APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-285/85-06 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-April 30, 1985

Inspector: for L. A. Yandell, Senior Resident Reactor Inspector Date 6/12/85

Approved: L. E. Martin, Section Chief, Project Section A, Reactor Project Branch 2 Date 6/12/85

Inspection Summary:

Inspection Conducted March 1-April 30, 1985 (Report 50-285/85-06)

Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings, operational safety verification, surveillance testing, maintenance activities, and outage activities. The inspection involved 122 inspector-hours onsite by one NRC inspector, of which 42 were offshift hours.

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

1. Persons Contacted

*R. L. Andrews, Division Manager, Nuclear Production
*K. J. Morris, Manager, Quality Assurance
*R. L. Jaworski, Section Manager, Technical Services
*J. K. Gasper, Manager, Administrative Services
*W. G. Gates, Manager, Fort Calhoun Station
*P. M. Surber, Section Manager, Generation Station Engineering
*J. J. Fisicaro, Supervisor, Nuclear Regulatory and Industry Affairs
*M. E. Kallman, Supervisor, Administrative Services & Security
M. R. Core, Supervisor, Maintenance
A. L. Richard, Supervisor, Technical
L. T. Kusek, Supervisor, Operations
R. J. Mueller, Supervisor, I&C and Electrical Field Maintenance
J. J. Fluehr, Supervisor, Station Training

*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. Licensee Action on Previous Inspection Findings

a. (Closed) Violation 285/8412-01, "Independent Verification." The licensee failed to require independent verification of tag-outs to ensure that equipment was properly isolated. Standing Order O-20, "Equipment Tagging Procedure," was revised to require the craftsman to verify that the equipment is properly isolated. This is done by "personally verifying that tags have been hung in accordance with the tag-out sheet and that tagged components are in their required position" or by "personally checking the adequacy of the component tag-out to ensure that it is safe for maintenance to proceed." The procedure provides new tag-sheets with a carbon copy that is to be attached to the maintenance order (MO) or applicable document to aid the craftsman in verification of a proper tag-out. The craftsman is required to sign the carbon copy to document the verification. The NRC inspector has observed this new system in operation and on several occasions reviewed MO packages to verify that the carbon copy was attached and signed off as required. This item is considered closed.

b. (Closed) Violation 285/8429-02, "Improper Valve Lineup." While performing Valve Checklist OI-CS-1-CL-A, "Containment Spray System," the NRC inspector found SI-342 closed and unlocked when the checklist required that the valve be closed and locked. The valve was immediately locked by operations personnel and verified by the NRC inspector. The valve had been operated during a short maintenance

outage as Step IV.Q of Operating Instruction OI-RC-4, "Reactor Coolant System Normal Shutdown," to aid in the pressurizer cooldown. Step IV.U called for the valve to be closed, but did not state that the valve was to be locked. OI-RC-4 was revised to require that SI-342 be closed and locked in Step IV.U and the NRC inspector has verified the status of this valve on a monthly basis since this violation. This item is considered closed.

3. 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 during power operation.

a. The NRC inspector made several control room observations to verify proper shift manning, operator adherence to approved procedures, adherence to selected Technical Specifications, and operability of the reactor protective system and engineered safeguards equipment. Selected logs, records, recorder traces, annunciators, panel indications, and switch positions were reviewed to verify compliance with regulatory requirements. The licensee's equipment control was reviewed for proper implementation by reviewing maintenance order status and the tag-out log, and by verifying selected safety-related tag-outs. The NRC inspector observed several shift turnovers.

