



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

March 31, 2020

EA -19-112

Ms. Cheryl Gayheart
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT - FINAL SIGNIFICANCE
DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND
ASSESSMENT FOLLOW-UP LETTER; NRC INSPECTION REPORT
05000424/2020090 AND 05000425/2020090

Dear Ms. Gayheart:

This letter provides you the final significance determination of the preliminary White finding discussed in our previous communication dated December 26, 2019, NRC Inspection Report 05000424,425/2019090. The finding involved a failure to adequately calibrate containment high range area radiation monitors so that they responded within the required range and accuracy to known inputs. This resulted in main control room (MCR) indications that were biased high and would have resulted in overly conservative Emergency Action Level (EAL) declarations during the course of certain accident scenarios.

In letter dated January 31, 2020, you provided a response to the NRC staff's preliminary determination regarding the finding. Your response indicated Southern Nuclear Operating Company, Inc. does not dispute that a violation occurred, but disagrees with the preliminary determination of low to moderate (White) safety significance and suggests that the finding is more appropriately characterized as very low safety significance (Green). Your response provided three main points: (1) The accident scenarios where the containment high range area radiation monitors could be used to declare a General Emergency (GE) would inevitably progress to a GE and high-biased MCR indications would simply cause the declaration to be made a few hours earlier than required (four examples were provided). Therefore, the erroneous indications would not result in unnecessary protective action recommendations. (2) Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident" Revision 2 allows for an overall accuracy of a factor of 2 and the worst-case bias for the containment high range area radiation monitors was a factor of 2.45^[1]. This additional error (0.45) is small and results in a one-hour difference in declaring a GE using a factor of 2 bias versus a factor of 2.45¹ bias. (3) The Emergency Preparedness (EP) cornerstone is not appropriate for this kind of performance deficiency involving radiation monitors and would be better evaluated under a different cornerstone.

^[1] The NRC calculated a maximum bias over the past 10 years of 2.28 using gain factors for Cs-137.

To evaluate your response, a caucus was held with Region II and headquarters technical experts and management. Each main point raised in your response was addressed, as follows:

1) The NRC disagrees that the four examples provided would inevitably result in a valid GE declaration. Specifically, it is possible that these scenarios would become stabilized at Alert or Site Area Emergency and not progress to GE, yet radiation monitor indications would lead to an overly-conservative determination of GE. In addition, by your own analysis, some of the examples could result in a GE declaration several hours earlier than required. This also represents an over-classification and results in unnecessary protective actions because they are unnecessary *at that time*.

2) Regulatory Guide 1.97, Revision 2, contains a design requirement for detector *energy response linearity* (i.e, detector response to different gamma energies) of “within a factor of two”, however it is incorrect to say that these instruments are accurate to “within a factor of two”. Guidance for high-range monitor accuracy is contained in ANSI N320-1979, “Performance Specifications for Reactor Emergency Radiological Monitoring Instrumentation”, which states that, “Overall system accuracy shall be within $\pm 40\%$ ”. Actual factory testing performed by Westinghouse determined that these ion chamber detectors easily met the energy linearity requirement of Regulatory Guide 1.97 and, considering all sources of error (including response to different gamma energies), overall detector accuracy was $\pm 29\%$. Furthermore, industry-standard guidance for periodic calibration of radiation detectors contained in ANSI N323-1978, “Radiation Protection Instrumentation and Calibration”, states that periodic calibration checks using a single source should be performed to within a tolerance of $\pm 20\%$. Therefore, a calibration response of $\pm 20\%$ is appropriate for your Cs-137 calibration source and is included as acceptance criteria in your implementing procedures for radiation monitor calibration. This calibration accuracy of $\pm 20\%$ is also included in your licensing basis in Table 12.3.4-2 of the Updated Final Safety Analysis Report.

In addition, it would be inappropriate to include a “range” of acceptable values for a radiation monitor EAL threshold setpoint. Radiation monitor setpoints used to move from one emergency classification to another should be single numbers and should be based on accident progression assumptions, including assumed radiological conditions inside containment. Therefore, it would be unacceptable to include an artificially high instrument bias on top of the pre-determined setpoint. Given this, the NRC determined that the positive factor of 2.45¹ presented in your response represents a substantial instrument bias that would lead to overly conservative EAL declarations during certain accident scenarios. Also, your independent contractor’s evaluation showed that the instrument bias would tend to increase over time, and your calibration program had no procedural controls to keep it in check. The theoretical maximum bias, determined by computer modeling, would be approximately a factor of 10.

