APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/92-04 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: Nemaha County, Nebraska

Inspection Conducted: February 5 through March 3, 1992

Inspector: E. E. Collins, Project Engineer

Approved: P. H. Harrell, Chief, Project Section C 3-9-92 Date

Inspection Summary

Inspection Conducted February 5 through March 3, 1992 (Report 50-298/92-04)

Areas Inspected: Special, unannounced inspection of the licensee's resolution of a deficient 250-volt battery cell which was documented in a nonconformance report.

Results:

- A significant area of concern exists with the licensee's surveillance program in that it allowed safety-related equipment to be considered operable when Technical Specification acceptance criteria were not satisfied. The procedure that provides guidance for operability determinations by the operating staff appeared to be inadequate and is an apparent violation of regulatory requirements.

- The operability determination made by plant personnel of Battery 1A was not reviewed by the Station Operations Review Committee, which is an apparent procedural violation and an indication of a procedural implementation weakness by plant personnel.

- The plant operated in a condition contrary to plant Technical Specifications, from December 29, 1991, to February 10, 1992, which is an apparent violation.

- The fact that a condition adverse to quality was identified and not corrected for an extended period of time is an apparent violation of regulatory requirements.

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. R. Flaherty, Engineering Manager
*L. E. Bray, Regulatory Compliance Specialist
*S. M. Peterson, Senior Manager of Technical Support Services
*M. A. Dean, Nuclear Licensing and Safety Supervisor
*C. R. Moeller, Technical Staff Supervisor
*S. S. Freeborg, Plant Engineering Supervisor
*R. W. Moberly, Electrical/I&C Engineer
C. J. Jorgensen, Lead Electrical/I&C Engineer

NRC Personnel

*R. V. Azua, Resident Inspector, Fort Calhoun Station
*E. E. Collins, Project Engineer (via telephone)
*P. H. Harrell, Chief, Project Section C (via telephone)

* The above personnel participated in the exit interview conducted by telephone on March 3, 1992.

The inspector also contacted other personnel.

2. Discussion

During performance of Surveillance Procedure 6.3.15.1, "125 V/250 V Station and Diesel Fire Pump Battery Quarterly Check," on December 18, 1991, the license documented that Cell 110 of the 250-volt Battery EE-BAT-250(1A), Model LCR-25 manufactured by the C&D Company, had an individual cell voltage of 2.05 volts. The surveillance test acceptance criteria stated, as specified by Technical Specification (TS) 4.9.A.4.b.2, that each connected cell shall be at a minimum of 2.15 volts. The surveillance test was completed, with the discrepancy noted on Nonconformance Report (NCR) 91-131, dated December 19, 1991. The NCR was dispositioned by the supervisor for system engineering, on December 20, 1991, to require the performance of a root cause analysis, to recommend and initiate corrective actions to prevent recurrence, and to take actions to restore the cell voltage. The Division Manager of Nuclear Operations concurred with the disposition of the NCR on December 23, 1991.

The acceptance criteria of Step 10.2 of Surveillance Procedure 6.3.15.1 specified that all data be within minimum and/or maximum limits listed in Attachment 2, which specified a minimum individual cell voltage of

2.15 volts. Cell 110 of Battery 1A was determined to be 2.05 volts, yet the test was completed and the battery was considered operable by the shift supervisor.

The system engineer performed an evaluation (not dated) to address the operability of Battery 1A, as a result of the cell voltage discrepancy identified on the NCR. The evaluation considered overall battery voltage and capacity with one bad cell and concluded that the battery would still perform its intended function even though one cell was at a voltage less than that required by the TS surveillance requirements. The evaluation also noted that Cell 110 in Battery 1A was suspected of having copper contamination. When the battery plates were manufactured, due to problems during the manufacturing process, the amount of lead coating over the copper inner plate was thin in some areas. After some operational time period, the lead coating was penetrated by the battery acid, causing the copper of the inner plate to go into solution and effect the performance of the battery cell. As a result of the concern with copper contamination, the evaluation performed by the system engineer stated that all battery cells with potential copper contamination would be monitored for individual cell voltages weekly to identify which cells were reaching the TS voltage limit.

In response to the NCR, the licensee concluded that a special procedure would be required to replace Cell 110 of Battery 1A while the plant was operating. On January 14, 1992, a request to extend the due date for battery cell replacement to March 1, 1992, was submitted. The request was reviewed and approved by the Division Manager of Nuclear Operations on January 15, 1992. However, the Division Manager failed to submit the operability determination to the Station Operations Review Committee (SORC) for an independent review and evaluation.

Section 8.3 of Procedure 0.27 requires, in part, that the SORC shall normally review, within 1 working day, all operability evaluations involving components that are subject to TS limiting conditions for operation. The failure to follow the requirements of Procedure 0.27 is an apparent procedural violation in that the operability evaluation for Battery 1A was not reviewed by the SORC.

