

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/84-15

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: July 1 - August 31, 1984

Inspectors:

D. L. DuBois

D. L. DuBois, Senior Resident Inspector (SRI)

9/28/84
Date

C. Abigail Evans

C. Abigail Evans, Physical Protection Specialist

10-5-84
Date

Russell Wise

Russell Wise, Radiation Specialist

10-5-84
Date

Approved:

R. Hall

R. Hall, Acting Chief, Physical Protection Section

10-5-84
Date

B. Murray

B. Murray, Chief, Facilities Radiological
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10-5-84
Date

J. P. Jaudon

J. P. Jaudon, Chief, Project Section A,
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10/17/84
Date

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Inspection Summary

Inspection Conducted July 1 - August 31, 1984 (Report 50-293/84-15)

Areas Inspected: Routine, announced inspection of operational safety verifications, monthly surveillance and maintenance observations, licensee event followup, plant trips - safety system challenges, refueling preparation, spent fuel shipping, and BWR recirculation system piping replacement. The inspection involved 156 inspector-hours onsite by three NRC inspectors.

Results: Within the eight areas inspected, one violation was identified (failure to perform accurately a part of Technical Specification required Surveillance Test 6.2.4.1, paragraph 2).

DETAILS

1. Persons Contacted

Principal Licensee Personnel

- *L. Kuncl, Assistant General Manager - Nuclear
- *P. Thomason, Division Manager of Nuclear Operations
- *K. Wire, Operations Manager
- *V. Wolstenholm, QA Manager
- *J. Meacham, Technical Manager
- *D. Whitman, Technical Staff Manager
 - J. Sayer, Staff Assistant - ALARA/IGSCC
 - L. Roder, Administrative Services Manager
- *C. Goings, Regulatory Compliance Specialist
 - R. Brungardt, Operations Supervisor
 - J. Flaherty, Lead Mechanical Engineer
 - W. Ward, Security Specialist - NPPD
 - F. Reavis, Security Supervisor - CNS
 - M. Hamm, Security Specialist - CNS
 - G. Horn, Construction Manager - CNS
 - L. Bednar, Electrical/I&C Supervisor
 - M. Edgerton, Shift Supervisor
 - G. Mace, Plant Engineering Supervisor

The NRC inspectors also interviewed other licensee and contractor personnel.

*Indicates presence at exit meeting.

2. Operational Safety Verification

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

- "A" and "B" Diesel Generators Starting Air Systems
- "A" Core Spray System
- "A" and "B" 115 VDC Battery Rooms Ventilation Systems
- Reactor Core Isolation Cooling System Pump
- Snubbers - N.E. Quadrant of the Reactor Building

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.

On July 18, 1984, while reviewing daily control room log sheets and surveillance tests, the SRI noted an off-normal data entry on Surveillance Procedure (SP) 6.2.4.1, "Daily Surveillance (Technical Specification)." Specifically, the data entry of concern was located on Attachment A, "Operations Daily Surveillance Log", page 13 of 15, "Standby Liquid Control System and REC Head Tank Level Checks," Item 2. Item 2 states, "Solution temperature (TIC-48 Rack 25-19): _____ (Minimum Temperature 85°F)."

The value of the data entered in the blank of Item 2 was obtained by an unlicensed station operator (SO) during his tour of the reactor building and was initially recorded as 104°F on the SO's reactor area log sheet, Attachment B, page 3, of Procedure 2.1.11. When the SO returned to the control room, he incorrectly transferred a solution temperature value of 70° instead of 104°F to Item 2 of SP 6.2.4.1, Attachment A, page 13 of 15. The SO signed his name below Item 2 at 1:55 a.m..

It should be noted that the Standby Liquid Control System entries on page 13 of 15 do not require a review by a licensed operator. An engineering review is required after the log sheets are completed. After the SRI brought the error to the attention of the on-shift SRO, the log entry was corrected to read 104°F.

CNS Technical Specifications, Section 3.4.C.2, requires that liquid control solution temperature be maintained above the curve shown in Figure 3.4.2. Although it was subsequently determined that the actual solution temperature met the Technical Specification requirement, the initial entry of 70°F should have been immediately recognized as out-of-specification and appropriate corrective measures implemented.

