APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/84-11

Docket: 50-298 License: DPR-46

Licensee: Nebraska Public Power District (NPPD)
P. O. Box 499
Columbus, Nebraska 68601

Facility Name: Cooper Nuclear Station (CNS)

Inspection At: Cooper Nuclear Station, Nemaha County, Nebraska

Inspection Conducted: May 1-June 30, 1984

Inspectors: E.H. Johnson 8/8/84
E. H. Johnson, Chief, Reactor Project Branch 1 Date

E.H. Johnson 8/8/84
FOR D. L. DuBois, Senior Resident Inspector (SRI) Date

E.H. Johnson 8/8/84
FOR L. A. Yandell, Senior Resident Inspector Date

J.R. Boardman 8/8/84
J. R. Boardman, Reactor Inspector Date

Approved: E.H. Johnson 8/8/84
FOR J. P. Jaudon, Chief, Project Section A, Date
Reactor Project Branch 1

Inspection Summary

Inspection Conducted May 1-June 30, 1984 (Report 50-298/84-11)

Areas Inspected: Routine, announced inspection including operational safety verifications, monthly surveillance and maintenance observation, licensee event followup, declaration of unusual event, preparation for refueling, observation of annual emergency preparedness exercise, followup of previously identified items, and BWR recirculation system pipe replacement. The inspection involved 270 inspection hours onsite by five NRC inspectors.

Results: Within the nine areas inspected, two violations were identified (failure to have procedures for maintenance, paragraph 4; failure to perform a safety review of a change made to the facility, paragraph 6).

1. Persons Contacted

Principle Licensee Personnel

*L. Kuncl, Assistant General Manager - Nuclear
L. Kohles, Project Manager - IGSCC
J. Cooper, Environmental Manager - Nuclear
G. Trevors, QA Division Manager
F. Williams, QA Manager
J. Pilant, Technical Staff Manager
R. Wilbur, Nuclear Services Division Manager
J. Weaver, Nuclear Licensing Department Manager
*P. Thomason, Division Manager of Nuclear Operations
*K. Wire, Operations Manager
*V. Wolstenholm, QA Manager, CNS
*D. Whitman, Technical Staff Manager - CNS
J. Sayer, Staff Assistant - ALARA/IGSCC
*G. Mace, Plant Engineering Supervisor
*C. Goings, Regulatory Compliance Specialist
*R. Brungardt, Operations Supervisor
*G. Horn, Construction Manager, CNS
*R. Windham, Emergency Planning Coordinator

NRC

J. O'Reilly, Regional Administrator, RII
R. Lewis, Director, Division of Reactor Projects, RII
H. Dance, Chief, Reactor Projects Branch 2, RII
V. Panciera, Chief, Reactor Projects Section 2B, RII
R. Crlenjak, SRI (Hatch Nuclear Station)
P. Holmes-Ray, RI (Hatch Nuclear Station)
B. Crowley, NDT/NDE Inspector, RII
B. Uryc, Allegation Specialist, RII
C. Perny, Security Specialist, RII
I. Barnes, Reactor Inspector, RIV
J. Jaudon, Chief, Reactor Projects Section 1A, RIV

Other Organizations

L. Sumner, Acting Plant Manager, Hatch Nuclear Station
D. Neely, ALARA Manager, Hydro-Nuclear Corporation
A. Cure, ALARA Engineer, Georgia Power Company
H. Rogers, Health Physics Superintendent, Georgia Power Company
D. Conway, Project Manager, Chicago Bridge and Iron Company
D. Tanis, Site Manager, Chicago Bridge and Iron Company

The NRC inspectors also interviewed other licensee and contractor personnel.

*Denotes presence at exit meetings.

