



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

July 26, 2002

EA-02-034

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

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING AND NOTICE OF VIOLATION (NRC INSPECTION REPORT 50-269/02-11, 50-270/02-11, 50-287/02-11, OCONEE NUCLEAR STATION)

Dear Mr. McCollum:

The purpose of this letter is to provide you with the NRC's final significance determination for a finding involving a vulnerability to flooding in the Oconee Unit 1 auxiliary building from a potential rupture of the high pressure service water (HPSW) system piping. The finding was the subject of a regulatory conference held with Duke Energy Corporation (DEC) on June 27, 2002. In summary, the NRC has concluded that the finding should be characterized as White and dispositioned as an old design issue. Additionally, the NRC has concluded that a violation occurred involving the requirements of 10 CFR 50, Appendix B, Criterion XVI, 10 CFR 50.48, and License Condition 3.D of the Oconee operating licenses.

The finding was documented in NRC Inspection Report No. 50-269/00-08, 50-270/00-08, 50-287/00-08, dated April 30, 2001, and was assessed under the significance determination process as a preliminary White issue, i.e., an issue of low to moderate safety significance, which may require additional NRC inspection. The finding involved a vulnerability to flooding in the Oconee Unit 1 auxiliary building from a potential rupture of the high pressure service water (HPSW) system piping. The NRC's letter of March 12, 2002, informed DEC of the NRC's preliminary conclusion, provided DEC an opportunity to request a regulatory conference on this matter, and forwarded the details of the NRC's preliminary estimate of the change in core damage frequency (CDF) for this finding. At DEC's request, an open regulatory conference was conducted with you and members of your staff on June 27, 2002, to discuss DEC's position on this issue. The enclosures to this letter include the list of attendees at the regulatory conference, and copies of the material presented by DEC and the NRC at the regulatory conference.

During the conference, your staff discussed the finding and DEC's assessment of its significance. The discussion highlighted differences between your estimate of the change in CDF and the NRC's preliminary estimate. In particular, DEC's pipe rupture frequency estimate used data from EPRI Technical Report TR-111880, Table A-43, Pipe Failure Rates for Babcock and Wilcox Fire Protection System (FPS), instead of Table A-40, Service Water System (SWS) Pipe Failure Rates, which was used by the NRC. Your staff also confirmed the existence of 33 HPSW piping header welds, which was less than the 50 welds assumed by the NRC in its

preliminary risk estimate. Based on this, DEC estimated the change in CDF to be approximately  $6 \times 10^{-7}$ /year (significantly less than the NRC's preliminary estimate of  $1.2 \times 10^{-6}$ /year), and concluded that the finding was of very low risk significance. DEC also indicated the EPRI tables were overly conservative and that the installation of new high temperature seals in the Unit 1 reactor coolant pumps in November 2000 further reduced the risk contribution of auxiliary building flooding from a rupture of HPSW piping to approximately  $1 \times 10^{-7}$ /year. Finally, DEC indicated that, based on the current plant configuration and procedures for flood mitigation, the change in CDF for this finding was approximately  $5 \times 10^{-9}$ /year.

At the conference, your staff disagreed with the NRC's characterization of the issue as an apparent violation of 10 CFR 50, Appendix B, Criterion XVI, and provided your perspective on the development, relative priority and safety significance of DEC's corrective actions. The corrective actions, which your staff characterized as integrated and risk-informed, included the initiation of an auxiliary building flood study, the development of an auxiliary building flood procedure, non-destructive examination of HPSW piping, and dialogue with the NRC staff to clarify the licensing basis requirements for the HPSW piping. Your staff stated that other initiatives were undertaken to improve the overall risk profile at Oconee, including the installation of high-temperature reactor coolant pump seals, which also had the effect of reducing the risk significance of a flooding event in the auxiliary building. Your staff indicated that the corrective actions for this finding, as well as the timeliness of the actions, were commensurate with DEC's understanding of the safety significance at the time of identification and that the actions were evaluated within the context of other site priorities. Furthermore, DEC stated that this issue should be considered an "old design issue", in accordance with Inspection Manual Chapter (IMC) 0305, Operating Reactor Assessment Program.

