

August 5, 1998

EA 98-268

Duke Energy Corporation  
ATTN: Mr. W. R. McCollum  
Vice President  
Oconee Nuclear Station  
P. O. Box 1439  
Seneca, SC 29679

SUBJECT: NOTICE OF VIOLATION AND EXERCISE OF ENFORCEMENT DISCRETION  
(NRC SPECIAL INSPECTION REPORT NOS. 50-269/98-12, 50-270/98-12,  
50-287/98-12)

Dear Mr. McCollum:

This refers to the special inspection conducted by the Nuclear Regulatory Commission (NRC) between April 22 and May 20, 1998, at your Oconee facility. The inspection included reviews of the adequacy of the borated water storage tank (BWST) level instrumentation, the reactor building (RB) wide range level instrumentation and emergency operating procedures (EOP) for all three units of the Oconee Nuclear Station. The results of the inspection were discussed with you at an exit conducted on May 21, 1998, and were formally transmitted to you by letter dated June 3, 1998. An open, predecisional enforcement conference was conducted in the Region II office on June 22, 1998, with you and members of your staff to discuss the apparent violations, the root causes, and corrective actions to preclude recurrence. A list of conference attendees, copies of the NRC's handouts, and Duke Energy Corporation's (DEC) presentation materials are enclosed.

Based on the information developed during the inspection and the information that you provided during the conference, the NRC has determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation, and the circumstances surrounding it are described in detail in the subject inspection report. The violation described in the enclosed Notice involves: (1) the failure to implement the requirements of 10 CFR 50, Appendix B, Criterion III, to incorporate design basis requirements into drawings and procedures; and, (2) the failure to maintain Technical Specification (TS) equipment in an operable condition. Specifically, DEC failed to ensure that the as-built height configuration of the BWST level instrument taps were adequately incorporated into system design drawings and calibration procedures and failed to incorporate fully the RB wide range level instrument uncertainties into the EOPs. As a result, DEC failed to meet the requirements of TS 3.3.4 to maintain two BWST level instruments operable which, during certain design basis accident scenarios, would have resulted in air entrainment in the emergency core cooling system (ECCS) and the inability to ensure an operable flowpath for the high pressure injection (HPI), low pressure injection (LPI) and reactor building spray (BS) systems.

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In late 1997, as part of DEC's Recovery Plan initiative at Oconee, your Self-Initiated Technical Audit (SITA) of the HPI and LPI systems identified that the BWST design drawing lacked a zero reference point. On February 12, 1998, during review of the drawing deficiency, your engineering staff, concluded that an elevation difference existed between the level transmitters and the instrument taps for the BWSTs of all three Oconee units resulting in up to an 18 inch non-conservative error between indicated and actual BWST level. The root cause of the error was the failure to compensate for instrument tap height when calibrating the BWST level instruments. This error of approximately 4 inches existed since initial plant construction and was increased to approximately 18 inches following modifications that replaced the level transmitters in the three Oconee units in 1989. In addition, on February 19, 1998, your engineering staff determined that the EOPs did not take into account a non-conservative uncertainty in the reactor building wide range level instruments which could have resulted in the instruments reading up to 18 inches lower than the actual level. This deficiency had existed since December 1986 when the RB wide range level instruments were installed in the three Oconee units.

The design basis of your facility, as described in Oconee's Final Safety Analysis Report Sections 6.2 and 6.3, requires that during certain loss of coolant accidents (LOCAs), reactor operators must be capable of manually providing a flowpath from the BWST or the Reactor Building Emergency Sump (RBES) to the HPI, LPI and BS pumps. The errors described above created a conflict between the BWST/RB levels specified in the EOP for swapover to the RBES and the BWST/RB levels indicated in the control room. As a result, during certain design basis accident scenarios, including small break LOCAs between 0.005 and 0.025 square feet, the level indication errors would have resulted in the failure to satisfy EOP requirements for the combination of indicated levels for the BWST and RBES and would have delayed swapover initiation resulting in vortexing in the BWST and air binding of the HPI, LPI, and BS pumps.

