



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005**

August 24, 2004

Jeffrey S. Forbes, Site Vice President,
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72801-0967

**SUBJECT: ARKANSAS NUCLEAR ONE - NRC RADIATION SAFETY TEAM INSPECTION
REPORT 05000313/2004009 and 05000368/2004009**

On June 18, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One, Units 1 and 2 facility. After additional information was reviewed, the team conducted a telephone conference on July 22, 2004. The enclosed integrated report documents the inspection findings, which were discussed at the conclusion of the inspection with you and other members of your staff.

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 inspection report documents one NRC-identified finding and one self-revealing finding of very low safety significance (Green). However, because of their very low safety significance and because the findings were entered into your corrective action program, the NRC is treating these findings as noncited violations (NCVs) consistent with Section V1.A of the NRC Enforcement Policy. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in Section 4OA7 of this report. If you contest these non-cited violations, 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 DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-001; and the NRC Resident Inspector at the Arkansas Nuclear One, Units 1 and 2, facility.

Entergy Operations, Inc.

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) 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//

Michael P. Shannon, Chief
Plant Support Branch
Division of Reactor Safety

Dockets: 50-313
50-368
Licenses: DPR-51
NPF-6

Enclosure:

NRC Inspection Report 05000313/2004009 and 05000368/2004009
w/Attachment: Supplemental Information

cc

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

Dockets: 50-313, 50-368
Licenses: DPR-51, NPF-6
Report: 05000313/2004009 and 05000368/2004009
Licensee: Entergy Operations, Inc.
Facility: Arkansas Nuclear One, Units 1 and 2
Location: Junction of Hwy. 64W and Hwy. 333 South
Russellville, Arkansas
Dates: June 14 through July 22, 2004
Inspectors: Larry Ricketson, P.E., Senior Health Physicist, Plant Support Branch
George Kuzo, Senior Health Physicist, NRC Region II
Bernadette Baca, Health Physicist, Plant Support Branch
Daniel R. Carter, Health Physicist, Plant Support Branch
Approved By: Michael P. Shannon, Chief, Plant Support Branch
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000313/2004-09, 05000368/2004-09; Arkansas Nuclear One, Units 1 and 2; Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems; Radioactive Material Processing and Transportation; Radioactive Material Control Program

The report covered a one week period of inspection on site by a team of four region-based health physics inspectors. Two findings of very low safety significance (Green) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process," (SDP). Findings for which the SDP 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 and Self-Revealing Findings

Cornerstone: Public Radiation Safety

- Green. The team identified a non-cited violation of Unit 1 Technical Specification 5.5.4 because the licensee failed to calibrate selected effluent monitoring instrumentation in accordance with Offsite Dose Calculation Manual specifications. Specifically, the liquid radioactive waste monitor (RE-4642) and the waste gas holdup system monitor (RE-4830) were not calibrated across the full range of energies that the instruments would be expected to detect. Additionally, the licensee's calibration process for these monitors did not establish that the channel outputs responded with an acceptable range and accuracy to the primary or secondary calibration sources. The licensee used a radioactive source to qualitatively verify that the monitor identified the primary calibration source energy peak but did not require a quantitative response. The finding was placed into the licensee's corrective action program.

The finding is more than minor because it was associated with the Public Radiation Safety Cornerstone plant equipment/process radiation monitoring attribute and affected the associated cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain. The finding had very low safety significance because: (1) the finding did not involve radioactive material control, (2) it involved the effluent release program, (3) it impaired the licensee's ability to assess dose, (4) it did not result in the licensee's failure to assess dose because the licensee was able to assess dose by alternate means, and (5) doses did not exceed 10 CFR Part 50, Appendix I, values (Section 2PS1).

- Green. The team reviewed a self-revealing, non-cited violation of 10 CFR 71.47 resulting from the licensee's failure to correctly prepare a radioactive shipment so that dose rates did not exceed regulatory limits. Specifically, on March 24, 2003, the licensee was notified by a shipment recipient that the contact radiation dose rate of a package exceeded 200 millirem per hour. A contact radiation dose rate of 380 millirem per hour was identified on the bottom

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of the package. However, the accessible radiation levels to the public from underneath the flatbed trailer were only 70 millirem per hour. The finding was placed into the licensee's corrective action program.

