



Carolina Power & Light Company
PO Box 10429
Southport NC 28461-0429

DEC 18 1995

William R. Campbell
Vice President
Brunswick Nuclear Plant

SERIAL:BSEP 95-0632
10CFR2.201

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
REPLY TO A NOTICE OF VIOLATION

Gentlemen:

On November 20, 1995, the Nuclear Regulatory Commission (NRC) issued a Notice of Violation for the Brunswick Steam Electric Plant, Units 1 and 2. The basis for the violation is provided in NRC Inspection Report 50-325/95-20 and 50-324/95-20. Carolina Power & Light Company finds the inspection does not contain information of a proprietary nature. Enclosure 1 provides a synopsis of our response to recent engineering performance issues at the Brunswick Plant. Enclosure 2 provides Carolina Power & Light Company's response to the Notice of Violation in accordance with the provisions of 10 CFR 2.201.

Please refer any questions regarding this submittal to Mr. G. D. Hicks at (910) 457-2163.

Sincerely,

William R. Campbell

SFT/
Enclosures

1. Synopsis
2. Reply to Notice of Violation
3. List of Commitments

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Q PDR

cc: Mr. S. D. Ebnetter, Regional Administrator, Region II
Mr. D. C. Trimble, Jr., NRR Project Manager - Brunswick Units 1 and 2
Mr. C. A. Patterson, Brunswick NRC Senior Resident Inspector
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 and 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
REPLY TO NOTICE OF VIOLATION

SYNOPSIS

On November 13, 1995, CP&L staff met with the NRC staff to discuss the circumstances surrounding this violation. As discussed at that meeting, the cause of the violation was the failure of engineering reviews conducted between 1992 and 1993 to adequately evaluate the acceptability of the proposed material change. Since the 1992-1993 timeframe, CP&L has worked to improve the quality of engineering products and continues to implement actions designed to affect the improvements necessary to raise Brunswick Engineering Support Section performance to desired standards. As discussed in the November 13, 1995 meeting and in our October 6, 1995 letter, several engineering improvement initiatives were established. These improvement initiatives include reorganizing the Brunswick Engineering Support Section, instilling a responsible engineer concept, enhancing engineering skill sets, redesigning the Engineering Service Request process, and establishing the Design Review Team, Product Review Team, and Product Affirmation review processes.

CP&L believes that these improvement initiatives have laid the foundation for ongoing and future engineering product improvements. CP&L further believes that the lessons-learned and improvement initiatives taken as a result of earlier issues led to the prompt identification of comprehensive corrective actions taken in response to this event. While further engineering performance improvement is expected, the response to this event and other recent engineering products indicate that engineering performance at the Brunswick Plant is improving. CP&L will continue to monitor the quality of engineering products to ensure that this positive engineering performance trend continues.

While these improvement initiatives address the issues associated with current engineering performance, additional measures are necessary to ensure that implementation of older engineering products does not resurrect old process issues. These additional measures include the use of the affirmation process prior to installation of products that will change plant configuration. The affirmation process requires the responsible engineer to assume ownership of the modification and to ensure the modification reflects the current design requirements and plant configuration. The scope of affirmation includes review of: key safety function and performance requirements, the clarity and adequacy of the instructions to support quality implementation, drawing clarity and accuracy, the adequacy of post installation testing to assess potential impacts on system performance and assure design attributes can be satisfied, and assumptions to ensure a technically sound and documented bases exists. Furthermore, the affirmation ensures that Operations has been advised of all potential impacts to the plant, the plant conditions necessary to perform the work have been specified, and a review of similar modifications is

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SYNOPSIS

performed when deficiencies were identified during the validation review. As of December 5, 1995, 141 engineering products have been affirmed/reviewed.

An interdisciplinary product review of direct replacements, permanent repair evaluations, and material equivalency evaluations performed on risk significant systems (High Pressure Coolant Injection, Reactor Core Isolation Cooling, Emergency Diesel Generator, Residual Heat Removal, Service Water, Reactor Protection, and DC power systems) and approved from 1992 through 1994 has been completed. This review examined the engineering products generated since the start of the dual unit shutdown in 1992 until the single engineering product process was implemented in 1994. This review has been completed with no safety concerns identified.

