

August 27, 1997

EA 97-297
EA 97-298

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

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTIES -
\$330,000 (NRC INSPECTION REPORT NOS. 50-269, 270, AND
287/97-07, AND 50-269, 270, AND 287/97-08)

Dear Mr. McCollum:

On June 6, 1997, the Nuclear Regulatory Commission (NRC) completed two special inspections at your Oconee Nuclear Station (ONS). During the inspections, the NRC examined the facts and circumstances surrounding an April 21, 1997, unisolable, reactor coolant leak on Unit 2 and a May 3, 1997, event which resulted in degradation of the high pressure injection (HPI) system during Unit 3 cooldown. The results of the inspections were discussed with members of your staff on June 6, 1997, and were formally transmitted to Duke Power Company (DPC) by separate letters, both dated June 27, 1997. An open predecisional enforcement conference was conducted in the Region II office on July 23, 1997, to discuss the apparent violations, the root causes, and your corrective actions to preclude recurrence of the violations. A summary of the conference was sent to DPC by letter dated July 29, 1997.

Based on the information developed during the inspections and the information that you provided during the conference, the NRC has determined that violations of NRC requirements occurred. The violations are cited in the enclosed Notice of Violation and Proposed Imposition of Civil Penalties (Notice), and the circumstances surrounding them are described in detail in the subject inspection reports.

Violation A in Part I of the Notice involves the failure to meet Technical Specification (TS) operability requirements for the Unit 3 HPI system. Specifically, between at least May 1 and May 2, 1997, and potentially since March 6, 1997, when Oconee Unit 3 reactor coolant was above 350 degrees Fahrenheit (°F), the HPI system would not have been able to perform its intended safety function in that there was inadequate level in the letdown storage tank (LDST) to provide the necessary net positive suction head required for HPI pump operability. On May 3, 1997, during a Unit 3 controlled shutdown, two of the three HPI pumps were damaged due to the loss of net positive suction head.

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A contributor to the decreased inventory in the LDST was due to an erroneously high LDST level indication. The cause of the erroneous indication was the loss of water from the common reference leg on the LDST level instrumentation. The last instance of assured operability of the HPI system was on February 22, 1997, when the LDST level instrumentation was last calibrated. At the conference, DPC admitted the violation and stated that the root causes of Violation A in Part I of the Notice were design deficiencies related to a common reference leg for the LDST level instrumentation and a leaking instrument fitting caused by inadequate maintenance practices.

Violation A in Part I of the Notice is of very significant regulatory concern because of the potential safety consequences associated with extended inoperability of the HPI system. For example, two HPI pumps are needed to meet the success criteria for HPI in the Oconee accident analysis. Due to the design of the HPI system at Oconee, there was a potential for a common mode failure of two or more HPI pumps whenever there was a problem with the HPI pump suction source. As discussed previously, such pump failures occurred while the system was performing its normal makeup function during Unit 3 cooldown on May 3, 1997. Also, contributing to the May 3, 1997, HPI event was the performance of control room operators. Operators were less than attentive to plant parameters and failed to recognize that, while used as a suction source for the HPI pumps, the indicated LDST level was not decreasing as would be expected. In addition, DPC failed to adequately assess operating experience both within DPC and the industry in order to recognize and correct the design vulnerability associated with the HPI system. As an example, several modifications to the HPI system were contemplated and/or proposed in the past which may have provided opportunities to identify and address the single failure vulnerabilities of the system earlier. Based on all of the above, the NRC concluded that the HPI system would not have been able to perform its intended safety function to mitigate a serious safety event. Therefore, this violation has been categorized in accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600, at Severity Level II.

