

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/90-38

Operating License: DPR-46

Docket: 50-298

Licensee: Nebraska Public Power District (NPPD)
P.O. Box 499
Columbus, Nebraska 68602-0499

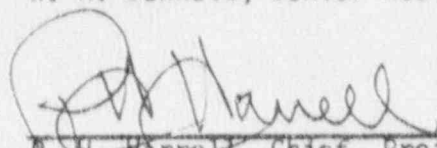
Facility Name: Cooper Nuclear Station (CNS)

Inspection At: CNS, Nemaha County, Nebraska

Inspection Conducted: November 27, 1990, through January 7, 1991

Inspectors: G. A. Pick, Resident Inspector
W. R. Bennett, Senior Resident Inspector

Approved:


R. H. Harrell, Chief, Project Section C

1-9-91
Date

Inspection Summary

Inspection Conducted November 27, 1990, through January 7, 1991
(Report 50-298/90-38)

Areas Inspected: Routine, unannounced inspection of operational safety verification, surveillance and maintenance observations, onsite followup of written reports, and followup of a previously identified inspection finding.

Results:

- ° The licensee made conservative preparations anticipating the annual drop in river level (paragraph 3.b).
- ° Good response was noted during observation of personnel responding to a fire drill (paragraph 3.d).
- ° Continued improvement was observed in the control and documentation of maintenance activities (paragraph 4.a).
- ° The licensee's on-the-job training of instrument and control (I&C) technicians continued to be a strength (paragraphs 5.a and 5.b).

- ° Adequate implementation of the maintenance and surveillance programs was noted.
- ° The licensee appeared to implement effective radiological control and security programs.

DETAILS

1. Persons Contacted

Principal Licensee Employees

- *J. M. Meacham, Division Manager of Nuclear Operations
- *E. M. Mace, Senior Manager of Staff Support
- *R. L. Gardner, Senior Manager of Operations
- *J. V. Sayer, Radiological Manager
- *B. A. Moeller, Acting Maintenance Manager
- *J. R. Flaherty, Engineering Manager
- *R. A. Jansky, Outage and Modifications Manager
- *H. T. Hitch, Plant Services Manager
- *R. Brungart, Operations Manager
- *C. H. Putnam, Senior Quality Assurance Specialist
- *L. E. Bray, Regulatory Compliance Specialist

The inspectors also contacted other personnel.

*Denotes those present during the exit interview conducted on January 7, 1991.

2. Plant Status

The plant operated at essentially 100 percent power throughout this inspection period.

3. Operational Safety Verification (71707)

- a. The inspectors observed operational activities throughout this inspection period. Proper control room staffing was maintained and control room professionalism and decorum were observed. Discussions with operators determined that they were cognizant of plant status and aware of the reason for each lit annunciator. The inspectors observed selected shift turnover meetings and noted that information concerning plant status and planned evolutions was properly communicated to the oncoming operators. The inspectors routinely verified, by visual inspection of emergency core cooling system valve indications, that the systems were maintained in a standby condition. The inspectors observed that all required limiting conditions for operation (LCO) were properly documented and tracked by the control room staff.
- b. Because low river levels have occurred during the previous 2 years, the licensee took actions to minimize potential problems concerning river level. A memo was issued to the operators reminding them of required actions to be taken as river level decreased. An additional level monitoring instrument was installed in the service water (SW) intake bay to be used if the river level decreased below 872 feet.

When the Corps of Engineers (Corps) decreased the release rate from the Gavins Point Dam, upstream of the CNS, to 10,000 cubic feet per second, the licensee began monitoring river level and release rate daily. The licensee contacted the Corps weekly to identify the expected release rate and river conditions for the upcoming week. From the weekly updates, a memo was prepared and distributed to various managers. The station operators logged river level each shift.

