



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
612 EAST LAMAR BLVD, SUITE 400  
ARLINGTON, TEXAS 76011-4125

August 1, 2008

D. J. Bannister  
Vice President and CNO  
Omaha Public Power District  
Fort Calhoun Station FC-2-4  
P.O. Box 550  
Fort Calhoun, NE 68023-0550

SUBJECT: FORT CALHOUN STATION NRC RADIATION SAFETY TEAM - INSPECTION  
REPORT 05000285/2008008

Dear Mr. Bannister:

On June 20, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Fort Calhoun Station. The enclosed report documents the inspection findings, which were discussed at the conclusion of the on site inspection on June 6, 2008, with you and other members of your staff. An additional telephonic exit was held on June 20, 2008, with Ms. D. Guinn, Supervisor, Regulatory Compliance, after we had reviewed the additional information that your staff provided.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license.

The team reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, the team evaluated the inspection areas within the Radiation Protection Strategic Performance Area that are scheduled for review every two years. These areas are:

- Radiation Monitoring Instrumentation,
- Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems,
- Radioactive Material Processing and Transportation,
- Radiological Environmental Monitoring Program, and
- Radioactive Material Control Program.

This report documents one NRC-identified and two self-revealing findings involving violations of NRC requirements; however, these findings were of the very low safety significance (Green). Because these findings were entered into your corrective action program, the NRC is treating these findings as noncited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the violations or the significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk,

Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 East Lamar Ryan Blvd., Suite 400, Arlington, Texas 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspectors at the Fort Calhoun Station facility.

In accordance with 10 CFR Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Gregory E. Werner, Chief  
Plant Support Branch 2  
Division of Reactor Safety

Docket: 50-285  
License: DPR-40

Enclosure:  
NRC Inspection Report 05000285/200808  
W/Attachment: Supplemental Information

cc w/Enclosure:

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SUNSI Review Completed: LC ADAMS:  **Yes**  
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Initials: GEW

ML

RIV:DRS/PSB	PSB	PSB	PSB	C:PSB
LCCarsonII	GLGuerra	LTRicketson	BDBaca	DLStearns
<b>/RA/</b>	<b>/RA/</b>	<b>/RA/</b>	<b>/RA/</b>	<b>/RA/</b>
7/2/08	7/2/08	7/23/08	7/2/08	7/3/08

C:PSB-2	C:DRP/E	C:PSB-2		
GEWerner	WCWalker	GEWerner		
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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 50-285  
License: DPR-40  
Report: 05000285/2008008  
Licensee: Omaha Public Power District  
Facility: Fort Calhoun Station  
Location: Fort Calhoun Station FC-2-4 Adm.  
P.O. Box 399, Highway 75 - North of Fort Calhoun  
Fort Calhoun, Nebraska  
Dates: June 2 - 20, 2008  
Inspectors: L. C. Carson II, Senior Health Physicist - Team Leader  
L. T. Ricketson, PE, Senior Health Physicist  
B. D. Baca, Health Physicist  
G. L. Guerra, CHP, Health Physicist  
D. L. Stearns, Health Physicist  
Accompanied By: J.M. Razo, Health Physicist  
Approved By: Gregory E. Werner, Chief  
Plant Support Branch 2  
Division of Reactor Safety

## SUMMARY OF FINDINGS

IR 05000285/200808; 06/02/2008 – 06/20/2008; Fort Calhoun Station, Radiation Monitoring Instrumentation and Protective Equipment, and Radioactive Material Processing and Transportation

The report covered a one-week period of on-site inspection by a team of five region-based health physics inspectors. Based upon the results of the inspection, the team identified three findings, one NRC-Identified violation and two self-revealing violations of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. NRC-Identified Findings and Self-Revealing Findings

- Green. The team identified a noncited violation of 10 CFR 20.1501(b) for failure to ensure that area radiation monitors used for quantitative measurements were calibrated. Specifically, the licensee's area radiation monitors calibration procedure established an acceptance criteria based on  $\pm 10$  percent of the instrument scale and not based on the response to a radiation source traceable to the National Institute of Standards and Technology. This resulted in the area radiation monitors having a calibration acceptance criterion of  $\pm 30$  to 45 percent using a traceable radiation source. Hence, the licensee's practice of using an acceptance criterion of  $\pm 10$  percent of the scale resulted in uncalibrated area radiation monitors. The licensee determined that 5 out of 23 area radiation monitors were out of tolerance based on the corrected acceptance criteria in which they promptly calibrated the monitors to the industry standard. This issue was entered into the corrective action program as Condition Report 200803979.

The finding is greater than minor because it was associated with the Occupational Radiation Safety cornerstone attribute of Plant Facilities/Equipment and Instrumentation and affected the cornerstone objective in that the failure to properly calibrate the area radiation monitors could underestimate the extent of radiological hazards detected and cause unintentional dose to radiation workers. This finding was evaluated using the Occupational Radiation Safety significance determination process and determined to be of very low safety significance (Green) because it did not involve: (1) As Low As is Reasonably Achievable planning and controls; (2) an overexposure; (3) a substantial potential for overexposure; or (4) an impaired ability to assess dose. This finding had a cross-cutting aspect in the area of problem identification and resolution related to the component of operating experience because the licensee did not implement and institutionalize operating experience, including vendor recommendations, through changes to station processes and procedures to support plant safety [P.2(b)] (Section 2OS3).

