August 20, 1991

Docket No. 50-298

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

Dear Mr. Horn:

SUBJECT: COOPER NUCLEAR STATION - AMENDMENT NO. 146 TO FACILITY OPERATING LICENSE NO. DPR-46 (TAC NO. 80661)

The Commission has issued the enclosed Amendment No. 146 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. The amendment consists of changes to the Technical Specifications in response to your application dated June 7, 1991, as supplemented by letter dated July 30, 1991.

The amendment changes the Technical Specifications to require that the operability of certain equipment be verified instead of demonstrated when a redundant component is found or made inoperable.

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

Sincerely,

Original signed by

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

Enclosures:
1. Amendment No. 146 to License No. DPR-46
2. Safety Evaluation

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

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2. Safety Evaluation

cc w/enclosures:
See next page

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

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 146
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 June 7, 1991, as supplemented by letter dated July 30, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility Operating License No. DPR-46 is hereby amended to read as follows:

   2. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No.146 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 20, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 146

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
4	4
108	108
110	110
115	115
116	116
117	117
118	118
119	119
120	120
125	125
127	127
131	131
165a	165a
183	183
205a	205a
215b	215b
215c	215c

L. Mode - The reactor mode is established by the mode selector-switch. The modes include refuel, run, shutdown and startup/hot standby which are defined as follows:

1. Refuel Mode - The reactor is in the refuel mode when the mode switch is in the REFUEL position. When the mode switch is in the REFUEL position, the refueling interlocks are in service.

2. Run Mode - In this mode the reactor system pressure is at or above 825 psig and the reactor protection system is energized with APRM protection (excluding the 15% high flux trip) and RBM interlocks in service.

3. Shutdown Mode - The reactor is in the shutdown mode when the mode switch is in the SHUTDOWN position.

4. Startup/Hot Standby - In this mode the reactor protection scram trips initiated by the main steam line isolation valve closure are bypassed, the low pressure main steam line isolation valve closure trip is bypassed, the reactor protection system is energized with APRM (15% SCRAM) and IRM neutron monitoring system trips and control rod withdrawal interlocks in service.

L.A Normal Ventilation - Normal ventilation is the controlled process of discharging and replacing air from/to a confinement to maintain temperature, humidity, or other conditions necessary for personnel safety and entry. The contents of the atmosphere being discharged from the confinement will have been established prior to establishing normal ventilation following a purging/venting operation.

M. Offsite Dose Assessment Manual (ODAM) - An OFFSITE DOSE ASSESSMENT MANUAL (ODAM) shall be a manual containing the methodology and parameters to be used in the calculation of offsite doses due to radioactive gaseous and liquid effluents, calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints, and describes the Environmental Radiation Monitoring Program.

N. Operable - Operability - Operating

1. Operable - Operability - A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources (except as specified in Section 1.0.J and 3.9), cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

   A verification of OPERABILITY is an administrative check, by examination of appropriate plant records (logs, surveillance test records), to determine that a system, subsystem, train, component or device is r t inoperable. Such verification does not preclude the demonstration (testing) of a given system, subsystem, train, component or device to determine OPERABILITY.

2. Operating - Operating means a system, subsystem, train, component, or device is performing its intended function in its required manner.

O. Operating Cycle - Interval between the end of one refueling outage and the end of the next subsequent refueling outage.

P. Primary Containment Integrity - Primary containment integrity means that the drywell and pressure suppression chamber are intact and all of the following conditions are satisfied:

1. All manual containment isolation valves on lines connected to the reactor coolant system or containment, and which are not required to be open during accident conditions, are closed.
2. At least one door in each airlock is closed and sealed.

3.4

4.4.A.2.c (Cont'd.)

pump demineralized water into the reactor vessel from the test tank.

These tests check the actuation of the explosive charge of the tested loop, proper operation of the valves, and pump operability. The replacement charges to be installed will be selected from the same manufactured batch as a previously tested charge.

d. Both systems, including both explosive valves, shall be tested in the course of two operating cycles.

B. <u>Operation with Inoperable Components</u>:

1. From and after the date that a redundant component is made or found to be inoperable, Specification 3.4.A.1 shall be considered fulfilled and continued operation permitted provided that the component is returned to an operable condition within seven days.

