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910 457-2496

September 9, 1994

SERIAL: BSEP 94-0350

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

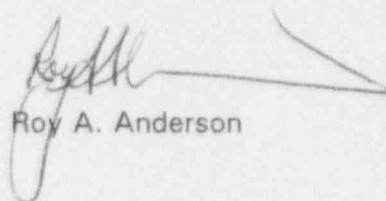
BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
NRC GENERIC LETTER 94-02, "LONG-TERM SOLUTIONS AND UPGRADE OF INTERIM
OPERATING RECOMMENDATIONS FOR THERMAL-HYDRAULIC INSTABILITIES IN BWRS"

Gentlemen:

On July 11, 1994, the NRC staff issued Generic Letter (GL) 94-02, "Long-Term Solutions and Upgrade of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in Boiling Water Reactors." Enclosure 1 provides the sixty-day response required by the generic letter for Carolina Power & Light Company's Brunswick Steam Electric Plant, Units 1 and 2. Enclosure 2 provides a list of commitments in this letter.

Please refer any questions regarding this letter to Mr. R. P. Lopriore at (910) 457-2212.

Sincerely,

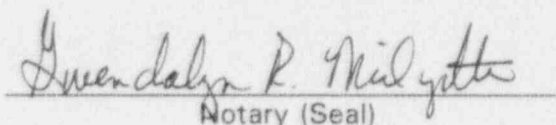


Roy A. Anderson

KAH/

Enclosures

Roy A. Anderson, 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, and agents of Carolina Power & Light Company.



Gweneth R. Milgott
Notary (Seal)

My commission expires: August 12, 1996

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ADD 1

cc: Mr. S. D. Ebnetter, NRC Regional Administrator, Region II
Mr. P. D. Milano, NRC/NRR Senior Project Manager - Brunswick
Mr. C. M. Mowry, Chairman - BWROG Enhanced Option I-A Committee
Mr. C. A. Patterson, NRC Senior Resident Inspector - Brunswick
Mr. H. C. Pfefferlen, GE BWROG Stability Committee Program Manager
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

RESPONSE TO NRC GENERIC LETTER 94-02

BACKGROUND

NRC Generic Letter 94-02 was issued on July 11, 1994 to holders of operating licenses or construction permits for boiling water reactors (BWRs). The purpose of NRC Generic Letter 94-02 is to request that each addressee 1) take the appropriate actions to augment its respective procedures and training for preventing or responding to thermal-hydraulic instabilities in its reactors and 2) submit to the NRC a plan describing the long-term stability solution option it has selected and the implementation schedule it proposes for the modification of plant protection systems to ensure compliance with General Design Criteria (GDC) 10 and 12 in 10 CFR Part 50, Appendix A.

The reporting requirements of this generic letter are:

1. Within sixty (60) days of the date of this letter:
 - a. Inform the NRC, in writing and under oath and affirmation, of the licensee's plans and status with respect to the actions requested in this letter; and
 - b. If the licensee does not plan to take an action requested in this letter, the reasons for not taking the action, a description of the nature of any substitute action, and a schedule for completing or implementing the substitute action;
2. If the licensee plans to take an action requested, or a substitute action, within thirty (30) days of the completion of the action, inform the NRC, in writing and under oath and affirmation, of the action taken and verify its completion or implementation.

The specific actions requested by NRC Generic Letter 94-02 and CP&L's response to each Requested Action follow. This response satisfies the sixty-day reporting requirement identified in NRC Generic Letter 94-02.

Requested Action 1:

All licensees of BWRs, except for Big Rock Point which does not have the capability for operation under variable flow conditions, are requested to review their current procedures and training programs and modify them as appropriate to strengthen the administrative provisions intended to avoid power oscillations or to detect and suppress them if they occur prior to implementation of the long-term solutions. The experience gained at WNP-2 should be a primary guide in this review. In doing this, each licensee of a BWR (except for Big Rock Point) should:

Requested Action 1.a:

Ensure that procedural requirements exist for initiation of a manual scram under all operating conditions when all recirculation pumps trip (or there are no pumps operating) with the reactor in the RUN mode, and ensure that operators are aware of the potential for very large power oscillations and the potential for exceeding core thermal safety limits before automatic protection systems function following the trip of all recirculation pumps (the procedural manual scram is not necessary after long-term solutions are approved and implemented for individual plants);

CP&L Response To Requested Action 1a:

NRC Bulletin 88-07, Supplement 1, "Power Oscillations in BWRs," required BWRs to implement BWR Owners' Group Interim Corrective Actions (ICAs). CP&L implemented these guidelines through procedure revisions and training. The revisions implemented at the Brunswick Plant include procedural requirements for initiation of a manual scram when both recirculation pumps trip and the mode switch is in the RUN position. Operators are trained to immediately insert a manual reactor scram upon a dual recirculation pump trip with the knowledge that core instabilities have the potential for exceeding core thermal safety limits before reactor protection system setpoints are achieved.