The finding was greater than minor because it is associated with the Public Radiation Safety Cornerstone attribute of Program and Process and affected the associated cornerstone objective (to ensure adequate protection of public health and safety from exposure to radioactive materials). The finding involved an occurrence in the licensee's radioactive material transportation program that is contrary to NRC regulations, therefore it was evaluated using the Public Radiation Safety Significance Determination Process. The finding had very low safety significance because: (1) it involved radioactive material control, (2) it was a transportation issue, (3) external radiation levels were exceeded, (4) dose rates in excess of regulatory limits were not accessible to the public, and (5) the radiation levels did not exceed two times the federal limits. This finding also had crosscutting aspects associated with human performance (Section 2PS2).

B. Licensee Identified Violation

A violation of very low safety significance (Green) which was identified by the licensee was reviewed by the team. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7.

REPORT DETAILS

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety [OS] and Public Radiation Safety [PS]

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 whole body counting equipment and radiation detection instruments utilized for personnel and material release from the radiologically controlled area
- Self-assessments and audits
- Corrective action program reports since the last inspection
- 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
- 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 licensee uses the Entergy Operations, Inc. central calibration facility. Therefore, the following item could not be reviewed during this inspection.

- Calibration of portable radiation detection instrumentation, electronic alarming dosimetry, and continuous air monitors used for job coverage

Either because the conditions did not exist or an event had not occurred, no opportunities were available to review the following items:

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- Licensee Event Reports
- Licensee action in cases of repetitive deficiencies or significant individual deficiencies

The inspector completed 9 of the required 9 samples.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

This area was inspected to ensure that the gaseous and liquid effluent processing systems are maintained so that radiological releases are properly mitigated, monitored, and evaluated with respect to public exposure. The team used the requirements in 10 CFR Part 20, 10 CFR Part 50 Appendices A and I, the Offsite Dose Calculation Manual (ODCM), and the licensee's procedures required by technical specifications as criteria for determining compliance. The team interviewed licensee personnel and reviewed:

- The most current radiological effluent release reports, changes to radiation monitor setpoint calculation methodology, anomalous sampling results, effluent radiological occurrence performance indicator incidents, self-assessments, audits, and licensee event reports
- Gaseous and liquid release system component configurations
- Routine processing, sample collection, sample analysis, and release of radioactive liquid and gaseous effluents as well as radioactive liquid and gaseous effluent release permits and dose projections to members of the public
- Changes made by the licensee to the ODCM, the liquid or gaseous radioactive waste system design, procedures, or operation since the last inspection
- Monthly, quarterly, and annual dose calculations
- Surveillance test results involving air cleaning systems and stack or vent flow rates
- Instrument calibrations of discharge effluent radiation monitors and flow measurement devices, effluent monitoring system modifications, effluent radiation monitor alarm setpoint values, and counting room instrumentation calibration and quality control

- Interlaboratory comparison program results
- Audits and self-assessments and corrective action reports performed since the last inspection

Either because the conditions did not exist or an event had not occurred, no opportunities were available to review the following items:

- Abnormal releases
- Licensee event reports and special reports

The inspector completed 10 of the required 10 samples.

b. Findings

Introduction. The team identified a Green, non-cited violation (NCV) because the licensee failed to implement ODCM calibration requirements for selected effluent process monitors.

Description. During personnel interviews and record reviews related to the calibration of the Unit 1 Liquid Radioactive Waste Monitor (RE-4642) and the Waste Gas Holdup System Monitor (RE-4830), the team identified two calibration problems. First, the subject monitors were not calibrated across the full range of energies that the instruments would be expected to detect. The recent effluent report data confirmed the presence of multiple radionuclides having a wide range of energies in both the liquid and gaseous effluent pathways. However, the most recent primary in-situ calibration record for each of these monitors confirmed that the licensee used a single source (Cs-137 for the liquid monitor and Kr-85 for the gas monitor), rather than a mixture of isotopes encompassing the entire range of energies.