- Green. The team reviewed a self-revealing, noncited violation of 10 CFR 20.2006(b) resulting from the licensee's failure to provide an accurate shipping manifest. On June 29, 2006, the licensee shipped used filters to a waste processor. The shipment included a total activity of only 10,200 millicuries with one of the packages containing four filters. However, the manifest papers accompanying the shipment only indicated a total activity of 10,000 millicuries with three filters. The licensee was notified of the problem by the shipment recipient. The problem involving the incorrect manifest was documented in the corrective action program as Condition Reports 200602820 and 200803963.

The finding is greater than minor because it was associated with the Public Radiation Safety cornerstone attribute of Program and Process (transportation program), and affected the cornerstone objective in that it provided incorrect information as part of hazard communication which could increase public dose. Using the Public Radiation Safety significance determination process, the team determined the finding had very low safety significance because it involved transportation, but (1) radiation limits were not exceeded; (2) there was no breach of a package during transit; (3) it did not involve a certificate of compliance issue; (4) it was not a low level burial ground nonconformance; and (5) it did not involve a failure to make notifications or provide emergency information (Section 2PS2).

Green. The team reviewed a self-revealing, noncited violation of 10 CFR 71.5 and 49 CFR 173.421(a)(2), which occurred when the licensee failed to ship radioactive material correctly. On December 8, 2006, the licensee was notified about a problem with a radioactive shipment that had been transported as an "excepted package-limited quantity." The notification came from the recipient, who identified that the contact dose rate on the external surface of the packages exceeded the 0.5 millirem per hour limit allowed by regulation. The licensee determined the apparent cause was inadequate packaging and bracing of the load. The licensee revised its shipping procedure to require a peer check on bracing and shoring of package content and a second independent survey for excepted limited quantity packages. This issue was entered into the licensee's corrective action program as Condition Report 200605883.

The finding is greater than minor because it was associated with the Public Radiation Safety cornerstone attribute of Plant Facilities/Equipment and Instrumentation (transportation packaging), and it affected the cornerstone objective because the failure to correctly ship radioactive material decreases the licensee's assurance that the public will not receive unnecessary dose. This finding cannot be evaluated by the Public Radiation Safety significance determination process because it does not involve radioactive shipments classified as Schedules 5 through 11, as described in NUREG-1660, "U.S. Specific Schedules of Requirements for Transport of Specified Types of Radioactive Material Consignments," and it does not fit traditional enforcement. Therefore, the finding was reviewed by NRC management using Inspection Manual Chapter 0609, Appendix M, and determined to be of very low safety significance because the package was not accessible by the public (Section 2PS2).

B. Licensee-Identified Violations

None.

## REPORT DETAILS

### 2 RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

#### 2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

##### a. Inspection Scope

This area was inspected to determine the accuracy and operability of radiation monitoring instruments that are used for the protection of occupational workers and the adequacy of the program to provide self-contained breathing apparatus (SCBA) to workers. The team used the requirements in 10 CFR Part 20 and the licensee's procedures required by technical specifications as criteria for determining compliance. The team interviewed licensee personnel and reviewed:

- Calibration of area radiation monitors associated with transient high and very high radiation areas and post-accident monitors used for remote emergency assessment;
- Calibration of portable radiation detection instrumentation, electronic alarming dosimetry, and continuous air monitors used for job coverage;
- Calibration of whole body counting equipment and radiation detection instruments utilized for personnel and material release from the radiologically controlled area;
- Licensee event reports, audits and self-assessments;
- Corrective action program reports since the last inspection;
- Licensee action in cases of repetitive deficiencies or significant individual deficiencies;
- Calibration expiration and source response check currency on radiation detection instruments staged for use;
- The licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions, status of SCBA staged and ready for use in the plant and associated surveillance records, and personnel qualification and training; and
- Qualification documentation for onsite personnel designated to perform maintenance on the vendor-designated vital components, and the vital component maintenance records for SCBA units.

The inspection team completed nine of the required nine samples.

b. Findings

Introduction. The team identified a Green noncited violation of 10 CFR 20.1501(b) for the licensee's failure to properly calibrate area radiation monitors (ARMs). The finding had very low safety significance.

