



UNITED STATES  
October 15, 1999

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. 50-285/99-10

Dear Mr. Gambhir:

This refers to the inspection conducted on September 13-17, 1999, at the Fort Calhoun Station facility. The results were discussed with Mr. R. Short and other members of your staff. The enclosed report presents the results of this inspection.

Based on the results of this inspection, the NRC found that, with the exception of one noncited violation discussed below and the associated examples of untimely monitoring of Maintenance Rule Functional Group performance, the portion of the Maintenance Rule Program reviewed in this inspection was implemented in accordance with the requirements of your license.

The NRC has determined that three examples of one violation of NRC requirements occurred. This violation is being treated as a noncited violation, consistent with the interim Enforcement Policy for pilot plants. This noncited violation is described in the subject inspection report. If you contest the violation or severity level of the noncited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with a copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Fort Calhoun Station facility.

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

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

Sincerely,

Original signed by

Dr. Dale A. Powers, Chief  
Engineering and Maintenance Branch  
Division of Reactor Safety

Docket No.: 50-285  
License No.: DPR-40

Enclosure:  
NRC Inspection Report No.  
50-285/99-10

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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-285

License No.: DPR-40

Report No.: 50-285/99-10

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: September 13-17, 1999

Inspector: Clifford Clark, Reactor Inspector

Approved By: Dr. Dale A. Powers, Chief,  
Engineering and Maintenance Branch  
Division of Reactor Safety

ATTACHMENT: Supplement Information

## SUMMARY OF FINDINGS

### Fort Calhoun Station NRC Inspection Report 50-285/99-10

The report covers a 1-week period of inspection by a regional inspector.

The body of the report is organized under the broad category of reactor safety.

Inspection findings were evaluated according to their potential risk significance for safety, using the NRC's 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 little effect on safety. WHITE findings indicate issues with some increased importance to safety, which may require additional NRC inspections. YELLOW findings are more serious issues with an even higher potential to affect safe performance and would require the NRC to take additional actions. RED findings represent an unacceptable loss of margin to safety and would result in the NRC taking significant actions that could include ordering the plant shut down. Those findings that can not be evaluated for a direct effect on safety with the Significance Determination Process, such as those findings that affect the NRC's ability to oversee licensees, are not assigned a color.

#### **Mitigating Systems**

\$ Green. On three occasions (September 14, 1998, January 4 and April 1, 1999), failures affecting components in Maintenance Rule functional groups were not incorporated into the corrective action program. The involved components were a temperature switch associated with the auxiliary building ventilation system providing temperature control for safety-related equipment structures, systems, and components and the radiation monitors providing both auxiliary building and containment atmosphere monitoring. Not documenting these component failures into condition reports contributed to untimely monitoring of Maintenance Rule functional group performance and delayed placement of associated functional groups into Category (a)(1). This issue was considered green in the significance determination process because the equipment involved was nonrisk-related (although safety-related and addressed by technical specification requirements). The failure to initiate condition reports was contrary to Technical Specification 5.8.1 in that Standing Order SO-R-2, a station procedure, required a condition report to be initiated for failures, malfunctions, or deficiencies affecting systems or components. This was a violation of NRC requirements. We are treating this violation as a noncited violation, consistent with the Interim Enforcement Policy for pilot plants. This violation is in the licensee's corrective action program as Condition Reports 199901795 and 199901808 (Section 1R12).

## 1 REACTOR SAFETY

### 1R12 Maintenance Rule Implementation

#### .1 Periodic Evaluation Review

##### a. Inspection Scope

The inspector reviewed the Fort Calhoun Station periodic evaluation of Maintenance Rule effectiveness from January 1, 1997, to July 31, 1998. This evaluation was published in a staff report titled, "Maintenance Rule Monitoring Assessment Report of Maintenance Effectiveness for Operating Cycle 17," dated February 17, 1999. This periodic evaluation was prepared as required by 10 CFR 50.65(a)(3).

The licensee's conclusions with regard to balancing structure, system, and component reliability and unavailability, and activities associated with placement of same in Categories (a)(1) and/or (a)(2) were examined. This examination of periodic evaluation conclusions was performed by reviewing Maintenance Rule implementation for raw water pumps, Auxiliary Feedwater Pump Train B (FW-10), Auxiliary Feedwater Pump Train C (FW-54), engineered safety features actuation system (General Electric HEA lockout relays), and power-operated relief valves.