Second, the licensee's calibration process for these two monitors did not establish that the channel outputs responded with acceptable range and accuracy to the (NIST-traceable) primary or secondary sources. Instead, the licensee used the radioactive source only to qualitatively verify that the monitor identified the primary calibration source energy peak. The licensee's Unit 1 calibration procedure did not require a quantitative response. Therefore, no quantitative acceptance criteria were established for subsequent (secondary) calibrations. In contrast, the team noted that analogous calibration procedures for monitors in Unit 2 correctly included criteria for a quantitative response within the established ranges.

Analysis. The team determined that the licensee's failure to correctly calibrate the process effluent monitors was a performance deficiency because the licensee did not meet the ODCM requirements. The finding is more than minor because it was associated with the Public Radiation Safety Cornerstone plant equipment/process radiation monitoring attribute and affected the associated cornerstone objective to ensure adequate

protection of public health and safety from exposure to radioactive materials released into the public domain. The finding involved an occurrence in the licensee's radiological effluent monitoring program that is contrary to requirements in the licensee's ODCM; therefore, the team used the Public Radiation Safety Significance Determination Process. The finding had very low safety significance because: (1) the finding did not involve radioactive material control, (2) it involved the effluent release program, (3) it impaired the licensee's ability to assess dose, (4) it did not result in the licensee's failure to assess dose because the licensee was able to assess dose by alternate means, and (5) doses did not exceed 10 CFR Part 50, Appendix I, values.

Enforcement. Technical Specification 5.5.4(a) establishes limitations on the functional capability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoint determination in accordance with the methodology in the ODCM. ODCM Appendix 1, Surveillance Limitation Requirements S2.1.1 and S2.2.1 require, respectively, that each radioactive liquid and gaseous effluent monitoring instrumentation channel be demonstrated operable by performance of the channel check, source check, channel calibration and analog channel operational test at the frequencies shown in Table 2.1-2 and Table 2.2-2. Table 2.1-2 and Table 2.2-2, respectively, require the monitor on the liquid effluent line and monitors on the gas decay tank systems be calibrated at least once per 18 months. Bases BL2.1.1 for Table 2.1-2, and BL 2.2.1 for Table 2.2-2, require initial channel calibrations be performed over their intended range of energy and measurements using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST. For subsequent channel calibration, sources that have been related to the initial calibration shall be used. ODCM Appendix 1, Section 1.4, defines an instrument channel calibration as a test, and adjustment (if necessary), to establish that the channel output responds with acceptable range and accuracy to known values of the parameter which the channel measures or an accurate simulation of these values.

The licensee violated this requirement when it failed to establish that the channel outputs of Unit 1 liquid release monitor and the Unit 1 Waste Gas Decay System Effluent monitoring system respond with acceptable range and accuracy to known values of the energies and activities of radioactive effluents released from the licensee's facility. Because the failure to correctly calibrate effluent monitors was determined to be of very low safety significance and has been entered into the licensee's corrective action program as Condition Reports CR-ANO-1-2004-01629 and CR-ANO-1-2004-01740, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000313/2004009-01, Failure to calibrate selected Unit 1 effluent monitoring instrumentation in accordance with ODCM requirements.

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 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
- Audits, state agency reports, self-assessments and corrective action reports performed since the last inspection

Either because the conditions did not exist or an event had not occurred, no opportunities were available to review the following items:

- Shipments of radioactive materials.
- Licensee event reports and special reports

The inspector completed 6 of the required 6 samples.

b. Findings

Introduction. The team reviewed a Green self-revealing, non-cited violation of 10 CFR 71.47. The licensee failed to prepare a shipment for transportation so that the radiation level did not exceed 200 millirem per hour at any point on the external surface of the package.

Description. The team reviewed Condition Report CR-ANO-C-2003-00227. It documented that, on March 24, 2003, the licensee was notified by a shipment receiver that a radioactive package of control rod drive mechanisms had radiation levels on the package in excess of federal limits. Radiation levels of 380 millirem per hour were identified on contact with the bottom of the package. However, the accessible radiation levels to the public from underneath the flatbed trailer were only 70 millirem per hour. The licensee's exit survey indicated that the highest dose rate on the bottom of the trailer, prior to leaving the site, was 55 millirem per hour.