C. Sodium Pentaborate Solution

At all times when the Standby Liquid Control System is required to be operable the following conditions shall be met:

1. The net volume versus concentration of the Liquid Control Solution in the liquid control tank shall be maintained as required in Figure 3.4.1.

2. The temperature of the liquid control solution shall be maintained above the curve shown in Figure 3.4.2.

B. <u>Surveillance with Inoperable Components</u>:

1. When a component is found to be inoperable, its redundant component shall be verified to be operable immediately and daily thereafter until the inoperable component is repaired.

C. Sodium Pentaborate Solution

The following tests shall be performed to verify the availability of the Liquid Control Solution:

1. Volume: Check and record at least once per day.

2. Temperature: Check and record at least once per day.

3. Concentration: Check and record at least once per month. Also check concentration anytime water or boron is

3.4 BASES

STANDBY LIQUID CONTROL SYSTEM

A. The conditions under which the Standby Liquid Control System must provide shutdown capability are identified via the Plant Nuclear Safety Operational Analysis (Appendix G). If no more than one operable control rod is withdrawn, the basic shutdown reactivity requirement for the core is satisfied and the Standby Liquid Control system is not required. Thus, the basic reactivity requirement for the core is the primary determinant of when the liquid control system is required.

The purpose of the liquid control system is to provide the capability of bringing the reactor from full power to a cold, xenon-free shutdown condition assuming that none of the withdrawn control rods can be inserted. To meet this objective, the liquid control system is designed to inject a quantity of boron that produces a concentration of 600 ppm of boron in the reactor core in less than 125 minutes. The 600 ppm concentration in the reactor core is required to bring the reactor from full power to a 3.0 percent Δk subcritical condition, considering the hot to cold reactivity difference, xenon poisoning, etc. The time requirement for inserting the boron solution was selected to override the rate of reactivity insertion caused by cooldown of the reactor following the xenon poison peak.

The minimum limitation on the relief valve setting is intended to prevent the recycling of liquid control solution via the lifting of a relief valve at too low a pressure. The upper limit on the relief valve settings provides system protection from overpressure.

B. Only one of the two standby liquid control pumping loops is needed for operating the system. One inoperable pumping circuit does not immediately threaten shutdown capability, and reactor operation can continue while the circuit is being repaired. Assurance that the remaining system will perform its intended function and that the long term average availability of the system is not reduced is obtained for a one out of two system by an allowable equipment out of service time of one third of the normal surveillance frequency. This method determines an equipment out of service time of ten days. Additional conservatism is introduced by reducing the allowable out of service time to seven days.

C. Level indication and alarm indicate whether the solution volume has changed, which might indicate a possible solution concentration change. The test interval has been established in consideration of these factors. Temperature and liquid level alarms for the system are annunciated in the control room.

