



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

February 21, 2019

EA-18-182

Mr. Joseph W. Shea
Vice President
Nuclear Regulatory Affairs and
Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A
Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT – PRELIMINARY WHITE FINDING AND
APPARENT VIOLATION (NRC INSPECTION REPORT NOS. 05000390/2019-
501 AND 05000391/2019-501)**

Dear Mr. Shea:

This letter and its enclosure documents a finding that the NRC has preliminarily determined to be of low-to-moderate safety significance (White), which may require additional NRC inspection. As described in this letter, and initially in Watts Bar Inspection Report 2018-004, an apparent violation (AV) was identified of Title 10 Code of Federal Regulations (CFR) Part 50.54(q)(2), regarding Tennessee Valley Authority's (TVA) failure to maintain the effectiveness of an emergency plan that meets the requirements in Appendix E and the planning standards of § 50.47(b). Title 10 CFR Part 50.47(b)(4), (b)(9), and Part 50 Appendix E, Section IV.B., "Assessment Actions," require licensees to have a standardized Emergency Action Level (EAL) scheme and adequate methods, systems, and equipment in use based on facility system and effluent parameters for assessing and monitoring actual or potential offsite consequences of a radiological emergency. Specifically, EAL threshold values for certain radiation monitors were found to be significantly non-conservative and therefore, would cause an Unusual Event, Alert, Site Area, and General Emergency to be declared in an untimely manner. The finding was assessed based on the best available information, using the Significance Determination Process (SDP). The final resolution of this finding will be conveyed in separate correspondence.

The finding was assessed for significance in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix B, "Emergency Preparedness Significance Determination Process." The inspectors determined that the situation constituted a degraded risk-significant planning standard. Additionally, incorrect effluent radiation monitor conversion factors were found in use in the licensee's dose assessment software that could affect the licensee's ability to perform dose assessment in some cases. Also, in accordance with IMC 0609, dose projections incapable of providing technically accurate estimates of radioactive material releases or projected offsite dose in some cases, is preliminarily assigned a White safety significance. Because these two findings resulted from the same performance deficiency, one finding with a

preliminary significance of White is identified.

The issue was entered into the site's corrective action program on September 11, 2018. Other actions taken by the licensee were to perform an extent of condition review and correct the errors in the associated procedures and calculations. In addition, a Root Cause Analysis was completed on December 27, 2018. The finding is an apparent violation of NRC requirements and is being considered for escalated enforcement action in accordance with the Enforcement Policy, which can be found on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>

In accordance with NRC Inspection Manual Chapter (IMC) 0609, we intend to complete our evaluation using the best available information and issue our final determination of safety significance within 90 days of the date of this letter. The SDP encourages an open dialogue between the NRC staff and the licensee; however, the dialogue should not impact the timeliness of the staff's final determination.

Before we make a final decision on this matter, we are providing you with an opportunity to (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 IMC 0609.

Please contact Eugene Guthrie at (404) 997-4662 or in writing using the address above, within 10 days from the issue date of this letter to notify us of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination. The final resolution of this finding 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 for this inspection finding at this time. In addition, please be advised that the number and characterization of the Apparent Violation described in this letter and the enclosure may change as a result of further NRC review.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room and in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA: Mark S. Miller for/

Anthony T. Gody, Director
Division of Reactor Safety

Docket Nos.: 50-390 and 50-391
License Nos.: NPF-90 and NPF-96

Enclosure:
Apparent Violation

cc: Distribution via Listserv

SUBJECT: WATTS BAR NUCLEAR PLANT – PRELIMINARY WHITE FINDING AND APPARENT VIOLATION (NRC INSPECTION REPORT NOS. 05000390/2019-501 AND 05000391/2019-501) dated February 21, 2019

DISTRIBUTION:

C. Haney, RII/ORA
 L. Dudes, RII/ORA
 A. Gody, RII, DRS
 G. Guthrie, RII, DRS
 S. Sanchez, RII, DRS
 A. Masters, RII, DRP
 S. Ninh, RII, DRP
 J. Seat, RII, DRP
 J. Nadel, RII, DRP
 J. Hamman, RII, DRP
 J. Jandovitz, RII, DRP
 S. Price, RII, ORA/RC
 M. Kowal, RII, EICS
 K. Sloan, RII, EICS
 S. Prasad, NSIR
 D. Jones, OE
 OEMAIL Resource
 RidsNrrDir's Resource
 Public

