



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
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April 10, 2000

S. K. Gambhir, Division Manager  
Nuclear Operations  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
P.O. Box 399  
Hwy. 75 - North of Fort Calhoun  
Fort Calhoun, Nebraska 68023-0399

SUBJECT: NRC INSPECTION REPORT NO. 50-285/00-02

Dear Mr. Gambhir:

This refers to the inspection conducted on February 6 through April 1, 2000, at the Fort Calhoun Station facility. The results were discussed with Mr. Clemens and other members of your staff. The enclosed report presents the results of this inspection.

The inspection was an examination of activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, this report focused on reactor safety.

Based on the results of this inspection, two issues were categorized as having low risk significance. These issues have been entered into your corrective action program. These issues are listed in the summary of findings and are discussed in the report.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

*/RA/*

Charles S. Marschall  
Project Branch C

Division of Reactor Projects

Docket No.: 50-285

License No.: DPR-40

Enclosure:

NRC Inspection Report No.

50-285/00-02

cc w/enclosure:

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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-285  
License No.: DPR-40  
Report No.: 50-285/00-02  
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: February 6 through April 1, 2000  
Inspectors: W. Walker, Senior Resident Inspector  
C. Osterholtz, Resident Inspector  
Approved By: Charles S. Marschall, Chief, Project Branch C

**ATTACHMENTS:**

Attachment 1: Supplemental Information  
Attachment 2: NRC's Revised Reactor Oversight Process

## SUMMARY OF FINDINGS

### Fort Calhoun Nuclear Station NRC Inspection Report 50-285/00-02 (DRP)

The report covers a 8-week period of resident inspection.

The body of the report is organized under the broad categories of Reactor Safety, Emergency Preparedness, and Other Activities as listed in the summaries below.

The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process in draft Inspection Manual Chapter 0609.

#### **Cornerstone: Mitigating Systems**

- Green. During the refueling outage, Instrument Air Check Valve IA-HCV-386-C failed it's accumulator drop test. The accumulator drop test ensures that the Safety Injection Refueling Water Tank Recirculation Valves HCV-385 and HCV-386 could be maintained closed in the event of a loss of instrument air, concurrent with a recirculation actuation.

The NRC staff determined this issue had low risk significance because Instrument Air Check Valves HCV-385 and -386 are in series, are always tested at the same time, and have never failed simultaneously. At the time of the HCV-386 failure, technicians tested HCV-385 with satisfactory results (Section 1R12).

- Green. During a design engineering review, the licensee determined that two portable heater loads rated at 13.5 kW each were being supplied from a 480 volt Motor Control Center MCC-3C2, which does not load shed.

The NRC staff determined that this issue had low risk significance. The increased loading caused by the heaters did not significantly increase the risk of overloading the diesel generators and the diesel generators remained operable (Section 1R15).

## Report Details

### Summary of Plant Status

The Fort Calhoun Station began this inspection period at 100 percent power and maintained that level until March 30, 2000.

On March 30, 2000, the plant began a planned shutdown to repair a control element assembly. At the end of the inspection period, the plant remained subcritical in hot shutdown with power ascension scheduled to begin on April 2, 2000.

### **1. REACTOR SAFETY** **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

#### 1R03 Emergent Work

##### .1 Exchange of Temperature Element TE-121C Cold Leg Temperature Indication

###### a. Inspection Scope

The inspectors reviewed the work order and observed troubleshooting related to the exchange of the temperature element input for the cold leg temperature indication. This indication provides input to the reactor regulating Channel B, the pressurizer level Channel LR-101Y, and the reactor coolant system leak rate calculation on the plant computer.

The inspectors discussed the licensee's work prioritization and risk determination associated with this activity to verify that they appropriately considered risk.

###### b. Observations and Findings

The inspectors did not identify any significant findings.

##### .2 Control Element Assembly 25 Troubleshooting

###### a. Inspection Scope

The inspectors reviewed troubleshooting activities after Control Element Assembly 25 failed to insert during partial performance of Surveillance Test OP-ST-CEA-0003, "Control Element Assembly Partial Movement Check."

The inspectors also discussed the scheduling and prioritization associated with the planned shutdown for repair of the assembly to evaluate the licensee's consideration of risk impact.

###### b. Observations and Findings

The inspectors did not identify any significant findings.