- c. The inspectors performed periodic tours of the reactor plant to verify proper system lineups and cleanliness. The inspectors periodically verified that electrical lineups were maintained for components needed to mitigate an accident. The inspectors determined that plant housekeeping had been maintained at an excellent level throughout this inspection period.
- d. On December 17, 1990, the inspector observed a fire brigade response to a simulated fire in the cable expansion room. All personnel responded and established communications within the required time. Each person donned the proper fire-fighting gear.
- e. The inspectors verified that selected activities of the licensee's radiological protection program were properly implemented. Radiation and contaminated areas were properly posted and controlled. Health physics (HP) personnel were observed touring work areas to ensure that the radiological protection program was properly implemented. Radiation work permits contained appropriate information to ensure that work could be performed in a safe and controlled manner.

On December 17 and 24, 1990, the inspector observed HP technicians perform the weekly functional checks of the personnel contamination monitors and the hand/foot monitors. No problems were identified.

On December 17 the inspector observed the torquing of the bolts on the radwaste container for Shipment 47. The torquing was witnessed by a properly qualified individual. The activity was controlled by Radwaste Procedure 2.5.4.4, "NUPAC Dewatering System," Revision 0.

- f. The inspectors observed security personnel perform vehicle, personnel, and package searches. Vehicles were properly authorized and controlled or escorted within the protected area (PA). The inspectors conducted site tours to ensure that compensatory measures were properly implemented. Personnel access was observed to be controlled in accordance with established procedures. The PA barrier was adequately illuminated and the isolation zones were free of transient materials.

In summary, the licensee made conservative preparations in anticipation of the annual drop in river level. Good response by all fire drill participants was observed.

4. Maintenance Observations (52703)

- a. During the period November 26-30, 1990, the inspector observed maintenance personnel perform a routine preventative maintenance (PM) overhaul of SW Pump D. This biennial PM (03925) was implemented by Maintenance Work Request (MWR) 90-4022, and the work was performed in accordance with Maintenance Procedure (MP) 6.2.15, "Service Water Pump Column Maintenance and Bowl Assembly Replacement," Revision 10, and MP 6.4.44.1, "AC Electric Motor Replacement and/or Rotation Test," Revision 0.

The inspector monitored the disassembly, inspection, and reassembly of the pump. All bearings and three bearing sleeves were replaced and a new pump bowl assembly installed. The removed sleeves had been tack welded; however, in response to questions by the licensee, the pump vendor recommended using set screws and a high strength metal adhesive to hold the sleeves onto the pump shaft. The licensee requested that a qualified welding procedure, or an alternative method for attaching the sleeves to the shaft, be prepared. The system engineer prepared detailed special work instructions for attaching the sleeves to the shaft. The special instructions were well written with appropriate signoffs and quality control (QC) holdpoints specified. The plant procedure provided sufficient guidance for the pump maintenance. The postmaintenance testing consisted of an inservice leak test for the replaced expansion boot and a full flow test including baseline inservice test (IST) data.

- b. On December 17 and 18, 1990, the inspector observed maintenance activities related to the installation of Service Water Booster Pump (SWBP) B in accordance with MWR 90-4018. The MWR was issued to implement routine PM 03951. The licensee installed the spare pump in accordance with MP 6.2.14, "RHR SWBP Overhaul and Replacement," Revision 13.

The machinists properly aligned the motor and pump shafts using the reverse dial indicator method. The SWBP postmaintenance testing included baseline IST vibration and differential pressure measurements. No problems were identified.

- c. During the SWBP B replacement, the licensee replaced the discharge check valve in accordance with MWR 90-4407, which implemented PM 00285. The 60-month PM called for inspection of the check valve; however, based on the previous inspection and performance of Special Test Procedure 85-009, the licensee decided to replace the check valve.

The licensee posted fire watches in accordance with the flame permit. The weld checklists specified the proper QC verifications. The postmaintenance testing for the replacement check valve involved running SWBP D while looking for reverse rotation of the SWBP B motor, which would indicate check valve back leakage.