In accordance with Section VI of the Enforcement Policy, a base civil penalty in the amount of \$88,000 is considered for a Severity Level II violation. In this case, the NRC has decided to exercise enforcement discretion, in accordance with Section VII.A of the Enforcement Policy, and propose a civil penalty of \$220,000, twice the maximum, statutory daily penalty of \$110,000, to appropriately reflect the safety and regulatory significance of the violation. This determination is based on: (1) the high risk significance of HPI inoperability; (2) the fact that DPC had a similar event in the past and numerous opportunities were available to identify and correct the design vulnerabilities through industry experience; and (3) the significant length of time that the violation may have existed. Although the specific duration of the violation was not conclusively determined by the licensee nor the NRC, it could have existed since the time of the last instrument calibration, nearly two months. For the purposes of this enforcement action, the NRC asserts that the condition existed at least two days prior to the May 3, 1997, event. The NRC acknowledges that your corrective actions described at the predecisional enforcement conference, both taken and planned, address the causes of the problems.

Violations B(1) and B(2) in Part I of the Notice involve two instances of the failure to establish adequate measures to identify and correct conditions adverse to quality. The first violation involves DPC's failure to implement an adequate augmented inservice inspection program for the detection of HPI cracks. This program, which was the subject of NRC Information Notice 82-09 and Generic Letter 85-20, had been established following the identification of cracks and other damage in HPI piping at Oconee and other Babcock & Wilcox plants. By letter to the NRC dated February 15, 1983, DPC formally committed to the NRC to conduct the inspection program; however, DPC failed to properly perform these inspections. As a result of the failure to implement effective corrective action via the augmented inservice inspection program, cracks in the Unit 2 and Unit 3 HPI piping remained undetected until a Unit 2 crack penetrated the wall of the piping and resulted in an unisolable reactor coolant leak on April 21, 1997. Inadequacies in the inspection program, implementation included the lack of acceptance criteria for radiographic testing and the failure to conduct ultrasonic testing on certain susceptible piping areas. The second violation involves the failure to take actions to assure that indications of thermal stratification, a mechanism known in the industry as a potential cause of pipe cracking, were evaluated and factored into the augmented inspection program. Specifically, in 1990, temperature measurements revealed that thermal stratification in the HPI lines was more severe than previously assumed. At the conference, DPC admitted these violations and stated that the root causes were inadequate commitment tracking and management of change.

The actual safety significance of Violations B(1) and B(2) in Part I of the Notice was limited by the immediate shutdown of Unit 2; however, the violations had the potential for a significant impact on safety. Evidence of thermal sleeve loosening was present on the film from 1996 radiographic tests, but DPC failed to identify and fully investigate the indications. The deficiencies in the licensee's augmented inspections resulted in a delay in identification of HPI cracks and ultimately led to the unisolable reactor coolant leak on April 21, 1997. The NRC is concerned that the April 21, 1997, event involved a known failure mode and that the program designed to detect precursors to such leaks was ineffective. The violation affected all three units, even though Unit 1 was less susceptible to cracking due to a different design. Not only did DPC fail to track and implement regulatory commitments effectively, it is also evident that DPC's examiners exhibited a poor questioning attitude with regard to the absence of acceptance criteria for the radiographic testing. Furthermore, the failure to pursue indications of thermal stratification in the HPI lines is an additional indicator of programmatic deficiencies. Based on the above, Violations B(1) and B(2) in Part I of the Notice have been categorized in accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600, as a Severity Level III problem.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$55,000 is considered for a Severity Level III problem. However, the NRC considers these violations to be of high regulatory significance and to involve particularly poor licensee performance. Specifically, the violations (1) affected all three units; (2) involved a known failure mode; (3) involved

a significant failure to implement an inspection program intended to identify the failure mode; and (4) resulted in an unisolable reactor coolant leak which was clearly preventable. For these reasons, the NRC is exercising discretion in accordance with Section VII.A of the Enforcement Policy and is proposing a civil penalty of \$110,000, twice the base, for this Severity Level III problem. The NRC acknowledges that the corrective actions as described at the predecisional enforcement conference are appropriate to the circumstances.

Therefore, to emphasize the importance of ensuring the operability of equipment required for accident mitigation and the need for comprehensive and lasting correction of significant conditions adverse to quality, I have been authorized, after consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Regulatory Effectiveness, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties, in the amount of \$330,000 for the Severity Level II violation and the Severity Level III problem.

