April 8, 1988

DISTRIBUTION
See attached sheet

Docket No. 50-324

Mr. E. E. Utley
Senior Executive Vice President
Power Supply and Engineering & Construction
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Dear Mr. Utley:

SUBJECT: ISSUANCE OF AMENDMENT NO. 150 TO FACILITY OPERATING LICENSE NO. DPR-62 - BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2, REGARDING RECIRCULATION PUMP TRIP INSTRUMENTATION (TAC NO. 66338)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. to Facility Operating License No. DPR-62 for the Brunswick Steam Electric Plant, Unit 2. The amendment consists of changes to the Technical Specifications in response to your submittal dated September 29, 1987.

The amendment changes the Technical Specification (TS) Tables 3.3.6.1-1, 3.3.6.1-2 and 4.3.6.1-1 and Section 3/4.3.6, to be consistent with the new instruments that have been installed for the alternate rod injection (ARI) and recirculation pump trip (RPT) systems. These systems were installed to mitigate the effects of an anticipated transient without scram (ATWS) event. However, as noted in the enclosed Safety Evaluation, the installed instruments do not assure compliance with the functional requirements of the ATWS Rule (10 CFR 50.62). However, 10 CFR 50.62(d) provides, that when full compliance with the functional requirements of 10 CFR 50.62 is not achieved, the licensee may propose a schedule, subject to the approval of the Commission, for meeting the functional requirements of the regulation. Having considered the explanations offered concerning the need for additional time to complete compliance with 10 CFR 50.62, the Commission agrees with an extension of time to fully comply with 10 CFR 50.62 until not later than the end of the next refueling outage.

A copy of the related Safety Evaluation is also enclosed. Notice of issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

E. Adensam for

Ernest D. Sylvester, Project Manager
Project Directorate II-1
Division of Reactor Project I/II

Enclosures:
1. Amendment No. 150 to License No. DPR-62
2. Safety Evaluation

cc w/enclosures:
See next page

PD21:DRPR
PAnderson/
3/24/88

PD21:DRPR
ESylvester
3/24/88

PD21:DRPR
EAdensam
3/24/88

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AMENDMENT NO. 150 TO FACILITY OPERATING LICENSE NO. DPR-62 - BRUNSWICK, UNIT 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 150
License No. DPR-62

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Carolina Power & Light Company (the licensee), dated September 29, 1987 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Facility Operating License No. DPR-62 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 150, are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

151

Elinor G. Adensam, Director
Project Directorate II-1
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 8, 1988

AD:DRPR
GLainas
4/8/88

LA:PD21:DRPR	PD:PD21:DRPR	SAD for	OGC-B	D:PD21:DRPR
PAnderson	ESylvester/pda	AThadani		EAdensam
3/24/88	3/24/88	3/25/88	4/6/88	4/8/88

ATTACHMENT TO LICENSE AMENDMENT NO. 150

FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Remove Pages	Insert Pages
3/4 3-78	3/4 3-78
3/4 3-78a	3/4 3-78a
3/4 3-79	3/4 3-79
3/4 3-80	3/4 3-80
3/4 3-81	3/4 3-81

INSTRUMENTATION

3/4.3.6 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

ATWS RECIRCULATION PUMP TRIP (RPT) SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.1 The ATWS-RPT system instrumentation trip systems shown in Table 3.3.6.1-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.1-2.

APPLICABILITY: OPERATIONAL CONDITION 1.

ACTION:

a. With an ATWS-RPT system instrumentation trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.6.1-2, declare the instrument channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within one hour.

c. With the total number of OPERABLE channels less than 3 as required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:

   1. If the inoperable channels consist of one reactor vessel water level channel and one reactor vessel pressure channel, place both inoperable channels in the tripped condition within one hour.

   2. If the inoperable channels include two reactor vessel water level channels or two reactor vessel pressure channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 14 days or be in at least STARTUP within the next 8 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or be in at least STARTUP within the next 8 hours.

SURVEILLANCE REQUIREMENTS

4.3.6.1.1 Each ATWS-RPT system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.1-1.

4.3.6.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

TABLE 3.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OF INSTRUMENT CHANNELS PER TRIP SYSTEM(a)
1. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024A-2, B-2; B21-LT-N025A-2, B-2) (B21-LTM-N024A-2, B-2; B21-LTM-N025A-2, B-2)	2(b)
2. Reactor Vessel Pressure - High (B21-PT-N045A&C, B21-PT-N045B&D) (B21-PTM-N045A&C, B21-PTM-N045B&D)	2(b)

(a) One trip system may be placed in an inoperable status for up to 2 hours for required surveillance provided that the other trip system is OPERABLE.