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 verified operability of the following safety-related systems by performing a walkdown and switch verification of the accessible portions of the system:

- Auxiliary Feedwater per Checklist ST-FW-1-CL-A
- Gaseous Waste Disposal System per Checklist WDG-1-CL-B
- Plant Electrical Distribution, 480V system per Checklist EE-2-CL-D
- Engineered Safeguards Controls per Checklist ES-1-CL-A

d. The NRC inspector observed portions of Containment Purges 85010, 85012, 85015, and 85018, reviewed the discharge permits, and noted the following for each:

- the X/Q log was maintained, the readings were within limits, and the shift supervisor review was performed
- the limiting X/Q was established
- VIAS was tested using either RM 060 or RM 061
- the stack dewpoint and annubar readings were taken
- the tritium sampler was in place and the sample was taken
- the recommended release rate was established, and the actual flow was lower than that authorized
- radioactivity analyses were performed
- the required effluent monitors and recorders were operational
- the required auxiliary building exhaust fans were operating
- OI-VA-1, Section IV.G was attached to the permit
- the initial reading of the stack flow integrator was noted on the recorders
- the operations checklist to CMP 4.5 was complete and signed off by the shift supervisor
- the permit was reviewed and signed off properly, and the termination time was established

Purge 85015 was performed under the new requirements of Section VIII of CMP 4.5 that established more definitive limits for terminating the release. In conjunction with these limits, "alert" setpoints on Discharge Monitors RM 050 and RM 051 were reset to give operators an indication of any increase in discharge activity. The NRC inspector observed the work performed by the I&C technicians, and verified that it was documented.

The NRC inspector reviewed the completed Discharge Permits 85004 and 85005 to verify that HP personnel performed final calculations and verifications to establish actual quantities released and to confirm that Technical Specification release limits were not exceeded.

e. The NRC inspector observed portions of the following waste tank discharges:

- Discharge Permit 85011 "B" Waste Gas Decay Tank. The NRC inspector verified that the X/Q and stack dewpoint logs were maintained, the operations checklist was completed and signed off, the maximum release rate was established, the required recorders were operational, and the start time was recorded.

- Discharge Permits 85033, 85039, and 85059 "A" Monitor Tank. The NRC inspector verified for each permit that tank sample had been taken, that all radiological and chemical discharge limits were satisfied in the discharge tunnel, that the operations checklist was signed off, that the maximum release rate was established, and that the shift supervisor had signed off the permit. For Permit 85033, the NRC inspector observed the valve lineup, testing of the overboard valves, and initiation of the discharge with the auxiliary building operator at AI-100.

f. On March 7, 1985, the NRC inspector administered an SRO requalification retake examination to two Fort Calhoun personnel who had failed to pass the initial requalification examination given in November 1984. The examination was provided by the Region IV Operator Licensing Section and personnel from that organization were consulted by phone to resolve questions raised by the examinees. An exam review was conducted with the licensee and these comments were summarized in a conference call with the Region IV staff as well as forwarded by letter for NRC consideration. The licensee was informed later that month that both candidates had passed the requalification examination.

g. The NRC inspector reviewed the plant manuals maintained at the remote shutdown panel in Room 57 and verified that the current revisions of Emergency Procedures EP-1 through EP-38 were present.

h. On March 20, 1985, the NRC inspector observed an emergency preparedness drill being conducted by the licensee. It was noted

that the drill crew diagnosed the simulated plant casualty, established the proper emergency classification, and implemented the appropriate response activities. The NRC inspector reviewed the Shift Supervisor's Emergency Checklist booklet and verified that current revisions of appropriate Emergency Plan Implementing Procedures were present.

No violations or deviations were identified.

4. Surveillance Testing

The NRC inspector witnessed portions of the following surveillance tests:

a. ST-ICI-2, F.1 (Monthly) Incore Detector Alarm Limits Verification

b. ST-FP-10, F.2 (18 Months) Visual Inspection of Halon System

c. ST-ISI-CVCS-3, F.1 (Quarterly) Chemical and Volume Control Pump Inservice Testing

d. ST-RPS-1, F.3 (Monthly) Power Range Safety Channels Test

e. ST-RPS-4, F.2 (Monthly) Thermal Margin/Low Pressure Channels Test

f. ST-ESF-6, F.2 (Monthly) Diesel Generator Check

g. ST-RM-2, F.2 (Monthly) Process Monitor Checks

h. ST-FW-3, F.2 (Monthly) Auto Initiation of Auxiliary Feedwater; Functional Check of Initiation Circuits

i. ST-PL-1, F.2 (Monthly) Pressurizer Level Channel Control Check

j. ST-PORV-2, F.1 (Quarterly) PORV Block Valve Operation

k. ST-DC-1, F.1 (Monthly) Station Battery Checks

l. ST-FW-1, F.2 (Quarterly) Auxiliary Feedwater Pump and Remotely Operated Valve Check

In the above surveillance tests, the NRC inspector verified where applicable that:

- testing was scheduled in accordance with Technical Specification requirements
- procedures were being followed
- calibrated test equipment was being used
- qualified personnel were performing the tests

. limiting conditions for operation were being met

. test data were being accurately recorded

No violations or deviations were identified.