During the check valve disassembly, the licensee identified backleakage from the SWBP B discharge gate valve. Subsequently, the licensee isolated the second SWBP in containment cooling Loop B to stop the flow of water and allow maintenance activities to proceed. This placed the plant in a 7-day LCO. Repairs to the check valve were performed on an around-the-clock basis. The work was completed in less than 36 hours.

In summary, control and documentation of work activities indicated continuing improvement in this area. The procedures and special instructions provided satisfactory guidance for conduct of the maintenance. Proper postmaintenance testing was specified.

5. Surveillance Observations (61726)

- a. On December 3, 1990, the inspector observed I&C technicians perform the functional test of the primary containment isolation system (PCIS) pressure switches that isolate the residual heat removal (RHR) system at pressures greater than 75 psig. The I&C technicians performed the Technical Specification (TS)-required surveillance in accordance with Surveillance Procedure (SP) 6.2.1.1, "PCIS Reactor High Pressure Calibration and Functional/Functional Test," Revision 16.

A trainee performed the necessary steps under observation of an experienced technician. The test equipment was within calibration. The trainee properly valved in and out of service the process instrument. Proper radiological practices were followed.

- b. On December 3, 1990, the inspector observed I&C technicians perform a functional test of core standby cooling system (CSCS) pressure switches that provide an open permissive signal to RHR and core spray (CS) valves and a close permissive signal for the reactor recirculation discharge valves. The technicians performed the TS-required functional test in accordance with SP 6.2.2.1.3, "CSCS Reactor Low Pressure Valve Permissive Calibration and Functional/Functional Test," Revision 19.

A trainee performed the surveillance while being observed by a qualified technician. The trainee followed proper radiological practices and paid attention to procedural details. Excellent communications were maintained between personnel at the test stations.

- c. On December 5, 1990, the inspector observed I&C technicians perform a calibration of Recirculation Loop B flow instruments. The calibration was performed as a result of changes in the gain factors for the loop flow units as determined by performance of Nuclear Performance Procedure 10.12, "Core Flow Determination." The I&C technicians performed the test in accordance with SP 6.1.18.1,

"Reactor Recirculation Flow Unit Quarterly Calibration and Functional Test," Revision 4.

All reviews and approvals were obtained prior to the start of the surveillance procedure. The I&C technicians performing this calibration knew the purpose of the test and the potential for impacting plant operations. All data was brought within operating limits. The technicians wrote a work item request to get the instrument repaired.

- d. On December 18, 1990, the inspector observed the functional test of PCIS main steam line, high-flow differential pressure instruments. The instruments initiate closure of the main steam isolation valves in the event of a steam line break. The technicians performed the TS-required test in accordance with SP 6.2.1.4.2, "PCIS Main Steam Line High Flow Calibration and Functional/Functional Test," Revision 22.

The technicians maintained continuous communications with other test personnel. The process instrument was properly removed and returned to service.

In summary, the licensee's on-the-job training program for I&C technicians continued to be a strength. The qualified technicians knew the potential effects their actions had on plant operations.

6. Onsite Followup of Written Reports (92700)

The following licensee event reports (LER) were reviewed to determine that corrective actions were accomplished and that actions were taken to prevent recurrence.

- a. (Closed) LER 298/88-024: Unplanned Actuation of the Group 6 Engineered Safety Feature (ESF) During Normal Operation Due to a Failed Zener Diode

Several successive Group 6 isolations (reactor building isolation/standby gas treatment system actuation) occurred due to intermittent tripping of a reactor building ventilation radiation monitor. An operator was stationed at the control panel to maintain the malfunctioning unit in reset condition while monitoring the other channel. The licensee's investigation determined that a Zener diode in the indicator/trip unit power supply had failed. This reduced the setpoint of the unit to background radiation levels which allowed the actuations to occur.

The licensee immediately replaced the failed component to prevent recurrence of the intermittent trips. The licensee modified the monthly surveillance procedure to require added voltage checks that will enable early detection of zener diode degradation.