2. Operational Safety Verification

The SRI observed control room operations, instrumentation, controls, reviewed applicable logs, and conducted discussions with control room operators. The SRI verified operability of:

- "B" Core Spray System
- Automatic Depressurization System
- Scram Discharge Instrument Volume
- Standby Liquid Control System

The SRI reviewed safety clearance records, including verification that affected components were removed from and returned to service in a correct and approved manner, that redundant equipment was verified operable, and that limiting conditions for operation were adequately identified and maintained. The SRI also verified that maintenance requests had been initiated for equipment discovered to require repair or routine preventive upkeep, appropriate priority was assigned, and maintenance commenced in a timely manner commensurate with assigned priorities.

Tours of accessible areas of the facility were conducted to verify that minimum shift crew requirements were met, to observe normal security practices, plant and equipment conditions including cleanliness, radiological controls, fire suppression systems, emergency equipment, potential fire hazards, fluid leaks, excessive vibration, and instrumentation adequacy.

The NRC inspectors observed licensee actions performed prior to, during, and following a Notification of Unusual Event. The event was declared on June 15, 1984, as a result of the Missouri River flooding conditions that existed adjacent to the plant site. Details regarding the event are provided in paragraph 6.

The tours, reviews, and observations were conducted to verify that facility operations were in conformance with the requirements established in the CNS Operating License and Technical Specification.

3. Monthly Surveillance Observations

The SRI observed Technical Specification required surveillance tests to verify that test prerequisities were completed, testing was performed in accordance with approved procedures, test instrumentation was in calibration, limiting conditions for operation were met, removal and subsequent restoration of affected components was accomplished, test results conformed with Technical Specification and procedure requirements, tests were reviewed by personnel other than the person directing the tests, and deficiencies identified during testing were properly reviewed and resolved by appropriate management personnel.

These reviews and observations were conducted to verify that facility surveillance operations were in conformance with the requirements established in the CNS Operating License and Technical Specification.

No violations or deviations were identified in this area.

4. Monthly Maintenance Observations

The following clearance orders were independently verified for proper placement/restoration of affected components:

- 84-290 "B" Service Water Booster Pump
- 84-358 "B" Reactor Equipment Cooling Pump

Included in the above were checks for availability of redundant equipment, adequate safety isolation and clearance, work was accomplished by qualified personnel in accordance with approved procedures and Technical Specification requirements, verification that QC checks were performed as required, cleanliness controls and health physics coverage were adequate, and post-maintenance surveillance testing was performed to prove operability of the affected component and/or system.

During this inspection, an NRC inspector found the following examples of lack of licensee procedures for safety-related maintenance which could result in degradation of safety-related equipment:

a. The licensee uses electrical termination lugs manufactured by Thomas & Betts (T&B) Company. Lugs are crimped at CNS using the following T&B crimping tools, at least one of which licensee personnel indicated had been onsite for 10 years:

   - WT 111M
   - WT 145A
   - WT 145C
   - TBM-8

   The NRC inspector contacted T&B Technical Service Representative, Mr. David Jeude, who stated that all the crimping tools used at CNS had calibration gages and should be periodically calibrated to assure that they will make acceptable crimps. In addition, the handles of crimping tool TBM-8, used with lug sizes 6, American Wire Size (6AWS) through 500,000 circular mils (500 MCM), are required to be adjusted prior to use, to assure a minimum and maximum setting.

   Large size crimping lugs are kept in small boxes while maintained in storage. The requirements applicable to multiple crimping are printed on the outer surface of the boxes. However, the NRC inspector observed that lugs removed from storage and transferred

to the electric shop, were taken out of the boxes and stored in bins. Thus, the printed requirements for multiple crimping were not present with the affected lugs located in the electric shop.

The licensee does not have a procedure which specifies periodic calibration of crimping tools used to make safety-related terminations. A procedure would assure proper adjustment of the TBM-8 crimping tool prior to use and would also specify the requirements for multiple crimping where required.

The NRC inspector was also informed by T&B of the existence of Installation Test Procedures that, if used, will assure that production crimps meet Underwriter's Laboratory (UL) Standard 486, the industry standard for acceptable crimped lug terminations.