During the period in which the violation existed, because these safety systems were not called upon to function, there was no actual safety consequence as a result of the incorrect BWST level indication or the failure to include RB level instrument uncertainties into the EOPs. The NRC acknowledges DEC's assessment that the probability of the event was low. However, we note that as discussed in NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance", LOCAs are important contributors to Core Damage Frequency (CDF) in Babcock and Wilcox plants and that the dominant contributor to core damage is ECCS failure during recirculation because of the required system realignment and because operator action is required to perform this switchover. In addition, your assessment depended heavily on the ability of operator action to resolve the EOP BWST and RB sump level conflicts and on the availability of the non-safety related third LPI pump. Successful operator response would require a quick diagnosis of the level discrepancies based on other indicators, and a decision to perform actions contrary to those directed by specific EOP steps including actions to stop the ECCS injection during a LOCA, and/or to initiate swapover without meeting the initial condition requirements.

If HPI pump damage did occur, as you indicated was possible during certain small break LOCA scenarios, performance of the required actions to depressurize the plant to within the discharge pressure capability of the LPI pumps would have been required. Given the matter of minutes between operator indication that the EOP conditions for swapover were not being met and the start of pump vortexing, air binding and pump damage, the NRC has determined that since the modifications in 1989, there was not reasonable assurance that the HPI, LPI and BS pumps could have fulfilled their intended safety functions and assured long-term core cooling across the full spectrum of break sizes that could result in a loss of coolant accident. Consequently, the NRC considers these failures to ensure implementation of the design basis resulting in the operator's inability to maintain critical TS equipment operable a very significant regulatory concern. Therefore, the violation has been classified in accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600, as a Severity Level II violation.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$88,000 is considered for a Severity Level II violation. Because your facility has been the subject of escalated enforcement actions within the last two years<sup>1</sup>, the NRC considered whether credit was warranted for Identification and Corrective Action in accordance with the civil penalty assessment process in Section VI.B.2 of the Enforcement Policy. Credit for Identification is warranted because the violation was identified during your voluntary SITA. The SITA team conducted a careful review of design basis compliance and engineering staff reviews of the issues identified for further analysis were thorough, resulting in identification of the BWST level issue and the RBES level issue. Credit is also warranted for Corrective Action because your immediate corrective actions were comprehensive and long-term corrective actions should ensure a comprehensive review of the affected programs. Corrective actions included EOP revisions and staff training, review of EOP setpoints, and review of the control of calculation input assumptions. In addition, you have a plan to implement broad-scope improvements to Oconee's calculation process and enhance risk-significant historical calculations.

Notwithstanding the credit for Identification and Corrective Action, Section VII.A.1 of the Enforcement Policy (EP) provides that discretion should be considered to propose a civil penalty for a violation categorized at a Severity Level II. However, the criteria of EP Section VII.B.3 provides that the NRC may refrain from issuing a civil penalty for a Severity Level II violation involving a past problem. The violation described in the enclosed Notice involved a past problem in design which DEC identified as a result of a voluntary effort. Corrective actions were comprehensive and routine licensee efforts were not likely to have identified the deficiencies. Therefore, after

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<sup>1</sup> A Severity Level III violation with a proposed civil penalty of \$50,000 was issued on March 5, 1996 (EA 96-019) for a violation related to fuel movement activities. A Severity Level II violation and a Severity Level III problem with a proposed civil penalty of \$330,000 was issued on August 27, 1997 (EAs 97-297 and 97-298) for violations related to inoperability of the HPI system and failure to identify and correct conditions adverse to quality affecting the HPI system.

consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Regulatory Effectiveness, I have been authorized to exercise discretion to not propose a civil penalty in this case.

The NRC has concluded that information regarding the reason for the violation and the corrective actions taken and planned to correct the violation and prevent recurrence is already adequately addressed on the docket in NRC inspection reports, the Licensee Event Report (LER) which you have submitted on this issue, and the materials you presented at the conference. 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.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and any response you submit will be placed in the NRC Public Document Room (PDR).

Sincerely,

Original Signed by  
Jon R. Johnson for

Luis A. Reyes  
Regional Administrator

Docket Nos. 50-269, 50-270, 50-287, 72-04  
License Nos. DPR-38, DPR-47, DPR-55, SNM-2503

Enclosures: 1. Notice of Violation  
2. List of Attendees  
3. NRC Slides  
4. Licensee Material

cc w/encls: (See next page)

DEC

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
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