The failure to perform accurately and to interpret properly the CNS Technical Specification required by SP 6.2.4.1, as stated above, constitutes a Severity Level IV Violation. (8415-01)

The SRI observed a reactor startup and heatup on August 10, 1984. The startup was performed following an automatic reactor scram that occurred at 4:38 p.m. on August 8, 1984 (see paragraph 6 for details). The SRI observed that shift crew manning requirements were met, technical Specification required pre-startup checks were completed satisfactorily, operating personnel adhered to approved operating procedures, and the licensee provided observation and hands-on experience to licensed personnel and licensee trainees. The reactor achieved criticality at 5:10 a.m., August 10, 1984.

The SRI observed performance of the following plant procedures during the reactor startup and heatup:

- 2.1.1 Cold Startup Procedure
- 2.1.3 Approach to Critical
- 2.1.15 Reactor Recirculation Pump Operation
- 2.2.56 Main Steam and Turbine Bypass System
- 2.2.77 Turbine Generator

The SRI reviewed the following completed plant procedures which were performed as a result of the August 1984, scram and August 10, 1984, startup:

- 2.1.1.2 Technical Specifications Pre-Startup Checks
- 2.1.2 Scram Recovery Checklist, Attachment A
- 2.1.4 Normal Shutdown from Power
- 2.1.5 Emergency Shutdown From Power, Attachment A
- 6.1.1 Skt⁴ Functional Test (Reactor not in run)
- 6.3.10.13 North and South SDV Vent and Drain Valves Cycling Open Verification, and Timing Test

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 prerequisites 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.

The SRI observed the performance of the following surveillance tests:

- 6.1.2 IRM Functional Test (Mode Switch not in run)
- 6.1.24 Rod Worth Minimizer Functional Test for Startup
- 6.1.26 Rod Sequence Control System Functional Test for Startup
- 6.2.4.1 Daily Surveillance (Technical Specifications)

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 by the SRI for proper placement/restoration of affected components:

- 84-394 "C" Service Water Pump
- 84-463 HPCI Auxiliary Oil Pump

Included with the above were checks for availability of redundant equipment, adequate 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.

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.

No violations or deviations were identified in this area.

5. Licensee Event Report Followup (LER)

The following LERs are closed on the basis of the SRI's inoffice review, review of licensee documentation, and discussions with licensee personnel:

- LER 84-006 Unmonitored Plant Off-Gas Stack Release
- LER 84-007 Inoperable Standby Gas Treatment System

- LER 84-008 Unmonitored Radioactive Liquid Discharge
- LER 84-009 Technical Specification Requirement/APRM Flow Bias Unit Operations Conflict

6. Plant Trips - Safety System Challenges

The SRI reviewed records and interviewed plant personnel concerning an unscheduled reactor scram that occurred on August 8, 1984, at 4:38 p.m. (Scram Report 84-05). The reactor was operating at 91% of rated power, normal operating conditions prior to the scram.

High plant area room temperature was being experienced due to the hot, summer conditions existing at the immediate site area. Inplant ventilation systems' capabilities have been historically marginal during the hottest period of the summers for basically two reasons: river water temperature is at its maximum (river water is used to cool heat exchangers that are used in the plant ventilation cooling systems); and outside air that is drawn into the plant ventilation intake ducts is also very hot.

Approximately 1 hour prior to the scram, the licensee began experiencing intermittent actuation of main steam line leak detection high temperature trip switches from the area of the steam tunnel. Investigation indicated that no steam leaks existed but did reveal that the steam tunnel air temperature was very hot. Portable fans were being placed in the steam tunnel to supplement normal ventilation when Group I isolation channels B and C tripped, thus causing an immediate closure of all main steam isolation valves (MSIVs) which, in turn, actuated an automatic reactor scram.

Following the scram, the plant operators maintained reactor water inventory by manual operation of the reactor core isolation cooling pump (RCIC). Reactor pressure control was automatically provided by the low-low set feature of the automatic depressurization system (ADS). Operators were required to reenergize nonvital 4160 VAC busses when they failed to automatically transfer to the startup transformer following the loss of the main generator. Vital 4160 VAC busses automatically transferred to the emergency transformer as required. Both emergency diesels automatically started but were not required to supply power to Vital 4160 VAC busses due to successful transfer of those busses to their emergency source. No other safety systems were required to operate. The plant was restarted and returned to power on August 10, 1984.

