



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

June 30, 2006

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

**SUBJECT: ARKANSAS NUCLEAR ONE - NRC RADIATION SAFETY TEAM INSPECTION
REPORT 05000313/2006009 AND 05000368/2006009**

Dear Mr. Forbes:

On June 8, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One, Units 1 and 2, facility. The enclosed 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

On the basis of the results of this inspection, no findings of significance were identified.

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

Entergy Operations, Inc.

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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 05000313/2006009 and 05000368/2006009
w/attachment: Supplemental Information

cc e/encl:
Senior Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

Vice President
Operations Support
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

Manager, Washington Nuclear Operations
ABB Combustion Engineering Nuclear
Power
12300 Twinbrook Parkway, Suite 330
Rockville, MD 20852

County Judge of Pope County
Pope County Courthouse
100 West Main Street
Russellville, AR 72801

Winston & Strawn LLP
1700 K Street, N.W.
Washington, DC 20006-3817

Entergy Operations, Inc.

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Bernard Bevill
Radiation Control Team Leader
Division of Radiation Control and
Emergency Management
Arkansas Department of Health
4815 West Markham Street, Mail Slot 30
Little Rock, AR 72205-3867

James Mallay
Director, Regulatory Affairs
Framatome ANP
3815 Old Forest Road
Lynchburg, VA 24501

Electronic distribution by RIV:
 Regional Administrator (**BSM1**)
 DRP Director (**ATH**)
 DRS Director (**DDC**)
 DRS Deputy Director (**RJC1**)
 Senior Resident Inspector (**RWD**)
 Branch Chief, DRP/E (**DNG**)
 Senior Project Engineer, DRP/E (**VGG**)
 Team Leader, DRP/TSS (**RLN1**)
 RITS Coordinator (**KEG**)
 DRS STA (**DAP**)
 S. O'Connor, OEDO RIV Coordinator (**SCO**)
ROPreports
 ANO Site Secretary (**VLH**)

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

Dockets: 50-313, 50-368

Licenses: DPR-51, NPF-6

Report: 05000313/2006009 and 05000368/2006009

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

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

Dates: June 5 - 8, 2006

Inspectors: Larry Ricketson, P.E., Senior Health Physicist, Plant Support Branch
Bernadette Baca, Health Physicist, Plant Support Branch
Gilbert Guerra, Health Physicist, Plant Support Branch
Donald Stearns, Health Physicist, Plant Support Branch
Binesh Tharakan, Health Physicist, Plant Support Branch

Accompanied By: Joe Furia, Senior Health Physicist, Region I

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

Enclosure

SUMMARY OF FINDINGS

IR 05000313/2006009, 05000368/2006009; 6/05/06-6/08/06; Arkansas Nuclear One, Units 1 and 2; Radiation Safety Team

The report covered a four-day period of inspection on site by a team of five region-based health physics inspectors.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee Identified Violations

None

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 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
- Self-assessments, audits, and Licensee Event Reports
- 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

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

- 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; 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, release of radioactive liquid and gaseous effluent, and radioactive liquid and gaseous effluent release permits and dose projections to members of the public
- Changes made by the licensee to the Offsite Dose Calculation Manual, 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
- Licensee event reports, special reports, audits, self-assessments and corrective action reports performed since the last inspection
- Program for identifying contaminated spills and leakage and the licensee's process for control and assessment; licensee's understanding of the location and

construction of underground pipes and tanks and storage pools that contain radioactive contaminated liquids; the licensee's capabilities of detecting spills or leaks and identifying groundwater radiological contamination both on site and beyond the owner-controlled area

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

- Abnormal releases

The inspector completed 11 of the required 11 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 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 nonexcepted package shipments
- Licensee event reports, special reports, audits, state agency reports, self-assessments and corrective action reports performed since the last inspection

The inspector completed 6 of the required 6 samples.

b. Findings

No findings of significance were identified.

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, 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
- 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 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
- Licensee event reports, special reports, 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:

- Collection and preparation of environmental samples

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

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)

a. Findings and Observations

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

On June 8, 2006, the team presented the inspection results to Mr. J. Forbes, Vice President Operations, and other members of the staff who acknowledged the findings. The team confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

D. Calloway, Environmental Specialist, Chemistry
G. Carothers, Journeyman Instrument Technician, Instrument and Control
G. Damron, Health Physicist, Radiation Protection
J. Forbes, Vice President Operations
M. Frala, Supervisor, Chemistry
A. Hawkins, Specialist, Licensing
P. Killane, Health Physicist, Radiation Protection
D. Marvel, Supervisor, Radiation Protection
M. McCullah, Technician, Radiation Protection
T. Mitchell, General Manager, Plant Operations
D. Moore, Superintendent, Radiation Protection
D. Norman, Health Physicist, Radiation Protection
G. Stephenson, Specialist, Chemistry
J. Tarvin, Supervisor, Instrument and Control
T. Wilkins, Maintenance Instrument and Control Specialist-Nuclear, Maintenance
M. Frala, Supervisor, Chemistry