Requested Action 1.b:

Ensure that factors important to core stability characteristics (e.g., radial and axial peaking, feedwater temperature, and thermal hydraulic compatibility of mixed fuel types) are controlled within appropriate limits consistent with the core design, power/flow exclusion boundaries, and core monitoring capabilities of the reactor in question, and that these factors are controlled through procedures governing changes in reactor power, including startup and shutdown, particularly at low-flow operating conditions. Each licensee should review its procedures and determine if instability can be avoided by these procedures and if the procedures can be carried out using existing instrument information. If it is concluded that a near-term upgrade of core monitoring capability is called for to ease the burden on operators, determine the need to incorporate on-line stability monitoring or monitors for stability sensitive parameters and inform the NRC of the schedule and technical evaluation for such upgrades found to be necessary. (These procedural operation controls will no longer be necessary for licensees which implement fully automatic long-term solutions, such as Options III or IIIa of Reference 2. Licensees should propose for plant-specific review the administrative controls to be retained in conjunction with other long-term solutions.)

CP&L Response To Requested Action 1b:

Parameters important to reactor stability have been addressed within BNP procedures and training. Startup, shutdown, transient response, and general operation procedures caution operators about the potential effects of plant systems on core instability (e.g., feedwater and High Pressure Coolant Injection systems). These system effects were emphasized

with respect to forced entry into the power/flow exclusion boundary (e.g., from dual recirculation pump trips) and operation near the boundary regions. Increased awareness and monitoring of nuclear instrumentation is practiced in these cases.

CP&L has supported the BWROG effort to develop improved guidelines for the ICAs to better address startup and low power maneuvering conditions. The improved BWROG guidelines incorporate an expanded exclusion region and power distribution control definition for oscillation prevention. In conjunction with the detection and suppression provisions of the improved guidelines, the oscillation prevention feature provides a higher degree of protection against unacceptable power oscillations.

Present Brunswick Plant procedures and training guides were developed using initial BWROG recommendations resulting from the WNP-2 event. Brunswick Nuclear Plant procedures and training packages are being further revised to incorporate more recent BWROG recommendations contained in the improved BWROG ICAs, which were submitted to the NRC staff by letter dated June 6, 1994. The only significant difference to be incorporated into Brunswick Plant procedures and training is the expanded exclusion region. Operator and reactor engineer impact from these revisions is expected to be minimal since the present BNP operating philosophy is to maintain a five (5) percent buffer from the region.

The BWROG improved stability ICA guidelines provide an acceptable interim method for preventing instability events at the Brunswick Plant. Instrumentation currently available to the operators and reactor engineers is adequate to monitor the core in accordance with the BWROG guidelines. Additional controls for entering the "controlled entry" region are not necessary.

The BWROG improved ICA guidelines are intended for use until a long-term stability solution is implemented at the Brunswick Plant; therefore, amendment of the Brunswick Plant Technical Specifications is not necessary at this time. The procedure revisions associated with the improved BWROG guidelines will be completed by October 31, 1994. Training of senior reactor operators and shift technical advisors will be completed during Licensed Operator Retraining Phase 94-06, to be completed by November 30, 1994. Training of the reactor engineers will also be completed by November 30, 1994.

Requested Action 2:

All licensees of BWRs, except for Big Rock Point, are requested to develop and submit to the NRC a plan for long-term stability corrective actions, including design specifications for any hardware modifications or additions to facilitate manual or automatic protective response needed to ensure that the plant is in compliance with GDC 10 and 12. An acceptable plan could provide for implementing one of the long-term stability solution options proposed by the BWROG and approved by the NRC in Reference 3 or in subsequent documentation. The plan should include a description of the action proposed and a schedule of any submittal requiring plant-specific design review and approval by the NRC and an installation schedule (if applicable). The plan should also address the need for near-term and long-term technical specification modifications. Generic BWROG documents or planned submittal may be referenced in the plan.

CP&L Response To Requested Action 2:

The concept of a long-term solution to the instability issue that would ensure compliance with GDC 10 and 12 was originally discussed in NRC Bulletin 88-07, Supplement 1. The bulletin acknowledged that the NRC staff was working with the BWROG to develop generic long-term approaches to resolve the instability issue.

The BWROG efforts have resulted in the solution concepts and methodology described in NEDO-31960, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," and NEDO-32339, "Reactor Stability Long-Term Solution: Enhanced Option I-A." Enhanced Option I-A introduces new plant hardware and software designed to prevent reactor coupled thermal-hydraulic instability events. CP&L has elected to participate with other utilities under the BWROG Enhanced Option I-A program to conduct initial application activities and develop the hardware and software design for this program. Continued participation in the Enhanced Option I-A program and implementation of Enhanced Option I-A at the Brunswick Plant is contingent upon NRC staff acceptance of this methodology as a long-term solution to the thermal-hydraulic instability issue.

