

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

NRC Inspection Report No. 50-285/92-08

Operating License No. DPR-40

Licensee: Omaha Public Power District (OPPD)
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

Facility Name: Fort Calhoun Station (FCS)

Inspection At: FCS, Blair, Nebraska

Inspection Conducted: March 16-19, 1992

Inspector: R. C. Stewart, Reactor Inspector, Materials and Quality Programs
Section, Division of Reactor Safety

Approved:

I. Barnes

I. Barnes, Chief Materials and Quality Programs
Section, Division of Reactor Safety

4/3/92
Date

Inspection Conducted March 15-19, 1992 (Report 50-285/92-08)

Areas Inspected: Routine, announced inspection of the licensee's boric acid corrosion prevention program procedures and implementation.

Results: Within the area inspected, no violations or deviations were identified. The licensee was found to have utilized various independently implemented procedures to address the recommendations of Generic Letter (GL) 88-05. However, observations were made by the inspector relative to programmatic shortcomings in the licensee's overall boric acid corrosion prevention program (see paragraph 2.2). These observations pertained to absence of documented engineering bases for selection of components, an apparent lack of coordination in implementation of the various program procedures, and inadequate criteria for documenting leakage conditions. On March 18, 1992, the inspector was informed that administration of the boric acid corrosion prevention program had been assigned to the special services engineering department, with an individual tasked with development of an overall administrative program document. An inspection followup item was identified (paragraph 2.2) with respect to review of licensee actions in this area.

DETAILS

1. PERSONS CONTACTED

OPPD

- *B. Blome, Supervisor, Corporate Quality Assurance (QA)
- *C. Bloyd, Lead Special Services Engineer-Programs Group
- *C. Boughter, Supervisor, Special Services Engineering
- *G. Cook, Supervisor, Site Licensing
- *D. Dale, Supervisor, Quality Control (QC)
- *J. Dyer, Senior QC Inspector
- M. Frans, Supervisor, Systems Engineering
- *J. Gasper, Manager, Training
- W. Gates, Division Manager, Nuclear Operations
- *K. Henry, Lead Systems Engineer
- *R. Jaworski, Manager, Station Engineering Nuclear
- *L. Kusek, Manager, Nuclear Safety Review
- *B. Mierzejewski, Systems Engineer
- P. Olsen, QC Inspector
- *T. Patterson, Manager, Fort Calhoun Station
- A. Richards, Assistant Manager, Fort Calhoun Station
- *R. Short, Manager, Nuclear Licensing and Industry Affairs
- *C. Simmons, Station Licensing Engineer

NRC

- *R. Mullikin, Senior Resident Inspector

The inspector also interviewed other employees during the inspection.

*Denotes those persons that attended the exit meeting on March 19, 1992.

2. BORIC ACID CORROSION PREVENTION PROGRAM (62001)

The objectives of this inspection were to verify that the licensee had a documented program for prevention of corrosion caused by boric acid solution leaking out from boric acid containing systems, as required by GL 88-05. Additional objectives were to verify that the licensee had prepared procedures which provide clear guidance for performing the activities required by the program and verify that the licensee had implemented the program in accordance with its written procedures.

2.1 Generic Letter 88-05 Recommendations

In summary, GL 88-05 recommends that the licensee: (1) determine the principal locations where leaks, smaller than the allowable Technical Specification limit, can cause degradation of the primary pressure boundary by boric acid corrosion. Particular consideration should be given to identifying those locations where conditions exist that could cause high concentrations of boric acid on pressure boundary surfaces; (2) include procedures for locating

small coolant leaks (i.e., leakage rates at less than Technical Specification limits) that establish the potential path of the leaking coolant and the reactor pressure boundary components that it is likely to contact; (3) establish methods for conducting examinations and performing engineering evaluations to establish the impact on the reactor coolant pressure boundary when leakage is located; and (4) establish corrective actions to prevent recurrences of this type of corrosion.

2.2 Fort Calhoun Boric Acid Corrosion Prevention Program

In response to GL 88-05, the licensee's letters dated June 7, 1988 and August 31, 1988, respectively, described the intent to upgrade an existing program, Procedure SP-CSF-1 (now superseded by Procedure SE-EQT-MX-0002) "Carbon Steel Fasteners Inservice Testing" and supplement that procedure with Surveillance Test ST-RLT-1, "Reactor Coolant System (RCS) Leak Rate Test." In reviewing the above procedures, the inspector observed that applicable components within the reactor coolant pressure boundary (RCPB) were not addressed with respect to inspection for boric acid leakage (i.e., reactor coolant pumps and reactor vessel head). However, review of additional procedures provided by the licensee (see listing in Attachment to this report), indicated that the additional RCPB components were subject to inspection.