Description. On June 3, 2008, during a review of licensee calibration records for ARMs, the team identified that the licensee's acceptance criteria for calibration was too broad and was without a basis. The team found that the licensee's calibration procedure had established an acceptance criterion of  $\pm 10$  percent of the instrument scale. Typically, the acceptance criteria for instrumentation is based on what is being measured, not the scale on which it is measured. To verify this, the team reviewed the instrument vendor's manual and American National Standards Institute (ANSI) N323D-2002, "American National Standard for Installed Radiation Protection Instrumentation." ANSI N323D is the industry standard for the calibration of radiation monitoring instrumentation installed in fixed locations. The vendor's manual specifies calibration acceptance criteria of  $\pm 15$  percent of the radiation exposure rate. Similarly, ANSI N323D, specifies instrument readings shall be within  $\pm 15$  percent of the true value of a calibration source for the lower point and  $\pm 10$  percent for the upper point. The licensee's acceptance criterion was much less restrictive than the vendor's recommendation or the industry standard. In April 2008, Containment Building ARMs (RM-070 and RM-074) were not calibrated using the vendor's manual or the ANSI standard criteria. If the licensee had used the ANSI standard criteria or vendor manual to calibrate the 10,000 millirem per hour (mr/hr) scale, the acceptance criteria would have been  $2153 \pm 323$  mr/hr ( $\pm 15$  percent of the exposure rate or true source value). However, in April 2008 the licensee used an acceptance criterion of  $2153 \pm 1000$  mr/hr (10 percent of the 10,000 scale) equaling  $\pm 45$  percent of the exposure rate or true radioactive source value. The licensee was unable to provide a basis for the acceptance criteria included in its calibration procedure. Therefore, the team concluded the instruments were not properly calibrated because the acceptance criterion was not restrictive enough. The licensee initiated condition report (CR) 200803979 to evaluate this issue. As part of the licensee's corrective actions, it evaluated 23 operating ARMs and determined that five were out of calibration based on a typical value of  $\pm 15$  percent. The licensee declared the five ARMs not functional and initiated immediate corrective action to calibrate the monitors in accordance with ANSI N323D-2002. Further corrective action planned by the licensee includes revising the calibration procedures for these instruments.

Analysis. The failure to properly calibrate radiation monitoring instrumentation is a performance deficiency. The finding is greater than minor because it was associated with the Occupational Radiation Safety cornerstone attribute of Plant Facilities/Equipment and Instrumentation and affected the cornerstone objective in that the failure to properly calibrate the ARMs could minimize the extent of radiological hazards detected and cause unintentional dose to radiation workers. This finding was evaluated using the Occupational Radiation Safety significance determination process and determined to be of very low safety significance (Green) because it did not involve: (1) As Low As is Reasonably Achievable (ALARA) planning and controls; (2) an overexposure; (3) a substantial potential for overexposure; or (4) an impaired ability to assess dose. This finding had a cross-cutting aspect in the area of problem identification and resolution related to the component of operating experience because the licensee did not implement and institutionalize operating experience, including

vendor recommendations, through changes to station processes and procedures to support plant safety [P.2(b)].

Enforcement. 10 CFR 20.1501(b) states that the licensee shall ensure that instruments and equipment used for quantitative radiation measurements (e.g., dose rate and effluent monitoring) are calibrated periodically for the radiation measured. Technical Specification 3.1, Table 3-3 Item 3(c), specifies a calibration frequency of every refueling outage for ARMs. Contrary to the above, on June 3, 2008, the team identified that the licensee had not been properly calibrating ARMs, a type of quantitative radiation measurement instrument, every refueling outage. This finding was of very low safety significance and was entered into the licensee's corrective action program as CR 200803979. This violation is being treated as a noncited violation, consistent with Section VI.A of the Enforcement Policy: NCV 05000285/2008008-01, Failure to Properly Calibrate Area Radiation Monitors.

## 2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

### a. Inspection Scope

This area was inspected to: (1) ensure that the gaseous and liquid effluent processing systems are maintained so that radiological discharges are properly mitigated, monitored, and evaluated with respect to public exposure; (2) ensure that abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out-of-service, are controlled in accordance with the applicable regulatory requirements and licensee procedures; (3) verify that the licensee's quality control program ensures that the radioactive effluent sampling and analysis requirements are satisfied so that discharges of radioactive materials are adequately quantified and evaluated; and (4) verify the adequacy of public dose projections resulting from radioactive effluent discharges. The team used the requirements in 10 CFR Part 20; 10 CFR Part 50, Appendices A and I; 40 CFR Part 190; the Offsite Dose Calculation Manual (ODCM), and licensee procedures required by the Technical Specifications as criteria for determining compliance.

The team conducted in-office inspection and reviewed:

- Appropriate program documents, procedures and evaluations related to the radiological effluent controls program listed in the attachment to this report;
- The implementation of the radiological effluent controls program requirements as described in Radiological Effluent Technical Specifications;
- Changes to the liquid or gaseous radioactive waste system design, procedures, or operation as described in the Updated Safety Analysis Report;
- Changes to the ODCM made by the licensee since the last inspection;
- Effluent monitoring instrumentation documentation to ensure adequate methods and monitoring of effluents;
- The program for identifying, assessing, and controlling contaminated spills and leaks;

- The annual effluent release reports and the correlation to the environmental monitoring results; and
- The results from quality assurance audits.