.3 Service Water Supply Line Troubleshooting and Repair

a. Inspection Scope

The inspectors reviewed troubleshooting and repair activities, after a leak developed outside the protected area in the normal service water supply to the plant, to assess the adequacy of measures to prevent risk impact on the plant.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R05 Fire Protection

Monthly Routine Inspection

a. Inspection Scope

The inspectors performed fire protection inspections to assess the condition of plant fire protection equipment and verify proper control of transient combustibles. Specific risk significant areas inspected included the diesel generator rooms, the safety injection pump rooms, and the cable spreading room.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R08 Inservice Inspection

a. Inspection Scope

The inspectors evaluated the effectiveness of the process for monitoring control element drive mechanism leak rates. The licensee uses this process for determining the periodicity for control element drive mechanism seal replacement.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R12 Maintenance Rule Implementation

Safety Injection Refueling Water Tank Recirculation Isolation Valves Maintenance (a)(1) Status

a. Inspection Scope

During plant status review, the inspectors reviewed Condition Report 200000077 dated January 13, 2000, concerning the failure of Instrument Air Check Valve IA-HCV--386-C to pass its accumulator drop test. The inspectors reviewed the licensee's actions in response to the failure of the valve to meet the required accumulator drop test acceptance criteria of less than 3 pounds of air loss in one hour.

b. Observations and Findings

On October 20, 1999, during cold shutdown, the licensee performed scheduled accumulator drop testing on Instrument Air Check Valves IA-HCV-385 and 386-C. The test was conducted to verify that safety injection refueling Water Tank Recirculation Valves HCV-385 and HCV-386 would remain closed in the event of a loss of instrument air, concurrent with a recirculation actuation. Closure of the check valves under these conditions prevents transfer of radioactive water outside containment and prevents diversion of core cooling water from the containment sump. Such a diversion would reduce the available core cooling water inventory. The surveillance specified a limit for acceptable leakage of no greater than three pounds of air loss over a one hour period. Valve IA-HCV-386-C failed the test in that seven pounds of air leaked from the accumulator in one hour. Mechanics repaired and successfully tested the valve.

The licensee postulated that particulate contamination caused the failure of the instrument air check valve to meet the accumulator drop test acceptance. The inspectors reviewed the licensee's evaluation and considered the licensee's conclusion reasonable.

The inspectors determined that the high as-found leakage for Valve IA-HCV-386-C had low risk significance. The valves are arranged in series. Valve IA-HCV-385-C demonstrated an acceptable leak rate at the time of the failure of Valve 386. The licensee has always tested Valves 385 and 386 together, and they have never failed simultaneously. Successful operation of only one check valve would have insured completion of the design function of the valves. However, since several other instrument air check valve failures have occurred, the licensee plans to install particulate filters upstream of Instrument Air Check Valves HCV-385 and HCV-386 to prevent particulate contamination.

1R13 Maintenance Work Prioritization

a. Inspection Scope

Throughout the inspection period, the inspectors reviewed weekly and daily work schedules to identify risk significant activities. The inspectors discussed selected activities with operations and work control personnel regarding risk evaluations and overall plant configuration control. The inspectors discussed emergent work issues with work control personnel and reviewed the potential risk impact of these activities.

Specific items reviewed during this period included the 12 year overhaul of Diesel Generator 1 and replacement of the cold leg temperature element.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R15 Operability Evaluations

.1 Diesel Loading and Portable Heaters

a. Inspection Scope

Inspectors reviewed an operability determination concerning portable heaters connected to a safety-related motor control center to determine if the licensee appropriately evaluated the impact on safety.

b. Observations and Findings

On December 10, 1999, during a design engineering review, engineers found that 480 volt Motor Control Center MCC-3C2 supplied power to two portable heaters rated at 13.5 kW each. Design features would not have removed the heaters' electrical load from the motor control center in response to a design basis accident. The diesel generator loading calculation did not account for this type of loading. The licensee initiated Condition Report 199902690 and performed an operability evaluation for the additional loads.

The licensee determined that the increased load did not affect functionality of the diesel generators. After discussions with an NRC senior reactor analyst, the inspectors considered that the increased load from the heaters did not significantly increase the risk of overloading the diesel generators. Since the diesel generators remained operable, the inspectors concluded that this issue had low risk significance.

