

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/90-14

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, Brownville, Nebraska

Inspection Conducted: April 9-13, 1990

Inspector: *T. F. Stetka for*
P. C. Wagner, Reactor Inspector, Plant Systems
Section, Division of Reactor Safety

4/23/90
Date

Approved: *T. F. Stetka*
T. F. Stetka, Chief, Plant Systems Section
Division of Reactor Safety

4/23/90
Date

Inspection Summary

Inspection Conducted April 9-13, 1990 (Report 50-298/90-14)

Areas Inspected: Routine, unannounced inspection of the licensee's program for accomplishing plant design changes and modifications. A review was also made of the licensee's actions on previously identified inspection findings.

Results: Within the area inspected, no violations or deviations were identified. The previous inspection findings reviewed were found to be satisfactory as noted in the report. Based on the design changes reviewed, the licensee's program for design changes appeared to be acceptable. The control of field changes to design modification packages appeared to be adequate. The amount of detail in the design modification packages was found to be sufficient to verify compliance with regulatory requirements.

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DETAILS

1. PERSONS CONTACTED

Licensee Personnel

- *L. Bray, Regulatory Compliance Specialist *
- L. Clark, Electrical Supervisor
- *J. Flaherty, Engineering Manager
- *R. Foust, Engineering Programs Supervisor
- *G. Horn, Division Manager, Nuclear Operations
- M. Siedlik, Civil/Structural Engineering Supervisor
- *G. Smith, Quality Assurance Manager
- *G. Smith, Licensing Supervisor

NRC Personnel

- *R. Stewart, Reactor Inspector, Region IV

*Denotes personnel who attended the exit meeting conducted on April 13, 1990.

The inspector also contacted other licensee personnel during the course of the inspection.

2. LICENSEE ACTIONS ON PREVIOUSLY IDENTIFIED ITEMS (92701)

2.1 (Closed) Unresolved Item (298/8630-07): Control Room Ventilation System (CRVS) Supports.

The original inspector was unable to locate detail drawings for the CRVS supports. A followup inspection (NRC Inspection Report 50-298/88-24) verified the existence of the required drawings but noted that revisions and modifications were in process. During this inspection, the inspector reviewed the CRVS duct plans and selected a sample of three CRVS supports for walkdown. The inspector checked the supports against the appropriate drawing details to verify that the drawings accurately reflected the as-built conditions. The supports that were inspected (CB-H-602, 603, and 606) were verified to be correct.

The inspector also verified that CRVS supports were located in the approximate positions indicated on the plan drawings (CB-HL-1A, -1B, and -2, Sheets 1, 2, and 3) by checking approximately six additional supports in the control room and in the cable spreading room. During this inspection activity, the inspector observed what appeared to be an unusual arrangement on Support CB-H-610. The inspector noted the configuration and verified that the detail drawing properly represented the as-built installation.

Based on the above verifications, this item is closed.

2.2 (Closed) Followup Item (298/8919-02): Replacement of SJO Electrical Cable.

During an inspection of the licensee's actions in response to industry identified problems with the Type SJO electrical cable, the inspector determined that the long-term corrective actions should be evaluated. The licensee has subsequently finalized the corrective actions and has replaced the SJO wiring with Rockbestos Firewall III wiring. A discussion of this wiring changeout is included in paragraph 4.2, below. This item is closed.

3. FOLLOWUP ON ITEMS OF NONCOMPLIANCE (92702)

3.1 (Closed) Violation (298/8919-01): Incomplete Instrument Calibration Program.

At the time of the previous inspection, a number of installed instruments being utilized by plant operators were not included in a calibration program. Subsequent to the inspection, the licensee reevaluated the instrument calibration program and issued new guidance. The requirements for the CNS instrumentation were promulgated in Administration Procedure 0.38, "CNS Calibration Program," Revision 0, dated September 30, 1989. The inspector reviewed the procedure and noted that Section 2.1.2 contained the criteria for instrumentation to be included in the calibration program. The criteria listed the following categories of instruments for inclusion in a calibration program:

- ° Instrumentation considered to be essential;
- ° Instrumentation used to conduct, or to support conducting, surveillance testing in accordance with the Technical Specifications;
- ° Instrumentation used to analyze gaseous, particulate, or liquid radiolytic samples, and instrumentation used to detect radiation, contamination, and personnel exposure; and
- ° Instrumentation reflected in plant operating procedures, including the operating logs, except as noted within the individual procedures.