The solution is kept at least 10°F above the saturation temperature to guard against boron precipitation. The margin is included in Figure 3.4.2.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.5.A (cont'd.)	4.5.A (cont'd.)
2. From and after the date that one of the core spray subsystems is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding seven days provided that during such seven days all active components of the other core spray subsystem and active components of the LPCI subsystem and the diesel generators are operable.	2. When it is determined that one core spray subsystem is inoperable, the operable core spray subsystem and the LPCI subsystem shall be verified to be operable immediately. The operable core spray subsystem shall be verified to be operable daily thereafter.
3. Both LPCI subsystems shall be operable: (1) prior to reactor startup from a Cold Condition, except as specified in 3.22.B.1, or (2) when there is irradiated fuel in the vessel and when the reactor vessel pressure is greater than atmospheric pressure, except as specified in 3.5.A.4 and 3.5.A.5 below.	3. LPCI subsystem testing shall be as follows: Item — Frequency a. Simulated Automatic Actuation Test — Once/Operating Cycle b. Pump Operability — Once/month c. Motor Operated Valve Operability — Once/month d. Pump Flow Rate — Once/3 months During single pump LPCI, each RHR pump shall deliver at least 7700 GPM but no more than 8400 GPM against a system head equivalent to a reactor vessel pressure of 20 psid above drywell pressure with water level below the jet pumps. At the same conditions, two LPCI flow shall be at least 15,000 GPM. e. Recirculation pump discharge valves shall be tested each refueling outage to verify full open to full closed in t ≤ 26 seconds.
4. From and after the date that one of the RHR (LPCI) pumps is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding thirty days provided that during such thirty days the remaining active components of the LPCI subsystem and all active components of both core spray subsystems and the diesel generators are operable.	4. When it is determined that one of the RHR (LPCI) pumps is inoperable at a time when it is required to be operable the remaining active components of the LPCI subsystems, the containment cooling subsystem and both core spray systems shall be verified to be operable immediately and the operable LPCI pumps daily thereafter.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.5.A (Cont'd.)	4.5.A. (Cont'd.)
5. From and after the date that one LPCI subsystem is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 7 days, unless it is sooner made operable, provided that during such 7 days all active components of both core spray subsystems, the containment cooling subsystems (including 2 LPCI pumps) and the diesel generators required for operation of such components shall be operable.	5. When it is determined that the LPCI subsystem is inoperable, both core spray subsystems and the containment cooling subsystem shall be verified to be operable immediately and daily thereafter.
6. All recirculation pump discharge valves shall be operable prior to reactor startup (or closed if permitted elsewhere in these specifications).	6. All recirculation pump discharge valves shall be tested for operability during any period of Reactor cold shutdown exceeding 48 hours, if operability tests have not been performed during the preceding 31 days.
7. The reactor shall not be started up with the RHR system supplying cooling to the fuel pool.	
8. If the requirements of 3.5.A 1,2,3,4,5,6 or 7 cannot be met, an orderly shutdown of the reactor shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.	
B. Containment Cooling Subsystem (RHR Service Water)	B. Containment Cooling Subsystem (RHR Service Water)
1. Except as specified in 3.5.B.2, 3.5.B.3, and 3.5.F.3 below both containment cooling subsystems loops shall be operable whenever irradiated fuel is in the reactor vessel and reactor coolant temperature is greater than 212°F, and prior to reactor startup from a Cold Condition.	1. Containment Cooling Subsystem Testing shall be as follows:

	Item	Frequency
a.	Pump & Valve Operability	Once/3 months
b.	Pump Capacity Test. Each RHR service water booster pump shall deliver 4000 gpm.	After pump maintenance and every 3 months
c.	Air test on drywell and torus headers and nozzles.	Once/5 years

LIMITING CONDITIONS FOR OPERATION

3.5.B (Cont'd.)

2. From and after the date that any RHR service water booster pump is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding thirty days, unless such pump is sooner made operable provided that during such thirty days all other active components of the containment cooling subsystem are operable.

3. From and after the date that one containment cooling subsystem loop is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding seven days unless such subsystem loop is sooner made operable, provided that all active components of the other containment cooling subsystem loop, including its associated diesel generator, are operable.

4. If the requirements of 3.5.B.1, 3.5.B.2 or 3.5.B.3 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

C. HPCI Subsystem

1. The HPCI Subsystem shall be operable whenever there is irradiated fuel in the reactor vessel, reactor pressure is greater than 113 psig, and prior to reactor startup from a Cold Condition, except as specified in 3.5.C.2 and 3.5.C.3 below.

SURVEILLANCE REQUIREMENTS

4.5.B (Cont'd.)

2. When it is determined that any RHR service water booster pump is inoperable, the remaining active components of the containment cooling subsystems shall be verified to be operable immediately and weekly thereafter.

3. When one containment cooling subsystem loop becomes inoperable, the operable subsystem loop shall be verified to be operable immediately and daily thereafter.

C. HPCI Subsystem

1. HPCI subsystem testing shall be performed as follows:

	Item	Frequency
a.	Simulated Automatic Actuation Test	Once/operating Cycle
b.	Pump Operability	Once/month
c.	Motor Operated Valve Operability	Once/month

LIMITING CONDITIONS FOR OPERATION

3.5.C HPCI Subsystem (cont'd.)

2. From and after the date that the HPCI Subsystem is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding seven days unless such subsystem is sooner made operable, providing that during such seven days all active components of the ADS subsystem, the RCIC system, the LPCI subsystem and both core spray subsystems are operable.

3. With the surveillance requirements of 4.5.C not performed at the required intervals due to reactor shutdown, a reactor startup may be conducted provided the appropriate surveillance is performed within 48 hours of achieving 150 psig reactor steam pressure.

