

**ENCLOSURE 2**

**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Docket No.: 50-295  
License No.: DPP-40  
Report No.: 50-285/97-19  
Licensee: Omaha Public Power District  
Facility: Fort Calhoun Station  
Location: Fort Calhoun Station FC-2-4 Adm.  
P.O. Box 399, Hwy. 75 - North of Fort Calhoun  
Fort Calhoun, Nebraska  
Dates: October 26 through December 6, 1997  
Inspectors: W. Walker, Senior Resident Inspector  
V. Gaddy, Resident Inspector  
N. Salgado, Resident Inspector  
Approved By: W. D. Johnson, Chief, Project Branch B

ATTACHMENT: Supplemental Information

## EXECUTIVE SUMMARY

Fort Calhoun Station  
NRC Inspection Report 50-285/97-19

### Operations

- In general, the conduct of operations was professional and safety-conscious. However, the inspectors identified an atmosphere which was nonprofessional in that breakfast was being cooked in the main control room (Section 01.2).
- A weakness existed in the licensee's controls for replacing burned out light bulbs in that, after initial shift supervisor approval was obtained, no further approval was required even if the approved work was delayed for several days (Section 02.1).
- The licensee's containment integrity operating instruction was inadequate in that all containment penetrations needed to establish containment integrity were not included in the operating instruction (Section 02.2).
- Improper installation of a locking device on a raw water inlet valve would not have prevented manipulation of the valve (Section 02.3).

### Maintenance

- The inspectors determined that the licensee had a program for addressing Model CR120A relay failures (Section M2).
- Inadequate corrective actions resulted in licensee personnel failing to properly test a containment penetration (Section M8.2).

### Engineering

- In 1995, licensee personnel failed to perform an annual evaluation of nonfuel items in the spent fuel pool (Section E1.1).

### Plant Support

- Radiation protection personnel were prompt in resolving housekeeping deficiencies inside the radiologically controlled area (Section R2.1).

## Report Details

### Summary of Plant Status

The Fort Calhoun Station began this inspection period at 100 percent power and maintained that level until November 14, 1997. On November 14, 1997, power was reduced to 84 percent to facilitate repairs on the leaking stator cooling water heat exchangers. On November 16, 1997, repairs were completed and a power ascension began with 100 percent power attained on November 17, 1997. The plant remained at 100 percent power throughout the remainder of the inspection period.

## I. Operations

### **O1 Conduct of Operations**

#### **O1.1 General Comments (71707)**

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety conscious; specific events and noteworthy observations are detailed in the sections below.

#### **O1.2 Control Room Observations (71707)**

The inspectors observed control room activities during the early morning hours on November 21, 1997. The activities ongoing when the inspectors entered the control room included cooking of breakfast in the main control room area. This activity did not provide a professional atmosphere in the control room. In addition, several nonoperations personnel were eating in the control room and were not discussing official business.

The inspectors reviewed the licensee's conduct of operations procedure and determined that failing to ensure that all control room business is conducted in such a manner that neither licensed control room operator attentiveness nor the professional atmosphere of the control room is compromised is a violation of Standing Order SO-O-1, "Conduct Of Operations," Revision 36, (50-285/9719-01).

As a corrective action, the manager of operations issued a memorandum to all operations personnel stating that all cooking of food within the main control room was to stop. Food was to be cooked in the designated kitchenette area and no food or drink was allowed over the main control boards in the control room. The inspector concluded that these actions were appropriate.

## O2 Operational Status of Facilities and Equipment

### 02.1 Replacement of Equipment Indicating Lights

#### a. Inspection Scope (71707)

The inspectors reviewed the licensee's procedural controls for replacement of burned out indicating bulbs.