##### b. Observations and Findings

There were no findings identified.

#### .2 Effectiveness of Maintenance Rule Program

##### 1. Inspection Scope

The inspector reviewed the Maintenance Rule functional failure determinations, performance criteria, movement of functional groups between Maintenance Rule Categories (a)(1) and (a)(2), Maintenance Rule (a)(1) goals and monitoring plans for the engineered safety features actuation system (General Electric HEA lockout relays), control room air conditioning system, auxiliary building ventilation system (Air Supply Unit VA-17), and containment atmosphere monitoring system.

##### 2. Observations and Findings

#### Functional Group VAC PABSUP (Ventilation and Air Conditioning (VAC) System - Auxiliary Building Supply Fans and Flow Path)

During review of this area, the inspector identified an example of a failure to document a component's functional failure in the licensee's corrective action program. The inspector noted that nonrisk-related Maintenance Rule Functional Group VAC PABSUP was placed into Category (a)(1) on August 11, 1999. This functional group's function was to have the auxiliary building ventilation supply fans and flow path provide temperature

control for safety-related structures, systems and components in applicable areas.<sup>@</sup> The performance criteria for Functional Group VAC PABSUP were (1) no maintenance preventable functional failures, and (2) no repeat maintenance preventable functional failures.

Freeze Stat YTC-850 is a temperature switch and is one of several components installed in the skid/housing assembly identified as Ventilation Air Supply Unit VA-17. Freeze Stat YTC-850 tripped at least four times within 13 months while the plant was at power and Functional Group VAC PABSUP of the ventilation and air conditioning system was disabled each time. When the freeze stat tripped, there was a reduction in the auxiliary building ventilation and air conditioning system air flow to both auxiliary building and containment atmosphere radiation monitors, and the radiation monitors tripped on low sample flow and were declared inoperable.

When component failures occurred, unplanned entries were made into Technical Specifications 2.15, Instrument and Control Systems,<sup>@</sup> and 2.21, Post-Accident Monitoring Instrumentation.<sup>@</sup> When technical specifications were entered, the operators normally verified ventilation system alignment and placed the freeze stat in override and the ventilation system was restarted. During a normal Freeze Stat YTC-850 actuation, Ventilation Fans VA-35B, VA-40A, VA-35A, and VA-40B (C) are normally rendered inoperable.

A preliminary evaluation performed by the reliability engineering group indicated that the four failures of Functional Group VAC PAPSUP had been caused by a design deficiency of sub-components within the Ventilation Air Supply Unit VA-17 housing/skid.

The inspector reviewed the Maintenance Rule group-s activities to monitor Functional Group VAC PABSUP performance and noted the following:

- \$ In July 1999, the Maintenance Rule group performed a review of two condition reports documenting Freeze Stat YTC-850 functional failures that occurred on January 9 and February 11, 1999. A follow up investigation of these two Freeze Stat YTC-850 functional failures found that, as of February 11, 1999, Freeze Stat YTC-850 had experienced three maintenance preventable functional failures and one repeat maintenance preventable functional failure. As a result of these four functional failures, the licensee determined Functional Group VAC PABSUP performance criteria were exceeded.
  
- \$ The four Freeze Stat YTC-850 functional failure events occurred on the following dates:
  - \$ First event: January 12, 1998. This event was documented in Condition Report 199800044 on January 13, 1998. This functional failure was not identified until 18 months later in July 1999.

- \$ Second event: January 4, 1999. This event was not documented in a condition report.
- \$ Third event: January 9, 1999. This event was documented in Condition Report 199900040 on January 10, 1999. This functional failure was not identified until 18 months later in July 1999.
- \$ Fourth event: February 11, 1999. This event was documented in Condition Report 199900231 on February 11, 1999. The Maintenance Rule group found that the Ventilation Air Supply Unit VA-17 design deficiency was known for at least a year and corrective action had not been implemented prior to this event. This Ventilation Air Supply Unit VA-17 failure was identified as a repeat maintenance preventable functional failure.
  
