

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/92-06 Operating License: DPR-46

Docket: 50-298

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

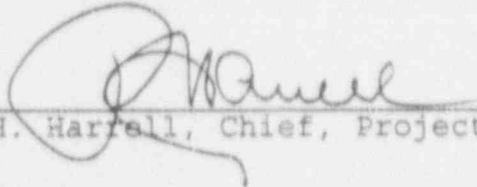
Facility Name: Cooper Nuclear Station

Inspection At: Brownville, Nebraska

Inspection Conducted: March 8 through April 18, 1992

Inspectors: R. A. Kopriva, Senior Resident Inspector
W. C. Walker, Resident Inspector
R. V. Azua, Resident Inspector, Fort Calhoun Station
M. L. McLean, Radiation Specialist, Nuclear
Materials Inspection Section

Approved:


P. H. Harrell, Chief, Project Section C

5-15-92

Date

Inspection Summary

Inspection conducted from March 8 through April 18, 1992
(Report 50-298/92-06)

Areas Inspected: Routine, unannounced inspection of onsite followup of events, operational safety verification, surveillance and maintenance observations, fitness-for-duty inspection, and management meetings.

Results:

- ° The licensee's response to the failure of Battery Charger B was satisfactory (paragraph 3).
- ° During review of the response by the onshift operators and management involvement to receiving numerous annunciator alarms was of concern in that weaknesses were identified with the use of repeat-back communications, generation of a nonconformance report to document the event, and management not being informed of the event (paragraph 4.a).

- ° Failure of a shift supervisor and plant operators to follow a special work permit, when working in a high radiation area, indicated a lack of respect by operations personnel for the radiological protection program (paragraph 4.b).
- ° Security personnel performed their duties in a satisfactory manner (paragraph 6.c).
- ° Good communication between operations personnel and maintenance personnel was observed during the performance of surveillance activities (paragraph 5.a and b).
- ° The fitness-for-duty program was being implemented in accordance with the requirements specified in 10 CFR Part 26 (paragraph 7).

DETAILS

1. Persons Contacted

R. L. Gardner, Division Manager of Nuclear Operations
C. M. Estes, Acting Senior Manager of Operations
J. V. Sayer, Radiological Manager
H. T. Hitch, Plant Services Manager
R. Brungart, Operations Manager
G. E. Smith, Quality Assurance Manager
R. W. Foust, Assistant Engineering Manager
R. L. Wenzl, Nuclear Engineering Department Site Manager
M. F. Young, Maintenance Supervisor
L. E. Bray, Regulatory Compliance Specialist

The above personnel attended the exit interview held on April 20, 1992. In addition to the above personnel, the inspectors also contacted additional personnel during this inspection period.

2. Plant Status

The plant operated at or near full power throughout this inspection period. At the end of this inspection period, the licensee was preparing to shut down the plant for a 6-day planned outage to replace several 250-Vdc battery cells that had been identified as having copper contamination. For details, see NRC Inspection Report 50-285/92-04.

3. Onsite Followup of Events (93702)

On April 7, 1992, at approximately 7:30 a.m., the licensee commenced a surveillance test on the 250-Vdc Battery B. After opening the battery charger cabinet door, the power supply breaker for the charger tripped open. An inspection of the cabinet was made and no evidence of a problem was identified.

The charger was then reenergized. The unit did not appear to load properly and the licensee started an investigation. The charger and the associated Battery B were declared inoperable and the Battery Charger B was removed from service. Battery Charger C, a spare charger, was placed in service to supply Battery B. Technical Specifications 3.5.A.5 and 3.5.F include requirements for the operability verification of both core spray subsystems, the low pressure coolant injection Subsystem A, and Diesel Generator No. 1. Additionally, since Battery B supplies

power to various high pressure coolant injection system components, the reactor core isolation cooling system was verified to be operable and operability of the automatic depressurization subsystem logic was demonstrated.

Based on the licensee's investigation, it appears that the battery charger was tripped by Relay K-3 on a high voltage signal. The licensee was considering further efforts to verify the cause of the K-3 relay actuation (i.e., using a two-channel recorder to monitor battery charger output voltages). Battery Charger B was subsequently returned to service and no additional problems occurred.

4. Operational Safety Verification (71707)

a. Control Room Observations

The inspectors observed operational activities throughout this inspection period. Proper control room staffing was maintained and control room professionalism and decorum were observed. Traffic into and out of the control room was kept to a minimum. Discussions with operators determined that they were cognizant of plant status. The inspectors observed selected shift turnover meetings and noted that excellent transfer of information concerning plant status and planned evolutions occurred between the offgoing and the oncoming shifts. The inspectors observed that Technical Specification limiting conditions for operation were properly documented and tracked by the control room staff.