Because the establishment of this program resolved the NRC concern about the adequacy of the breadth of the CNS instrumentation calibration program, this item is closed. The implementation of the program will continue to be evaluated as part of the routine NRC inspection program.

3.2 (Closed) Violation (298/8928-01): Inadequate Control of Design Changes.

The inspector discovered an instance in which an on-the-spot-change (OSC) to a station design change (DC) altered the basis for the original approval of the change. The specific design change involved control rod insertion limitations that had been previously approved by the NRC. The licensee, by letter dated September 19, 1989, has requested NRC concurrence on revised control rod limits.

The inspector reviewed changes implemented by the licensee to ensure that future OSCs receive proper evaluation prior to their implementation. The inspector reviewed Revision 1 of CNS Engineering Procedure 3.4.10, "Revisions, Amendments, and On-the-Spot Changes," which was implemented on November 30, 1989. The revised procedure defined an OSC as a minor change that would not (among others) alter the intent or change the scope of a modification, nor modify the results of an existing safety evaluation. The NRC concern that an OSC could alter an approved safety evaluation has, therefore, been acceptably addressed. The implementation of the licensee's program will continue to be evaluated as part of the normal inspection program. In addition, the inspector noted only one small problem with one OSC during the review of the DCs discussed below.

Based on the program procedure requirements and the implementation observations, this item is closed.

4. DESIGN CHANGES AND MODIFICATIONS (37700)

4.1 Background

The inspector evaluated recently completed, and in progress, design changes and modifications which the licensee had determined did not require prior NRC approval. The inspection was performed to ascertain if the facility changes were in conformance with the requirements of the Technical Specifications, 10 CFR Part 50.59, the Updated Safety Analysis Report, and the licensee's Quality Assurance Program. The inspector selected two changes completed during the 1989 refueling outage and six changes from the ongoing 1990 refueling outage worklist. Of the present outage sample, three had already been completed.

The inspector reviewed documentation packages for the sampled design changes (DCs) to evaluate the following attributes:

- Review and approval of the change in accordance with TS requirements;
- Control and implementation of the change in accordance with approved procedures;
- Documentation of the potential effect on operational safety as a consequence of the change;
- Training and documentation changes implementation to reflect the change; and
- Reporting of the change to the NRC.

The inspection of changes requiring prior NRC approval (i.e., not allowed by 10 CFR 50.59) are evaluated as part of a separate inspection activity. The inspection of the licensee's program to control and implement design changes and the program to implement adequate post-change testing are also inspected as separate activities.

4.2 Findings

The inspector made the following observations during the review of the sampled design changes:

° DC 87-006, "Installation of Drain and Vent Lines"

This design change provided for installing a 1-inch vent line and a 1-inch drain line in the high pressure coolant injection (HPCI) system piping. The additional lines were to be installed between Valves HPCI-MOV-M019 and HPCI-AOV-A018 to provide a more efficient means of performing local leak rate tests on Check Valve A018. During this design effort, the licensee determined that a pipe support (RF-H53) did not meet requirements and included the modification of the support in this DC.

The vent and drain lines both incorporated two isolation valves and the installed configuration was designed to meet the original design and material requirements of the system. This modification had not been implemented.

° DC 87-118, "Addition of Interlocks to RHR Valves"

This design change was initiated as a result of the licensee's review of an INPO Significant Operation Experience Report (SOER No. 87-2). The change was implemented to ensure that only one set of residual heat removal (RHR) valves were open at any time to preclude the possibility of draining reactor coolant from the operating RHR loop through the full-flow test return lines to the suppression pool. (Interlocks already existed between the shutdown cooling suction valves and the suppression pool suction valves.)

The inspector found this DC to be complete and to contain adequate detail in the installation instructions. The inspector observed, however, that seven OSCs were necessary to correct problems encountered during the installation and testing of the modifications. No problems were identified with the control and implementation of the OSCs. This DC was completed on May 17, 1989.