Section 8.2.1.2 of Procedure 0.26, "Surveillance Program," states that the acceptance criteria of the surveillance test were to ensure that the TS were met. Note 1 states that whenever a surveillance procedure cannot be completed due to degradation of TS-related equipment, system operability shall be reviewed. Step 2.1.8 of Procedure 0.27, "Component Operability," states, in part, that if a component fails to pass the acceptance criteria of a surveillance, it normally cannot be considered operable.

This event identified a significant weakness in the surveillance test program. Procedure 0.26 only required that system operability be reviewed. Station personnel did document that Cell 110 was below 2.15 volts, but did not recognize that the TS surveillance criteria were regulatory

requirements necessary to satisfy the limiting condition for operation. This weakness allowed plant personnel to conclude that TS equipment could be considered operable when the TS surveillance acceptance criteria were not met.

Due to a lack of specific guidance in Procedure 0.26 for making TS operability determinations, it appears that the procedure is inadequate and is an apparent violation.

On February 6, 1992, during a review of open NCRs, the inspector noted that Cell 110 of Battery 1A was documented as being below the TS acceptance criteria and that no action had been implemented to replace or remove the deficient battery cell. This was discussed with the system engineer who confirmed that the deficient battery cell was still connected. The engineer indicated that the battery was operable based on a previously completed evaluation. Additional discussions with licensee personnel indicated that it was considered acceptable to perform an operability analysis even though TS acceptance criteria were not met.

On February 7, 1992, a telephone conference call was conducted between the licensee and the NRC to discuss the licensee's position on battery operability with one cell in Battery 1A at a voltage below the TS allowed minimum. During the discussion, the NRC indicated that plant TS surveillance acceptance criteria were regulatory requirements that were issued to ensure the necessary quality of systems and components and that the limiting condition of operation is not met if testing indicates that equipment can not meet the criteria. Based on the discussions, the licensee then declared Battery 1A inoperable and expedited activities to replace the deficient battery cell.

TS 3.9.B.c.1 states, in part, from and after the date that one of the battery systems is found to be inoperable for any reason, continued reactor operation is permissible during the succeeding 10 days. Operation of the station, from December 18, 1991, until February 10, 1992, with one connected cell of 250-volt Battery 1A below 2.15 volts, which was 41 days in excess of the 10 days allowed by the TS, is an apparent violation.

This occurrence indicated a potentially significant programmatic weakness with the licensee's corrective action program. During discussions with licensee personnel, it was noted that the time allowed to address deficiencies identified on NCRs was routinely provided as 30 days. It was not apparent that an evaluation was performed to determine the safety significance and assign a review period commensurate with the significance of the identified deficiency. In addition, it was noted that extensions of the original 30-day time period were routinely granted.

On February 10, 1992, while reviewing the weekly data recorded on February 5, 1992, for battery cells with copper contamination, the licensee identified that Cell 88 of Battery 1B was less than 2.15 volts. The individual cell voltage for Cell 88 was measured at 2.13 volts, and on February 10, 1992, the voltage of Cell 88 was 2.06 volts.

The licensee declared Battery 1B inoperable on February 10, 1992, initiated a plant shutdown, as required by the TS, and declared a Notice of Unusual Event. Cold shutdown was reached on February 11, 1992.

Criterion XVI of Appendix B to 10 CFR Part 50 requires that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Section 1.2 of the licensee's Quality Assurance Program for Operation (QAP-2300) states that corrective action activities include nonconformance reports. Section 1.3.b states that actions taken in response to identified deficiencies include immediate corrective action. Cell 110 of Battery 1A was below the TS limit of 2.15 volts, when the battery was required to be operable, documented in a nonconformance report, from December 18, 1991, until February 10, 1992, with no corrective action implemented to promptly correct the condition adverse to quality. This is an apparent violation.

Due to the immediate concern of this significant safety issue, a management meeting was held with licensee personnel in the Region IV offices on February 21, 1992. The basis of the meeting was for the licensee to provide assurance that the facility was not being operated outside of the limits specified in the TS by failing to declare equipment inoperable when surveillance criteria were not met. The licensee stated that additional examples of the failure to declare equipment inoperable, when surveillance criteria were not met, did not exist.

3. Conclusions

A significant weakness existed in the licensee's surveillance program in that it allowed TS equipment to be considered operable when the acceptance criteria specified in the TS were not satisfied. The guidance provided in Procedure 0.26, for operability determination, did not provide operations personnel with an appropriate level of instructions and is an apparent violation for an inadequate procedure.

The operability determination of Battery 1A was not reviewed by the SORC. This is an apparent procedural violation and indicated a weakness by facility personnel in procedure implementation.

The plant operated in a condition contrary to the TS, from December 29, 1991, to February 10, 1992, which is an apparent violation of TS 4.9.A.4.b.2.

An apparent violation of Criterion XVI of Appendix B was identified in that a condition adverse to quality was identified and not corrected for an extended period of time.

4. Exit Interview

An exit meeting was conducted by telephone on March 3, 1992, with the licensee representatives identified in paragraph 1. During this telephone conference, the inspector 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 inspector.