

APPENDIX B
U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-285/84-07

License: DPR-40

Docket: 50-285

Licensee: Omaha Public Power District
1623 Harney Street
Omaha, Nebraska 68102

Facility Name: Fort Calhoun Station

Inspection At: Fort Calhoun Station, Blair, Nebraska

Inspection Conducted: March 1-31, 1984

Inspector: LA. Yandell
L. A. Yandell, Senior Resident Reactor Inspector

4/11/84
Date

Approved: W. D. Johnson
W. D. Johnson, Chief, Project Section A, RPB2

4/18/84
Date

Inspection Summary

Inspection Conducted March 1-31, 1984 (50-285/84-07)

Areas Inspected: Routine, announced inspection of operational safety verification, maintenance activities, preparation for refueling, outage activities, and followup of IE Circulars. The inspection involved 116 inspector-hours onsite by one NRC inspector.

Results: Within the five areas inspected, one violation was identified (violation - failure to follow procedures - paragraph 2).

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DETAILS

1. Persons Contacted

- *W. C. Jones, Division Manager, Production Operations
- *K. J. Morris, Manager, Administrative Services
- *W. G. Gates, Manager, Fort Calhoun Station
- *M. E. Kallman, Supervisor, Administrative and Security Services
- L. T. Kusek, Supervisor, Operations
- A. W. Richard, Supervisor, Technical
- J. J. Fluehr, Reactor Engineer
- R. J. Mueller, Supervisor, I&C and Electrical Field Maintenance
- D. W. Dale, Senior QC Inspector
- M. R. Core, Supervisor, Maintenance
- J. C. Branch, Licensing Engineer
- G. L. Roach, Supervisor, Chemistry & Radiation Protection

*Denotes attendance at the exit interview.

The NRC inspector also talked with, and interviewed, other licensee employees during the inspection. These employees included licensed and unlicensed operators, craftsmen, engineers, and office personnel.

2. Operational Safety Verification

The NRC inspector performed activities as described below to ascertain that the facility is being maintained in conformance with regulatory requirements and that the licensee's management control system is effectively discharging its responsibilities for continued safe shutdown.

- a. The NRC inspector made several control room observations to verify proper shift manning, operator adherence to approved procedures, and adherence to selected Technical Specifications specific to the shutdown condition. Selected logs, records, recorder traces, annunciators, panel indications, and switch positions were reviewed to verify compliance with regulatory requirements. Radiation controlled area access points were observed at various times to verify that they were being maintained in accordance with approved procedures. The licensee's equipment control was reviewed for proper implementation by reviewing the maintenance order and tag-out logs, and by verifying selected safety-related tag-outs. The NRC inspector observed several shift turnovers and attended a number of the outage planning meetings.
- b. The NRC inspector toured the plant at various times to assess plant and equipment conditions. The following items were observed during these tours:
 - . general plant conditions

- . vital area barriers not degraded or appropriately manned by security personnel
 - . adherence to requirements of radiation work permits (RWPs)
 - . proper use of protective clothing and respirators
 - . plant housekeeping and cleanliness practices including fire hazards and the control of combustible material
 - . work activities being performed in accordance with approved activities
 - . physical security
 - . HP instrumentation is operable and calibrated
- c. At about 2:10 p.m. on March 14, 1984, Fort Calhoun Station experienced a loss of Panel AI-41B, one of the main DC panels on the No. 2 DC Bus. As a result of this loss a partial containment isolation actuation signal (CIAS) and a steam generator low signal (SGLS) were actuated. Due to the loss of DC power, the component cooling water/raw water interface valves opened allowing the CCW to dump into the Missouri River. The CCW system was restored within one hour, and the initial river samples indicated that chromium limits were not exceeded. Due to this inadvertent actuation of the safeguard signals, the licensee made the proper four-hour notification to the NRC. The NRC inspector observed the licensee's actions taken to restore CCW and attended the debriefing held with the operating crew. The cause of the outage was determined to be operator error when he inadvertently opened the DC panel breaker while shifting inverters for maintenance purposes.
- d. The NRC inspector attended a Systems Acceptance Committee meeting to review the work done under FC-80-19, "Wide-Range Excore Detectors." This work is only partially complete, but two channels have been made operational to permit refueling. The committee gave conditional acceptance for Channels B and C for refueling on the basis that these two channels had been installed and a count rate calibration had been performed in accordance with the requirements of Technical Specification 2.8(4).
- e. The NRC inspector observed portions of Containment Purges 84011, 84013, 84015, and 84028 and reviewed the discharge permits. In all cases the following items were verified:
- . the permit was properly filled out and approved
 - . the appropriate samples were taken and analyzed
 - . the required effluent monitors and recorders were operational

- . the required supply and discharge fans were operating
- . the maximum release rates were calculated and established
- . the limiting X/Q was established
- . the functional test of VIAS was performed using Procedure OI-VA-1, Section IV.F
- . the stack dew point readings were taken
- . the Iritium sample was obtained

For Purge 84015, the NRC inspector observed the lineup being performed, the testing of the VIAS, and the initiation of the purge. It was observed that appropriate annotations on the effluent recorders and the proper log entries were made.

