CP&L

Carolina Power & Light Company

P. O. Box 1551 • Raleigh, N. C. 27602

DEC 28 1990

R. A. WATSON
Senior Vice President
Nuclear Generation

SERIAL: NLS-90-259

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
REPLY TO NOTICE OF VIOLATION (EA 90-154)

Gentlemen:

On November 30, 1990, the Nuclear Regulatory Commission issued a Notice of Violation (EA 90-154) for events at the Brunswick Steam Electric Plant that led to a Unit 2 reactor scram on August 19, 1990. Details of the NRC's inspections were provided in Inspection Report Nos. 50-325/90-29 and 50-324/90-29 and Augmented Inspection Team Report Nos. 50-325/90-36 and 50-324/90-36. Carolina Power & Light Company (CP&L) hereby responds to the Notice of Violation. Attachment 1 to this letter is CP&L's "Reply to Notice of Violation" in accordance with the provisions of 10 CFR 2.201.

If you have any questions concerning this response, please contact Mr. S. D. Floyd at (919) 546-6901.

Yours very truly,

R. A. Watson

R. A. Watson

WRM/cwh (933BNP)

Attachment

R. A. Watson, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Debra C. Johnson
Notary (Seal)

My commission expires: 6/26/94

cc: Mr. S. D. Ebneter
Mr. N. B. Le
Mr. R. L. Prevatte

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ENCLOSURE 1

CAROLINA POWER & LIGHT COMPANY
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I. INTRODUCTION

In accordance with 10 CFR 2.201 of the Commission's Regulations and as described in the Staff's November 30, 1990 letter transmitting the subject Notice of Violation, Carolina Power & Light Company (CP&L) hereby responds to the cited Notice of Violation.

II. REPLY TO INDIVIDUAL ALLEGED VIOLATIONS

The Notice of Violation states the particular violations as follows:

Violation A:

A. Technical Specification 6.5.1.a. requires that written procedures be established, implemented, and maintained for applicable procedures recommended in Appendix A, Regulatory Guide 1.33, Quality Assurance Program Requirements, November 1972, which requires that administrative procedures be established detailing procedure adherence requirements.

Appendix A, Section H.2, Regulatory Guide 1.33, November 1972, requires that procedures be written and implemented for each surveillance test listed in Technical Specifications.

Maintenance Management Manual 0-MM-001, Maintenance; Conduct of Operations, Revision 13, Section 5.2.2, requires that maintenance procedures be conducted with strict adherence to procedure steps. The steps are to be performed in the sequence written and, where indicated, procedure steps should be initialed upon completion of stated action.

Plant Administrative Procedure AP, Volume 1, Revision 126, Section 11.7, requires that independent verification be performed on components returned to service for systems listed in Table 11.7.1, including the Primary Containment Isolation System. Individuals performing independent verification shall not rely upon the observed actions of the individual performing the initial alignment.

Contrary to the above, on August 19, 1990, Maintenance Surveillance Test (MST) 2MST PCIS24M, Primary Containment Isolation System High Condenser Pressure Trip Unit Channel

Calibration, Revision 4, which satisfies the requirements of Technical Specification 4.3.2.1 and Tables 3.3.2-2 (Item 1.e) and 4.3.2-1 (Item 1.e) was not properly implemented in that testing of channel A-2 was not complete prior to testing channel B-2. Further, steps 7.5.15, 7.5.36, 7.5.37, 7.5.38, 7.5.39, 7.5.58, 7.5.59, and 7.5.63 were inappropriately initialed as completed when they had not been performed. In addition, 2MST PCIS24M was not properly implemented, in that required independent verification was not performed. Further, steps 7.5.50 through 7.5.54 and steps 7.5.57 through 7.5.60 that require independent verification, were inappropriately initialed-off as being independently verified when they had not been. The improper performance of the MST resulted in a Group 1 isolation and a Unit 2 automatic reactor scram.

This is a Severity Level III violation (Supplement I).

CP&L RESPONSE:

A. Admission of the Violation

CP&L acknowledges that the violation occurred as stated.

