

APPENDIX  
U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-285/84-11

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: April 1-30, 1984

Inspector:

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

5/9/84  
Date

Approved:

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

5/21/84  
Date

Inspection Summary

Inspection Conducted April 1-30, 1984 (50-285/84-11)

Areas Inspected: Routine, announced inspection of operational safety verification, surveillance testing, maintenance activities, outage activities, and followup of Licensee Event Reports. The inspection involved 117 inspector-hours on site by one NRC inspector.

Results: Within the five areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

- \*W. G. Gates, Manager, Fort Calhoun Station
- L. T. Kusek, Supervisor, Operations
- M. R. Core, Supervisor, Maintenance
- A. W. Richard, Supervisor, Technical
- J. J. Fluehr, Reactor Engineer
- R. J. Mueller, Supervisor, I&C and Electrical Field Maintenance
- G. L. Roach, Supervisor, Chemical and Radiation Protection
- J. M. Mattice, Plant Health Physicist
- C. R. Crawford, ALARA Coordinator
- D. W. Dale, Senior QC Inspector
- K. C. Hyde, Test Engineer
- J. J. Fisicaro, Licensing Administrator Supervisor, Nuclear Regulatory and Industry Affairs
- J. Ozol, Engineer GSE
- J. A. Drahota, I&C Engineer
- M. L. Gutierrez, Production Operations Engineer
- C. J. Brunnert, QA Operations Supervisor
- R. F. Mahaffey, Supervisor, Electrical and I&C Technical Services
- J. Dyer, QC Inspector
- C. W. Norris, Senior Engineer, Nuclear & Chemical Technical Services
- G. Jepson, Technical Services Engineer
- D. L. Stading, Shift Technical Advisor
- M. M. Bare, Training Coordinator
- F. E. Swihel, Training Coordinator

\*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. The NRC inspector observed portions of Containment Purges 84030 and 84031 and reviewed the discharge permits. The following items were verified:

- . the permit was properly filled out and approved
- . VIAS was tested in accordance with OI-VA-1
- . the appropriate samples were taken and analyzed
- . the maximum release rates were calculated and established
- . the limiting X/Q was established
- . the required effluent monitors and recorders were operational
- . the tritium sampler was in place and the sample was obtained during the purge

- . the required supply and discharge fans were operating
  - . stack dew point and annubar readings were obtained as required during the purge
- d. The NRC inspector performed Valve Lineup OI-CO-4-CL-A, "Containment Isolation Status During Refueling Operations," in conjunction with the plant refueling. Due to accessibility during the outage, the NRC inspector has been performing system walkdowns inside the containment. The NRC inspector performed a partial walkdown of the High Pressure Safety Injection System, the Low Pressure Safety Injection System, and the Safety Injection Tanks and Leakage System to confirm that P&ID E-23866-210-130 (Sheets 1 and 2) reflect the as-built installation. The following CQE piping isometrics were reviewed to verify that the as-built configuration of hangers, snubbers, and supports is accurately presented on the drawings:
- . D-4253
  - . D-4255
  - . D-4256, Sheets 1 and 2
  - . D-4299, Sheets 1 and 2

Hanger BIH-179 was found to have a bolt missing and the licensee has issued a maintenance order (MO) to correct this before startup. A few minor typographical errors were identified and this information was given to the licensee for his use.

No violations or deviations were identified.

### 3. Surveillance Testing

The NRC inspector witnessed portions of the following surveillance tests performed as a part of the refueling outage:

- a. Offsite Power Low System (OPLS) Matrix Check (Refueling) ST-ESF-14, F.3. This is a three-part procedure that verifies proper initiation of the matrix logic, performs a functional test of the OPLS lockout relay, and verifies operation of the test switches for the existing loss of voltage relays. Over a period of three days, the NRC inspector observed portions of Part I in the control room and verified that the correct procedure revision was being used and that signoffs were being maintained current.
- b. Station Battery No. 2 Performance Capacity Test (Refueling) ST-DC-1, F.3. This test is performed every third refueling to verify that the capacity of the battery is adequate for the specified loads. The NRC inspector

reviewed the procedure and verified that all initial conditions had been satisfied and signed off. The NRC inspector observed the specific gravities and voltages for each cell being taken and recorded, and verified that minimum specific gravities and cell voltage averages were within required limits. The NRC inspector observed the initiation of the test, the establishing of the discharge current, and the initial set of readings. The correct procedure revision was being used and qualified personnel were performing the test.

