.9.A (cont'd.)

when compared to the supplier's certificate, or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89, or an API gravity of greater than or equal to 26 degrees but less than or equal to 38 degrees;

b) A Kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes (alternately, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6, but less than or equal to 40.1), if gravity was not determined by comparison within supplier's certification;

c) A flash point equal to or greater than 125°F;

d) A clear and bright appearance with proper color when tested in accordance with ASTM-D4176-1991.

Failure to meet any of the above limits specified in e.1 above is cause for rejecting the new fuel oil, but does not represent a stored diesel fuel oil concern since this fuel has not been added to the storage tanks.

2. By verifying within 30 days of obtaining the sample that the other properties specified in Table 1 of ASTM-D975-1989a are met when tested in accordance with ASTM-D975-1989a except that the analysis for sulfur may be performed in accordance with ASTM-D1552-1990 or ASTM-D2622-1992.

f. At least once per month check for and remove accumulated water from the diesel generator fuel oil day tanks.

g. At least once per month check for and remove accumulated water from the diesel generator fuel oil storage tanks.

h. At least once per 18 months, during shutdown, each diesel generator shall be given an inspection in accordance with instructions based on the manufacturer's recommendations.

LIMITING CONDITIONS FOR OPERATION

3.9.B (cont'd.)

3. DC Power

a. From and after the date that one of the four unit 125 volt or 250 volt batteries is made or found to be inoperable for any reason, restore the inoperable battery to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.A (cont'd.)

3. DC Power

a. Every week, the following parameters shall be verified:

1. The parameters of each designated pilot cell meet the Category A limits in Table 3.9.1.

2. The total terminal voltage for each 125-volt battery is greater than or equal to 125 volts on float charge, and for each 250-volt battery the terminal voltage is greater than or equal to 250 volts on float charge.

b. Every quarter, and within 7 days after a battery discharge causing battery terminal voltage below 105 volts for a 125-volt battery or 210 volts for a 250-volt battery, or battery overcharge with battery terminal voltage above 140 volts for a 125-volt battery or 280 volts for a 250-volt battery, it shall be verified that:

1. The parameters for cell-to-cell meet the Category B limits in Table 3.9.1.

2. There is no abnormal corrosion at either terminal or connectors which could affect connection resistance, or the bar connection resistance of these items is less than or equal to 150×10^{-6} ohm, and the inter-rack cable connection resistance shall be less than or equal to 280×10^{-6} ohm.

3. The electrolyte temperatures in a representative sample of cells, has an average temperature of at least 70°F.

c. Once each operating cycle:

1. The cells, cell plates, and battery racks shall be visually inspected.

LIMITING CONDITIONS FOR OPERATION

3.9.B.3 (cont'd.)

b. From and after the date that a unit battery charger is made or found to be inoperable, restore the inoperable battery charger to OPERABLE status or replace with the spare battery charger within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.A.3 (cont'd).

2. The cell-to-cell and terminal connections shall be verified to be clean, tight, and free of corrosion, and coated with anti-corrosion material.

3. The resistance of each cell-to-cell and terminal bar connection shall be verified to be less than or equal to 150×10^{-6} ohm, and the inter-rack cable connection resistance shall be verified to be less than or equal to 280×10^{-6} ohm.

4. Each 125 volt battery charger will supply 200 amperes at 125 volts for at least 4 hours, and each 250 volt battery charger will supply 200 amperes at 250 volts for at least 4 hours.

d. Once each operating cycle, during shutdown, one of the following tests will be performed:

1. A battery service test to verify that battery capacity is adequate to supply the emergency load profile.

2. A performance discharge test, in lieu of the above service test, once every five years to verify that battery capacity is at least 90% of the manufacturer's rating.

3. A performance discharge test, in lieu of the above service test, when the battery shows signs of degradation or has been in service seventeen years or longer.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.9.B (cont'd.)	4.9.A (cont'd).
4. Power Monitoring System for RPS System	4. Power Monitoring System for RPS System
a. 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.	The above specified RPS power monitoring system instrumentation shall be determined operable:
b. With both RPS electric power monitoring channel 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.	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.