5. Maintenance Activities

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

a. MO 843745, "B Concentrate Tank Outlet Pipe Replacement." A leak was identified on the pump suction piping, and the NRC inspector verified that a PRC approved procedure was prepared to cover this work. QC requirements were established for a certified welder, the weld rod, and the welding procedure. The NRC inspector noted that QC performed a visual inspection after the weld repairs were completed, and all material used was identified on the MO. Tag-Out 84-1625 was assigned to this work. The NRC inspector reviewed the work procedure and verified that the prerequisites were signed off, QC hold points were observed, the calibration gauge was identified and calibrated before and after the leak test, the safety analysis was completed and attached, and Procedure Changes 13768, 13798, 14065, and 14196 were attached and properly entered.

b. MO 850935, "Breaker for Raw Water Pump AC-10A." The NRC inspector observed performance of preventive maintenance under Procedure PM-EE-1.1, "Type Am-4.16-250 Magne-Blast Circuit Breaker," and noted that the correct procedure revision was being used, that the precautions and limitations were signed off, that the QC signoff was present, and that qualified craftsmen were assigned to the job. Tag-Out 85-289 was assigned to this work, and the NRC inspector verified the placement of these tags.

During the performance of Item 6.3.6.1.c, it was determined that the main contact wipe was out of the specified range. This MO was written to cover the maintenance done to correct this problem. The NRC inspector observed the preparation, review, and approval of the MO and verified that it was properly filled out. The NRC inspector observed the work performed to correct the problem and the remaining portion of the preventive maintenance procedure.

c. MOs 850655 and 850656, "Perform Qualified Life PM as per PM-EE-12." These MOs covered work performed on Containment Fans VA-3A and VA-3B during the weekend maintenance outage . In order to maintain the qualified life on the motors, Procedure PM-EE-12, "Vent Air Fan Motors VA-3A, 3B, 7C, 2A, 2B, 12A and 12B," was performed. The NRC inspector reviewed the completed MOs and procedures, verified that bearing lubrication was done with required lubricant, and that vibration readings were taken. The NRC inspector reviewed Tag-Out

85-220 assigned to this job and verified that signoffs were complete, the applicable Technical Specification was identified, and qualified personnel were assigned to perform the work.

d. MO 850770, "Feedwater Control to Steam Generator A." The operators observed that the "A" Steam Generator level was varying more than normal. The NRC inspector observed the preparation of the MO and observed troubleshooting being performed by I&C personnel. It was noted that the MO was filled out and properly approved, and that the applicable referenced drawings were available at the worksite.

e. MOs 851540 and 851541, "Perform MP-LS-1 to Maintain Qualified Life." Maintenance was done on the NAMCO limit switches on Cooling Water Valves HCV-2899A and HCV-2898A (Control Room A/C Units 46B and 46A respectively) to maintain their qualified life. Procedure MP-LS-1, "Limit Switch Type EA 180 Preventative Maintenance to Maintain 79-01B Qualification," calls for inspection and lubrication of the limit switch, replacement of the bottom cover gasket, the lever shaft and the o-ring assembly, cleaning of the contacts, and measurement of the contact resistance. The NRC inspector verified that the MO was signed off properly, that QC signoffs were present, and that all spare parts utilized were identified on the MO. Procedure MP-LS-1 was filled out correctly, QC hold points were observed, qualified personnel were assigned to the job, and Form 198, "Electrical Equipment Qualification/Qualified Life Program," information sheet was filled out.

f. MO 851034, "Low Pressure Safety Injection Pump SI-2C." This maintenance item covered the performance of MP-EE-8, "General Electric 8000 Series Horizontal Induction Motors," to maintain the qualified life of the motor. This work included cleaning the motor and air openings, inspecting the motor bearings and bearing housing, draining and flushing the motor lubrication system, meggering the motor, and testing the unit.