The team conducted an onsite inspection that included interviewing cognizant licensee personnel, performing walkdowns of facilities and equipment, and observing licensee activities to review:

- The gaseous and liquid discharge system configuration;
- Selected point of discharge effluent radiation monitoring systems and flow measurement devices;
- The observation of selected portions of the routine processing and discharge of radioactive gaseous and liquid effluent (sample collection and analysis) including a selection of radioactive gaseous and liquid waste effluent discharge permits;
- Effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors including the projected doses to members of the public;
- Surveillance test results on non-safety related ventilation and gaseous discharge systems (HEPA and charcoal filtration) including the methodology to determine the stack and vent flow rates;
- The identification of non-radioactive systems that have become contaminated;
- Effluent monitoring instrument (installed and counting room) maintenance, quality control, and calibration;
- The methods used to determine the isotopes in the plant source term, meteorological dispersion and deposition factors, and hydrogeologic characteristics used in the ODCM and effluent dose calculations including a selection of monthly, quarterly, and annual dose calculations;
- The land-use census;
- The implementation of the voluntary Nuclear Energy Institute/Industry Ground Water Protection Initiative;
- Records of abnormal gaseous or liquid discharges including the evaluation and analysis of events involving spills or discharges, dose assessments to members of the public, required (or voluntary) offsite notifications, and assessments and reporting of abnormal discharges in the Annual Radiological Effluent Release Report;
- Evaluations of discharges from onsite surface water bodies;
- Routine groundwater monitoring results;

- Self-assessments, audits, and licensee event reports;
- The results of the inter-laboratory comparison program;
- Effluent sampling records; and
- The calibration of post-accident effluent monitoring instrumentation and expected accident source.

The team reviewed the licensee's program of problem identification and resolution, including:

- Placement of problems identified through audits, self assessments, and monitoring results into the corrective action program and adequacy of immediate and long term corrective actions;
- Problem identification and resolution follow-up activities; and
- Identification of repetitive deficiencies or significant individual deficiencies in problem identification and resolution identified by the licensee's self-assessment activities.

The inspection team completed three of the required three samples.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

a. Inspection Scope

This area was inspected to verify that the licensee's radioactive material processing and transportation program complies with the requirements of 10 CFR Parts 20, 61, and 71 and Department of Transportation (DOT) regulations contained in 49 CFR Parts 171-180. The team interviewed licensee personnel and reviewed:

- The radioactive waste system description, recent radiological effluent release reports, and the scope of the licensee's audit program;
- Liquid and solid radioactive waste processing systems configurations, the status and control of any radioactive waste process equipment that is not operational or is abandoned in place, changes made to the radioactive waste processing systems since the last inspection, and current processes for transferring radioactive waste resin and sludge discharges;
- Radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides;
- Shipment packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and disposal manifesting;

- Shipping records for non-excepted package shipments; and
- Licensee event reports, special reports, audits, state agency reports, self-assessments and corrective action reports performed since the last inspection.

The inspection team completed six of the required six samples.

b. Findings

1. Introduction. The team reviewed a self-revealing, Green noncited violation of 10 CFR 20.2006(b) for failure to ship radioactive waste with an accurate manifest

Description. On June 29, 2006, the licensee shipped used filters to a waste processor. The shipment included a total activity of 10,200 millicuries. However, the manifest (NRC Forms 540 and 541) accompanying the shipment only indicated a total activity of 10,000 millicuries. The licensee faxed an advanced copy of the manifest to the waste processor on June 26, 2006. This manifest listed the correct number of filters and activity. However, the licensee changed the date of the shipment and re-generated the manifest. This revision of the manifest incorrectly listed the number of filters (three in one package instead of four) and the activity. The licensee's review of the paperwork failed to identify the problem. On June 30, 2006, the shipment arrived at the waste processor. Before accepting the shipment, the waste processor reviewed the manifest accompanying the shipment and compared it with the advanced copy, identified the information on the two did not agree, and notified the licensee. The licensee regenerated the manifest yet again and included the correct number of filters and the correct activity. After receiving the corrected manifest, the waste processor took possession of the shipment. The licensee contacted its software vendor for help in identifying the source of the problem, but no solution was found. The problem involving the incorrect manifest was documented in the corrective action program as Condition Reports 200602820 and 200803963.

Analysis. The failure to include the correct total activity on a waste manifest is a performance deficiency. The finding is greater than minor because it was associated with the Public Radiation Safety cornerstone attribute of Program and Process (transportation program), and affected the cornerstone objective, in that it provided incorrect information as part of hazard communication which could increase public dose. The finding involved an occurrence in the licensee's radioactive material transportation program that is contrary to NRC regulations. Using the Public Radiation Safety significance determination process, the team determined the finding had very low safety significance because it involved transportation, but (1) radiation limits were not exceeded; (2) there was no breach of a package during transit; (3) it did not involve a certificate of compliance issue; (4) it was not a low level burial ground nonconformance; and (5) it did not involve a failure to make notifications or provide emergency information.