4. If the requirements of 3.5.C.1 cannot be met, an orderly shutdown shall be initiated and the reactor pressure shall be reduced to 113 psig or less within 24 hours.

D. Reactor Core Isolation Cooling (RCIC) Subsystem

1. The RCIC Subsystem shall be operable whenever there is irradiated fuel in the reactor vessel, the reactor pressure is greater than 113 psig, and prior to reactor startup from a Cold Condition, except as specified in 3.5.D.2 and 3.5.D.3 below.

SURVEILLANCE REQUIREMENT

4.5.C. HPCI Subsystem (cont'd.)

	Item	Frequency
d.	Flow Rate at approximately 1000 psig Steam Press.	Once/3 months
e.	Flow Rate at approximately 150 psig Steam Press.	Once/operating cycle

The HPCI pumps shall be demonstrated to be capable of delivering at least 4250 gpm for a system head corresponding to a reactor pressure of 1000 to 150 psig.

2. When it is determined that the HPCI Subsystem is inoperable the RCIC, the LPCI subsystem, and both core spray subsystems shall be verified to be operable immediately. The RCIC system shall be verified to be operable daily thereafter. In addition, the ADS subsystem logic shall be demonstrated to be operable immediately and daily thereafter.

D. Reactor Core Isolation Cooling (RCIC) Subsystem

1. RCIC Subsystem testing shall be performed as follows:

	Item	Frequency
a.	Simulated Automatic Actuation Test	Once/operating cycle

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
3.5.D (cont'd.)	4.5.D (cont'd.)

	Item	Frequency
b.	Pump Operability	Once/month
c.	Motor Operated Valve Operability	Once/month
d.	Flow Rate at approximately 1000 psig Steam Pressure	Once/3 months
e.	Flow Rate at approximately 150 psig Steam Pressure	Once/operating cycle

The RCIC pump shall be demonstrated to be capable of delivering at least 400 gpm for a system head corresponding to a reactor pressure of 1000 to 150 psig.

2\. When it is determined that the RCIC subsystem is inoperable, the HPCIS shall be verified to be operable immediately.

2\. From and after the date that the RCICS is made or found to be inoperable for any reason, continued reactor power operation is permissible only during the succeeding seven days provided that during such seven days the HPCIS is operable.

3\. With the surveillance requirements of 4.5.D not performed at the required intervals due to reactor shutdown, a reactor startup may be conducted provided the appropriate surveillance is performed within 48 hours of achieving 150 psig reactor steam pressure.

4\. If the requirements of 3.5.D 1 & 2 cannot be met, an orderly shutdown shall be initiated and the reactor pressure shall be reduced to 113 psig or less within 24 hours.

E. <u>Automatic Depressurization System (ADS)</u>

1\. The Automatic Depressurization Subsystem shall be operable whenever there is irradiated fuel in the reactor vessel and the reactor pressure is greater than 113 psig and prior to a startup from a Cold Condition, except as specified in 3.5.E.2 and 3.5.E.3 below.

E. <u>Automatic Depressurization System (ADS)</u>

1\. During each operating cycle the following tests shall be performed on the ADS:

A simulated automatic actuation test shall be performed prior to startup after each refueling outage.

LIMITING CONDITIONS FOR OPERATION

3.5.E (cont'd)

2. From and after the date that one valve in the automatic depressurization subsystem is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding seven days unless such valve is sooner made operable, provided that during such seven days the HPCI subsystem is operable.

3. With the surveillance requirements of 4.6.D.5 not performed at the required intervals due to reactor shutdown, a reactor startup may be conducted provided the appropriate surveillance is performed within 12 hours of achieving 113 psig reactor steam pressure.

4. If the requirements of 3.5.E.1 or 3.5.E.2 cannot be met, an orderly shutdown shall be initiated and the reactor pressure shall be reduced to at least 113 psig within 24 hours.

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. During any period when one diesel generator is inoperable, continued reactor operation is permissible only during the succeeding seven days unless such diesel generator is sooner made operable, provided that all of the low pressure core and containment cooling subsystems and the remaining diesel generator shall be operable and the requirements of 3.9.A.1 are met. If this requirement cannot be met, the requirements of 3.5.F.2 shall be met.