TABLE 3.9.1

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A[1] (WEEKLY)	CATEGORY B[2] (QUARTERLY)	
	Limits for each designated pilot cell	Limits for each connected cell	Allowable[3] value for each connected cell
Electrolyte Level	≥Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	≥Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥2.13 volts	≥2.13 volts[4]	≥2.10 volts
Specific Gravity[5]	≥1.195[6]	≥1.190 Average of all connected cells ≥1.200	Not more than 0.020 below the average of all connected cells Average of all connected cells ≥1.190[6]

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided that Category B parameter(s) are restored to within limits within 7 days.

(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

(4) May be corrected for average electrolyte temperature.

(5) Corrected for electrolyte temperature and level.

(6) Or battery charger current is less than 2 amperes when on float charge.

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.

The condition defined in Specification 3.9.B.1.b.4 is entered as a result of failure to meet the acceptance criterion for particulates. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sampling procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulate does not mean failure of the fuel to burn properly in the diesel engine, the particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 1 month), it is prudent to allow a seven day period for corrective action prior to declaring the associated DG inoperable. The 7 day completion time allows for further evaluation, resampling, and re-analysis of the DG fuel oil.

3.9 BASES (cont'd)

The condition defined in Specification 3.9.B.1.b.5 is entered as a result of failure to meet the acceptance criteria for new diesel fuel properties. A period of 30 days is allowed for restoring the stored diesel fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or a combination of these procedures. Even if a DG start and load was required during this time interval and the fuel properties were outside the limits, there is high likelihood that the DG would still be capable of performing its intended function.

The D.C. Power Systems allowable out-of-service time is based on NRC Regulatory Guide 1.93, "Availability of Electrical Power Sources." The two-hour limit to restore battery operability minimizes reactor operation while in a degraded condition.

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.

Diesel fuel oil degradation during long term storage shows up as an increase in particulate, mostly due to oxidation. The presence of particulate does not mean that the diesel fuel oil will not burn properly in the diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure. Particulate concentrations shall be determined in accordance with ASTM-D2276-1989, Method A. The frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between frequency intervals.

The tests for diesel fuel oil properties defined in Surveillance Requirement (SR) 4.9.A.2.e.1 are a means of determining whether new diesel fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate detrimental impact on diesel engine combustion. If results from the test defined in SR 4.9.A.2.e.1 are within acceptable limits, the diesel fuel oil may be added to the storage tanks without concern for contaminating the entire volume of diesel fuel oil in the storage tanks. These tests are to be conducted prior to adding the new diesel fuel oil to the storage tanks, but in no case is the time between receipt of new diesel fuel oil and conducting the tests to exceed on month.

Within one month following the initial new diesel fuel oil sample (SR 4.9.A.2.e.1), the new diesel fuel oil is analyzed to establish that the remaining fuel oil

properties defined in SR 4.9.A.2.e.2 are met when tested in accordance with ASTM-D975-1989a. The one month period is acceptable because the diesel fuel oil properties of interest (SR 4.9.A.2.e.2), even if they were not within stated limits, would not have an immediate effect on Diesel Generator operation. This surveillance ensures the continued availability of high quality diesel fuel oil for the Diesel Generators.

Microbiological fouling is a major cause of diesel fuel oil degradation. There are numerous bacteria that can grow in diesel fuel oil storage tanks and cause fouling, but all must have a water environment in order to survive. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the water tight integrity of the fuel oil system. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil bacteria. This surveillance requirement is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed. If the presence of water is detected by Surveillance Requirement 4.9.A.2.f, the removal of water to the extent practical from the diesel fuel oil day tanks must be accomplished within two days of the discovery of the water. If the presence of water detected by Surveillance Requirement 4.9.A.2.g is greater than a nominal value of four inches from the bottom of the diesel fuel oil storage tanks, then a maximum of seven days is allowed for removal of the water. The nominal four inch value is a function of the water that can be practically removed from the diesel fuel oil storage tanks.

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.

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 surveillance requirements for demonstrating the OPERABILITY of the unit batteries are in accordance with the recommendations of NRC Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," dated February 1978 and IEEE Std 450-1987, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

4.9 BASES (cont'd)

Once each operating cycle, during shutdown, either a service test or performance discharge is performed on the 125 V and the 250 V batteries. The performance discharge test is performed in lieu of the service test when a battery shows signs of degradation. Degradation is indicated when battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

Replacement criteria for 125V and 250V station batteries is ≤80% 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.