NRC personnel

E. Crowe, Resident Inspector
J. Kirkland, Project Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Opened and Closed During this Inspection

NONE

LIST OF DOCUMENTS REVIEWED

Section 20S3: Radiation Monitoring Instrumentation and Protective Equipment

Audits and Self-Assessments

LO-ALO-2005-00090, CA-10

Calibration Maintenance and Work Orders

50276702, 50284608, 50618122, 50966818, 50966819, 50966887, 50967879, 51000710, 51001238

Condition Reports

CR-ANO-1-2004-01629, CR-ANO-1-2004-01740, CR-ANO-1-2005-02928, CR-ANO-1-2006-00735

CR-ANO-2-2004-01476, CR-ANO-2-2005-01942, CR-ANO-2-2005-02310, CR-ANO-2-2006-00281, CR-ANO-2-2006-00360

CR-ANO-C-2004-01077, CR-ANO-C-2004-01975, CR-ANO-C-2005-01108, CR-ANO-C-2006-00079

CR-ECH-2004-00392, CR-ECH-2004-00573

Instrument Calibration Reports

11082, 11345, AMS4-006, AMS4-039, AMS4-042, EMP-003, EMP-010, GN006, GN008, GSAM003, GSAM005, HP-CS-011, PCM012, PCM013, PING002, PING006,

WBC HSS#026 (1) and (2) Calibration Certificate dated August 10 - 12, 2005
WBC HSS#026 (1) and (2) Calibration Certificate dated August 24 - 26, 2004

Procedures

08-S-10-11, Calibration of Portable Scalers, Revision 3
1313.009, Calibration of the Eberline PING-1A Air Monitor System, Revision 6
1313.029, RADECO Model HD-29 Air Sampler Calibration, Revision 5
1313.056, Calibration of the Eberline Model EC4-3 Portable Area Monitor, Revision 4
1313.057, NEA Model SAM9/11 Small Article Monitor Calibration, Revision 2
1313.065, Eberline Model AMS-4 Beta Particulate Monitor Calibration, Revision 3
2304.133, Unit 2 High Range Containment Radiation Monitor Calibration, Revision 10
2304.143, PASS Building Area Radiation Monitoring System Calibration, Revision 5
2304.265, Unit 1 & 2 Control Room Radiation Monitor 18 Month Test, Revision 6
ENS-RP-306, Operation and Calibration of the Eberline PM-7, Revision 3
ENS-RP-307, Operation and Calibration of the Eberline Personnel Contamination Monitors (PCM), Revision 4
ELP-GET-RPT, Respiratory Protection Training, Revision 1
EPF-GET-RPT, Respiratory Protection Practical Factor Guide, Revision 2
RP-502, Inspection and Maintenance of Respiratory Protection Equipment, Revision 5

Miscellaneous

Personnel Listing of Positive Whole-Body Counts
Radiation Protection Shift Turnover Log
List of operators and respiratory protection training dates

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

Calibration Maintenance and Work Orders

50618124, 50685568, 50966681, 50981160, 50982449, 50993325

Procedures

1304.027, Unit 1 Effluent Process Radiation Monitor Calibration, Revision 19
2304.006, Unit 2 Gaseous Process Radiation Monitoring System Calibration, Revision 17
2304.141, Calibration of PASS Building 2RX-9840 (SPING 9), Revision 22

Procedures

1042.003, Radiochemistry Routine Surveillance Schedule and Tech. Spec. Reporting, Revision 018-02
1604.015, Analysis of Unit Vents, Revision 014-05
1604.017, Analysis of Liquid Waste, Revision 018-04
1607.009, Sampling the Treated Waste Monitor Tanks, Revision 011-03
2607.010, Sampling the Unit 2 Vents, Revision 011-01

Condition Reports

CR-ANO-C-2004-1069, CR-ANO-C-2004-1070, CR-ANO-C-2004-1266, CR-ANO-1-2004-1941, CR-ANO-2-2004-1344, CR-ANO-2-2004-2168, CR-ANO-C-2005-1381, CR-ANO-1-2005-0746, CR-ANO-1-2005-0791, CR-ANO-1-2005-0970, CR-ANO-1-2005-1363, CR-ANO-1-2005-1411, CR-ANO-2-2005-0061, CR-ANO-2-2005-2279, CR-ANO-C-2006-0501

Audits and Surviellances

QA-6-2005-ANO-1, Quality Assurance Audit Report, Nuclear Effluents and Environmental Monitoring, August 26, 2005
QA-2-2004-ANO-1, Quality Assurance Audit Report, Chemistry, December 7, 2004
O2C-ANO-2005-0144, Oversight Observation
LO-ALO-2005-00090, CA-10, Radiation Safety Assessment