B. Reason That the Violation Occurred

This violation was the result of two technicians acting without regard for site procedures or work practices with which they were familiar. Their familiarity with these practices was clearly demonstrated by their successful conduct of a similar test during the time preceding the conduct of 2MST-PCIS24M. Additionally, in statements made to the Site Incident Investigation Team after discovery of the procedure falsification, both individuals indicated that they were aware of the requirements for proper conduct of the procedure steps.

In the case of the first technician, the individual performing 2MST-PCIS24M on August 19, 1990, a conscious decision was made by the individual to proceed with a surveillance test knowing that his partner was in the shop. By making this decision, features of the surveillance test which are designed to minimize the potential of an inadvertent isolation during its conduct were negated. Specifically, the test is designed with steps requiring independent verification of channel restoration prior to proceeding with the next channel test. The technician failed to comply with the procedural requirements to conduct this independent verification. The willful nature of this non-compliance is substantiated by the number of independent verification steps passed over by the first technician as he conducted tests on the first two channels, without the aid of his partner.

Secondly, the individual conducting the test failed to perform certain restoration-to-service steps as required by the test at the completion of testing the third channel (channel A2). The act of omitting these restoration-to-service steps was clearly not an intentional one. However, when combined with the willful noncompliance with procedural requirements to obtain independent verification prior to proceeding to subsequent steps, a group 1 isolation and reactor scram occurred.

Finally, the second technician, the individual responsible for conducting the independent verification steps required by the procedure, allowed himself to be convinced to falsify the conduct of these steps. The true cause of this act remains unclear. The integrity of the process whereby an individual attests to performing a step by initialing in the associated blank is at the foundation of our industry.

The Company believes that this is an isolated occurrence. However, due to the significance of the event, the following corrective actions are appropriate.

C. Corrective Actions Taken and Results Achieved

Numerous corrective actions have been taken to address the causes for this event.

1. After the completion of the appropriate administrative processing, including Fitness For Duty testing, the employment of these two technicians was terminated.

2. A Human Performance Evaluation of the event was conducted.

3. Tests performed by these technicians that weekend were re-performed.

4. On August 20, 1990, briefings were held with maintenance personnel to discuss the actions leading up to the event.

5. On August 24, 1990, briefings were held with I&C maintenance personnel led by sub-unit managers detailing communications expectations. These briefings stressed the thoroughness and clarity of communications with Operations as well as the development of a questioning attitude.

6. Maintenance Policy Notice, MPN 90-017 was implemented formalizing the conduct of pre-job and post-job briefings. This policy notice requires firstline supervisors or designated lead personnel to devote time at the beginning and end of each shift to discuss the shift activities, focusing on such issues as critical tasks and the potential consequences of improper performance and observations made during task performance. Additionally, this policy notice

has recently been revised to require the initiation of the site corrective action program, if appropriate, based on observations discussed during the post job briefings.

7. "Reducing Human Errors" training has commenced. Currently, the training is being delivered by site management personnel to all site personnel. The course stresses the significance of each individual's contribution to the safe operation of the plant. Additionally, the importance of the various barriers to event causes are discussed. Open discussion about the event detailed in this violation as well as other site events occurs. Finally, parallels to the airline industry are illustrated by viewing portions of the film "The Wrong Stuff."

8. A Project Quality Team has been formed to improve Command and Control. Members of this team include senior operations and maintenance management personnel who possess an extensive experience base in operating and maintaining a facility.

D. Additional Corrective Actions Planned

1. Complete the "Reducing Human Error" training. Projected completion date is January 31, 1991.

2. Conduct "Please Listen" training based on a course developed by another utility. This course is viewed as a follow-up to the "Reducing Human Errors" training.

3. Continue the problem definition and solution development begun by the Command & Control Project Quality Team. Projected completion date is yet to be determined.

E. Date When Full Compliance Will Be Achieved

The nature of this violation is such that demonstration of full compliance is difficult to document. It is a violation in which two individuals chose to violate the trust placed in their actions by willfully violating procedures they knew they were obligated to follow. Therefore, full compliance currently exists given the fact that these individuals are no longer employed at this facility.