On March 18, 1992, the inspectors were performing a routine walkdown of the control room panels, when approximately 60 annunciators actuated, indicating initiation of many of the emergency core cooling systems and a possible reactor trip. The actual indicators for plant operation did not change when the annunciators were actuated. The licensee determined that a multiplexing card in the computer system responsible for annunciator operation had malfunctioned. This card was replaced and annunciator operation returned to normal. The entire event lasted approximately 1 hour.

The inspectors observed that the initial response by the operating crew to receiving numerous annunciator alarms was less than expected. For example, communications between the shift supervisor and the reactor operators were not clear. Immediate

verification of plant conditions was made by the reactor operators; however, it appeared that the use of repeat-back communications, to provide the shift supervisor with all the information he would need with the numerous annunciator alarms actuated, did not meet the licensee's established standards. During training provided by the licensee on the simulator, the licensee stresses the need to use formal, feedback communications during performance of routine and emergency response to plant events. Although some onshift crews have implemented repeat-back communications as a routine, the use of repeat-back communications during this event was not apparent.

The inspectors observed the use of Abnormal Procedure 2.4.8.2, "Annunciator Failures," which referred them to System Operating Procedure 2.2.64, "Ronan Annunciator System." Procedure 2.2.64 provided instructions on troubleshooting and correcting annunciator problems. The annunciators were returned to service and no additional problems have occurred.

Since the inspectors noted that this event was not recorded in the shift supervisor's log, the procedure for specifying the types of entries to be made in the balance-of-plant and the shift supervisor's logs was reviewed. Procedure 2.02, "Operations Logs and Reports," required that this type of activity be placed in the various logs. The inspectors have routinely reviewed logs in the past and have not noted any problems; therefore, it appears that the failure to enter the loss of annunciators in the logs was an isolated event. Licensee management met with all onshift operators to stress the need for maintaining complete and accurate log entries of all plant occurrences and evaluations. The inspectors will continue to monitor performance in this area during future routine inspections.

As a result of this event, the inspectors identified the following items with respect to the performance of the operations staff and management involvement in the event:

- (1) The inspectors questioned licensee management concerning annunciator failures that have occurred since 1989. Management stated that a number of similar events had occurred, but did not know exactly how many. Management stated that the failures were due to computer software problems,

causing multiplexers to malfunction and input failures into the Ronan annunciator system.

The licensee completed an additional software modification on April 23, 1992, to correct the problem.

- (2) The inspectors questioned the licensee's training department personnel on whether this particular annunciator failure event had ever been run on the simulator during the training of operating crews. Also, what effect would an annunciator failure, such as the one experienced, have if a real transient occurred at the same time. Licensee personnel stated that the event, as experienced in the control room, could not be duplicated in the simulator; therefore, no training had been provided to the licensed operators.
- (3) The inspectors discussed the lack of repeat-back communications in the control room during the event. This issue is a concern since repeat-back communications are stressed during licensed operator training. Licensee management stated that actions would be taken to address this issue; however, as of the end of this inspection period, the licensee had not provided any information as to what actions would be taken to address this concern.
- (4) The inspectors noted that the Division Manager of Nuclear Operations was not aware of the loss-of-annunciator event until approximately 10 a.m. the day following the event, when the inspectors brought it to his attention.

Licensee management stated that actions would be taken to address this issue; however, as of the end of this inspection period, management had not provided any information as to what actions would be taken.

- (5) This event, and none of the previous events, were documented by a nonconformance report, even though the event was of sufficient significance to warrant a nonconformance report. After discussions with the inspectors, the licensee concurred that a nonconformance report should have been generated and subsequently wrote a report to document the failure of the annunciators.

This is an example of an item requiring corrective action that was not documented on a nonconformance report. The NRC's concern with the licensee's failure to document potential safety issues on nonconformance reports is discussed in the Systematic Assessment of Licensee Performance (NRC Inspection Report 50-298/92-99).

Items (3) and (4) will be tracked as an inspection followup item, pending review by the inspectors to determine what actions will be taken by the licensee to resolve these issues (298/92-99 001).

b. Radiological Protection Observations

The inspectors verified that selected activities of the licensee's radiological protection program were properly implemented. Radiation and contaminated areas were properly posted. Health physics (HP) personnel were observed routinely touring the controlled areas.

On February 17, 1992, the licensee received the low- and high-level alarms for Heaters A-4 and -3, respectively. The shift supervisor concluded that one of the two heater bay level control valves (CD-AOV-LCV61A or -LCV61B) had failed. Thus, at 9:20 p.m., the shift supervisor and a shift operator entered the heater bay to investigate. The area was posted as a high radiation area and the operators entered under Special Work Permit (SWP) 92-218, which requires that HP be notified prior to starting work in any SWP area. The individuals failed to notify HP prior to entering a high radiation area, as required by the SWP. This is the first example of the failure to meet the requirements of the SWP.