Release Permits

1LR2004-0118 T16B, Treated Waste Monitor Tank, July 4, 2004
1LR2004-0128 T16A, Treated Waste Monitor Tank, August 3, 2004
1LR2005-0034 T50, Neutralization Tank, March 29, 2005
1LR2005-0149, Condensate Reject to Flume, October 6, 2005
2LR2004-0045 2T69B, Boric Acid Condensate Tank, July 8, 2004
2LR2005-0084 2TB, Sump, October 7, 2005
2LR2005-0029 2T92C, Regenerative Waste Tank, March 19, 2005
1GR2004-0081 RWA, Radwaste Area Vent, July 29, 2004
1GR2005-0028 FHA, Fuel Handling Area Vent, March 24, 2005

1GR2005-0136 FHA, Fuel Handling Area Vent, October 13, 2005
2GR2004-0083 2RWA, Radwaste Area Vent, July 27, 2004
2GR2005-0026 2RWA, Radwaste Area Vent, March 8, 2005
2GR2005-0133 2ABE, Aux Building Ext Vent, October 20, 2005
2GR2005-0145 2RWA, Radwaste Area Vent, November 15, 2005
2GR2006-0072 2RWA, Radwaste Area Vent, June 6, 2006
2GR2006-0073 2FHA, Fuel Handling Area Vent, June 6, 2006

Air Filtration Testing

5120.413, In-Place Testing of the Unit 1 Fuel Handling Area Filtration System, Change 003-02-0
(3/22/06)
5120.423, In-Place Testing of the Unit 2 Fuel Handling Area Filtration System, Change 005-00-0
(4/19/06)
5120.415, In-Place Testing of the Unit 1 Control Room Filtration System, Change 005-00-0
(9/12/05)
5120.417, In-Place Testing of the Unit 1 Penetration Room Filtration Systems, Change 003-02-0
(4/19/05)

Other Documents

Annual Radioactive Effluent Release Report for 2004
Annual Radioactive Effluent Release Report for 2005
Offsite Dose Calculation Manual, Arkansas Nuclear One, Revision 014-03-0
2004 Count Room QC Reports Trend Plots
2005 Count Room QC Reports Trend Plots

Section 2PS2: Radioactive Material Processing and Transportation

Condition Reports

LO-ALO-2004-00164, CR-ANO-C-2005-00008, CR-ANO-C-2005-00594,
CR-ANO-C-2005-01519, CR-ANO-C-2005-02151, CR-ANO-C-2005-02153,
CR-ANO-C-2005-02073, CR-ANO-C-2006-00809, CR-ECH-2006-00174

Procedures

EN-RW-101, Radioactive Waste Management, Revision 0
EN-RW-102, Radioactive Shipping Procedure, Revision 3
EN-RW-104, Scaling Factors, Revision 2
EN-RW-105, Process Control Program, Revision 0
EN-RW-106, Integrated Transportation Security Plan, Revision 0
ENS-RP-121, Radioactive Material Control, Revision 1
1601-502, Radioactive Material Control at Radwaste, Revision 3
1601.503, Radioactive Material Packaging, Revision 2
1601.505, Processing of Spent Radioactive Resin, Revision 3

Audits and Assessments

Quality Assurance Audit Report AQ-15-2005-ENS-1

Shipment Packages (Shipment #)

RSR-04-037, RSR-04-051, RSR-05-087, RSR-06-008, RSR-06-044, RSR-06-045,
Fuel 01-06

Miscellaneous

2006 ANO Radwaste Part 61, Sample Validation and Database Update Reports
ANO-S-LP-HZM-C5001, Hazardous Materials Training, Revision 1

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

Condition Reports

ANO-C-2004-01181, ANO-C-2005-00053, ANO-C-2005-00080, ANO-C-2005-00564,
ANO-C-2005-01053, ANO-C-2005-01573, ANO-C-2005-01578, ANO-C-2005-01579,
ANO-C-2005-01608, ANO-C-2006-00323, ANO-C-2006-00372, and ANO-1-2006-00035.

Procedures

ENS RP-121, Radioactive Material Control, Revision 1
1052.003, Nuclear Chemistry Quality Control Program, Change Number 020-02-0
1303.077, Air Rotometer Calibration, Revision 4
1304.062, Meteorological Monitoring System Calibration, Change 012-00-0
1608.005, Environmental Radiation Monitoring Program, Change Number 028-03-0

Calibration Records

M&TE No. CRO029, Rotometer (Air Flow 0 to 40 LPM) Calibration Report, 10/31/05
Meteorological instruments, 10/26/05

Audits

LO-ALO-2005-0058, LO-ALO-2005-0090, LO-ANO-2006-0052, QA-6-2005-ANO-1

Miscellaneous

Annual Radiological Environmental Operating Report for 2004
Annual Radiological Environmental Operating Report for 2005
Offsite Dose Calculation Manual, Revision 014-03-0