.2 Control Room Air Conditioning System

a. Inspection Scope

The inspectors reviewed Safety Analysis for Operability 99-01 and Technical Specification 2.12, "Control Room Systems," to verify operability of the control room air conditioning system under design basis accident conditions.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R19 Postmaintenance Testing

a. Inspection Scope

The inspectors observed or evaluated the following postmaintenance tests to determine whether the tests adequately confirmed equipment operability:

- Work Order 17803 for testing Diesel Generator 1 following a scheduled 12 year overhaul, and
- Work Order 51716 for testing of Safety Injection Pump 2B following routine preventive maintenance.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed all or part of the following surveillance activities to confirm that the licensee effectively controlled risk impact:

- Surveillance Test Procedure OP-ST-ASP-0001, "Alternate Shutdown Capability Instrumentation Functional Check," Revision 10,
- Surveillance Test Procedure OP-ST-ESF-0009, "Channel A Safety Injection, Containment Spray and Recirculation Actuation Signal Test," Revision 30,
- Surveillance Test Procedure OP-ST-DG-0001, "Diesel Generator 1 Check," Revision 31,
- Surveillance Test Procedure OP-ST-DG-0002, "Diesel Generator 2 Check," Revision 31, and
- Surveillance Test Procedure OP-ST-AFW-0004, "Auxiliary Feedwater Pump FW-10 Operability Test," Revision 20.

b. Observations and Findings

The inspectors did not identify any significant findings.

1R23 Temporary Plant Modifications

Service Water Header Modification

a. Inspection Scope

The inspectors reviewed a temporary modification performed to supply service water from the administrative building to the service water header. The inspectors verified that the temporary modification did not adversely impact plant risk.

b. Observations and Findings

The inspectors did not identify any significant findings.

## **Emergency Preparedness**

### 1EP1 Drill, Exercise, and Actual Events

#### Emergency Plan Drill

a. Inspection Scope

The inspectors reviewed a licensee prepared emergency plan drill scenario, observed performance of the drill by licensee personnel in the simulator, and reviewed the licensee's drill critique for the identification of and resolution of performance weaknesses.

b. Observations and Findings

The inspectors did not identify any significant findings.

## **4. OTHER ACTIVITIES**

### 4OA4 Other

.1 (Closed) Licensee Event Report (LER) 285/98-005-00: Emergency Diesel Generator Start Due to Failure of One of the Off Site Power Sources. This event resulted in the issuance of a Notice of Violation (285-9811-01) which was satisfactorily closed in NRC Inspection Report 50-285/99-02. This LER is closed.

.2 The following LER's were determined to be of minor significance and are closed:

LER 285/98-001-01: Inservice Testing

LER 285/98-006-01: Design Basis for a Loss of Coolant Accident with the Plant Shutdown

LER 285/98-010-00: Core Monitoring Program

LER 285/98-011-00: Technical Specification on Engineered Safety System Equipment Operability

LER 285/98-013-00: Control Room Radiological Dose Consequences

40A5 Exit Meeting Summary

On March 31, 2000, the inspectors presented the inspection results in a meeting with Mr. Clemens and other members of your staff. The licensee acknowledged the findings as presented. The licensee did not consider any material examined during the inspection proprietary.

## ATTACHMENT 1

### PARTIAL LIST OF PERSONS CONTACTED

#### Licensee

J. Chase, Division Manager, Nuclear Assessments  
R. Clemens, Plant Manager  
M. Frans, Manager, Nuclear Licensing  
S. Gambhir, Division Manager, Nuclear Operations  
W. Gates, Vice President  
R. Phelps, Division Manager, Nuclear Engineering  
R. Short, Assistant Plant Manager  
J. Spilker, Manager, Corrective Action Group

### ITEMS OPENED, CLOSED, AND DISCUSSED

#### Closed

285/98-001-01	LER	Inservice Testing (Section 40A4)
285/98-005-00	LER	Emergency Diesel Generator Start Due to Failure of One of the Off Site Power Sources (Section 40A4)
285/98-006-01	LER	Design Basis for a Loss of Coolant Accident with the Plant Shutdown (Section 40A4)
285/98-010-00	LER	Core Monitoring Program_(Section 40A4)
285/98-011-00	LER	Technical Specification on Engineered Safety System Equipment Operability (Section 40A4)
285/98-013-00	LER	Control Room Radiological Dose Consequences (Section 40A4)

## ATTACHMENT 2

### NRC'S REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

<b>Reactor Safety</b>	<b>Radiation Safety</b>	<b>Safeguards</b>
<ul style="list-style-type: none"><li>•Initiating Events</li><li>•Mitigating Systems</li><li>•Barrier Integrity</li><li>•Emergency Preparedness</li></ul>	<ul style="list-style-type: none"><li>•Occupational</li><li>•Public</li></ul>	<ul style="list-style-type: none"><li>•Physical Protection</li></ul>

To monitor these seven cornerstones of safety, the NRC used two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection

findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.