The licensee dispatched a representative to evaluate the package condition. On March 25, 2003, the representative confirmed the dose rate to be 360 millirem per hour using a licensee survey instrument. The representative's inspection of the package revealed that the control rod drive mechanism's cribbing and lead shielding had moved during transit. This caused the radioactive components to be unshielded or less effectively shielded, resulting in increased dose rates.

Analysis. The failure to prepare a shipment to comply with federal regulations is a performance deficiency. The finding was greater than minor because it is associated with the Public Radiation Safety Cornerstone attribute of Program and Process and affected the associated cornerstone objective (to ensure adequate protection of public health and safety from exposure to radioactive materials). The finding involved an occurrence in the licensee's radioactive material transportation program that is contrary to NRC regulations, therefore it was evaluated using the Public Radiation Safety Significance Determination Process. The finding had very low safety significance because: (1) it involved radioactive material control, (2) it was a transportation issue, (3) external radiation levels were exceeded, (4) dose rates in excess of regulatory limits were not accessible to the public, and (5) the radiation levels did not exceed two times the federal limits. This finding had crosscutting aspects associated with human performance. The failure of licensee personnel to follow programmatic guidance for shipment preparation directly contributed to the finding.

Enforcement. 10 CFR 71.47 states in part, that each package of radioactive materials offered for transportation must be designed and prepared for shipment so that, under conditions normally incident to transportation, the radiation level does not exceed 200 millirem per hour at any point on the external surface of the package.

The licensee violated this requirement when it failed to prepare the package so that it did not exceed federal limits. Because this failure is of very low safety significance and has been entered into the licensee's corrective action system as condition report CR-ANO-C-2003-00227, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313/200409-02; 05000368/200409-02, Radioactive Shipment Package Exceeded 10 CFR 71.47 Radiation Limits.

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

a. Inspection Scope

This area was inspected to ensure that the REMP 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, 10 CFR Part 50, Appendix I, the ODCM, 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
- A sampling of air sampling stations and thermoluminescence dosimeter (TLD) 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 TLD, or anomalous measurement
- Calibration and maintenance records for air samplers and environmental sample radiation measurement instrumentation, quality control program, and interlaboratory comparison program results
- Locations where the licensee monitors potentially contaminated material leaving the 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
- Audits, self-assessments, and corrective action reports performed since the last inspection

Either because the conditions did not exist or an event had not occurred, no opportunities were available to review the following items:

- Significant changes made by the licensee to the ODCM as the result of changes to the land census or sampler station modifications since the last inspection
- Licensee event reports and special reports performed since the last inspection

The inspector completed 10 of the required 10 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)
- Radiological Environmental Monitoring Program and Radioactive Material Control Program (Section 2PS3)

b. Findings and Observations

No findings of significance were identified.

4OA4 Cross-Cutting Aspects of Findings

Section 2PS2 describes an issue with a human performance cross-cutting aspect which involved the failure of workers to correctly prepare a radioactive shipment for transportation.

4OA6 Management Meetings

Exit Meeting Summary

On June 18, 2004, the team presented the inspection results to Mr. J. Forbes, Site Vice President, and other members of his staff who acknowledged the findings, but stated that they would provide additional information related to effluent monitor calibrations. The

team confirmed that proprietary information was not provided or examined during the inspection. After the additional information was reviewed, the team conducted a telephone conference on July 22, 2004, and discussed the results with Messrs. D. James, Manager, Licensing, and R. Scheide, Specialist, Licensing.

40A7 Licensee-Identified Violations

The following finding of very low safety significance was identified by the licensee as a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a NCV.

Unit 2 Technical Specification 6.8.1.a requires written procedures applicable to Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Appendix A, Section 7, references procedures for control of radioactivity. Procedure 1012.020, "Radioactive Material Control," Change Number 006-05-0, Section 6.9.1 states, in part, that any item which has been evaluated to have no inaccessible areas that may have become contaminated and has no detectable contamination greater than the minimum sensitivity of the combined survey method and instrument may be unconditionally released from radiological restrictions. However, on September 24, 2003, a vacuum cleaner containing radioactive material was found in an un-posted area of the Unit 2 Turbine Building, outside the controlled access area. This issue is documented in the licensee's corrective action program by Condition Report CR-ANO-2-2003-01302. Using the Public Radiation Safety Significance Determination Process, the team determined that the finding is of very low safety significance because (1) the finding was a radioactive material control issue (2) it was not a transportation issue, (3) it did not result in a dose to the public greater than 0.005 rem, and (4) the number of occurrences was not greater than five.

