



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

December 21, 2023

EA-23-093

Eric S. Carr
President, Nuclear Operations and
Chief Nuclear Officer
Dominion Energy
5000 Dominion Blvd., Floor: IN-3SE
Glenn Allen, Virginia 23060

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION – FINAL SIGNIFICANCE
DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND
ASSESSMENT FOLLOWUP LETTER – NRC INSPECTION REPORT
05000395/2023091

Dear Eric Carr:

This letter provides you the final significance determination of the preliminary Yellow finding discussed in the U.S. Nuclear Regulatory Commission's (NRC) inspection report dated October 4, 2023 (Agency Documents Access and Management System (ADAMS) Accession Number ML23268A467). The finding is associated with a self-revealing apparent violation (AV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to identify and correct a condition adverse to quality resulting in the inoperability of the 'A' emergency diesel generator (EDG).

Dominion Energy South Carolina (DESC) provided supporting documentation (ADAMS Accession Number ML23304A288) to the NRC in a letter dated October 31, 2023, which included updated risk determination information associated with the finding. Additionally, at your request, a regulatory conference was held on November 13, 2023, to discuss your views on this issue. A copy of the presentation DESC provided at the meeting can be found in ADAMS (Accession Number ML23325A245). During the meeting, your staff described your assessment of the significance of the finding and the corrective actions taken to resolve it, including details regarding the root cause evaluation of the finding. Specifics regarding the NRC's consideration of the information you provided in the October 31, 2023, letter and at the regulatory conference, are detailed in Enclosure 2 of this report.

After considering the information developed during the inspection, the additional information provided in your letter dated October 31, 2023, and the information you provided at the regulatory conference, the NRC has concluded that the finding is appropriately characterized as White with low to moderate safety significance.

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 NRC Inspection Manual Chapter 0609 Attachment 2, "Process for Appealing NRC Characterization of Inspection Findings (SDP Appeal Process)." An appeal must be sent in writing to the Regional Administrator, Region II, 245 Peachtree Center Avenue N.E., Suite 1200, Atlanta, Georgia 30303-1257.

The NRC has also determined that the failure to identify and correct a condition adverse to quality resulting in the inoperability of the 'A' EDG is a violation of 10 CFR 50, Appendix B, Criterion XVI, as cited in the attached Notice of Violation (Notice) in Enclosure 1. The circumstances surrounding the violation were described in detail in the October 4, 2023, NRC inspection report (ADAMS Accession Number ML23268A467). 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.

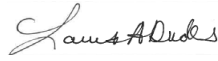
The NRC has determined that the performance at Virgil C. Summer Nuclear Station would be in the Regulatory Response Column of the Reactor Oversight Process Action Matrix beginning in the 4th Quarter of 2023 (October 1, 2023). Therefore, the NRC plans to conduct a supplemental inspection in accordance 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 letter supplements, but does not supersede, the annual assessment letter issued on March 1, 2023 (ADAMS ML Accession Number ML23055B058).

For administrative purposes, this inspection report is issued as NRC inspection report 05000395/2023091. Accordingly, AV 05000395/2023002-01 is updated consistent with the regulatory positions described in this letter as NOV 05000395/2023002-01 in the Mitigating Systems cornerstone with a safety significance of White with no cross-cutting aspect assignment.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made

available electronically for public inspection in the NRC Public Document Room or from 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,



Signed by Dudes, Laura
on 12/21/23

Laura A. Dudes,
Regional Administrator

Docket No. 05000395
License No. NPF-12

Enclosures:

1. Notice of Violation
2. NRC Response to Licensee Supplemental Information

cc w/encl: Distribution via LISTSERV

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION – FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND ASSESSMENT FOLLOWUP LETTER – NRC INSPECTION REPORT 05000395/2023091 – DATED: DECEMBER 21, 2023

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NOTICE OF VIOLATION

Dominion Energy South Carolina
Virgil C. Summer Nuclear Station

Docket No.: 05000395
License No.: NPF-12
EA-23-093

During an NRC inspection conducted from June 12, 2023, to November 17, 2023, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the *Code of Federal Regulations* (10 CFR) 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, measures shall be established to assure that conditions adverse to quality (CAQ), such as nonconformances are promptly identified and corrected.

Section 16, "Corrective Action," of the V.C. Summer Quality Assurance Program Description, Revision 2 (2014), described the methods to meet Criterion XVI, which stated, in part, "when complex issues arise where it cannot be readily determined if a condition adverse to quality exist, [licensee] documents establish the requirements for documentation and timely evaluation of the issue."

Licensee procedure SAP-0999, Corrective Action Program, Revision 12 (2014), step 6.3.1 stated, "When an issue is recognized that it is not meeting performance expectations, the event should be documented via a [condition report] CR." An example of a condition that required a CR is "The failure mechanism has implications that may affect multiple systems or components."