Enforcement. 10 CFR 20.2006(b) requires, "any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal facility document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee in accordance

with Appendix G to 10 CFR Part 20.” Appendix G, Section I. B, requires, in part, that: “The shipper of the radioactive waste shall provide the following information regarding the waste shipment on the uniform manifest: the total number of packages/disposal containers; and the total radionuclide activity in the shipment.” Contrary to the above, on June 29, 2006, the licensee failed to provide an accurate manifest with radioactive waste Shipment RW06-20. Specifically, the manifest incorrectly listed the number of filters in the package (three in one package instead of four) and the total amount radioactivity in the shipment (10,000 millicuries instead of 10,200 millicuries). Because this violation was of very low safety significance and was entered into the licensee’s corrective action program as Condition Reports 200602820 and 200803963, it is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000285/2008008-02, Failure to Provide an Accurate Shipping Manifest.

2. Introduction. The team reviewed a self-revealing, Green noncited violation of 10 CFR 71.5 and 49 CFR 173.421(a)(2), which occurred when the licensee failed to ship radioactive material correctly.

Description. On December 8, 2006, the licensee was notified about a problem with Shipment Number FCS-NW-06-89. The radioactive shipment had been transported as an “excepted package-limited quantity.” The notification came from the recipient, who identified that the contact dose rate on the external surface of the packages exceeded the 0.5 mr/hr limit allowed by regulation. The recipient measured a contact radiation level of 3.2 mr/hr on Package Number B75 and 3.4 mr/hr on Package Number B80. The licensee’s survey conducted before shipment indicated that the highest dose rate on the package was 0.1 mr/hr. The package contained lead shielding blankets and shielding straps. The licensee determined the apparent cause was inadequate bracing and shoring when packaging the load. The licensee revised its shipping procedure to require a peer check on bracing and shoring of package contents. Also, the licensee revised the shipping procedure to add a second independent survey for limited quantity packages.

Analysis. The failure to ship limited quantity radioactive material in accordance with federal regulations is a performance deficiency. The finding is greater than minor because it was associated with the Public Radiation Safety cornerstone attribute of Plant Facilities/Equipment and Instrumentation (transportation packaging) and it affected the cornerstone objective because the failure to correctly ship radioactive material decreases the licensee’s assurance that the public will not receive unnecessary dose. This finding cannot be evaluated by the Public Radiation Safety significance determination process because it does not involve radioactive shipments classified as Schedules 5 through 11, as described in NUREG-1660, “U.S. Specific Schedules of Requirements for Transport of Specified Types of Radioactive Material Consignments,” and it does not fit traditional enforcement. Therefore, the finding was reviewed by NRC management using Inspection Manual Chapter 0609, Appendix M, and determined to be of very low safety significance because the package was not accessible by the public.

Enforcement. 10 CFR 71.5 states, in part, that each licensee who transports licensed material on public highways shall comply with applicable requirements of the DOT regulations in 49 CFR Parts 171 through 180. 49 CFR 173.421(a)(2) states that the radiation level at any point on the external surface of the package does not exceed 0.005 milliSievert/hour (0.5 hr) for excepted packages for limited quantities of Class 7 materials. Contrary to the above, on December 8, 2006, the licensee failed to ensure that a radioactive shipment that was transported as an “excepted package-

limited quantity” did not exceed the dose rate limit of 0.5 hr for Class 7 radioactive materials. Specifically, radiation levels on Package Numbers B75 and B80 measured 3.2 hr and 3.4 hr, respectively. Because this violation was of very low safety significance and was entered into the licensee’s corrective action program as CR 200605883, it is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000285/2008008-03, Failure to Ship Radioactive Material Correctly.

2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Program (71122.03)

a. Inspection Scope

This area was inspected to ensure that the radiological environmental monitoring program verifies the impact of radioactive effluent releases to the environment and sufficiently validates the integrity of the radioactive gaseous and liquid effluent release program; and that the licensee’s surveys and controls are adequate to prevent the inadvertent release of licensed materials into the public domain. The team used the requirements in 10 CFR Part 20, Appendix I of 10 CFR Part 50, the Offsite Dose Calculation Manual, and the licensee’s procedures required by technical specifications as criteria for determining compliance. The team interviewed licensee personnel and reviewed:

- Annual environmental monitoring reports and licensee event reports;
- Selected air sampling and thermoluminescence dosimeter monitoring stations;
- Collection and preparation of environmental samples;
- Operability, calibration, and maintenance of meteorological instruments;
- Each event documented in the Annual Environmental Monitoring Report which involved a missed sample, inoperable sampler, lost thermoluminescence dosimeter, or anomalous measurement;
- Significant changes made by the licensee to the Offsite Dose Calculation Manual as the result of changes to the land census or sampler station modifications since the last inspection;
- Calibration and maintenance records for air samplers, composite water samplers, and environmental sample radiation measurement instrumentation, quality control program, interlaboratory comparison program results, and vendor audits;
- Locations where the licensee monitors potentially contaminated material leaving the radiological controlled area [or controlled access area] and the methods used for control, survey, and release from these areas;
- Type of radiation monitoring instrumentation used to monitor items released, survey and release criteria of potentially contaminated material, radiation detection sensitivities, procedural guidance, and material release records; and

- Licensee event reports, special reports, audits, self-assessments and corrective action reports performed since the last inspection.

