

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-285/88-19

License: DPR-40

Docket: 50-285

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

Facility Name: Fort Calhoun Station (FCS)

Inspection At: FCS, Blair, Nebraska

Inspection Conducted: June 1-30, 1988

Inspector:

R.P. Mulliken
for P. H. Harrell, Senior Resident Reactor
Inspector

8/3/88

Date

Approved:

T. F. Westerman
for T. F. Westerman, Chief, Projects Section B
Division of Reactor Projects

8/3/88

Date

8/5/88

Date

Inspection SummaryInspection Conducted June 1-30, 1988 (Report 50-285/88-19)

Areas Inspected: Routine, unannounced inspection including followup on previously identified items, licensee event report followup, operational safety verification, plant tours, safety-related system walkthroughs, monthly maintenance observations, monthly surveillance observations, security observations, radiological protection observations, in-office review of periodic and special reports, and new fuel receipt activities.

Results: Within the 11 areas inspected, no violations or deviations were identified.

DETAILS1. Persons Contacted

*W. Gates, Plant Manager
*C. Brunnert, Supervisor, Operations Quality Assurance
M. Core, Supervisor, Maintenance
T. Dexter, Supervisor, Security
*J. Fisicaro, Supervisor, Nuclear Regulatory and Industry Affairs
J. Foley, Instrumentation and Control Engineer
*J. Kecy, Reactor Engineer
*D. Matthews, Supervisor, Licensing
*K. Miller, Supervisor, Maintenance
T. Patterson, Supervisor, Technical
*G. Roach, Supervisor, Chemical and Radiation Protection
*C. Simmons, Plant Licensing Engineer
J. Smith, Manager, Security Services
*D. Trausch, Supervisor, Operations

*Denotes attendance at the monthly exit interview.

The NRC inspector also contacted other plant personnel, including operators, technicians, and administrative personnel.

2. Plant Status

As of June 30, 1988, FCS had operated continuously for 389 days. Persistent heat in June has elevated the temperature of the ultimate heat sink (Missouri river) to higher than normal levels. The river temperature, coupled with degraded condenser efficiency, forced FCS to operate at approximately 90 percent power for the latter half of June.

3. Followup on Previously Identified Items (927C1)

(Closed) Open Item 285/8811-01: Lack of a program for replacement of breaker position indication bulbs.

This open item concerned the licensee's lack of a program for routinely checking and replacing breaker position indication bulbs. The concern arose when the NRC inspector noted that both the open and closed indicating bulbs for safety-related breakers were burned out. The NRC inspector's concern was that certain emergency procedures require that the operator perform specific steps based on the local indication.

The supervisor of operations implemented a program for monitoring indicating bulbs on all motor control centers (MCC) and remote panels via Operations Memorandum 88-04. The turbine building, auxiliary building, and water plant operators have been tasked with this function. The task has been formally incorporated into Forms FC-77, FC-78 and FC-143.

While performing tours of their respective areas in the plant, the operators are required to make a list of all burned out status indicating bulbs. The operator is then required to make a verbal request for approval to change burned out light bulbs to the shift supervisor. Those bulbs approved for changeout shall be replaced.

All requests for bulb changeout not approved by the shift supervisor will be kept on a list by the shift supervisors. The shift supervisors will transfer this list to a Form FC-1110, "Burned Out Status Indicating Light Bulb List," and turn this list over to the electrical maintenance department every Wednesday. The electrical maintenance department will then be responsible for changeout of affected bulbs with shift supervisor authorization.

The NRC inspector has reviewed the operations memorandum describing the program and the implementing forms. Based on this review, it appears that the newly implemented program adequately addresses the problem of a lack of a program for indicating bulb monitoring and replacement.

During tours of the plant, the NRC inspectors routinely check the status of breakers and the indicating lights. Tours performed during this inspection period specifically focused on the status of the breaker indicating lights. No problems were noted with burned out bulbs during any of the tours.

