



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064**

December 3, 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. 50-285/99-14**

Dear Mr. Gambhir:

On November 4, 1999, the NRC completed an inspection at the Fort Calhoun Station 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 program for ensuring that occupational radiation doses are as low as is reasonably achievable (ALARA).

Based on the results of this inspection, the NRC determined that two violations of NRC requirements occurred. These violations are being treated as noncited violations (NCVs), consistent with the Interim Enforcement Policy for pilot plants. These NCVs are described in the subject inspection report. If you contest these 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 copy 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, its enclosure, and your response, if requested, will be placed in the NRC Public Document Room (PDR).

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,

John L. Pellet for

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

Docket No.: 50-285

License No.: DPR-40

cc w/enclosure:

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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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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-285  
License No.: DPR-40  
Report No.: 50-285/99-14  
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 - 22 and November 1 - 4, 1999  
Inspector: Larry Ricketson, P.E., Senior Radiation Specialist  
Approved By: Gail M. Good, Chief, Plant Support Branch

## SUMMARY OF FINDINGS

### Fort Calhoun Station NRC Inspection Report No. 50-285/99-14

This announced inspection focused on planning and controls to maintain the occupational dose as low as is reasonably achievable (ALARA).

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. Two examples of failures to perform ALARA reviews were identified. The first example was identified after the NRC observed inconsistencies in the use of engineering controls and respiratory protection equipment. The first example involved the failure of ALARA planners to review the need for engineering controls or respiratory protection equipment during certain quality control inspections. The second example involved the failure of ALARA planners to review dose reduction methods associated with outage activities that exceeded their estimated dose totals. These findings were examples of a violation of Technical Specification 5.11.1, which requires that procedures for personnel radiation protection be prepared consistent with the requirements of 10 CFR Part 20 and be approved, maintained, and adhered to for all operations involving personnel radiation exposure. The failure to perform ALARA reviews could result in unplanned personnel radiation dose, if appropriate dose saving measures were not identified and implemented. However, because the incidents did not result in overexposures or have a significant potential to cause overexposures in these examples, the Occupational Radiation Safety Significance Determination Process indicated that both violation examples had a very low risk significance. This violation is being treated 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 199902241 and 199902258.
- Green. A violation of 10 CFR 20.1703(a)(3)(iv) was identified because the licensee's self-contained breathing apparatus training program was incomplete and, therefore, inadequate. Specifically, the procedure used to train non-fire brigade personnel in the use of self-contained breathing apparatuses was inadequate because it did not inform individuals as to the correct method of changing air supply bottles during use. This

resulted in some individuals receiving incomplete training in the use of respiratory protection equipment. The violation could result in personnel injury if individuals were inadequately trained and unable to change air supply bottles while in an atmosphere that was immediately dangerous to life or health. However, through use of the Emergency Preparedness Significance Determination Process, the NRC determined the violation had a very low risk significance because it did not involve the failure to implement or meet an emergency preparedness planning standard and there had been no actual event. This violation is being treated 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 199700559.

Report Details

**2. RADIATION SAFETY**

2OS2 ALARA Planning and Controls

a. Inspection Scope

The inspector interviewed licensee personnel and reviewed the following items:

- Engineering control use
- Source term reduction and control techniques
- Person-rem totals and 3-year average
- Radiation work permits and job history packages
- Exposure tracking and in-progress reviews
- Declared pregnant worker dose controls
- Respiratory protection for emergency responders

b. Observations and Findings

ALARA Results

The following table shows the licensee's annual collective dose (in person-rem), 3-year average results, and the national average results for pressurized water reactors (PWR). The information from this section of the report was used in the Occupational Radiation Safety Significance Determination Process.

	1996	1997	1998
Licensee's Yearly Totals	226	41	224
Licensee's 3-year Average	129	135	164
PWR National Average (From NUREG 0713)	131	132	not available

By the end of the inspection, the licensee's year-to-date person-rem total exceeded 200 person-rem, and licensee representatives acknowledged that the site's 1999 3-year average would likely exceed the PWR national average, primarily because of leaking fuel.

ALARA Reviews

10 CFR 20.1101(b) requires that licensees use, to the extent practicable, procedures and engineering controls to achieve occupational doses that are as low as is reasonably

achievable. 10 CFR 20.1501(a) requires that each licensee make surveys that are reasonable under the circumstances to evaluate the potential radiological hazards that could be present. 10 CFR 20.1701 requires that the licensee use, to the extent practical, process or other engineering controls to control the concentrations of radioactive material in air. 10 CFR 20.1702 states that, when it is not practical to apply process or other engineering controls to control radioactive material concentrations in the air to values below the airborne radioactivity area threshold, the licensee shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes. Means of limiting intakes include: access control, exposure time limitation, and respiratory protection equipment use. Technical Specification 5.11.1 requires that procedures for personnel radiation protection be prepared consistent with the requirements of 10 CFR Part 20 and be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

The inspector identified two examples in which ALARA personnel did not conduct evaluations or reviews properly because they did not follow the procedural guidance intended to implement the requirements above.

