



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

December 19, 2005

EA-05-228

Duke Energy Corporation  
ATTN: Mr. R. A. Jones  
Site Vice President  
Oconee Nuclear Station  
7800 Rochester Highway  
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION - NRC INSPECTION REPORT NOS.  
05000269/2005012, 05000270/2005012, AND 05000287/2005012;  
PRELIMINARY GREATER THAN GREEN FINDING

Dear Mr. Jones:

This letter and the enclosed supporting documentation discuss a finding that appears to have greater than very low safety significance. As described in Section 02.03B.(9) of NRC Supplemental Inspection Report No. 05000269,270,287/2002007, issued on May 31, 2002, Unresolved Item (URI) 05000287/2002007-02 was identified regarding the north wall of the Oconee Unit 3 main control room not being designed and constructed to withstand the tornado effects (wind force, missiles, and differential pressure) described in the Updated Final Safety Analysis Report (UFSAR). At the time, Duke Energy Corporation (DEC) considered the Oconee Unit 3 control room north wall to be operable but non-conforming with the UFSAR. Specifically, DEC determined that (1) the wall did not have sufficient energy absorption capacity to stop certain missiles at design wind speed and (2) the calculated capacity of the wall, when considering the combined effects of wind speed and differential pressure, would be exceeded. As the supporting evaluation indicated that missile effects were probabilistically negligible, submittal of a license amendment request (LAR) was planned to change the licensing basis for missiles. Additionally, a design modification was planned to resolve the wind loading issue.

Subsequently, as described in Section 40A2.2b.(1) of NRC Inspection Report No. 05000269,270, 287/2004003, issued on July 23, 2004, the NRC identified that in lieu of a LAR, the 10 CFR 50.59 process was inappropriately used to change the Unit 3 control room tornado missile licensing basis in the UFSAR. This use of 10 CFR 50.59 was an attempted corrective action. In general, the inappropriate change resulted in more than a minimal increase in occurrence of a malfunction of the Unit 3 control room by (1) reflecting the use of the TORMIS probabilistic risk methodology to determine that additional physical protection from tornado generated missiles was not necessary for the Oconee Unit 3 control room north wall and (2) indicating that specified missile design requirements were no longer applicable to the Unit 3 control room. Pending risk analysis, this use of the 10 CFR 50.59 process to resolve the Unit 3 control room tornado licensing issue was identified as URI 05000287/2004003-02. The associated UFSAR change was subsequently withdrawn, but as of December 2005, a LAR had

not been submitted. In addition, the planned design modification to resolve the wind loading concern was deferred without a projected completion date. Consequently, it has been concluded that adequate corrective actions have not been taken to promptly resolve the tornado-related concerns with the Unit 3 north control room wall.

Absent the aforementioned design modification, DEC's Unit 3 north control room wall operability evaluation credited partial failure of the wall in reducing the peak differential pressure across the wall. Given such a failure, a spectrum of missiles with greater probabilities than the design basis missiles would have the potential to penetrate the degraded wall and damage structures, systems, and components necessary for safe shutdown. Accordingly, there is a lack of reasonable assurance that the Unit 3 control room, and therefore its related safety functions, would be available upon being subjected to design tornado effects.

This finding was assessed based on the best available information, including influential assumptions, using the applicable Significance Determination Process (SDP) and was preliminarily determined to be a Greater Than Green Finding. Enclosed is a summary of the SDP Phase 3 analysis. The finding has a potentially greater than very low safety significance because, during a design basis tornado, the Unit 3 control room may not physically be protected. Loss of the control room boundary during a tornado could lead to missile debris and water intrusion, which in turn could cause a trip as well as adversely affect the control of multiple safety systems/functions. Furthermore, the response of control room operators and the damage control teams stationed in the Unit 3 control room could be adversely affected.

The NRC staff conducted a qualitative evaluation of the risk based on information previously made available from DEC. The staff did not conduct a refined risk analysis. Other related risk factors (e.g., resultant effects on control room functions, safety systems, operator response, etc.) were not considered in addressing the significance of this finding.

The finding is also an apparent violation (AV) of 10 CFR Part 50, Appendix B, Criteria XVI, Corrective Action, for failure to promptly identify and correct this significant condition adverse to quality. Specifically, since being initially identified in 1996, DEC has not performed any plant modifications or taken an appropriate licensing action to resolve the long-standing discrepancy between the Unit 3 control room and its tornado licensing basis specified in UFSAR Section 3.5.1.3 and UFSAR Table 3-23. This includes the related UFSAR change in December 2003, which improperly used the 10 CFR 50.59 process to effectively negate the Unit 3 control room tornado design criteria contained in UFSAR Section 3.5.1.3 and Table 3-23. This apparent violation (identified as AV 05000287/2005012-01: Failure to Promptly Identify and Correct a Long-Standing Discrepancy Between the Unit 3 Control Room and its Tornado Licensing Basis Specified in the UFSAR) is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy). Accordingly, for administrative purposes, URI 05000287/2002007-02 and 05000287/2004003-02 are considered closed. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>.

