

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-298/84-18

License: DPR-46

Docket: 50-298

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: September 1-30, 1984

Inspector: J. P. Jaudon  
for D. L. DuBois, Senior Resident Inspector (SRI)

10/31/84  
Date

Approved: J. P. Jaudon  
J. P. Jaudon, Chief, Project Section A,  
Reactor Project Branch (RPB) 1

10/31/84  
Date

Inspection Summary

Inspection Conducted September 1-30, 1984 (Report 50-298/84-18)

Areas Inspected: Routine, announced inspection of operational safety verifications, monthly surveillance and maintenance observations, licensee event followup, core power distribution limits surveillance, local power range monitor system calibration, average power range monitor system calibration, core thermal power evaluation, refueling activities, spent fuel pool activities, plant shutdown, and a management meeting with the licensee. The inspection involved 60 inspector-hours onsite by one NRC inspector.

Results: Within the 12 areas inspected, one violation was identified (failure to follow procedure in accomplishing Technical Specification required Surveillance Procedure 6.3.9.4, paragraph 2).

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DETAILS

1. Persons Contacted

Principal Licensee Personnel

- \*L. Kunc1, Assistant General Manager - Nuclear
- \*P. Thomason, Division Manager of Nuclear Operations
- \*K. Wire, Operations Manager
- \*J. Pilant, Manager, Technical Staff, Nuclear Power Group
- V. Wolstenholm, Quality Assurance Manager
- C. Goings, Regulatory Compliance Specialist
- R. Brungardt, Operations Supervisor
- G. Horn, Construction Manager - CNS
- G. Mace, Plant Engineering Supervisor
- R. Beilke, C&HP Supervisor
- D. Reeves, Training Manager
- J. Scheuerman, Lead Reactor Engineer
- M. Unruh, Maintenance Planner/Scheduler
- R. Gardner, Surveillance Coordinator

NRC

- \*P. Check, RIV Deputy Administrator
- \*E. Johnson, Chief, RPBI
- \*J. Jaudon, Chief, Project Section A, RPBI
- \*R. Cooley, Chief, Operator Licensing
- \*T. Westerman, Enforcement Officer
- \*D. DuBois, SRI

The NRC inspector also interviewed other licensee and contractor personnel.

\*Indicates presence at the NRC/licensee management meeting on September 25, 1984.

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:

- Offsite Power Sources
- 4160 VAC Vital Electrical Distribution 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 and, 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.

During the midnight to 8:00 a.m. shift on September 1, 1984, the licensee performed Surveillance Procedure 6.3.9.4, "Main Steam Isolation Valves Operability Test." Procedure 6.3.9.4, Section VIII.A.4, states, "Place the control switch, on Panel 9-3, for the selected MSIV to CLOSE and start the stopwatch.

- a. Check that the green CLOSED indicating lights come on.
- b. Check that the red OPEN indicating lights go out.
- c. Time required to close is 3-to-5 seconds. Record the data.
- d. Check that F16-88A (F16-88B), (F16-88C), (F16-88D) falls to zero on Panel 9-5 and record data.
- e. Check that both RPS relays on Panels 9-15 and 9-17 deenergize."

When MSIV 86A was closed, only intermediate valve position indication was obtained; i.e., simultaneous illumination of the green and red indicating lights. The licensee did observe that Main Steam Line "A" Flow Indicator FI-88A indicated essentially zero while MSIV 86A was closed. The shift supervisor determined that MSIV 86A valve position indication was not working properly and initiated Maintenance Work Request 84-2068 which identified the problem and requested that it be repaired. The licensee subsequently reopened MSIV 86A and repeated the test, but the valve still indicated an intermediate position when it was closed. MSIV 86A closure time was obtained during the second test using the change in steam flow as indicated on FI-88A. MSIV 86A was subsequently reopened and normal power operation was resumed. Nonconformance Report 002682 was initiated on September 4, 1984, to document and track the position indication problem.

The failure to obtain MSIV 86A closure time as delineated in Step VIII.A.4 of Procedure 6.3.9.4 as stated above, constitutes an apparent violation. (298/8418-01)

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. These observations verified that:

- Test prerequisites were completed
- Testing was performed in accordance with approved procedures
- Test instrumentation was in calibration
- Limiting conditions for operation were met
- Return to service was accomplished
- Test results were reviewed

It was also noted that when deficiencies were identified during surveillance testing, these were corrected.

No violations or deviations were identified in this area.

4. Monthly Maintenance Observations

The SRI observed preventative and corrective maintenance activities during this inspection period. Observations made included checks for the availability of redundant equipment and for adequate isolation and clearance. The SRI also found that the work was accomplished by qualified personnel in accordance with approved procedures and the Technical Specification requirements. Additionally, the performance of quality control checks and the adequacy of health physics coverage were verified, as were appropriate cleanliness controls. The SRI monitored postmaintenance surveillance and other testing, which established the operability of affected systems and components.

No violations or deviations were identified in this area.

