

September 8, 1995

EA 95-166

Carolina Power & Light Company
ATTN: Mr. W. R. Campbell
Vice President
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

SUBJECT: NOTICE OF VIOLATION
(NRC INSPECTION REPORT NOS. 50-325/95-13 AND 50-324/95-13 AND
50-325/95-14 AND 50-324/95-14)

Dear Mr. Campbell:

This refers to the inspections conducted between April 29 and August 10, 1995, at the Brunswick facility. The inspections included a review of the circumstances associated with deficiencies identified in design control, implementation of plant modifications, and post-modification testing. The results of these inspections were sent to you by letters dated June 29, July 27, and August 11, 1995. A closed predecisional enforcement conference was conducted in the Region II office on August 28, 1995, to discuss the apparent violations, the root causes, and your corrective actions to preclude recurrence. A list of conference attendees, NRC slides and a copy of your presentation summary are enclosed.

Based on the information developed during the inspections and the information you provided during the conference, the NRC has determined that violations of NRC requirements occurred. These violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection reports. Violation A, described in the enclosed Notice, involved two examples of the failure to confirm the adequacy of a design change to the high pressure coolant injection system (HPCI) by design reviews or by the performance of a suitable post modification testing program. In the first example, the design review for Plant Modification 92-79 did not identify the susceptibility of the HPCI system to a direct current ground. Between May 18, 1995, when HPCI was declared operable following implementation of Modification 92-79, and June 9, 1995, when a ground developed during a routine HPCI surveillance test, the HPCI system was susceptible to a direct current ground which could cause erroneous speed and flow indications resulting in HPCI being inoperable in the automatic mode of operation. Opportunities to prevent the violation were missed on May 11 and May 29, 1995, when isolation and grounding problems were identified. The root causes of this example of Violation A were the failure to include reviews of ground isolation in the design review, failure to recognize isolation of the controller inputs/outputs as an important design characteristic, and failure to fully apply the implications of the information obtained during your May 11 and May 29 reviews of the isolation and grounding problems to the adequacy of the modification to the HPCI system.

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In the second example of Violation A and Violation B, additional post-modification testing of the HPCI and reactor core isolation cooling system (RCIC) improperly included tuning of the HPCI and RCIC flow controllers under recirculation conditions which did not account for the different hydrodynamic conditions of vessel injection. Between May 18, 1995, when HPCI and RCIC were declared operable and May 20, 1995, when the flow controllers were reset, the RCIC system was not available in the automatic mode of operation. The fact that system parameters were adjusted to values significantly different from parameters established during the initial system tests without questioning the validity of the new values is of particular concern to the NRC. It was only fortuitous that HPCI was operable during this period of time as the improper adjustments to the HPCI flow controllers fell within acceptable parameters. The root causes of example 2 of Violation A and Violation B were ineffective communication and inadequate interface between the design engineer responsible for the modifications and the system engineer conducting the tests, failure to conduct diverse reviews of the tuning methods used, and failure to question post test data. These inadequacies reflect a failure to exercise broadscope engineering oversight.

The availability of operator action to operate the HPCI and RCIC systems in the manual mode reduced the actual consequence to safety of these violations. However, the flawed modifications degraded the HPCI and RCIC systems during the same time period. Operability of these two systems has been shown through probabilistic risk assessment to be a key contributor to the reduction in accident consequences at the Brunswick plant. The NRC is particularly concerned that your development of these modifications did not take into account that similar modifications to these key systems warranted diverse, rigorous reviews to ensure the adequacy of the modifications and post-modification testing. Therefore, these violations are classified in the aggregate in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), (60 FR 34381; June 30, 1995/NUREG-1600) as a Severity Level III problem.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$50,000 is considered for a Severity Level III problem. Because your facility has not been the subject of escalated enforcement actions within the last two years, the NRC considered whether credit was warranted for *Corrective Action* in accordance with the civil penalty assessment provision in Section VI.B.2 of the Enforcement Policy. Your immediate corrective actions included returning equipment to operable status and evaluating the impact of the events on equipment operability. At the conference, you stated that your planned long-term corrective actions included training on management expectations regarding the quality of design review and post-modification testing with your design and system engineering staffs and utilizing Engineering Product and Engineering Design Review Teams to review major modifications that impact safety significant systems. You also restated your efforts to strengthen your engineering organizations by integrating design and system engineering, forming design review teams, enhancing engineering skills, and implementing a

"responsible engineer" concept to ensure accountability in the overall design process. Based on these facts, the NRC determined that credit was warranted for the factor of *Corrective Action*.

Therefore, to encourage prompt, comprehensive correction of violations and in recognition of the absence of previous escalated enforcement action, I have been authorized, after consultation with the Director, Office of Enforcement, not to propose a civil penalty in this case. However, significant violations in the future could result in a civil penalty.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be placed in the NRC Public Document Room (PDR). 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 without redaction.

The responses directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96.511.

Sincerely,

**Original Signed by
Luis A. Reyes for**

Stewart D. Ebnetter
Regional Administrator

Docket No.: 50-325
License No.: DPR-71

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

cc w/encls: (See next page)

cc w/encls:

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