During the review of Purge 84013, the NRC inspector noted that the 8:00 a.m. reading was greater than the limiting X/Q for the established flow rate. Procedure CMP-4.5, "Containment Purge Release Permit," states in Section VIII.6(c) that, "during the use of the containment purge system, the release must be terminated if the X/Q value becomes greater than $\frac{E}{\text{CFM}}$ Sec/M³ (the limiting X/Q) based on _____ CFM." The licensee failed to terminate the purge when the 8:00 a.m. X/Q was 1.49×10^{-4} Sec/M³ and the limiting X/Q was established at 9.314×10^{-5} Sec/M³. This failure to adhere to the requirements of CMP-4.5 is an apparent violation against Technical Specification 5.8.1 which requires that, "written procedures . . . be established, implemented, and maintained that meet or exceed the minimum requirements of Sections 5.1 and 5.3 of ANSI N18.7-1972, and Appendix A of US NRC Regulatory Guide 1.33" (50-285/8407-01)

The licensee immediately terminated the purge and performed calculations to determine what no release limits had been exceeded. Both the 6:00 a.m. and 10:00 a.m. X/Q readings had been in specification, and the licensee was able to recommence the purge after establishing a revised flow rate and a limiting X/Q for the current atmosphere conditions. Since this event, the licensee has provided with each purge, a series of flow limits and associated limiting X/Q's to enable the operators to modify purge flows as necessary and remain within the atmospheric dispersion limits.

No other violations or deviations were identified.

3. Maintenance Activities

The NRC inspector witnessed portions of the work performed on the following maintenance activities:

- a. Maintenance Order (MO) 23146, "Component Cooling Water Pump AC-3A." During performance of Surveillance Test ST-ISI-CC-3, vibration of the inboard bearing (horizontal) was in the high alert range. Machinery history records showed that this bearing had exhibited higher than normal vibration readings in recent tests, and the licensee elected to investigate the problem. The NRC inspector reviewed the MO for completeness and proper signoffs, and noted that QC hold points were established, the appropriate Technical Specification reference was identified, and that an approved maintenance procedure (MP-AC-3, "Inspection and Overhaul of CCW Pumps") was attached. During the course of the job, the NRC inspector verified that the maintenance procedure was being maintained current at the jobsite and that the Flame Cutting and Welding Permit was present and signed off. The unit was tagged out properly, and it was verified that qualified personnel were assigned to the job. The NRC inspector noted that Surveillance Test ST-ISI-CC-3 was to be performed after repairs were complete to verify operability.
- b. SRDCO 84-9/MR-FC-78-74, "Modification to HCV 1041/1042 Control Circuitry." The licensee has initiated a modification to provide separate controls to valves HCV-1041C and HCV-1042C, bypasses around the stop check valves on the mainsteam lines. The NRC inspector observed work in progress at Control Board CB-4 and noted that the technicians were using a PRC approved procedure. The Safety-Related Design Change Order (Form F) was properly signed off with both QA and QC requirements established. The NRC inspector verified that Tag-Out 84-324 was properly established, that purchase order information for CQE equipment used was recorded, that the shift supervisor authorized the work, and that QA was notified when the job commenced. Drawings 161F530 (Sheet 2) and 161F591 (Sheets 2 and 5) were present at the jobsite, and the Pre-Installation Modification Control Checklist (Form H) and the Safety Evaluation were attached to the work package. This modification is scheduled to be fully tested at the end of the refueling outage.
- c. MO's 840418, 840419, 840420, and 840421 for the four plant instrument inverters. These MO's called for inspection and repairs as necessary for each of the inverters using Maintenance Procedure MP-EE-9, "Instrument Inverter Maintenance," and the vendor representative. The NRC inspector observed the work being done on "A" Inverter and reviewed the paperwork on the remaining three. It was verified that the MO's were signed off properly, that tag-outs were established, and that the Technical Specification reference was identified. Where necessary, the MO required that a fire watch be established if the rollup doors are opened. QA and QC signoffs were present, and it was verified that hold points were established and observed.
- d. MO 841069, "Valve HCV-1041A." The NRC inspector observed that Valve HCV-1041A was disassembled for refurbishing and witnessed the magnetic particle inspection on the "tailink" assembly. It was verified