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 discussions with licensee personnel:

- LER 84-010, "Reactor Trip"

6. Core Power Distribution Limits Surveillance

The SRI conducted discussions with CNS reactor engineers and operations department personnel, reviewed records and data applicable to core thermal limits, and verified that appropriate corrective actions were taken when core thermal data indicated an approach to limiting conditions. The review and discussions included the following:

- Verification that the linear heat generation rate (LHGR), core maximum peaking factors, minimum critical power ratio, and average plant linear heat generation rate were within prescribed Technical Specification limits.

- Examinations of local power range monitor (LPRM) and BASE distribution calculations as typed out by the OD-1, "LPRM Calibration and Base Data," on-demand typewriter. Typed alarms, errors, and other inprocess messages were also reviewed.
- Verification that traversing incore probe (TIP) machine normalization factors were properly obtained.
- Examination of licensee procedures for ascertaining operation within licensed limits, should the process computer become unavailable.
- Verification that average power range monitor (APRM) channel gains were adjusted as necessary following an LPRM calibration.
- Verification that following an APRM gain adjustment, a subsequent P-1 was run to assure that APRM gain adjustment factor reflected such gain adjustments.
- Examination of licensee procedures which are used to correct abnormal core thermal conditions.

The following computer printouts edited from June 1-September 15, 1984, were reviewed:

- OD-1, "LPRM Calibration and BASE Data"
- OD-3, "Core Thermal Power and APRM Calibration"
- OD-5, "Thermal Data Specified Fuel Bundles"
- OD-7, "Control Rod Notch Positions"
- OD-8, "LPRM Console Readings"
- OD-16, "Target Exposure and Power Data"
- P-1, "Periodic Core Performance"

The following CNS procedures were reviewed:

- 10.4, Revision 7, "Core Thermal Hydraulic Evaluation"
- 10.7, Revision 8, "Maximum Average Planar and Peak Linear Heat Generation Rates and Minimum Critical Power Rates"
- 10.8, Revision 8, "Reactivity Follow Check"
- 10.9, Revision 13, "Control Rod Scram Time Evaluation"

- 10.10, Revision 6, "Limiting Control Rod Pattern Determination"
- 10.11, Revision 7, "Control Rod Sequence Exchange"
- 10.13, Revision 12, "Control Rod Sequence and Movement Control"

The reviews and discussions were conducted to verify that the plant is being operated within licensed power distribution limits.

No violations or deviations were identified in this area.

#### 7. LPRM System Calibration

The SRI reviewed records and procedures applicable to calibrations of the LPRM system which were performed during the period March 1-September 15, 1984. Included in the review was verification of the following:

- Performance of TIP intercalibration scans and core flux mapping.
- Accurate determination of individual LPRM calibration currents, calibration constants, and amplifier gain adjustment factors.
- Reactor thermal power was maintained within prescribed limits and control rod movement did not occur during the performance of the LPRM calibrations.
- All LPRM detector readings were obtained prior to and following LPRM amplifier gain adjustment.
- APRM channel recalibration followed the affected APRM channel(s) associated LPRM group adjustments.
- LPRM calibrations were performed at the required frequency.

The following CNS procedures were reviewed:

- 10.5, Revision 16, "LPRM Calibration"
- 10.14, Revision 4, "TIP Reproducibility and Core Power Symmetry Test (Beginning of Cycle)"

The reviews were conducted to verify that calibration of the LPRM system was performed in accordance with approved procedures and that the APRM system was recalibrated following an associated LPRM adjustment.

No violations or deviations were identified in this area.

#### 8. APRM System Calibration

The SRI reviewed licensee records and procedures applicable to calibration of the APRM system. Included in the review were the following:

- Verification that control rod positions and reactor core flow were held as constant as possible during data collection.
- Verification that APRM amplifier gains were adjusted to indicate the percent of rated power as determined by performance of CNS Procedure 10.1.
- Verification that data was correctly transferred from the following computer printouts to Attachment "A" of Procedure 10.1:
  - a. OD-3, "Core Thermal Power and APRM Calibration"
  - b. P-1, "Periodic Core Performance Log"

The following CNS procedure was reviewed:

- 10.1, Revision 14, "APRM Calibration"

The reviews were conducted to verify that the APRM system was properly calibrated to actual core thermal power using technically adequate and approved procedures.

No violations or deviations were identified in this area.

9. Core Thermal Power Evaluation

The SRI reviewed licensee records, data sheets, and procedures applicable to reactor core thermal power evaluation and performance which were conducted during the period March 1-September 15, 1984. The SRI verified the following:

- Procedure prerequisites were met prior to performing the core thermal power evaluations.
- Figures and curves corresponding to specific reactor conditions were interpreted properly and recorded on data forms.
- Calculations were correct.
- The evaluation frequency met CNS Technical Specification requirements.

The following CNS procedures were reviewed:

- 10.2, Revision 11, "IRM Power Calibration"
- 10.3, Revision 5, "Core Thermal Power Evaluation"
- 10.18, Revision 2, "Routine Core Performance Data Gathering"
- 10.19, Revision 2, "Guide for OD-1 and OD-2 Utilization"

The reviews were conducted to verify that CNS is operated within licensed core thermal power limits.

No violations or deviations were identified in this area.