Upon entering the heater bay, the operators identified that the air filter for air-operated Control Valve CD-AOV-LCV61A was laying on the floor by Heater A-3. The operators made an attempt to replace the filter, but were unable to do so because the threads were stripped. The shift supervisor decided to take control of the valve and manually control the level. It was determined that climbing would be involved in manipulating the valve and that personnel involved would probably exceed the administrative 150 mrem exposure limit.

The shift supervisor called the backshift HP to request permission to exceed this administrative limit. The HP

informed the shift supervisor that the HP supervisor would be contacted to get permission. During this conversation, the shift supervisor failed to convey to the HP technician the work that had been performed, the extent of the work that was yet to be performed, and the number of personnel involved. In turn, the HP technician failed to question why the shift supervisor and the operator with him would receive a dose exposure in excess of 150 mrem. Prior to calling the HP supervisor, it was identified by operations personnel that the administrative exposure limits had recently been changed to 500 mrem per quarter, thus no other calls were made to HP personnel.

The continued efforts by the operators to take manual control of feedwater heater level were hampered by the valve position indicator, which had been installed backwards, and by the valve handwheel, which fell off when the operators attempted to turn it. Approximately 35 minutes was required for the operators to reinstall it. Subsequently, three more operators entered the area to assist in this effort. In all, five operations personnel made eight entries over approximately a 2-hour period, as indicated in the SWP supplementary time record.

During this effort, the shift supervisor continued to violate the requirements of the SWP, which requires that HP be notified whenever the scope of work in an SWP area changes, by failing to notify HP of the changing scope of the work being performed. This is the second example of the failure to follow the requirements specified on the SWP.

It was noted that the shift supervisor left the area at approximately 10:20 p.m. Following his departure, four additional entries were made, as other operators arrived to support this effort. It was apparent that the other operators did not question the need to contact an HP technician or question the absence of HP, even though the SWP required intermittent coverage by HP.

The total exposure for all the personnel involved was 751 mrem. Poor implementation of as-low-as-reasonably-achievable (ALARA) principles and a general unawareness of ALARA procedural requirements were a contributing factor to the cumulative dose received. An example of this was the survey map used by the shift supervisor for this effort. The survey

map posted outside the heater bay is generally updated only once a month, thus, potentially did not reflect current dose rates. In addition, the survey was performed at ground level and did not take into account personnel climbing to higher elevations as did some of the operators performing this effort.

The licensee identified this event while performing routine daily audits of the SWP. The personnel involved were interviewed and then counselled on proper radiation protection practices. Subsequently, Radiological Safety Incident Report No. 92-1 was written, followed by a root cause analysis and recommended corrective actions to preclude recurrence of this event. Although this event did not result in overexposure to any personnel, it identified several weaknesses in licensee personnel knowledge of radiation protection practices. Of significant concern was the nonquestioning attitude displayed by the licensed operators. Such an attitude may result in personnel errors, or in the very least, prevent early identification of abnormal conditions. The licensee, recognizing these concerns, planned, in part, to provide ALARA training to operations personnel; cover this event in industry events training for operators and onsite individuals, stressing the need for a questioning attitude; publicize "Maintaining a Questioning Attitude," describing what this means and what questioning can do for the worker; review onsite training program description; and review the SWPs that discuss work, tours, and inspections.

Another item highlighted by this event was the licensee's inadequate notification to personnel of changes to the radiation protection procedures (i.e., changes to the personnel exposure limits from 150 mrem per week to 500 mrem per quarter). Again, the licensee plans to review the process for informing station personnel on changes to procedures and the reason for the changes.

The failure of the shift supervisor to contact HP prior to the start of work and to notify HP of the changing scope of work, as required by the SWP and associated procedures, is a violation of NRC requirements (285/9206-02).

In response to this violation, the licensee should specifically address the corrective actions that will

be taken to ensure that all licensee supervisors properly implement radiation protective measures.

c. Security Program Observations

The inspectors observed various aspects of the security program. Personnel, packages, and vehicles were noted to be properly searched prior to entering the protected area. It was noted that guards were posted when vital area doors were open for plant activities.

d. Organizational Changes

The licensee announced that, as of March 16, 1992, Mr. R. L. Gardner had assumed the duties and responsibilities, on a temporary basis, of the Division Manager of Nuclear Operations at the Cooper Nuclear Station. Mr. J. M. Meacham, who was the Division Manager of Nuclear Operations, has been assigned the responsibilities of formalizing the position of a Site Manager, including the procedural changes and documentation submittals necessary to accomplish these organizational changes. The Site Manager concept should allow the division managers and their staff to become more focused on their assigned areas.

Conclusions

Although the loss-of-annunciators event was of minor safety significance, review of the event identified six concerns with the performance of the operations staff and a lack of management expectations for the performance of the operations staff.

