



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

June 11, 2022

EA-22-033

Mr. 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 05000382/2022501 AND
PRELIMINARY WHITE FINDING

Dear Mr. Ferrick:

This letter refers to the inspection conducted from April 24 to May 17, 2022, by the U.S. Nuclear Regulatory Commission (NRC) regarding the Waterford Steam Electric Station, Unit 3. The purpose of the inspection was to evaluate your emergency preparedness programs. On May 17, 2022, a final exit briefing was conducted telephonically 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 January 18, 2022, licensee staff identified that the engineering conversion and calibration factors used with the main condenser wide range gas monitor (WRGM) had been in error since January 1, 2011. The condenser WRGM was used as part of the site's emergency action level scheme until July 21, 2021, and is still used in radiological dose projection modeling for emergency response purposes. The errors resulted in the WRGM reading 69 to 76 percent higher than it should for the actual radiological conditions, which introduced the potential to overclassify radiological emergencies, and made the results of dose projections using the condenser WRGM inaccurate. These deficiencies were corrected on February 4, 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) 50.54(q)(2) involves the failure of a holder of a license under 10 CFR Part 50 to 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).

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 significance determination process encourages an open dialogue between your staff and the NRC; however, the dialogue should not 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 SDP 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 05000382/2022501; EA-22-033" 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, 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 Mr. 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.

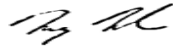
Because the NRC has not made a final determination in this matter, no Notice of Violation is being issued at this time. In addition, please be advised that the number and characterization of the apparent violation described in the enclosed inspection report may change as the result of further NRC review.

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 Mr. Mark Haire of my staff at 817-200-1223.

Sincerely,



Signed by Muessle, Mary
on 06/11/22

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

Docket No. 05000382
License No. NPF-38

Enclosure:
Inspection Report 05000382/2022501

cc w/ encl: Distribution via LISTSERV®

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 EMERGENCY
 PREPAREDNESS INSPECTION REPORT 05000382/2022501 AND
 PRELIMINARY WHITE FINDING – DATED JUNE 11, 2022

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ADAMS ACCESSION NUMBER: **ML22159A275**

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

OFFICE	RCB	C:RCB	C:PBD	TL:ACES	RC
NAME	SHedger	MHaire	JDixon	JGroom	DCylkowski
SIGNATURE	/RA/ E	/RA/ E	/RA/ E	/RA/ E JGK for	/RA/ E
DATE	05/26/22	05/25/22	05/25/22	05/25/22	05/25/22
OFFICE	NRR	OE	D:DORS	D:DRSS	
NAME	/RA/ E	/RA/ E	RLantz	MMuessle	
SIGNATURE	RFelts	PSnyder	REL	MCM	
DATE	06/07/22	06/07/22	06/10/22	06/11/22	

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

Docket Number: 05000382

License Number: NPF-38

Report Number: 05000382/2022501

Enterprise Identifier: I-2022-501-0011

Licensee: Entergy Operations, Inc.

Facility: Waterford Steam Electric Station, Unit 3

Location: Killona, LA

Inspection Dates: April 24 to May 17, 2022

Inspectors: S. Hedger, Sr. Emergency Preparedness Inspector

Approved By: Mark S. Haire, Chief
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 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 EAL Thresholds and Dose Assessment Methods			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	Preliminary White AV 05000382/2022501-01 Open EA-22-033	None	71114.05
The inspectors identified a finding of low to moderate safety significance (preliminary White) and apparent violation of 10 CFR 50.54(q)(2). Specifically, the licensee failed to maintain the reliable and accurate indications on PRM-IRE-0002, Condenser Exhaust wide range gas monitor (WRGM), Mid and High Range Detectors. This resulted in the potential to over classify an emergency up to a General Emergency, as well as to produce inaccurate dose assessments from January 2011 to February 4, 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 Sample)