#### b. Observations and Findings

On November 3, 1997, an electrical maintenance technician was replacing a burned out indicating light bulb on the 125 Vdc manual transfer switch panel for Diesel Generator 2. This switch would be used to transfer dc control power for the diesel generator from the normal source, which is Battery 2, to the emergency power source, which is Battery 1. During the replacement of the bulb, a fuse failure made the transfer to the emergency (alternate) supply source for 125 Vdc power inoperable. Based on Technical Specifications, the diesel was still considered operable without the alternate source.

The inspectors questioned the licensee regarding why work was being performed on Diesel Generator 2 when Diesel Generator 1 was out of service and inoperable for preplanned maintenance. The licensee stated that the indicating light bulb replacement had originally been scheduled and approved by the shift supervisor for October 31. The indicating light bulb replacement was postponed until November 3. Based on discussions with the electrical maintenance supervisor, it was expected that the electrical maintenance technician would notify the control room again prior to beginning replacement of the indicating light bulb on November 3. The electrical maintenance technician failed to notify the control room prior to replacing the indicating light bulb. The inspectors considered this to be a weakness in the licensee's work control process.

A risk assessment had been performed as required by the licensee's procedures prior to beginning work on Diesel Generator 1. However, no risk assessment was performed taking into account the indicating light bulb replacement on Diesel Generator 2. Based on the inspectors' discussions with the risk assessment personnel, the indicating light bulb replacement would not have been approved for performance on November 3 with Diesel Generator 1 inoperable.

The licensee made the following changes to preclude this from recurring:

- All electrical maintenance personnel were counseled on proper communications with the control room immediately prior to replacing indicating lights.

- A warning sign will be posted at the door of any inoperable diesel generator to inform plant personnel that work on the operable diesel generator is limited.

c. Conclusions

A weakness existed in the licensee's controls for replacing burned out indicating light bulbs in that, after initial shift supervisor approval was obtained, no further approval was required even if the approved work was delayed for several days.

02.2 Containment Integrity Verification

a. Inspection Scope (71707)

The inspectors performed a verification of containment integrity.

b. Observations and Findings

On November 19, 1997, the inspectors performed a verification of containment integrity using Operating Instruction OI-CO-5, "Containment Integrity," Revision 11. While verifying the integrity of electrical and piping penetrations in the main steam room using Checklist OI-CO-5-CL-D, the inspectors identified that Electrical Penetrations G1 through G4 and Piping Penetration H1 were not included on the checklist. This operating instruction was used to verify that containment piping penetrations were properly capped and that the nitrogen pressure of containment electrical penetrations was greater than 20 psig.

The inspectors informed system engineering personnel of the observation. System engineering determined that the penetrations had been included in Revision 10 of the operating instruction. However, while reformatting the operating instruction for Revision 11, these penetrations were omitted. Revision 11 became effective on April 2, 1997. Revision 10 of the operating instruction was last performed during the 1996 refueling outage. The inspectors reviewed Operating Instruction OI-CO-5 and noted that it did not have a performance frequency. The inspectors asked if Revision 11 had been used to verify containment integrity. The licensee stated that Revision 11 had been used to verify containment integrity during reactor startup from the steam pipe rupture in May 1997. The licensee stated that performing Operating Instruction OI-CO-5 was a condition for satisfying Surveillance Test OP-ST-CONT-0002, "Secured Closed, Containment Penetration Isolation Verification." The inspector verified that Surveillance Test OP-ST-CONT-0002 was documented as completed on May 8, 1997. Section C.5 of Surveillance Test OP-ST-CONT-0002 states, in part, that, in preparation for reactor startup, containment integrity has been established in accordance with Operating Instruction OI-CO-5. Although in May 1997 the licensee performed Revision 11 of Operating Instruction OI-CO-5 to verify the referenced surveillance, it was

inadequate in that it did not include four electrical penetrations and one piping penetration for containment integrity verification (50-285/9719-02).

As corrective action, the licensee initiated Condition Report 199701586 to document the deficiency, initiated a change to correct the procedure, performed a review of Operating Instruction OI-CO-5, and verified that the penetrations met their acceptance criteria. The inspectors verified that no Technical Specifications were violated.

c. Conclusions

The licensee's containment integrity operating instruction was inadequate in that all containment penetrations needed to establish containment integrity were not included in the operating instruction.