2. During any period when both diesel generators are inoperable, continued reactor operation is permissible only during the succeeding 24 hours unless one diesel generator is sooner made operable, provided that all the low pressure core and containment cooling subsystems are operable and the reactor power level is reduced to 25% of rated power and the requirements of 3.9.A.1 are met. If this requirement cannot be met, either the requirements shall be met or an orderly shutdown shall be initiated and the reactor placed in the cold shutdown condition within 24 hours.

SURVEILLANCE REQUIREMENTS

4.5.E (cont'd)

2. When it is determined that one valve of the ADS is inoperable, the ADS subsystem actuation logic for the other ADS valves shall be demonstrated to be operable immediately. In addition, the HPCI subsystem shall be verified to be operable immediately.

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. When it is determined that one diesel generator is inoperable, all low pressure core cooling and containment cooling subsystems shall be verified to be operable immediately and daily thereafter. In addition, the operable diesel generator shall be demonstrated to be operable immediately and every three days thereafter.

core spray subsystems and LPCI constitute a 1 out of 3 system; however, the combined effect of the two systems to limit excessive clad temperatures must also be considered. The test interval specified in Specification 4.5 is 1 month.

Should one core spray subsystem become inoperable, the remaining core spray and the LPCI system are available should the need for core cooling arise. To assure that the remaining core spray and LPCI subsystems are available, they are verified to be operable immediately.

Should the loss of one LPCI pump occur, a nearly full complement of core and containment cooling equipment is available. Three LPCI pumps in conjunction with the core spray subsystem will perform the core cooling function. Because of the availability of the majority of the core cooling equipment, which will be verified to be operable, a thirty day repair period is justified. If the LPCI subsystem is not available, at least 1 LPCI pump must be available to fulfill the containment cooling function. The 7 day repair period is set on this basis.

B. Containment Cooling Subsystem

The containment cooling subsystem for CNS consists of two loops each with 2 RHR (LPCI) pumps serving one side of the RHR heat exchanger and two RHR Service Water Booster Pumps serving the other side. The design of the loops is predicted upon the use of one RHR Service Water Booster Pump and one RHR heat exchanger, for heat removal after a design basis accident. Thus, there are ample spares for margin above design conditions. Loss of margin should be avoided and the equipment maintained in a state of operation. So a 30 day out-of-service time is chosen for this equipment. If one loop is out-of-service reactor operation is permissible for seven days.

With components or subsystems out-of-service, overall core and containment cooling reliability is maintained by verifying the operability of the remaining cooling equipment. For routine out-of-service periods caused by preventive maintenance, etc., the operability of other systems and components will be verified as given in the Technical Specifications. However, if a failure, design deficiency, etc., caused the out-of-service period, then a demonstration of operability may be needed to assure that a similar problem does not exist on the remaining components. For example, if an out-of-service period were caused by failure of a pump to deliver rated capacity, the other pumps of this type might be subjected to a capacity test.

The pump capacity test is a comparison of measured pump performance parameters fication to assure that when the reactor is being started up from a Cold Condition, the HPCI is not known to be inoperable.

D. RCIC System

The RCIC is designed to provide makeup to the nuclear system as part of the planned operation for periods when the main condenser is unavailable. The nuclear safety analysis, FSAR Appendix G, shows that RCIC provides water to cool the fuel when feed water is lost. In all other postulated accidents and transients, the ADS provides redundancy for the HPCI. Based on this and judgements on the reliability of the HPCI system, an allowable repair time of 7 days is specified. Immediate verifications of HPCI operability during RCIC outage is considered adequate based on judgement and practicality.

E. Automatic Depressurization System (ADS)

The limiting conditions for operating the ADS are derived from the Station Nuclear Operational Analysis (Appendix G) and a detailed functional analysis of the ADS (Section VI.).

This specification ensures the operability of the ADS under all conditions for which the automatic or manual depressurization of the nuclear system is an essential response to station abnormalities.

The nuclear system pressure relief system provides automatic nuclear system depressurization for small breaks in the nuclear system so that the low pressure coolant injection (LPCI) and the core spray subsystems can operate to protect the fuel barrier.