Radiation Protection Procedure RP-201, "Radiation Work Permits," Revision 15, Section 7.4.4, required that an individual preparing a radiation work permit determine engineering controls and respiratory protection requirements when disturbing contaminated surfaces greater than or equal to 10,000 disintegration per minute per 100 centimeters squared.

On October 20, 1999, a quality control inspector, using Radiation Work Permit 1999-3521, "Reactor Head Removal/Replacement," Revision 1, performed an inspection of the reactor head flange area. During the inspection, the quality control inspector determined it was necessary to touch the underside of the flange. Smear surveys counted after the job identified contamination levels on the underside of the flange as high as 400,000 disintegrations per minute per 100 centimeters squared. (NRC Inspection Report 50-285/99-12, Section 2OS1, contained additional findings involving these radiation surveys.) Upon exiting the radiological controlled area, the quality control inspector caused the personnel contamination monitor to alarm, and radiation protection personnel identified contamination on the quality control inspector's face. However, a whole-body count confirmed that the quality control inspector had no significant uptake of radioactive material.

The inspector interviewed radiation protection personnel about the occurrence. According to the ALARA planner responsible for Radiation Work Permit 1999-3521, the ALARA planner did not evaluate the radiological conditions and determine engineering controls or respiratory protection requirements for the work activity involving the quality control inspector. The failure to evaluate the radiological conditions and determine engineering controls or respiratory protection requirements for the work activity was a violation of Radiation Protection Procedure RP-201 requirements and the first example of a violation of Technical Specification 5.11.1. Even though it was determined that the quality control inspector received no significant increase in internal exposure as a result of this incident, the failure to evaluate the radiological conditions or determine engineering controls and respiratory protection could result in unplanned personnel radiation dose if it occurred again. However, because the incident did not result in an

overexposure or have a significant potential to cause an overexposure in this example, the Occupational Radiation Safety Significance Determination Process indicated that the violation had a very low risk significance. This violation is being treated as a noncited violation, consistent with the Interim Enforcement Policy for pilot plants. This example of a violation is in the licensee's corrective action program as Condition Report 199902241 (50-285/9914-01).

Radiation Procedure RP-301, "ALARA Job Review," Revision 13, Section 7.2.1, required that work-in-progress reviews be performed and documented on radiation work permits where: (1) the estimated exposure is greater than or equal to 1 person-rem (total effective dose equivalent) and (2) the actual person-rem exceeds the estimated person-rem.

During interviews with ALARA planners, the inspector determined that a work-in-progress review had not been performed on a radiation work permit with an actual dose that exceeded the estimated dose. The licensee estimated that Radiation Work Permit 99-2500, "Steam Generator Support in High Radiation Areas," would accrue 2.500 person-rems. By October 20, 1999, Radiation Work Permit 2500 had accrued 3.699 person-rems and no work-in-progress review was conducted. Licensee representatives reviewed daily dose totals and determined that Radiation Work Permit 2500 exceed its budget (estimated dose) on October 13, 1999. By November 3, 1999, Radiation Work Permit 2500 had accrued 5.098 person-rems. The failure to conduct work-in-progress reviews was a violation of Radiation Protection Procedure RP-301 requirements and, therefore, a second example of a violation of Technical Specification 5.11.1. Work-in-progress reviews are a form of radiological hazard evaluation and a means of determining if the originally planned dose prevention methods remain viable. The failure to evaluate the radiological conditions could result in unplanned personnel radiation dose if it occurred again. However, because the incident did not result in an overexposure or have a significant potential to cause an overexposure in this example, the Occupational Radiation Safety Significance Determination Process indicated that the violation had a very low risk significance. This violation is being treated as a noncited violation, consistent with the Interim Enforcement Policy for pilot plants. This example of a violation is in the licensee's corrective action program as Condition Report 199902258 (50-285/9914-01).

#### Respiratory Protection

10 CFR 20.1703(a)(3)(iv) requires, in part, that if the licensee uses respiratory protection equipment to limit intakes pursuant to 10 CFR 20.1702, the licensee shall implement and maintain a respiratory protection program that includes written procedures regarding training of personnel.