The failure of operations personnel to implement the requirements of an SWP, when working in a high radiation area, is an indication of a lack of respect for the radiation protection program by these individuals and a lack of oversight by supervisory personnel.

5. Surveillance Observations (61726)

a. Control Rod Operability Test

On March 29, 1992, the inspectors observed operators in the control room perform functional tests on all of the reactor control rods. This test was performed using Surveillance Procedure 6.4.1.2, "Withdrawn Control Rod Operability Test," which is performed weekly. The

inspectors noted that all communications associated with the operators were good. No anomalies with performance of this procedure were noted.

b. Diesel Generator Operability Test

On March 30, 1992, the inspectors monitored the performance of Surveillance Procedure 6.3.12.1, "Diesel Generator Operability Test," for Diesel Generator A. The surveillance was a routine monthly operability test and was observed from the control room. The inspector questioned the operators performing the test and determined that they were knowledgeable of the purpose of the surveillance and familiar with their respective responsibilities. Good communication was noted between the operators in the control room and the technicians in the diesel generator room. No problems were noted in the performance of this procedure.

Conclusions

Surveillance activities were well performed in a well controlled manner.

6. Maintenance Observation (62703)

On March 26, 1992, the inspector observed maintenance personnel disassemble, inspect, and clean the steam trap for the reactor core isolation cooling pump turbine. Because of the previous problems experienced with the steam trap, the cleaning of the trap has been placed in the preventive maintenance program. During observation of this activity, no problems were identified with the work performed by the maintenance personnel.

Conclusions

No concerns were identified during the review of this maintenance activity.

7. Fitness-for-Duty (FFD) Inspection (81502)

The inspector verified that selected areas of the licensee's FFD program were being implemented properly. The inspector confirmed this through interviews with FFD staff personnel and review of licensee procedures, as discussed below:

- ° Changes to the licensee's written FFD policies and procedures were commensurate with regulatory requirements, have not adversely affected program

implementation, and the changes were reviewed, approved, and retained, as required.

- ° One significant procedural change was made with regard to the appeal process. The procedure on appeals was rewritten to clarify the process for contractors. The change was consistent with the requirements of 10 CFR Part 26. Another procedure change dealt with the breath alcohol concentration test. The change eliminated the 15 minute waiting time on test individuals. Originally, alcohol breath tests were delayed at least 15 minutes on individuals from the time they entered the collection room. The new procedure allows the breath test to be conducted sooner on individuals who have verified that they have not had anything by mouth upon arrival at the collection facility. This change has expedited the collection process and was consistent with the requirements of Part 26.
- ° Changes have been made to key FFD personnel including the security supervisor, who has been responsible for the daily operation of the collection facility, and all of the collection site personnel are new since the original FFD inspection. However, the reporting structure remained the same and management support appeared to have remained at the appropriate level of oversight. The inspector reviewed the training and qualifications of the site personnel and verified that these individuals understood their responsibilities and authorities. All personnel appeared to have an understanding of the site collection procedures.
- ° A change to the licensee's chemical testing procedures involved the 60 milliliter volume of urine required for testing. The change allowed for a reduced volume to be sent for testing whenever an individual has not been able to provide the 60 milliliter volume after several hours of waiting. Before making the change, the licensee contacted their Department of Health and Human Services certified laboratory to verify that less than 60 milliliters would be adequate for testing. The laboratory stated that they could use as little as 30 milliliters and obtain accurate results.
- ° The inspector reviewed selection and notification procedures for random testing rate and testing frequency for weekends, holidays, and backshifts.

- ° Review of the licensee's FFD audit, which had been completed in March 1992 and was still in draft form, indicated that the audit was thorough and corrective actions for the findings were in progress at the time of this inspection.

Conclusions

No problems were identified during this review. It appeared that the licensee's FFD program complied with the requirements specified in Part 26.

8. Management Meeting (30702)

At a public meeting held on March 24, 1992, the NRC Region IV staff presented the results of the Systematic Assessment of Licensee Performance report to the licensee. The meeting, held at the licensee facility near Brownville, Nebraska, consisted of various members of NRC Region IV, NRC Headquarters, licensee staffs, and members of the public. NRC Inspection Report 50-298/92-99 evaluated the licensee's performance July 16, 1990, through January 18, 1992.

9. Summary Of Open Items

The following is a synopsis of the status of all open items generated in this inspection report:

- ° Inspection Followup Item 298/9206-01: Review of the licensee's actions in response to the loss-of-annunciator event
- ° Violation 298/9206-02: Failure to comply with the requirements of an SWP

10. Exit Interview

An exit meeting was conducted on April 20, 1992, with the licensee representatives identified in paragraph 1. During this meeting, the inspectors reviewed the scope and findings of the inspection. During the exit meeting, the licensee did not identify as proprietary, any information provided to, or reviewed by, the inspectors.