We considered the information developed during the inspection and the information DEC provided at the conference and concluded that the final risk significance of the inspection finding is appropriately characterized as White, in the mitigating system cornerstone. After adjusting the risk analysis for the actual number of HPSW piping header welds (33), the NRC staff found that the change in CDF was slightly greater than  $1 \times 10^{-6}$ /year. This conclusion reflects our disagreement with your staff's view regarding the use of EPRI Table A-43, Pipe Failure Rates for Babcock and Wilcox Fire Protection System (FPS) to estimate the frequency of HPSW pipe ruptures in the Oconee Unit 1 auxiliary building. We recognize that the failure rates in the EPRI report were derived from observed failure events and that the failure rates have been correlated with system construction and operating characteristics. We note that Fire Protection systems generally include both concrete line and metallic piping, whereas SWS systems generally include only metallic piping. In addition, most FPS draw from clean, closed water systems, whereas the SWS failure rates reflect corrosion mechanisms associated with drawing water from open and often untreated sources. Finally, the FPS failure rates reflect a system constructed, in part, from corrosion resistant metal and concrete, and subjected to a relatively low corrosive environment, whereas the SWS failure rates reflect a system constructed of metal and subjected to a relatively high corrosive environment. The Oconee HPSW system is constructed of metal, uses untreated lake water, and has shown signs of corrosion. Based on this information, the staff found that the failure rates in Table A-40, SWS Pipe Failure Rates, provide a more appropriate estimate of failure rates for of the HPSW piping.

You have ten business 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 NRC Inspection Manual Chapter 0609, Supplement 2.

The NRC also determined that a violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, occurred. Although DEC identified the lack of mitigation capabilities for an auxiliary building flood during a design basis reconstitution effort in December 1995, as identified in PIP O-96-00421, dated February 29, 1996, and again in PIP O-98-3017, dated October 15, 1998, the NRC staff concluded that DEC did not initiate specific corrective actions to address the condition adverse to quality in a timely manner. Specifically, we found that the risk significance of this issue should have resulted in more prompt action, including the auxiliary building flooding procedure that was implemented in August 2001 and other plant modifications that have been recently initiated to mitigate the impact of potential flooding in the auxiliary building. This violation resulted in an additional non-compliance with the requirements of 10 CFR 50.48 and License Condition 3.D of the Oconee facility operating licenses, in that DEC did not assure that a rupture of the fire suppression system (HPSW system piping) in the auxiliary building would not significantly impair safety related equipment. The NRC concluded that this violation is a result of DEC's failure to promptly correct the condition adverse to quality, and as such the failure to meet these requirements has been cited as one violation in the enclosed Notice of Violation (Notice). The circumstances surrounding the violation are described in detail in NRC Inspection Report Nos. 50-269/00-08, 50-270/00-08, 50-287/00-08. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the Notice is considered escalated enforcement action because it is associated with a White finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved is adequately addressed on the docket in NRC Inspection Report 50-269/00-08, 50-270/00-08, 50-287/00-08, and in the information presented by DEC at the regulatory conference (Enclosure 4). Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

The NRC has also concluded that this finding should be dispositioned within the Reactor Oversight Process as an "old design issue" in accordance with IMC 0305. Although the NRC concluded that DEC was untimely in its corrective actions after identifying the issue in 1996 and 1998, the staff concluded that the corrective action deficiencies were not indicative of DEC's current performance and that the additional factors specified in IMC 0305 for consideration of a finding as an old design issue have been satisfied. As a result, the staff will not use this finding in consideration of Oconee's overall performance in the Action Matrix. However, this White finding will be posted on the NRC's Web site for a period of four quarters. In addition, because some of your corrective actions have not been implemented or completed, we believe that a supplemental inspection is warranted. Our supplemental inspection effort will be limited, in recognition of your identification of the issue and inspections already performed. We will inform you separately of our plans for this supplemental inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures, and your response (should you choose to provide one), will be available

electronically for public inspection in the NRC Public Document Room (PDR) or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR and PARS without redaction.

For administrative purposes, this letter is issued as a separate NRC Inspection Report, No. 50-269/02-11, 50-270/02-11, 50-287/02-11, and the above violation is identified as VIO 50-269,270, 287/02-11-01: Inadequate Corrective Actions in Response to a Lack of Mitigation Capabilities for a Potential Auxiliary Building Flood. Additionally, the NRC's letter of March 12, 2002, identified a related non-cited Severity Level IV violation involving the failure to update the Final Safety Analysis Report (FSAR), as required by 10 CFR 50.71(e). This non-cited violation will be identified as NCV 50-269,270,287/02-11-02, Failure to Update the FSAR Regarding Portions of the HPSW Piping in the Auxiliary Building. Accordingly, unresolved item 50-269,270,287/00-08-02, which originally documented the associated finding, is administratively closed.

Should you have any questions regarding this letter, please contact Binoy Desai, Acting Branch Chief, Branch 1, Division of Reactor Projects, at 404-562-4550.