Because the Automatic Depressurization System does not provide makeup to the reactor primary vessel, no credit is taken for the steam cooling of the core caused by the system actuation to provide further conservatism to the CSCS. Performance analysis of the Automatic Depressurization System is considered only with respect to its depressurizing effect in conjunction with LPCI or Core Spray. There are six valves provided and each has a capacity of 800,000 lb/hr at a set pressure of 1080 psig.

The allowable out of service time for one ADS valve is determined as seven days because of the redundancy and because the HPCIS is verified to be operable during this period. Therefore, redundant protection for the core with a small break in the nuclear system is still available.

The ADS test circuit permits continued surveillance on the operable relief valves to assure that they will be available if required.

F. Minimum Low Pressure Cooling and Diesel Generator Availability

The purpose of Specification F is to assure that adequate core cooling equip-

4.5 BASES

Core and Containment Cooling Systems Surveillance Frequencies

The testing interval for the core and containment cooling systems is based on industry practice, quantitative reliability analysis, judgement and practicality. The core cooling systems have not been designed to be fully testable during operation. For example, in the case of the HPCI, automatic initiation during power operation would result in pumping cold water into the reactor vessel, which is not desirable. Complete ADS testing during power operation causes an undesirable loss-of-coolant inventory. To increase the availability of the core and containment cooling systems, the components which make up the system; i.e., instrumentation, pumps, valves, etc., are tested frequently. The pumps and motor operated injection valves are also tested each month to assure their operability. A simulated automatic actuation test once each cycle combined with frequent tests of the pumps and injection valves is deemed to be adequate testing of these systems.

When components and subsystems are out-of-service, overall core and containment cooling reliability is maintained by verifying the operability of the remaining equipment. For routine out-of-service periods caused by preventative maintenance, etc., the operability of other systems and components will be verified as given in the Technical Specifications. However, if a failure or design deficiency caused by outage, then a demonstration of operability may be needed to assure that a generic problem does not exist. For example, if an out-of-service period were caused by failure of a pump to deliver rated capacity due to a design deficiency, the other pumps of this type might be subjected to a flow rate test.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT

3.7.B (cont'd)

b. The results of laboratory carbon sample analysis shall show ≥99% radioactive methyl iodide removal with inlet conditions of: velocity ≥27 FPM, ≥1.75 mg/m^3 inlet methyl iodide concentration, ≥70% R.H. and ≤30°C.

c. Each fan shall be shown to provide 1780 CMF ±10%.

3. From and after the date that one standby gas treatment system is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such system is sooner made operable, provided that during such seven days all active components of the other standby gas treatment system, and its associated diesel generator, shall be operable.

   Fuel handling requirements are specified in Specification 3.10.E.

4. If these conditions cannot be met, procedures shall be initiated immediately to establish reactor conditions for which the standby gas treatment system is not required.

C. <u>Secondary Containment</u>

1. Secondary containment integrity shall be maintained during all modes of plant operation except when all of the following conditions are met.

4.7.B (cont'd)

b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

d. Each system shall be operated with the heaters on at least 10 hours every month.

e. Test sealing of gaskets for housing doors downstream of the HEPA filters and charcoal adsorbers shall be performed at, and in conformance with, each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3. System drains where present shall be inspected quarterly for adequate water level in loop-seals.

4.a. At least once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated.

b. At least once per operating cycle manual operability of the bypass valve for filter cooling shall be demonstrated.

c. When one standby gas treatment system becomes inoperable the other standby gas treatment system shall be verified to be operable immediately and daily thereafter. A demonstration of diesel generator operability is not required by this specification.

C. <u>Secondary Containment</u>

1. Secondary containment surveillance shall be performed as indicated below:

with an adsorbent qualified according to Table 5.1 of ANSI N509-1980. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1980. Any filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d. of Regulatory Guide 1.52, Revision 2, March, 1978.

All elements of the heater should be demonstrated to be functional and operable during the test of heater capacity. Operation of the heaters will prevent moisture buildup in the filters and adsorber system.

With doors closed and fan in operation, DOP aerosol shall be sprayed externally along the full linear periphery of each respective door to check the gasket seal. Any detection of DOP in the fan exhaust shall be considered an unacceptable test result and the gaskets repaired and test repeated.