(b) Trip System A consists of 4 channels: LT/LTM-N024A-2, LT/LTM-N025A-2, PT/PTM-N045A, and PT/PTM-N045C
Trip System B consists of 4 channels: LT/LTM-N024B-2, LT/LTM-N025B-2, PT/PTM-N045B, and PT/PTM-N045D

TABLE 3.3.6.1-2

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 2 (B21-LTM-NO24A-2,B-2; B21-LTM-NO25A-2,B-2)	$\geq$ + 112 inches*	$\geq$ + 112 inches*
2. Reactor Vessel Pressure - High (B21-PTM-NO45A,B,C,D)	$\leq$ 1120 psig	$\leq$ 1120 psig

*Vessel water levels refer to REFERENCE LEVEL ZERO.

TABLE 4.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Reactor Vessel Water Level - Low, Level 2			
(B21-LT-NO24A-2, B-2; B21-LT-NO25A-2, B-2)	NA[a]	NA	R[b]
(B21-LTM-NO24A-2, B-2; B21-LTM-NO25A-2, B-2)	D	M	M
2. Reactor Vessel Pressure - High (B21-PT-NO45A, B, C, D)	NA[a]	NA	R[b]
(B21-PTM-NO45A, B, C, D)	D	M	M

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 150 TO FACILITY OPERATING LICENSE NO. DPR-62

CAROLINA POWER & LIGHT COMPANY et al.

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

DOCKET NO. 50-324

1.0 INTRODUCTION

By application dated September 29, 1987, Carolina Power & Light Company (the licensee) requested an amendment to the Technical Specifications for Facility Operating License No. DPR-62 for the Brunswick Steam Electric Plant, Unit 2 (Unit 2). The proposed Technical Specification (TS) changes would incorporate revised instrument numbers in TS Tables 3.3.6.1-1, 3.3.6.1-2 and 4.3.6.1-1 and revise TS Section 3/4.3.6 to reflect the new instruments that have been installed for the Alternate Rod Injection (ARI) and the Recirculation Pump Trip (RPT) System to mitigate postulated anticipated transient without scram (ATWS) events. This system was presented to the staff for review by letters dated April 14, June 18, July 24, and August 24, 1987, in accordance with the requirements of 10 CFR 50.62.

In response to the staff's request for additional information, the licensee stated in Enclosure 2, Item 4, of its April 14, 1987 letter that the instrument channel components, including the sensors, signal conditioning and isolation devices, will be diverse from the existing Reactor Trip System (RTS) Components. Based on this information, the staff accepted the Brunswick design and issued a Safety Evaluation on August 31, 1987.

2.0 EVALUATION AND CONCLUSION

The ATWS Rule (10 CFR 50.62) requires specific improvements in the design and operation of commercial nuclear power facilities to reduce the likelihood of failure to shut down the reactor following anticipated transients, and to mitigate the consequences of an ATWS event. The ATWS mitigation system components are required to be diverse from the reactor trip system, from sensor output to the final actuation device.

The Safety Evaluation Report on the BWROG Topical Report NEDE-31096-P states that equipment diversity to the extent reasonable and practicable, to minimize the potential for common cause failures, is required. This should include all diverse reactor trip system instrument channel components, excluding sensors, but including all signal conditioning.

In the submittal dated September 29, 1987, CP&L states that they plan to replace the existing digital reactor vessel pressure switches of the ATWS-RPT system with an analog pressure transmitter/master trip unit. Based on the information reviewed to date, the staff believes that the analog transmitter/master trip units installed for the ARI/RPT system are identical to the analog transmitter/master trip units installed in the Reactor Trip System. Identical components used in both the existing RTS and the ARI/RPT system are subject to potential common mode failures and do not meet the functional requirements of 10 CFR 50.62. Therefore, the staff concludes that the type of signal conditioning (Rosemount analog transmitter/trip units) provided for the Brunswick ATWS design does not meet the diversity requirements of 10 CFR 50.62 in that diversity, to the extent reasonable and practicable, has not been provided. Instrumentation is available from other manufacturers that would provide the required degree of diversity. A more complete discussion of the staff's position on diversity requirements is stated in Appendix 1 (attached).

In telephone conversations with the licensee, we have learned that the Rosemount analog transmitter/trip units have been installed during the ongoing Unit 2 refueling outage. The TS changes requested in the September 29, 1987 submittal must, therefore, be issued to permit startup of the plant in the current configuration. Because startup from this outage is scheduled for mid-April 1988, we recognize that there is not sufficient time available to redesign, purchase and install equipment that will satisfy the functional requirements of the design and meet the diversity requirements of the ATWS Rule before restart. However, 10 CFR 50.62 (the ATWS Rule) requires that the specified equipment be installed before startup from the second refueling outage after July 26, 1984, or by a later date agreed upon by the Commission and the licensee.