The licensee does not have procedures which include the installation test procedures.

b. The NRC inspector reviewed licensee preventive maintenance (PM) procedures to verify that bearings for safety-related equipment were certified as having a 40-year design life, or had PM procedures specifying periodic bearing replacement. This area was reviewed because operation of equipment with bearings which have exceeded their design life can result in common mode failures. The following examples were found in which safety-related equipment bearings were not identified as having a 40-year design life and for which a maintenance procedure did not exist to accomplish periodic bearing replacement:

1. The Reactor Containment Building Component Cooling Water (REC) system pump vendor manual (Licensee Manual No. 68-63-6) indicated that the pump bearings have an average bearing life of 100,000 hours (approximately 11.4 years).

2. The above vendor manual did not identify a design life for the REC pump motor bearings. This inadequacy had not been identified by the licensee during their design review for environmental equipment qualification performed in response to NRC Bulletin 79-01.

3. There was no bearing life identified for the Residual Heat Removal (RHR) system pump motors in Licensee Vendor Manual 66-31-2. This motor was also reviewed for environmental qualification by the licensee in response to NRC Bulletin 79-01.

4. The bearing life for the Core Spray (CS) pump motors, as noted in Licensee Vendor Manual 66-31-33, is greater than 5 years. This is the third environmentally qualified motor reviewed by the licensee in response to NRC Bulletin 79-01.

5. There was no bearing life indicated for the Standby Liquid Control (SLC) system pump motors in Licensee Vendor Manual 66-31-8.

c. The NRC inspector discovered that a licensee maintenance procedure applicable to lubrication of motor ball bearings in the SLC pump motors does not exist. Licensee Vendor Manual 66-31-8 shows a 5-year lubrication cycle for these bearings in the least severe service cycle.

The licensee's Preventive Maintenance Procedure 1.7.2, Revision 3, "Work Item Tracking-Preventive Maintenance," approved August 30, 1983, does not require review and preparation of maintenance procedures for component parts which are not designed for 40-year plant life service, or which require periodic lubrication in order to retain their capability to perform their safety functions. Also, licensee personnel stated that licensee procedures governing equipment qualification to NRC Bulletin 79-01 did not cover review of bearing life to maintain equipment qualification.

Failure to have procedures for maintenance of safety-related equipment to assure equipment function for safe shutdown is a violation of 10 CFR Part 50, Appendix B, Criterion V, which states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." Failure to meet the requirements of 10 CFR Part 50, Appendix B, Criterion V constitutes a Severity Level IV Violation. (298/8411-01)

The NRC inspector reviewed PMs performed on the REC pumps and motors. All four motors had been rewound by an outside contractor who had been subsequently disapproved by the licensee's QA department. The licensee could not provide documentation of the acceptability and compliance of this work. The licensee did not provide QA or design criteria for the motor bearings, nor prohibited bearing substitution.

This will remain an unresolved item pending further review by the NRC inspector during a subsequent inspection. (298/8411-03)

A review by the NRC inspector discovered that the 125 volt DC system overvoltage alarm is set at 146 volt DC. Many 125 volt DC system components, such as ASCO solenoid valves, are designed for a maximum of 140 volt DC. An overvoltage condition can result in component and system degradation and ultimate common mode failure. This will remain an unresolved item pending further review by the NRC inspector during a subsequent inspection. (298/8411-04)

These reviews and observations were conducted to verify that facility maintenance operations were in conformance with the requirements established in the CNS Operation License and Technical Specification.

5. Licensee Event Report Followup (LER)

The following LER is closed on the basis of the SRI's inoffice review, review of licensee documentation, and discussion with licensee personnel:

. LER 84-005 Primary Coolant Pipe Weld Failure

6. Declaration of Unusual Event

On June 13, 1984, at approximately 10:00 p.m. central daylight time, the duty shift supervisor informed the SRI that the Missouri River was predicted to reach a level of 895 feet above Mean Sea Level (MSL) at the Plant Intake Structure during the following midnight shift. At 3:00 a.m. on June 14, 1984, the river level reached 895 feet and the licensee fully implemented CNS Emergency Procedure 5.1.3, "Flood Above Elevation 901' 2"."