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability of the battery to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Due to the physical configuration of the CNS batteries, two different inter-cell connection resistance values are surveilled. Each division of the 125V and 250V batteries are configured into two racks, coupled with inter-rack connectors. Therefore, separate resistance values are provided for both the inter-cell (copper-bar type) and inter-rack (cable-type) connectors to demonstrate acceptability of battery connection resistance.

Table 3.9.1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells ensure that their float voltage and specific gravity are characteristic of a charged cell with adequate capacity, and ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 3.9.1 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity ensures that an individual cell's specific gravity will not be more than 0.020 below the average specific gravity of all connected cells and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.10 volts, ensures the battery's capability to perform its design function.

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.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 165 TO FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated September 2, 1992, as supplemented by letter dated June 23, 1993, the Nebraska Public Power District (NPPD, or the licensee) submitted a request for changes to the Cooper Nuclear Station (CNS) Technical Specifications (TS). The requested changes modify the TS to (1) increase the minimum total amount of diesel fuel oil required to be available in the two on-site diesel fuel oil storage tanks from 45,000 to 48,000 gallons, (2) update the standard to which the fuel oil quality is tested from ASTM-D975-1968 to ASTM-D975-1989a, and (3) add additional testing requirements for particulates and water in the fuel. Specifically, the amendment makes the following changes in the TS:

Limiting Condition for Operation (LCO) 3.9.A.1.b is modified to change the minimum quantity of diesel fuel in the fuel oil storage tanks from 45,000 gallons to 48,000 gallons.

Old Surveillance Requirement (SR) 4.9.A.2.d, which requires the quantity of available diesel fuel oil to be logged once a month, has been renumbered SR 4.9.A.2.c, but is otherwise unchanged (old SR 4.9.A.2.c was deleted by a previous amendment).

New SR 4.9.A.2.d requires monthly testing of the diesel fuel oil for particulates per ASTM-D2276-1991, Method A, and specifies a limiting particulate concentration of 10 mg/liter.

Old SR 4.9.A.2.e, which required testing of the fuel oil per ASTM-D975-68, has been deleted. New SR 4.9.A.2.e requires that prior to adding new diesel fuel oil to the storage tanks, the oil must be sampled and tested and shown to meet the requirements of ASTM-D975-1989a for specific gravity, kinematic viscosity, flash point, and appearance. New SR 4.9.A.2.e further requires that within 30 days of obtaining the sample, the licensee must verify that the other fuel oil properties specified in Table 1 of ASTM-D975-1989a are met.

Old SR 4.9.A.2.f has been renumbered SR 4.9.A.2.h. New SR 4.9.A.2.f requires monthly checking for the presence of water in the diesel fuel oil day tanks, and the removal of any water found.

New SR 4.9.A.2.g requires monthly checking for the presence of water in the diesel fuel oil storage tanks, and the removal of any water found.

New SR 4.9.A.2.h, defines the Diesel Generator 18 month inspection. This SR was previously numbered SR 4.9.A.2.f, but is otherwise unchanged.

New LCO 3.9.B.1.b.4 is associated with SR 4.9.A.2.d, the new SR requiring testing the particulate concentration in the oil. This LCO allows 7 days to restore the diesel fuel oil to acceptable limits if particulate concentration levels tested per the SR are found to be outside the specified limit of 10 mg/liter.

New LCO 3.9.B.1.b.5 is associated with SR 4.9.A.2.e.2, the expanded SR for sampling and testing new diesel fuel oil. This LCO allows 30 days to restore the diesel fuel oil in the storage tanks to acceptable limits when the parameters tested per SR 4.9.A.2.e.2, are found to be outside the specified limits of ASTM-D975-1989a.

New information is added to the 3.9 Bases section, discussing the new LCOs 3.9.B.1.b.4 and 3.9.B.1.b.5. These discussions follow the BWR/4 STS concerning the allowable LCO duration and why it is acceptable. Also, new information is added to the 4.9 Bases section. This information discusses the SRs added to section 4.9. These discussions also follow the BWR/4 STS and staff recommendations concerning the SR frequency intervals and why they are acceptable.

