



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV

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August 13, 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. 50-285/99-07

Dear Mr. Gambhir:

On July 23, 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.

The inspection focused on the accuracy and operability of the radiation monitoring instrumentation used for the protection of occupational workers. Based on the results of this inspection, the NRC identified one issue which was evaluated under the risk significance determination process and was determined to be of low risk significance. No regulatory requirement was violated. This issue is listed in the summary of findings and is 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.

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

Sincerely,

original signed by

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

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

Omaha Public Power District

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Enclosure:  
NRC Inspection Report No.  
50-285/99-07

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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-285  
License No.: DPR-40  
Report No.: 50-285/99-07  
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: July 19-23, 1999  
Inspector: Michael P. Shannon, Senior Radiation Specialist  
Approved By: Gail M. Good, Chief, Plant Support Branch

## SUMMARY OF FINDINGS

Fort Calhoun Station  
NRC Inspection Report No. 50-285/99-07

This announced inspection by a regional senior radiation specialist focused on the accuracy and operability of the radiation monitoring instrumentation used for the protection of occupational workers.

Findings are assessed according to their potential risk significance and are assigned colors of green, white, or yellow. Green findings are indicative of issues that, while may not be desirable, represent little or no risk to safety. White findings indicate issues with some increased risk to safety, which may require additional inspection resources. Yellow findings are more serious issues with higher potential risk to safe performance. The findings are considered in total with other inspection findings and performance indicators to determine overall plant performance.

### Occupational Radiation Safety

- Green. A radiation protection technician failed to response check a neutron survey meter prior to use during an at power entry into the reactor containment building. Using a survey instrument that was not response checked prior to use could have provided inaccurate information needed to assess radiological conditions (Section 40A1).

## Report Details

### **2. RADIATION SAFETY**

#### 2OS3 Radiation Monitoring Instrumentation

##### a. Inspection Scope

The inspector reviewed the calibration and source response checking programs for:

- Portable radiation protection instrumentation
- Personnel contamination monitors
- Small article release monitors
- Whole-body counters

Additionally, the inspector reviewed the calibration, operability, and alarm set points of radiation monitors associated with area radiation monitors, emergency assessment, and radwaste processing evolutions. Radiation monitors covered under the maintenance rule were not included in this inspection.

##### b. Observations and Findings

There were no findings identified and documented during this inspection.

#### 4OA1 Identification and Resolution of Problems

##### a. Inspection Scope

The inspector reviewed the following radiation monitoring instrumentation related items written since July 1997:

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

##### b. Observations and Findings

There were no findings identified and documented during this inspection pertaining to quality assurance audits and surveillances, and department self-assessments. However, during the review of conditions reports, the inspector noted that on July 10, 1999, the licensee wrote Condition Report 99-1245 documenting that two neutron radiation survey meters (remballs) failed while in use during a power entry in the reactor containment building. The inspector noted that as of July 22, 1999, corrective actions pertaining to this event were in the process of being evaluated by the licensee. The entry was made to identify the cause of two fire detection zone alarms. The initial entry

was made with a remball which was function (response) checked prior to use. When this remball failed, (later determined to be caused by an electrical short), the radiation protection technician requested that a second remball be brought to the reactor building containment entrance. However, this remball was not response checked prior to use. At the conclusion of the reactor containment building entry the second remball also failed. This failure was later determined to be a battery failure.

During the review of radiation monitoring instrumentation procedures, the inspector noted that Section 7.1 of Procedure RP 403, "Instrument Response Testing," Revision 11, required portable survey instruments be response tested daily when in use. Technical Specification 5.8.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A, Section 7.e, recommends procedures for the radiation protection program; however, it does not specifically require procedures for radiation protection instrumentation.

The inspector did not identify a regulatory requirement to response check portable radiation survey meters prior to use. Using malfunctioning instrumentation could result in inaccurate surveys and radiological assessments under certain conditions (if the meter was not responding properly). Therefore, because the second remball was not response checked prior to use, it could have provided inaccurate survey information needed to assess radiological conditions in the work areas. The failure to accurately assess radiological conditions could have had a safety or regulatory impact. Using the significance determination process, this item was determined to be within the licensee's response band (green). The significance determination process is used to determine the magnitude of a finding.

#### Licensee Position

On Monday, July 26, 1999, the licensee provided the following information to support its position that the issue was not a candidate for the significance determination process.

1. There is no NRC requirement to response test the instrument prior to use.
2. The remball that was not response checked had a current calibration date.
3. Both remballs functioned properly until failure. A response test was later performed on the second remball after replacing the batteries, and it was determined to be responding properly.
4. The failure to response check the second remball was being addressed in Fort Calhoun Station's corrective action program.
5. The ability to monitor and assess the workers' dose was never lost. The dose was conservatively estimated during the entry, and the workers'

thermoluminescent dosimeters were being processed to determine the actual dose.