that a qualified level 2 inspector was performing the inspection and that the current procedure (Appendix E to Standing Order G-26A, "Quality Control Program") was present at the jobsite. Form FC-180, "Magnetic Particle Inspection Report," was filled out and the examination equipment identified. This inspection was being performed as required by Maintenance Procedure MP-MSIV-1, "Disassembly Procedure for HCV-1041A and HCV-1042A," and the NRC inspector verified that the procedure signoffs were current.

- e. MO 830176, "Valve FCV-1102." The licensee is modifying the plug assembly for Main Feedwater Regulating Valve FCV-1102 as was performed on FCV-1101 during the 1983 refueling outage. The NRC inspector observed the initial phases of the work and verified that the MO was complete and approved properly. QC hold points were established to inspect the modified plug assembly and perform closeout inspection. Maintenance Procedure MP-CV-EHD, "Inspection and Repair of FCV-1101, FCV-1102," was attached to the MO, Procedure Change PC-11918 was entered properly, and the signoffs were current. The NRC inspector verified Tag-Out 84-296 that was assigned to this job.
- f. MO's 840791, "Valve HCV-317," and 840792, "Valve HCV-320." During the performance of Surveillance Test ST-SILVCOV-1, "Safety Injection Loop Valve Contractor Operating Voltage," the open contactor on these two valves failed to "seal in" at low 102 VAC. Tag-Out 84-507 was assigned to this work, and qualified personnel were assigned to troubleshoot this problem. The MO was properly signed off and repairs were completed by adjusting the contacts. ST-SILVCOV-1 was performed to verify operability and QC reviewed the completed test. The MO also referenced the Qualified Life Program (QLP) established under Standing Orders G-17A and G-56. This program has been established by the licensee to maintain the qualified life of safety-related electrical equipment installed in a harsh environment. All MO's are being screened to determine if repairs are being performed on equipment under the QLP and any such repairs are being documented on Form FC-198, "Qualified Life Program Information Sheet." The NRC inspector has reviewed this program with the licensee and will be monitoring its effectiveness as it becomes fully operational.
- g. MO 840597, "Valve CH-339." Valve Ch-339, the gravity feed valve from Concentrated Boric Acid Storage Tank CH-11A was found to be difficult to operate. The NRC inspector observed the review and signoff of the MO in the Control Room and the establishment Tag-Out 84-559. It was verified that the requirements of Technical Specification 2.2(1) were satisfied in that there existed, "at least one flow path to the core for boric acid injection." The NRC inspector noted that a PRC approved procedure to perform this work was attached to the MO, and that QC had been identified to verify the repairs.

No violations or deviations were identified.

4. Preparation for Refueling

In preparation for fuel movement early next month, the NRC inspector reviewed Operating Procedure OP-11, "Reactor Core Refueling Procedure," and the Technical Specification requirements under Section 2.8. The fuel movement sequence (Appendix A to OP-11) had been prepared by the OPPD engineering staff and given a "dry run" by the Fort Calhoun reactor engineer prior to going to the PRC for approval. The NRC inspector reviewed the initial conditions required under Section II of OP-11, and noted that all were signed off prior to fuel transfer. The final status of the initial conditions requires a PRC approval in Step FF before allowing fuel movement to commence, and the NRC inspector verified that this final review was performed.

No violations or deviations were identified.

5. Outage Activities

Fort Calhoun Station commenced shutdown on the afternoon of March 2, 1984, in accordance with OP-5, "Plant Shutdown," and by March 5th was cooled down and had initiated shutdown cooling per OI-SC-1, "Initiation of Shutdown Cooling." During this reporting period several of the major outage activities, as discussed in paragraph 5 of NRC Inspection Report 84-04, were performed.

Eddy current testing (ECT) of both steam generators was completed. The NRC inspector attended the briefing meeting for the ECT teams and noted that the ALARA coordinator, Fort Calhoun Station management personnel, health physics technicians, quality control inspectors, and the contract personnel were present. Emphasis was placed on setting up the job, precautions to follow, and work practices expected to be used at the Fort Calhoun Station. Tool accountability was explained and discussed, and any questions about the evolution were resolved. Preliminary results from the testing call for three tubes to be plugged in Steam Generator "A" and six tubes to be plugged in Steam Generator "B". This came not from indications obtained during testing, but because the probe could not traverse the entire tube section. The licensee will prepare a final report on this work at the completion of the outage.

