



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

August 15, 2023

EA-23-071

Phil Hansett, Site Vice President
Entergy Operations, Inc.
5485 U.S. Highway 61N
St. Francisville, LA 70775

**SUBJECT: RIVER BEND STATION - FINAL SIGNIFICANCE DETERMINATION OF A
WHITE FINDING, NOTICE OF VIOLATION, AND FOLLOW-UP ASSESSMENT
LETTER; NRC INSPECTION REPORT 05000458/2023092**

Dear Phil Hansett:

This letter provides you the final significance determination of the preliminary White finding discussed with you and members of your staff during the telephonic exit briefing on July 18, 2023. The finding involved errors associated with calibration of radiation monitoring systems which introduced the potential to not classify radiological emergencies up to a General Emergency as well as inaccurate dose assessments.

Following the exit briefing, you informed Geoffrey Miller, Director (Acting), Division of Radiological Safety & Security, and members of the U.S. Nuclear Regulatory Commission (NRC) staff that you accept the violation, as described in the exit briefing, and the characterization of the finding as White, a finding of low to moderate safety significance. In addition, you declined the opportunity to discuss this issue in a regulatory conference or to provide a written response, and understood that NRC Inspection Manual Chapter 0609, Attachment 2 appeal rights only apply to those licensees that have either attended a regulatory conference or submitted a written response to a preliminary determination letter.

After considering the information developed during the inspection, the NRC has concluded that the finding is appropriately characterized as White. The NRC has also determined that the failure to maintain the effectiveness of an emergency plan that met the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix E, and the planning standards of 10 CFR 50.47(b), is a violation of 10 CFR 50.54(q)(2) as cited in Enclosure 1, Notice of Violation (Notice). The circumstances surrounding the violation are described in the inspection report, Enclosure 2. In accordance with the NRC Enforcement Policy, the Notice is considered an escalated enforcement action because it is associated with a White finding.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

The NRC evaluated the finding in accordance with Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," to determine if the finding meets the criteria for an old design issue. The NRC determined that the finding did not meet the criteria for an old design issue because this finding involves calibration of radiation monitoring systems and the associated impacts on emergency action level classification and dose assessment that were introduced during system updates in the 2008 time period. The performance deficiency, which was the proximate cause of the degraded condition, involved a widely known issue that was shared through industry operating experience where your staff had opportunities between 2008 and 2023 to identify and correct. Therefore, this finding will be treated similar to any other inspection finding, and additional NRC actions will be taken in accordance with the Action Matrix.

As a result of our review of the River Bend Station's performance, including this White finding, we have assessed that the performance of River Bend Station continues to be in the Regulatory Response column of the NRC's Action Matrix, effective the second quarter of 2023. We had previously assessed the performance of the River Bend Station to be in the Regulatory Response column based on a White finding documented in our letter dated July 20, 2023, Agencywide Documents Access and Management System (ADAMS) Accession No. ML23187A639. Therefore, we plan to conduct a supplemental inspection using Inspection Procedure 95001, "Supplemental Inspection Response to Action Matrix Column 2 (Regulatory Response) Inputs," when your staff has notified us of your readiness for this inspection. This inspection procedure is conducted to provide assurance that the root cause and contributing causes of risk significant performance issues are understood, the extent of condition and the extent of cause are identified, and the corrective actions are sufficient to prevent recurrence.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room and from the NRC's ADAMS, accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

If you have any questions concerning this matter, please contact Geoffrey Miller of my staff at 817-200-1180.

Sincerely,



Signed by Monninger, John
on 08/15/23

John D. Monninger
Regional Administrator

Docket No. 05000458
License No. NPF-47

Enclosures:

1. Notice of Violation
2. Inspection Report 05000458/2023092

RIVER BEND STATION - FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING, NOTICE OF VIOLATION, AND FOLLOW-UP ASSESSMENT LETTER; NRC INSPECTION REPORT 05000458/2023092 – DATED AUGUST 15, 2023

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ARiveraVarona, DRSS	KBrock, NSIR	MWaters, NSIR

ADAMS ACCESSION NUMBER: **ML23201A132**

SUNSI Review: ADAMS: Non-Publicly Available Non-Sensitive Keyword:
 By: JGK Yes No Publicly Available Sensitive

