



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**

REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
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November 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. 50-285/99-12

Dear Mr. Gambhir:

On October 22, 1999, the NRC completed an inspection at your Fort Calhoun reactor facility. The results of the inspection were discussed with you and other members of your staff at the completion of the inspection. The enclosed report presents the results of this inspection.

This inspection was an examination of activities conducted under your license as they relate to radiation safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, this inspection focused on the implementation of your access control to radiological significant areas program and a review of your occupational exposure control and radiological effluent performance indicators.

Based on the results of this inspection, five issues of low risk significance were identified that have been entered into your corrective action program. These five issues are discussed in the summary of findings and in the body of the attached inspection report. These issues were determined to involve violations of NRC requirements, but because of their low risk significance, the violations are not cited. If you contest these noncited violations, 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, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Fort Calhoun Station.

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.

Omaha Public Power District

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

Sincerely,

/s/

Gail M. Good, Chief  
Plant Support Branch  
Division of Reactor Safety

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

Enclosures:  
NRC Inspection Report No.  
50-285/99-12

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Omaha Public Power District

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E-Mail report to D. Lange (DJL)

E-Mail report to NRR Event Tracking System (IPAS)

E-Mail report to Document Control Desk (DOCDESK)

E-Mail all documents to Jim Isom for Pilot Plant Program (JAI)

E-Mail all documents to Sampath Malur for Pilot Plant Program (SKM)

bcc to DCD (IE06)

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DRP Director

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Project Engineer (DRP/C)

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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-285  
License No.: DPR-40  
Report No.: 50-285/99-12  
Licensee: Omaha Public Power District  
Facility: Fort Calhoun Station  
Location: Fort Calhoun Station FC-2-4 Adm., P.O. Box 399,  
Hwy. 75 - North of Fort Calhoun  
Fort Calhoun, Nebraska  
Dates: October 18 to 22, 1999  
Inspector: Michael P. Shannon, Senior Radiation Specialist  
Plant Support Branch  
Approved By: Gail M. Good, Chief, Plant Support Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

### Fort Calhoun Station NRC Inspection Report No. 50-285/99-12

This announced inspection focused on the implementation of the licensee's access control to radiological significant areas program and a review of the occupational exposure control and radiological effluent performance indicators.

Inspection findings were assessed according to potential risk significance and were assigned colors of GREEN, WHITE, YELLOW, or RED. GREEN findings are indicative of issues that, while not necessarily desirable, represent little risk to safety. WHITE findings would indicate issues with some increased risk to safety, which may require additional NRC inspections. YELLOW findings would be indicative of more serious issues with higher potential risk to 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. No individual finding by itself would be indicative of either acceptable or unacceptable performance. The findings, considered in total with other inspection findings and performance indicators, will be used to determine overall plant performance.

#### **Cornerstone: Occupational Radiation Safety**

- Green. The inspector identified a violation for the failure of a contractor radiation protection technician to meet the minimum qualifications of Technical Specification 5.3.1. Using radiation protection personnel that do not meet the minimum qualifications of Technical Specification 5.3.1 could ultimately result in improper radiation worker job coverage and/or inaccurate radiological assessments of work areas and conditions. In utilizing the significance determination process, this issue was determined to have very low risk significance, because there were no instances of an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 199902232 (Section 2OS1).
- Green. The inspector identified two examples of a violation of 10 CFR 19.12(a) for the failure to inform radiation workers of the radiological conditions in their work area prior to the start of work. The failure to inform workers of the radiological conditions in their work area could cause the workers to receive unnecessary radiation exposure or become contaminated. In utilizing the significance determination process, these examples were determined to have very low risk significance, because there were no instances of an overexposure event and general area radiation levels were approximately 600 millirems per hour. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 199902241 (Section 2OS1).
- Green. The licensee identified a violation of Technical Specification 5.11.2 for the failure to lock a restricted high radiation area to prevent an unauthorized entry. The

failure to lock a restricted high radiation area could cause a worker to receive an unplanned radiation exposure. In utilizing the significance determination process, this issue was determined to have very low risk significance, because there were no instances of an overexposure event and general area radiation levels were approximately 1500 millirems per hour. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 199902076 (Section 4OA1).