4. Licensee Event Report (LER) Followup (92700)

Through direct observation, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

The LER listed below is closed:

88-013 Failure to Bypass an Inoperable Reactor Protective System Channel

LER 88-013 provided information regarding Channel C reactor coolant low-flow trip being found inoperable during performance of Surveillance Test ST-RPS-3. While performing the test on May 9, 1988, the assigned instrument and control (I&C) technician recognized Channel C to be out of tolerance. However, he felt that it was out-of-tolerance in the conservative direction. The I&C technician did not notify the shift supervisor of the out-of-tolerance condition. The I&C technician did inform his supervisor who also felt the out-of-tolerance condition was conservative. The surveillance report was submitted to the plant technical staff for review.

The technical review supervisor, who is responsible for the review of surveillance tests, found that the condition was nonconservative and that

Channel C should have been placed in bypass. A maintenance order was issued to investigate the cause of the condition. The channel was placed in bypass on May 11, 1988. The investigation determined that a failed power supply to the Channel C low-flow trip unit caused the setpoint to be driven out of specification. The power supply was replaced, the unit calibrated and returned to operable status at 10:42 p.m. on May 11, 1988. This was 59 hours and 40 minutes after the time the unit should have been declared inoperable. The elapsed time is contradictory to Technical Specification (TS) 2.15, which requires that if the number of operable channels falls below the total number of installed channels the inoperable channel shall be placed in the bypass or tripped condition within 1 hour. TS 2.15 also states that the inoperable channel may be bypassed for up to 48 hours.

The degradation of the Channel C low-flow trip did not cause a safety challenge for the plant. It reduced the RPS trip logic to a 2 out of 3 configuration in lieu of the normal 2 out of 4 logic. Had a low-flow condition existed during the inoperability of the Channel C, a reactor trip would have been actuated by the remaining operable channels within the limits as specified in the TS.

To preclude events of a similar nature from recurring, the licensee has taken the following corrective actions:

- All reactor protection system (RPS) surveillance tests governing trip unit setpoint verification have been revised to instruct the technician conducting the test, whenever a trip unit is found out of specification, to immediately notify the shift supervisor for operability determination.
- A memorandum from the supervisor of maintenance to I&C and electrical maintenance personnel was issued stressing the importance of operability determination when TS equipment is found to be out of specification.

The NRC inspector reviewed the changes made to all of the RPS surveillance tests concerning setpoint verification and the memorandum issued to I&C and electrical maintenance personnel. Based on this review, it appears that the licensee has taken and instituted adequate corrective actions to preclude recurrence of similar events.

No violations or deviations were identified.

5. Operational Safety Verification (71707)

The NRC inspectors conducted reviews and observations of selected activities to verify that facility operations were performed in conformance with the requirements established under 10 CFR, the licensee's administrative procedures, and the TS. The NRC inspectors made several control room observations to verify the following:

- Proper shift staffing
- Operator adherence to approved procedures and TS requirements
- Operability of reactor protective system and engineered safeguards equipment
- Logs, records, recorder traces, annunciators, panel indications, and switch positions complied with the appropriate requirements
- Proper return to service of components
- Maintenance orders (MO) initiated for equipment in need of maintenance
- Appropriate conduct of control room and other licensed operators
- Management personnel toured the control room on a regular basis

On June 23, 1988, the NRC inspector was notified by the NRC Region IV office of a problem with the diesel generator output breakers at the Brown's Ferry Nuclear Plant with possible generic implications. At Brown's Ferry it was found that, subsequent to a loss of offsite power and after the diesel generator output breakers had closed, if an engineered safety feature actuation signal (ESFAS) occurred the generator output breaker would open and could not be reclosed onto the bus without manually resetting the breakers.

A review of the FCS design revealed that similar diesel generator output breakers were used. However, in the FCS design, the diesel generator output breakers would not open if an ESFAS occurred following a loss of offsite power. Therefore, the scenario described at Browns Ferry would not be applicable to the FCS.

No violations or deviations were identified.

6. Plant Tours (71707)

The NRC inspectors conducted plant tours at various times to assess plant and equipment conditions. The following items were observed during the tours:

- General plant conditions, including operability of standby equipment, were satisfactory.
- Equipment was being maintained in proper condition, without fluid leaks and excessive vibration.
- Plant housekeeping and cleanliness practices were observed, including no fire hazards and the control of combustible material.