The licensee's Radiological Emergency Response Plan, Section 4, stated that onsite emergency response members are qualified to wear self-contained breathing apparatus through the General Employee Training, Level III, Respiratory Protection Training Program. Through interviews with licensee personnel and reviews of training procedures, the inspector determined that this training did not include an important aspect of self-contained breathing apparatus use. This training did not include instruction on the correct method of replacing an empty self-contained breathing

apparatus air supply bottle during use. This could be significant if the individuals, such as emergency response organization members, were in an atmosphere that was immediately dangerous to life or health.

Licensee representatives responded that many emergency response organization members were also members of the fire brigade. Fire brigade members were provided additional training in which they were trained to replace empty air supply bottles and were required to demonstrate air supply bottle replacement during practical training.

However, the inspector determined through interviews that some of the emergency response organization members were not fire brigade members. Within the operations staff, for example, the shift manager and the station technical advisor were not members of the fire brigade. Therefore, these individuals did not receive the additional training to ensure that they could change self-contained breathing apparatus air supply bottles.

An example of the need to change out air supply bottles during emergency situations was identified in Operating Procedure OI-PAP-12, Revision 14, "Toxic Gas Accidents," Revision 14. Step 3 of the procedure stated, "If the [toxic gas] measurements from the control room indicates gas concentrations beyond the [toxic gas monitor alarm] setpoints, then don self-contained breathing apparatus until the accident is terminated or gas concentrations are below the setpoints." An individual air supply bottle contained enough air to breathe for approximately 30 minutes, depending on the individual user and the activities in which the user was involved. If toxic gas accident conditions continued longer than this time, the user would need to replenish the air supply.

The inspector, after conferring with representatives of the Office of Nuclear Reactor Regulation, determined that the licensee's respiratory protection training procedure was incomplete and, therefore, inadequate. Specifically the procedure used to train non-fire brigade personnel in the use of self-contained breathing apparatuses was inadequate because it did not inform individuals as to the correct method of changing air supply bottles during use. The inspector identified the failure to implement and maintain a respiratory protection program that included an adequate written procedure regarding training of personnel as a violation of 10 CFR 20.1703(a)(3)(iv).

The licensee provided the inspector with written comments, disputing the identification of a violation in this situation. The licensee's position paper is an attachment to this inspection report. After consideration of the licensee's position, the inspectors concluded as follows:

In an emergency situation, there is no assurance that individuals that have been trained will be able to aid those that have not been trained. All emergency response organization members face the potential of being in an atmosphere that is immediately dangerous to life or health. Therefore, all emergency response organization members are required to be provided with adequate training.

The inspectors acknowledged that the licensee initiated Condition Report 199700559 on May 5, 1997 to document "a discrepancy in the quality/effectiveness of the self-contained breathing apparatus training provided to fire brigade personnel and other

personnel required to maintain self-contained breathing apparatus qualification.” The inspectors also noted that the condition report was assigned a low priority and the condition had not been corrected by November 3, 1999.

Even though a similar problem at a different site was not identified as a violation, this does not ensure that subsequent examples will not be identified as violations, particularly if licensees have knowledge that such problems can occur. NRC Information Notice 98-20, dated June 3, 1998, alerted the licensee of weaknesses in respiratory protection programs supporting emergency preparedness. Among other problems, the information notice discussed a licensee’s failure, in 1997, to train the operators to change out self-contained breathing apparatus air supply bottles. Information Notice 98-20 stated that the NRC expected licensees to consider actions to avoid similar problems.

The violation of 10 CFR 20.1703(a)(3)(iv) is more than minor. The violation could result in personnel injury if an individual had not been trained and was unable to change air supply bottles while in an atmosphere that was immediately dangerous to life or health. However, through use of the Emergency Preparedness Significance Determination Process, the NRC determined the violation had a very low risk significance because it did not involve the failure to implement or meet an emergency preparedness planning standard and there had been no actual event. This violation is being treated 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 199700559 (50-285/9914-02).

#### 2OS4 Radiation Worker Performance

##### a. Inspection Scope

The inspector interviewed licensee personnel and observed radiation worker performance during the refueling outage.

##### b. Observations and Findings

There were no findings identified and documented during this inspection.

#### **4 OTHER ACTIVITIES**

##### 4OA1 Identification and Resolution of Problems

##### a. Inspection Scope

The inspector reviewed the following items:

- Problem identification reports
- Audits, surveillances, and self-assessments

b. Observations and Findings

There were no findings identified and documented during this inspection.