ATTACHMENT
SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee personnel

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D. Calloway, Specialist, Chemistry
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D. Hawkins, Specialist, Licensing
D. Hicks, Radwaste Supervisor, Radiation Protection
D. James, Manager, Licensing
M. McCullah, Transportation Specialist, Radiation Protection
D. Moore, Supervisor, Radiation Protection
S. Morris, Specialist III, Health Physics/Chemistry
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G. Stephenson, Senior Specialist, Health Physics/Chemistry
D. White, Specialist, Chemistry

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R. Deese, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Opened and Closed During this Inspection

05000313/2004009-01	NCV	Failure to Calibrate Select Unit 1 Effluent Process Monitors In Accordance with ODCM Requirements (Section 2PS1)
05000313,368/2004009-02	NCV	Radioactive Shipment Package Exceeded 10 CFR 71.47 Radiation Limits.

Previous Items Closed

NONE

LIST OF DOCUMENTS REVIEWED

Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment

Surveillance Test Results

- 1304.133 Unit 1 Containment High Range Radiation Monitor Functional Test, Change 017-01-0 (Work Order Package 50618119 01 for 8060 and 8061)
- 1304.160 Unit 1 Reactor Building Area Radiation Monitoring System Calibration, Change No. 011-01-0 (Work Order Package 50684763 01 for RE-8017 and RE-8019 calibration)
- 2304.133 Unit 2 High Range Containment Radiation Monitor Calibration, Change 009-00-0 (Work Order Page 50276270 01 for 8925)
- 2304.265 Unit 1&2 Control Room Radiation Monitor 18 Month Test, Change 005-00-0 (Work Order Package 50278702 01 for 8001A, 8001B, 8750-1A, and 8750-1B)

Certificate of Calibration - Helgeson Whole Body Counter, Serial No. HSS 026 (#1)

Audits and Self-Assessments

QA-14-2003-ANO-1, Quality Assurance Audit Report - Radiation Protection

Corrective Action Documents (Condition Reports)

1-2002-01674, 1-2002-00702, 1-2003-00380, 2-2002-01338, 2-2002-01657, 2-2003-00454, 2-2003-00686, 2-2003-00881, C-2002-00555, C-2002-00678, C-2003-00206, C-2004-00219, C-2004-00600

Procedures

- RP-307 Operation and Calibration of Eberline Personnel Contamination Monitors, Revision 3
- RP-308 Operation and Calibration of Gamma Scintillation Tool Monitors, Revision 2
- RP-309 Operation and Calibration of the Eberline AMS-3/3A Continuous Air Monitor, Revision 2
- RP-502 Inspection and Maintenance of Respiratory Protection Equipment, Revision 1
- RP-504 Breathing Air, Revision 1
- 1313.057 NEA Model SAM9/11 Small Article Monitor Calibration, Change No. 002-01-0

Section 2PS1: Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems

Reports, Records, Data Reviewed/Discussed In Detail

2002 Annual Radioactive Effluent Release Report
2003 Annual Radioactive Effluent Release Report

Release Logs and Permits

U1 and U1 Liquid Release Logs for Calendar Year (CY) 2002 and CY 2003
U1 and U2 Gaseous Release Logs for CY 2002 and CY 2003

Unit 2, Liquid Radioactive Waste Release Permit, (2LR) 2004-0036, 2T92C Regenerative Waste Tank, 5/22/04
2LR 2004-0039, 2T69B, Boric Acid Condensate Tank, 6/10/04
Unit 1, Gaseous Radioactive Waste Release Permit, (1GR) 2004-0049, for T18D Waste Gas Decay Tank, 5/12/04
1GR 2003-0051, for T18B Waste Gas Decay Tank, 5/20/20003