The inspector verified the applicable procedures were modified to reflect the voltage checks. Additionally, the inspector's review determined the licensee's justification for the zener diode failure to be satisfactory.

b. (Closed) LER 298/89-005: AC Voltage Regulation Concerns Identified During an NRC Inspection

During the NRC's Safety System Functional Inspection (SSFI), performed in 1987, a number of nonconservative errors were identified in the licensee's, "Critical AC Voltage Regulation," study that rendered the results of the study invalid.

The licensee's response indicated that the offsite power sources would be adequate above certain minimum voltages, 165 kV and 65.55 kV, respectively. The actions taken to prevent recurrence included:

- (1) Modifying the CS and RHR logic circuits to require sequential, in lieu of simultaneous, pump starts when powered from the startup transformer. This change reduced the severity of the voltage transients during pump starts.
- (2) Verifying the reliability of the emergency offsite 69-kV line above a lower voltage limit of 66.7 kV.
- (3) Changing the administrative checklist in Engineering Procedure 3.4, "Station Modifications," to require the ac/dc load studies to be revised when altering electrical loads.
- (4) Adding annunciation to the control room panels that will actuate upon degraded conditions of the incoming emergency power source.

An SSFI followup inspection, conducted in February 1989, reviewed, in part, the updated load study calculation. Based on the sample selected, the inspection team found the load study to be satisfactory for voltages down to 480 Vac. From review of the input data, assumptions, and results of the study, the inspection team found the design of the emergency offsite power supply to be satisfactory. Review of activities related to the 120-Vac circuits as documented in NRC Inspection Report 50-298/89-22. The licensee had refined the 120-Vac load study and verified that the calculations were accurate by taking sample measurements.

During the past year, the inspector observed operators perform the SP that verified operation of the undervoltage relays. The inspector verified that the annunciators were installed in the control room and the administrative checklist in Engineering Procedure 3.4 was changed to require review of the load study, as necessary. From review of the diesel generator sequential loading procedure, the inspector determined that the RHR and CS pumps are not started simultaneously.

c. (Closed) LER 298/89-021: Undocumented Wiring Configurations Associated With Safety Related Equipment

During implementation of design change activities in April 1989, the licensee discovered an undocumented wiring configuration in conduits that contained process instrument wiring for differential pressure instruments.

The licensee initiated immediate corrective actions to identify the scope of the problem. After determining the scope of the problem, the licensee evaluated operability of the affected equipment while the plant was shut down. The licensee replaced all unqualified wiring prior to startup from the refueling outage. The licensee notified General Electric (GE) that this may be reportable in accordance with 10 CFR Part 21. The vendor responded that, due to the uniqueness of the environmental qualification requirements for individual facilities, GE did not have sufficient information to determine reportability. Subsequently, the vendor issued a memorandum notifying BWR owners that this might be a potentially reportable condition.

NRC followup of licensee actions are documented in NRC Inspection Report 50-298/89-22, paragraph 7. The licensee promptly reported this condition and implemented the necessary corrective actions. No problems were identified.

7. Followup of a Previously Identified Inspection Finding (92701)

(Open) Open Item 298/8809-01: Engineering Evaluations for Electrical Relay Replacement

This item concerned the failure to consider relay environment in determining the useable life of electrical relays. During a previous inspection, an inspector identified that predictive maintenance trending of relays had not been implemented. From discussions with the licensee, the inspector determined a procedure was being developed for use of recently acquired relay test equipment. The licensee planned to implement the trending of relays during the next refueling outage. This item remains open pending NRC review of the protective relay testing and trending program.

8. Exit Interview

An exit meeting was conducted on January 7, 1991, with licensee representatives identified in paragraph 1. During this interview, the inspectors reviewed the scope and findings of the inspection. Other meetings between the inspectors and licensee management were held periodically during the inspection period to discuss identified concerns. During the exit meeting, the licensee did not identify, as proprietary, any information provided to, or reviewed by, the inspectors.