The licensee completed replacement of the case-to-cover gaskets on all four reactor coolant pumps as recommended by the pump manufacturer. The NRC inspector observed a portion of the work being performed on RCP-3C under MO 840176. It was noted at the jobsite that qualified personnel were assigned to this task and that continuous HP coverage was provided. Special Procedure SP-RC-10, "Reactor Coolant Pump Disassembly," and SP-RC-11, "Reactor Coolant Pump Assembly," were used on-the-job and copies were maintained at the jobsite with signoffs up-to-date. The NRC inspector verified that all required QA and QC hold points were observed and signed off.

Sludge lancing of the steam generators was completed this month. Initially, the "A" Steam Generator was lanced while a helium leak check was performed on the "B" Steam Generator to locate the primary to secondary leak that was identified shortly before shutdown. The leak check was performed by an outside contractor using Special Procedure SP-SGHE-1, "Leak Check of RC-2B." The first round of checks failed to locate the leak, so the licensee elected to proceed with sludge lancing of the "B" Steam Generator in hopes that this would make detection of the leak easier. Following the sludge lancing, the helium leak check was performed again but no positive confirmation of a leak was obtained. This effort was suspended to allow refueling to proceed, but the licensee intends to continue looking for the leak in "B" Steam Generator.

In preparation for refueling the NRC inspector witnessed the closeout inspection of the "A" Steam Generator under MO 840839. The NRC inspector attended the job briefing held in the QC office and reviewed the MO for completeness. This MO covered removal of the nozzle covers, ventilation, and the indicators used to mark which tubes are to be plugged. The NRC observed this work being done and the final QC closeout (including the tool accountability log) prior to the manways being installed. The manways were then replaced under MO 830019 in accordance with Maintenance Procedure MP-RC-2-1-B, "Steam Generator Primary Manway Replacement."

One major outage activity that has developed since plant shutdown is the removal of the drilled tube support plate rim in both steam generators. Other plants have experienced tube "denting" because of holes in the support plates "growing" smaller and squeezing the tubes. The NSSS vendor determined that this potential for damage could be reduced if the stresses in the support plates could be relieved. This is accomplished by removing the outer rim of the plates so that the plates are detached from the shroud and allowed to "grow" unrestrained. The initial inspection of the Fort Calhoun Station steam generators showed no indication of this stress problem, but OPPD has elected to perform the modification on the recommendation of the NSSS vendor. It is estimated that this job will take 12-to-14 days using almost 100 boilermakers but is not expected to impact the critical path schedule. Because of the magnitude of this undertaking, the Plant Manager had the entire PRC inspect the steam generator and view the expected working conditions so that they might better understand the work procedure when it comes before them for review and approval. The NRC inspector, along with two regional NRC inspectors, participated in this inspection which included a job briefing by the ALARA coordinator, assignment to teams, and the actual S/G entry under the supervision of an NSSS vendor representative. The licensee is presently preparing the "rim cut" procedure and beginning to bring boilermakers onsite for orientation and training.

Other outage activities observed by the NRC inspector included removal of the pressurizer safety valves and removal of cable trays and ventilation

pipng in preparation for lifting of the vessel head. The NRC inspector attended a briefing meeting held by the OPPD Senior QC Inspector for contract personnel serving in a QC capacity during the outage. Governing OPPD/Fort Calhoun Station procedures were identified and discussed, the QC organizational setup was explained, and individual QC inspector responsibility with regard to shutdown authority was discussed. The NRC inspector has observed that QC personnel are making routine inspections of the auxiliary building and containment for safety and cleanliness, and are documenting their findings in formal reports.

No violations or deviations were identified.

6. Followup of IE Circulars

The NRC inspector reviewed the following IE Circulars to verify that the document had been received by the licensee and reviewed for applicability:

- . Circular 80-09, "Problem With Plant Internal Communications Systems"
- . Circular 80-10, "Failure to Maintain Environmental Qualification of Equipment"
- . Circular 80-15, "Loss of Reactor Coolant Pump Cooling and Natural Circulation Cooldowns"
- . Circular 80-17, "Fuel Pin Damage Due to Water Jet From Baffle Plate Corner"

It was verified that in each instance the licensee addressed the problem presented and documented their findings and actions. These items are considered closed.

7. Exit Interview

The NRC inspector met with licensee representatives on March 30, 1984, to summarize the scope and findings of the inspection.