Ventilation Testing Data

Procedure No. 5120.414, In -Place Testing of the U1 Radwaste Area Filtration System, Conducted 6/16/04
2VSF-9 Control Room Filtration Surveillance Data/Results for Visual Inspection, Mechanical Leakage/Efficiency; Flowrate; Radioiodine Retention/Penetration/Efficiency; conducted 8/06/03
VEF-38A Penetration Room Exhaust Surveillance Data/Results for Visual Inspection, Mechanical Leakage/Efficiency; Flowrate; Radioiodine Retention/Penetration/Efficiency; conducted 12/03/02
VEF-38B Penetration Room Exhaust Surveillance Data/Results for Visual Inspection, Mechanical Leakage/Efficiency; Flowrate; Radioiodine Retention/Penetration/Efficiency; conducted 1/15/04
2VEF-38A Penetration Room Exhaust Surveillance Data/Results for Visual Inspection, Mechanical Leakage/Efficiency; Flowrate; Radioiodine Retention/Penetration/Efficiency; conducted 12/03/02
2VEF-38B Penetration Room Exhaust Surveillance Data/Results for Visual Inspection, Mechanical Leakage/Efficiency; Flowrate; Radioiodine Retention/Penetration/Efficiency; conducted 7/21/03

Monitor Calibration Data

Work Order (WO) 50685568 01, Procedure Number (No.) 1304.027, Unit 1 (U1) Effluent Process Radiation Monitor Calibration, Completed 5/19/04
Maintenance Action Item (MAI) 77804, Procedure No. 1304.137, U1 Calibration of Containment Purge RX-9820 (SPING 1), Completed 03/13/03

MAI 77678, Procedure No. 1304.138, U1 Calibration of Radwaste Area Monitor RX-9825 (SPING 2), Completed 02/14/03
WO 50572646 01, Procedure No. 2304.137, Unit 2 (U2) Calibration of Containment Purge, 2RX-9820 (SPING 5), Completed 4/12/04
MAI 81650, Procedure No. 2304.138, U1, Calibration of Radwaste Area Monitor RX-9825 (SPING 2), Completed 02/07/03
WO 50275689 01, Procedure No. 2304.138, Unit 2 (U2), Calibration of Radwaste Area Monitor 2RX-9825 (SPING 6), Completed 04/18/03
WO 50571965 01 Procedure No. 2304.142, U2, Calibration of Auxiliary Building Extension Monitor 2RX-9845 (SPING 10), Completed 04/12/04
WO 50278757 01, Procedure No. 1304.140, U1 Calibration of Emergency Penetration Room Monitor RX-9835 (SPING 4), Completed 01/16/04
WO 50335008 01, Procedure No. 2304.156, U2, Calibration of Low Level Radwaste Storage Building 2RX-9850 (SPING 11), Completed 03/31/04
WO 50278764 01, Procedure No. 2304.027, U2 Liquid Process Radiation Monitoring System Calibration, Completed 10/23/03
WO 5057228301, Procedure No. 1304.131, U1 Liquid Radwaste Instrument Calibration, Completed 5/26/04
WO 50278415 01, U1 Clean, Inspect, and Calibrate Waste Gas Discharge Flow/Pressure Transmitter and Switch Equipment PDT-4830, conducted 6/30/03

Eberline Instrument Corporation PING/SPING Calibration Checkout Procedure Records for Detectors: [Serial Number (S/N)126, completed (12/20/80)]; S/N 129, 12/20/80; S/N 130, 12/24/80; S/N 132, 12/20/80; S/N134, 12/24/80; S/N 135 12/24/80; S/N 136, 12/24/80; S/N 137m S/N 137; S/N 149, 12/18/80; S/N 152, 12/20/80
PING/SPING Primary Gas Calibration and Detector Response to Beta and Photon Sources, December 1988

Cross Check Results

2002 Radiochemistry Quality Control Program Results
2003 Radiochemistry Quality Control Program Results
Count Room Quality Control Data for Selected Gamma Spectroscopy and Liquid Scintillation Counter Instrumentation, January - May 2004

Audits and Self-Assessments

Quality Assurance Audit Report, QA-6-2003-ANO-1, dated October 8, 2003

Corrective Action Documents (Condition Reports)