If system drains are present in the filter/adsorber banks, loop-seals must be used with adequate water level to prevent by-pass leakage from the banks.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

Demonstration of the automatic initiation capability and operability of filter cooling is necessary to assure system performance capability. If one standby gas treatment system is inoperable, the other system's operability is verified daily. This substantiates the availability of the operable system and thus reactor operation or refueling operation can continue for a limited period of time.

3.7.D & 4.7.D BASES

Primary Containment Isolation Valves

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss-of-coolant accident.

The maximum closure times for the automatic isolation valves of the primary containment and reactor vessel isolation control system have been selected in consideration of the design intent to prevent core uncovering following pipe breaks outside the primary containment and the need to contain released fission products following pipe breaks inside the primary containment.

These valves are highly reliable, have a low service requirement, and most are normally closed. The initiating sensors and associated trip channels are also checked to demonstrate the capability for automatic isolation. The test interval of once per operating cycle for automatic initiation

LIMITING CONDITIONS FOR OPERATION

3.10.B (Cont'd)

4. During spiral reload, SRM operability will be verified by using a portable external source every 12 hours until the required amount of fuel is loaded to maintain 3 cps. As an alternative to the above, two fuel assemblies will be loaded in different cells containing control blades around each SRM to obtain the required 3 cps. Until these two assemblies have been loaded, the 3 cps requirement is not necessary.

C. Spent Fuel Pool Water Level

Whenever irradiated fuel is stored in the spent fuel pool, the pool water level shall be maintained at or above 8½' above the top of the fuel.

D. Time Limitation

Irradiated fuel shall not be handled in or above the reactor prior to 24 hours after reactor shutdown.

E. Standby Gas Treatment System

From and after the date that one standby gas treatment system is made or found to be inoperable for any reason, fuel handling is permissible only during the succeeding seven days unless such system is sooner made operable, provided that during such seven days all active components of the other standby gas treatment system, and its associated diesel generator, shall be operable.

At least one diesel generator shall be operable during fuel handling operations. This one diesel shall be capable of supplying power to an operable Standby Gas Treatment System.

F. Core Standby Cooling Systems

During a refueling outage, refueling operation may continue with one core spray system or the LPCI mode of RHR inoperable for a period of 30 days. Refueling is permitted with the suppression chamber drained provided an operable core spray system or subsystem of the LPCI mode of RHR is aligned to take a suction on the condensate storage tank containing at least 150,000 gallons (>14 ft. indicated level).

SURVEILLANCE REQUIREMENTS

4.10 (Cont'd)

C. Spent Fuel Pool Water Level

When irradiated fuel is stored in the spent fuel pool, the water level shall be recorded daily.

E. Standby Gas Treatment System

When one standby gas treatment system becomes inoperable, the other standby gas treatment system shall be verified to be operable immediately and daily thereafter. A demonstration of diesel generator operability is not required by this specification.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.12 (cont'd)	4.12 (cont'd)

LIMITING CONDITIONS FOR OPERATION

3.12 (cont'd)

B. Reactor Building Closed Cooling Water System (REC)

1. Both reactor building closed cooling water loops and their associated pumps shall be operable whenever irradiated fuel is in the vessel or the spent fuel pool, except as specified in 3.12.B.2 and 3.12.B.3 below.

2. From and after the date that any component in one loop becomes inoperable continued reactor operation is permissible during the succeeding thirty days provided that during such thirty days all the components of the other loop and the active components of the engineered safeguards compartment cooling systems, the diesel generator associated with the operable loop are operable.

   The allowable repair time does not apply when the reactor is in the shutdown mode and reactor pressure is less than 75 psig.

3. Both reactor building closed cooling water loops with one pump per loop shall be operable as stated in 3.12.B.1 and 3.12.B.2 above during reactor head-off operations requiring LPCI or Core Spray System availability or service water cooling shall be available.

4. If the requirements of 3.12.B.1 through 3.12.B.3 cannot be met, the reactor shall be shutdown in an orderly manner and in the Cold Shutdown condition within 24 hours or operations requiring LPCI or core spray system availability shall be halted.

SURVEILLANCE REQUIREMENTS

4.12 (cont'd)

B. Reactor Building Closed Cooling Water System (REC)

1. REC System Testing

	Item	Frequency
a.	Pump Operability	Once/Month
b.	Motor operated Valve Operability	Once/Month
c.	Pump flow rate Each pump shall deliver 1175 gpm at 65 psid.	Once/3 months and after pump maintenance
d.	System head tank level shall be monitored.	Daily

2. When it is determined that any active component in an REC loop is inoperable, all components in the other loop shall be verified operable immediately and weekly thereafter.