- Performance of work activities was in accordance with approved procedures.
- Portable gas cylinders were properly stored to prevent possible missile hazards.
- Tag-out of equipment was performed properly.
- Management personnel toured the operating spaces on a regular basis.

No violations or deviations were identified.

7. Safety-Related System Walkdowns (71710)

The NRC inspector walked down accessible portions of the following safety-related systems to verify system operability. Operability was determined by verification of selected valve and switch positions. The systems were walked down using the drawings and procedures noted.

- Feedwater System (Procedure OI-FW-2, Revision 17, and Drawing 11405-M-253, Revision 49)
- Main Steam System (Procedure OI-MS-1, Revision 15, and Drawing 11405-M-252, Revision 49)

During the walkdowns, the NRC inspector noted no discrepancies between the drawings, procedures, and plant as-built conditions for the selected areas checked.

8. Monthly Maintenance Observations (62703)

The NRC inspectors reviewed and/or observed selected station maintenance activities on safety-related systems and components to verify the maintenance was conducted in accordance with approved procedures, regulatory requirements, and the TS. The following items were considered during the reviews and/or observations:

- The TS limiting conditions for operation were met while systems or components were removed from service.
- Approvals were obtained prior to initiating the work.
- Activities were accomplished using approved M0s and were inspected as applicable.
- Functional testing and/or calibrations were performed prior to returning components or systems to service.
- Quality control records were maintained.
- Activities were accomplished by qualified personnel.

- Parts and materials used were properly certified.
- Radiological and fire prevention controls were implemented.

The NRC inspector reviewed and/or observed the following maintenance activities:

- Calibration of condenser cold-gas temperature Monitor CP-5141 (MWR 882708)
- Calibration of Component Cooling Water (CCW) Pump AC-3A breaker (PM 8804726)

A discussion of each item is provided below:

- a. On June 20, 1988, the NRC inspector observed an I&C technician perform a calibration check on hydrogen cold-gas Monitor CP-5141. This cold or machine gas is the medium used to cool the main generator. This is not safety-related equipment, but it is significant at this time because this parameter, machine gas temperature, is currently the limiting factor on reactor power. The turbine generator supplier, General Electric Corporation, will not allow generator operation with a machine gas temperature greater than 56°C. During the abnormally hot June, the machine gas came to within 1°C of its maximum operating temperature. This forced FCS to operate at a reduced power level of approximately 90 percent. The machine gas could not be properly cooled due to abnormally high river temperatures compounded by inefficiency of the condenser attributed to biofouling and internal leakage. Operation in the described configuration does not constitute a safety hazard.

The NRC inspector observed the calibration of the temperature monitor by an I&C technician using approved procedures and calibrated instruments. The monitor was found to be within specification. No abnormalities were noted.

- b. On June 21, 1988, the NRC inspector observed the calibration and routine maintenance performed on CCW Pump AC-3A breaker. The inspector observed that approved procedures were employed, test instrumentation used was calibrated, and the affected pump was appropriately tagged out in the control room. Additionally, it was noted that TS Limiting Condition for Operation 2.4 was properly entered when Component Cooling Water Pump AC-3A was taken out of service.

No violations or deviations were identified.

9. Monthly Surveillance Observations (61726)

The NRC inspectors observed selected portions of the performance of, and/or reviewed, completed documentation for the TS-required surveillance testing on safety-related systems and components. The NRC inspectors verified the following items during the testing:

- Testing was performed by qualified personnel using approved procedures.
- Test instrumentation was calibrated.
- The TS limiting conditions for operation were met.
- Removal and restoration of the affected system and/or component were accomplished.
- Test results conformed with TS and procedure requirements.
- Test results were reviewed by personnel other than the individual directing the test.
- Deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The NRC inspectors observed and/or reviewed the documentation for the following surveillance test activities. The procedures used for the test activities are noted in parenthesis.