- c. Channels A & B Automatic Engineered Safeguards Actuation, Manual Safety Injection Initiation, Manual Containment Spray Initiation, and Manual Containment Isolation Initiation (Refueling) ST-ESF-2, F.3 and F.4. The NRC inspector reviewed the procedure and noted that the proper revision was being used, Procedure Changes No.s 12227, 12228, and 12229 were entered properly, and the signoffs were being maintained current.
- d. Diesel Generator Check and Diesel Generator Automatic Operation (Monthly and Refueling) ST-ESF-6, F.2, F.3 (DG-1), and F.4 (DG-2). Each diesel generator performed Section F.2 to accomplish the one-hour run as a prerequisite for Sections F.3 and F.4. The NRC inspector observed Section F.2 and reviewed the initial conditions for Sections F.3 and F.4. This test initiates engineered safeguards on pressurizer pressure low signal, verifies that the diesel generator comes up to idle speed, and proves that various safeguards equipment "auto starts" at the proper sequence interval. Then the OPLS signal is initiated to verify that load shedding of the buses occurs, that the diesel generator comes up-to-speed and closes in on the dead bus, and that engineered safeguards equipment is sequentially loaded onto the diesel supplied bus. The NRC inspector verified that the latest version of the test was used, that QA signoffs were present, and that QC personnel were available to witness the test. The NRC inspector observed the electrical breaker lineup being performed and noted the switch lineup on Panels AI-30-A and B. During the performance of Section F.4, four ESF components did not start in AUTO, and MO's 841407, 841408, 841409, and 841410 were written to correct these problems. In conjunction with this test, MO 841324 had been written to verify that Valves HCV-258, HCV-265, HCV-1386, HCV-1387A/B, and HCV-1388A/B would attain their accident position when provided an engineered safeguards signal. These valve checks had been carried over from a previous ESF test, and QC personnel verified during the performance of ST-ESF-6, that these valves operated properly. The NRC inspector reviewed MO 841299 that was written on Valves HCV-314, HCV-318, and HCV-320 because they, "did not open when 86B/SIAS tripped during ST-ESF-2, F.4." Repairs were completed and the NRC inspector noted that operability was verified during the performance of ST-ESF-6 and witnessed by QC personnel. The NRC inspector witnessed the performance of Section F.3 of ST-ESF-6, and reviewed the completed test to verify that all steps had been performed. Component Cooling Water Pump AC-3C failed to start during the first run, and an MO was issued to identify and correct the problem. The same component was slow

starting on the retest, and additional repairs were completed. An evaluation was performed and AC-3C was allowed to be tested satisfactorily off the timer rather than do the complete Section F.3 again. The NRC inspector noted that two on-the-spot procedure changes were necessary to make technical corrections to initial conditions and procedure steps to allow the test to be completed, and he will followup on these items in subsequent revisions to the procedure to ensure that this information is properly incorporated.

- e. Safety Injection Valves Category C In-Service Valve Exercising Test (Refueling) ST-ISI-SI-1, F.4. These valve tests are performed after ST-ESF-6, F.3 and F.4 are completed. The NRC inspector reviewed the valve data sheets and verified that the required data were properly recorded and within specifications.
- f. Pressurizer Pressure Low Signal Actuation and Blocking Logic Calibration (Refueling) ST-ESF-1, F.4. The NRC inspector observed this procedure being performed and verified that qualified personnel were assigned to the test, QC prerequisites were satisfied, test equipment calibration data were recorded on Table A, the correct procedure revision was used, and all procedure steps were signed off.

No violations or deviations were identified.

#### 4. Maintenance Activities

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

- a. SRDCO 82-78/FC-81-99, Part 4, "Installation of MI Seismic Supports." The NRC inspector reviewed the completed design package for these seismic supports and observed the discussion of this design change at the Systems Acceptance Committee (SAC) meeting. It was verified that the package contained the following completed items:
  - . Form E, "Modification Completion Report"
  - . Form F, "Safety-Related Design Change Order"
  - . Form H, "Pre-Installation Modification Control Checklist"
  - . Form I, "Post-Installation Modification Control Checklist"
  - . PRC approved procedure with work instructions signed off
  - . FC-154, "Safety Evaluation"
  - . ALARA Review Checklist

- . analysis of supports installed with appropriate seismic information
- . verification signoff sheets for each support (approximately 129)
- . updated Drawing E-4054, Sheets 1-3

The Station System Acceptance Checklist (Form J) was reviewed and the design change signed off by all members of the SAC as "accepted."