In addition, Part II of the enclosed Notice addresses four violations which have been categorized at Severity Level IV. These violations, associated with the LDST, include (1) the failure to follow operations procedures for monitoring plant conditions; (2) the failure to assign a dedicated Low Temperature Overpressure Protection operator on May 2-3, 1997; (3) the failure to have adequate maintenance procedures for compression fittings; and, (4) the failure to maintain configuration control for certain LDST instrument line valves.

At the conference, several other apparent violations described in the subject inspection reports were discussed and are dispositioned as follows. The apparent violation associated with the failure of operators to implement procedures promptly at the initiation of the May 3, 1997 event, is being withdrawn. This conclusion is based on the additional information that DPC provided at the conference indicating a supplemental reactor operator entered several Alarm Response Guides and an Abnormal Procedure within minutes of receiving the HPIP DISCHARGE HEADER PRESSURE LOW alarm on May 3, 1997. The apparent violations associated with the failure to implement corrective actions for design vulnerabilities and operational concerns identified subsequent to the November 1979 event are also being withdrawn. Specifically, DPC stated that the design deficiencies which were the subject of several cancelled modifications would not have prevented the May 3, 1997, event. However, DPC did acknowledge that the failure to evaluate properly and to take actions on industry operating experience was a significant contributor to its failure to correct the design deficiency associated with the LDST common reference leg. This causal factor is addressed in the discussion of Violation A in Part I of the Notice. The apparent violation regarding the failure to provide adequate design control measures for LDST level and pressure instrumentation is also being withdrawn. Specifically, DPC provided adequate justification, that, in accordance with the Oconee licensing basis, the instrumentation was not required to be classified as Quality Assurance (QA) Category 1. However, at the conference, DPC informed the NRC staff of its decision to voluntarily reclassify the instrumentation as QA Category 1.

Lastly, at the conference DPC denied the apparent violation of 10 CFR 50.72 regarding the failure to report, within four hours, the fact that the HPI system would not have been able to perform its safety function from "February 22 until May 3, 1997." NRC has reevaluated this issue and has concluded that a violation of 10 CFR 50.72 (b)(2)(i) and/or (c) did occur. Enclosure 2 provides the NRC staff's analysis of why a violation of reporting requirements did occur. However, enforcement discretion is being exercised in accordance with Section VII.B.6 of the Enforcement Policy, and the violation will not be cited. The bases for the exercise of discretion are: (1) DPC was in a declared emergency at the time the past operability determination was made; (2) DPC was in periodic communication with the NRC during the event; and, (3) the lack of the operability information did not result in a delayed or inappropriate response by the NRC as an Augmented Inspection Team had already been dispatched to the site.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

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

Sincerely,

Original Signed by
L. A. Reyes

Luis A. Reyes
Regional Administrator

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

Enclosures: 1. Notice of Violation and Proposed
Imposition of Civil Penalties
2. Staff Analysis of Reportability Violations

cc w/encls: (See Page 6)

cc w/encls:

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NRC STAFF RATIONALE FOR OCCURRENCE OF 10 CFR 50.72 REPORTING VIOLATION

At the conference, the DPC staff expressed the view that events reported under 10 CFR 50.72(a) do not need to be reported again under 10 CFR 50.72(b) and that the new information determined on May 5, 1997, did not appear to meet the supplemental reporting requirements of 10 CFR 50.72(c). DPC also indicated that the criteria for followup notifications were not well understood and requested further NRC staff input on the matter. Accordingly, the following explanation of why the NRC staff considers that a violation occurred is provided.

At 3:45 p.m. (EDT) on May 3, 1997, DPC declared and reported an Unusual Event pursuant to 10 CFR 50.72(a)(i). The emergency classification was based on the identification that two of three high pressure injection (HPI) pumps were inoperable during a planned shutdown.

Following this notification, communications with the NRC Operations Center were frequent and commensurate with the significance of the event. Therefore, the NRC staff concludes there is no violation for failure to report under 10 CFR 50.72(a). According to our records, at no time during the period 3:45 p.m. on May 3, 1997, until 7:46 p.m. on May 5, 1997, when the Unusual Event was terminated, was there any communication that a determination had been made regarding the past inability of the HPI system to perform its intended safety function for an extended period of time. The notification and subsequent communications of May 3, 1997 through May 5, 1997, only conveyed to the NRC that two of three HPI pumps were inoperable at the time they were called upon to provide makeup during the May 3, 1997 planned shutdown.