- \$ The INPO 98-01, AEquipment Performance and Information Exchange System,@ is an industry computer data base that the licensee-s Maintenance Rule group entered Maintenance Rule information and specifically functional failures for use in industry-s monitoring. In mid-July 1999, the Maintenance Rule monitoring group implemented actions in response to AEquipment Performance and Information Exchange System@ Functional Failure Reports 150, 151, 152, and 153 that documented the last four functional failures of Ventilation Air Supply Unit VA-17. At this time, the Maintenance Rule group identified that Functional Group VAC PABSUP experienced a functional failure on January 12, 1998, 18 months earlier. The inspector considered that the identification in July 1999, that the performance criteria for Functional Group VAC PABSUP had been exceeded, 18 months earlier in January 1998, an example of untimely performance monitoring. The evaluation for placement of Functional Group VAC PABUP into Category (a)(1) was, thus, delayed until 19 months after the performance criteria for that functional group had been exceeded.
  
- \$ Since the January 4, 1999, functional failure of Freeze Stat YTC-850 was not documented in a condition report, timely notification of the failure of Functional Group VAC PAPSUP was not provided to the Maintenance Rule group monitoring the reliability of structures, systems, and components. The January 4, 1999, failure of Functional Group VAC PAPSUP was identified 6 months later in July 1999, during a follow up investigation of two condition reports issued to document other functional failures of Freeze Stat YTC-850. The inspector considered this an additional example of untimely performance monitoring.
  
- \$ On August 11, 1999, a cause determination was completed and Condition Report 199901456 was issued to place Ventilation Air Supply Unit VA-17 of Maintenance Rule Functional Group VAC PABSUP into Maintenance Rule

Category (a)(1). The inspector considered the 19-month delay between January 12, 1998, the date the performance criteria for Functional Group VAC PABSUP were exceeded, to August 11, 1999, the date Functional Group VAC PABSUP was placed into Category (a)(1), an additional example of untimely performance monitoring.

\$ As of September 15, 1999, while several personnel in the operation and engineering groups were aware of the January 4, 1999, failure of Freeze Stat YTC-850, no one had issued a condition report to document this occurrence.

On September 16, 1999, the licensee issued Condition Report 199901795. Condition Report 199901795 documented the January 4, 1999, functional failure of Freeze Stat YTC-850 and clarified that it was operations management expectations that a condition report would be written when this equipment was disabled in the manner described above.

Neither 10 CFR 50.65 or the Fort Calhoun Station Maintenance Rule Program procedures identifies a specific time period for completing a performance evaluation of a functional group after it has been identified that the functional group experienced a failure. The inspector noted that 10 CFR 50.65(a)(1) indicates that licensee-established goals for performance evaluation shall be established commensurate with safety and that performance of these evaluations will also normally occur during the licensee's balancing of availability and reliability in accordance with 10 CFR 50.65(a)(3).

Technical Specification 5.8.1 and Appendix A of NRC Regulatory Guide 1.33 requires, in part, that written procedures shall be established, implemented, and maintained covering administrative procedures. Section 2.2 of Standing Order SO-R-2, ACondition Reporting and Corrective Action,@ Revisions R8 and R9, require origination of a condition report for failures, malfunctions, deficiencies, or deviations affecting systems or components that are considered sudden or unexpected and outside the anticipated performance history of the system or component. This NRC-identified example of a failure to issue a condition report as of September 15, 1999, for the January 4, 1999, functional failure of Freeze Stat YTC-850 was identified as an example of a violation of Standing Order SO-R-2. As a result, the inspector identified this as an example of a violation of NRC requirements (50-285/99010-01). We are treating this violation as a noncited violation, consistent with the Interim Enforcement Policy for pilot plants. This violation is in the licensee's corrective action program as Condition Report 199901795.

Functional Group RMS CTSKID (Containment Atmosphere Monitoring - Radiation Monitoring System/RM 050 and 051)

During review of this area, the inspector identified two examples of a failure to document a component's functional failure in the licensee's corrective action program. The inspector noted that the nonrisk-related, Maintenance Rule Functional Group RMS CTSKID (radiation monitoring functions) was placed in Category (a)(1) on September 8, 1999. Functional Group RMS CTSKID provides radiation indication and alarm on demand. The performance criteria for Functional

Group RMS CTSKID were (1) three functional failures, and (2) no repeat maintenance preventable functional failures.