- (1) The inspectors reviewed information related to calibration issues with wide range gas monitors (WRGMs) used for emergency response. Specifically, on January 18, 2022, condition report CR-WF3-2022-00284 identified incorrect calibrations and application of engineering conversion factors associated with three of the WRGMs. The issues were further evaluated in a causal analysis associated with the condition report, dated February 24, 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 EAL Thresholds and Dose Assessment Methods			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	Preliminary White AV 05000382/2022501-01 Open EA-22-033	None	71114.05
The inspectors identified a finding of low to moderate safety significance (preliminary White) and apparent violation of 10 CFR 50.54(q)(2). Specifically, the licensee failed to maintain the reliable and accurate indications on PRM-IRE-0002, Condenser Exhaust WRGM, Mid and High Range Detectors. This resulted in the potential to over classify an emergency up to a General Emergency, as well as to produce inaccurate dose assessments from January 2011 to February 4, 2022.			
<u>Description:</u> On January 18, 2022, the licensee identified that calibration and engineering conversion factors for three of the WRGMs had been in error for various lengths of time (condition report CR-WF3-2022-00284). Of the three, the radiation monitors in two WRGMs are used in implementation of EALs, as well as being inputs to the radiological dose projection modeling software used in emergency response.			
· PRM-IRE-3032, Fuel Handling Building WRGM, Mid-Range Detector – errors			

introduced in 2008, used in EALs AU1.1, AA1.1, and AS1.1, until present

- PRM-IRE-0002, Condenser Exhaust WRGM, Mid and High Range Detectors – errors introduced in 2011, used in EALs AU1.1, AA1.1, AS1.1 and AG1.1, until July 21, 2021

The licensee evaluated the potential effects of the errors on EAL classification as part of a causal evaluation (apparent cause analysis CR-WF3-2022-00284, Revision 0, dated February 24, 2022). These errors were introduced in 2008 and 2011 when new radiation detectors were installed within the WRGMs. In industry forums in 2009, end users were informed that radiation detectors being replaced within WRGMs needed to adjust engineering conversion factors for the new device (specific to the radiation detector). Also, a sensitivity adjustment needed to be made with new radiation detectors to relate the device back to the WRGM's primary calibration standard. Plant staff had an opportunity to correct the issues with the 2008 installation, and prevent those in 2011 based on the information provided during the 2009 industry forums. The licensee identified that the WRGMs in question still had errors in calibration and engineering conversion factors until recently.

Based on review of the licensee's evaluation and supplemental information provided by the licensee, the inspectors determined:

- For PRM-IRE-3032, the errors in the calibration factor and engineering conversion factor offset each other such that the affected EALs could be declared in a timely and accurate manner.

- For PRM-IRE-0002, the combination of errors did not offset each other. Due to additional errors made in the calibration of the newly installed radiation monitors in 2011, the monitors would read between 69 to 76 percent higher than they were supposed to. During a radiological emergency, classifications up to a General Emergency could be declared when the radiological conditions did not warrant it. This would result in the licensee issuing protective action recommendations (PARs) to offsite authorities that were not based on the actual radiological conditions, which could result in unnecessary risk to the public involving evacuations.

Additionally, both of the WRGMs provide inputs to the licensee's dose projection model. Based on review of the licensee's evaluation and supplemental information provided by the licensee, the inspectors concluded:

- The offsetting errors involved with PRM-IRE-3032 would result in no noticeable effect on accuracy of dose projections involving releases from the Fuel Handling Building.

- The net error related to PRM-IRE-0002 would result in Condenser Exhaust release dose projections being higher than expected by 69 to 76 percent.

Corrective Actions: The licensee corrected the engineering conversion and calibration factors for the WRGMs on February 4, 2022. Additional reviews to validate the calibration of other radiation monitors onsite is ongoing. The licensee is documenting the issues in the corrective action program.

Corrective Action References: Condition Report CR-WF3-2022-00284

Performance Assessment:

Performance Deficiency: The failure to maintain correct function of the condenser WRGM equipment was a performance deficiency. By not maintaining correct calibration and engineering conversion factors, it resulted in (a) not establishing and maintaining adequate EALs, and (b) the incapability, in some cases, 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 Equipment Performance 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, protective action recommendations, or dose projections that are appropriate based on the given radiological conditions.