- b. MO 840525, "HCV-385," and MO 840526, "HCV-386." Both valves were found to be leaking through. The NRC inspector reviewed the MO's and verified that they were signed off and approved correctly, that QA and QC requirements were identified, that a PRC approved work procedure was attached, and that the valves were tagged out properly in accordance with Tag-Out 84-636. It was noted that the PRC approved procedure included MP-CV-HS, "Inspection and Repair of Body Design H. S. Control Valves," and a separate RWP (No. 222) was issued for this work. The NRC inspector observed the initial setup and draindown for the job to allow craftsmen to remove the valve internals for rework and noted that qualified personnel were assigned to the job. Surveillance Test ST-ISI-SI-1 was performed after repairs were complete to verify operability.
- c. MO 841168, "Repair of HCV-507A&B." The leak test on Penetration M-14 using ST-CONT-3 showed that excessive leakage was present and repairs were required. The NRC inspector reviewed this MO at the signoff stage and noted that a PRC approved repair procedure was attached, that the appropriate vendor drawing was attached and that a safety evaluation was performed. QC requirements were specified to ensure that a certified welder, weld rod, and welding procedure were used, that a QC representative would verify the repairs completed, and that QC would witness closeout and operability testing using ST-ISI-WD-1, F.1.
- d. SRDCO 82-72, "Replace FCV-326." During the 1983 outage, the low pressure safety injection piping had been modified and spool pieces installed with the older valve in preparation for this outage. The NRC inspector observed portions of the installation in room 13 and noted that interference problems with the studs had to be resolved. The design engineer was present to address this matter, and modifications to the studs allowed installation to be completed the next day. The NRC inspector reviewed the design package and noted that an approved PRC procedure was attached, that the procedure signoffs were current, that QA/QC hold points were observed, and that the correct Technical Specification reference was identified on the MO. Limitations on supports and snubbers were spelled out, and Surveillance Test ST-HSS-3 for SIS-86 was attached. Procedure Changes PC12335 and PC12336 were entered properly, the ALARA review checklist was filled out and signed, and Tag-Out 84-680 was properly issued for the job.

- e. MO 841409, "CH-1B." Charging Pump CH-1B had failed to start during automatic actuation of ESF as part of Surveillance Test ST-ESF-6, Section F.4 (see paragraph 3) and repairs were required. The NRC inspector observed the preparation and approval steps of this MO, that QA/QC signoffs were obtained, and that qualified personnel were assigned to investigate this problem. It was determined that a switch contact was not opening in the AUTO mode, and needed to be replaced. During the retest of ST-ESF-6, CH-1B started in automatic and operated properly.
- f. SRDCO 84-6/FC-82-91, "Steam Generator Blowdown Radiation Monitor (RM-054A&B) Relocation." This design modification was implemented in response to NRC Open Item 8016-26 to provide better shielding for these two monitors and reduce the effect of high background radiation. The NRC inspector inspected the new installation and reviewed the design change package. It was noted that the SRDCO, Form F and Form H, "Pre-Installation Modification Control Form," were complete and signed off properly. The completed ALARA checklist was present, and RWP-128 was issued to cover this work. The PRC approved procedure was reviewed and the NRC inspector noted that QC signoffs were observed, that QC witnessed the leak test, and that calibration equipment was identified and verified in calibration. The seismic support installation procedure was attached to the design package and properly filled out. At the time of this inspection, the final calibration by I&C still had to be done and this was noted on the work procedure. The NRC inspector verified Tag-Out 84-488 that was issued for this work, and noted that vendor Drawings D-63060-841-33-28, D-63060-841-5-4, and B-63060-GEL-841-36 were current and present at the worksite.
- g. MO 841358, "Flush Component Cooling Water System." This was issued to flush sand from the system prior to having a CCW system outage to repair valves. The NRC inspector reviewed the MO for completeness and signoffs, and verified that a PRC approved procedure was attached to accomplish this task. The NRC inspector observed portions of the flush and verified that the work was performed in accordance with the procedure.
- h. MO 840034, "Repair Suction Isolation Valve to AC-3C; AC-106," and MO 840035, "Repair Valve AC-103." These repairs were performed during the CCW system outage. The NRC inspector noted that the MO's were properly filled out and approved, and that the appropriate Technical Specification reference was identified. PRC approved procedures with maintenance manual information attached were part of both MO work packages. The NRC inspector observed the tag-out performed (84-756), the system draindown, and initial work.
- i. FC-83-104, "Qualification of Splices on CCW, HPSI, LPSI, and CS Pumps." The licensee had determined that the electrical connections for the above listed pumps lacked sufficient documentation to verify qualifica-



