



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

September 5, 2024

EA-24-049

Nicole Flippin
Site Vice President
Catawba Nuclear Station
Duke Energy Carolinas, LLC
4800 Concord Road
York, SC 29475-9635

SUBJECT: CATAWBA NUCLEAR STATION – FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND ASSESSMENT FOLLOWUP LETTER; NRC INSPECTION REPORT 05000414/2024091

Dear Nicole Flippin:

This letter provides you with the final significance determination of the preliminary White finding discussed in U.S. Nuclear Regulatory Commission's (NRC) inspection report 05000414/2024090, dated June 24, 2024 (Agency Documents Access and Management System (ADAMS) Accession Number ML24166A010). The finding involved a failure to maintain the functionality of the emergency ventilation system which resulted in 2A emergency diesel generator inoperability. The NRC concluded that the finding is appropriately characterized as White, a finding of low to moderate safety significance.

We carefully considered the information that you provided to us. You provided information to the NRC by letters dated July 31, 2024, and August 6, 2024, (ADAMS Accession Numbers ML24214A224 and ML24219A249, respectively). At your request, we held a regulatory conference on August 7, 2024, to discuss your views on this issue. During this public meeting, your staff described your assessment of the significance of the finding, the causes, and the corrective actions taken. You included a copy of your presentation for this meeting in your July 31, 2024, letter. We have included the details of our consideration of this information in Enclosure 2 of this report.

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 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; with copies to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; the Director, Office of Enforcement; and the NRC Resident Inspector at Catawba Nuclear Station.

The NRC has also determined that the failure to maintain the functionality of the emergency ventilation system, which resulted in 2A emergency diesel generator inoperability, was a violation of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," as cited in Enclosure 1, Notice of Violation (Notice). The circumstances surrounding the violation were described in detail in NRC Inspection Report 05000414/2024090, dated June 24, 2024 (ADAMS Accession Number ML24166A010). In accordance with the NRC Enforcement Policy, the Notice is considered an 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 Enclosure 1 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.

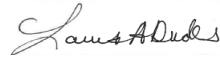
The NRC has determined that the performance at Catawba Nuclear Station, Unit 2 would be in the Regulatory Response Column of the Reactor Oversight Process Action Matrix beginning in the 1st quarter of 2024 (January 1, 2024). Therefore, the NRC plans to conduct a supplemental inspection in accordance 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 February 28, 2024 (ADAMS Accession Number ML24052A408).

For administrative purposes, this inspection report is issued as NRC inspection report 05000414/2024091. Accordingly, apparent violation (AV) 05000414/2024001-01 is updated consistent with the regulatory positions described in this letter to notice of violation (NOV) 05000414/2024001-01 in the Mitigating Systems cornerstone with a White safety significance and cross-cutting aspect H.12, "Avoid Complacency."

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, 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,



Signed by Dudes, Laura
on 09/05/24

Laura A. Dudes
Regional Administrator

Docket No.: 05000414

License No.: NPF-52

Enclosures:

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

cc w/ encls: Distribution via LISTSERV

SUBJECT: CATAWBA NUCLEAR STATION – FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION AND ASSESSMENT FOLLOWUP LETTER; NRC INSPECTION REPORT 05000414/2024091 DATED SEPTEMBER 5, 2024

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NOTICE OF VIOLATION

Duke Energy Carolinas, LLC
Catawba Nuclear Station

Docket No.: 05000414
License No.: NPF-52
EA-24-049

During an NRC inspection conducted from January 3, 2024, to August 13, 2024, 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), Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions...and design control measures shall be applied to items such as delineation of acceptance criteria for inspections and tests.

Catawba's Updated Final Safety Analysis Report (UFSAR), Section 9.4.4, "Diesel Building Ventilation System," subsection 9.4.4.2, "System Description," states in part that the emergency ventilation system, the safety-related subsystem of the diesel building ventilation system, for each diesel enclosure consists of two 50 percent capacity fans, ductwork, and modulating return air and outside air dampers arranged to maintain space temperature between 60°F and 120°F when the diesel is operating... proportioning controls are provided to modulate the outdoor air dampers toward the open position and the return air dampers toward the closed position.

UFSAR subsection 9.4.4.4, "Inspection and Testing Requirements," states in part, essential electrical components, switchovers, and starting controls are tested during preoperational tests and periodically thereafter coincident to testing of the diesels as required by the technical specifications.

Technical Specification (TS) 3.8.1, "AC Sources - Operating," Limiting Condition of Operation (LCO) 3.8.1.b requires, in part, that two diesel generators capable of supplying the onsite essential auxiliary power systems shall be operable while in modes 1, 2, 3, and 4. LCO 3.8.1.d, requires in part, the diesel generator from the opposite unit necessary to supply power to the shared systems (such as the Control Room Area Ventilation System (CRAVS) and the Control Room Area Chilled Water System (CRACWS) covered in TS 3.7.10 and TS 3.7.11, respectively) shall be operable while in modes 1, 2, 3 and 4.

