



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

January 12, 2023

EA-22-119

John Ferrick, Site Vice President  
Entergy Operations, Inc.  
17265 River Road  
Killona, LA 70057

**SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – EMERGENCY  
PREPAREDNESS INSPECTION REPORT 05000382/2022091 AND  
PRELIMINARY WHITE FINDING**

Dear John Ferrick:

This letter refers to the inspection conducted from October 23 to December 7, 2022, by the U.S. Nuclear Regulatory Commission (NRC) at Waterford Steam Electric Station, Unit 3. The purpose of the inspection was to evaluate your emergency preparedness programs. On December 7, 2022, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

The enclosed report discusses a preliminary White finding (i.e., a finding with low-to-moderate safety significance that may require additional NRC inspections) with an associated apparent violation. As described in Section 71114.05 of the enclosed report, on September 8, 2022, your staff identified that that engineering conversion factors used with the plant stack wide range gas monitor (WRGM) had been in error since June 6, 2022. The plant stack WRGM is used in radiological dose projection modeling for emergency response purposes. The errors resulted in the WRGM reading 30.5 percent lower than it should for the actual radiological conditions, which made the results of dose projections in some cases using the plant stack WRGM inaccurate. These deficiencies were corrected on September 9, 2022. We assessed the significance of the finding using the significance determination process and readily available information.

The finding has an associated apparent violation which is being considered for escalated enforcement in accordance with the NRC Enforcement Policy, which can be found on the NRC website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The apparent violation of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.47(b)(9) involves the failure to maintain adequate methods for assessing the potential consequences of a radiological emergency condition. Because we have not made a final determination in this matter, no notice of violation is being issued at this time. Please be advised that the number and characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

In accordance with NRC Inspection Manual Chapter 0609, we intend to complete our evaluation using the best available information and issue our final significance determination and enforcement decision, in writing, within 90 days from the date of this letter. The NRC's significance determination process is designed to encourage an open dialogue between your staff and the NRC; however, neither the dialogue nor the written information you provide should impact the timeliness of our final determination.

Before we make a final decision on this matter, we are providing you with an opportunity to either: (1) attend a regulatory conference where you can present to the NRC your perspective on the facts and assumptions the NRC used to arrive at the finding and assess its significance; or (2) submit your position on the finding to the NRC in writing. If you request a regulatory conference, it should be held within 40 days of the receipt of this letter, and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. The focus of the regulatory conference is to discuss the significance of the finding and not necessarily the root cause(s) or corrective action(s) associated with the finding. If a regulatory conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 40 days of your receipt of this letter.

If you decline to request a regulatory conference or to submit a written response, you relinquish your right to appeal the final significance determination process determination, in that by not doing either, you fail to meet the appeal requirements stated in the Prerequisite and Limitation sections of Attachment 2 of NRC Inspection Manual Chapter 0609.

If you choose to provide a written response, it should be clearly marked as a "Response to Apparent Violation in NRC Inspection Report 05000382/2022091; EA-22-119" and should include for the apparent violation: (1) the reason for the apparent violation or, if contested, the basis for disputing the apparent violation; (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 was achieved. Your response may reference or include previously docketed correspondence if the correspondence adequately addresses the required response.

Additionally, your written response should be sent to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Director, Division of Radiological Safety and Security, U.S. Nuclear Regulatory Commission, Region IV, 1600 East Lamar Blvd., Arlington, Texas 76011-4511, and the NRC Resident Inspector at Waterford Steam Electric Station, Unit 3, and emailed to [R4Enforcement@nrc.gov](mailto:R4Enforcement@nrc.gov), within 40 days of the date of this letter. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision or schedule a Regulatory Conference.

Please contact Mark Haire at 817-200-1223 within 10 days from the issue date of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision. The final resolution of this matter will be conveyed in separate correspondence.

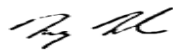
If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with a copy to the Director, Division of Radiological Safety and Security, U.S. Nuclear Regulatory Commission, Region IV, 1600 East Lamar Blvd., Arlington,

Texas 76011-4511, and the NRC Resident Inspector at Waterford Steam Electric Station, Unit 3, and emailed to [R4Enforcement@nrc.gov](mailto:R4Enforcement@nrc.gov).

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, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room and from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions concerning this matter, please contact Mark Haire of my staff at 817-200-1223.