tion in accordance with IE Bulletin 79-01B. To correct this, the licensee elected to replace the existing insulation material and replace it with materials qualified per IEEE-323-1974. The NRC inspector observed the work being performed on CCW Pump AC-3B and verified that the unit was tagged out properly (84-813), that the proper work procedure was at the jobsite, that the required tape (Uratene SPT 42003 and PVC) was used and applied in the proper manner, and that the detailed sketch of the specific connector was present at the jobsite.

- j. MO 830012, "Couple Control Element Assemblies per MP-RC-10-7." The NRC inspector observed this activity over several shifts from both the control room and inside the containment at the head area. MP-RC-10-7, "Procedure for Coupling Control Element Assemblies," was reviewed and verified by the NRC inspector that initial conditions had been established as required. QC hold points were observed and QA signoff at the start of the procedure was obtained. Communications between the head area, the control room operator, and the supervising electrician in the control room were established and maintained throughout the procedure. The dynamometer was verified as calibrated, and it was noted that this calibration data was verified and recorded in the procedure by QC personnel.

No violations or deviations were identified.

## 5. Outage Activities

Core refueling commenced at the beginning of this report period, and the NRC inspector observed various portions of the activity during the seven-day period. The NRC inspector reviewed OP-11, "Reactor Core Refueling Procedure," and verified that Revision 10 dated March 19, 1984, was being used. During this review it was noted that I/M plots were being maintained using Appendix C to the procedure and that Appendix A, "Fuel Movement Sequence," was present in the control room (master copy), at the Refueling Machine FH-1, and at the spent fuel pool. The fuel status boards were being maintained current in the control room and at the refueling cavity. It was verified that the minimum refueling personnel were onshift in accordance with Technical Specification requirements and that the core boron concentration was being analyzed once-per-shift. The NRC inspector reviewed all the prerequisites and verified that they were signed off by the PRC prior to fuel movement. The NRC inspector reviewed Valve Lineup OI-CO-4, "Containment Isolation Status During Refueling Operation," and performed an independent verification. Surveillance Test ST-RM-2 (F.2), "Process Monitor Checks," was performed and the setpoint for RM-073 was temporarily changed above the background reading in accordance with OP-11 initial conditions. It was verified that the required radiation monitors were operable, and that caution tags (84-584) had been hung on the LPSI pumps, HIC-341, and HCV-335 to ensure that flow to the core was not interrupted. Continuous communications were established between the control room, refueling machine, and the spent

fuel pool. The spent fuel pool charcoal filter (VA-66) was caution tagged under Tag-Out 84-586 in the filter mode for spent fuel handling. The NRC inspector observed approximately ten percent of the 1,380 steps of the fuel movement sequence at various locations. The NRC inspector reviewed Procedure OI-FH-1, "Fuel Handling Equipment," to ensure that prerequisites had been satisfied and that various required data were being logged by the control room operator on Appendix A. During observations at the core area, the NRC inspector observed operation of the upender and fuel transfer machine and verified that the correct procedure was available and being followed.

The NRC inspector observed the core verification performed in accordance with Appendix M of OP-11. Qualified engineers, QA personnel, and operators were present and one bundle was found 90° out-of-orientation. This was noted on the verification procedure and corrected the next day.

The NRC inspector attended a planning meeting and observed licensee preparation to drain the Safety Injection Refueling Water Tank (SIRWT) for cleaning and maintenance activities. The tank was drained by operations personnel to provide access and HP personnel conducted the initial tank entry for surveys. The NRC inspector noted that an approved tank entry permit was obtained and posted to cover this work. Repair work on Valves LCV-383-1 and LCV-383-2 required access to the tank for about two days and touchup painting was considered. The NRC inspector noted that the general area radiation levels were 50 mr/hr, tank ventilation was established, and the atmosphere was sampled for oxygen content. The maintenance work was completed and the SIRWT was closed out by QC.