- Green. The licensee identified two examples of a violation of 10 CFR 20.1902 for the failure to post a radiation and high radiation area. Not posting radiation and high radiation areas could cause a worker to receive an unplanned radiation exposure. In utilizing the significance determination process, this issue was determined to have very low risk significance, because there was not a substantial potential for an overexposure event and general area radiation levels were approximately 200 millirems per hour. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. These examples of a violation are in the licensee's corrective action program as Condition Reports 199902046 and 199902099 (Section 4OA1).
- Green. The licensee identified three examples of a violation of Technical Specification 5.8.1 for the failure to follow the requirements of a radiation work permit. Specifically, the three examples pertained to workers entering posted airborne radioactivity areas using radiation work permits that did not authorize such entries. Not adhering to the requirements of a radiation work permit could cause a worker to receive an unplanned radiological exposure. In utilizing the significance determination process, this issue was determined to have very low risk significance, because there was not a substantial potential for an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. These examples of a violation are in the licensee's corrective action program as Condition Reports 199900951, 199901945, and 199902034 (Section 4OA1).

## Report Details

### 2. RADIATION SAFETY

#### 2OS1 Access Control

##### a. Inspection Scope

Selected radiation protection personnel involved in the radiological controls program were interviewed. A number of tours of the radiological controlled area, including the reactor containment building, were performed. The following items were reviewed:

- Control and posting of contaminated, airborne, radiation, and high radiation areas
- Personnel dosimetry use
- Radiation work permits
- Job coverage by radiation protection personnel
- Air sampling, including the use of continuous air monitors and filtration units
- Control of radioactive material
- Adequacy of the surveys necessary to assess personnel exposure
- Resumes and qualification cards of contractor radiation protection technicians
- Adequacy of radiation protection procedures

##### b. Observations and Findings

Technical Specification 5.3.1 states that each member of the plant staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971. ANSI N18.1 - 1971, states that technicians shall have a minimum of two years of working experience in their speciality. Four contractor/loaned radiation protection technician resumes were randomly selected during the review of outage planning and preparation. From the review of the above resumes on October 23, 1999, the inspector identified that one contractor radiation protection technician, who was assigned health physics job coverage, had approximately 17 months experience working in the health physics discipline. The failure to meet the minimum qualifications of ANSI N18.1 - 1971 is a violation of Technical Specification 5.3.1. Using radiation protection personnel that do not meet the minimum qualifications of ANSI N18.1 - 1971 could ultimately result in improper radiation worker job coverage and/or inaccurate radiological assessments of work areas and conditions.



From interviews with radiation protection management and the radiation protection technician involved in the violation, the inspector determined that the above radiation protection technician was assigned health physics job coverage duties since the beginning of the refueling outage on October 2, 1999.

Using the Occupation Radiation Safety Significance Determination Process, the inspector determined that the violation had low safety significance, because there were no instances of an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 199902232 (50-285/9912-01).

10 CFR 19.12(a) states, in part, all individuals who in the course of employment are likely to receive in a year an occupational dose in excess of 100 mrem shall be kept informed of the storage, transfer, or use of radiation and/or radioactive material.

On October 20, 1999, at approximately 3:30 a.m., the inspector observed a quality control worker who signed in on Radiation Work Permit 1999-3521, "Reactor Head Removal/Replacement," Revision 1, perform an inspection of the reactor head flange area. The inspector observed that the radiation protection technician had not verified and informed the quality control worker of the radiation levels prior to the start of the task. Additionally, although a radiological contamination survey was performed during the observed task, the smears were not counted until the completion of the job.