02.3 Improperly Installed Locking Device on Valve HCV-2812C

a. Inspection Scope (71707)

The inspectors reviewed the installation of locking devices on valves in the high pressure safety injection system.

b. Observations and Findings

On December 3, 1997, the inspectors verified that locking devices were correctly installed on several valves in the high pressure safety injection system. However, the inspectors identified that the locking device on Valve HCV-2812C (raw water inlet to High Pressure Safety Injection Pump 2C bearing cooler) did not appear to provide a physical restraint to prevent operation of the valve. The inspectors questioned the licensee on this particular locking device and the auxiliary building operator was sent to investigate. The auxiliary building operator determined that the locking device on the valve was incorrectly installed and did not provide a physical restraint to prevent operation of the valve. The licensee's immediate corrective action was to reinstall the locking device correctly. The licensee initiated Condition Report 199701642 to further resolve the issue. The auxiliary building operator verified that the valve was in its required closed position.

The inspectors reviewed Standing Order SO-O-44, "Administrative Controls For Locking Of Components," and noted that Valve HCV-2812C was required to be locked closed. The standing order also stated that locking devices shall at the very least provide a limited physical restraint on the operation of the valve. Failing to ensure that the locking device installed on Valve HCV-2812C provided the required physical restraint was a violation (50-285/9719-03).

c. Conclusions

The inspectors identified a violation of the licensee's administrative controls for locking valves. The locking device on Valve HCV-2812C was improperly installed and would not have prevented manipulation of the valve. The licensee promptly initiated corrective action to properly lock the valve.

O7.1 Licensee Safety Committee Activity

During the inspection period, the inspectors attended several sessions of the safety audit and review committee. This is the offsite safety review committee for the Fort Calhoun Station. The sessions attended included discussions on:

- An integrated assessment schedule with oversight provided by the nuclear safety review group,
- Closeout of several action items from previous meetings, and
- Review of the quarterly trend report for the third quarter.

The inspectors observed that Fort Calhoun Station senior management was present as an active participant at the safety audit and review committee meeting. The inspectors determined that the reviews and root cause analysis of events completed by the nuclear safety review committee were rigorous and self-critical. The inspectors concluded that the self-assessment activities observed were effective.

## II. Maintenance

**M1 Conduct of Maintenance**

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following activities:

- Repair of Charging Pump CH-1B,
- Troubleshooting the bypass transformer for Inverter 1,
- Oil leak repairs on Feedwater Pump FW-4B,
- Thermography on safety-related breakers, and
- Cleaning raw water/component cooling water Heat Exchanger AC-1C.

b. Observations and Findings

The inspectors found the work performed under these activities to be professional and thorough. All work observed was performed with the work package present and in active use. Maintenance technicians were experienced and knowledgeable of their assigned tasks. The inspectors frequently observed supervisors and system engineers monitoring job progress, and quality control personnel were present when required by procedure.

In addition, see the specific discussions of maintenance observed in Section M2.

c. Conclusions

The maintenance activities observed were conducted in a controlled and professional manner.

M1.2 Surveillance Activities

a. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillance activities:

- OP-ST-DG-0002, "Diesel Generator 2 Check," Revision 24;
- OP-ST-OF-3002, "Diesel Generator 2 Fuel Oil System Pump Inservice Test," Revision 15;
- OP-ST-DG-0001, "Diesel Generator 1 Check," Revision 23; and
- OP-PM-AFW-0004, "Third Auxiliary Feedwater Pump Operability Verification," Revision 12.

b. Observations and Findings

Surveillance activities were generally completed thoroughly and professionally. The inspectors noted that in all of the safety-related surveillances observed, a test monitor was present and actively involved in ensuring that procedures were completed exactly as written and that any changes needed to ensure the accuracy of the procedures were identified for revision.

c. Conclusions

The surveillance activities observed by the inspectors were completed in a controlled manner and in accordance with procedures.