The inspector reviewed the Maintenance Rule group activities implemented to place Functional Group RMS CTSKID back into Maintenance Rule Category (a)(1) on September 8, 1999, and noted the following:

\$ On September 14, 1998, Radiation Monitors RM-050 and RM-051 were removed from service for a change out of the shared sampling particulate filter tape. When the radiation monitors were returned to service, the filter tape drive would not automatically advance. This component failure caused the unplanned unavailability of Radiation Monitors RM-50 and RM-51, and the failure of Functional Group RMS CTSKID. When Radiation Monitors RM-50 and RM-51 were declared inoperable and Functional Group RMS CTSKID was disabled, an unplanned entry was made into Technical Specification 2.15, Instrumentation and Control System, as discussed above.

\$ On September 16, 1998, Work Request 00000477 was written to repair the filter tape drive. On September 23, 1998, Work Order 00013451 01 was issued to replace the tape drive motor. The work was completed on September 28, 1998.

Since a condition report was not written for this functional failure, the Maintenance Rule group was not aware of it until approximately 10 months later. In July 1999, while performing back-end reviews of completed work orders, the Maintenance Rule group noted that Work Order 00013451 01 identified a functional failure within Functional Group RMS CTSKID. The inspector considered this 10-month delay an additional example of untimely performance monitoring.

\$ On April 1, 1999, Radiation Monitor RM-050 was declared inoperable to perform a preventive maintenance activity, replacement of the sampling filter tapes. It was determined later that the filter tape drive was not operating, which caused the failure of Maintenance Rule Functional Group RMS CTSKID. On April 3, 1999, Work Request 00007296 and Work Order 00024375 01 were issued to replace the filter tape drive motor and Radiation Monitor RM-050 was returned to service. The failed tape drive motor was being handled as a run to failure device, and had been last replaced on February 2, 1999. A condition report was not issued for the April 1, 1999, component failure.

Since a condition report was not written for this functional failure, the Maintenance Rule group was not aware of this functional failure until approximately 3 months later. In July 1999, while performing back-end reviews of completed work orders, the Maintenance Rule group noted that Work Order 00024375 01 identified a functional failure within Functional Group RMS CTSKID. The inspector considered this 3-month delay an additional example of untimely performance monitoring.

\$ On September 8, 1999, a cause determination was completed and Condition Report 1999901745 was issued to place Maintenance Rule Functional Group RMS CTSKID into Maintenance Rule Category (a)(1).

\$ As of September 15, 1999, while several personnel in the operation and engineering groups were aware of the two failures of the radiation monitor filter tape drives on September 14, 1998, and April 1, 1999, condition reports had not been issued to document either occurrence.

Technical Specification 5.8.1 and Appendix A of NRC Regulatory Guide 1.33. requires, in part, that written procedures shall be established, implemented, and maintained covering administrative procedures. Section 2.2 of Standing Order SO-R-2, ACondition Reporting and Corrective Action,@ Revisions R8 and R9, require origination of a condition report for failures, malfunctions, deficiencies, or deviations affecting systems or components that are considered sudden or unexpected and outside the anticipated performance history of the system or component. These two NRC-identified examples of a failure to issue a condition report as of September 15, 1999, for the September 14, 1998, and April 1, 1999, failures of the filter tape drives for Radiation Monitors RM-050 and RM-051 were identified as two examples of a violation of Standing Order SO-R-2. As a result, the inspector identified these as additional examples of a violation of Technical Specification 5.8.1 (50-285/99010-01). We are treating this violation as a noncited violation, consistent with the Interim Enforcement Policy for pilot plants. This violation is in the licensee-s corrective action program as Condition Report 199901808.

#### Meeting to Discuss Inspector-s Maintenance Rule Program Observations

On September 17, 1999, after the inspector-s exit, the inspector and the inspector-s branch chief met with members of the licensee-s management and staff to discuss the inspector-s observations on the implementation of the licensee-s Maintenance Rule Program. The following subjects were discussed:

#### \$ Timeliness of Monitoring Structures, Systems, and Components

The supervisor of the Maintenance Rule group and his staff acknowledged the inspector-s observations on untimely Maintenance Rule Program performance monitoring. The Maintenance Rule group personnel noted that the inspector-s observation was similar to a weakness they had identified in a self assessment of the Maintenance Rule Program implementation, performed September 1-3, 1999. The undated Self-Assessment Report, AReliability Engineering Maintenance Rule Implementation Self Assessment Report,@ identified the following:

\$ Maintenance Rule information is exceptionally difficult to tie with the Condition Report System.