ANO-1-2003-00647, ANO-1-2003-00688, ANO-1-2002-01809, ANO-1-2004-0003, and ANO-1-2004-01437

Procedures

Offsite Dose Calculation Manual, Arkansas Nuclear One, Revision (Rev.) 014-01-0

Procedure Number (No.) 1052.022, Radiological Effluents and Environmental Monitoring Program, Change 002-04-0

Procedure No. 1052.032, Nuclear Chemistry Quality Control Program, Change 019-04-0

Procedure No. 1604.015, Analysis of Unit Vents, Change 014-04-0

Procedure No. 1604.017, Analysis of Liquid Waste, Change 018-02-0

Procedure No. 1604.051, Eberline Radiation Monitoring System, Change: 010-05-0

Procedure No. 1608.008, Sampling the Filtered Waste Monitor Tank, (T-21A/B), Rev. 006-05-0

Procedure No. 1607.025, Sampling the Unit One Condenser Vacuum Pump Discharge, Change 004-06-0

Procedure No. 2607.010, Sampling the U2 Vents, Change 011-00-0

Design Change Package

Design Change Package 88-2104, Low Level Radioactive Waste Storage Building (LLRWSB) Radiation Monitor Upgrade, 7/20/90

Section 2PS2: Radioactive Material Processing and Transportation

Waste Stream Sample Results

2002, 2003

Shipment Packages

03-009, 03-037, 03-043, 03-055, and 04-013

Consignee Licenses

097, 947, R-79266-K09, R-I2005-K01, and R-8601-K06

Certificate of Compliance

9204

Audits

QS-2002-ANO-160, QS-ANO-180, QS-2002-ANO-136, and QA-15-2003-RBS-1-Multi

Corrective Action Documents (Condition Reports)

ANO-1-2004-0533, ANO-1-2003-1071, ANO-C-2002-0413, ANO-C-2003-0762, ANO-C-2004-0656, ANO-C-2004-0354, ANO-C-2004-0083, ANO-C-2003-0227, ANO-C-2003-1068, ANO-C-2002-0478, ECH-2002-0060, ECH-2003-0317, ECH-2004-0168, ECH-2003-0235, ECH-2004-0050, and LO-ELO-2003-0125

Procedures

NS-205 Hazardous Material Transportation Security Guide, Revision 0
RW-102 Radioactive Shipping Procedure, Revision 1
RW-104 Scaling Factors, Revision 0
RW-105 Process Control Program, Revision 1
RPD-08 Radioactive Material Shipping Instructions, Revision 2
1601.505 Processing of Spent Radioactive Resin, Revision 003-02-0

Training Lesson Plans

Hazmat Transportation Safety: Security Awareness
Hazsec DOT Hazmat Security Training

Section 2PS3: Radiological Environmental Monitoring Program (REMP) And Radioactive Material Control Program

Annual Reports, Assessments, Quality Audits, and Surveillances

2003 Assessment of the Radiological Environmental Program and the Radiological Effluent Controls Program (River Bend)
Annual Radiation Protection Report for 2002 and 2003
Annual Radiological Environmental Operating Report for 2002 and 2003
LO-ALO-2003-00032
LO-ALO-2003-00117
QA-6-2003-ANO-1
QA-14-2003-ANO-1
QS-2002-ANO-066
QS-2003-ANO-059
QS-2003-ANO-065
QS-2004-ANO-005

Meteorological Reports

Annual Meteorological Tower Data Reports for 2002 and 2003
Monthly Meteorological Tower Data Reports for January 2004 - May 2004

Calibrations

MT&E No. CRO020 Rotometer (Air Flow 0 to 40 LPM) Calibration Report, 08/08/03
Work Order Package 50968238-01, "Semi-Annual Meteorological Monitoring Calibration"

Corrective Action Documents (Condition Reports)

ANO-1-2002-01875, ANO-2-2002-01338, ANO-2-2002-01638, ANO-2-2003-01302,
ANO-C-2002-00402, ANO-C-2002-00672, ANO-C-2002-00845, ANO-C-2002-00849,
ANO-C-2002-00967, ANO-C-2003-00082, ANO-C-2003-00283, ANO-C-2003-00394,
ANO-C-2003-00421, ANO-C-2003-00487, ANO-C-2003-00758, ANO-C-2004-00037,
ANO-C-2004-00391, ANO-C-2004-00600, ANO-C-2004-00900, ANO-C-2004-00969,
ECH-2003-00089