- Monthly testing of the automatic load sequencers (ST-ESF-5)
- Each shift check of the safety injection tank level and pressure instruments (ST-ESF-8)
- Monthly testing of the containment pressure high signal (ST-ESF-3)
- Annual functional check of the dry pipe deluge valve for the diesel generator rooms (ST-FP-11)
- Monthly testing of the high containment pressure channels (ST-RPS-8)

A discussion of each surveillance observed is provided below:

- a. On June 27, 1988, the NRC inspector observed the performance of ST-ESF-5. It was independently verified that Automatic Load Sequencer S1-2 properly operated and that its timer settings were as specified. This surveillance was performed by a licensed senior reactor operator. The procedure was performed as written with no abnormalities noted.

- b. On June 20, 1988, the NRC inspector independently verified that the monitors for pressure and level of each safety injection tank were within the limits specified by TS 2.3.(1)c. The NRC inspector also verified that no applicable alarms were present.
- c. On June 28, 1988, the NRC inspector observed an I&C technician perform the monthly check of the high containment pressure channels of the reactor protection system and the containment pressure high signal input to the safety injection actuation signal, an engineered safeguards feature. These tests both were performed as written with no abnormalities noted. The NRC inspector observed good coordination and cooperation between the I&C technician performing the test, the I&C technician remotely inputting the test signals, and the control room staff.
- d. On June 27, 1988, the NRC inspector observed the annual functional test of the dry pipe deluge valve for the diesel generator rooms per Procedure ST-FP-11. The NRC inspector notes that, during the 1987 performance of this test, water from the fire water system entered the instrument air system and ultimately caused the failure of Diesel Generator 2. Refer to NRC Inspection Reports 50-285/87-27 and 50-285/88-15 for details of this event.

The NRC inspector notes that since the 1987 event, instrument air no longer services this system. It has been replaced by service air. Service air is not directly connected to any safety-related components as was instrument air. However, the service air components connected to the deluge valve are still designated as "IA" or instrument air components. The licensee stated that these components would be relabeled. Reidentification of these improperly labeled components is considered an open item. (285/8819-01)

The NRC inspector attended the pretest briefing on this test and noted that a licensed individual on shift was not aware that instrument air no longer serviced the deluge valve. It was also noted that the nonlicensed operator assigned to conduct the test was also unaware of the system change. The NRC inspector then questioned the other three licensed individuals on shift as to their knowledge of the system. All three were aware of the design change which had been implemented. The lack of knowledge of the licensed individual on the system change is significant in that it may indicate a deficiency in licensed operator training. Licensee management was concerned with this apparent deficiency and agreed to investigate the root cause. The licensee's investigation into the apparent failure of the licensed individual to receive training in system design change information will remain an unresolved item pending review by the NRC inspector. (285/8819-02)

The NRC inspector then witnessed the performance of the surveillance test. It appeared that the test as written was adequate to

demonstrate functionability of the dry pipe valve. Minor comments on how the procedure could be improved were conveyed to the licensee for their consideration.

No violations or deviations were identified.

10. Security Observations (71881)

The NRC inspectors verified the physical security plan was being implemented by selected observation of the following items:

- The security organization was properly manned.
- Personnel within the protected area (PA) displayed their identification badges.
- Vehicles were properly authorized, searched, and escorted or controlled within the PA.
- Persons and packages were properly cleared and checked before entry into the PA was permitted.
- The effectiveness of the security program was maintained when security equipment failure or impairment required compensatory measures to be employed.
- The PA barrier was maintained and the isolation zone kept free of transient material.
- The vital area barriers were maintained and not compromised by breaches or weaknesses.
- Illumination in the PA was adequate to observe the appropriate areas at night.
- Security monitors at the secondary and central alarm stations were functioning properly for assessment of possible intrusions.

No violations or deviations were identified.

11. Radiological Protection Observations (71709)

The NRC inspectors verified that selected activities of the licensee's radiological protection program were implemented in conformance with the facility policies and procedures and in compliance with regulatory requirements. The activities listed below were observed and/or reviewed:

- Health physics (HP) supervisory personnel conducted plant tours to check on activities in progress.

- Radiation work permits contained the appropriate information to ensure work was performed in a safe and controlled manner.
- Personnel in radiation controlled areas (RCA) were wearing the required personnel monitoring equipment and protective clothing.
- Radiation and/or contaminated areas were properly posted and controlled based on the activity levels within the area.
- Personnel properly frisked prior to exiting an RCA.