Missouri River levels, as measured at the CNS Plant Intake Structure, require the following licensee actions or attention:

. 895' CNS Technical Specification, Section 3.13.A requires implementation of the licensee's Flood Procedure 5.1.3.

. 895' 10" The north access road to CNS will be covered with water.

. 897' CNS Emergency Plan Implementation Procedure (EPIP) 5.7.1, Attachment C, submodule 12.1.2, requires the licensee to classify a Notification of Unusual Event.

. 902' CNS Technical Specification, Section 3.13.B requires the licensee to initiate an orderly shutdown and vent the reactor vessel to atmosphere.

. 902' The south access road to CNS will be covered with water.

. 903' EPIP 5.7.1, Attachment C, submodule 12.2.4, requires the licensee to classify an Alert.

. 903' 6" CNS grade level

At 7:30 a.m. on June 14, 1984, the SRI established frequent communications with the CNS Emergency Director, NRC Region IV Management, and the Kansas City, Missouri, and Omaha, Nebraska, National Weather Service Offices. The communications were maintained throughout the period that river level remained above 895'. The U.S. Weather Service determined that the river would crest at approximately 897' 6" the morning of June 15, 1984. Licensee preparations for flooding continued.

At approximately 6:15 a.m., June 15, 1984, the river level at the Plant Intake Structure had risen to 897'. The licensee declared a Notification of Unusual Event at 6:18 a.m.

The river crested at a level of 897' 11" at the site on June 15, 1984, at approximately 11:00 p.m. River level began decreasing 7 hours later.

At 8:00 a.m., June 17, 1984, the river level dropped to less than 897'. The licensee did not secure from the Notification of Unusual Event at that time because the U.S. Weather Service was forecasting another increase in level due to more rainfall upstream of the plant. At 5:30 p.m., June 19, 1984, the river crested at 897' 6". At approximately 5:00 a.m., June 21, 1984, the river level decreased to less than 897'. The licensee terminated the Notification of Unusual Event at 1:18 p.m. after being assured by the U.S. Weather Service that the river level would continue to decrease.

The NRC monitored onsite licensee actions on a 24-hour per day basis from June 14-17, 1984. Onsite NRC coverage was provided by the SRI, regional inspectors, and the SRI from Fort Calhoun Nuclear Station. The inspectors notified NRC Region IV of initial licensee actions and implementation of their Emergency Plan. They supplied supplementary information to NRC RIV as necessary throughout the event.

Specific activities monitored by onsite NRC personnel included:

. Identification of Technical Specification LCOs applicable to increasing river level.

. Appropriate and timely implementation of CNS Flood Procedure 5.1.3 by the licensee.

. Implementation of the CNS Emergency Plan including appropriate event classification and notifications of the NRC and offsite agencies.

The NRC inspectors performed followup inspections and review of the below listed data, procedures, and events:

- Review of control room logs and data sheets for complete, precise, and timely entry of significant events, data, and information.

- Review of procedures and checklists applicable to the declaration of and termination of the Unusual Event.

- Review of licensee followup reports to the NRC. Reference the event summary that was submitted to the NRC in a letter to Mr. J. T. Collins (NRC) from Mr. P. Thomason (NPPD) dated June 22, 1984.

- Measurement of river levels.

- Review of the following EPIPs:

EPIP 5.7.1	Attachment B	Classification Checklist
EPIP 5.7.1	Attachment C	Classification Guide
EPIP 5.7.2	Attachment A	Notification of Unusual Event Implementing Procedure Checklist
EPIP 5.7.6	Attachment A	Nuclear Power Plant Incident Initial Report
EPIP 5.7.6	Attachment C	Emergency Notification Call Checklist
EPIP 5.7.6	Attachment F	Emergency Notification Board

- Procedure 1.27, Attachment A, Notification of Significant Events Checklist (Per 10 CFR 50.72).