The following observations were made by the inspector regarding the program procedures which were discussed with the cognizant licensee representative during the course of the inspection and identified at the exit meeting:

- o The procedures relating to boric acid corrosion/leakage prevention were independently administered by various system engineers/special services engineers. In addition, with the various procedures in effect, there did not appear to be a systematic or coordinated effort established for boric acid leakage control. On March 18, 1992, the inspector was informed that the administration functions for the boric acid corrosion prevention program had been assigned to the special services engineering department, with an individual designated as being responsible for incorporating the applicable procedures into an overall administrative program document. Review of licensee actions in this area is considered an inspection followup item (285/9208-01).
- o During the inspector's review of the principal procedure (SE-EQT-MX-0002), it was observed that there were 62 components (flanged joints, valves, etc) within containment and 71 components within the auxiliary building being examined. However, there were no documented engineering evaluations that provided the bases for selection and inclusion of components in the boric acid corrosion prevention program.
- o Procedure SE-EQT-MX-0002 requires that the examination of components be performed by QC inspectors who had been certified Level II in VT-3 inspection. The procedure instructions for the QC inspectors included "Any time leakage is found, inspect the immediate and surrounding area for equipment damage and corrosion." There was, however, no apparent requirement or criteria for the QC inspectors to either quantify boric

acid leakage for subsequent engineering evaluation, or to identify leaking components for subsequent tracking or trending for potential corrective action in reducing boric acid leakage.

2.3 Program Implementation

The inspector reviewed the results of the visual examinations conducted in accordance with Procedure SE-EQT-MX-0002, "Carbon Steel Fasteners Inservice Testing Refueling Inspection," during the 11th, 12th and current 13th refueling outages. It was noted that detailed sketches and/or isometric drawings for each component were referenced and provided to the QC inspectors to assist in component location and markup. The procedural requirements appeared to have been effectively implemented during these examinations.

In conjunction with the above review, the inspector conducted a walkdown with the responsible systems engineer and a QC inspector of systems/components within the containment building. During the walkdown, the QC inspector demonstrated the examination techniques prescribed by Procedure SE-EQT-MX-0002 on a sample of approximately 10 components (flanged flow elements and valves). There were no procedural implementation deficiencies observed by the inspector during this review.

3. EXIT REVIEW

An exit interview was conducted on March 19, 1992, with those personnel denoted in paragraph 1 in which the inspection findings were summarized. No information was presented to the inspector that was identified by the licensee as proprietary.

ATTACHMENT

Correspondence

R. L. Andrews to NRC, letter dated June 6, 1988, SUBJECT: Response to NRC GL 88-05

R. L. Andrews to NRC, letter dated August 31, 1988, SUBJECT: Additional Information for Response to NRC GL 88-05

Procedures

SE-EQT-MX-0002, "Carbon Steel Fasteners Inservice Testing Refueling Inspection," Revision 0

MM-RR-RC-0010, "Inspecting and Cleaning Reactor Coolant Pump Studs," Revision 0

MM-RR-RC-1000, "Cleaning of Reactor Vessel Studs, Nuts, and Washers," Revision 3

MM-RR-RC-0313, "Reactor Vessel Closure Head Flange Preparation," Revision 0

MM-RR-RC-0312, "Reactor Vessel Flange Cleaning and Preparation," Revision 0

PE-RR-RC-0101, "Opening of Steam Generator Primary Side," Revision 3

PE-RR-RC-0103, "Pressurizer Manway Cover Removal," Revision 5

PE-RR-RC-0400, "Pressurizer Safety Valve Removal," Revision 2

OP-ST-RC-3001, "Reactor Coolant System (RCS) Leak Rate Test," Revision 1

OP-ST-RC-3007, "Reactor Coolant Leak Test No Repair or Modification," Revision 1

OP-ST-RC-3008, "Reactor Coolant System Integrity Test (Repair or Modification)," Revision 1

01-RC-2C, "Reactor Coolant System Cold Hydrostatic Test," Revision 6

Test Reports

SP-CSF-1, "Carbon Steel Fasteners Inservice Testing," Revision 3, test completed December 15, 1988

SP-CSF-1, "Carbon Steel Fasteners Inservice Testing," Revision 5, test completed May 7, 1990

SE-EQT-MX-0002, "Carbon Steel Fasteners Inservice Testing Refueling Inspection," Revision 0, testing/inspection in progress March 18, 1992