No violations or deviations were identified.

12. In-office Review of Periodic and Special Reports (90713)

In-office review of periodic and special reports was performed by the NRC resident inspectors and/or the NRC Fort Calhoun project engineer to verify the following, as appropriate:

- Correspondence included the information required by appropriate NRC requirements.
- Test results and supporting information were consistent with design predictions and specifications.
- Determination that planned corrective actions were adequate for resolution of identified problems.
- Determination as to whether any information contained in the correspondence report should be classified as an abnormal occurrence.
- Correspondence did not contain incorrect, inadequate, or incomplete information.

The NRC inspectors reviewed the following:

- Monthly operations report for May, undated
- Response to request for additional information concerning NUREG-0737, Item II.D.1, Relief and Safety Valve Test Requirements, dated June 28, 1988

No violations or deviations were identified.

13. New Fuel Receipt Activities (60705)

The NRC inspector witnessed activities related to the receipt, inspection, and storage of new fuel assemblies. The inspector verified that the inspections were performed in accordance with the requirements established by Procedure SP-NFR-1, "Fuel Receipt Procedure." The selected verifications performed by the inspector included determination that the

personnel performing the inspections were qualified, documentation was accurately completed, and the fuel was properly handled. Based on the observations and reviews performed by the NRC inspector, it appeared that the fuel was inspected and handled appropriately.

The NRC inspector observed, on numerous occasions, the uncrating, receipt inspection, and storage of new fuel bundles. The NRC inspector voiced the following concerns to licensee management:

- The procedure in use by the health physics (HP) technicians radiologically surveying the new bundles was not a controlled document.
- Persons were performing the receipt inspection of new fuel in street clothes.
- Fuel bundles appeared vulnerable to damage from the aluminum tripod ladder being used for inspection.
- The procedure in use for transferring the new bundles from the receipt inspection location to the new fuel racks did not require the operator to monitor the drag force between the bundle and the new fuel rack.

The NRC inspector observed an uncontrolled sheet of guidelines in use by the HP technicians for surveying the new fuel bundles. However, the NRC inspector found that, in the data sheets for controlling Procedure SP-NFR-1, controlled radiological limits were established which were required to be verified. Additionally, the licensee QA group identified the same deficiency immediately after the NRC inspector discovered it on June 21, 1988. The QA group had the uncontrolled guidelines immediately removed from the job site and had the HP department place requirements in the developmental Radiation Protection Plan to issue specific instructions for surveying new fuel bundles prior to the next cycle. The issuance of a radiological procedure for surveying of new fuel bundles is considered an open item. (285/8819-03)

On June 21, 1988, the NRC inspector observed the new fuel receipt activities being performed in street clothes. The NRC inspector questioned this practice and pulled the applicable radiation work permit (RWP 88-200-6) to see if this practice was allowed. The RWP stated that the shift HP would determine dress requirements as the job dictated. The shift HP explained that since the initial surveys proved to be within specified limits, the remainder of the inspection could be performed without protective clothing. The NRC inspector accepted this position but was more concerned that foreign material from the inspectors clothing could possibly contaminate the fuel bundles. The NRC inspector addressed this concern to the reactor engineer who indicated this was an accepted practice. The NRC inspector notes that licensee personnel did wear cotton gloves during the inspection process.

The NRC inspector was concerned that the ladder in use to facilitate inspection of the fuel bundles could possibly cause damage to the bundles especially when it was moved from one bundle to another. Licensee management agreed that the ladder was not the ideal tool for this task but it was approved for this application.

The NRC inspector was concerned that the operator was not procedurally required to monitor drag forces when inserting the new fuel bundle into the new fuel rack. The NRC inspector voiced this concern to the reactor engineer who stated that the existing clearances were substantial enough that drag was not a concern.

No violations or deviations were identified.

14. Exit Interview

The NRC inspector met with Mr. W. G. Gates (Plant Manager) and other members of the licensee staff at the end of this inspection. At this meeting, the NRC inspector summarized the scope of the inspection and the findings.