

**ENCLOSURE**

**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

**Docket Nos.:** 50-313  
50-368

**License Nos.:** DPR-51  
NPF-6

**Report No.:** 50-313/99-18  
50-368/99-18

**Licensee:** Entergy Operations, Inc.

**Facility:** Arkansas Nuclear One, Units 1 and 2

**Location:** Junction of Hwy. 64W and Hwy. 333 South  
Russellville, Arkansas

**Dates:** December 13-16, 1999

**Inspector:** Michael P. Shannon, Senior Radiation Specialist

**Approved By:** Gail M. Good, Chief, Plant Support Branch

**Attachment :** Supplemental Information

## EXECUTIVE SUMMARY

Arkansas Nuclear One, Units 1 and 2  
NRC Inspection Report No. 50-313/99-18; 50-368/99-18

### Plant Support

- Engineering safety feature filter ventilation systems were properly maintained. System engineers responsible for the engineering safety feature filter ventilation systems were knowledgeable of the systems. Overall, good in-place filter and laboratory testing programs were maintained (Sections E2.1 and 3.1).
- On June 12, 1998, the licensee identified a violation of Technical Specification 4.9.11.2 for the failure to determine Unit 2's fuel handling area ventilation system flow rate in accordance with the recommendations of ANSI N510-1975. This Severity Level IV violation is being treated as a noncited violation, consistent with Section VII.B.1.a. of the NRC Enforcement Policy. The licensee documented this issue in Condition Report C-1998-0149 (Section E8.1).
- Overall, the radioactive effluent monitoring program was effectively maintained. The licensee's radioactive effluent sampling and analysis met the requirements of the Offsite Dose Calculation Manual. Whole-body doses to the public from radioactive effluents releases for 1997 and 1998 were less than 1 percent of the yearly regulatory limit (Section R1.1).
- A good effluent monitor calibration and channel check program was in place. Effluent monitors were properly calibrated, and channel checks were performed in accordance with the Offsite Dose Calculation Manual requirements. Analytical instrumentation used to analyze effluent samples was properly maintained and calibrated (Section R2).
- An effective effluent training program was in place. Continuing training program course material was well organized, covering the subject areas needed to accomplish the required tasks and help ensure that the organization's technical competence was maintained (Section R5).
- Quality assurance oversight was effective. Audits were intrusive and thorough, providing management with a good assessment of the radiological effluent controls program. Audit findings were properly documented, tracked in the station's condition reporting system, and closed in a timely manner. Quality assurance department surveillance reports were well written and properly assessed the program areas reviewed. Condition reports identified issues at the proper threshold to provide management with the tools needed to assess the program (Section R7).

### III. Engineering

#### **E2 Engineering Support of Facilities and Equipment**

##### **E2.1 Engineered Safety Feature Filter Ventilation Systems**

###### **a. Inspection Scope (84750)**

The inspector performed visual inspections of Unit 1 and 2's control room and fuel handling area ventilation filtration systems and Unit 1's penetration area ventilation filtration system, and interviewed the engineers assigned to the systems.

###### **b. Observations and Findings**

During walkdowns of the above ventilation filtration systems, the inspector noted that, in general, the equipment was properly maintained. The inspector determined that there was no obvious physical damage to the air cleaning systems which would have prevented them from performing their required functions. However, the inspector noted that in the discharge housing compartment of Unit 2's fuel handling area ventilation system (2VFC-1), gray "duct" tape was used to seal numerous lines which were connected into the charcoal removal manifold to help maintain a vacuum on the manifold during the charcoal removal process. After discussions with maintenance supervision, the system engineer for the above system informed the inspector that the duct tape was used to help reduce charcoal dust during the charcoal removal process. On December 14, 1999, the licensee wrote Maintenance Action Item (MAI) 19520 to remove the tape.

Redundant systems were available, as required. Test ports for in-place filter testing were installed and accessible. From interviews with the system engineers responsible for the air cleaning systems, the inspector concluded that they were knowledgeable of the systems. Housekeeping in the areas of the air cleaning systems was good.