- Minutes of Safety Operations Review Committee (SORC) meetings applicable to changing river level conditions.

The NRC inspectors took independent measurements of the river level at the Plant Intake Structure and performed calculations of available onsite water storage capabilities of the liquid waste system sumps and tanks, rad-waste building lower floor, and torus room area. They also inspected for erosion of the river bank and levees located in structural integrety checks of the primary and secondary flood barriers installed by the licensee and monitored the condition of the Plant Intake Structure which is located on the river's edge. Hourly communications was established with NRC RIV staff personnel and periodically with the NRC Operations Center in order to provide the NRC with the most recent updated condition of the licensee's protective measures, changing weather conditions, and increasing river levels.

While reviewing licensee actions required by the CNS Technical Specification, FSAR, and Flood Procedure 5.1.3, the SRI discovered an apparent unreviewed safety question. In answer to question 2.34 of Amendment 17 to the licensee's FSAR, the licensee committed to the following:

- A site flood control procedure would be prepared (reference CNS Procedure 5.1.3).

- Two portable gasoline powered pumps required for implementing the flood control procedure will be maintained onsite.

Contrary to the above, at 11:30 a.m. on June 14, 1984, the SRI identified that only one portable gasoline powered pump was onsite. Also, the SRI discovered that Procedure 5.1.3, Attachment E, "Flood Control-Bill of Material," identified the necessity for maintaining only one gasoline powered pump onsite. The licensee's failure to perform a safety review prior to reducing the number of onsite located FSAR required gasoline powered pumps from two to one constitutes a Severity Level IV Violation. (298/8411-02)

The SRI notified the CNS Emergency Director and Division Manager of Nuclear Operations of the shortage of onsite gasoline powered pumps at 12:00 p.m. on June 14, 1984. By 2:00 p.m., June 14, 1984, the licensee had a second gasoline powered pump onsite. That same day, the licensee purchased two new gasoline powered pumps that are to be dedicated to potential or actual river flooding conditions only.

The NRC inspectors performed the above observations, reviews, and follow-up, and determined that licensee performed all other actions required by the Technical Specification, operating procedures, and the CNS Emergency Plan.

7. Preparation For Refueling

The SRI observed the receipt, handling, inspection, and temporary storage of new fuel received onsite by the licensee on June 13, 1984, (shipment No. 2). The shipment consisted of 15 packages, each containing two fuel bundles. The SRI performed independent radiation and contamination surveys of the transport vehicle; outer wooden shipping containers; inner metal shipping containers; handling and storage areas; and also inspected the physical condition of the slings, cables, handling tools, shipping containers, and transport vehicle truck and trailer.

Included in the above SRI observations, independent inspections, and radiological surveys were the following packages:

Outer Shipping Containers	Inner Shipping Containers
2865	2755
0279	0851
0434	0508
1096	2211
3119	2393
3061	3125

2562	1279
0652	0022
2195	3109
3229	0263
2396	3663

The SRI compared the labels on the outer and inner shipping containers with the G. E. Domestic Memo of Shipment, No. 33485063, for serial numbers of the fuel bundles contained within the above containers. Also included in the labeling/serial number verification checks were the following packages:

Outer Shipping Containers	Inner Shipping Containers
3264	2502
3316	2205
2802	2250
2132	1038

The NRC inspector reviewed the following licensee documentation applicable to the receipt, handling, inspection, and storage of new fuel:

a. Radiation and contamination surveys performed on June 13, 1984. Items surveyed included the transport vehicle, outer wooden shipping containers, inner metal shipping containers, and the transport vehicle unloading area.

b. New fuel shipping and receiving documents; including vendor supplied Radioactive Materials Packaging and Shipping Record; Fuel Bundle Shipping Document; Domestic Memo of Shipment; Radiation Survey Report; Bill of Lading; Project Quality Certifications; labeling and instructions for empty radioactive materials shipping containers; and DOE/NRC-741, "Special Nuclear Material Transfer Document."

c. CNS Fuel Handling and Accountability, Procedure 3.1, Attachment A, "Special Nuclear Material Transfer Forms."

d. CNS Fuel Handling and Accountability, Procedure 3.2, Attachment C, "Radiation Survey of Metal Shipping Containers."