OFFICE	SES:ACES	TL:ACES	EPI:RCB	C:RCB	RC	C:PBC
NAME	JKramer	JGroom	HStrittmatter	BAlferink	DCylkowski	DProulx
SIGNATURE	/RA/ E	/RA/ E	/RA/ E	/RA/ E	/RA/ E	/RA/ E
DATE	07/20/23	07/21/23	07/20/23	07/25/23	07/25/23	07/25/23
OFFICE	NSIR	OE	NRR	D:DORS	DD:DRSS	RA
NAME	MWaters	JPeralta	RFelts	MHay	ARiveraVarona	JMonninger
SIGNATURE	/RA/ E	/RA/ E	/RA/ E	/RA/ E	/RA/ E	/RA/ E
DATE	08/03/23	08/04/23	08/02/23	08/07/23	08/07/23	08/15/23

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NOTICE OF VIOLATION

Entergy Operations, Inc.
River Bend Station

Docket No. 05000458
License No. NPF-47
EA-23-071

During an NRC inspection conducted from April 12 to July 18, 2023, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50.54(q)(2) requires, in part, that a holder of a license under 10 CFR Part 50 shall follow and maintain the effectiveness of an emergency plan that meets the requirements in 10 CFR Part 50, Appendix E, and the planning standards of 10 CFR 50.47(b).

10 CFR 50.47(b)(4) requires, in part, that a standard emergency classification and action level scheme is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

10 CFR 50.47(b)(9) requires, in part, that adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

Contrary to the above, from December 4, 2008, to May 22, 2023, the licensee failed to follow and maintain the effectiveness of an emergency plan which met the requirements in 10 CFR Part 50 Appendix E and the planning standards of 10 CFR 50.47(b).

Specifically, the licensee failed to maintain a standard emergency classification scheme as required by 10 CFR 50.47(b)(4) because RMS-RE125 (Main Plant Exhaust Primary), RMS-RE126 (Main Plant Exhaust Secondary), RMS-RE5A (Fuel Building Ventilation Primary), RMS-RE6A (Radwaste Building Vent Primary), and RMS-RE107 (Liquid Radwaste Effluent) had errors causing them to read lower values than they should causing emergency action levels up to the General Emergency level to be ineffective. In addition, the licensee failed to use adequate methods, systems, and equipment for assessing and monitoring actual and potential offsite consequences of a radiological emergency as required by 10 CFR 50.47(b)(9), because those same errors, excluding RMS-RE107 since it is not used for dose assessment, would result in inaccurate dose assessments for a radiological release through the main plant exhaust, fuel building, and radwaste building paths.

This violation is associated with a White significance determination process finding.

Pursuant to 10 CFR 2.201, Entergy Operations, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 1600 East Lamar Blvd., Arlington, Texas 76011-4511, and the NRC Resident Inspector at the River Bend Station, and email it to R4Enforcement@nrc.gov within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation, EA-23-071" and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved.

Your response may reference or include previous docketed correspondence if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, the NRC may issue an order or a demand for information requiring you to explain why your license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room and from the NRC's ADAMS, accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy or proprietary information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information).

Dated this 15th day of August 2023

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 05000458

License Number: NPF-47

Report Number: 05000458/2023092

Enterprise Identifier: I-2023-092-0002

Licensee: Entergy Operations, Inc.

Facility: River Bend Station

Location: St. Francisville, LA

Inspection Dates: April 12 to July 18, 2023

Inspectors: H. Strittmatter, Emergency Preparedness Inspector

Approved By: Beth S. Alferink, Chief (Acting)
Response Coordination Branch
Division of Radiological Safety and Security

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a NRC inspection at River Bend Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

Failure to Maintain Accurate EAL Thresholds and Dose Assessment Methods			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	White NOV 05000458/2023092-01 Open EA-23-071	None (NPP)	71114.05
The inspectors identified a finding of low to moderate safety significance (White) and associated violation of 10 CFR 50.54(q)(2). Specifically, the licensee failed to maintain the reliable and accurate indications on four Wide Range Gas Monitors (WRGMs) and one liquid effluent monitor: RMS-RE125 (Main Plant Exhaust Primary), RMS-RE126 (Main Plant Exhaust Secondary), RMS-RE5A (Fuel Building Ventilation Primary), RMS-RE6A (Radwaste Building Vent Primary), RMS-RE107 (Liquid Radwaste Effluent). This resulted in the potential to not classify a potential emergency condition up to a General Emergency, as well as to produce inaccurate dose assessments from December 4, 2008, to May 22, 2023.			

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71114.05 - Maintenance of Emergency Preparedness

Inspection Review (IP Section 02.01 - 02.11) (1 Partial)

(1) (Partial)

The inspectors reviewed information related to calibration issues with Radiation Monitoring System (RMS) used for emergency response. Specifically, on March 18, 2023, condition report CR-RBS-2023-02765 documented potential issues associated with the calibration of 11 RMS and application of engineering conversion factors. The issues were further evaluated in condition report CR-RBS-2023-04450, created on May 18, 2023, and five RMS, categorized as Equipment Important to Emergency Response (EITER), were discovered to have the wrong engineering conversion factors post detector replacement. Since these instruments have been used as part of the licensee's emergency action level (EAL) scheme, as well as for dose projection process, the NRC inspector evaluated the issues for emergency preparedness program impacts and non-compliances with NRC regulation.