The SRI conducted interviews with plant personnel and reviewed control room records, indicators, recorders, and computer logs applicable to the automatic reactor scram. The SRI verified that the plant responded as designed, that plant personnel performed appropriate immediate and followup corrective actions, and that no unreviewed safety questions existed.

The SRI reviewed Station Operations Review Committee (SORC) meeting minutes Nos. 298, 299, and 300 dated August 9 and August 10, 1984, respectively. The purpose of the review was to ensure that the licensee had thoroughly reviewed the above scram and that these reviews, inspections, special tests, and surveillances indicated that plant startup could be authorized.

Prior to plant startup the licensee performed the following:

- Replaced an overheated General Electric (GE) 120 VAC type HFA relay, RPS-REL-5A-K4D, which is used for actuation of primary containment high pressure protection (reference Nonconformance Report (NCR) 002676 dated August 10, 1984).
- Successfully tested the automatic transfer feature of the nonvital 4160 VAC busses per Maintenance Work Request 84-1706 (reference NCR 002664 dated August 9, 1984, and SORC Meeting No. 298 dated August 9, 1984).
- Replaced 16 main steam line break temperature detectors and raised the trip setpoints for all detectors to 193°F. The Technical Specification required setpoint is <200°F (reference NCR 002666 dated August 9, 1984).
- Prestartup surveillance procedures and prestartup checks.

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

No violations or deviations were identified in this area.

7. Refueling Preparation

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

- 3.1 Special Nuclear Materials Control and Accountability Instructions
- 3.2 Receiving and Handling Unirradiated Fuel
- 3.3 Inspection and Channeling of Unirradiated Fuel

The SRI reviewed the following completed licensee documentation which is applicable to the inspection, transfer, and storage of new fuel assemblies:

- 3.1 Attachment A, Fuel Movement Data Sheet - SNM Transfer other than Refueling Outage
- 3.3 Attachment A, Fuel Assemblies Check Sheet
- G.E. Customer Site Receiving Inspection Record - Fuel Bundles; G. E. Form QC-152 (4/82).

On July 23, 1984, the SRI observed the following licensee activities associated with the handling, inspection, transfer, and storage of new fuel assemblies:

- Removal from metal shipping containers (MSC).
- Transfer to the inspection stand and subsequently to storage in the spent fuel pool.
- Removal of plastic shipping spacers.
- General inspection and cleaning of new fuel.
- Dimensional measurements taken of fuel rod spacings, spring lengths, channel spacing, and channel fastener torque.
- Channeling of fuel bundles in the new fuel inspection stand.

<u>MSC No.</u>	<u>Fuel Bundle No.</u>	<u>Channel No.</u>
1-0626	LY 6448	3850 D
1-0626	LY 6461	3998 D
1-2278	LY 6462	4090 D
1-2278	LY 6466	4075 D

The reviews and observations were performed to verify that the licensee had approved and had available technically adequate procedures for use during fuel handling, inspection, and storage activities; and that licensee personnel adhered to those procedures during the performance of those activities. The SRI also verified that documentation of the above activities was complete and accurate.

No violations or deviations were identified in this area.

8. Spent Fuel Shipment

The SRI, in accompaniment with an NRC Region IV based physical security specialist and a radiation specialist, performed a special inspection associated with the licensee's preparations for shipment of spent fuel from CNS. Included in the inspection were observations and reviews of

applicable procedures, documentation, surveys, inspections, and shipping document preparation.

The NRC inspectors verified by review of licensee documentation, through discussions with responsible personnel, and by independent inspection that the licensee completed the following:

- Shipping documents
- Notification of affected state governors
- Proper placarding of the transport vehicles
- Appropriate labeling of the spent fuel shipping casks
- Establishment of provisions for response by escorts and local law enforcement agencies
- Testing of communications systems
- Training of on-board escort personnel
- Proper loading, testing, and sealing of the spent fuel shipping casks
- U. S. Department of Energy and U. S. Nuclear Regulatory Commission "Nuclear Material Transaction Report," DOE/NRC Form 741, signed and dated August 22, 1984
- Bill of Lading, signed and dated August 22, 1984
- CNS Procedure 9.5.3.7, Attachment B, HP-14A, Radioactive Material Shipment Record, signed and dated August 22, 1984
- CNS HP-138, Contamination Survey - Sample Count Data Sheets
- CNS HP-141, Contamination Survey - Railroad Car for IF 300 Irradiated Fuel Shipping Cask
- CNS HP-142, Contamination Survey - IF 300 Shipping Cask
- CNS HP-143, Radiation Survey - IF 300 Shipping Cask
- CNS HP-302, Contamination Survey - Tennelec Sample Count Data Sheet