4OA5 Management Meetings

Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at an exit meeting on November 4, 1999. The licensee acknowledged the findings presented, but disagreed with the violation associated with self-contained breathing apparatus training. The licensee's position is provided as an attachment to this report. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

G. Cavanaugh, Engineer, Licensing  
J. Chase, Division Manager, Nuclear Assessment  
R. Clemens, Manager Maintenance  
S. Dixon, Technician, Radiation Protection  
E. Matzke, Engineer, Licensing  
S. Gambhir, Division Manager, Nuclear Operations  
G. Gates, Vice President, Nuclear  
B. Glover, Radiation Protection Technician  
R. Hamilton, Manager, Chemistry  
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R. Hodson, ALARA Coordinator  
T. Jamieson, Radiological Operations Supervisor, Radiation Protection  
R. Juza, ALARA technician  
M. Puckett, Manager, Radiation Protection  
L. Schneider, Senior Quality Assurance Auditor  
J. Solymossy, Plant Manager  
D. Spires, Manager, Quality Assurance  
C. Williams, ALARA technician

### NRC

W. Walker, Senior Resident Inspector  
V. Gaddy, Senior Resident Inspector, Callaway Plant

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-285/9914-01	NCV	Violation of Technical Specification 5.11.1/Failure to perform ALARA Reviews (Section 2OS2)
50-298/9914-02	NCV	Violation of 10 CFR 20.1703(a)(3)(iv)/Inadequate self-contained breathing apparatus training procedure (Section 2OS2)

### Closed

50-285/9914-01	NCV	Violation of Technical Specification 5.11.1/Failure to perform ALARA Reviews (Section 2OS2)
50-285/9914-02	NCV	Violation of 10 CFR 20.1703(a)(3)(iv)/Inadequate self-contained breathing apparatus training procedure (Section 2OS2)

LIST OF DOCUMENTS REVIEWED

Radiation Protection Assessment (August 23-27, 1999)  
SARC Audit Report No. 58 - Radiation Protection

Procedures

OI-PAP-12	Toxic Gas Accidents, Revision 14
RPP	Radiation Protection Plan, Revision 16
RP-201	Radiation Work Permits, Revision 15
RP-301	ALARA Job Reviews, Revision 13
RP-304	Radiological Goals Program, Revision 2
RP-306	ALARA Suggestion Program, Revision 3
RP-306	Hot Spot and Point Source Identification and Tracking Procedure, Revision 10
RP-502	Use of Respiratory Protection Equipment, Revision 10
RP-505	Issue and Control of Respiratory Protection Equipment, Revision 11
RP-507	Inspection and Maintenance of Respiratory Protection Equipment, Revision 13
RP-511	Recharging of SCBA Cylinders, Revision 2
RP-513	Baron II SCBA Fill System, Revision 6
SO-G-101	Radiation Worker Practices, Revision 13

Fort Calhoun Station Position  
On A Potential Violation Concerning the Operating Staff Not Being Trained On  
Air Supply Cylinder Change-Out (IER 99-14)

On November 3, 1999, NRC Inspector Larry Ricketson informed Fort Calhoun Station that an item had been discovered during the second week of the inspection that would be proposed as a violation. The item noted that the Shift Manager and the Shift Technical Advisor are not trained in the change-out of the air supply cylinders for a SCBA. Mr. Ricketson noted that this item would be discussed as a potential violation of 10 CFR 20.1703.a(3).iv.

Omaha Public Power District (OPPD) acknowledged this weakness, and in 1997, generated a condition report that was provided to Mr. Ricketson. In review of the regulation, OPPD is confident that the intent of the regulation is currently being met. OPPD has procedures which require personnel to be trained in the use of SCBA equipment as described in the regulation. Several of those individuals have received training in the change-out of air supply cylinders. The regulation does not currently specify that all individuals in a particular group be able to perform this particular task. Those individuals with the additional training could assist the two positions that do not currently receive this particular training. Additionally, the condition report written in 1997 began a series of corrective actions which will soon be implemented to improve training for various staff members in the use of SCBA's, including the changing of air supply cylinders.

At the South Texas Project plants, NRC inspection report 97-13 revealed that the NRC had previously identified this identical issue. In the case of South Texas Project, the NRC chose to not cite the utility.

Finally, this issue when is compared to the recent information from the Office of Enforcement concerning minor violations, this issue clearly appears to meet the criteria of disposition as a minor violation.

In consideration, OPPD previously identified this weakness and is nearing completion to the corrective actions. Additionally, a precedent now exists where the NRC previously identified this issue at another plant and did not cite the utility in that case. OPPD believes that because this is a self-identified issue (weakness) and the fact that the NRC did not cite the utility for this identical issue in the past, that the NRC should not consider this issue as a potential violation. If the NRC chooses to consider this issue, OPPD believes that it falls to the level of a minor violation and should not be discussed in the report.