Although the installation of the Rosemount analog transmitters/trip units does not satisfy the requirements of 10 CFR 50.62, that rule does not establish an inflexible deadline for compliance. It provides that a schedule beyond the second refueling outage after July 1984 can be established if justified and mutually agreed upon by the Commission and the licensee. The licensee's explanation of the circumstances concerning the Rosemounts provides a reasonable justification for an extension to the deadline until not later than the end of the next refueling outage and the Commission has granted such extension. Therefore, the installation of the Rosemount analog transmitter/trip units and the issuance of the associated TS change does not assure

compliance with the functional requirements of the Rule, but neither are these actions in violation of the Rule. Based on the above, we find that the proposed TS changes are acceptable until a date agreed upon by the staff and licensee for full compliance with 10 CFR 50.62. At that time, further changes may be required to these TS sections to reflect the installation of diverse signal conditioning units.

3.0 ENVIRONMENTAL CONSIDERATIONS

An Environmental Assessment has been prepared pursuant to 10 CFR 51.32 and published in the FEDERAL REGISTER on April 7, 1988 at 53 FR 11576.

4.0 CONCLUSION

The Commission made a proposed determination that this amendment involves no significant hazards consideration which was published in the FEDERAL REGISTER (52 FR 42048) on November 2, 1987, and consulted with the State of North Carolina. No public comments or requests for hearing were received, and the State of North Carolina did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: H. Li

Dated: April 8, 1988

APPENDIX 1: THE STAFF POSITION ON DIVERSITY REQUIREMENTS

The basic premise behind the ATWS rule as documented in SECY-83-293, "Amendments to 10 CFR 50 Related to Anticipated Transients Without Scram (ATWS) Events" is to require systems/equipment that are diverse (and independent) to those portions of the existing reactor trip system (RTS) where only minimal diversity is currently provided, and which are capable of preventing or mitigating the consequences of an ATWS event. An ATWS event is defined as an expected operational transient (such as loss of feedwater, loss of condenser vacuum, or loss of offsite power) which is accompanied by a failure of the RTS to shutdown the reactor. The failure mechanism of concern is a common mode failure of identical components within the RTS (e.g., logic channels, actuation devices and instrument channels, excluding sensors).

Common mode failures (CMF) are failures of identical components due to the same failure mechanism (e.g., manufacturing defect, design defect, calibration or maintenance error). Common cause failures are a broader class of failures consisting of the failure of multiple components, not necessarily identical in design, due to the same cause, typically environmental in nature (e.g., extreme temperature, humidity induced corrosion, vibration). Existing RTS are considered to have, by design, sufficient redundancy and testability features to prevent random failures from leading to system unavailability. However, because the redundant components are in general identical in manufacturer and design, they are subject to potential common mode failures. Existing reactor trip systems are typically located in controlled environments; and, thus, the potential for many types of common cause failures is minimized. Common mode failures are a subset of common cause failures. Common mode failures, but not necessarily common cause failures, can be eliminated by providing total/absolute diversity. The diversity required by the ATWS rule is intended to ensure that common mode failures which disable the electrical portion of the existing reactor trip system will not affect the capability of systems/equipment installed in accordance with ATWS rule requirements (to prevent or mitigate the consequences of ATWS events) to perform their design functions. Therefore, the diversity required by the ATWS rule is hardware/component diversity (to prevent CMF from disabling both the existing RTS and ATWS preventive/mitigative systems). It is recognized that total/absolute component/hardware diversity can be difficult and sometimes impossible to achieve. For these instances, acceptable level of component/hardware diversity can be achieved in accordance with combinations of allowable methods such as energization states, AC versus DC power, functional capability, and the use of components from different manufacturers.

The concept of equipment/hardware diversity has been firmly established and well documented throughout the history of the ATWS issue and rulemaking process. Appendix C (ATWS Equipment Requirements) to NUREG-0460, "Anticipated Transients Without Scram for Light Water Reactors," Volume 3 (published in December 1978), states that the equipment (installed to

prevent/mitigate the consequences of ATWS events) shall be independent and separate from components for systems that initiate the anticipated transient(s) being analyzed and diverse from the normal scram system (postulated to fail) to minimize the probability of the ATWS disabling its operation.

The supplementary information provided with the FEDERAL REGISTER notification of the ATWS rule includes guidance concerning the diversity required of diverse reactor trip systems (diverse scram systems) and mitigating systems from the existing reactor trip system. The guidance states that equipment diversity to minimize the potential for common cause failures is required from sensor output to and including the components used to interrupt control rod power (circuit breakers from different manufacturers alone is not sufficient to provide the required diversity for interruption of control rod power) for diverse scram systems, and from sensor output to, but not including, the final actuation device for mitigating systems (e.g., diverse turbine trip and diverse auxiliary feedwater actuation). Therefore, all diverse scram system and mitigating systems instrument channel components (excluding sensors) and logic channel components, and all diverse scram system actuation devices must be diverse from the existing RTS in accordance with the methods of achieving required equipment diversity identified above to obtain a level of diversity acceptable to satisfy the requirements of the ATWS rule. Identical components used in both the existing RTS and the diverse scram system or mitigating systems are subject to potential common mode failures, and therefore, are not acceptable.