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

October 18, 2022

EA-22-039

Mr. Daniel G. Stoddard
Senior Vice President and Chief Nuclear Officer
Dominion Energy
Innsbrook Technical Center
5000 Dominion Blvd, Floor: IN-2SW
Glen Allen, VA 23060

SUBJECT: VIRGIL C. SUMMER–FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND ASSESSMENT FOLLOWUP LETTER; NRC INSPECTION REPORT 05000395/2022091

Dear Mr. Stoddard:

This letter provides you the final significance determination of the preliminary White finding discussed in our previous communication dated July 14, 2022 (refer to NRC's document system (ADAMS) ML22194A020), which included the subject inspection report. The finding is associated with an NRC-identified apparent violation of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action" for the failure to identify and correct a condition adverse to quality which resulted in the inoperability of the 'B' emergency diesel generator (EDG).

In a letter dated August 22, 2022 (ML22236A117), you provided a response to the NRC staff preliminary determination regarding the finding. Your response indicated that an engineering analysis was performed that provided a high degree of confidence the 'B' EDG was operable during the period from January 16, 2022, through February 9, 2022, and was in full compliance with Regulatory Guide (RG) 1.9 and the V.C. Summer Technical Specifications. After a review of your letter dated August 22, 2022, as well as the independent engineering evaluation (reference 1 of the letter), the NRC determined that the letter and referenced report did not demonstrate functionality of the 'B' Emergency EDG. The NRC perspective that the 'B' EDG was going to degrade further and completely lose function at some point while in the isochronous mode of a required event after January 16, 2022, was not changed by the written response provided. This is based on two areas of disagreement with your response. These areas are: 1) use of RG 1.9 transient performance limits, and 2) issues not realistically and reasonably addressed in the engineering report. These areas are addressed in detail below:

1. Use of Regulatory Guide 1.9 transient performance limits

   Your response stated that the disturbances associated with the broken connector pin were of short duration and it was appropriate to consider transient performance limits in RG 1.9.

The NRC staff considers the guidance provided in RG 1.9 as applicable to the EDG voltage and frequency for transient conditions observed during the load sequencing period only. The allowable transient voltage (75 percent) and frequency (95 percent) bands provide assurance that each load that is operating on the EDG has adequate voltage and frequency during the sequencing of additional loads and does not stall or trip due to voltage perturbations associated with step loads. The recovery voltage (±10 percent) and frequency (±2 percent) provide assurance that the voltage and frequency oscillations have damped sufficiently to provide adequate voltage and frequency for the next load that must be started.

The frequency and voltage criteria in RG 1.9 are specified in the context of the capability of the EDG to recover from a transient such as EDG load sequencing. As such, the allowable transient voltage (75 percent) and frequency (95 percent) bands and the ±2 percent criterion on frequency and the ±10 percent criterion on recovery voltage and frequency is not applicable for generic steady-state operation.

2. Items not realistically and reasonably addressed by the engineering evaluation

The engineering analysis assumed that the open circuit conditions observed during the surveillance run, with the EDG synchronized with the grid, were bounding (magnitude and duration) for all modes of operation and would not degrade further during operation. Based on this assumption, your analysis concluded that the large observed EDG perturbations (KW swings) were minor and within the capability of the EDG to recover during steady operation. The NRC disagrees with this conclusion based on the following:

- Duration of open circuit condition - The broken connection resulted in intermittent open circuit conditions. The magnitude, duration and frequency of the open circuit conditions were largely dependent on engine vibrations and resultant wear and tear of the contact surfaces of the broken connector pin. The engine vibrations were also dependent on the EDG mode of operation, isochronous mode operating in isolation or droop mode and connected to the grid. The engineering report assumed a single open circuit condition of a short duration which may not be bounding based on increasing frequency of oscillations observed during the latter parts of surveillance testing and the parallel, droop mode of EDG operation. Unlike the surveillance run observations, in an isochronous mode, the voltage, current, and frequency of the loads would be affected, degrading the motors and other loads supported by the EDG. The likelihood of loads stalling and overloading or not functioning properly would have had an adverse impact on the safety functions. The engineering analysis did not demonstrate the capability of components powered by the EDG to remain functional or satisfy assumptions in accident analyses.

- Random nature of failures - During an isochronous, or emergency mode (EM) of operation, the EDG would experience large load perturbations. During the EM operation, the open circuit conditions would result in changes to EDG frequency (speed), voltage and power (real and reactive) and the duration and frequency and characteristic of the vibrations would be significantly affected. The engineering report did not address the randomness of the failures, did not develop any correlation between the two different modes of operation, and did not discuss the potential differences in expected engine vibrations.

- Limited data - The two surveillance runs developed a limited data set. The frequency of open circuit conditions demonstrated an upward trend. It is very likely that the wear and tear at the connection point would lead to a permanent open circuit resulting in complete failure of the electronic speed control system.
- Impacts on the diesel control system - The degraded diesel control system itself was not evaluated in the report. The intermittent oscillations created by the broken pin would challenge feedback to the control loops making successful loading of the diesel in isochronous mode unlikely.
- Impact to fuel delivery components - Mechanical stress from the fuel racks intermittently and rapidly extending to the maximum travel stops could affect the integrity of the fuel delivery system. This possibility was not evaluated by the licensee-provided engineering report.