° DC 88-156, "Replacement of 125VDC Station Batteries"

This change included the replacement of the 1A and 1B 250 volt batteries, the associated battery racks, and the associated battery chargers. The change also included the addition of a third battery charger to provide a spare for either the 1A or 1B battery charger. The batteries were replaced prior to reaching their design lifetime, to ensure continued service capacity capabilities. The racks were replaced to accommodate the larger size, lead-calcium battery cells. The spare "swing" charger was added to provide operational flexibility, and the 1A and 1B chargers were replaced to enhance operations and to ensure a continued source of replacement parts. These changes were implemented during the previous refueling outage and were completed on May 29, 1989.

The DC referenced IEEE Standards 450-1987, "IEEE Recommended Practices for Maintenance, Testing, and Replacement of Large Stationary - Type Power Plant and Substation Load Storage Batteries," and 485-1983, "IEEE Recommended Practices for Sizing Large Lead Storage Batteries for Generating Stations and Substations."

The inspector verified that the installation of new and replacement electrical cables were adequately controlled by the procedure provided in the DC. The inspector also verified that the DC contained extensive acceptance testing requirements. The inspector noted that the DC contained, or referenced, evaluations for seismic considerations of hangers, supports and racks, for fire protection considerations, and for electrical separation considerations.

The inspector noted that the ampacity of the new batteries was 1800 ampere hours (AH), compared to the 1368 AH rating of the old batteries. The inspector, therefore, questioned the sizing and testing requirements for the batteries. The inspector was informed that the battery size was based on load profile studies conducted by the licensee. The load profile information had also been used to select the discharge currents for the performance of the battery service tests. The inspector reviewed Surveillance Procedure 6.3.15.10, "250 V Battery 1A Service Test," Revision 0, dated May 2, 1989, and found it to be acceptable.

The inspector also reviewed the current revision of Surveillance Procedure 6.3.15.9, "250 V Station Battery Performance Discharge Test," (Revision 0, dated May 31, 1988). The inspector found this procedure inadequate because it did not require the discharge rate needed to evaluate the condition of the higher capacity batteries. The inspector was informed that Procedure 6.3.15.9 had been revised to include the appropriate discharge rate of 225 amperes but had not, as yet, been approved. The review process, and approval, of the revision had been slow because the revised procedure was not required to be implemented until approximately the fifth year of battery service.

The inspector verified that proper battery capacity tests had been performed by the manufacturer prior to shipping the batteries to the CNS. The inspector also reviewed the data from the service test conducted on the 1A 250V Battery on March 28, 1990, and found the results to be quite good. Based on the completion of the above tests, the inspector concluded that the licensee was fulfilling the commitment to comply with IEEE 450-1987.

The inspector also noted that the DC contained proposed revisions to the training lesson plan and the operating procedure for the 250 vdc electrical systems. The inspector reviewed the present revision (No. 17) to Procedure 2.2.24, "250vDC Electrical System," and found no reference to the new, swing battery charger. The inspector was informed that the use of the 1C battery charger was not allowed at this time because of ventilation system heat loading considerations. Therefore, the proposed revision to Procedure 2.2.24, contained in the DC, was never approved.

The inspector was further informed that when ventilation system modifications are made to improve heat removal capabilities, the use of the IC charger may be allowed and Procedure 2.2.24 will be revised to control its operation.

° DC 88-222E, "Control Room Panel Modifications"

This design change provided the controls for modifying seven control room panels in accordance with the recommendations from the licensee's detailed control room design review (DCRDR). The changes involved moving components from one panel to another, the addition of new equipment, and the replacement of some panels.

The inspector noted that the DC installation instructions included provisions for quality control (QC) verification of lifting and landing electrical leads and for verification of cable pulling activities. The inspector also noted that the existing electrical separation criteria would be maintained by the DC.

This DC was on hold awaiting receipt of required parts.

° DC 89-107, "Diesel Generator (DG) Day Tank Flow Meter"

This design change provided the controls for installing a flow meter in the fuel oil transfer pump discharge to the day tank. The permanently installed device, with remote indication, would simplify the transfer pump testing procedure. The DC included the installation of a manual bypass line as the normal system lineup, but evaluated the effects of having the flow meter inadvertently valved in during DG operation. The licensee determined that the size of the flow meter and its piping were such that the flow of fuel oil to the day tank would not be impeded. However, the inspector questioned how the valving would be controlled to ensure that the nonqualified components would be separated from the seismically qualified systems.

