



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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February 29, 2000

Randal K. Edington, Vice President - Operations
River Bend Station
Entergy Operations, Inc.
P.O. Box 220
St. Francisville, Louisiana 70775

SUBJECT: NRC INSPECTION REPORT NO. 50-458/00-06

Dear Mr. Edington:

This refers to the inspection conducted on February 7-10, 2000, at the River Bend Station facility. The purpose of the inspection was to review the radioactive waste effluent program. The enclosed report presents the results of this inspection.

We found that this program was correctly implemented.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

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

Docket No.: 50-458
License No.: NPF-47

Enclosure:
NRC Inspection Report No.
50-458/00-06

Entergy Operations, Inc.

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 NPG1 River Bend RI
 PJS River Bend Site Secretary
 NBH RITS Coordinator
 EWM Regional Administrator
 KEB DRP Director
 ATH DRS Director
 GMG C:DRS/PSB
 WDJ Branch Chief (DRP/B)
 RAK1 Sr. Project Engineer (DRP/B)
 RVA Project Engineer
 LAY Branch Chief (DRP/TSS)
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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-458
License No.: NPF-47
Report No.: 50-458/00-06
Licensee: Entergy Operations, Inc.
Facility: River Bend Station
Location: 5485 U.S. Highway 61
St. Francisville, Louisiana
Dates: February 7-10, 2000
Inspectors: Larry Ricketson, P.E., Senior Radiation Specialist
Plant Support Branch
Daniel R. Carter, Radiation Specialist
Plant Support Branch
Approved By: Gail M. Good, Chief, Plant Support Branch
Division of Reactor Safety
Attachment: Supplemental Information

EXECUTIVE SUMMARY

River Bend Station NRC Inspection Report No. 50-458/00-06

This announced, routine inspection reviewed engineered-safety-feature-filter ventilation system in-place filter testing program; implementation of the liquid, gaseous, and particulate radioactive effluent monitoring program; effluent radiation monitor calibrations; and quality assurance oversight.

Plant Support

- The licensee's engineered-safety-feature filtered ventilation systems were properly designed and maintained (Section M2.1).
- The engineered-safety-feature filter testing program was correctly implemented. The engineered-safety-feature filtered ventilation systems were routinely tested within the intervals required by Technical Specifications. Test procedures followed regulatory guidance. Testing personnel were properly trained. Test results met regulatory requirements. The licensee followed the instructions of NRC Generic Letter 99-02 (Section M3.1).
- The licensee properly implemented its radioactive effluent management program. Radioactivity in effluent releases and associated doses were within regulatory limits. The licensee's radioactive effluent sampling, analysis, and dose projection program met the requirements of the Offsite Dose Calculation Manual (Section R1.1).
- The licensee calibrated the effluent radiation monitors correctly and maintained them well. Monitor setpoints were calculated using proper Offsite Dose Calculation Manual methodology; however, some setpoint calculation inputs may have been nonconservative (Section R2.1).
- An infrequently-used radiation health physics procedure was poorly written because it did not define all the variables used for manually calculating dose rates from gaseous effluents (Section R3.1).
- The radioactive effluent monitoring program was audited as required in 1998. Audit team members had appropriate technical expertise and provided performance-based findings and recommendations (Section R7).

Report Details

II. Maintenance

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Engineered-Safety-Feature Filtered Ventilation Systems

a. Inspection Scope (84750)

With the engineered-safety-feature ventilation system engineer, the inspectors performed visual inspections of the control room fresh air, standby gas treatment, and fuel building ventilation systems.

b. Observations and Findings

There was no obvious physical damage to the air cleaning systems that would have prevented them from performing their required functions. The air cleaning equipment appeared to have been properly maintained. Redundant systems were available, as required. Permanent test ports for in-place filter testing were installed and relatively easy to access. The engineered-safety-feature filtered ventilation systems met the general design criteria outlined in Regulatory Guide 1.52, Revision 2, and ASME N509-1980.

c. Conclusions

The licensee's engineered-safety-feature filtered ventilation systems were properly designed and maintained.

M3 Maintenance Procedures and Documentation

M3.1 Engineered-Safety-Feature Filtered Ventilation System Equipment Testing Results

a. Inspection Scope (84750)

The inspectors interviewed the engineered-safety-feature ventilation system engineer and reviewed the following records:

- High efficiency particulate air filter and charcoal adsorber in-place testing results
- Laboratory test results of charcoal adsorber samples
- Selected training records

b. Observations and Findings

The engineered-safety-feature ventilation system engineer was primarily responsible for all engineered-safety-feature filter in-place testing. The inspectors confirmed by

reviewing training records that the system engineer had received specialized training to perform the in-place filter tests.

Through a review of test results, the inspectors confirmed that the licensee complied with Technical Specification 5.5.7, "Ventilation Filter Testing Program," and Technical Requirement 5.5.7, which supplements the Technical Specification.