###### **c. Conclusions**

Engineering safety feature filter ventilation systems were properly maintained. System engineers responsible for the engineering safety feature filter ventilation systems were knowledgeable of the systems. Housekeeping in the areas of the air cleaning systems was good.

#### **E3 Engineering Procedures and Documentation**

##### **E3.1 Engineered Safety Feature Filter Ventilation System Equipment Testing Results**

###### **a. Inspection Scope (84750)**

The inspector reviewed the following documents to determine compliance with Technical Specification requirements:

- Records of in-place filter testing of high efficiency particulate air filters and charcoal adsorbers
- Records of laboratory tests of charcoal adsorbers

b. Observations and Findings

Filter testing was properly tracked by the responsible system engineer. Through a review of the in-place filter test results and the results of the laboratory testing of charcoal adsorber samples, the inspector confirmed that the licensee complied with the appropriate Technical Specification requirements.

c. Conclusions

Overall, good in-place filter and laboratory testing programs were maintained.

**E7 Quality Assurance In Engineering Activities (84750)**

The inspector confirmed that an audit was performed of the vendor performing laboratory testing of samples of the charcoal adsorber material. The inspector concluded from a review of the audit summary that there were no adverse findings which would render the vendor laboratory test results invalid.

**E8 Miscellaneous Engineering Issues (84750)**

**E8.1 (Closed) Licensee Event Report 50-368/98-004-00:** Unit 2's Fuel Handling Area exhaust fan flow rates were not performed as required by Technical Specifications. Unit 2 Technical Specification 4.9.11.2.a.3 states, in part, the Fuel Handling Area ventilation system shall be demonstrated operable at least once per 18 months when irradiated fuel is in the storage pool by verifying a system flow rate of 39,700 cubic feet per minute +/- 10 percent during system operation when tested in accordance with ANSI N510-1975. ANSI N510-1975 requires flow tests be performed using a pitot-tube velocity-traverse method.

On January 13, 1994, Arkansas Nuclear One test procedures were changed to allow the ventilation systems flow rate to be determined using either the instrumentation associated with the Super Particulate Iodine Noble Gas (SPING) monitors or the pitot-tube velocity-traverse method. From a review of the test information, the inspector determined that Unit 2's Fuel Handling Area ventilation system was tested twice between January 13, 1994, and June 22, 1998, using the SPING method to determine the flow rate. The failure to use the ANSI N510-1975 method to determine the ventilation system flow rate is a violation of Technical Specification 4.9.11.2. This Severity Level IV violation is being treated as a noncited violation, consistent with Section VII.B.1.a. of the NRC Enforcement Policy. On June 12, 1998, the licensee identified this issue and documented it in Condition Report C-1998-0149 (50-368/9918-01).

#### IV. Plant Support

### **R1 Radiological Protection and Chemistry Controls**

#### **R1.1 Implementation of the Liquid, and Gaseous Radioactive Waste Program**

##### **a. Inspection Scope (84750)**

Selected personnel involved in the radioactive waste effluent program were interviewed. The following items were reviewed:

- Offsite Dose Calculation Manual
- 1997 and 1998 annual effluent release reports
- Release permits
- Sampling procedures
- Technical Specification requirements

##### **b. Observations and Findings**

A review of the Annual Effluent Release Reports for 1997 and 1998 revealed that the reports were written in the format described in NRC Regulatory Guide 1.21, Revision 1, June 1974, and were submitted in accordance with Unit 1 and 2 Technical Specifications 6.12.2.6 and 6.9.3, respectively. Additionally, the above Annual Effluent Release Reports contained the information required by the Offsite Dose Calculation Manual.

From a review of the above annual reports and data supplied by the licensee, the inspector determined that whole-body dose to the public from radioactive effluent releases were less than 1 percent of the yearly regulatory limit and did not exceed the limits defined within the Offsite Dose Calculation Manual. The inspector determined from a review of the 1997 and 1998 annual reports, that all liquid and gaseous effluents discharged by the licensee during the above period were in compliance with regulatory requirements.