Sincerely,



Signed by Muessle, Mary  
on 01/12/23

Mary C. Muessle, Director  
Division of Radiological Safety & Security

Docket No. 05000382  
License No. NPF-38

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV

WATERFORD STEAM ELECTRIC STATION, UNIT 3 – EMERGENCY PREPAREDNESS  
INSPECTION REPORT 05000382/2022091 AND PRELIMINARY WHITE FINDING – DATED  
JANUARY 12, 2023

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ADAMS ACCESSION NUMBER: **ML22348A272**

☒ SUNSI Review:

ADAMS:

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Keyword:

By: SDH

☒ Yes ☐ No

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SIGNATURE	/RA/ E	/RA/ E	/RA/ E	/RA/ E	/RA/ E
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OFFICE	NRR	OE	NSIR	D:DORS	D:DRSS
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**U.S. NUCLEAR REGULATORY COMMISSION**  
**Inspection Report**

Docket Number: 05000382

License Number: NPF-38

Report Number: 05000382/2022091

Enterprise Identifier: I-2022-091-0003

Licensee: Entergy Operations, Inc.

Facility: Waterford Steam Electric Station, Unit 3

Location: Killona, LA

Inspection Dates: October 23 to December 7, 2022

Inspectors: S. Hedger, Sr Emergency Preparedness Inspector

Approved By: Mark S. Haire, Chief  
Response Coordination Branch  
Division of Radiological Safety & Security

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an emergency preparedness inspection at Waterford Steam Electric Station, Unit 3, 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 Dose Assessment Methods			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	Preliminary White AV 05000382/2022091-01 Open EA-22-119	[H.5] - Work Management	71114.05
The inspectors identified a finding of low to moderate safety significance (preliminary White) and an apparent violation of 10 CFR 50.47(b)(9). Specifically, the licensee failed to maintain the reliable and accurate indications on PRM-IRE-0110, Plant Stack wide range gas monitor (WRGM), High Range Detector. This resulted in the potential to produce inaccurate dose assessments from June 6 to September 9, 2022.			

### 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 Sample)

- (1) The inspectors reviewed information related to calibration issues with wide range gas monitors (WRGMs) used for emergency response. Specifically, on September 8, 2022, condition report CR-WF3-2022-06367 documented an incorrect application of engineering conversion factors associated with the plant stack WRGM. An extent of condition review found a similar case of incorrect factor application for the fuel handling building WRGM documented in condition report CR-WF3-2022-06372. The issues were further evaluated in a root cause evaluation associated with condition report CR-WF3-2022-06367, dated October 26, 2022. 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 Dose Assessment Methods			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	Preliminary White AV 05000382/2022091-01 Open EA-22-119	[H.5] - Work Management	71114.05
The inspectors identified a finding of low to moderate safety significance (preliminary White) and an apparent violation of 10 CFR 50.47(b)(9). Specifically, the licensee failed to maintain the reliable and accurate indications on PRM-IRE-0110, Plant Stack WRGM, High Range Detector. This resulted in the potential to produce inaccurate dose assessments from June 6 to September 9, 2022.			
<b>Description:</b> On September 8, 2022, the licensee identified that engineering conversion factors for PRM-IRE-0110, the Plant Stack WRGM had been in error since June 6, 2022 (Condition Report CR-WF3-2022-06367). The radiation monitors in the WRGM are inputs to the radiological dose assessment modeling software used in emergency response.			
The licensee evaluated the issues in an extent of condition review and root cause evaluation			

associated with CR-WF3-2022-06367. In addition, the licensee responded to questions provided by the inspectors focused on understanding the effects of the errors on EAL classification and dose assessment capabilities. Based on review of the evaluations and supplemental information provided by the licensee, the inspectors determined:

- The errors were introduced when an incorrect version of the correction factors database was used to upload the values after maintenance was completed on the WRGM on June 6, 2022.
- The errors affected the function of the WRGM's high-range detector.
- The affected high range detector would read 30.5 percent lower than it was supposed to. The normal calibration range is plus or minus 10 percent.

The effects on emergency preparedness capabilities were the following:

- For classification, the high-range detector would not be used for classifying EALs AU1.1, AA1.1, AS1.1 and AG1.1 (classification is addressed with the mid-range detector, which was not affected by the error).
- For dose assessment, the error would result in Plant Stack release dose assessments for radiological releases being lower than expected by approximately 30.5 percent. This would be used in assessing protective action recommendations for the public at distances of 5 and 10 miles from the site boundary.