## M2 Maintenance and Material Condition of Facilities and Equipment

### M2.1 Review of Material Condition during Plant Tours

#### a. Inspection Scope (62707)

The inspectors followed up on the failure of a relay in the back panels of the control room.

#### b. Observations and Findings

On November 29, 1997, at 5 a.m., the operators in the control room detected a burning smell and immediately began searching for the cause. The smell was strongest in the walk-in back panel area behind Control Boards 1, 2, and 3 in the control room. While the operator was in the back panel, Relay A1-4A-K11 caught fire and was immediately extinguished with a carbon dioxide fire extinguisher. The fire lasted less than 1 minute and the licensee entered Abnormal Operating Procedure AOP-06, "Fire Emergency," for 1 minute.

The main equipment effected by the relay failure was the loss of pressurizer level control when Pressurizer Channel X failed low. This caused the letdown isolation valve to go closed and one of the two charging pumps in service to trip, as expected. The operators then secured the second charging pump and letdown was isolated for approximately 20 minutes while the operators transferred pressurizer level control to Channel Y and then restored letdown. No power fluctuations were observed and all equipment functioned as expected.

The inspectors discussed the relay failure with the system engineer and were informed that the relay was a General Electric, Model CR120A, 120 Vac, continuously energized relay. The inspectors discussed with the system engineer whether similar failures had been observed. The system engineer provided the following information on the relays and failure history:

- There are 596 Model CR120A relays installed in the plant.
- In the mid to late 1980's the licensee identified degradation from excessive heat on Model CR120A relays in dc applications and began a systematic replacement of these relays.
- Criteria for selecting which relays to replace was: dc application, normally energized, critical quality element, and operational difficulties could be caused by the failure of the relay.
- 165 relays were identified for replacement.

- Four Model CR120A relays in dc applications and one relay in an ac application had failed in the last 3 years.
- Additional data provided from the plant computer database indicated that a total of 12 relays in dc applications and two relays in ac applications had failed since 1985.

The inspectors discussed with the system engineer whether the relay which failed would be sent out for a root cause determination. The system engineer stated that, due to the age of the relay, the failure was considered to be age related, and no further analysis was planned. The system engineer also stated that no plans existed for replacement of the Model CR120A relays in ac applications since only two failures had been identified since 1985.

c. Conclusions

The inspectors determined that the licensee had a program for addressing Model CR120A relay failures. Systems engineering personnel had implemented and nearly completed a program for replacement of the dc relays most susceptible to failure. A similar program for replacement of ac relays had not been implemented due to the limited number of failures.

**M8 Miscellaneous Maintenance Issues**

- M8.1 (Closed) Inspector Followup Item (IFI) 50-285/9718-04: diesel generator field flashing circuit. On September 17, 1997, the inspectors observed a normal start of Diesel Generator 1. During the test, the electrical field for the generator failed to flash. The electrical maintenance technicians identified that a diode in the field flashing circuit was degraded. Based on testing of the field flashing circuit and the vendor's recommendation, the diode was replaced in both diesel generators. The inspectors followed up on the maintenance history regarding degradation of the diode in the field flashing circuit for the diesels. No previous indications of the diode being degraded were identified. Additionally, the inspectors reviewed documentation for the design application for the diesel generator field flashing circuit diodes and found them to be appropriate.
- M8.2 (Closed) Licensee Event Report (LER) 50-285/96-13: failure to satisfy surveillance requirement for Containment Penetration M-80. On November 16, 1996, the licensee discovered that a pipe nipple, used to pressurize Containment Penetration M-80 for leak rate testing, did not penetrate the system piping. The licensee's record review indicated that tests performed during the 1993 and 1995 refueling outages using this pipe nipple were invalid as a result of this problem.