* See previous page for concurrence

☒ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☒ NON-SENSITIVE

ADAMS: ☒ Yes ACCESSION NUMBER: **ML 19053A547** ☐ SUNSI REVIEW COMPLETE ☒ FORM 665 ATTACHED

OFFICE	RII/DRS/OL2	RII/DRS/OL2	RII/ DRP / PB5	RII/ ORA	RII/ EICS	RII/DRS/OL2	RII/ DRS
SIGNATURE	SPS	GXG	SON or ADM2	SAP1	MXK7	GXG	MSM for ATG
NAME	SANCHEZ	GUTHRIE	MASTERS	PRICE	KOWAL	GUTHRIE	GODY
DATE	2/ 11 /2019	2/11/2019	2/ 12/2019	2/13/2019	2/13/2019	2/ 21 /2019	2/ /2019
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	OE						
SIGNATURE	DAJ2						
NAME	D. Jones						
DATE	2/ 14 /2019						
E-MAIL COPY?	YES NO						

J. Shea

4

OFFICIAL RECORD COPY
CHOICE LTR WITH AV.DOCX

DOCUMENT NAME: G:\DRS\OB2\EMERGENCY PREPAREDNESS\WATTS BAR\2019\WBN

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers: 50-390, 50-391

License Numbers: NPF-90, NPF-96

Report Numbers: 05000390/2019501, 05000391/2019501

Enterprise Identifier: I-2019-501-0026

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Units 1 and 2

Location: Spring City, TN 37381

Inspection Dates: November 26 – 30, 2018

Inspectors: S. Sanchez, Senior Emergency Preparedness Inspector
C. Fontana, Emergency Preparedness Inspector
J. Walker, Emergency Preparedness Inspector

Approved By: A. Gody, Director
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee performance by conducting baseline inspections at Watts Bar Nuclear Plant, Units 1 and 2, 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. NRC-identified findings, apparent violations, and additional items are summarized in the table below.

List of Findings and Violations

Apparent Violation

Failure to Maintain the Effectiveness of the Emergency Plan and a Standard Emergency Classification Scheme Which Included Facility Effluent Parameters			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Emergency Preparedness	Preliminary White Apparent Violation (AV) 05000390,391/2019501-01 Open EA 18-182	[H.3] – Human Performance, Change Management	71114.04 – Emergency Action Level and Emergency Plan Changes
<p><u>Introduction:</u></p> <p>The inspectors identified an AV of 10 CFR Part 50.47(b)(4), (b)(9), and Part 50 Appendix E, for failure to maintain the effectiveness of the emergency plan and a standard emergency classification scheme which included facility effluent parameters. Specifically, since Unit 1 and Unit 2 initial plant startup until September 17, 2018, the licensee failed to maintain a standard emergency classification scheme which included facility effluent parameters in that effluent parameter classification threshold values for EALs RG1, RS1, RA1, and RU1 were significantly non-conservative. Radiation monitors, calibrated with the non-conservative EAL threshold values, were being relied upon to continuously assess the impact of the release of radioactive materials, provide criteria for determining the need for notification and participation of local and State agencies, and provide technically accurate dose assessments.</p>			

Description:

The licensee conducted a design change impact review of NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors", and identified errors in the Radiological Emergency Plan (REP) Appendix C and Watts Bar EAL implementing procedure EPIP-1. The licensee determined that a multitude of calculation errors over time contributed to the EAL radiation monitor threshold values being incorrect. These errors, which impacted EPIP-1 and EPIP-13 (dose assessment implementing procedure), were determined to exist from Unit 1 and 2 initial plant startup until September 17, 2018, when the licensee corrected the errors. For several of the radiation monitors, the licensee recognized that emergency classifications would be declared in a degraded manner and that dose assessment would not be technically accurate under certain accident conditions.

The inspectors reviewed the compiled information describing timeframes, types of errors, and the impact of those errors, to help understand the significance of the errors. The licensee's ability to declare emergencies based on effluent radiation monitor values was degraded because event classification using these radiation monitors would be delayed under certain accident conditions. The accident conditions were failed fuel and steam generator tube rupture. The affected radiation monitors were shield building exhaust, condenser vacuum exhaust, and main steam line radiation monitors. The radiation monitor threshold values calibrated for these radiation monitors were significantly non-conservative and therefore, would cause the Notification of Unusual Event (NOUE), Alert, Site Area Emergency (SAE), and General Emergency (GE) event classifications to be declared in an untimely manner. Additionally, incorrect effluent radiation monitor conversion factors found in use in the licensee's dose assessment software, which resulted in non-conservative EAL threshold values, affected the licensee's ability to adequately provide technically accurate dose assessments under these same accident conditions.