The licensee completed the rim cut procedure on both steam generators during this reporting period (see discussion in NRC Inspection Report 84-07, paragraph 5). The NRC inspector attended the engineering planning meeting and noted that the first drafts of the rim cut, shielding and welding procedures were prepared, that the SRDCO was in preparation, and that the mockup was being setup in the small warehouse for training. Health physics matters were discussed including the air monitoring requirements for the workers, HP training, and extensions to be processed to allow workers to go to 2400 mrem exposure. The NRC inspector attended the ALARA subcommittee meeting to discuss the rim cut procedure and the RWP/ALARA worksheet (FC-378). The job was divided into three parts; (1) cut and remove angle supports, install/remove shielding, (2) remove/replace interference, and (3) setup and perform rim cut. A total exposure of 93.06 man-rem was estimated. The NRC inspector reviewed Procedure SP-SGRC-01, "Steam Generator Rim Cut," and verified that it was PRC approved. The NRC inspector observed work on the mockup used for training and noted that each craftsman scheduled to perform the cutting procedure would be qualified on the mockup before being allowed to work inside the steam generator. The work was completed without any damage to the steam generator tubes, and the total job exposure was less than 48 man-rem.

In their continuing efforts to detect a possible tube leak in "B" Steam Generator, the licensee performed a dye leak test. The NRC inspector reviewed the Special Procedure SP-SGDLT-1, "Steam Generator Dye Leak Test," and verified that the procedure was PRC approved, that HP and QC hold points were established, and that required plant conditions were identified in the prerequisites. The dye solution was injected into the steam generator over a weekend and pressurized with nitrogen to about 265 psi. As nitrogen was received onsite, this pressure was increased to about 500 psi while a "blacklight" inspection was being done on the primary side. No positive indication of a leak was identified. During the performance of the test, the NRC inspector reviewed the procedure for signoffs and verified that tank entry permits had been issued and posted, that RWP 280 had been issued for this job, that the emergency feedwater tank was available for filling with water greater than 90° F., that FW-6 was available to fill the steam generator using the main feedwater ring, and that steam generator metal temperatures were being checked periodically to ensure that MPT limits are being satisfied.

The licensee performed tube plugging on both steam generators based on the results of eddy current testing. The NRC inspector attended the job briefing for the tube plugging work to be done in "A" Steam Generator. Special Procedure SP-RC-2, "Plugging Steam Generator Tubes," was reviewed and verified as approved by the PRC. Separate RWP's were established for the setup and the actual plugging. It was noted that access control points were established, primary side ventilation had been established, and QC support was available. A tank entry permit was issued for each side of the channel head and posted near the stepoff pad. QC personnel established materials accountability and verified the location of tubes to be plugged. The NRC inspector observed preparation of the templates for plugging of the steam generator tubes in company with a licensee QC representative and verified that the information from the eddy current tests was correctly transferred to the template.

The licensee has issued training manuals describing plant/system changes that have been incorporated for cycle 9. This is the third such book prepared by the licensee's training department and represented the best effort yet to provide background design information to the operators. Specific operating/emergency procedures were still being prepared at the time of training and will have to be covered with the operators at a later time. The NRC inspector attended the formal classroom training and observed that the operators were quizzed and graded on the material.

No violations or deviations were identified.

#### 6. Followup of Licensee Event Reports

LER 82-011, "Blowdown Sampling Line for "B" Steam Generator Was Found Isolated." During steady state operation the blowdown sample isolation

valve to "B" Steam Generator was inadvertently closed and the control room annunciator failed to alarm. An analysis of this incident determined that a design change would be initiated to provide for automatic closure of the blowdown system isolation valves when a loss of blowdown sample flow was detected. This modification was accomplished during this current outage under FC-82-71, "Automatic Closure of Steam Generator Blowdown Isolation Valves." The NRC inspector reviewed the final design package, including the approval letter to proceed with the work, and the construction package. The work has been completed, tested, and signed off as approved by the SAC. This item is closed.

7. Exit Interview

The NRC inspector met with the plant manager on May 1, 1984, to summarize the scope and findings of the inspection.