Sincerely,

*/RA/*

Victor M. McCree, Deputy Director  
Division of Reactor Projects

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

Enclosures: 1. Notice of Violation  
2. List of Attendees  
3. Material presented by NRC  
4. Material presented by CP&L

cc: (see page 5)

DEC

5

cc w/encls:

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NAME	WROGERS	VMCCREE	CEVANS	FCONGEL	CCARPENTER	
DATE	7/17/02		7/23/02	7/19/02	7/25/02	

## NOTICE OF VIOLATION

Duke Energy Corporation  
Oconee Nuclear Station  
Units 1, 2 and 3

Docket Nos.:50-269, 50-270, 50-287  
License Nos.: DPR-38, DPR-47, DPR-55  
EA-02-034

During an NRC inspection completed on March 12, 2002, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," (Enforcement Policy), the violation is listed below:

10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, requires that 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.

10 CFR 50.48(a)(1) states that each operating nuclear power plant must have a fire protection [program] plan that satisfies Criterion 3 of Appendix A of this part.

10 CFR 50.48(b)(1) states that, except for Sections III.G, III.J, and III.O, the provisions of Appendix R to this part shall not be applicable to plants licensed to operate prior to January 1, 1979, to the extent that fire protection features proposed or implemented have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position BTP APCS 9.5-1 as reflected in NRC fire protection safety evaluation reports issued prior to the effective date of this rule (November 19, 1980). The NRC's SER of July 6, 1973, Section 7.1.8, Non-Class I Equipment Failure, documented that, "a rupture of the fire protection system piping would not cause flooding of the auxiliary building and significantly impair safety related equipment."

10 CFR Part 50, Appendix A, Criterion 3 requires that "Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of structures, system and components" important to safety.

License Condition 3.D of the Oconee facility operating licenses DPR-38, DPR-47, and DPR-55, states that the licensee will implement and maintain in effect all provisions of the NRC-approved fire protection program, as described in the Updated Safety Analysis Report for the facility and as approved in NRC safety evaluation reports.

Oconee's Updated Safety Analysis Report, Section 9.5-1 states that failure or inadvertent operation of an automatic fire suppression system will not incapacitate redundant safe shutdown systems or functions.

Contrary to the above, from approximately December 1995 until April 2001, a condition adverse to quality was not promptly corrected following the identification of conflicting information within the Final Safety Analysis Report regarding the high pressure service water (HPSW) system in the auxiliary building being filled and pressurized with water verses a dry system. A rupture of the HPSW line in the auxiliary building would cause flooding and could disable safety related equipment. The lack of mitigation capabilities for an auxiliary building flood represented a condition adverse to quality. The licensee

Enclosure 1

identified this condition during a design basis reconstitution effort in specification OSS-0254.00-00-3007, dated December 1, 1995, and in PIP O-96-00421, dated February 29, 1996, and again in PIP O-98-3017, dated October 15, 1998. As a result, the licensee failed to implement and maintain in effect all provisions of the NRC-approved fire protection program as required by Condition 3.D of the Oconee facility operating licenses, in that the licensee did not assure that a rupture of the fire suppression system in the auxiliary building would not significantly impair safety related equipment.

This violation is associated with a White SDP finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance was achieved is already adequately addressed on the docket in NRC Inspection Report Nos. 50-269/00-08, 50-270/00-08, 50-287/00-08 and in the information presented by Duke Energy Corporation at the regulatory conference. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region RII, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made 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). Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 26<sup>th</sup> day of July 2002



## LIST OF REGULATORY CONFERENCE ATTENDEES

### NUCLEAR REGULATORY COMMISSION:

L. Reyes, Regional Administrator, Region II (RII)  
V. McCree, Deputy Director, Division of Reactor Projects (DRP), RII  
B. Desai, Acting Branch Chief, DRP, RII  
M. Shannon, Senior Resident Inspector, Oconee Nuclear Plant, RII  
C. Evans, Enforcement Officer, RII  
R. Carroll, Oconee Senior Project Engineer, DRP, RII  
W. Rogers, Senior Reactor Analyst, Division of Reactor Safety, (DRS), RII  
H. Berkow, Office of Nuclear Reactor Regulation (NRR) (teleconference)  
L. Olshan, NRR (teleconference)  
J. Fair, NRR (teleconference)  
P. Qualls, NRR (teleconference)  
M. Sally, NRR (teleconference)  
P. Wilson, NRR (teleconference)  
J. Tatum, NRR (teleconference)

### DUKE ENERGY CORPORATION:

W. McCollum, Site Vice President, Oconee Nuclear Station  
B. Hamilton, Oconee Nuclear Station  
D. Brewer, Oconee Nuclear Station  
S. Nader, Oconee Nuclear Station  
L. Nicholson, Regulatory Compliance Manager, Oconee Nuclear Station  
G. McAninch, Oconee Nuclear Station

OPEN REGULATORY CONFERENCE

OCONEE NUCLEAR STATION

JUNE 27, 2002  
NRC REGION II OFFICE, ATLANTA, GA.