The inspector randomly selected 12 liquid radioactive effluent and 8 gaseous radioactive effluent release permits and their periodic sample analysis results for review. The selection confirmed that sampling and analyses were performed in accordance with the requirements of Tables 2.3-1 and 2.4-1 of the Offsite Dose Calculation Manual. Cumulation dose contributions from liquid and gaseous effluents were determined at least once per 31 days in accordance with the methodologies and parameters described in the Offsite Dose Calculation Manual.

On December 14, 1999, the inspector observed the sampling, analysis, and preparation of the gaseous batch release permits for Unit 2's Radwaste Area and Post Accident Sampling Building discharge monitors. No problems were identified during the above evolutions. The inspector observed that proper radiological controls and precautions were used during sampling to ensure that sample integrity was not compromised. The

inspector noted a good use of station procedures during the sampling and analysis tasks.

c. Conclusions

Overall, the radioactive effluent monitoring program was effectively maintained. The licensee's radioactive effluent sampling and analysis met the requirements of the Offsite Dose Calculation Manual. Whole-body doses to the public from radioactive effluents releases for 1997 and 1998 were less than 1 percent of the yearly regulatory limit.

**R2 Status of Radiation Protection and Chemistry Facilities and Equipment**

a. Inspection Scope (84750)

Areas reviewed included:

- Effluent monitor physical condition
- Effluent monitor calibrations
- Analytical instrumentation calibrations

b. Observations and Findings

During walkdowns of the liquid and gaseous effluent radiation monitors and effluent storage tanks, the inspector found all monitors to be operable, and all monitors and tanks to be in good material condition. Additionally, housekeeping in the above areas was very good. The inspector determined that gaseous and liquid radioactive waste was properly stored and inventories were properly maintained.

A review of the calibration records and channel check documentation for the effluent monitors revealed that the monitors were properly calibrated, and channel checks were performed in accordance with station procedures and the Offsite Dose Calculation Manual requirements.

The inspector determined from observations and interviews with chemistry department counting room personnel that all analytical instrumentation used for analyzing effluent samples was properly maintained and calibrated.

c. Conclusions

A good effluent monitor calibration and channel check program was in place. Effluent monitors were properly calibrated, and channel checks were performed in accordance with the Offsite Dose Calculation Manual requirements. Housekeeping in the areas where effluent monitors and tanks were located was very good. Analytical instrumentation used to analyze effluent samples was properly maintained and calibrated.

**R5 Staff Training and Qualification**

a. Inspection Scope (84750)

Personnel involved with the radioactive waste effluent training program were interviewed. The following items were reviewed:

- Instructor qualifications
- Continuing training lesson plans
- Management oversight of the training program

b. Observations and Findings

The inspector reviewed the qualifications of the instructors assigned to provide continuing training to the chemistry staff involved in the radioactive effluent program. Both instructors had strong technical chemistry backgrounds, and one of the instructors had operational effluent program experience.

A review of the continuing training program course materials revealed that the training material was well organized, covering the subject areas needed to accomplish the required tasks. Additionally, continuing training course material provided technicians with the appropriate topics to help ensure that their technical competence was maintained. The inspector noted good use of course feedback forms for program improvements.

Lesson plans were well organized, developed, and site and industry lessons learned were incorporated in the training material. The inspector determined that chemistry management was appropriately involved in developing the training topics.

c. Conclusions

An effective effluent training program was in place. Continuing training program course material was well organized, covering the subject areas needed to accomplish the required tasks and help ensure that the organization's technical competence was maintained.

**R7 Quality Assurance In Radiation Protection and Chemistry Activities**

a. Inspection Scope (84750)

Selected quality assurance department personnel involved with the oversight of the radioactive waste effluent program were interviewed. The following items were reviewed:

- Qualifications of personnel who perform quality assurance department audits and surveillances
- 1997 and 1998 quality assurance audits

- Quality assurance surveillances
- Radioactive waste effluent program Condition Reports

b. Observations and Findings

Audits and Surveillances

A review of the qualifications of the lead auditor involved in the oversight of the radiological effluent control program revealed that the auditor had adequate experience and training to perform effective audits and surveillances.