Corrective Action(s): The licensee entered the issue into the corrective action program on September 11, 2018. Other actions taken by the licensee were to perform an extent of condition review and correct the errors in the associated procedures and calculations. In addition, a Root Cause Analysis was completed on December 27, 2018.

Corrective Action Reference: CR 1446537

Performance Assessment:

Performance Deficiency: Errors made in the design basis engineering calculations generated for Main Steam Line and Condenser Vacuum Exhaust radiation monitor dose conversion factors were carried forward in subsequent design calculations, which perpetuated inaccurate effluent radiation monitor EAL threshold values and degraded dose assessment software. The failure to maintain the effectiveness of an emergency plan to meet the requirements of Title 10 CFR Part 50.47(b)(4), (b)(9), and Part 50 Appendix E to have a standardized EAL scheme with adequate methods, systems, and equipment in use based on facility system and effluent parameters for assessing and monitoring actual or potential offsite consequences of a radiological emergency, was a performance deficiency.

Screening: The performance deficiency was determined to be more than minor because it was associated with the Emergency Preparedness cornerstone attribute of Procedure Quality and adversely affected the cornerstone objective of ensuring 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. Specifically, the licensee's ability to provide technically accurate estimates of projected offsite doses and to declare a NOUE, Alert, SAE, and GE based on effluent radiation monitor values were degraded in that event classification using these radiation monitors could be delayed.

Significance: The finding was assessed for significance in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix B, "Emergency Preparedness Significance Determination Process," which states, "Failure to comply means that a program is noncompliant with a Regulatory requirement." The inspectors determined the licensee was noncompliant with 10 CFR 50.54(q), 50.47(b)(4), 50.47(b)(9), and Appendix E, Section IV.B in that, due to calculation errors from an original calculation, the abnormal radiological initiating conditions for EALs RG1, RS1, RA1, and RU1 contained classification threshold values that were significantly non-conservative. The inspectors determined that this issue constituted a degraded risk-significant planning standard. Accordingly, the finding is preliminarily assigned White significance. Additionally, the incorrect effluent radiation monitor conversion factors found in use in the licensee's dose assessment software, which resulted in non-conservative EAL threshold values, could affect the licensee's ability to perform dose assessment in some cases. In accordance with IMC 0609, dose projections incapable of providing technically accurate estimates of radioactive material releases or projected offsite dose in some cases, is preliminarily assigned White Significance. Because these two findings resulted from the same performance deficiency, one finding with a preliminary significance of White is identified.

Cross-Cutting Aspect: The cause of the finding was determined to be associated with a cross-cutting aspect in the change management component of the human performance area because the licensee failed to use a systematic process for evaluating and implementing changes so that nuclear safety remains the overriding priority [H.3].

Enforcement:

Violation: Title 10 CFR Part 50.54(q)(2) requires that a holder of a nuclear power reactor operating license under this part, shall follow and maintain the effectiveness of an emergency plan that meets the requirements in Appendix E to this part and the planning standards of 10 CFR 50.47(b). Title 10 CFR Part 50.47(b)(4) requires that a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, 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. Title 10 CFR 50.47(b)(9) requires that adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition be in use. Title 10 CFR Part 50, Appendix E, Section IV.B., "Assessment Actions," requires in part, that the means to be used for determining the magnitude of, and for continuously assessing the impact of, the release of radioactive materials shall be described, including EALs that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other federal agencies. The EALs shall be based on in-plant conditions and instrumentation, in addition to onsite and offsite monitoring.

Contrary to the above, since Unit 1 and Unit 2 initial plant startup until September 17, 2018, the licensee failed to maintain the effectiveness of their emergency plan and a standard emergency classification scheme which included facility effluent parameters. Specifically, the licensee failed to maintain a standard emergency classification scheme which included facility effluent parameters in that effluent parameter classification threshold values for EALs RG1, RS1, RA1, and RU1 were significantly non-conservative. These radiation monitors were being relied upon to continuously assess the impact of the release of radioactive materials, provide criteria for determining the need for notification and participation of local and State agencies, and provide for technically accurate dose assessments. The failure to maintain the effectiveness of an emergency plan to meet the requirements of 10 CFR Part 50.47(b)(4), (b)(9), and Part 50 Appendix E, is preliminarily determined to be White and identified as AV 05000390, 391/2019501-01, "Calculation Errors Results in Significantly Non-Conservative EAL Threshold Values and Technically Inaccurate Dose Assessments".

Enforcement Action: This violation is being treated as an AV pending a final significance determination.

EXIT MEETINGS AND DEBRIEFS

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

- On January 17, 2019, the inspector presented the inspection results to Paul Simmons and other members of the licensee staff.