The inspection team completed ten of the required ten samples.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Problem Identification and Resolution

Annual Sample Review

a. Inspection Scope

The team evaluated the effectiveness of the licensee's problem identification and resolution process with respect to the following inspection areas:

- Radiation Monitoring Instrumentation (Section 2OS3),
- Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (Section 2PS1),
- Radioactive Material Processing and Transportation (Section 2PS2), and
- Radiological Environmental Monitoring Program and Radioactive Material Control Program (Section 2PS3)

b. Findings

Section 2OS3(b) discusses a noncited violation resulting from failure to calibrate area radiation monitors based on current operating experience, industry standards, and vendor recommendations. The licensee initiated CR 200803979 to address the calibration issue. In addition, the licensee will address effectively incorporating pertinent industry operating experience into their instrument calibration program.

Section 2PS2(b)1 discusses a noncited violation resulting from a waste manifest with incorrect information. The licensee initiated CR 200602820 to document the issue; however, it contained no corrective actions. It stated only that the software vendor would research the problem to try to find a cause. Additionally, this condition report did not address the fact that the manifest had two levels of review and neither identified a problem. After the team identified this situation, the licensee initiated CR 200803963 to develop and implement corrective actions that were missed during the initial review of CR 200602820 and address subsequent review failures.

4OA6 Meetings

Exit Meeting Summary

On June 6, 2008, the team presented the onsite inspection results to Mr. D. Bannister, Vice President, and other members of licensee management, who acknowledged the inspection findings. The team confirmed that no proprietary information was provided to the team. On June 20, 2008, a telephonic exit was held with Ms. D. Guinn, Supervisor, Regulatory Compliance, to discuss a finding based on information provided by your staff that the team reviewed. The results of the findings were acknowledged.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

M. Anderson, Senior Technician, Radioactive Waste  
D. Bannister, Vice President  
D. Brehm, Supervisor, Radiation Instruments  
C. Brendon, Technician, Instrument and Control  
M. Breuer, Senior Technician, Radioactive Waste  
R. Clemens, Division Manager, Nuclear Engineering  
T. Costanzo, Technician, Environmental  
T. Dukarski, Supervisor, System Chemistry  
S. Gebers, Corporate Health Physicist  
B. Glover, Technician, Radiation Protection  
D. Guinn, Supervisor, Regulatory Compliance  
R. Haug, Manager, Radiation Protection  
M. Hawes, Technician, Environmental  
J. Hoffman, Chemist, Chemistry  
T. Maine, Supervisor, Radiation Protection Operations,  
M. Marcellus, Chemist, Chemistry  
T. Matthew, Manager, Nuclear Licensing  
T. Nellenbach, Division Manager, Nuclear Operations/Plant Manager  
M. Newland, Coordinator, Measuring and Test Equipment Laboratory  
T. Pilmaier, Manager, Performance Improvement and Corrective Action  
M. Porter, Senior Chemist Technician, Chemistry  
C. Sarnowski, Clerk, Radiation Protection  
J. Shipman, Chemist, Chemistry  
M. Tesar, Division Manager, Nuclear Support

#### **NRC Personnel**

J. Hanna, Senior Resident Inspector  
J. Kirkland, Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### **Opened and Closed**

05000285/2008008-01	NCV	Failure to Properly Calibrate Area Radiation Monitors (Section 2OS3)
05000285/2008008-02	NCV	Failure to Provide an Accurate Shipping Manifest (Section 2PS2)

05000285/2008008-03

NCV

Failure to Ship Radioactive  
Material Correctly (Section 2PS2)

Closed

NONE

Discussed

NONE

### LIST OF DOCUMENTS REVIEWED

#### **Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment (71121.03)**

##### Condition Reports

200602972	200604266	200703069	200703821	200704683	200704942
200705143	200705201	200800710	200801877	200802623	200802633
200803880	200803881	200803918	200803979		

##### Procedures

RP-AD-400	Radiation Protection Instrumentation Program	Revision 8
RP-401	Issue, Control and Accountability of Radiation Protection Instrumentation	Revision 12
RP-402	Calibration and Test Requirements for Radiation Protection Equipment	Revision 10
RP-403	Instrument Response Testing	Revision 21
RP-404	Quality Assurance of Counting Systems and Portable Counters	Revision 9
RP-CP-07-0207	Calibration of the Canberra Whole Body Counters	Revision 2
CH-ST-RM-4300	Laboratory and Radioactive Waste Processing Building Exhaust Stack Gas Radiation Monitor, RM-043, Primary Calibration	Revision 5
CH-ST-RM-5200	Auxiliary Building Exhaust Stack/Containment Gas Radiation Monitor, RM-052, Primary Calibration	Revision 13