\$ There is no way of querying the condition report database by using the Maintenance Rule equipment system, functional group, train, or risk significant categorizations. This makes it extremely difficult to review condition reports that could potentially be Maintenance Rule functional failures.

\$ Functional failure determination is not normally performed until after the equipment is fixed. This has caused situations where the functional failure data has not been entered into the INPO 98-01, AEquipment

Performance and Information Exchange System.® in a timely manner. Because of the timeliness problem of entering the functional failure data into the AEquipment Performance and Information Exchange System® data base, it has significantly impaired the Maintenance Rule group-s ability to promptly evaluate equipment functional failures for Category (a)(1) consideration.

The Maintenance Rule group noted that the weaknesses identified in the above self assessment were documented in the corrective action program in Condition Reports 199901764, 199901765, and 199901766. In addition, the Maintenance Rule group personnel noted the following:

- \$ The implementation of new computer systems, the Resource Acquisition Management Systems, at the Fort Calhoun Station in 1998 and 1999, had initially had a negative effect upon obtaining reports required to perform effective and timely monitoring of Maintenance Rule performance at Fort Calhoun Station.
- \$ Licensee management was reviewing a proposal to have the Maintenance Rule group perform daily Afront-end® reviews of all condition reports and work orders, as they were issued, to determine Maintenance Rule applicability.

The inspector noted that the new reports and Afront-end® reviews should improve monitoring of Maintenance Rule performance at Fort Calhoun Station.

\$ Corrective Action Program

During the meeting, the manager of the corrective action group disagreed that the three examples identified in Violation 50-282/9910-01 were valid examples of a violation of Standing Order SO-R-2 instructions. The manager of the corrective action group-s position was that operators and other facility personnel knew:

- \$ Freeze Stat YTC-850 had and could fail/trip during cold weather operations. The failure of Freeze Stat YTC-850 and associated Functional Group VAC PABSUP was not outside the anticipated performance history of the component. The manager noted that he would not have expected a condition report to have been written for the January 4, 1999, functional failure of Freeze Stat YTC-850.
- \$ Radiation monitor filter tape drives have been unreliable and have failed often. The failure of a filter tape drive and associated Functional Group RMS CTSKID basically constituted a planned failure. The manager noted that he would not have expected a condition report to have been written for the September 14, 1998, and April 1, 1999, failures of the radiation monitor filter tape drives.

The NRC personnel disagreed with the corrective action group manager-s opinion on when condition reports were required to be written for the three examples discussed above. On October 5, 1999, Fort Calhoun Station Division Manager of

Nuclear Operations contacted the inspector-s branch chief and the Region IV Project Branch C branch chief and during the discussion stated that he agreed that a violation of Standing Order SO-R-2, as identified above, had occurred.

The inspector identified three examples of failures affecting components in Maintenance Rule functional groups, that were not incorporated into the corrective action program. Not documenting these component failures into condition reports contributed to untimely monitoring of Maintenance Rule functional group performance and delayed placement of associated functional groups into Category (a)(1). In the examples discussed above, the placement of the discussed functional groups into Category (a)(1) were delayed from 10 to 19 months after the performance criteria for the functional groups had been exceeded.

#### **4. OTHER ACTIVITIES**

##### **4OA5 Exit Meeting Summary**

The inspector presented the inspection results to Mr. R. Short and other members of licensee management at the conclusion of the inspection on September 17, 1999. The licensee-s management acknowledged the findings presented, and requested a meeting after the exit to discuss the findings in more detail. The licensee-s management did not consider any material examined during the inspection proprietary.

On October 5, 1999, the Fort Calhoun Station Division Manager of Nuclear Operations contacted the inspector-s branch chief and the Region IV Project Branch C branch chief and during the discussion stated that he agreed that a violation of Standing Order SO-R-2, as identified above, had occurred.