Significance: Using Manual Chapter 0609, "Significance Determination Process," Attachment 4, Tables 1, 2, and 3 worksheets (effective date December 20, 2019); and the corresponding Appendix B, "Emergency Preparedness Significance Determination Process," Attachment 2 (issue date September 22, 2015); the finding is a failure to comply with risk significant planning standards (RSPSs). For the issue, since the General Emergency classification would be made when it was not necessary (over-classification), and 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 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." This results in degraded, but not failed, risk significant planning standard (RSPS) functions. The finding had no actual safety consequences, since no events occurred at Waterford Steam Electric Station Unit 3 related to the main condenser exhaust radiological releases, during the period in question.

Cross-Cutting Aspect: None. The cause of this issue occurred in 2011 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 January 1, 2011, to February 4, 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 maintain a standard emergency classification scheme as required by 10 CFR 50.47(b)(4) because PRM-IRE-0002 had errors in its output that could result in an over-classification up to a General Emergency, resulting in unnecessary public protective actions. Also, 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 would result in inaccurate dose assessments for a radiological release through the main condenser 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 May 17, 2022, the inspectors presented the emergency preparedness inspection results to Mr. 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	Calculations	HP-CALC-2005-002	Emergency Action Levels (EALs) (Abnormal Rad Levels and Radiological Effluent) Based on Power Uprate Source Terms	4/4/2005
	Corrective Action Documents	Condition Reports (CR-WF3-)	2022-00284	
	Miscellaneous	ACA-CR-WF3-2022-00284	Condition Analysis - Site/Unit: Waterford 3; CR Number: CR-WF3-2022-00284; Event Title: WRGM; Event Date: 01/18/2022; Revision: 0	02/24/2022
		W3F1-2010-0052	Proposed Emergency Action Levels Using NEI 99-01 Revision 5 Scheme; Waterford Steam Electric Station Unit 3; Docket No. 50-382; License No. NPF-38	9/16/2010
		W3F1-2011-0017	Response to Request for Additional Information (RAI) on the Proposed Revision to the Emergency Plan (EP) Emergency Action Levels (EALs); Waterford Steam Electric Station Unit 3; Docket No. 50-382; License No. NPF-38	3/28/2011
		W3F1-2011-0034	Correction to Response to Request for Additional Information (RAI) on the Proposed Revision to the Emergency Plan (EP) Emergency Action Levels (EALs); Waterford Steam Electric Station Unit 3 (Waterford 3); Docket No. 50-382; License No. NPF-38	5/4/2011
		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
			Responses to WRGM Inspection Questions	3/29/2022
			Waterford 3 Wide Range Gas Monitor Issue – Response to NRC Questions	4/11/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Response for 4/13/22 NRC Follow-up Questions	4/19/2022
			Response to 4/21/22 NRC Follow-up Questions	4/26/2022
			Steam Generator Tube Rupture (SGTR) Scenario – Fission Product Barrier EALs	5/12/2022
	Procedures	EN-EP-202	Equipment Important to Emergency Response (EITER)	1, 3
		EN-EP-313	Offsite Dose Assessment Using the Unified RASCAL Interface	4
		EN-LI-108	Event Notification and Reporting	21
		EN-LI-108-05	WF3 Site Reporting Requirements	0
		EP-001-001	Recognition and Classification of Emergency Conditions	33, 36
		EP-002-031	In-Plant Radiological Controls and Surveys During Emergencies	302
		EP-002-034	Onsite Surveys During Emergencies	302
		EP-002-050	Offsite Dose Assessment	308
		EP-002-060	Radiological Field Monitoring	309
		EP-002-061	Emergency Environmental Monitoring	305
		EPP-428	Equipment Important to Emergency Response	307
UNT-006-010	Event Notification and Reporting	309		
Work Orders	Work Orders	65970, 170336, 573237, 573242, 573245, 52278964		