Additionally, CP&L has taken the initiative to identify and complete a review of modifications which have been initiated but not fully closed. Approximately eighty plant modifications have been determined to be initiated but not fully closed. Sixty-five of these eighty modifications are scheduled to be closed out by the end of 1995. To close the remaining fifteen modifications requires an outage or the completion of another modification. The work required to close these modifications that results in a modification to the plant configuration will be subjected to the affirmation process.

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 and 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
REPLY TO NOTICE OF VIOLATION

VIOLATION:

During an NRC inspection conducted on September 2-30, 1995, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 50, Appendix B, Criterion III, Design Control, requires, in part, that measures shall be established for the selection and review for suitability of application of materials that are essential to the safety-related function of the components and shall provide for verifying and checking the adequacy of the design. Design changes shall be subject to design control measures commensurate with the original design.

Contrary to the above, during the period May 1992 through August 31, 1995, the licensee failed to adequately implement measures for the selection and review for suitability of application material for the channelstream retainer replacements for the Residual Heat Removal Heat Exchanger Service Water Discharge Valves, 1-E11-PDV-F068A/B and 2-E11-PDV-F068B. Specifically, the licensee did not consider the effects of mating two Inconel surfaces when it performed the equivalency evaluation for the installation of the Inconel retainers using Engineering Procedure, 0-ENP-03.4, Equivalent Component Evaluation, Revision 0, and documented in Attachment, SEEF No. 93-0091. The failure to perform an adequate evaluation and review resulted in the galling of the plug and retainer in the three valves, two of which seized and failed during surveillance tests conducted on August 23 and 25, 1995. (01013)

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

RESPONSE TO VIOLATION:

Admission or Denial of Violation:

Carolina Power & Light admits this violation.

Reason for Violation:

On August 23, 1995, during performance of a periodic surveillance test, the Unit 2 B RHR Heat Exchanger Service Water Discharge Valve (2-E11-PDV-F068B) failed to stroke fully closed after having been stroked fully open. The valve plug was found seized in the valve retainer. The Unit 1 E11-PDV-F068A valve also failed to stroke fully closed during subsequent testing after having been stroked fully open.

The RHR Service Water F068 valves are 16" by 20" Valtek Mark I, 6-stage channelstream valves with an SMB-2 Limitorque actuator. CP&L disassembled the bound valves and found the valve plug seized in the retainer. Galling was evident between the plug face and the retainer. The retainer basket and plug for both of the failed valves were constructed of Inconel 625 material.

In August of 1992, to eliminate erosion concerns with the original valve retainers, engineering approved a specification waiver which allowed for a change in the retainer material from nickel-aluminum bronze to Inconel 625. The Inconel retainer baskets were installed in the Unit 1 F068B valve in June of 1993, the Unit 2 F068B valve in April 1994, and the Unit 1 F068A valve in April 1995. The Unit 2 F068A valve was not modified.

During the event investigation, CP&L engineers identified that the valve retainer and plug material were of the same hardness. This finding led CP&L to conclude that the galling was due to an incorrect material configuration. The valve vendor was contacted and confirmed that the installed material configuration (Inconel 625 retainer and Inconel 625 plug) was subject to galling. The vendor stated that Inconel 625 retainers should be installed with hard faced plugs to prevent galling.

CP&L's investigation into the valve failures determined that CP&L reviews of the recommended retainer material change had concentrated on the suitability of the material for fluid environment, erosion resistance, and effects on pipe stresses. The cause of the valve binding is attributed to an inadequate analysis of a proposed material change by the CP&L engineering organization. This inadequate analysis resulted in an inconel valve retainer being installed into the F068 valves without also installing a hardened plug.

Corrective Actions Which Have Been Taken and Results Achieved:

The 1-E11-PDV-F068A and 2-E11-PDV-F068B valves were re-assembled with Nickel-Aluminum-Bronze retainers and Inconel 625 plugs. Initial investigation identified a similar improper material configuration existed in the Unit 1 E11-PDV-F068B valve; however, testing of this valve revealed normal run currents during stroking with no indication of binding. Engineering evaluation determined that the Unit 1 F068B valve was operable. On October 12, 1995, a new hard faced plug was installed in the 1-E11-PDV-F068B valve to preclude galling. A refurbished Inconel retainer was also installed in this valve. All four of the F068 valves have been tested and confirmed operable.

