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Paul Wood
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10 CFR 50.73

W3F1-2020-0061

October 23, 2020

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Licensee Event Report (LER) 2020-002-00
Violation of Technical Specification 3.4.5.1 (Reactor Coolant System Leakage Detection Instrumentation) Due to Personnel Error

Waterford Steam Electric Station, Unit 3 (Waterford 3)
NRC Docket No. 50-382
Renewed Facility Operating License No. NPF-38

The enclosed report is being sent pursuant to 10 CFR 50.73.

This letter contains no new regulatory commitments.

Should you have any questions or require additional information, please contact Paul Wood, Regulatory Assurance Manager, at 504-464-3786.

Respectfully,

Jeffrey K. Bradley

Digitally signed by Jeffrey K. Bradley
Date: 2020.10.23 06:55:06 -05'00'

Regulatory Assurance Manager (Acting)

JKB/mmz

Enclosure: Waterford 3 Licensee Event Report 2020-002-00

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Waterford 3
NRC Project Manager – Waterford 3

Enclosure

W3F1-2020-0061

Waterford 3 Licensee Event Report 2020-002-00

NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk ail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Waterford Steam Electric Station, Unit 3	05000382	1 OF 3

4. Title

Operation or Condition Prohibited by Technical Specifications for Technical Specification 3.4.5.1 (Reactor Coolant System Leakage Detection Instrumentation) due to Personnel Error

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
										05000
08	24	2020	2020	002	00	10	23	2020	Facility Name	Docket Number
										05000

9. Operating Mode	10. Power Level
1	100

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ **Other** (Specify here, in Abstract, or in NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include Area Code)
Paul Wood - Manager, Regulatory Assurance	504-464-3786

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To IRIS	Cause	System	Component	Manufacturer	Reportable To IRIS
A	IL	RI	G063/General Atomics	Y					

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☒ No	☐ **Yes** (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 24, 2020, Engineering identified that an incorrect and nonconservative moving filter particulate channel engineering conversion factor was being used for all radioactive particulate detectors installed at Waterford 3. Affected instruments included the containment atmospheric monitor particulate channel, which is required to be operable for reactor coolant system leakage detection per Technical Specification (TS) 3.4.5.1, "Leakage Detection Instrumentation." The containment atmospheric monitor particulate channel was declared inoperable per TS 3.4.5.1. The time period that the monitor was inoperable exceeded the allowed outage time of 30 days, resulting in an Event or Condition Prohibited by Technical Specifications.

The cause of this event was personnel error. The vendor representative incorrectly calculated the conversion factor. The factors did not account for filter speed, flow rate, and flow-rate conversion factor. There was lack of vendor oversight on the part of the licensee when the factors were originally developed. Review of historical records identified that the condition had existed since installation (during the Waterford 3 construction phase, prior to startup). Corrective action to update the instrument with the correct conversion factor values was completed on September 10, 2020, thus restoring operability, and TS 3.4.5.1 was exited.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Waterford Steam Electric Station, Unit 3	05000-382	2020	- 002	- 00

NARRATIVE

EVENT DESCRIPTION

A. Plant Status

At the time of this event Waterford 3 was operating at 100% reactor power (Mode 1). There were no other structures, systems or components out of service that contributed to this event.

B. Event Chronology and Description of Event

On August 24, 2020, a Waterford 3 engineer identified that the engineering conversion factors used for all eleven moving filter particulate detectors in operation at Waterford 3 were incorrect and nonconservative. The factor did not account for filter speed, flow rate, and a flow-rate conversion factor. This was identified while reviewing information related to a planned modification which includes changing from moving to fixed filter mode of operation. This condition was entered into the corrective action process.