LCO 3.7.10 requires two CRAVS trains to be operable in all modes, and Condition F requires immediate entry into LCO 3.0.3 when two trains of CRAVS are inoperable. LCO 3.7.11 requires two CRACWS trains to be operable in all modes, and Condition E requires immediate entry into LCO 3.0.3 when two trains of CRACWS are inoperable. LCO 3.0.3 requires in part, that when an LCO and the associated actions for a condition are not met, action shall be initiated within 1 hour to place the unit in mode 3 within 7 hours; mode 4 within 13 hours; and mode 5 within 37 hours.

Contrary to the above, from at least 2006, the licensee failed to establish measures to assure the design basis for the emergency ventilation system was correctly translated into procedures and instructions; and failed to apply design control measures for delineating acceptance criteria for emergency ventilation system testing to ensure it remained functional. Specifically,

- 1) The licensee did not ensure design basis information contained in UFSAR Section 9.4.4.2 was translated into surveillance procedures and instructions associated with the emergency ventilation system. This resulted in the licensee tagging the 2A2 fan out of service for an extended period of time (85 days) and relying on one 50 percent capacity fan to maintain space temperature between 60°F and 120°F during emergency diesel generator (EDG) operation. Additionally, the 2A2 fan was not tested coincident with the diesels in accordance with UFSAR subsection 9.4.4.4, during the EDG surveillance tests conducted in December 2023 and January 2024.
- 2) The licensee did not delineate acceptance criteria to verify proper system response of essential electrical components during surveillance testing. Test procedures validated that the fans started and the fan indications were illuminated, but did not verify that damper response was consistent with the system's design basis. This allowed the failed damper controller to go undetected sometime after the August 2022 surveillance test.

As a result, with the 2A2 emergency ventilation fan tagged out of service for maintenance and the 2A1 emergency ventilation fan unable to provide sufficient outside air due to the failed damper controller, the 2A EDG emergency ventilation system was nonfunctional which rendered the 2A EDG inoperable from at least December 5, 2023, to January 2, 2024. With the 2A EDG inoperable, the licensee failed to take the required actions of LCO 3.8.1, Condition B, for one LCO 3.8.1.b EDG inoperable.

Consequently, because the 'A' train CRAVS and 'A' train CRACWS were inoperable per LCO 3.8.1, Required Action D.3; and the 'B' Train CRAVS and 'B' Train CRACWS shared systems were declared inoperable for planned maintenance between December 17, 2023, at 1543, and December 19, 2023, at 2057, the licensee failed to enter LCO 3.0.3 for two inoperable trains as required by LCO 3.7.10 (CRAVS), Condition F and LCO 3.7.11 (CRACWS), Condition E.

This violation is associated with a White finding.

Pursuant to the provisions of 10 CFR 2.201, Duke Energy Carolinas, LLC 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-24-049" and should include: (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 5th September 2024

NRC RESPONSE TO LICENSEE SUPPLEMENTAL INFORMATION

In your letters dated July 31, 2024, and August 6, 2024, (ADAMS Accession Numbers ML24214A224, and ML24219A249, respectively), you provided new information that you believed supported a final significance determination of Green (a finding of very low safety significance) for the preliminary White finding discussed in the U.S. Nuclear Regulatory Commission's (NRC) inspection report 05000414/2024090, dated June 24, 2024 (ADAMS Accession Number ML24166A010). The evaluation that accompanied your written response included a re-evaluation of the components within the 2A emergency diesel generator (EDG) room to determine the most limiting component maximum allowable temperature, as well as updates to the analysis for operator actions. During the regulatory conference with the NRC on August 7, 2024, you acknowledged the apparent violation, described your assessment of the significance of the finding, the causes, and the corrective actions taken to resolve it. Our assessment of the key new information is summarized below.

1. Raised equipment failure temperature from 131°F to 139°F room temperature

You provided an evaluation that updated the limiting EDG room components and raised the allowable EDG room temperature limit from 131°F to 139°F.

The evaluated surge capacitor was designed by Westinghouse Electric Company's (WEC) T&D Components Division. Asea Brown Boveri (ABB) purchased the division from WEC and produced a different design. Your evaluation of the temperature effects for your capacitor relied on a newer ABB design instead of the WEC design. The ABB revision 2 design you evaluated was rated for 60°C. However, an earlier revision that more closely matched the vintage of the WEC design was rated for 50°C. The NRC noted the ABB designs did not reflect the same voltages, technologies, construction, or configuration of the installed WEC design. With the provided information, the NRC could not conclude the evaluated room temperatures would not adversely impact the function of the WEC-designed surge capacitor.

Environmental specifications for the molded case circuit breakers (MCCBs) that were evaluated did not indicate they would be reliable at 55°C (131°F). Additionally, the information provided did not include justification for the 125°C (257°F) maximum temperature that was relied on in your evaluation. The NRC also noted that the evaluation specified 90°C wiring for the MCCBs terminations, which exceeded the equipment terminal ratings. This would further limit the allowable current for the associated temperature rise. With the provided information, the NRC could not conclude the evaluated room temperatures would not adversely impact the function of these components.

