

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-298/96-03

License: DPR-46

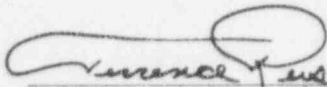
Licensee: Nebraska Public Power District
P.O. Box 499
Columbus, Nebraska

Facility Name: Cooper Nuclear Station

Inspection At: Brownville, Nebraska

Inspection Conducted: February 4 through March 16, 1996

Inspectors: M. H. Miller, Senior Resident Inspector
C. E. Skinner, Resident Inspector
W. M. McNeill, Reactor Inspector, RIV/DRS

Approved: 

T. Reis, Acting Chief, Project Branch C

4-12-96
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of onsite review of events, operational safety verification, plant support activities, surveillance and maintenance observations, followup of corrective actions for violations, followup of licensee event reports (LERs), and updated final safety analysis report (UFSAR) review.

Results:

Plant Operations

- A control room supervisor performed an excellent briefing on a change to the diesel generator lockout procedure (Section 2.1).
- The control room staff failed to document three unexpected half-scrams in the control room logs. Operations management issued a memorandum to all shift supervisors to reemphasize management's expectations for log keeping (Section 4.1).

Maintenance

- Inspectors identified that vendor manual requirements to not fill the reactor core isolation cooling (RCIC) turbine with oil until it was

cooled were not recognized or followed when maintenance personnel replaced RCIC oil, resulting in oil being filled above the high level limit (Section 3).

- The inspector identified that the methodology used to obtain proper oil level for the RCIC turbine was not consistent with vendor manual guidance. The discrepancy did not affect component operability (Section 3).
- A noncited violation was identified in that maintenance failed to replace the cap on a sump vent beneath the elevated release point, resulting in an unmonitored release for approximately 2 months and the potential for a ground level accident source term release (Section 6).
- A noncited violation was identified in that maintenance technicians failed to complete a procedure step, which resulted in a half-scrum (Section 4.1).
- The maintenance department exhibited increased safety awareness in that significant effort and management involvement were initiated to identify and correct causes of unexpected half-scrums during surveillances (Section 4.1).

Engineering

- A system engineer identified that a cap had been left off of a vent on the sump below the elevated release point (Section 6).
- The listing of inservice testing (IST) boundary valves documented in the UFSAR was inaccurate for 15 valves (Section 10).
- The engineering department initiated efforts to coordinate and assist maintenance in evaluating and reducing the number of unanticipated half-scrums (Section 4.1).

Plant Support

- Inspectors identified to licensee staff the need to evaluate the past safety significance of the potential exposure from the uncapped sump vent (Section 6).
- Inspectors identified that fire brigade training for security personnel who augment the fire brigade was listed as expired (greater than 90 days) on training records, although the required quarterly training should have allowed up to 179 days. This resulted in confusing training information and could encourage the practice of overlooking expired training (Section 7.3).

Summary of Inspection Findings:

Open Items

- Noncited violation 298/9603-01 (Section 4.1)
- Noncited violation 298/9603-02 (Section 6)

Closed Items

- Violation 298/9317-05 (Section 7.1)
- Violation 298/93202-04 (Section 7.2)
- Violation 298/93202-05 (Section 7.3)
- Violation 298/9403-02 (Section 7.4)
- Violation 298/9406-01 (Section 7.5)
- Violation 298/9414-05 (Section 7.6)
- Violation 298/9416-01 (Section 7.7)
- Violation 298/9416-03 (Section 7.8)
- Inspector Followup Item 298/93201-03 (Section 8.1)
- LER 94-032, Revision 0 (Section 9)
- LER 95-022, Revision 0 (Section 9)
- LER 95-022, Revision 1 (Section 9)

Attachment:

- Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS

At the beginning of the inspection period the plant was at 100 percent power. On February 24, 1996, power was reduced to 70 percent for turbine valve testing and control rod scram time testing. On February 25, the plant was restored to 100 percent power, where it remained to the end of this inspection period.

2 OPERATIONAL SAFETY VERIFICATION (71707)

2.1 Control Room Observations

The inspectors observed briefings and turnovers on several occasions. These appeared appropriate and no issues or concerns were identified. One particular briefing by a control room supervisor was performed in a superior manner. The briefing involved a change to the diesel generator lockout procedure, in which the control room supervisor emphasized several critical steps involved and discussed steps where errors may occur if operators were not attentive.

2.2 Plant Tours

During routine plant tours the inspectors identified minor deficiencies, i.e., a leaking RCIC suction relief valve, which were brought to the attention of the licensee. The inspectors concluded that the licensee appropriately dispositioned each item.