Arkansas Nuclear One Site Procedures

1000.031	Radiation Protection Manual, Change Number 019-03-0
1012.018	Administration of Radiological Surveys, Change Number 006-03-0
1012.020	Radioactive Material Control, Change Number 006-05-0
1012.028	Radiation Protection Records Management, Change Number 005-01-0
1303.077	Air Rotometer Calibration, Revision 4
1304.062	Meteorological Monitoring System Calibration, Change Number 012-00-0
1608.005	Environmental Radiation Monitoring Program, Change Number 028-02-0
RPD-7	Radioactive Material Control, Revision 1

SUMMARY OF FINDINGS

IR 05000313/2004-09, 05000368/2004-09; Arkansas Nuclear One, Units 1 and 2; Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems; Radioactive Material Processing and Transportation; Radioactive Material Control Program

The report covered a one week period of inspection on site by a team of four region-based health physics inspectors. Two findings of very low safety significance (Green) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process," (SDP). Findings for which the SDP 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 and Self-Revealing Findings

Cornerstone: Public Radiation Safety

G. Kuzo (4640)

PIM NRC NCV PRS July 22, 2004 71122.01
Failure to Calibrate Select Unit 1 Effluent Process Monitors In Accordance with ODCM Requirements

- Green. The team identified a non-cited violation of Unit 1 Technical Specification 5.5.4 because the licensee failed to calibrate selected effluent monitoring instrumentation in accordance with Offsite Dose Calculation Manual specifications. Specifically, the liquid radioactive waste monitor (RE-4642) and the waste gas holdup system monitor (RE-4830) were not calibrated across the full range of energies that the instruments would be expected to detect. Additionally, the licensee's calibration process for these monitors did not establish that the channel outputs responded with an acceptable range and accuracy to the primary or secondary calibration sources. The licensee used a radioactive source to qualitatively verify that the monitor identified the primary calibration source energy peak but did not require a quantitative response. The finding was placed into the licensee's corrective action program.

The finding is more than minor because it was associated with the Public Radiation Safety Cornerstone plant equipment/process radiation monitoring attribute and affected the associated cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain. The finding had very low safety significance because: (1) the finding did not involve radioactive material control, (2) it involved the effluent release program, (3) it impaired the licensee's ability to assess dose, (4) it did not result in the licensee's failure to assess dose because the licensee was able to assess dose by alternate means, and (5) doses did not exceed 10 CFR Part 50, Appendix I, values (Section 2PS1).

D. Carter (4640)

PIM SELF NCV PRS

July 22, 2004

71122.02

Radioactive Shipment Package Exceeded 10 CFR 71.47 Radiation Limits

- Green. The team reviewed a self-revealing, non-cited violation of 10 CFR 71.47 resulting from the licensee's failure to correctly prepare a radioactive shipment so that dose rates did not exceed regulatory limits. Specifically, on March 24, 2003, the licensee was notified by a shipment recipient that the contact radiation dose rate of a package exceeded 200 millirem per hour. A contact radiation dose rate of 380 millirem per hour was identified on the bottom of the package. However, the accessible radiation levels to the public from underneath the flatbed trailer were only 70 millirem per hour. The finding was placed into the licensee's corrective action program.

The finding was greater than minor because it is associated with the Public Radiation Safety Cornerstone attribute of Program and Process and affected the associated cornerstone objective (to ensure adequate protection of public health and safety from exposure to radioactive materials). The finding had very low safety significance because: (1) it involved radioactive material control, (2) it was a transportation issue, (3) external radiation levels were exceeded, (4) dose rates in excess of regulatory limits were not accessible to the public, and (5) the radiation levels did not exceed two times the federal limits. This finding also had crosscutting aspects associated with human performance (Section 2PS2).

B. Licensee Identified Violation

A violation of very low safety significance (Green) which was identified by the licensee was reviewed by the team. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7.