The schedule for completion of joint design and licensing activities is provided in Attachment 1 to this Enclosure. Contingent upon completion of joint development activities and NRC acceptance of Enhanced Option I-A as a long-term solution for the instability issue at the Brunswick Plant, CP&L targets to have the long-term solution operational during the first quarter of 1997 on Unit 2 (Cycle 12) and the third quarter of 1997 on Unit 1 (Cycle 11). Attachment 2 of this Enclosure provides the plant specific implementation schedule of the long-term stability resolution for the Brunswick Nuclear Plant.

NEDO-32339 contained proposed Technical Specification changes for Option I-A plants. These proposed specifications will be revised, as necessary, for the Brunswick Plant and submitted to the NRC staff at least 6 months prior to final implementation of Enhanced Option I-A at the Brunswick Plant.

SUMMARY

The BWROG improved stability ICA guidelines provide an acceptable interim method for preventing instability events at the Brunswick Plant. Instrumentation currently available to the operators and reactor engineers is adequate to monitor the core in accordance with the BWROG guidelines. The procedure revisions associated with implementing the improved BWROG guidelines will be completed by October 31, 1994. Training of senior reactor operators and shift technical advisors will be completed during Licensed Operator Retraining Phase 94-06, to be completed by November 30, 1994. Training of the reactor engineers will also be completed by November 30, 1994.

CP&L has elected to participate with other utilities under a BWROG Enhanced Option I-A program to conduct initial application activities and develop the hardware and software design for this program. Contingent upon completion of joint development activities and NRC acceptance of Enhanced Option I-A as a long-term solution for the instability issue at the Brunswick Plant, CP&L targets to have the long-term solution operational during the first quarter of 1997 on Unit 2 (Cycle 12) and the third quarter of 1997 on Unit 1 (Cycle 11).

ATTACHMENT 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62

RESPONSE TO NRC GENERIC LETTER 94-02

ENHANCED OPTION I-A
BWROG SCHEDULE FOR DESIGN AND LICENSING MILESTONE ACTIVITIES

<u>ACTIVITY</u>	<u>SCHEDULE*</u>
BWROG Issue Licensing Topical Report (LTR) - Enhanced Option I-A	4/11/94*
ORNL Issue Technical Evaluation Report (TER) - Enhanced Option I-A	10/94
ORNL Issue ODYSY TER	10/94
NRC Issue ODYSY and Enhanced Option I-A Safety Evaluation (SE)	10/94
BWROG Issue Hardware Topical Report - Enhanced Option I-A	1Q95
NRC Issue Hardware SE - Enhanced Option I-A	5/95
First Plant Implementation - Enhanced Option I-A	1Q96
All Plant Implementation - Enhanced Option I-A	1997

* Denotes Actual Completion Date

ATTACHMENT 2

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
RESPONSE TO NRC GENERIC LETTER 94-02

BNP LONG-TERM IMPLEMENTATION SCHEDULE - ENHANCED OPTION I-A

<u>ACTIVITY</u>	<u>SCHEDULE*</u>
BNP Submit Unit 2 License Amendment Request*	1Q96
Begin Implementation - Unit 2 B212R1 Refuel Outage**	1Q96
NRC Approval of BNP License Amendment Request	4Q96
BNP Enhanced Option I-A Implementation Complete - Unit 2**	1Q97
BNP Submit Unit 1 License Amendment Request*	4Q96
Begin Implementation - Unit 1 B111R1 Refuel Outage**	4Q96
NRC Approval of BNP License Amendment Request	2Q97
BNP Enhanced Option I-A Implementation Complete - Unit 1**	3Q97

* Submittal to me made at least six months prior to implementation.

** Long-Term modification implementation dates based on current outage start/end dates and are contingent upon NRC acceptance of Enhanced Option I-A as a long-term solution for the instability issue. Dates may change as outage dates shift.

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 NRC DOCKET NOS. 50-325 & 50-324 OPERATING LICENSE NOS. DPR-71 & DPR-62

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**
1. The procedure revisions associated with the improved BWROG guidelines will be completed by October 31, 1994.	10/31/94
2. Training of senior reactor operators and shift technical advisors on the improved BWROG Stability ICA guidelines will be completed during Licensed Operator Retraining Phase 94-06, to be completed by November 30, 1994.	11/30/94
3. Training of reactor engineers on the improved BWROG Stability ICA guidelines will be completed by November 30, 1994.	11/30/94
4. CP&L plans targets to have the long-term instability solution (Option I-A) operational during the first quarter of 1997 on Unit 2 (Cycle 12) and the third quarter of 1997 on Unit 1 (Cycle 11).	1Q97 (Unit 2) 3Q97 (Unit 1)
5. The Technical Specifications proposed in NEDO-32339 for Enhanced Option I-A will be revised, as necessary, for the Brunswick Plant and submitted to the NRC staff at least 6 months prior to final implementation of Enhanced Option I-A at the Brunswick Plant.	1Q96 (Unit 2) 4Q96 (Unit 1)

** Long-Term modification implementation dates based on current outage start/end dates and are contingent upon NRC acceptance of Enhanced Option I-A as a long-term solution for the instability issue. Dates may change as outage dates shift.