CH-ST-RM-5400	Steam Generator "A" Blowdown Liquid Radiation Monitor, RM-054A, Primary Calibration	Revision 8
CH-ST-RM-5500	Overboard Waste Discharge Radiation Monitor, RM-055, Primary Calibration	Revision 5
CH-ST-RM-5700	Condenser Off-Gas Radiation Monitor, RM-057, Primary Calibration	Revision 12
CH-ST-RM-6200	Auxiliary Building Exhaust Stack Gas, NRC Radiation Monitor, RM-062, Primary Calibration	Revision 7
IC-ST-RM-0049	Calibration of Containment Operating Level North High Range Radiation Monitor RM-091B	Revision 7
IC-ST-RM-4300	Electronic and Secondary Calibration of Radiation Monitor RM-043, Revision 15	Revision 15
IC-ST-RM-5200	Electronic and Secondary Calibration of Radiation Monitor RM-052	Revision 20
IC-ST-RM-5400	Electronic and Secondary Calibration of Radiation Monitor RM-054A	Revision 10
IC-ST-RM-5500	Electronic and Secondary Calibration of Radiation Monitor RM-055	Revision 10
IC-ST-RM-5700	Electronic and Secondary Calibration of Radiation Monitor RM-057	Revision 14
IC-ST-RM-6200	Electronic and Secondary Calibration of Radiation Monitor RM-062	Revision 17
IC-ST-RM-6300	Calibration of Post Accident Radiation Monitor RM-063	Revision 9
CH-ANL-MI-0007	Determination of Carbon Monoxide, Carbon Dioxide, Water, Odor, and Oil in Compressed Air	Revision 5
RP-AD-500	Respiratory Protection Program	Revision 14
RP-AD-502	Use of Respiratory Protection Equipment	Revision 14
RP-AD-507	Inspection & Maintenance of Respiratory Protection Equipment	Revision 21
RP-AD-511	Recharging of SCBA Cylinders	Revision 8

Calibration Packages

222656	235098	243274	243275	248652	248653
250529	250537	253279	254530	258519	265656
266309	266315	267488	271517	276759	282176

**Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)**

Audits and Self-Assessments

06-QUA-053, 06-QUA-055, 07-QUA-028, and 07-QUA-035

Nuclear Procurement Issues Committee (NUPIC) Audit Numbers:  
19309 for Teledyne Brown Engineering Environmental Services,  
19470 for AmeriAirFilter International,  
19545 for NCS Corporation (Nuclear Cont. Sys),  
19793 for Mass Spectrometer Services,  
19980 for Canberra,  
20076 for NUCON International, Inc.,  
20117 for Eckert & Ziegler Analytics

Condition Reports

200601140	200602901	200603219	200605881	200701164
200701384	200701490	200701627	200702008	200702702
200703239	200703821	200704519	200704840	200705198
200705301	200801260	200801639	200802915	200803854

Procedures

CH-AD-0021	Containment Release Permit and Summary	Revision 21
CH-AD-0027	Waste Gas Decay Tank Release Permit and Summary	Revision 11
CH-AD-0029	Quarterly Cumulative Dose Calculations from Radioactive Effluents	Revision 5
CH-AD-0045	Laboratory and Radioactive Waste Processing Building Exhaust Stack Release Summary	Revision 5
CH-AD-0050	Annual Radioactive Effluent Release Report	Revision 7
CH-CP-RA-0001	Calibration of Beckman Liquid Scintillation Spectrometer, Model LS 6500	Revision 5
CH-CP-RA-0006	Calibration of Canberra Gamma Spectroscopy Detectors	Revision 10
CH-ODCM-0001	Off-Site Dose Calculation Manual	Revisions 17

CH-SMP-RE-0004	Containment Atmosphere Sampling Radioactive Gas Particulate and Iodine Using Either RM-050/051 or RM-052	and 18 Revision 13
CH-SMP-RE-0008	Waste Gas System (AI-110) Sampling	Revision 9
CH-SMP-RE-0011	Containment Tritium Sampling Using Either RM-050/051 or RM-052	Revision 9
CH-SMP-RE-0018	Laboratory and Radioactive Waste Processing Building Exhaust Stack Sampling	Revision 20
CH-ST-VA-0002	Laboratory and Radioactive Waste Processing Building Exhaust Stack Sampling and Analysis	Revision 7
CH-ST-VA-0005	Laboratory and Radioactive Waste Processing Building Exhaust Stack Quarterly Composite Analysis	Revision 6
SO-T-25	Quality Control Program for Evaluating Chemistry Laboratory Performance	Revision 9

Release Permits

2008023, 2008042, 2008045, 2008093

Miscellaneous

2006 and 2007 Annual Report for Technical Specification 5.9.4.a  
 2006 and 2007 Quarterly Gaseous and Liquid Release Activity Summaries  
 2006 through 2007 Cross Check Program Results  
 Effluent monitor set points from 2005 through 2007 (Technical Data Book TDB-IV.7, "Process Monitor Set points")  
 2005 through 2007 Calibration records: gamma spectroscopy systems (Detectors 1, 2, and 4), and Liquid Scintillator Model LS 6500  
 Grab Sample Log records from May 2006 through March 2008  
 Groundwater monitoring results for first quarter 2008  
 Reactor Operator Log records (effluent monitors removed from service entries) from May 2006 through December 2007