An independent review of the failure mechanism for the valves has been completed. A third party engineering organization (Kalsi Engineering, Inc.) has completed a review to challenge the operability conclusion for the 1-E11-PDV-F068B valve based on the postulated failure mechanism. The reviewer confirmed the adequacy of BNP's failure mode evaluation and determined that valve was fully functional.

An engineering stop work order was implemented by Brunswick Engineering Support Section management on September 26, 1995. This order stopped all design and installation work for all products or modifications affecting the configuration of plant systems. Lifting of the stop work order was contingent on reinforcement of engineering responsibilities and accountabilities as well as an additional engineering review of the products to re-evaluate the quality of the work. The stop work order was lifted following completion of an engineering stand-down and implementation of a quality affirmation program.

A two-day engineering stand-down involving approximately 190 people was held on September 27 and 28, 1995. The purpose of the stand-down was to reinforce senior management expectations and emphasize personal awareness of engineering accountability. Breakout sessions focused on performance deficiencies in areas of ownership, communication, product quality, and proactive support. Additional sessions provided training on skills and methods for improving design products. The significance of the F068 valve event was recognized and communicated to the engineering staff during the stand-down. As a result of this stand-down, engineering personnel have a heightened awareness of their responsibilities and accountabilities in the preparation and implementation of plant configuration changes. Appropriate administrative action was taken for those individuals involved with the engineering reviews associated with the F068 valve event.

A quality affirmation program was initiated to continue reinforcement of engineering responsibilities. For each design product, the responsible engineer affirms that appropriate reviews have been completed to confirm that the quality is commensurate with the high standards established by the Brunswick Engineering Support Section. The scope of affirmation includes review of: key safety function and performance requirements, the clarity and adequacy of the instructions to support quality implementation, drawing clarity and accuracy, the adequacy of post installation testing

to assess potential impacts on system performance and assure design attributes can be satisfied, and assumptions to ensure a technically sound and documented bases exists. Furthermore, the affirmation ensures that Operations has been advised of all potential impacts to the plant, the plant conditions necessary to perform the work have been specified, and a review of similar modifications is performed when deficiencies were identified during the validation review. As of December 5, 1995, 141 engineering products have been affirmed/reviewed. The affirmation program has not identified any significant discrepancies to date.

Brunswick Engineering Support Section personnel have been provided with failure mode analysis information for use in identifying and assessing failure modes for plant components. This information will be supplemented with additional training in January 1996.

An interdisciplinary product review of direct replacements, permanent repair evaluations, and material equivalency evaluations performed on risk significant systems (High Pressure Coolant Injection, Reactor Core Isolation Cooling, Emergency Diesel Generator, Residual Heat Removal, Service Water, Reactor Protection, and DC power systems) and approved from 1992 through 1994 has been completed. This review examined the engineering products generated since the start of the dual unit shutdown in 1992 until the single engineering product process was implemented in 1994. This review has been completed with no safety concerns identified.

CP&L expanded the F068 valve event investigation and formed a team with support from the corporate Nuclear Engineering organization to review this event and assess previous practices with respect to procurement of replacement parts. This assessment identified the following engineering performance concerns: a lack of training in the use of failure modes analysis for evaluating replacement parts; inadequate communication, team building, and problem solving facilitation; and lack of ownership. This review is complete and recommended corrective actions to prevent recurrence have been identified. CP&L is currently reviewing these recommended actions.

Corrective Steps Which Will Be Taken to Avoid Further Violations:

No additional corrective actions are considered necessary to avoid further violations.

Date When Full Compliance Will Be Achieved:

Carolina Power and Light believes that it is in full compliance with 10 CFR 50, Appendix B, Criterion III, as it applies to the issues identified in the violation.

Enclosure
List of Regulatory Commitments

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
NONE	