Your May 6, 1997, followup report, which was only made after NRC expressed concern with your failure to report, stated that at 3:45 p.m. on May 5, 1997, your engineering staff concluded that the Oconee Unit 3 HPI system would not have been able to perform its intended safety function during power operations from February 22, 1997 until May 3, 1997. This is a substantially different communication than the initial emergency notification that conveyed two of three HPI pumps were inoperable when called upon during a planned shutdown.

To reiterate the NRC's position, 10 CFR 50.72(b)(2)(i) requires that if not reported under paragraphs (a) or (b)(i) of that section, the licensee shall notify the NRC as soon as practical and in all cases, within four hours of the occurrence of any of the following:

"(i) Any event, found while the reactor is shutdown, that, had it been found while the reactor was in operation, would have resulted in the nuclear power plant, including its principal safety barriers, being seriously degraded or being in an unanalyzed condition that significantly compromises plant safety."

The May 5, 1997, engineering evaluation, which was completed with the reactor shutdown, concluded that during power operations from February 22, 1997 through May 3, 1997, the unit, because the HPI system was inoperable, operated

Enclosure 2

in a condition that significantly compromised plant safety. Therefore, the conclusions of the engineering evaluation were reportable pursuant to 10 CFR 50.72(b)(2)(i).

Further, 10 CFR 50.72(c), "Followup Notification," requires that,

"With respect to the telephone notifications made under paragraphs (a) and (b) (emergency and non-emergency reports), in addition to making the initial notification, each licensee, shall during the course of the event:

(2) Immediately report (i) the results of ensuing evaluations or assessments of plant conditions,...."

Therefore, the NRC considers that the results of the engineering evaluation, which became available while the emergency classification of unusual event was still in effect, were reportable under 10 CFR 50.72(c)(2)(i).

NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTIES

Duke Power Company
Oconee Nuclear Station
Units 1, 2, and 3

Docket Nos. 50-269, 270, and 287
License Nos. DPR-38, 47, and 55
EAs 97-297 and 97-298

During Nuclear Regulatory Commission (NRC) inspections conducted from April 22 to June 6, 1997, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions," NUREG-1600, the NRC proposes to impose civil penalties pursuant to Section 234 of the Atomic Energy Act of 1954 (Act), as amended, 42 U.S.C. 2282, and 10 CFR 2.205. The particular violations and associated civil penalties are set forth below:

I. Violations Assessed a Civil Penalty

- A. Technical Specification (TS) 3.2.1, "High Pressure Injection and Chemical Addition Systems," requires that the reactor shall not be critical unless two high pressure injection (HPI) pumps per unit are operable except as specified in TS 3.3.

TS 3.3.1.a(1), "High Pressure Injection System," requires that when the reactor coolant system (RCS), with fuel in the core, is in a condition with temperature above 350 degrees Fahrenheit (°F) and reactor power less than 60 percent full power, two independent trains, each comprised of an HPI pump and a flow path capable of taking suction from the borated water storage tank and discharging into the RCS automatically upon Engineered Safeguards Protective System actuation, shall be operable. TS 3.3.1.c(1) further requires that when reactor power is greater than 60 percent full power that the remaining HPI pump shall be operable.

Contrary to the above, between at least May 1 and May 2, 1997, with fuel in the Oconee Unit 3 core and RCS temperature greater than 350°F, the licensee failed to maintain the HPI system operable, as required by TSs. Specifically, the licensee operated with the HPI system outside of the letdown storage tank (LDST) level versus pressure analyzed limitation curve which resulted in all of the HPI pumps being inoperable and unable to perform their safety-related function if called upon to operate, due to inadequate net positive suction head. (01012)

This is a Severity Level II violation. (Supplement I)
Civil Penalty - \$220,000

Enclosure 1