LIMITING CONDITIONS FOR OPERATION

3.12 (cont'd)

C. Service Water System

1. Both service water subsystems with both pumps in each subsystem shall be operable whenever irradiated fuel is in the vessel or spent fuel pool and prior to reactor startup except as specified in 3.12.C.2 below.

2. From and after the date that any component in the service water subsystem is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding thirty days provided that during such thirty days all active components of the other service water subsystem and its associated diesel generator are operable.

3. If the requirement of 3.12.C.1 and 3.12.C.2 cannot be met, an orderly shutdown of the reactor shall be initiated and the reactor shall be in the Cold Shutdown Condition within 24 hours.

D. Battery Room Ventilation

1. Battery room ventilation shall be operable on a continuous basis whenever specification 3.9.A is required to be satisfied.

2. From and after the date that either of the two battery room vent fans is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding 7 days.

3. If the requirements of 3.12.D.1 & 2 cannot be met, an orderly shutdown of the reactor shall be initiated and the reactor shall be in Cold Shutdown within 24 hours.

SURVEILLANCE REQUIREMENTS

4.12 (cont'd)

C. Service Water System

1. Service Water System Testing

	Item	Functional
a.	Pump Operability	Once/Month
b.	Motor Operated Valve Operability	Once/Month
c.	Pump discharge head tests	Once/3 months

2. When it is determined that any required service water system component is inoperable, the operable service water subsystem components shall be verified to be operable immediately and weekly thereafter.

D. Battery Room Ventilation

1. The spare battery room ventilation fan shall be checked for operability once/week.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 146 TO FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated June 7, 1991, as supplemented by letter dated July 30, 1991, Nebraska Public Power District (the licensee) submitted a request for changes to the Cooper Nuclear Station, Technical Specifications (TS). The requested changes would require that the operability of certain equipment be verified instead of demonstrated when a redundant component is found or made inoperable.

The July 30, 1991, letter corrected a typographical error and did not alter the action noticed or change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The Cooper TS include requirements to demonstrate the operability of redundant trains or systems whenever one train of several safety systems are declared inoperable. The demonstration of operability has included the performance of testing which may temporarily degrade the ability of the operable train or system to fulfill its safety function. In addition, the testing may introduce unnecessary wear on the equipment and increase the potential for human error which could degrade the performance of the operable train or system or, in the worst case, result in the total loss of a safety function.

The proposed amendment revises the TS requirements for several systems to a verification of the operability of the redundant train or system and adds to the TS Section 1.0, Definitions, to delineate what constitutes a verification of operability. Verification is defined as an administrative check, by examination of appropriate plant records, to determine that a system or device is not inoperable. Testing would be performed only for those cases in which a generic problem or issue which resulted in a train or component being declared inoperable might also affect the redundant train or system.

The proposed change from a demonstration of operability to a verification of operability is reflective of general industry practice as incorporated into the Standard Technical Specifications (STS) and previous TS amendments for those plants which had requirements similar to Cooper. The basic premise for the trend away from performing testing to demonstrate operability is that the testing does not significantly improve the confidence in operability but does introduce concerns regarding system degradations during the testing and after completion of the testing due to equipment wear and the potential for human error. The NRC staff has agreed with this position in the development of the STS and the approval of previous TS amendments.

In addition to the revisions associated with changing to verifications of operability, the licensee has proposed several editorial changes which do not affect the actual technical requirements of TS. The letter dated July 30, 1991, corrected an error which was introduced into the TS by Amendment No. 141. The error involved the velocity requirements for the Standby Gas Treatment System laboratory carbon sample analysis which was revised by Amendment No. 136 but was not reflected by the TS page issued as part of Amendment No. 141.

Based upon its review, the staff concludes that those revisions associated with changing demonstrations of operability to verifications of operability improve plant safety and are therefore acceptable. In addition, the changes proposed as editorial improvements and corrections are also deemed acceptable.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (56 FR 31438). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: W. D. Reckley

Date: August 20, 1991