2.0 BACKGROUND

NRC Information Notice (IN) 86-70, "Potential Failure of All Emergency Diesel Generators," described design deficiencies that could disable both diesel generators at a nuclear power plant by placing unanalyzed loads on the diesel generator power buses. NRC Information Notice 89-50, "Inadequate Emergency Diesel Generator Fuel Supply," described discrepancies at several nuclear power plants where the plant technical specifications and/or the Final Safety Analysis Report (FSAR) did not correctly determine the amount of on-site fuel required to allow 7-day post-accident operation of the emergency diesel generators (EDG).

In its September 2, 1992, request for TS changes, the licensee stated that in response to these Information Notices, the licensee evaluated the CNS EDG loads to determine if the EDGs had any of the problems identified in the Information Notices. The licensee calculated the EDG fuel oil storage requirements in an EDG loads evaluation, based on the guidance contained in Regulatory Guide 1.137, "Fuel Oil Systems for Standby Diesel Generators," as recommended by Information Notice 89-50. The licensee used a calculational method based on time-dependant EDG loads, including the capacity to power the engineered safety features.

The licensee stated that its EDG loads evaluation concluded that the 45,000 gallon on-site fuel oil storage requirements currently listed in TS 3.9.A.1.b is adequate to supply an EDG with enough fuel to power its essential loads for a 7-day post-accident event, taking into account all the guidance given in Information Notices 86-70 and 89-50. However, the licensee stated that it desires to raise this storage requirement, to provide an expanded reserve margin of available diesel fuel oil, and also to allow for any future loading additions that could be powered by the diesel generator during loss of coolant accident (LOCA)/loss of offsite power (LOOP) events.

In addition, the licensee has requested that the TS be modified to update the ASTM standard to which the oil is required to be tested. The licensee states that it has found that testing of fuel oil quality to the edition of the standard previously referenced in TS 4.9.A.2.e, ASTM D975-1968, has become increasingly difficult because diesel fuel oil testing facilities have upgraded to the newer version of the standard. Therefore, the licensee requested that the TS be revised to require testing the fuel oil quality to ASTM D975-1989a, the newer edition of the previously required standard.

The NRC staff reviewed the licensee's submittal of September 2, 1992, and based on its review, the staff requested that the licensee consider adding requirements to test for particulates and water. The licensee's submittal of June 23, 1993, added these changes to the proposed TS revision.

3.0 EVALUATION

The NRC staff has reviewed the licensee's proposed TS changes contained in its letters of September 2, 1992, and June 23, 1993, and finds them to be acceptable. The staff's evaluation of each of the specific changes proposed by the licensee is given below.

With regard to the increase in the required amount of the diesel fuel oil storage from 45,000 to 48,000 gallons, the licensee states that the increase in the on-site diesel fuel oil storage requirements will continue to ensure that sufficient fuel is stored on-site for seven days of operation of one EDG unit under postulated accident conditions. Operation of the EDGs and their auto-start signals are not altered by the increased fuel oil storage requirement. The licensee states that the ability of the EDGs to meet their Safety Design Basis defined in the Updated Safety Analysis Report (USAR) is not affected by the change. The licensee's analysis has shown that the previous storage capacity is sufficient to power the time-dependant EDG loads, including the capacity to power the engineered safety features. The diesels will remain able to perform their accident mitigative actions as described in the USAR, so that the consequences of previously evaluated accidents remain bounding. Based on the licensee's determination that a 45,000 gallon requirement is adequate, and that a 48,000 gallon requirement will provide additional reserve margin, the NRC staff finds the change acceptable.

With regard to the revision of the ASTM standard used for the testing of diesel fuel oil quality to a newer edition of the same standard, the NRC staff finds this acceptable because the updated standard is an improved version of

the previous standard, and contains acceptable criteria for assuring fuel oil quality.

With regard to adding requirements for testing the fuel oil for water and particulates, the staff finds that the licensee's proposals are in agreement with the BWR/4 Standard Technical Specifications, and are, therefore, acceptable.

The licensee also proposed to modify the TS Bases to give the basis for each of the proposed changes to the TS, which the staff has reviewed and found acceptable.

In summary, the proposed TS changes increase the quantity of diesel fuel oil required, update the standard for testing the diesel fuel oil, and add testing requirements for water and particulates in conformance to the STS. The NRC staff finds these changes to be acceptable on the bases given above.

4.0 STATE CONSULTATION

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.

5.0 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 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 (57 FR 61113). 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.

6.0 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 Contributors: E. Tomlinson
H. Rood

Date: July 16, 1993