6. When unexpected meter readings were observed, the workers immediately left the containment.

Therefore, following the guidance identified in Section 05.02 b, of NRC Inspection Manual Chapter 0610\*, dated May 19, 1999, Omaha Public Power District concluded that this issue did not meet the threshold for discussion in the inspection report. Additionally, the licensee believes, as shown in Item 6 above, the workers would have exited if any unexpected readings had been observed

#### NRC Evaluation of Licensee Position

1. Although there is no regulatory requirement to response check portable radiation survey meters prior to use, there is a requirement to perform a radiation survey to evaluate the extent of the radiation levels that could be present (10 CFR 20.1501(a)) in the work area. Radiation protection instrumentation must be operational and accurate to survey radiological conditions. The licensee's procedure required portable radiation survey instrumentation to be response checked daily, or prior to use, to ensure the meter is operational and accurate for use during survey activities.
2. Even though the instrument had a current calibration date, it did not necessary mean that the instrument was operational and able to provide accurate readings.
3. Even though both remballs functioned until the failures, it was not known whether the second remball was providing accurate radiation measurements while it was being used.
4. It is appropriate to assess the significance of issues captured in the licensee's corrective action program.
5. While the ability to monitor the workers' neutron dose was never lost, because the workers were wearing neutron sensitive dosimetry, this method provided information after the fact. The failure to use a verified accurate portable survey instrument could compromise the ability to assess work area dose rates.
6. In this case, the unexpected meter readings were "zero" and thus obvious. In other circumstances, a survey instrument reading which response checked outside the +/- 20 percent range of a known standard may not be as easily recognized or noticed.

Therefore, using the guidance in Section 5.02 b. of NRC Inspection Manual Chapter 0610\*, the NRC determined that the failure to response checking a neutron survey meter prior to use could have a safety or regulatory impact. Accordingly, this issue met the threshold for being evaluated under the significance determination process.



4OA5 Management Meetings

Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on July 23, 1999. The licensee acknowledged the findings presented. However, the licensee stated that the issue involving survey instrument response check did not meet the threshold for entering the significance determination process. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

R. Clemens, Manager Maintenance  
S. Dixon, Technician, Radiation Protection  
D. Dryden, Licensing Engineer, Licensing  
S. Gambhir, Division Manager, Nuclear Operations  
R. Hamilton, Manager, Chemistry  
B. Hansher, Supervisor, Licensing  
R. Haug, Corporate Health Physics  
T. Jamieson, Radiological Operations Supervisor, Radiation Protection  
T. Nguyen, Radiation Monitor System Engineer  
R. Phelps, Division Manager, Nuclear Engineering  
M. Puckett, Manager, Radiation Protection  
L. Schneider, Senior Quality Assurance Auditor  
C. Simons, Specialist, Nuclear Safety Review Group  
J. Solymossy, Plant Manager  
D. Spires, Manager, Quality Assurance

### NRC

V. Gaddy, Resident Inspector

## ITEMS OPENED, CLOSED, AND DISCUSSED

None

## LIST OF BASELINE INSPECTIONS PERFORMED

Radiation Monitoring Instrumentation	OS3
Identification and Resolution of Problems	OA1
Meetings, including Exit	OA5

## LIST OF DOCUMENTS REVIEWED

A summary of condition reports pertaining to radiation monitoring instrumentation written since July 1997

Quality Assurance Surveillance Report H-99-1 dated July 16, 1999

Radiation Protection Procedure RP-AD- 400, "Radiation Protection Instrumentation Program," Revision 3

Radiation Protection Procedure RP 401, "Issue, Control and Accountability of Radiation Protection Instrumentation," Revision 8

Radiation Protection Procedure RP 403, "Instrument Response Testing," Revision 11

Radiation Protection Procedure RP-CP-02-0220, "Calibration of DCA AM-3 Model 3090 Area Monitor," Revision 4

Radiation Protection Procedure RP-CP-02-0221, "Calibration of Xetex Model 412AT Teledose Dosimeter," Revision 1

Radiation Protection Procedure RP-CP-02-0222, "Calibration of the Alnor Rad 100 Electronic Dosimeter," Revision 1

Radiation Protection Procedure RP-CP-02-0223, "Calibration of Xetex Model 330A Telescan," Revision 0

Radiation Protection Procedure RP-CP-02-0605, "Calibration of AMS-3 Air Monitoring System," Revision 4

Radiation Protection Procedure RP-CP-02-0610, "Calibration of Eberline AMS-4 Air Monitoring System," Revision 1

Radiation Protection Procedure RP-CP-07-0002, "Calibration of NNC Gamma-10 Portal Monitor," Revision 8

Radiation Protection Procedure RP-CP-07-0003, "Calibration of NNC Gamma-60 Portal Monitor," Revision 8

Radiation Protection Procedure RP-CP-07-0004, "Calibration of Eberline TCM-2," Revision 6

Radiation Protection Procedure RP-CP-07-0005, "Calibration of Eberline PCM-1B," Revision 11

Radiation Protection Procedure RP-CP-07-0606, "Calibration of Eberline Constant Air Monitor PING-1A," Revision 11