The licensee's surveillance procedures for in-place testing of high efficiency particulate air filters and charcoal adsorbers implemented the guidance in Regulatory Guide 1.52, Revision 2, and ANSI/ASME N 510-1989. The licensee performed surveillances on the air cleaning systems once per 18 months and demonstrated that high efficiency particulate air filters and charcoal adsorbers met the Technical Specification acceptance criteria for penetration and bypass.

The inspectors confirmed that the licensee had responded to NRC Generic Letter 99-02 within the required 180 days and submitted a request to amend its Technical Specifications to reference ASTM D3803-1989. The inspectors also confirmed that laboratory testing of charcoal samples performed 60 or more days after the date of the generic letter was performed in accordance with ASTM D3803-1989.

c. Conclusions

The engineered-safety-feature filter testing program was correctly implemented. The engineered-safety-feature filtered ventilation systems were routinely tested within the intervals required by Technical Specifications. Test procedures followed regulatory guidance. Testing personnel were properly trained. Test results met regulatory requirements. The licensee followed the instructions of NRC Generic Letter 99-02.

IV. Plant Support

R1 Radiation Protection and Chemistry Controls

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

a. Inspection Scope (84750)

The inspectors interviewed licensee personnel and reviewed the following documentation:

- 1998 annual effluent release report
- Release permits
- Quarterly and monthly sampling results

b. Observations and Findings

From the latest annual report effluent release report, the inspectors determined that radioactivity concentrations and calculated personnel doses resulting from the release of

radioactive effluents were below regulatory limits and did not exceed the commitments within the Final Safety Analysis Report.

The inspectors reviewed sampling results and confirmed that sampling was performed in accordance with Tables 3.11.1.1-1 and 3.11.2.1-1 of the Offsite Dose Calculation Manual.

The cognizant radiation protection technical specialist demonstrated manual calculation methods to the inspectors to verify examples of computer-generated, dose calculation results. The specialist successfully verified both liquid and gaseous effluent dose calculation examples. The inspectors concluded that the licensee correctly calculated the cumulative dose contributions from liquid and gaseous radioactive effluents once per 31 days in accordance with the methodologies and parameters in the Offsite Dose Calculation Manual.

c. Conclusions

The licensee properly implemented its radioactive effluent management program. Radioactivity in effluent releases and associated doses were within regulatory limits. The licensee's radioactive effluent sampling, analysis, and dose projection program met the requirements of the Offsite Dose Calculation Manual.

R2 Status of Radiation Protection and Chemistry Facilities and Equipment

R2.1 Effluent Radiation Monitors

a. Inspection Scope (84750)

The inspectors interviewed licensee personnel and reviewed the following items related to the effluent radiation monitors:

- Physical condition
- Calibrations
- Setpoint calculations

b. Observations and Findings

The inspectors toured the licensee's facility and observed the effluent radiation monitors. The monitors were operational and appeared to be well maintained. The inspectors reviewed effluent monitor calibration records and determined that the licensee calibrated the effluent radiation monitors within the required intervals.

The inspectors also reviewed the licensee's use of effluent monitor setpoints. Alarm and trip setpoints were used by the licensee to ensure that regulatory release limits were not exceeded. Technical Specification 5.5.1.a requires that methodology from the Offsite Dose Calculation Manual be used to calculate effluent monitor alarm setpoints and trip setpoints. Offsite Dose Calculation Manual, Sections 7 and 8 established the methods for calculating monitor setpoints for liquid and gaseous monitors, respectively.

The inspectors reviewed gaseous effluent monitor setpoint calculations and verified that the setpoints installed matched the calculated values. Since gaseous effluent release was a continuous process, the setpoint values did not change routinely. However, because liquid effluents were released in batches, the liquid effluent monitor setpoint was calculated and installed for each release. The licensee normally used a computer code to prepare release permits and to calculate the appropriate liquid effluent monitor setpoint. However, at the inspectors' request, a cognizant chemistry specialist demonstrated the manual method of calculating a liquid effluent monitor setpoint, using Chemistry Procedure CSP-0110, "Radioactive Liquid Effluent Batch Discharge," Revision 14.

Chemistry Procedure CSP-0110 implemented the Offsite Dose Calculation Manual method of calculating the liquid effluent monitor setpoint. The setpoint was calculated using the formula:

$$\text{Alarm setpoint} = (M)(A)(g)(f_1 + f_2)/(R)(f_1)$$

where

M = a setpoint adjustment factor

A = the sum of the concentrations of gamma-emitting radionuclides in the sample, as measured in the laboratory

g = the ratio of the liquid effluent radiation monitor reading to the laboratory analysis of radionuclide concentrations in the liquid to be released

f₁ = undiluted release rate

f₂ = cooling tower blowdown release rate

R = effluent concentration limit fraction sum in the recovery sample tank

The chemistry specialist's manual calculation results verified the computer-generated setpoint value that had been used for the selected liquid batch release. However, the chemistry specialist did not know where the value of "g" originated. The g value used by the specialist was recorded on a data board in the chemistry offices. The inspectors determined that the same g value was used in the licensee's computer code, and it had been used repetitively since January 1994. Since the g value was dependent on a laboratory analysis of the radionuclide mix within the liquid effluent stream, this meant that the licensee assumed that the radionuclide relative abundances had not changed since that time. The inspectors noted that the licensee had experienced leaking fuel problems since 1994. The fuel leaks could have affected the assumed radionuclide mix, making the g value incorrect. In turn, an incorrect g value could have resulted in a nonconservative monitor setpoint. The licensee agreed that it would be prudent to review the matter and initiated Condition Report 2000-0273 to document the situation. The use of a potentially nonconservative monitor alarm setpoint would not be a regulatory issue, unless it led to the release of radioactivity in excess of the allowable limits.