VIOLATION B.1:

B. Technical Specification 6.8.1.a. requires that written procedures be established and implemented for applicable procedures recommended in Appendix A, Regulatory Guide 1.33, November 1972.

1. Appendix A, Section E, Regulatory Guide 1.33, November 1972, requires that procedures be established for correcting alarm conditions.

   Operating Instructions, OI-01, Operating Principals and Philosophy, Revision 32, Section 6.4.7, requires that the Plant Monitor Reactor Operators silence, acknowledge, and respond to annunciators.

   Section 9.0 states that all alarms should be investigated thoroughly and immediately.

   Contrary to the above, the Plant Monitor Reactor Operator did not properly acknowledge and respond to annunciators GRPI ISOL Logic A/C TRIPPED (A-05 5-3) and RPS Chan B Trip Cabinet Trouble (A-04 6-1) which existed simultaneously at approximately 9:50 p.m. on August 19, 1990, on Unit 2. The failure to properly acknowledge and respond to these alarms resulted in the Instrumentation and Control (I&C) technician continuing with the surveillance test and tripping Unit 2.

This is a Severity Level IV violation (Supplement I)

CP&L RESPONSE:

A. Admission of the Violation

CP&L acknowledges that the violation occurred as stated.

B. Reason That the Violation Occurred

Each Maintenance Surveillance Test contains a list of expected alarms. The Control Operator is not expected to reference the Annunciator Panel Procedure for each alarm that comes in during the MST. However, the operator should have recognized that alarms from both the A and B channels should not have occurred simultaneously. He did not recognize the significance of this condition for two reasons:

1. Operations personnel were not concerned due to the long history of success with surveillance testing performed by Maintenance personnel.

2. The annunciators are not arranged by channel. There is no cue other than the annunciator labels that both channels were affected simultaneously.

C. Corrective Steps That Have Been Taken and Results Achieved

Pre-job briefings with Operations personnel are now conducted prior to surveillance testing performed by Maintenance personnel.

These briefings have increased the operators' awareness of what to expect during maintenance surveillance tests, thus they are better prepared to identify abnormalities and take appropriate action to prevent a repeat of this type of event.

Licensed Operators have received a thorough review of this event during Licensed Operator Retraining.

D. Additional Corrective Actions Planned and Date of Full Compliance

As previously stated, "Reducing Human Errors" training is in progress for site personnel. The purpose of this training is to increase the sensitivity and awareness of project personnel to factors in our work environment that negatively impact on our drive for excellence.

E. Date When Full Compliance Will Be Achieved

CP&L believes that full compliance has been achieved in this area.

VIOLATION B.2:

2. Appendix A, Section D, Regulatory Guide 1.33 November 1972, requires that procedures be established for Reactor Core Isolation Cooling (RCIC) Systems and the Feedwater System.

Contrary to the above:

a. OP-16, Reactor Core Isolation Cooling System, Revision 57, Section 4.0, states that DC limitorque valves are limited to a duty cycle of three starts in five minutes followed by a fifty minute cool-down period. OP-16 was not implemented in that the RCIC V8, a trip and throttle DC limitorque motor operated valve, was cycled a fourth time after three starts in a five minute period without a fifty minute cool-down period on Unit 2 at approximately 2:00 a.m. on August 20, 1990. The valve motor tripped on thermal overload during the fourth cycle.

b. 2-OP-32, Condensate and Feedwater System Operating Procedure Revision 58, Section 5.2, and GP-05, Plant Shutdown, Revision 43, requires that V177, the long cycle cleaning return to condenser valve, not be opened until the Startup Level Control Valve (SULCV) is opened. 2-OP-32 and GP-05 were not properly implemented in that the V177 was opened prior to opening the SULCV when placing the SULCV in service on August 19, 1990, at approximately 11:30 p.m.

This is a Severity Level IV violation (Supplement I).

CP&L RESPONSE:

A. Admission of the Violation

CP&L acknowledges that the violation occurred as stated.