3) The NRC considered use of the Public Radiation Safety Significance Determination Process (SDP) and Occupational Radiation Safety SDP, however these cornerstones are valid for routine operations only. Since the containment high range area radiation monitors have no function during routine operations, neither of these SDPs can be used to evaluate the significance.

However, from a safety significance standpoint, the effect of an across-the-board high bias on instrument indications in the MCR during an accident is essentially the same as a case where all of the EAL threshold values for these monitors had been set too low in the EAL scheme. In both cases, MCR operators would make EAL declarations in an overly conservative manner.

Although there were no errors identified with the EAL scheme in this case, the safety significance is the same and can be evaluated using the same logic in section 5.4, "10 CFR 50.47(b)(4), Emergency Classification System" of the EP SDP.

After considering the information developed during the inspection and the additional information you provided in your letter dated January 31, 2020, the NRC has concluded that the finding is appropriately characterized as White, or low to moderate safety significance.

According to NRC Inspection Manual Chapter (IMC) 0609, appeal rights only apply to those licensees that have either attended a regulatory conference or submitted a written response to the preliminary determination letter.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in the IMC 0609, Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region II, 245 Peachtree Center Avenue, NE, Suite 1200, Atlanta, GA 30303-1257.

The NRC has also determined that the failure to adequately calibrate the containment high range area radiation monitors is a violation of Technical Specifications, as cited in the attached Notice of Violation (Notice). The circumstances surrounding the violation were described in detail in inspection reports 05000424/2019003 and 05000425/2019003; and 05000424/2019090 and 05000425/2019090. In accordance with the NRC Enforcement Policy, the Notice is considered 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.

For administrative purposes, this letter is issued as a separate NRC Inspection Report No. 05000424/2020090 and 05000425/2020090. Accordingly, apparent violation (AV) 05000424/2019003-01 and 05000425/2019003-01 is updated consistent with the regulatory positions described in this letter. Therefore, AV 05000424/2019003-01 and 05000425/2019003-01, Failure to Calibrate Containment High-range Area Radiation Monitors, is updated as NOV 05000424/2019003-01 and 05000425/2019003-01 in the EP Cornerstone with a safety significance of White with a cross-cutting aspect of H.1, Resources.

The NRC has determined the performance at Vogtle Units 1 and 2 would be in the Regulatory Response Column of the Reactor Oversight Process Action Matrix beginning 4th Quarter of 2019. Therefore, the NRC plans to conduct a supplemental inspection in accordance with Inspection Procedure (IP) 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area." This IP is conducted to provide assurance that the root and contributing causes for the performance issues are understood, and to provide assurance that the corrective actions are sufficient to address the root and contributing causes and prevent recurrence. This inspection will be scheduled after you notify the NRC of your readiness. This letter supplements, but does not supersede the annual assessment letter issued on March 3, 2020.

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

Sincerely,

/RA/

Laura A. Dudes
Regional Administrator

Docket Nos. 05000424/05000425
License Nos. NPF-68/NPF-81

Enclosure:
Notice of Violation

cc: Distribution via ListServ

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT – FINAL SIGNIFICANCE
 DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND
 ASSESSMENT FOLLOWUP LETTER; NRC INSPECTION REPORT
 05000424/2020090 AND 05000425/2020090 DATED: March 31, 2020

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Official Record Copy

NOTICE OF VIOLATION

Southern Nuclear Operating Company, Inc
Vogtle Electric Generating Plant Unit 1 and Unit 2

Docket Nos.
05000424/05000425
License Nos.
NPF-68/NPF-81
EA-19-112

During an NRC inspection conducted on July 1, 2019, through September 30, 2019, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Technical Specification (TS) 3.3.3 requires the licensee to perform periodic channel calibrations for post-accident monitoring equipment, including radiation monitors 1RE-0005, 1RE-0006, 2RE-0005, and 2RE-0006. Section 1.1 of the TS states that "A channel calibration shall be the adjustment, as necessary, of the channel so that it responds within the required range and required accuracy to known inputs." Specifically, the source-to-detector geometry used for isotopic calibrations was not fixed and reproducible.

Contrary to the above, from each unit's initial plant startup until September 30, 2019, the licensee failed to periodically calibrate containment high-range area radiation monitors 1RE-0005, 1RE-0006, 2RE-0005, and 2RE-0006 so that they responded within the required accuracy to known inputs. This resulted in main control room indications that were biased high and would have resulted in overly conservative Emergency Action Level declarations during certain accident scenarios.

This violation is associated with a White Significance Determination Process finding.

Pursuant to the provisions of 10 CFR 2.201, Southern Nuclear Operating Company, 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, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, 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-19-112" and should include for each violation: (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, an order or a Demand for Information may be issued as to why the 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards 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). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 31st day of March 2020