Containment Penetration M-80 and associated boundary valves were not checked for leakage as required by Technical Specification 3.5(5) since no pressure was applied to the penetration.

The licensee performed a root cause analysis that determined the cause of the event to be a lack of complete and thorough corrective action. Piping system nipples which did not penetrate piping boundaries had been previously identified by the licensee in 1993. However, the corrective actions taken failed to identify and resolve the concern for Containment Penetration M-80.

The licensee's current corrective action included modifying the pipe nipple to pressurize Containment Penetration M-80. The Technical Specification required leak rate test was subsequently performed satisfactorily. The licensee also performed a review of all similarly configured penetrations to verify that no other blocked or undrilled pipe nipples were being used for leak rate testing. No other problems were identified.

Failing to perform the Technical Specification required leak rate test is a violation. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the NRC Enforcement Policy (50-285/9719-04).

### III. Engineering

#### **E1 Conduct of Engineering**

##### **E1.1 Spent Fuel Pool Inventory Review**

###### **a. Inspection Scope (71707)**

The inspectors performed an evaluation to assess the licensee's control of material stored in the spent fuel pool.

###### **b. Observations and Findings**

On November 17, 1997, the inspectors performed an inventory of items stored in the spent fuel pool and assessed the foreign material exclusion controls of the spent fuel pool and the area immediately adjacent to the spent fuel pool. Spent fuel pool inventory was controlled by Standing Order SO-O-47, "Spent Fuel Inventory Control," and cleanliness was controlled by Standing Order SO-M-10, "Foreign Material Exclusion."

The inspectors obtained a copy of the spent fuel pool inventory ledger. This ledger contained a list of all nonfuel items stored in the spent fuel pool. The ledger contained 16 entries. The inspectors verified that these nonfuel items were in the spent fuel pool.

During the inspection, the inspectors noted the area immediately surrounding the pool was free of debris. All items were properly anchored or secured. However, the inspectors did note a few discrepancies with the foreign material exclusion logs. The inspectors noted five entries from September 1996 and one entry from November 7, 1997, which indicated material had entered the foreign material exclusion area but had not been logged as being removed from the area. During the inspection, the inspectors could not find these items. The reactor engineer indicated that the log should have been updated to show that the items had been previously removed.

The inspectors also noted a plastic bucket hanging from a rope inside the spent fuel pool. The inspectors asked the reactor engineer about the bucket. The reactor engineer stated that two plastic buckets were actually inside the spent fuel pool. The reactor engineer stated that one plastic bucket had been inside the pool since 1994 and the other since 1990. The reactor engineer stated that the buckets were on the spent fuel pool inventory ledger. The inspectors asked if the licensee had performed an evaluation to determine what effect the spent fuel pool environment (radiation, thermal) would have on the two plastic buckets. The reactor engineer stated that, in 1996, he gave a verbal authorization to allow the buckets to remain inside the spent fuel pool because Standing Order SO-O-47 did not require that a written evaluation be performed. The reactor engineer stated that he based this decision on the fact that the plastic buckets were located inside a stainless steel basket and, if the plastic buckets degraded, their contents would be captured by the stainless steel basket.

Standing Order SO-O-47 required the licensee to annually evaluate nonfuel items in the spent fuel pool. The licensee stated that, in 1995, the reactor engineer did not perform this annual evaluation. Failing to perform the annual inventory evaluation of nonfuel items in 1995 is a violation. Once identified, the licensee performed the annual evaluation. This licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the NRC Enforcement Policy (50-285/9719-05).