B. Reason the Violation Occurred

The RCIC trip and throttle valve (V8) is a spring operated trip valve with a motor operator to reset it after an electrical or mechanical trip, or to provide throttling motion. The motor operator has its own position indication on the Reactor Turbine Gauge Board (RTGB) and is normally open. After the turbine trips, the motor operator is run to the closed position where it latches onto the valve stem. The motor operator is then run back to the open position with the valve, and the turbine is ready to operate. The motor operator has a spring return switch which must be held in the closed position for several seconds after the motor operator indicates full closed, to allow it to latch onto the valve. The RCIC V8 valve was cycled excessively for two reasons. First, when resetting the valve, the operator did not hold the control switch in the closed position for a sufficient time after the motor operator was indicated to be in the full closed position. This caused him to have to repeat the resetting process. The requirement to hold the switch in the closed position was not contained in any procedure and the simulator model did not include this attribute. Second, the caution on duty cycles was not considered to apply under all conditions. It was originally implemented to extend the life of the operator motors. The prevalent belief was that the duty cycle limit could be exceeded during transients or emergencies. The wording of the caution was consistent with this belief. The thermal limit devices were recently modified to enforce the duty cycle limit and no training was conducted. The simulator model did not include the duty cycle limit.

The V17 was opened prior to placing the SULCV in service because of operator error. The misposition was immediately corrected by the second reactor operator assigned to the Unit 2 control board.

C. Corrective Steps That Have Been Taken and Results Achieved

The RCIC operating procedure has been revised to include a caution on resetting the V8 trip and throttle valve. The simulator model has been modified to include the requirement to hold the V8 operator switch for several seconds after it indicates closed.

The simulator model has also been modified to enforce the duty cycle of the RCIC V8 valve.

Licensed operators have been trained on this event. Included in this training was a session on the simulator dedicated to Startup Level Control Valve operation.

D. Actions to Prevent Recurrence

An assessment of DC valve duty cycle and thermal limit requirements is being performed to ensure that safety related DC valves are capable of performing their design function without exceeding duty cycle limits.

E. Date When Full Compliance Will Be Achieved

CP&L believes that full compliance has been achieved in this area.

VIOLATION B.3:

3. Appendix A, Section D, Regulatory Guide 1.33, November 1972, requires that procedures be established for the Main Steam System Reactor Core Isolation Cooling System and Emergency Core Cooling Systems.

Contrary to the above:

a. The procedure Operator Aid 210099, used by the operator to open the main steam isolation valves (MSIV) on August 19, 1990, at approximately 10:30 p.m. was inadequate in that it did not require the operator to place the condenser vacuum bypass switch in the bypass position prior to attempting to open the MSIVs when a low vacuum condition existed.

b. 2-OP-16, Reactor Core Isolation Cooling System, Revision 57, was inadequate in that the method used to re-latch the Reactor Core Isolation Cooling (RCIC) trip and throttle valve (V8) following a turbine trip, holding the valve close switch closed for an additional five seconds after receiving closed indications, is not specified.

This is a Severity Level IV violation (Supplement I).

CP&L RESPONSE:

A. Admission of the Violation

CP&L acknowledges that the violation occurred as stated.

B. Reason That the Violation Occurred

The operator aid was prepared based on the assumption that MSIVs would be reopened only when adequate condenser vacuum existed. This assumption was not valid under all conditions.

The RCIC operating procedure did not contain the caution because it was felt that the caution label on the RTGB was sufficient to guide the operator.

C. Corrective Steps That Have Been Taken and Results Achieved

The operator aids and both Operating Procedures have been corrected. These changes and the training received in Licensed Operator Retraining on this event have been effective in making the operators aware of these requirements.

D. Actions to Prevent Recurrence

A review of other existing RTGB operator aids for correctness was performed.

E. Date When Full Compliance Will Be Achieved

CP&L believes that full compliance has been achieved in this area.

VIOLATION C:

C. 10 CFR 50.72(b)(2)(ii) requires that the licensee notify the NRC Operations Center via the Emergency Notification System as soon as possible and in all cases, within four hours of the occurrence of any event or condition that results in manual or automatic actuation of any Engineered Safety Feature including the Reactor Protection System. The Final Safety Analysis Report, Chapter 6, lists the Engineered Safety Features including the Containment Isolation System.