The SRI reviewed the following plant procedures applicable to the receipt, handling, inspection, transfer, and storage of new fuel assemblies:

. 3.1 - Rev. 15, Special Nuclear Materials Control and Accountability Instructions

. 3.2 - Rev. 16, Receiving and Handling Unirradicated Fuel

These reviews, observations, and independent surveys were performed to verify that the licensee has approved and technically adequate procedures available for use during fuel receipt, handling, inspection, and storage activities; and that licensee personnel adhered to the procedures during the performance of those activities. The SRI inspector also verified that documentation of activities relating to new fuel inspection, transfer, storage, inventory, accountability, and traceability were complete and accurate.

No violations or deviations were identified in this area.

8. Annual Emergency Preparedness Exercise

The CNS annual emergency exercise occurred in two parts. The first part took place during the evening hours of May 15, 1984. The second part occurred between 4:00 a.m. and 2:36 p.m. on May 16, 1984.

The SRI acted as an NRC observer in the control room and technical support center areas. Specific comments provided by the SRI are documented in NRC Inspection Report 50-298/84-08.

On May 17, 1984, the SRI attended the licensee's critique of the exercise to ensure that personnel participating in the exercise and the NPPD exercise observers were given the opportunity to express their specific comments and recommendations. The SRI reviewed the minutes of the CNS Safety Operations Review Committee meeting conducted May 17, 1984, to verify that an adequate review and evaluation of the exercise was performed by plant management.

No violations or deviations were identified by the SRI in this area.

9. Followup of Previously Identified Items

Unresolved Item 8332-03 (Closed): Complete Review of Abnormal Occurrences and Emergency Procedures.

The SRI has verified that all senior licensed operators, who are not assigned to shifts and who intend on maintaining their licenses, have completed their required review of abnormal occurrences and emergency procedures. This item is considered closed.

10. BWR Recirculation System Piping Replacement

The SRI, with selected NRC Region IV inspectors, travelled to NRC Region II Office, Hatch Nuclear Station, NPPD General Office, and CNS to interview personnel and/or to perform inspection of activities planned, in progress, or completed relevant to BWR recirculation system piping replacement.

Location	Period
NRC Region II Office	June 18-19, 1984
Hatch Nuclear Station	June 20-21, 1984
NPPD General Office	June 25-27, 1984
CNS	June 28-29, 1984

The purposes of the above trips were to:

- Gain information concerning the NRC inspection effort and oversight dedicated to the Hatch Nuclear Station by NRC Region II personnel.

- Discuss with representatives of the Georgia Power Company and its contracted organizations, their initial planning, implementation, and followup plans of the recirculation system piping replacement project that is near completion at the Hatch Nuclear Station.

- Discuss with NPPD management and general office personnel, the licensee's preoutage planning and scheduling of the CNS recirculation system piping replacement activities that will commence during the fall of 1984.

- Meet with CNS project personnel and onsite located contractors to discuss and review schedules, procedures, and organizational structures which will be dedicated to the CNS recirculation system piping replacement project.

CNS is scheduled to shutdown in September 1984, and remain shutdown for approximately 8 months, to perform refueling operations, recirculation system piping replacement, and to perform other modifications and maintenance to plant equipment.

The SRI has observed that purchase of materials, project staffing, procedures and plans development, and scheduling of activities are still in progress. Concentrated preoutage reviews and inspections will be conducted by NRC personnel to ascertain the licensee's capabilities and readiness to enter into the planned outage.

Other comments applicable to the above interviews and inspections are documented in NRC Inspection Report 50-298/84-14.

No violations or deviations were identified by the SRI in this area.

11. Exit Meetings

Exit meetings were conducted at the conclusion of each portion of the inspection. The division manager of nuclear operations was informed of the above findings.