The containment atmospheric monitor particulate channel [RI] is required to be operable for reactor coolant system [AB] leakage detection per Technical Specification (TS) 3.4.5.1, "Leakage Detection Instrumentation." This TS requires this instrument to be operable (in combination with other diverse measurement means available) in order to provide a high degree of confidence that a 1 gallon per minute (gpm) reactor coolant pressure boundary leak is detected. This instrument was one of the eleven instruments that was identified with an incorrect engineering conversion factor (note: the other ten radiation monitors identified with incorrect engineering conversion factors are not the subject of any TS). The incorrect engineering conversion factor was orders of magnitude different than the correct factor, resulting in the instrument's inability to detect a 1 gpm leak; therefore, it was incapable of performing its TS 3.5.4.1 function. The containment atmospheric monitor particulate channel was declared inoperable and TS 3.4.5.1 action a. was entered. This action requires restoring the monitor to operable status within 30 days, or, be in Mode 3 in 6 hours and Mode 5 in the following 30 hours.

Review of historical records identified that the condition had existed since installation (during the Waterford 3 construction phase, prior to startup). The amount of time that the containment atmospheric monitor particulate channel was inoperable exceeded the TS 3.4.5.1 action a. allowed outage time of 30 days. This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B), Operation or Condition Prohibited by Technical Specifications.

C. Event Causes

To determine causal factors for this event, Event and Causal Factor Charting was performed. Through this method of evaluation, it was concluded that the vendor incorrectly calculated particulate channel engineering conversion factors during plant construction (Causal Factor 1) and there was lack of vendor oversight when the engineering conversion factors were developed (Causal Factor 2).

A review of historical records revealed that the test procedure for the instrument was completed by a vendor test operator in 1980. The transfer calibration was performed on the instrument in 1981. These procedures require the database be loaded with the required monitor and channel items; therefore, there is reasonable assurance that the incorrect moving filter particulate engineering conversion factor was installed prior to performance of the test procedure in 1980. The correct engineering conversion factor calculation methodology for a moving filter particulate detector is listed in the original revision for the radiation monitoring

database manual; however, this methodology was not used by the vendor representative. It is unknown what guidance was available to the representative at that time.

There is evidence that the incorrect factor was provided to Waterford 3 upon acceptance of each monitor from the vendor in 1984, and that the incorrect factor was used at the inception of the radiation monitor system database in 1985. Oversight of the vendor by Waterford 3 personnel was not rigorous. Note: This is a latent issue. Existing processes are in place which require detailed technical review of equipment/components prior to installation and return to service for operational use.

CORRECTIVE ACTIONS

1) Revise the original configuration of the containment atmospheric monitor particulate channel with the correct conversion factor values (complete – September 10, 2020).

2) Revise the alert and alarm setpoints for the containment atmospheric monitor particulate channel to account for the engineering conversion factor applicable to the fixed filter mode of operation (complete – October 19, 2020).

SAFETY EVALUATION

The actual consequence of this event was that the conversion factor used in the containment atmospheric monitor particulate channel was determined to have been incorrectly established, resulting in the channel being incapable of performing its TS 3.4.5.1 function. There were no other actual consequences to the safety of the general public, nuclear safety, industrial safety, or radiological safety for this event.

The potential consequence to the safety of the general public, nuclear safety, industrial safety or radiological safety of this event (i.e., if the containment sump monitor particulate channel instrumentation is unavailable) is inability to detect a 1 gpm leak from the reactor coolant pressure boundary. The safety significance of leaks from the reactor coolant pressure boundary can vary widely depending on the source of the leak as well as the leakage rate and duration.

The risk if no action is taken is low. The basis for this determination is as follows:

Multiple alternative monitoring methods exist and are readily available to the operators to detect a 1 gpm leak from the reactor coolant pressure boundary. These indications include containment sump level, sump weir flow, and containment gaseous, iodine, and particulate levels. Additional indications available include pressurizer, reactor drain tank, quench tank, and volume control tank levels.

PREVIOUS OCCURRENCES

Using the Waterford 3 corrective action process database and other databases, operating experience searches were performed for applicable condition reports that were originated between January 2000 and August 2020. The search yielded seven condition reports. All condition reports were reviewed, and none were found to be applicable to this evaluation.

Note: Energy Industry Identification System (EIIS) codes and component codes are identified in the text as [XX].