Independent radiation and contamination surveys were performed by the NRC inspectors. Surveys of the following were performed and verified to be satisfactory:

- Contact radiation surveys of the shipping casks
- Radiation surveys at a distance of three meters from the transport vehicles
- Radiation surveys adjacent to occupied passenger compartments that were located adjacent to the cask rail cars
- Contamination surveys of the shipping casks surfaces
- Contamination surveys of the cask transport vehicles

The SRI reviewed CNS Procedure 3.7, Revision 6, dated August 6, 1984, for detail and technical adequacy. The licensee incorporated into Procedure 3.7 specific handling instructions for the G.E. Type IF 300 spent fuel shipping cask. Also included within Procedure 3.7 is Attachment E, "Handling and Loading of IF300 Spent Fuel Shipping Cask Data Sheet." The data sheet provided two functions: it identified important steps used in the receipt, inspection, preparation, movement, loading, leak testing, decontamination, loading of the cask onto the transport vehicle, and final preparation for shipping; and it provided a checkoff list including spaces for signatures and/or initials of personnel who perform or witness the performance of key steps of the procedure. The SRI verified that Attachment E of Procedure 3.7 was properly completed, signed, and dated.

The NRC inspectors attended a special meeting conducted on-site by the licensee at 8:00 p.m., August 22, 1984. Attendees included representatives from the shipper, NPPD board of directors, and federal and state agencies. The meeting consisted of a final review of licensee preparations and documentation of activities relevant to the shipment of the spent fuel from CNS. The licensee determined that all preparations and requirements were completed. The spent fuel shipment left the CNS at approximately 10:00 p.m. on August 22, 1984, and arrived at the G.E. Morris Operation Complex, Morris, Illinois, on August 24, 1984. The shipment consisted of 3 spent fuel shipping casks, each of which contained 18 spent fuel bundles. The spent fuel cask identification numbers were:

- USA/9001/B F301
- USA/9001/B F302
- USA/9001/B F304

The observations, reviews, and independent inspections were conducted to verify that spent fuel handling and shipment operations were in

conformance with the requirements established in the CNS Operating License and Technical Specifications.

No violations or deviations were identified in this area.

S. BWR Recirculation System Piping Replacement

The SRI traveled to the NRC Region IV office located at Arlington, Texas, and to NRC Headquarters at Bethesda, Maryland, during this inspection period. The purposes of both trips were to present and to receive recent information concerning the upcoming recirculation system piping replacement activities that are to commence at CNS following the scheduled September 24, 1984, plant shutdown. The duration of the outage is expected to last approximately 8 months.

On July 5, 1984, the SRI traveled to the NRC Region IV office to attend a meeting with Mr. John T. Collins, NRC Region IV Administrator, and selected members of the regional staff. The purposes of the meeting were to:

- Receive information from the SRI which he acquired during his trips to NRC Region II office, Hatch Nuclear Station, and the NPPD General Office, during June, 1984. Hatch Nuclear Station underwent recirculation system piping replacement from spring to summer of 1984. CNS will undergo recirculation system piping replacement during the winter of 1984 through the spring of 1985.
- Discuss NPPD's plans and schedules for the upcoming 8 month outage.
- Review the status of NPPD's preparation for the outage including staffing, procedure development, training, and procurement of materials.
- Discuss NRC inspections and manpower needs as they relate to the upcoming outage.

On July 12, 1984, the SRI attended a meeting at NRC Headquarters, Bethesda, Maryland. The meeting consisted of a presentation by NPPD to NRC personnel in attendance which included the following subjects:

- An overview of the CNS recirculation system piping replacement project.
- A discussion of the piping installation including weld techniques, procedures, equipment qualification, and post installation/preoperational test program.

- The proposed ALARA program including methods and techniques for implementation.
- Technical Specification revisions that would become necessary as a result of the recirculation system modifications.
- An open discussion period which provided the NRC an opportunity to ask questions and express concerns to the licensee relative to the overall piping replacement project.

No violations or deviations were identified in this area.

10. 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.