INSPECTION RESULTS

Failure to Maintain Accurate EAL Thresholds and Dose Assessment Methods			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	White NOV 05000458/2023092-01 Open EA-23-071	None (NPP)	71114.05
<p>The inspectors identified a finding of low to moderate safety significance (White) and associated violation of 10 CFR 50.54(q)(2). Specifically, the licensee failed to maintain the reliable and accurate indications on four Wide Range Gas Monitors (WRGMs) and one liquid effluent monitor: RMS-RE125 (Main Plant Exhaust Primary), RMS-RE126 (Main Plant Exhaust Secondary), RMS-RE5A (Fuel Building Ventilation Primary), RMS-RE6A (Radwaste Building Vent Primary), RMS-RE107 (Liquid Radwaste Effluent). This resulted in the potential to not classify a potential emergency condition up to a General Emergency, as well as to produce inaccurate dose assessments from December 4, 2008, to May 22, 2023.</p> <p><u>Description:</u> On March 18, 2023, River Bend Station (RBS) staff conducted an extent of condition following the Waterford Steam Electric Station Unit 3 radiation monitor system</p>			

White finding and subsequent 95001 inspection. During this extent of condition, RBS staff identified that calibration and engineering conversion factors for four of the wide range gas monitors (WRGMs) and one of the Liquid Effluent Monitors, had been in error for various lengths of time (condition report CR-RBS-2023-02765). The errors were introduced when new detectors were installed. In industry forums in 2009, end users were informed that radiation detectors being replaced needed to adjust engineering conversion factors for the new device specific to the new radiation detector. The station had an opportunity to correct the issues with the 2008 installation and prevent all those since 2009 based on the information made available in the 2009 industry forums. The RMSs are used during implementation of EALs and the four WRGMs are also inputs to the radiological dose assessment modeling software used in emergency response.

- RMS-RE125, Main Plant Exhaust Primary, Mid-Range and High-Range Detectors – errors introduced in 2018 and 2020, used in EALs AU1.1, AA1.1, AS1.1, and AG1.1
- RMS-RE126, Main Plant Exhaust Secondary, Low-Range Detector – errors introduced in 2009, used in EALs AU1.1, and AA1.1
- RMS-RE5A, Fuel Building Ventilation Primary, Low/Mid/High-Range Detectors – errors introduced in 2009, 2011, and 2012 – used in EALs AU1.1, AA1.1, AS1.1, and AG1.1
- RMS-RE6A, Radwaste Building Vent Primary, Low-Range and Mid-Range Detectors – errors introduced in 2008 and 2019, used in EALs AU1.1, AA1.1, and AS1.1
- RMS-RE107, Liquid Radwaste Effluent, Low-Range Detector, error introduced in 2021, used in EAL AU1.1

The licensee evaluated the potential effects on EAL classification. Since all the errors would have caused the instruments to indicate lower than actual, this precludes an over classification and resultant unnecessary protective action recommendations to the offsite response organizations. However, there would have been significant delays in providing protective action recommendations to offsite response organizations. The licensee determined that a classification of the appropriate level (i.e., Unusual Event, Alert, Site Area Emergency, General Emergency) would have been made in a timely and accurate manner using other EAL thresholds. The inspectors reviewed the licensee's evaluation and determined that the licensee could have reasonably classified emergencies at the appropriate level in a timely and accurate manner using other EAL thresholds and plant indications.

Additionally, the four WRGMs provide inputs to the licensee's dose assessment model. The licensee concluded that they would indicate lower than actual by the below percentages.

- RMS-RE125: 60 to 66 percent lower than expected.
- RMS-RE126: 29 percent lower than expected.
- RMS-RE5A: 25 to 35 percent lower than expected.
- RMS-RE6A: 78 to 96 percent lower than expected.

Based on these errors, the inspectors concluded that during events involving the above RMSs that the licensee's dose projection process would have been incapable of providing technically adequate estimates of radioactive material releases to the environment or projected offsite doses in some cases.

Corrective Actions: The licensee corrected the engineering conversion and calibration factors for the RMSs on May 22, 2023. The licensee is conducting a root cause evaluation. The licensee is documenting the issues in the corrective action program.