2.3 Review of INPO Report on Fall 1995 Outage

The inspector reviewed the INPO report evaluating the licensee's fall 1995 outage. The results of this report were consistent with similar evaluations performed by the NRC. No new issues or concerns were identified.

3 MAINTENANCE OBSERVATIONS (62703)

RCIC Turbine High Oil Level

On February 21, 1996, the inspector observed a maintenance technician take an oil sample immediately after the pump was secured from its monthly test, while still hot, then replace the oil by filling the oil level to the upper marking on the sight gauge. On February 26, the inspector identified that the oil level on the RCIC turbine was 0.25 inches above the upper marking on the sight gauge. When questioned, the shift supervisor stated that the oil gauge reading was valid only during turbine operation. In addition, the system engineer stated that the high oil level was not an operability concern.

The inspector reviewed the RCIC vendor manual and found that the maximum limit to which the turbine oil system could be filled was the upper marking on the sight gauge and that the oil system should be filled and measured only when the turbine was shut down and the oil was at ambient temperature.

On March 4, after discussions with the inspector concerning the RCIC vendor manual guidance, the licensee wrote a condition report (CR) to address the high oil level. As part of the corrective actions, the licensee plans to revise the procedure to ensure the proper oil level following oil sampling and will train operators concerning the conditions when RCIC oil sight gauge readings are accurate.

Based on a telephone conversation in which the RCIC vendor stated that an oil level slightly beyond the upper mark on the sight gauge was undesirable but would not cause operational problems with the RCIC turbine.

In summary, the inspector found that the shift supervisor and the control room shift crew did not understand when the oil gauge measurement was valid and that discussions with the inspector were required before the licensee addressed why the RCIC turbine oil system was not maintained in accordance with the vendor manual. The inspectors further concluded that the resulting overfill of the RCIC turbine did not impact operability.

4 SURVEILLANCE OBSERVATIONS (61726)

4.1 Licensee Initiative to Evaluate Unexpected Half-Scrams

On March 15, 1996, during a scram discharge volume vent and drain valve surveillance, the licensee received three half-scrams. Although half-scrams were expected during this surveillance, each of these half-scrams occurred at an unexpected time. Two were attributed to kinks and debris in flexible instrument tubing. The third was caused by a technician not completing a second action required by a procedure step. As part of their corrective actions, the licensee is investigating the appropriateness of allowing up to three actions to be performed per procedure step, as is permitted in current guidance.

During review of control room logs the following day, the inspectors identified that the three unexpected half-scrams had not been recorded in the control room logs. In addition, the inspectors found that the operators believed that logging half-scrams expected during a surveillance was optional. Following this event, to clarify management expectations concerning control room log keeping, licensee management issued a memorandum to all shift supervisors to reemphasize expectations concerning log keeping.

Prior to this event and in order to heighten sensitivity and clarify ambiguous direction in procedures regarding half-scrams, licensee management emphasized to engineering and maintenance personnel the need to record and evaluate all unexpected half-scrams. As a result, engineering management and staff initiated reviews of past half-scrams to identify root causes and develop

recommendations for preventing recurrence. In addition, maintenance technicians identified several maintenance activities where half-scrams are possible and recommended methods for reducing the likelihood of their occurrence.

Inspectors concluded that the increased sensitivity to risks associated with half-scrams as evidenced by involvement, problem identification, corrective action, and continuing management involvement is an example of improvement in licensee safety awareness. Clear management commitment to achieve long-term safety performance improvement by identifying and reducing unexpected half-scrams is also a significant improvement. The failure to properly implement the surveillance procedure resulting in an unexpected half-scam is a violation of 10 CFR Part 50, Appendix B, Criterion V, which states that procedures will be properly implemented. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (298/9603-01).

4.2 Surveillance Observations

The inspector observed the performance of all or portions of the surveillances listed below. The observations included a review of the procedures for technical adequacy, conformance to Technical Specifications, and limiting conditions for operation; verification of test instrument calibration; observation of all or part of the actual surveillance; removal and return to service of the system or component; and review of the data for acceptability based upon the acceptance criteria. Concerns with Procedure 6.2DG.201 were discussed in NRC Inspection Report 50-298/96-04. No other problems were noted.

<u>Procedure Number</u>	<u>Title</u>
6.2DG.201	Diesel Generator 2 Monthly Muffler Bypass Valve Test
6.RCIC.101	RCIC Monthly Test Mode Surveillance Operation
6.SW.402	Diesel Generator Service Water Supply check Valve IST Opening Test

5 **ONSITE ENGINEERING (37551)**

Seismic/Housekeeping Issues

The inspectors identified a 3-foot metal lifting device leaning against the wall near essential tubing in the DG 2 muffler bypass room, two similar pieces of metal in the DG 1 muffler bypass room, and five boxes stacked against a control room panel containing essential equipment.