Furthermore, the NRC noted that you indicated the reduction in risk that could be attributed to this increase in allowable room temperature was approximately a 40% reduction in the preliminarily estimated delta-core damage frequency (Δ CDF). The NRC concluded that crediting the increased room temperature would not have altered the overall conclusions regarding the significance of the finding.

2. Diurnal treatment of ambient temperature conditions

Your response indicated that the updated evaluations considered diurnal treatment of ambient air temperatures to account for natural daily variations. The NRC agreed that the revised evaluation's consideration of temperature variation (typically warmer temperatures during the day and cooler temperatures at night) was more consistent with expected daily temperature variations. The NRC also noted that while this adjustment did lower the estimated risk of the finding, the impact was relatively modest, corresponding to approximately a 10% reduction in the preliminarily estimated Δ CDF, and would not have altered the overall conclusions regarding the significance of the finding.

3. Operator actions to open the EDG room stairwell doors following ventilation failure

Your response indicated that the analysis for EDG room cooling that would occur if operator actions were credited to open the stairwell doors had been revised to cover a broader range of outside ambient air temperatures. The updated evaluation also concluded that if operators were successful in opening the stairwell doors, this would increase the maximum acceptable outside air temperature by approximately 3°F. The NRC agreed that the updated evaluation addresses a broader range of ambient air temperatures than was considered in the initial evaluation and that successful operator actions to open the doors would be expected to raise the maximum acceptable outside air temperature. The NRC noted that the operator actions to open the stairwell doors were not called out specifically in licensee procedures used to address high EDG room temperature prior to the failure that led to identification of the finding. The NRC does acknowledge that the amount of time that would have been available for operators to diagnose and implement the door-opening action in the absence of proceduralized direction could warrant the consideration of some credit in the analysis. However, your response also indicated that the reduction in risk that could be attributed to this operator action was approximately a 9% reduction in the preliminarily estimated Δ CDF. The NRC concluded that given the relatively modest risk benefit, crediting this operator action would not have altered the overall conclusions regarding the significance of the finding.

4. Operator actions to install jumpers to override the failed controller

Your response included an additional operator action to recover from the failed temperature controller. The operator action would include diagnosis of the failure, development of a repair plan, and installation of jumpers by instrumentation and control technicians to override the failed temperature controller and restore the affected ventilation fan flow path for outside air. The NRC noted that operator actions to install jumpers to recover failed temperature controllers were not specifically called out in licensee procedures used to address high EDG room temperature prior to the failure that led to identification of the finding. Additionally, the NRC noted uncertainties regarding the nature of other concurrent failures that would have occurred in the dominant accident sequences. Those failures would be expected to include, in part, the concurrent failures of the B-train EDG and normal sources of power to the engineered safety features switchgear. Although the updated analysis considered the need for diagnosis of the ventilation failure, the NRC noted those considerations are accompanied by uncertainties regarding the treatment of the adverse impact of concurrent failures on diagnosis and recovery actions. Accordingly, the NRC does not agree that credit for this diagnosis and repair action would be appropriate to the circumstances.

5. Seasonal maintenance scheduling and maintenance administrative controls

Your updated evaluation included consideration for the performance of maintenance during the cooler portions of the year that was also enforced by administrative controls. Your response included an updated analysis that considered seasonal outside air temperatures during the condition exposure period. This update to your analysis had the most significant impact on the overall results and corresponded to a 90% reduction in the preliminarily estimated Δ CDF. The NRC noted that although your updated analysis restricted probabilistic treatment of ambient air temperatures to only the cooler months of the year (which lowered the estimated risk), the updated analysis did not apply that approach to other basic events in the probabilistic risk assessment model that represented an 'annualized' likelihood of occurrence. An example of this included the test and maintenance basic events for other plant equipment that may have been removed from service during the condition exposure period. Rather than set those basic events to 'failed' or 'unavailable' to reflect the actual status for the conditional case (which would increase the estimated risk contribution), these terms were left at the nominal likelihood of unavailability. Additionally, the NRC's preliminary risk estimates credited, and therefore reflected, the administrative controls that were in place to limit the performance of fan maintenance during cooler periods. This was accomplished by a basic event representing the failure to implement those administrative controls that used a value very similar to the one used in your updated analysis. The NRC did not agree with selective use of only those seasonal temperatures that existed during the condition exposure period and considered that treatment to be a departure from a conditional significance determination process evaluation.

The NRC determined that although consideration for diurnal treatment of outside air temperatures and operator actions to open the EDG room stairwell doors (Items 2 and 3 above) was warranted and would have the effect of reducing the estimated risk, the combined impact of these changes would not be sufficient to alter conclusions regarding the significance of the finding. As such, the NRC has concluded that the finding is appropriately characterized as White, a finding of low to moderate safety significance.