Corrective Action References: Condition Report CR-RBS-2023-04450

Performance Assessment:

Performance Deficiency: The licensee failed to maintain correct function of the RMS equipment, which resulted in: a) not establishing and maintaining adequate emergency action levels (EALs), and b) the licensee was incapable of providing a technically adequate estimate of offsite doses using their dose assessment process. The effects adversely impacted the ability to classify a potential emergency condition associated with effluent releases accurately and in a timely manner, as well as the capability to accurately estimate offsite releases.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Facilities and Equipment attribute of the Emergency Preparedness cornerstone and adversely affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The cornerstone objective was adversely affected because the licensee may not implement adequate measures to protect the health and safety of the public if they fail to implement classifications or protective actions that are appropriate based on the given radiological conditions.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter (IMC) 0609 Appendix B, "Emergency Preparedness Significance Determination Process." Using IMC Chapter 0609, Attachment 4, Tables 1, 2, and 3 worksheets (effective date December 20, 2019); and the corresponding Appendix B, Attachment 2 (issue date September 22, 2015); the finding is a failure to comply with risk significant planning standards (RSPSs).

This finding is associated with risk significant planning standards 10 CFR 50.47(b)(4) and 10 CFR 50.47(b)(9), in addition to Appendix E to 10 CFR 50, IV.B, "Assessment Actions."

- For the 10 CFR 50.47(b)(4) issue, since the General Emergency would not be declared for a particular off-normal event, but because of other EALs, an appropriate declaration could be made in an accurate and timely manner, the finding is not a Loss of RSPS function nor a Degraded RSPS function (Green).

- For the 10 CFR 50.47(b)(9) issue, since there were some (but not all) cases in which the dose assessment process would be incapable of providing technically adequate estimates of real or projected radioactive material releases to the environment in some cases, the finding is not a Loss of RSPS function but rather a Degraded RSPS function (White).

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance. The cause of this issue occurred in 2008 and is not indicative of present performance.

Enforcement:

Violation: 10 CFR 50.54(q)(2) requires, in part, that a holder of a license under 10 CFR Part 50 shall follow and maintain the effectiveness of an emergency plan that meets the requirements in 10 CFR Part 50, Appendix E, and the planning standards of 10 CFR 50.47(b).

10 CFR 50.47(b)(4) requires, in part, that a standard emergency classification and action level scheme is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

10 CFR 50.47(b)(9) requires, in part, that adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

Contrary to the above, from December 4, 2008, to May 22, 2023, the licensee failed to follow and maintain the effectiveness of an emergency plan which met the requirements in 10 CFR Part 50 Appendix E and the planning standards of 10 CFR 50.47(b). Specifically, the licensee failed to maintain a standard emergency classification scheme as required by 10 CFR 50.47(b)(4) because RMS-RE125, RMS-RE126, RMS-RE5A, RMS-RE6A, and RMS-RE107 had errors causing them to read lower values than they should causing EALs up to the General Emergency level to be ineffective. In addition, the licensee failed to use adequate methods, systems, and equipment for assessing and monitoring actual and potential offsite consequences of a radiological emergency as required by 10 CFR 50.47(b)(9), because those same errors, excluding RMS-RE107 since it is not used for dose assessment, would result in inaccurate dose assessments for a radiological release through the main plant exhaust, fuel building, and radwaste building paths.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On July 18, 2023, the inspector presented the RMS issue inspection results to Phil Hansett, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71114.05	Corrective Action Documents	CR-RBS-2023-	04689, 02765, 02766, 02767, 02768, 04450	
	Miscellaneous		White Paper on EAL and Dose Assessment Evaluation	05/31/2023
			White Paper on Detector Replacement and Calibration	05/31/2023
			White Paper on EAL Evaluation	06/15/2023
			Enclosure 5 of License Amendment Request to Revise EAL Scheme to NEI 99-01 Revision 6	04/30/2018
		ML18128A052	Enclosure 1-4 of License Amendment Request to Revise EAL Scheme to NEI 99-01 Revision 6	04/30/2018
		ML18296A101	Response to Request for Additional Information for License Amendment Request, Adoption of Emergency Action Level Scheme Pursuant to NEI 99-01 Revision 6	10/18/2018
		ML19070A062	Issuance of License Amendment to Revise Emergency Action Levels to a Scheme Based on NEI 99-01, Revision 6	05/14/2019
	Procedures	EIP-2-001	Classification Of Emergencies	30
		EIP-2-024	Offsite Dose Calculations	27
		EN-EP-202	Equipment Important to Emergency Response (EITER)	4
		EN-EP-202-03	RBS EITER Matrix	0
		EPP-2-503	River Bend Station Equipment Important to Emergency Response (EITER)	7