In-Place Filter Testing Surveillances

SE-ST-VA-0004	Freon Test of Safety Injection Pump Room Charcoal Filter Adsorbers VA-26A/26B (04/05/07)
SE-ST-VA-0005	Safety Injection Pump Room Charcoal Filter VA-26A/26B (05/02/07)
SE-ST-VA-0006	VA-64A Control Room HEPA and Charcoal Filter Test (09/25/07)

SE-ST-VA-0007	VA-64B Control Room HEPA and Charcoal Filter Test(10/16/07)
SE-ST-VA-0008	Control Room Charcoal Filter VA-64A Replacement or Methyl Iodine Removal Efficiency Test (11/9/07)
SE-ST-VA-0015	Control Room Charcoal Filter VA-64B Replacement or Methyl Iodine Removal Efficiency Test (5/03; 11/04)
SE-ST-VA-0009	Freon Test of Spent Fuel Pool Area Charcoal Filter VA-66 (11/1/07)
SE-ST-VA-0010	Spent Fuel Storage Pool Area Charcoal Filter VA-66 Elemental Charcoal (11/22/07)

Procedures

IC-ST-TM-0005	Quarterly Calibration of Ammonia Monitor A, Loop YIS-6287A	Revision 7
IC-ST-TM-0005	Quarterly Calibration of Ammonia Monitor B, Loop YIS-6287B	Revision 8

**Section 2PS2: Radioactive Material Processing and Transportation (71122.02)**

Condition Reports

200605883 and 200602820

Audits and Self-Assessments

SARC Audit Report No. 63, Radioactive Material, Effluents, and Process Control (4/19/07)

Vendor Audits

NUPIC Joint Audit of Teledyne Brown Engineering Environmental Services

Procedures

RW-AD-100	Radioactive Waste Management Program	Revision 8
RW-218	10CFR61 Classification	Revision 14
RW-221	10CFR61 Sampling	Revision 7
RW-300	Shipping and Radioactive Waste Materials	Revision 15

Shipping Packages

RW06-20      Filters – LSA II  
RW06-24      Primary resin - Type B package  
RW06-51      DAW & metals - LSA II

**Section 2PS3: Radiological Environmental Monitoring Program and Radioactive Material Control Program (71122.03)**

Procedures

CH-AD-0049	Annual Meteorological Data	Revision 5
CH-AD-0050	Annual Radioactive Effluent Release Report	Revision 7
CH-AD-0054	Annual Radiological Environmental Operating Report	Revision 1
CH-SMP-RV-0001	Environmental Well Water Sample Collection	Revision 4
CH-SMP-RV-0002	Environmental Soil Sample Collection	Revision 2
CH-SMP-RV-0012	Environmental Sample Shipment	Revision 2
CH-SMP-RV-0013	Environmental Vegetation Sample Collection	Revision 2
CH-ST-RV-0001	Environmental Sample Collection – Water	Revision 7
CH-ST-RV-0002	Environmental Sample Collection – Milk or Equivalent	Revision 10
CH-ST-RV-0003	Environmental Sample Collection – Quarterly Environmental Dosimeters (TLD)	Revision 11
CH-ST-RV-0004	Environmental Sample Collection – Sediment	Revision 7
CH-ST-RV-0005	Environmental Sample Collection – Fish	Revision 6
CH-ST-RV-0006	Environmental – Land Use Survey	Revision 10
CH-ST-RV-0010	Environmental Sample Collection – Air Monitoring	Revision 18
CH-ST-RV-0011	Environmental Sample Collection – Groundwater	Revision 0
QAP-10.1	Audit Program and Audits	Revision 15

SO-G-118	Site Groundwater Protection Program	Revision 0
IC-CP-03-0042	Calibration of AVS-28A Air Sampler	Revision 3
IC-CP-01-6289	Calibration of Meteorological Instrumentation	Revision 8

Condition Reports

200602181	200602901	200603186	200603960	200604964	200702624
200702745	200702785	200703680	200704085	200700689	200701626
200701892	200701894				

Audits and Self Assessments

NUPIC Audit 20076, NUCON International, dated April 14, 2008  
 NUPIC Audit 19238, Environmental Inc., dated January 18, 2006  
 SARC Audit Report No. 63, Radioactive Material, Effluents and Process Control  
 Quality Department Surveillance Report Effluent Monitoring Program 06-QUA-053

Miscellaneous

2006 Interlaboratory Comparison Program Results  
 2007 Interlaboratory Comparison Program Results  
 Fort Calhoun Station Groundwater Protection Plan  
 EPRI Groundwater Assessment for OPPD Fort Calhoun Site, dated April 27, 2007  
 Work Order 300453-01, Environmental Sample Collection – Water  
 Work Order 300448-06, Perform RM Operational Checks

Calibration Records

Calibration of AVS-28A Air Sampler MT-04245, dated March 20, 2008  
 Calibration of AVS-28A Air Sampler MT-04253, dated February 12, 2008  
 Calibration of Loop 6289, MET Tower Instruments, dated March 12, 2008  
 Calibration of Loop 6289, MET Tower Instruments, dated May 7, 2008