10. Refueling Activities

The SRI observed fuel handling activities conducted September 23, 1984. He also reviewed licensee documentation associated with preparation, performance, and verification of actions required for refueling operations. The SRI verified the following:

- Surveillance testing was performed prior to and periodically during fuel handling operations.
- Secondary containment integrity was maintained.
- Precautions were taken to prevent foreign objects from falling into the reactor vessel and refueling cavity.
- Good housekeeping practices were maintained in the refueling area.
- Shift manning responsibilities and requirements were met.
- Continuous communications were maintained between the refueling bridge, refueling area, and the control room.
- Radiological precautions were observed.
- Fuel accountability status boards and records were maintained during refueling operations.
- A control point log in which a record of all handheld tools and equipment, used over the reactor vessel, was established and maintained.
- The reactor control mode selector switch remained in the REFUEL position.
- Control room operators monitored nuclear instrumentation and other core parameters for verification of reactor conditions.
- Fuel bundles and double blade guides were moved in accordance with approved procedures.

The SRI reviewed the following refueling related procedures:

- 2.2.31, Revision 6, "Fuel Handling - Refueling Platform"
- 3.5, Revision 18, "Refueling"



- 3.6, Revision 6, "Working Over or in Reactor Vessel Requirements"
- 5.3.5, Revision 4, "Refueling Floor High Radiation"

The SRI observed the removal of fuel bundles from the core and their transfer to the spent fuel pool (SFP) for storage as indicated below:

<u>Fuel Bundle No.</u>	<u>From Core Position</u>	<u>To SFP Storage Position</u>
LY3850	49-3c	7J1
LJD891	51-30	7K1
LJD893	51-32	3C3
LY2102	49-30	7L1
LY2032	49-28	7M1
LJD930	51-26	3D3
LJD895	51-28	3E3
LY2082	49-26	12A2
LY2085	49-24	12B2

The SRI observed the installation of double blade guides into the following reactor core positions:

- 49-32 and 51-30
- 49-28 and 51-26

The reviews and observations were conducted to verify that refueling activities were performed in accordance with the requirements established in the CNS Operating License and Technical Specifications.

No violations or deviations were identified in this area.

#### 11. Spent Fuel Pool Activities

The SRI observed that the following Technical Specification requirements were met during fuel handling activities:

- Spent Fuel Pool Water Level
- Spent Fuel Pool Ventilation
- Reactor Building Negative Pressure

No violations or deviations were identified in this area.

12. Plant Shutdown

The SRI reviewed control room records including log entries, computer printouts, and recorder traces associated with the conduct of a normal plant shutdown conducted on September 15, 1984. The shutdown was completed at 9:06 p.m. by the initiation of a manual reactor scram from approximately 30 percent power (reference Scram Report 84-06). The plant was subsequently cooled down and depressurized. The planned shutdown was performed in order to commence an extended outage period during which the reactor recirculation system piping is to be replaced.

This review was conducted to verify that plant shutdown was performed in conformance with established procedures. No violations or deviations were identified in this area.

13. NRC/Licensee Management Meeting

On September 25, 1984, Mr. P. S. Check, NRC Region IV Deputy Administrator, and members of the NRC Region IV staff held a management meeting with Mr. L. G. Kuncl, Assistant General Manager - Nuclear NPPD, and senior members of the NPPD general office and CNS site staff. The meeting was held at the NRC Region IV office for the purpose of discussing previously identified NRC findings in the area of safety-related surveillance test performance.

Specific findings discussed were:

- Violation 298/8404-01, "Failure to Accurately Perform a Part of Specification Required Surveillance Test 6.2.4.1"; e.g., daily jet pump operability check.
- Violation 298/8415-01, "Failure to Accurately Perform a Part of Technical Specification Required Surveillance Test 6.2.4.1"; e.g., standby liquid control system checks.
- Violation 298/8411-02, "Failure to Perform a Safety Review of a Change Made to the Facility," e.g., less than the required number of portable gasoline powered pumps available onsite.
- Violation 298/8418-01, "Failure to Follow Procedure while Accomplishing Technical Specification Required Surveillance"; e.g., main steam isolation valve operability test.

The basis for Violations 8404-01 and 8415-01 are similar and together indicate a trend of recurring problems in the area of surveillance test performance. Common problems have included:

- Entry of incorrect data onto surveillance test records.
- Failure to identify that the incorrect data did not meet Technical Specification requirements.

- An inadequate final review of the test data sheets by the shift supervisor and/or other designated reviewers.

The basis for Violation 8411-02 was a failure to review adequately commitments made in the Final Safety Analysis Report when it was subsequently revised and reissued as the Updated Safety Analysis Report.

Violation 8418-01 indicated that shift supervisory personnel did not make a conservative decision relative to Technical Specification requirements when a subsystem of a safety-related component did not operate normally. Also, the affected shift supervisors appeared to lack sensitivity with regards to the importance of implementing prompt troubleshooting methods and timely corrective actions when the safety-related problem was first observed with the subsystem. Licensee management was reminded that licensed personnel should believe the worst indication and implement corrective actions accordingly.

14. Exit Meetings

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