The inspector verified that Operating Procedure 2.2.12A, "Diesel Fuel Oil Transfer System Valve Checklist" had been revised to include the valves installed by this DC and that the revised procedure (Revision 1) was scheduled for Station Operations Review Committee (SORC) review to determine final approval on April 12, 1990. The inspector also verified that operator training was being conducted on the effects of this DC and that the annunciator response procedure for low fuel oil day tank level included instructions to check for leaks.

The inspector observed one small problem with on-the-spot-change (OSC) No. 2. The OSC 2 description for DG 1 referred to the valves associated with DG 2; the procedure markup, however, referred to the correct valves.

The installation of the flow meters was completed on March 23, 1990.

- ° DC 90-009, "Automatic Isolation of Service Water (SW) Loop Crosstie Valve."

This design change was implemented to provide added assurance that the nonessential cooling water loop would be isolated from the essential SW system if low pressure conditions occurred. The original design provided automatic, low pressure isolation signals from both SW trains to the common isolation valve for the nonessential cooling loop. Since the common isolation valve (MOV-117) received motive power from Division I, if the normal offsite power and the Division I diesel generator were lost, the valve could not be repositioned. The DC removed the Division II pressure signal from the common valve and inserted the automatic isolation signal into the control circuitry for the Division II crosstie valve. Therefore, the nonessential loop would be isolated under low pressure conditions regardless of the remaining power supply situation.

The inspector noted that the installation procedure wiring steps included a "QC witness" requirement and that post-implementation system tests and calibrations were required. This modification was completed on March 9, 1990. Operator training on this modification was scheduled to be completed by April 20, 1990.

- ° DC 90-181, "Modification of Circuit Breakers"

This DC was developed to convert some 250VDC and 125VDC circuit breakers to fused disconnect switches. The change was originated because replacement parts for the existing overcurrent trip devices were no longer available. The DC referenced seismic qualification and electrical load and coordination studies which had been conducted for the involved distribution systems and components. The installation procedure also included instructions for post-modification testing.

The inspector's questions concerning fuse selection and replacement were resolved by reviewing Engineering Procedure 3.19.1, "Fuse Control," Revision 1, dated September 7, 1989. The inspector checked the installation of the fuses in place of the overcurrent trip devices on one 250VDC and one 125VDC circuit breaker. The inspector found the installation kits and the completed installation to be acceptable.

Although the DC was still in process, the installation work had been completed on most of the involved circuit breakers at the time of this inspection.

- ° ESC 89-268, "Replacement of SJO Cable"

This equipment specification change (ESC) dealt with the replacement of SJO type electrical cable inside 11 control room electrical cabinets. The degradation problem with the original (SJO) electrical wire was documented in NRC Inspection Report 50-298/89-19. The licensee evaluated a replacement cable (Rockbestos Firewall III) and found it acceptable. The

replacement work was conducted under an ESC because the scope of the change involved only the type of wiring being used and, therefore, did not constitute a design change.

The inspector noted that the wiring changeout procedure required QC verification of the original wiring connections prior to removal in addition to verification of proper reinstallation. The installation procedure also included acceptance tests for each of the replaced electrical cables. The wiring changeout was completed on April 3, 1990.

4.3 Conclusion

The inspector found the DC documentation packages to contain a large amount of detailed information and to contain references to other germane studies. All of the DCs that were reviewed were determined to contain sufficiently detailed instructions to ensure proper installation, and all contained acceptance testing requirements and criteria. The licensee was able to adequately resolve all of the inspector's questions related to the reviewed DCs in a timely manner.

The inspector also concluded that the licensee was adequately controlling the revisions to facility procedures and drawings, including training personnel to the revisions, required for implemented design changes.

5. EXIT INTERVIEW

The inspector summarized the scope and findings of the inspection during an exit interview on April 13, 1990, with the personnel identified in paragraph 1. The licensee did not identify any of the information discussed at this exit interview as proprietary.