After considering the information developed during the inspection and the additional information you provided in your letter dated August 22, 2022, the NRC has concluded that the finding is appropriately characterized as White.

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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at V. C. Summer.

The NRC has also determined that this failure to identify and correct a condition adverse to quality resulting in the inoperability of the 'B' emergency diesel generator is a violation of 10 CFR 50, Appendix B, Criterion XVI, as cited in the enclosed Notice of Violation (Notice). The circumstances surrounding the violation were described in detail in the subject inspection report. 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. 05000395/2022091. Accordingly, apparent violation (AV) 05000395/2022001-01 is updated consistent with the regulatory positions described in this letter, as NOV 05000395/2022001-01 in the Mitigating Systems Cornerstone with a safety significance of White with cross-cutting aspect P.1 – Identification.

The NRC has determined that the performance at V.C. Summer would be in the Regulatory Response Column of the Reactor Oversight Process Action Matrix beginning in the First Quarter of 2022 (January 1, 2022). 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 2, 2022.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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 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,

Laura A. Dudes

Digitally signed by Laura A. Dudes
Date: 2022.10.18 09:50:32 -04'00'

Laura A. Dudes
Regional Administrator

Docket No. 05000395
License No. NPF-12

Enclosure:
Notice of Violation

cc w/ encl: Distribution via LISTSERV

NOTICE OF VIOLATION

Dominion Energy
Virgil C. Summer

Docket No.: 05000395
License No.: NPF-12
EA-22-039

During an NRC inspection conducted from February 10 to September 21, 2022, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50, Appendix B, Criterion XVI establishes the requirements for the licensee's quality assurance program and requires, in part, "measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

DOM-QA-1, "Nuclear Facility Quality Assurance Program Description," Section XVI, states, "Company procedures assure that corrective action is documented and initiated following the determination of a condition adverse to quality (such as a nonconformance, failure, malfunction, deficiency, deviation, adverse trend, and defective material and equipment) in accordance with regulatory guidance and industry quality standards."

Dominion Fleet procedure PI-AA-200, "Corrective Action," "establishes measures to be taken to assure that conditions adverse to quality (e.g., failures malfunctions, deficiencies, defective material and equipment, and nonconformances) are promptly identified and corrected." Section 5.3.14 of PI-AA-200 defines an adverse condition, in part, as an other-than-expected result of an activity, or a non-routine occurrence or condition, regardless of quality classification, that affects or results in the following: a) defective material; b) items whose condition is indeterminate; and c) other causes resulting in other-than-expected equipment performance, test results, or failure to operate within established limits. Furthermore, PI-AA-200, Section 5.3.14, requires the submittal of a condition report (CR) for any issue or concern that does not meet specific requirements of procedures, policies, management expectations, or accepted industry standards.

PI-AA-200 Attachment 1, "Examples of Conditions that Require a CAQ CR" lists examples describing conditions requiring a CAQ CR, including but not limited to: a) an event, condition, or situation, which on its own, is a condition potentially adverse to quality or meets the criteria for submitting a Condition Report, even if the item will be addressed by a separate process; and b) problems found during preoperational, post-modification, surveillance and post-maintenance testing.

Technical Specification (TS) 3.8.1.1.b limiting condition for operation requires two separate and independent EDGs be operable during Modes 1 through 4.

Action Statement 3.8.1.1.b.4 requires, in part, that if one EDG is inoperable, then it must be restored to operable within 72 hours and if this required action cannot be met, then the plant must be in Mode 3 within 6 hours and Mode 5 within 30 hours.

Contrary to the above, on January 16, 2022, the licensee inadequately assessed erratic governor behavior during EDG testing; therefore, failed to identify and correct a condition adverse to quality. Specifically, during a technical specification EDG surveillance, the 'B' EDG was exhibiting other-than-expected and non-routine conditions in the form of significant fuel rack and kilowatt swings. These conditions resulted in a condition of indeterminate cause and other-than-expected equipment performance found during surveillance testing as described in guidance examples of licensee procedure PI-AA-200, "Corrective Action", which required a CAQ CR by the licensee staff even if the item will be addressed by a separate process. This resulted in a failed electrical connector not being identified and therefore the 'B' EDG not being capable of performing accident functions since January 16, 2022. Because the licensee was not aware of the inoperability, the allowed outage time in Action Statement 3.8.1.1.b.4 was exceeded, and the conditions of TS 3.8.1.1.b were not met.

This violation of 10 CFR 50, Appendix B, Criterion XVI is associated with a White SDP finding.

Pursuant to the provisions of 10 CFR 2.201, Dominion 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 of Violation (Notice), within 30 days of the date of the letter transmitting this Notice. This reply should be clearly marked as a "Reply to a Notice of Violation; EA-22-039" 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, U.S. 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 18th October 2022

Enclosure

SUBJECT: VIRGIL C. SUMMER–FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND ASSESSMENT FOLLOWUP LETTER; NRC INSPECTION REPORT 05000395/2022091 – DATED: OCTOBER 18, 2022

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