The inspector reviewed an earlier task, which included the removal and cut up of the reactor head O-ring, associated with Radiation Work Permit 1999-3521, and interviewed the radiation protection technician who provided health physics job coverage for this task. From this review, the inspector determined that the radiological contamination survey to determine the actual conditions prior to the start of work was performed while the work was in progress and not counted until the completion of the task.

From a review of the radiological survey information documented during these evaluations, the inspector determined that general area radiation levels ranged from 30 mrems per hour to as high as 800 mrems per hour, and contamination levels ranged from 30,000 disintegrations per minute per 100 centimeters squared to as high as 160 mrad per hour.

From the review for the above two tasks, the inspector determined that there were two examples of the failure to inform workers, who in the course of employment were likely to receive in a year an occupational dose in excess of 100 mrem, of the radiological conditions in their work area prior to the start of work. The failure to inform radiation workers of the radiological conditions in their work area prior to the start of work is a violation of 10 CFR 19.12. The failure to obtain and inform workers of the radiological conditions in their work area could cause the workers to receive unnecessary radiation exposure.

Using the Occupation Radiation Safety Significance Determination Process, the inspector determined that the violation had low safety significance, because there were no instances of an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 199902241 (50-285/9912-02).

#### 2OS4 Radiation Worker Performance

##### a. Inspection Scope

Selected radiation workers were interviewed and their performance was observed throughout the radiological controlled area to assess their compliance with radiation protection procedures and management expectations.

##### b. Observations and Findings

There were no findings identified.

#### 4OA1 Identification and Resolution of Problems

##### a. Inspection Scope

The following radiological controls related items written since December 1, 1998, were reviewed:

- Quality assurance audits and surveillances
- Department self-assessments
- Condition reports

##### b. Observations and Findings

There were no findings identified during this inspection pertaining to quality assurance audits and surveillances, and department self-assessments. However, during the review of conditions reports, the inspector noted the following items.

Technical Specification 5.11.2 requires, in part, each area with general radiation levels greater than 1000 mrem per hour to be locked to prevent unauthorized entry into such areas. On October 11, 1999, the licensee identified that the reactor building containment sump hatch was not locked properly to prevent unauthorized entry. From a review of licensee supplied radiological survey information, the inspector noted that general area radiation dose rates in the reactor building containment sump area ranged from as low as 50 mrem per hour to as high as 2000 mrem per hour, and the area was unlocked for approximately 22 hours. The failure to lock the reactor building containment sump area to prevent unauthorized entry is a violation of Technical Specification 5.11.2. The failure to lock the above area could cause a worker to receive an unplanned radiation exposure.

Using the Occupation Radiation Safety Significance Determination Process, the inspector determined that the violation had low safety significance, because there were no instances of an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 199902076 (50-285/9912-03).

10 CFR 20.1902(a) and (b) requires radiation and high radiation areas, respectively, to be posted. 10 CFR 20.1003 defines a radiation area as an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 mrem in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates. It also defines a high radiation area as an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 100 mrem in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

On October 8, 1999, the licensee identified that an area surrounding Level Control Valves 101 and 102, on elevation 994 foot of the reactor containment building was not posted as a high radiation area. General radiation levels ranged from 250 mrem per hour to 500 mrem per hour. From a review of licensee supplied information, the inspector determined that this condition existed for approximately seven hours. On October 10, 1999, the licensee identified that an area, in which general radiation levels were 10 mrem per hour, inside Room 27 of the auxiliary building was not posted as a radiation area. From a review of licensee supplied information, the inspector determined that this condition existed for approximately 18 hours. The failure to post the above two areas in accordance with the requirements of 10 CFR Part 20 are two examples of a violation of 10 CFR 20.1902. Not posting radiation and high radiation areas could cause a worker to receive an unplanned radiation exposure.

Using the Occupation Radiation Safety Significance Determination Process, the inspector determined that the two examples of the above violation have low safety significance, because there was not a substantial potential for an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. These examples of a violation are in the licensee's corrective action program as Condition Reports 199902046 and 199902099, respectively (50-285/9912-04).