   The NRC inspector verified Tag-Out 85-325 for this work and noted that the applicable Technical Specification was referenced on the MO. Following completion of the work, Surveillance Test ST-SI/CS-1, "SI/CS Pumps and Valves," was performed on SI-2C to verify operability and Form FC-198 was filled out and submitted with the MO.

g. MO 851134, "Changing Isolation Valve to Loop 1A, HCV-247." Valve HCV-247 was shut while performing Surveillance Test ST-ISI-CVCS-1, F.1, "CVCS Category B Valve Exercising Test," and would not reopen. The NRC inspector observed troubleshooting performed by I&C technicians who checked for grounds and verified solenoid operability. After consultation and evaluation, the licensee secured the charging pump and the valve opened. Normal charging was reestablished and the surveillance performed again to

verify that the valve would go shut. It appears that the problem is mechanical at the valve itself, which is inaccessible during operation. The licensee annotated the completed surveillance test with the condition of the valve, tagged the control board switch with the appropriate status information regarding closing of the valve, and kept this MO open pending shutdown to allow examination and repair of the valve.

No violations or deviations were identified.

6. Outage Activities

While performing a surveillance test on February 19, 1985, the licensee determined that Control Element Assembly (CEA) 22 failed to move. As discussed in NRC Inspection Report 50-285/85-05, paragraph 5.e, the licensee was considering shutting down "to change the drive package and correct the problem."

On March 15, 1985, the licensee initiated a weekend shutdown to change out the drive package on CEA 22. Procedure OP-8, "Reactor Shutdown," was modified by Procedure Change MO 13540 to account for CEA 22, and it was reported to the NRC inspector early the next day that the CEA dropped in 1.6 seconds as expected. This confirmed that the problem was with the electrical drive package and not "excessive function or mechanical interference" with the CEA itself. MO 850419, "Replacement of CEA 22 Drive Package," was issued to cover this repair, and the NRC inspector verified that a PRC approved procedure was attached to the MO, that the MO was properly signed off and approved, that Tag-Out 85-211 was properly hung, and that qualified personnel were assigned to the job. During the shutdown the NRC inspector reviewed the Technical Specifications associated with containment integrity and shutdown margin, and verified that the licensee was in compliance. During a tour of the auxiliary building the NRC inspector observed that guards were properly posted at the containment entrance, that accountability was being maintained, and that required radiological controls (including full face mask) were in effect. Other activities planned during this short outage included work on the stator cooling system, examination of the position indications on HCV-2500 and HCV-2501, repair of HCV-311 Limit Switch, and performance of various preventive maintenance (EEQ related) procedures on containment equipment.

The plant started up on Sunday, March 17, 1985, and was at 30 percent power the next morning waiting for secondary chemistry to come into

specification. The NRC inspector observed portions of Startup 85-01 and reviewed the following startup documents:

- CO-5-CL-A, "Containment Integrity," Checklist

- ST-ESF-6, F.1, "Diesel Auto Start Initiating Circuit Check," for both diesel generators

- ST-RPS-2, F.2, "Wide Range Logrithmic Channel Functional Check"
- ST-RPS-9, F.1, "Turbine Loss of Load Channel Check"
- ST-RPS-10, F.1, "Manual Trip Check"
- ST-CEA-1, F.1, "CEA Drive System Interlocks Check"
- CO-1-CL-A, "Containment Closure Checks"
- Shutdown Margin Worksheets
- OP-8, "Reactor Shutdown"
- OP-5, "Plant Shutdown"
- OP-7, "Reactor Startup"
- Estimated Critical Boron Concentration Work Sheet. The estimated critical boron concentration was 698 ppm and the actual critical boron concentration was 715 ppm.
- OP-3, "Plant Startup from Hot Standby to Minimum Load."

No violations or deviations were identified.

7. Exit Interview

The NRC inspector met with licensee representatives on May 3, 1985, to summarize the scope and findings of the inspection.