



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

February 19, 2009

EA-08-324

Mr. David A. Baxter
Vice President
Duke Power Company, LLC
d/b/a Duke Energy Carolinas, LLC
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING (NRC
INSPECTION REPORT NO. 05000269/2009007, 05000270/2009007 AND
05000287/2009007, OCONEE NUCLEAR STATION)

Dear Mr. Baxter:

The purpose of this letter is to provide you the final results of our significance determination of the preliminary Greater than Green finding discussed in NRC Inspection Report No. 05000269/2008010, 05000270/2008010 and 05000287/2008010, dated November 21, 2008. The Initiating Events Cornerstone inspection finding (identified as FIN 05000269/2008010-01, Failure to Implement an Adequate Automatic Voltage Regulator (AVR) Maintenance Procedure) was assessed using the Significance Determination Process (SDP) and was preliminarily characterized as Greater than Green; a finding of greater than very low safety significance resulting in the need for further evaluation to determine significance and, therefore, the need for additional NRC action. This Greater than Green finding involved a maintenance procedure that failed to identify and electrically isolate all main generator AVR trip outputs to the main generator lockout relay. Consequently, during AVR maintenance on Duke Energy Carolinas', LLC (DEC's) Oconee Unit 1 on April 15, 2008, a main generator lockout occurred, resulting in a loss of power event that ultimately led to a loss of reactor coolant system inventory while in Mode 6 (reactor head closure bolts de-tensioned) on decay heat removal. As such, this finding was considered to have a cross-cutting aspect associated with procedural adequacy [H.2(c)], as described in the resources component of the human performance cross-cutting area.

At your request, a Regulatory Conference was held on January 22, 2009, to discuss your views on this issue. During the meeting, DEC acknowledged the identified finding's performance deficiency and cross-cutting aspect, as well as described their assessment of the significance of the finding, the root cause evaluation of the finding, and the corrective actions taken. DEC highlighted differences between its risk assessment and the NRC's preliminary estimate as documented in our Inspection Report of November 21, 2008. In summary, DEC identified the following technical differences that would serve to reduce the overall change in core damage frequency: (1) DEC concluded that there was an additional 30 minutes available for operators to recognize and mitigate the drain down prior to decay heat removal loss; (2) DEC noted that there were additional personnel available in the main control room to assist the operating crew in identifying that the drain down was ongoing prior to decay heat removal loss; (3) DEC noted that

operators were and would have been under nominal stress versus the high stress considered in the NRC analysis; (4) DEC concluded that the dependency analysis for human actions should be broken into the execution and the action components when evaluating the second human action in accident sequences; and (5) DEC viewed the failure of Motor Control Center (MCC) 1XP (due to the incorrect setting of MCC 1XP alternate feeder breaker) to be an independent failure caused from a latent human error which should be evaluated separately from the performance deficiency (inadequate AVR maintenance procedure resulting in a loss of power to the main feeder bus). Accordingly, DEC's analysis modeled it as a random failure probability rather than a failure probability of "1.0" as was done in the NRC's preliminary analysis. Based on these differences, DEC concluded that the finding was of very low safety significance (Green).

After considering the information developed during the inspection and information provided by DEC at the regulatory conference, the NRC has concluded that the finding is appropriately characterized as White. In summary, the NRC reviewed the differences as presented by DEC and integrated these where appropriate into the final significance evaluation. Specifically, the NRC agreed that an additional 30 minutes would be available for operators to recognize and mitigate the drain down prior to decay heat removal loss, and that additional personnel were available in the main control room to assist the operating crew. Consequently, due to the combination of additional time and personnel, the initial diagnostic failure probability was reduced.

As for the stress performance shaping factor reference by DEC at the conference, the NRC notes that the initiating event involved multiple instruments that were unexpectedly and simultaneously alarming. This condition is indicative of the high stress performance shaping factor originally considered in the NRC analysis. Consequently, no change was made in the NRC's assessment for operator stress level. The NRC agreed, however, with DEC's dependency analysis for human action input, and incorporated this modification into the final risk assessment.

With regard to the treatment of MCC 1XP as an independent failure, the NRC's methodology for analyzing the performance deficiency required evaluation of the actual drain down event including conditions that contributed to the event. Following the protocols of Inspection Manual Chapter 0609, Appendix G, Shutdown Operations Significance Determination Process, the inspection finding was classified as a precursor to an initiating event, i.e., a "precursor finding," versus a "condition finding." In accordance with Step 4.2 of Attachment 2, precursor findings include findings that increase the likelihood of a loss of decay heat removal or result in a shutdown event. Conversely, "condition findings" only involve a degradation of capability to mitigate an event if it were to occur. DEC's position regarding modeling of the incorrect MCC breaker setting would have potential merit if the finding had been classified as a "condition finding." However, precursor findings are evaluated using Step 4.3 of Appendix G, Attachment 2, which directs the NRC to calculate the corresponding Conditional Core Damage Probability (CCDP) for that event. In this case, the MCC 1XP failure was determined to be a direct contributor to the event. Therefore, the NRC determined it was appropriate to set its failure probability to 1.0 in order to calculate the CCDP of the event.

The above modifications resulted in a reduction to the NRC's preliminary risk estimate by approximately a half order of magnitude. Therefore, the final significance of the finding was determined to be of low to moderate safety significance (White).

You have 30 calendar days from the date of this letter to appeal the staff's significance determination for this finding. Such appeals will be considered to have merit only if they meet

the criteria given in NRC Inspection Manual Chapter 0609, Attachment 2.

Because plant performance for this issue has been determined to be in the regulatory response band, we will use the NRC's Action Matrix to determine the most appropriate NRC response for this event. We will notify you, by separate correspondence, of that determination.

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

Luis A. Reyes
Regional Administrator

Docket Nos.: 50-269, 50-270, 50-287
License Nos.: DPR-38, DPR-47, DPR-55

cc: (See page 4)

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