Technical Specification 5.8.1. requires procedures to be implemented and maintained in accordance with Appendix A of Regulatory Guide 1.33. Section 7e(1) of Regulatory Guide 1.33 requires procedures for the radiation work permit system. Procedure RPP, "Radiation Protection Plan," Revision 16, required that station personnel obey the requirements of Standing Order SO-G-101, "Radiation Worker Practices," Revision 13. Section 4.2 of the above Standing Order stated that persons entering the radiological controlled area are responsible for adhering to the requirements listed on the radiation work permit.

On May 28, 1999, the licensee identified that two workers entered Room 5 in the auxiliary building, a posted airborne radioactivity area, using a radiation work permit that did not authorize entry into such an area. On October 2, 1999, the licensee identified

that three workers entered the reactor containment building a posted airborne radioactivity area, using a radiation work permit that did not authorize entry into such an area. On October 8, 1999, the licensee identified another example in which two workers entered the reactor containment building under the same conditions as stated above. The above three examples are a violation of Technical Specification 5.8.1. Not adhering to the requirements of a radiation work permit could cause a radiation worker to receive an unplanned radiological exposure.

Using the Occupation Radiation Safety Significance Determination Process, the inspector determined that the three examples of the above violation have low safety significance, because there was not a substantial potential for an overexposure event. This violation is being treated as a noncited violation, consistent with Appendix F of the NRC Enforcement Policy. These examples of a violation are in the licensee's corrective action program as Condition Reports 199900951, 199901945, and 199902034, respectively (50-285/9912-05).

#### 40A2 Performance Indicator Verification

##### a. Inspection Scope

The inspector reviewed corrective action program records for restricted high radiation area, very high radiation area, and unplanned exposure occurrences for the past 12 quarters to confirm that these occurrences were properly recorded as performance indicators. Radiological controlled area exit transactions with exposures greater than 100 mrem for the past 12 quarters were reviewed, and selected examples were investigated to determine whether they were within the dose projections of the governing radiation work permits. Additionally, radiological effluent release program corrective action records and annual reports documented during the past 4 quarters were reviewed to confirm whether events which exceeded the criteria described in Section 03.02m, of NRC Inspection Manual Procedure 71151, were properly recorded as performance indicators.

##### b. Observations and Findings

There were no findings identified.

#### 40A4 Other

10 CFR 50.70(b)(4), states, in part, that the licensee shall ensure that the arrival and presence of an NRC inspector is not announced or otherwise communicated by its employees or contractors to other persons at the facility. On October 20, 1999, at approximately 3:15 a.m. the inspector overheard an announcement on the radiation protection radio system at the health physics access point, that the NRC inspector was about to enter the radiological controlled area. This issue is identified as an Unresolved Issue pending further NRC review. This issue is in the licensee's corrective action program as Condition Report 199902216 (URI 50-285/9912-06).

4OA5 Management Meetings

Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on October 22, 1999. The licensee acknowledged the findings presented. However, the licensee stated that the issue involving the restricted high radiation area door should not be a green finding because it is accounted for in the occupational exposure performance indicator process. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

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### NRC

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V. Gaddy, Senior Resident Inspector  
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J. Wigginton, Senior Health Physicist, NRR

## ITEMS OPENED AND CLOSED

### OPENED

50-285/9912-06	URI	Failure to ensure that the arrival and presence of an NRC inspector was not announced (Section 40A4).
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### OPENED and CLOSED

50-285/9912-01	NCV	Failure to meet the requirements of Technical Specification 5.3.1 (Section 2OS1).
50-285/9912-02	NCV	Failure to inform radiation workers of the radiological conditions in their work area prior to start work (Section 2OS1).
50-285/9912-03	NCV	Failure to lock a restricted high radiation area to prevent unauthorized entry (Section 40A1).
50-285/9912-04	NCV	Failure to post a radiation and high radiation area (Section 40A1).

50-285/9912-05      NCV      Failure to follow the requirements of a radiation work permit (Section 4OA1).