In accordance with Inspection Manual Chapter (IMC) 0609, we intend to complete our evaluation using the best available information and issue our final determination of safety significance within 90 days of this letter. The significance determination process encourages an open dialog between the staff and the licensee; however, the dialogue should not impact the timeliness of the staff's final determination. Before we make a final decision on this matter, we are providing you an opportunity to: (1) present to the NRC your perspectives on the facts and

assumptions, used by the NRC to arrive at the finding and its significance, at a Regulatory Conference or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least 1 week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. The NRC will also issue a press release to announce the conference. If you decide to submit only a written response, such a submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Mr. Michael Ernstes at (404) 562-4540 within 10 business days of the date of your receipt of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decisions and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued at this time. In addition, please be advised that the number and characterization of the apparent violation may change as a result of further NRC review.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Charles Casto, Director  
Division of Reactor Projects

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

Enclosure: SDP Phase 3 Summary

DEC

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cc w/encl:

B. G. Davenport  
Compliance Manager (ONS)  
Duke Energy Corporation  
Electronic Mail Distribution

Lisa Vaughn  
Associate General Counsel  
Duke Energy Corporation  
526 South Church Street  
Mail Code EC 07H  
Charlotte, NC 28201-1244

David A. Repka  
Winston & Strawn LLP  
Electronic Mail Distribution

Beverly Hall, Acting Director  
Division of Radiation Protection  
N. C. Department of Environmental  
Health & Natural Resources  
Electronic Mail Distribution

Henry J. Porter, Assistant Director  
Div. of Radioactive Waste Mgmt.  
S. C. Department of Health and  
Environmental Control  
Electronic Mail Distribution

R. Mike Gandy  
Division of Radioactive Waste Mgmt.  
S. C. Department of Health and  
Environmental Control  
Electronic Mail Distribution

County Supervisor of  
Oconee County  
415 S. Pine Street  
Walhalla, SC 29691-2145

Lyle Graber, LIS  
NUS Corporation  
Electronic Mail Distribution

R. L. Gill, Jr., Manager  
Nuclear Regulatory Issues  
and Industry Affairs  
Duke Energy Corporation  
526 S. Church Street  
Charlotte, NC 28201-0006

Peggy Force  
Assistant Attorney General  
N. C. Department of Justice  
Electronic Mail Distribution

DEC

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Distribution w/encl:

L. Olshan, NRR  
C. Evans, RII EICS  
L. Slack, RII EICS  
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## Significance Determination Process (SDP) Phase 3 Summary

### *Statement of the Performance Deficiency*

The performance deficiency concerns a failure to take adequate corrective actions to bring the Unit 3 control room (i.e., north control room wall) within its licensing basis to withstand the tornado effects (wind force, missiles, and differential pressure) described in the Updated Final Safety Analysis Report UFSAR. As such, there is a lack of reasonable assurance that the Unit 3 control room, and therefore its related safety functions, would be available upon being subjected to design tornado effects.

### *Significance Determination Basis*

#### Phase 1 Screening Logic, Results, and Assumptions

This finding affects the Mitigating Systems Cornerstone, as the control room wall protects the safety-related mitigating functions/systems performed/operated from inside the control room. As the finding is potentially risk significant due to a severe weather initiating event, a Phase 3 analysis is required.

It was assumed that the condition existed since Unit 3 construction.

#### Phase 3 Analysis

The following risk assessment was performed with the intent of covering both inadequate corrective action violation examples. The first concerns a failure to take adequate corrective actions to bring the Unit 3 control room (i.e., north control room wall) within its licensing basis to withstand the effects (wind force, missiles, and differential pressure) of differing tornado intensities. The second concerns the inadequate corrective actions involving the inappropriate use of the 10 CFR 50.59 process to effectively eliminate the Unit 3 control room tornado missile requirements from the UFSAR.

The NRC does not have risk tools that allow quantification of the impact of the finding. However using information previously available from the licensee, a qualitative evaluation of the risk can be made as follows:

- In Problem Investigation Process Report (PIP) O-04-2365, updated on April 26, 2005, the licensee calculated a mean core damage frequency of  $4E-7$  and noted that with double the number of potential missiles the mean damage frequency would be  $9E-7$ . In PIP O-01-2827, updated on June 2, 2005, the licensee calculated tornado impact on the Unit 3 control room wall would result in a core damage frequency of  $6E-7$ .
- At the time of the 10 CFR 50.59 change, the resident inspectors noted that the licensee was storing a significant amount of unsecured material in zones that would significantly increase the number of potential missiles over the quantity assumed in the licensee's risk evaluation. The number of added missiles was

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estimated by the resident inspectors to be an increase of 10 to 20 times greater than assumed in the TORMIS model. This would increase the likelihood of missiles striking the wall.

- The licensee noted, "the material properties of the block walls were mis-characterized in an overly optimistic manner with respect to the intended TORMIS code." This was an assumption that the walls were 6-inch reinforced concrete instead of the existing cement block wall construction. This could impact the ability of the walls to stop missiles thrown by the tornado and could impact the ability of the wall to withstand differential pressure associated with the tornado without failure.
- The licensee's risk assessment assumes that the operators are pre-staged at the standby shutdown facility (SSF) prior to the tornado. The licensee's risk evaluation noted: "From a human action standpoint, if the SSF is not pre-staged when a tornado warning is given then some adverse impact is possible on operator response time," and "We only have a qualitative argument at this point." High uncertainties are associated with even well defined human actions. Without more data this human reliability analysis term is a source of high uncertainty.

Although the NRC does not currently have risk tools to analyze the significance of the apparent violation(s), there is enough uncertainty, and indications of nonconservatism in the licensee's prior calculations to indicate the risk associated with this item is likely greater than 1E-6.