The licensee immediately moved the items away from essential equipment and determined that, under design basis seismic conditions, the items would not

have damaged the essential equipment and considerable design margins were available. Based on the examples identified by the inspectors, the licensee engineering staff expedited issuance of an already planned seismic/housekeeping procedure to clarify expectations to plant personnel.

The inspectors concluded that appropriate actions were taken to address this issue.

6 PLANT SUPPORT ACTIVITIES (71750)

Unmonitored Release Due to Failure to Cap a Sump Vent

On February 29, 1996, the licensee identified an unmonitored release when a system engineer noted a plume of steam near the elevated release tower and found that a cap was missing from a sump vent located at ground level, beneath the elevated release point tower. In investigating the cause of the missing cap, the licensee found that the vent had released off-gas steam from the turbine during reactor operations since startup on December 30, 1995. The licensee determined that, during work on the sump in the fall 1995 refueling outage, maintenance or chemistry technicians had removed the vent cap for sampling and failed to replace it at the conclusion of the maintenance activity. Operators performing daily tours in the area had not noticed the plume of steam, because it was visible only intermittently since the outage. The licensee documented the problem in a CR.

The licensee completed an analysis and determined that the unmonitored release had negligible impact on the general public and did not exceed any limits specified in either 10 CFR Part 20 Sections 2204 or 2203, 10 CFR Part 50 Sections 72 or 73, or TS Section 3.21. Surveys near the release point indicated no activity above background. The licensee concluded that the safety significance of this unmonitored release during normal plant operations was low. Inspectors reviewed the analysis and found it satisfactory.

The inspectors identified that, during design basis events involving core damage, releases via this vent could result in unanticipated exposure to individuals performing activities outside of ventilation controlled areas. For example, during a loss of off-site power, operations support personnel would be expected to run several feet of cable between a diesel generator room and the off-gas building near this release point. The licensee stated that exposures would be minimized because the standby gas treatment system would provide cleanup of high activity dose before its release via the missing cap. In addition, the licensee's emergency response personnel determined that all activities performed during an event require staff to be accompanied by radiation protection monitoring. Based on the inspectors questioning, the licensee performed an additional analysis to determine the radiological consequences and affects on personnel following a design basis accident with the cap removed from the sump. The existing analysis concluded that the highest dose rate with the cap installed was 1.6 rem/hr. The additional analysis determined that, with the cap missing, an additional 0.005 rem/hr DDE and 0.695 rem/hr to the thyroid would be received by an individual involved in

installing the cable in response to a loss of off-site power, as described above. This dose is well within licensee administrative limits of 10 rem and 10 CFR Part 20 limits of 25 rem to save equipment. The analyses also demonstrated that the increased dose at the site boundary was well within 10 CFR Part 100 limits. The inspectors reviewed the analyses and found it satisfactory.

The failure to replace the vent cap after the maintenance activities is a violation of 10 CFR Part 50, Appendix B, Criteria V, which requires that procedures and documented instructions be appropriate to the circumstances and accomplished in accordance with the instructions. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (298/9603-02).

7 FOLLOWUP ON CORRECTIVE ACTIONS FOR VIOLATIONS (92702)

7.1 (Closed) Violation 298/9317-05: An Inadequate Justification for Reverse Direction Testing of Containment Isolation Valves and Nonconservative Testing of Valves

This problem occurred because the licensee did not adequately review information from valve vendors. The licensee review of this problem identified that 47 valves, including 24 identified in the inspection report, were tested in the reverse direction rather than in the accident direction. Some of these valves could not be demonstrated to produce equivalent testing in the accident direction, so a design change was written to modify the valves so that proper testing could be performed. The existing configuration for some of the 47 valves allowed testing in the accident direction and new procedures were written for testing in the accident direction. Exemptions were obtained for four valves.

Two of the 47 valves were identified in the Updated Safety Analysis Report as not required to be part of Appendix J testing requirements because they were on lines terminating below the minimum torus water level.

Twenty-four valves were modified in accordance with Design Change 93-050 to allow testing in the accident direction. The inspectors reviewed Design Change 93-050 and found no deficiencies. The inspectors also verified that procedures were revised for eight valves which were determined to be testable and for the 24 valves which were modified. In addition, 12 containment isolation valves were required to be tested only in the reverse (nonaccident) direction based on analysis provided by the valve vendor. The inspectors verified that the information from the vendor was technically sound.