Contrary to the above, a notification to the NRC Operations Center was not made within four hours of the following events:

1. Containment Isolation System (Group 1) actuation on Unit 2 at 10:27 p.m. on August 19, 1990.

2. Reactor Protection System and Containment Isolation System (Groups 2, 6, and 8) actuations in Unit 2 at 11:17 p.m. on August 19, 1990, and 12:04 a.m. on August 20, 1990.

3. Containment Isolation System (Group 3) actuation in Unit 2 at 12:27 a.m. on August 20, 1990.

This is a Severity Level IV violation (Supplement I).

CP&L RESPONSE:

A. Admission of the Violation

CP&L acknowledges that the violation occurred as stated.

B. Reason that the Violation Occurred

This violation occurred because of the difficulties encountered while recovering from the scram. The Senior Reactor Operators and Shift Technical Advisors were occupied with stabilizing the plant and overlooked the reporting requirement.

C. Corrective Steps That Have Been Taken and Results Achieved

The required reports were made on August 20, 1990 and September 7, 1990. Licensed Operators have been trained on this event.

D. Actions to Prevent Recurrence

The Licensed Operator Retraining has been restructured to increase the amount of simulator training from 40 hours to a minimum of 64 hours per year. This will give the control room staff more experience using the Plant Emergency Procedure (PEP) in evaluating plant conditions and classifying and reporting events.

E. Date When Full Compliance Will Be Achieved

CP&L believes that full compliance has been achieved in this area.

VIOLATION D:

D. CFR Part 50.47(b)(4) requires that emergency response plans for nuclear power reactors be in use including a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters.

10 CFR Part 50, Appendix E (IV)(B) requires that emergency plans include the means to be used for determining action levels that are to be used as criteria for determining the need for notification and participation of local and state agencies, the Commission, and other Federal agencies. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to on-site and off-site monitoring.

Technical Specification 6.8.1.e. requires that written procedures be established, implemented, and maintained covering the Emergency Plan implementation.

Plant Emergency Procedure PEP 02.1, Initial Emergency Action, Revision 27, Section 2, Step 2.1.1, requires that an Unusual Event

be declared upon failure of a nuclear steam system safety/relief valve, including Automatic Depressurization System, to open if challenged as indicated at panel (P603) on C32-R609, or C32-R605.

Contrary to the above, PEP 02.1 was not properly implemented in that on August 19, 1990, an Unusual Event was not declared following the failure of Unit 2 nuclear steam system safety/relief valves B21-F013 A, C, G, H, and K to open when challenged following the automatic reactor shutdown at 9:54 p.m.

This is a Severity Level IV Violation (Supplement VIII).

CP&L RESPONSE:

A. Admission of the Violation

CP&L acknowledges that the violation occurred as stated.

B. Reason That The Violation Occurred

The Shift Technical Advisor detected the malfunction of the SRVs and recognized that the Emergency Action Level for Unusual Event had been met. He informed the Operations Manager promptly. However, previous industry and site problems with the Target Rock SRVs caused the Operations Manager to doubt that an actual malfunction had occurred. He requested an assessment from the Technical Support organization prior to declaring an emergency condition. An Unusual Event was subsequently declared and terminated on August 20, 1990 at 5:45 p.m.

C. Corrective Steps That Have Been Taken and Results Achieved

A review of our Plant Emergency Procedure (PEP) identified the Emergency Action Level (EAL) for safety relief valve (SRV) failure was not consistent with applicable guidelines and was subject to interpretation and difficult to assess at the time of an event. The EAL for SRV failure has been simplified and revised to a pre-established reactor coolant pressure (1250 psi). This will allow the operators to make the correct determination in a more timely manner.

D. Actions to Prevent Recurrence

As previously stated, the increased simulator time during Licensed Operator Requalification will give the operators more experience using the PEPs.

E. Date When Full Compliance Will Be Achieved

CP&L believes that full compliance has been achieved in this area.