Contrary to the above, following discovery of cracked components in the EDG fuel oil system dating back to 2003, the licensee fixed the cracked piping/fittings but failed to identify and correct the failure mechanism that affected the fuel oil system piping on both the 'A' and 'B' EDGs, eventually leading to the failure of the 'A' EDG fuel oil piping during testing on November 2, 2022. Specifically, CR's documenting failures in 2020 were classified as non-conditions adverse to quality and represented a missed opportunity for the licensee to perform an evaluation to identify whether a common CAQ existed and determine if previous failures in 2003 and 2014 were indicative of a more significant problem with the EDG fuel oil system piping.

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

Pursuant to the provisions of 10 CFR 2.201, Dominion Energy South Carolina 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-23-093" and should include for each violation: (1) the reason for the 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 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.

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 21st day of December 2023

NRC RESPONSE TO LICENSEE SUPPLEMENTAL INFORMATION

In your letter dated October 31, 2023 (ADAMS Accession Number ML23304A288), you provided new amplifying information that you believed supported a final significance determination of White (Low to Moderate Safety Significance) for the preliminary Yellow finding discussed in the U.S. Nuclear Regulatory Commission's (NRC) inspection report dated October 4, 2023 (ADAMS Accession Number ML23268A467). The evaluation that accompanied your written response in the letter focused on adjustments that were made to the fire probabilistic risk assessment (PRA) because fire sequences were strongly dominant in the preliminary risk results from both your PRA model and the NRC Standardized Plant Analysis Risk (SPAR) model. During the regulatory conference with the NRC on November 13, 2023, you reiterated the information described in the letter, and acknowledged the apparent violation occurred as stated in the October 4, 2023, NRC inspection report. The key new information and our assessment is summarized below.

1) Thermohydraulic Analysis

The preliminary risk determination did not include credit for operation of the A-train motor-driven emergency feedwater (MDEFW) pump for a period of approximately 6 hours prior to the performance-deficiency induced failure of the 'A' emergency diesel generator (EDG) fuel oil piping. Your evaluation stated that during that 6-hour period the 'A' EDG would have been available to power the MDEFW pump and remove reactor decay heat prior to the onset of Station Blackout (SBO) plant conditions. This 6-hour offset of SBO, and loss of feed conditions was not factored into the preliminary risk determination because, at the time of the evaluation, a thermohydraulic analysis had not been completed. The thermohydraulic analysis forms a basis for decay heat that could have been removed during the six-hour time period and the resulting impact of that pre-SBO heat removal on the timeframes available for mitigation of the SBO condition using diverse and flexible coping strategies (FLEX).

NRC Evaluation and Conclusion

The NRC agrees that the preliminary risk determination did not credit A-train MDEFW pump operation for the period that the 'A' EDG would have run prior to failure of the fuel oil system piping and onset of SBO conditions. The NRC acknowledges that the preliminary risk determination was made with best available information at the time that the detailed risk evaluation was completed. The NRC agrees that the recent thermohydraulic analysis supports consideration of the delayed start of SBO conditions (and the potential additional time afforded for mitigation) described in your new risk analysis. The NRC determined the consideration of pre-SBO decay heat removal to be realistic and consistent with the actual circumstances associated with this finding, as supported by the thermohydraulic analysis results.

2) Pre-SBO Decay Heat Removal Period

Because the preliminary risk evaluation did not include the potential for 6-hours of additional emergency feedwater (EFW) feed to the steam generators prior to onset of SBO conditions, the preliminary risk evaluation did not credit FLEX mitigation equipment when the core damage sequence included SBO conditions concurrent with failure of the turbine-driven emergency feedwater (TDEFW) pump. Your evaluation stated that this assumption would be

overly conservative because the potential for pre-SBO decay heat removal prior to the 'A' EDG failure would extend the amount of time until core damage and, therefore, the amount of time for employment of FLEX mitigating equipment.

NRC Evaluation and Conclusion

The NRC agrees that SBO sequences accompanied by failure of the turbine-driven source of emergency feedwater to the steam generators early in the accident sequence would not normally warrant consideration of FLEX mitigating equipment due to the unavailability of time prior to core damage. The NRC acknowledges that pre-SBO decay heat removal could provide more time for implementation of FLEX mitigation equipment due to the delayed nature of the 'A' EDG failure in the sequence.

NRC Final Significance Determination

The NRC noted that your evaluation focused on fire PRA sequences due to their strongly dominant presence in the estimated risk and that this was consistent with earlier NRC SPAR model risk estimates. The NRC reviewed the assumptions and limitations that were used in your technical evaluation, the PRA modeling changes including reliability of FLEX equipment, updates made to the fire PRA, mitigation procedures, development of sequence timelines based on thermohydraulic analysis, and the human reliability analysis for operator actions necessary for event mitigation. The NRC noted that the technical analysis and risk estimate you provided were only applicable to the specific plant conditions and expected failure mechanism that was assessed for this finding. The NRC also noted that the new risk evaluation estimates were consistent with NRC SPAR model preliminary risk results for those sequences that included credit for FLEX mitigation. The NRC determined that the conclusions described in your updated risk evaluation were based on an updated realistic assessment of the plant conditions that include consideration of pre-SBO decay heat removal and the additional time that would be available to employ FLEX mitigating equipment. As such, the NRC determined that the estimated risk was consistent with a significance determination of White (Low to Moderate Safety Significance) for the finding (EA-23-093).