7.2 (Closed) Violation 298/93202-04: Shift Technical Advisors (STA) Failed to Maintain Their Training Qualifications

The violation involved five shift technical advisors who stood watch although their training had expired.

The inspectors verified that the licensee had revised the STA training program description to clearly describe the STA training requirements. The inspector also validated that the STAs on shift were currently qualified.

The licensee committed to other corrective actions for the overall training program. These commitments are discussed in Section 7.3 of this report.

7.3 (Closed) Violation 298/93202-05: Fire Brigade Members Failed to Maintain Their Training Qualifications

This violation involved fire brigade members who had not received quarterly fire brigade training.

In February 1996, the licensee completed a self-assessment of training, identifying several programmatic weaknesses. Corrective actions are in progress.

To address two violations (this section and Section 7.2) and overall weaknesses, the licensee had committed to the following corrective actions: redesign the training tracking system (to be user friendly, permit custom reports, permit real time data review, and permit tracking of certifications and/or requalification due dates) and develop a training compliance matrix (to define the basis for existing training programs and to ensure that internal and external training requirements were being met).

In letters dated June 20 and December 19, 1994, and April 11 and June 30, 1995, the licensee extended commitment dates and ultimately stated that the NRC would be notified by letter when the commitment was completed. This occurred on December 15, 1995. The corrective action to ensure internal requirements were met was different than the original proposed corrective action, but did appear to address the concern appropriately. The corrective actions were implemented a year after the licensee's original due date of December 31, 1994.

The inspector verified that the licensee revised the fire brigade training program description to clearly define the fire brigade training requirements. The inspector also verified whether personnel on shift were currently qualified and noted that on March 4, 1996, a security shift crew included four security officers whose fire brigade training was listed as expired as of February 29, 1996. The licensee stated that the expiration date was inaccurate, in that the training expired at the end of the following quarter rather than 90 days after the last training. The scheduled quarterly fire brigade training had not yet occurred. The licensee revised expiration dates for quarterly training to avoid confusion and avoid a practice of overlooking expired training dates.

7.4 (Closed) Violation 298/9403-02: Two Examples of Manual Primary Containment Isolation Valves That Were Not Being Controlled by an Approved Station Procedure

This problem was caused by the lack of attention to detail by the design engineer, resulting in inadequate testing of two containment isolation valves. The licensee revised Procedure 2.2.60A, Revision 8, "Primary Containment Cooling and Nitrogen Inerting System Valve Checklist," to include the two valves. In addition the licensee revised Procedure 3.4.11, Revision 6, "Status Reports," to require that modifications affecting a system lineup procedure be identified and dispositioned. The corrective actions for this concern were included in the Configuration Management Phase 3 Program so that future events may be avoided.

The inspectors verified that the revisions of the procedures were accomplished and that "tailgate sessions" were held which documented the discussions of the problem with the engineering staff. The inspectors verified that the licensee's Phase 1 Performance Improvement Plan, Project 4.1, evaluated past design changes with respect to current valve lists.

7.5 (Closed) Violation 298/9406-01: The Plant Temporary Modification Procedure Did Not Require Approval From the Onsite Review Committee of All Temporary Modifications Before Installation as Required by Technical Specifications

The temporary modification procedure did not require prior approval of temporary modifications by the Station Operations Review Committee. The licensee revised Procedure 2.0.7, Revision 18, "Plant Temporary Modification Control," to require Station Operations Review Committee approval before installation.

The inspectors examined the revised procedure and verified that prior approval is currently required. The inspectors reviewed the 22 currently open temporary modifications and verified that all were approved by the Station Operations Review Committee prior to installation.

7.6 (Closed) Violation 298/9414-05: Three Examples of the Licensee's Failure to Assure Design Bases Were Correctly Translated Into Specifications and Instructions as Required by Technical Specifications

The licensee had found 13 primary containment penetrations had no redundant valves, 10 penetrations had only a single manual valve for isolation, and approximately 300 containment penetrations had not been designed, fabricated, or installed to the same standards as the primary containment.

The licensee concluded that a lack of rigor in maintaining configuration controls resulted in the loss of redundancy. The containment was walked down and design changes written on the discrepancies identified. The licensee found that penetration classification was an original design error, in that the passive function of containment integrity had not been recognized as a

safety function. Therefore, some penetrations were not classified as essential (safety-related). The licensee reviewed the misclassified penetrations and identified welds with insufficient inspection. The design, fabrication, and installation for these penetrations was later found to be of equivalent quality as the original essential quality classification of the primary containment. The penetrations have been reclassified as essential (safety-related). In addition, an evaluation of ASME Section XI boundaries was performed.