c. Conclusions

The licensee calibrated the effluent radiation monitors correctly and maintained them well. Monitor setpoints were calculated using proper Offsite Dose Calculation Manual methodology; however, some calculation inputs may have been nonconservative.

R3 Radiological Protection and Chemistry Procedures and Documentation

a. Inspection Scope (84750)

The inspectors reviewed the radiation protection and chemistry procedures listed in the attachment to this report.

b. Observations and Findings

When the cognizant technical specialist verified the computer-generated gaseous effluent dose calculations through manual calculations (Section R1), the specialist used Radiation Health Physics Procedure RHP-0032, "Dose Rate Calculations from Gaseous Effluents," Revision 6. The inspectors reviewed the procedure and noted the following omissions and lack of guidance.

- A formula for the calculation of the release rate for a specific isotope contained an undefined variable. The variable, ICF, was intended to be an instrument calibration factor; however, it was not discussed in the definition section or elsewhere in the procedure. The gaseous effluent dose could not be manually calculated without knowing how to determine this variable. Also, the formula used a conversion factor without explaining its origin or its units.
- The formula for the calculation of the dose rates resulting from effluents released from the main stack, fuel building, and radwaste building contained an undefined factor. The factor, K_i , was intended to represent the nuclide specific dose transfer factor; however, the procedure did not define the factor and did not explain where to find a value for the factor.

The cognizant technical specialist was knowledgeable enough to complete the calculation correctly, despite the lack of procedural guidance. The inspectors noted that manual dose rate calculation was an infrequently performed task. Dose rates were routinely calculated using a computer code which calculated the instrument correction factors, performed unit conversions, and inserted the correct nuclide specific dose transfer factors.

c. Conclusions

An infrequently-used radiation health physics procedure was poorly written because it did not define all the variables used for manually calculating dose rates from gaseous effluents.

R7 Quality Assurance in Radiological Protection and Chemistry Activities

a. Inspection Scope (84750)

The inspectors interviewed quality assurance personnel and reviewed the following:

- 1998 quality assurance audit of the radioactive effluent management program
- Auditor qualifications
- Condition Reports

b. Observations and Findings

The inspectors reviewed the 1998 quality assurance audit report and noted that the audit team included members with practical knowledge of chemistry and radioactive effluent management. The audit scope was acceptably broad and the findings indicated a critical review. The audit findings were appropriately placed into the licensee's corrective action program.

c. Conclusions

The radioactive effluent monitoring program was audited as required in 1998. Audit team members had appropriate technical expertise and provided performance-based findings and recommendations.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at an exit meeting on February 10, 2000. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

- C. Fantacci, Senior Chemistry/Health Physics Specialist
- T. Hildebrandt, Maintenance Manager and Acting General Manager
- H. Holmes, Chemistry/Health Physics Specialist
- J. Holmes, Technical Support Manager
- A. Maryman, Chemistry Supervisor
- W. McDougald, Engineered-Safety-Feature Ventilation System Engineer
- D. Myers, Senior Licensing Specialist
- D. Pace, Engineering Director
- J. Parker, Radiation Monitor System Engineer
- C. Young, Chemistry/Health Physics Specialist

NRC

- T. Pruett, Senior Resident Inspector
- N. Garrett, Resident Inspector

INSPECTION PROCEDURES USED

84750 Radioactive Waste Systems

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

List of Condition Reports related to radioactive effluents and engineered-safety-feature air cleaning systems 1/01/99 to 2/01/00

Procedures

CSP-0100	Chemistry - Required Surveillances and Actions, Revision 18
CSP-0110	Radioactive Liquid Effluent Batch Discharge, Revision 14
RHP-0032	Dose Rate Calculation from Gaseous Effluents, Revision 6
RPP-0027	Gaseous Effluents Monitor Setpoint Determination, Revision 3A
RPP-0097	Manual Method of Determining Cumulative Dose Contributions from Liquid Effluents, Revision 6
RSP-0008	Offsite Dose Calculation Manual, Revisions 7 and 9
STP-402-3601	In Service Testing of Control Room Ventilation Filtration System
STP-406-6301	In Service Testing of Fuel Building Ventilation Filtration System
STP-257-3601	In Service Testing of Standby Gas Treatment Filtration System