- I. OPENING REMARKS, INTRODUCTIONS AND MEETING INTENT  
L. Reyes, Regional Administrator
- II. NRC REGULATORY CONFERENCE POLICY  
V. McCree, Deputy Director, Division of Reactor Projects
- III. STATEMENT OF THE ISSUE WITH RISK PERSPECTIVES  
V. McCree, Deputy Director, Division of Reactor Projects
- IV. SUMMARY OF APPARENT VIOLATIONS  
V. McCree, Deputy Director, Division of Reactor Projects
- V. LICENSEE RISK PERSPECTIVE PRESENTATION
- VI. LICENSEE RESPONSE TO APPARENT VIOLATIONS
- VII. BREAK / NRC CAUCUS  
L. Reyes, Regional Administrator
- VIII. CLOSING REMARKS  
L. Reyes, Regional Administrator

## **Draft Apparent Violations**

Note: The apparent violations discussed at this Regulatory Conference are subject to further review and subject to change prior to any resulting enforcement action.

1. 10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, requires that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. This requirement is implemented through the licensee's Quality Assurance Program Manual, in Section 17.3.2.13, which states that conditions adverse to quality are to be corrected.

Contrary to the above, a condition adverse to quality was not promptly corrected following the identification of conflicting information within the Final Safety Analysis Report (FSAR) regarding the high pressure service water (HPSW) system in the auxiliary building being filled and pressurized verses a dry system. A rupture of a pressurized HPSW line would cause flooding in the auxiliary building and could disable safety related equipment. Mitigation capabilities for auxiliary building flooding caused by a HPSW line rupture had not been established, in part, due to the understanding that the system was dry. The licensee identified this condition in PIP O-98-3017, dated October 15, 1998. The lack of mitigation capabilities for an auxiliary building flood constitutes a condition adverse to quality. As of July 2001, adequate corrective actions to resolve this condition had not been implemented. Specifically, the licensee had not resolved the FSAR discrepancies for the HPSW system, had not developed procedures or determined what equipment would be necessary for mitigation of flooding in the auxiliary building, and had not implemented proposed plant modifications associated with auxiliary building flood mitigation.

2. 10 CFR 50.48(a)(1) states that each operating nuclear power plant must have a fire protection [program] plan that satisfies Criterion 3 of Appendix A of this part.

10 CFR 50.48(b)(1) states that, except for Sections III.G, III.J, and III.O, the provisions of Appendix R to this part shall not be applicable to plants licensed to operate prior to January 1, 1979, to the extent that fire protection features proposed or implemented have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position BTP APCS 9.5-1 as reflected in NRC fire protection safety evaluation reports issued prior to the effective date of this rule (November 19, 1980). The NRC's SER of July 6, 1973, Section 7.1.8, Non-Class I Equipment Failure, documented that, "a rupture of the fire protection system piping would not cause flooding of the auxiliary building and significantly impair safety related equipment."

10 CFR Part 50, Appendix A, Criterion 3 requires that "Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of structures, system and components" important to safety.

License Condition 3. E (3. D as of May 23, 2000) of the Oconee facility operating licenses DPR-38, DPR-47, and DPR-55, states that the licensee will implement and maintain in effect all provisions of the NRC-approved fire protection program, as described in the Updated Final Safety Analysis Report for the facility and as approved in NRC safety evaluation reports.

Oconee's Updated Final Safety Analysis Report, Section 9.5-1 states that failure or inadvertent operation of an automatic fire suppression system will not incapacitate redundant safe shutdown systems or functions. Similarly, the August 11, 1978, safety evaluation report referenced in License Condition 3. E (3. D as of May 23, 2000) indicated that water spraying from suppression system discharge or pipe breaks had been analyzed and determined that it would have no adverse effect on safety-related equipment.

Contrary to the above, the licensee failed to implement and maintain in effect all provisions of the NRC-approved fire protection program, in that they did not assure that a rupture of the fire suppression system in the auxiliary building would not significantly impair safety related equipment. Specifically, as indicated in the licensee's Auxiliary Building Flood Study, dated November 7, 2000, a rupture of the fire protection system could cause significant flooding, resulting in the potential loss of high pressure injection, low pressure injection, and building spray systems.