In response to this issue, 183 penetrations were analyzed. Fifty were added to the inservice inspection program for pressure testing, 12 were added to the inservice inspection program for visual inspection of welds, 58 valves were added to the inservice testing program, and 14 associated supports were added to the inservice inspection program. The inspectors reviewed Design Change 94-212J, which was issued to upgrade penetrations from the original design in order to meet the containment integrity safety function. This design change resulted in radiography of 35 welds and penetrant inspection of 260 welds, which the inspectors examined. The inspectors found no problems with the upgrading.

The inspectors walked down the primary containment and verified that a sample of 50 penetrations were properly identified on drawings and included in the required programs. During this review, the inspectors found the listing of penetrations in the UFSAR, Table V-2-2, had many errors of very minor safety significance. These errors are identified in Section 10 of this report.

7.7 (Closed) Violation 298/9416-01: The Licensee Failed to Provide Appropriate Instructions for a Safety-related Activity

This violation was addressed fully in NRC Inspection Report 50-298/94-31, Section 5. The inspectors concluded that the licensee's corrective actions were comprehensive and effectively implemented.

7.8 (Closed) Violation 298/9416-03: The Emergency Diesel Generators Were Not Operable Because 480 Volt Breakers Load Shed Were Inoperable

This violation was addressed fully in NRC Inspection Report 50-298/94-31, Section 5. The inspectors concluded that the licensee's corrective actions were comprehensive and effectively implemented.

8 FOLLOWUP (92701)

8.1 (Closed) Inspector Followup Item 298/93201-03: Lack of Training for Outage Personnel on Shutdown Risk

The inspectors observed that the training for outage contractor personnel was informal compared to the training given the permanent station personnel. The training of outage contractor personnel was provided by immediate supervisors. During the 1993 outage there were approximately 200 contractor personnel.

The inspectors found the licensee had decided to not develop additional training on this subject for outage contractor personnel. The basis for this was that, since 1992 a work planning and scheduling group was created, divisional separation of work activities became a standard practice, a shutdown risk assessment guide for the outage planning group was developed, and prejob briefings had been standardized. The inspectors concurred with the licensee decision. The inspectors observed many prejob briefings where shutdown risk was discussed in a satisfactory manner. In addition, the inspectors observed several cases where the changes to the outage schedule were formally and conservatively evaluated in accordance with the shut down risk guidance.

9 IN OFFICE REVIEW OF LERs (90712)

- (Closed) LER 298/94-032, Revision 0: Weakness in ASME Section XI IST Program Due to Discrepancies in Component Boundary Selection Criteria. This event was discussed and dispositioned as a violation in NRC Inspection Report 50-298/93-17 and the violation was closed in NRC Inspection Report 50-298/95-18. No new issues were revealed by the LER.
- (Closed) LER 298/95-022, Revisions 0 and 1: Reactor trip signal, engineered safety feature actuation, and loss of shutdown cooling during maintenance activity. This event was discussed and dispositioned as a violation in NRC Inspection Report 50-298/95-17. No new issues were revealed by the LER.

10 REVIEW OF UFSAR COMMITMENTS

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures, and/or parameters to the UFSAR description. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected. The following inconsistency was noted between the wording of the UFSAR and the plant practices, procedures, and/or parameters observed by the inspectors:

- Table V-2-2, "Penetration Schedule," pages V-2-9 to V-2-12 of the USAR failed to list penetrations; the quantity of lines in three penetrations was incorrect; and line descriptions in five penetrations were incorrect. The licensee initiated CR 96-0160 to document and correct the descriptions in accordance with UFSAR update procedures.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

J. Mueller, Site Manager
D. Billesbach, Acting Work Control Manager
M. Boyce, Engineering Support Manager
D. Bremer, Operations Support Group Supervisor
J. Dillich, Maintenance Manager
J. Gausman, Plant Engineering Manager
R. Godley, Nuclear Licensing and Safety Manager
P. Graham, Senior Engineering Manager
J. Hale, Radiological Manager
B. Houston, Emergency Preparedness Manager
R. Jones, Senior Manager Safety Assessment
G. Smith, Quality Assurance Operations Manager
B. Victor, Licensing and Compliance Specialist

1.2 NRC Personnel

M. Miller, Senior Resident Inspector
C. Skinner, Resident Inspector
R. Schaaf, Project Manager, NRR
D. Wigginton, Senior Project Manager, NRR

1.3 Others

J. Jeffries, SRAB member
B. Turnbull, MEC Senior Nuclear Engineering

The personnel listed above attended the exit meeting. In addition, the inspectors contacted other licensee personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on March 20, 1996. During this meeting, the inspectors reviewed the scope and findings of this report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.