The issue resulted from a failure to update a controlled copy of the WRGM conversion factors based on recent calibration activities. Between February 2-4, 2022, the Plant Stack WRGM high-range detector was re-calibrated as part of an ongoing corrective action effort. As part of this, the engineering conversion factors in question were corrected to reflect the sensitivity values from detector replacement in June 2005. Updates to the Radiation Monitoring System (RMS) control room database manual, which would have captured the updated conversion factor and other information from the calibration for future use, did not occur. Following troubleshooting and repair activities on the Plant Stack WRGM low-range detector on June 6, 2022, the conversion factors for all of the detectors were reloaded with RMS database values that did not reflect the changes made between February 2-4, 2022. Work control and information update processes did not provide for use of the most current and accurate database values to ensure WRGM correct function.

Corrective Actions: The licensee corrected the engineering conversion factors for the Plant Stack WRGM high-range detector on September 9, 2022. The controlled copy of the RMS database has been updated with the correct factors. Changes to the licensee's work control processes are in progress in an effort to prevent this from occurring again. The licensee is documenting the issues in the corrective action program.

Corrective Action References: CR-WF3-2022-06367

Performance Assessment:

Performance Deficiency: The failure to maintain correct function of the Plant Stack WRGM equipment was the performance deficiency. By not maintaining correct engineering conversion factors, it resulted in the incapability, in some cases, of providing a technically adequate estimate of offsite doses using the dose assessment process. The effects adversely impacted 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 protective actions that are appropriate based on the given radiological conditions.

**Significance:** The inspectors assessed the significance of the finding using IMC 0609 Appendix B, "Emergency Preparedness SDP." Using IMC 0609, Appendix B, Attachment 2 (issue date September 22, 2015); the finding is a failure to comply with a risk significant planning standard (RSPS). For the issue, since there were some (but not all) cases in which the dose projection process would be incapable of providing technically adequate estimates of radioactive material releases to the environment or projected offsite doses, the finding is not a Loss of RSPS function but rather a Degraded RSPS function (preliminary White).

This finding is associated with risk significant planning standard 10 CFR 50.47(b)(9), in addition to Appendix E to 10 CFR 50, IV.B, "Assessment Actions." This results in a degraded, but not failed RSPS function. The finding had no actual safety consequences since no events occurred at Waterford Steam Electric Station Unit 3 related to releases through the Plant Stack WRGM during the period in question.

**Cross-Cutting Aspect:** H.5 - Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities. Specifically, the licensee's work management process did not ensure that accurate, up to date information was used appropriately to return equipment in maintenance to full functionality. The process allowed use of an incorrect copy of the engineering conversion factor database during equipment restoration, thus degrading their capability to meet their emergency preparedness function.

**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)(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 June 6 to September 9, 2022, 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 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 conversion factor errors would result in inaccurate dose assessments for a radiological release through the plant vent stack exhaust path.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

## **EXIT MEETINGS AND DEBRIEFS**

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

- On December 7, 2022, the inspectors presented the emergency preparedness inspection results to John Ferrick, 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	Condition Reports (CR-WF3-)	2022-04744, 2022-06367, 2022-06372, 2022-06378	
	Miscellaneous		Waterford 3 Wide Range Gas Monitor Issue - Response to NRC Questions (September 20, 2022)	10/07/2022
			Responses to 10/21/22 NRC Follow-up Questions	11/3/2022
		CR-WF3-2022-6367	Root Cause Evaluation, Incorrect Calibration of Wide Range Gas Monitors Used in Emergency Response Procedures	10/26/2022
		W3F1-2020-0036	License Amendment Request, Adoption of Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6; Waterford Steam Electric Station, Unit 3; NRC Docket No. 50-382; Renewed Facility Operating License No. NPF-38	6/1/2020
		W3F1-2020-0062	Response to U.S. Nuclear Regulatory Commission Request for Additional Information Regarding License Amendment Request for Adoption of Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6; Waterford Steam Electric Station, Unit 3; NRC Docket No. 50-382; Renewed Facility Operating License No. NPF-38	12/15/2020
	Procedures	EN-EP-313	Offsite Dose Assessment Using the Unified RASCAL Interface	4
		EP-001-001	Recognition and Classification of Emergency Conditions	36
		EP-002-050	Offsite Dose Assessment	308
		EP-002-052	Protective Action Guidelines	27
		UNT-007-029	Control of the Radiation Monitor System Database	4, 5