Standing Order SO-O-47 did not require that nonfuel items deposited into the spent fuel pool be evaluated by the reactor engineer prior to being placed in the spent fuel pool. However, the standing order did require that annual evaluations of nonfuel items inside the spent fuel pool be performed. Since the spent fuel pool inventory control standing order failed to require nonfuel items to be evaluated by the reactor engineer prior to being placed in the spent fuel pool, nonfuel items could be in the spent fuel pool for a year before being evaluated to determine their compatibility with the spent fuel pool. The inspectors discussed with the reactor engineer whether nonfuel items were evaluated prior to placing them in the spent fuel pool. The reactor engineer stated that it was his practice to evaluate nonfuel items prior to placing them in the spent fuel pool.

c. Conclusions

The spent fuel pool inventory control program did not require nonfuel items be evaluated to determine their compatibility with the spent fuel pool prior to being placed in the spent fuel pool. The inspectors considered this to be a weakness in the spent fuel pool inventory control program. Failure to perform the 1995 annual evaluation of nonfuel items in the spent fuel pool resulted in a noncited violation.

**IV. Plant Support**

**R2 Status of Radiological Protection and Chemistry Facilities and Equipment**

**R2.1 Radiologically Controlled Area Housekeeping**

a. Inspection and Scope (71750)

The inspectors assessed housekeeping inside the radiologically controlled area.

b. Observations and Findings

During the inspection period, the inspectors made numerous housekeeping tours throughout the radiologically controlled area. In general, the inspectors noted that housekeeping was good with a few exceptions. On October 31, 1997, the inspectors noted several items had been left inside the contamination boundary of Containment Spray Pumps SI-3B and SI-3C. Inside the contamination boundary of Containment Spray Pump SI-3B, there was a plastic bag, a pair of rubber gloves, and a pair of cloth gloves. Inside the contamination boundary of Containment Spray Pump SI-3C, there was a lab coat, rubber gloves, and cloth gloves.

On November 17, 1997, the inspectors noted housekeeping weaknesses in Drumming Room 27. The inspectors noted an open bag of trash labeled radioactive material lying on the floor in the room. Part of the trash had spilled onto the floor. The inspectors asked radiation protection personnel if the trash was contaminated. Radiation protection personnel stated the trash had been removed from clean areas inside the plant and it was not contaminated. In each instance, radiation protection personnel immediately resolved the inspectors' housekeeping concerns.

c. Conclusions

Radiation protection personnel were prompt in resolving housekeeping deficiencies inside the radiologically controlled area.

V. Management Meetings

**X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management on December 8, 1997. The licensee acknowledged the findings as presented.

The inspectors asked the licensee whether any materials examined during the inspection period should be considered proprietary. No proprietary information was identified.

## ATTACHMENT

### SUPPLEMENTAL INFORMATION

#### PARTIAL LIST OF PERSONS CONTACTED

##### Licensee

M. Bare, System Engineer  
D. Buell, System Engineer  
J. Chase, Manager, Fort Calhoun Station  
D. Dryden, Station Licensing Engineer  
M. Ellis, Supervisor, Maintenance Support  
J. Foley, System Engineer  
T. Gurtis, Electrical Maintenance Supervisor  
R. Phelps, Manager, Station Engineering  
R. Short, Manager, Operations  
C. Stafford, Reactor Engineer

#### INSPECTION PROCEDURES USED

IP 37551: On-site Engineering  
IP 61726: Surveillance Observations  
IP 62707: Maintenance Observations  
IP 71707: Plant Operations  
IP 71750: Plant Support Activities

#### ITEMS OPENED AND CLOSED

##### Opened

50-285/9719-02 VIO inadequate containment integrity operating instruction (Section 02.2)  
50-285/9719-03 VIO improperly installed locking device (Section 02.3)

##### Closed

50-285/9718-04 IFI diesel generator field flashing circuit (Section M8.1)  
50-285/96-13 LER failure to satisfy surveillance requirement for Containment Penetration M-80 (Section M8.2)

Opened and Closed

50-285/9719-01	VIO	cooking in main control room area (Section 01.2)
50-285/9719-04	NCV	failing to satisfy surveillance requirement for containment Penetration M-80 (Section M8.2)
50-285/9719-05	NCV	failing to perform annual inventory evaluation of nonfuel items (Section E1.1)