Two quality assurance program audit reports QAP22-98 and QAP28-98, which covered the radiological effluent control program, were performed since the last inspection of this area in August 1997. The inspector determined that both audits were intrusive and thorough, providing management with a good assessment of the radiological effluent controls program. Three effluent related findings and one recommendation were identified during Audit 28-98. All findings were properly documented, tracked in the station's condition reporting system, and closed in a timely manner.

Three quality assurance department surveillance reports, two of which pertained to the radiological effluent monitoring program, and a third which pertained to the ventilation/filtration testing program, were written after August 1997. The inspector determined that the surveillances were well written and properly assessed the program areas reviewed.

Condition Reports

A review of the radiological effluent control program condition reports written after August 1, 1997, revealed that the licensee identified issues at the proper threshold to provide management with the tools needed to assess the program. The review also identified that, in general, response timeliness was appropriate and, overall, corrective actions appeared to be effective to correct the issue identified.

c. Conclusions

Quality assurance oversight was effective. Audits were intrusive and thorough, providing management with a good assessment of the radiological effluent controls program. Audit findings were properly documented, tracked in the station's condition reporting system, and closed in a timely manner. Quality assurance department surveillance reports were well written and properly assessed the program areas reviewed. Condition reports identified issues at the proper threshold to provide management with the tools needed to assess the program.

**V. Management Meetings**

**X1 Exit Meeting Summary**

The inspector presented the inspection results to members of licensee management at an exit meeting on December 16, 1999. The licensee acknowledged the findings presented. No proprietary information was identified.

**ATTACHMENT**

**Supplemental INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

**Licensee**

**C. Anderson, General Manager Plant Operations  
R. Bement, Unit 2 Plant Manager  
D. Fowler, Quality Assurance Supervisor  
M. Frala, Chemistry Supervisor  
C. Harris, Chemistry Trainer  
G. Hettel, System Engineer Supervisor  
M. McInerney, Engineering Programs Specialist  
R. Partridge, Chemistry Superintendent  
W. Perks, Technical Support Manager  
S. Pyle, Licensing Specialist  
G. Stephenson, Chemistry Specialist  
J. Vandergriff, Nuclear Safety Director**

**NRC**

**K. Weaver, Resident Inspector**

**LIST OF INSPECTION PROCEDURES USED**

**IP 84750      Radioactive Waste Treatment, and Effluent and Environmental Monitoring**

**LIST OF ITEMS OPENED AND CLOSED**

**Opened and Closed**

**368/9918-01    NCV    Failure to correctly determine Unit 2's fuel handling area ventilation system flow rate (Section E8.1).**

**Closed**

**368/98-004    LER    Unit 2's Fuel Handling Area exhaust fan flow rates were not performed as required by Technical Specifications (Section E8.1).**

**LIST OF DOCUMENTS REVIEWED**

**Chemistry Procedure 1604.015, "Analysis of Unit Vents," Revision 13**

**Chemistry Procedure 1604.016, "Analysis of Gaseous Waste Decay Tanks," Revision 8**

**Chemistry Procedure 1607.018, "Sampling the Unit 1 Waste Gas Decay Tanks and Surge Tank," Revision 5**

**Quality Assurance Audit QAP-22-98, Chemistry and Radiochemistry Audit**

**Quality Assurance Audit QAP-28-98, Environmental Monitoring Audit**

**Quality Assurance Surveillance SR-028-99, Weekend Chemistry Observations**

**Quality Assurance Surveillance SR-029-99, ANO Ventilation/Filtration Testing Programs**

**Quality Assurance Surveillance SR-031-99, T16 Resin Intrusion**

**Offsite Dose Calculation Manual, Revision 13**

**Nuclear Chemist Training Records**

**1997 and 1998 Annual Radioactive Effluent Release Reports**

**A summary of effluent program related condition reports written since August 1997**

**Calibration and channel functional test data for the liquid and gaseous effluent radiation monitors listed in tables 2.1-2 and 2.2-2 of the ODCM.**