Sepatember 11, 1990

Docket Nos. 50-325
and 50-324

DISTRIBUTION
See attached list

Mr. Lynn W. Eury
Executive Vice President
Power Supply
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Dear Mr. Eury:

SUBJECT: ISSUANCE OF AMENDMENT NO. 144 TO FACILITY OPERATING LICENSE NO. DPR-71 AND AMENDMENT NO. 175 TO FACILITY OPERATING LICENSE NO. DPR-62 - BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2, REGARDING ROD SEQUENCE CONTROL SYSTEM/ROD WORTH MINIMIZER (TAC NOS. 76164 AND 76165)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 144 to Facility Operating License No. DPR-71 and Amendment No. 175 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your submittal dated March 14, 1990, as supplemented August 9, 1990, and August 29, 1990.

The amendments change the TS to (1) permit the removal of the rod sequence control system and (2) reduce the rod worth minimizer cutoff setpoint from 20% rated thermal power to 10% rated thermal power.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's bi-weekly Federal Register Notice.

Sincerely,

Original Signed By:

Ngoc B. Le, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 144 to License No. DPR-71
2. Amendment No. 175 to License No. DPR-62
3. Safety Evaluation

cc w/enclosures:
See next page

OFC	:LA:PD21:DRPR	:PM:PD21:DRPR	:D:PD21:DRPR	:	:	:
NAME	:PAnderson	:NLe:sw	:EAdensam	:	:	:
DATE	:9/12/90	:9/12/90	:9/12/90	:	:	:

OFFICIAL RECORD COPY

AMENDMENT NO. 144 TO FACILITY OPERATING LICENSE NO. DPR-71 - BRUNSWICK, UNIT 1
AMENDMENT NO. 175 TO FACILITY OPERATING LICENSE NO. DPR-62 - BRUNSWICK, UNIT 2

Docket File
NRC PDR
Local PDR
PDII-1 Reading
S. Varga (14E4)
G. Lainas
E. Adensam
P. Anderson
N. Le
OGC
D. Hagan (MNBB 3302)
E. Jordan (MNBB 3302)
G. Hill (4) (P1-137)
Wanda Jones (P-130A)
J. Calvo (11D3)
R. Jones (8-E-23)
T. Husang (7C17)
ACRS (10)
GPA/PA
OC/LFMB
Brunswick File

cc: Brunswick Service List

cc:

Mr. Russell B. Starkey, Jr.
Vice President
Brunswick Nuclear Project
P. O. Box 10429
Southport, North Carolina 28461

Mr. R. E. Jones, General Counsel
Carolina Power & Light Company
P. O. Box 1551
Raleigh, North Carolina 27602

Ms. Frankie Rabon
Board of Commissioners
P. O. Box 249
Bolivia, North Carolina 28422

Resident Inspector
U. S. Nuclear Regulatory Commission
Star Route 1
P. O. Box 208
Southport, North Carolina 28461

Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

Mr. Dayne H. Brown, Director
Division of Radiation Protection
N. C. Department of Environmental,
Commerce and Natural Resources
P. O. Box 27687
Raleigh, North Carolina 27611-7687

Mr. J. L. Harness
Plant General Manager
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, North Carolina 28461

Mr. H. A. Cole
Special Deputy Attorney General
State of North Carolina
P. O. Box 629
Raleigh, North Carolina 27602

Mr. Robert P. Gruber
Executive Director
Public Staff - NCUC
P. O. Box 29520
Raleigh, North Carolina 27626-0520

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

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 144
License No. DPR-71

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

   A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated March 14, 1990, as supplemented August 9 and 29, 1990, 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-71 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 144 , 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

Original Signed By:

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 11, 1990

OFC	LA:PD21:DRPR	PM:PD21:DRPR	OGC	D:PD21:DRPR			
NAME	PAnderson	NLe:sw	EBachmann	EAdensam			
DATE	7/ 6/90	7/16 /90	7/17/90	8/17/90			

OFFICIAL RECORD COPY

ATTACHMENT TO LICENSE AMENDMENT NO. 144

FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

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
IV	IV
IX	IX
XII	XII
3/4 1-4	3/4 1-4
3/4 1-5	3/4 1-5
3/4 1-7	3/4 1-7
3/4 1-8	3/4 1-8
3/4 1-9	3/4 1-9
3/4 1-11	3/4 1-11
3/4 1-12	3/4 1-12
3/4 1-14	3/4 1-14
	3/4 1-14a
3/4 1-15	3/4 1-15
3/4 1-16	
3/4 10-2	3/4 10-2
B 3/4 1-3	B 3/4 1-3
B 3/4 1-4	B 3/4 1-4
B 3/4 1-5	B 3/4 1-5
B 3/4 10-1	B 3/4 10-1

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

BASES

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

2. If the inoperable control rod(s) is inserted:

   a) Within one hour disarm the associated directional control valves either:

      1) Electrically, or

      2) Hydraulically by closing the drive water and exhaust water isolation valves.

   b) Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

c. With more than 8 control rods inoperable, be in at least HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The scram discharge volume drain and vent valves shall be demonstrated OPERABLE at least once per 31 days by:*

a. Verifying each valve to be open.

b. Cycling each valve at least one complete cycle of full travel.

4.1.3.1.2 All withdrawn control rods not required to have their directional control valves disarmed electrically or hydraulically shall be demonstrated OPERABLE by moving each control rod at least one notch:

a. At least once per 7 days when above the preset power level of the RWM and

b. At least once per 24 hours when above the preset power level of the RWM and any control rod is immovable as a result of excessive friction or mechanical interference.

4.1.3.1.3 All withdrawn control rods shall be determined OPERABLE by demonstrating the scram discharge volume drain and vent valves OPERABLE, when the reactor protection system logic is tested per Specification 4.3.1.2, by verifying that the drain and vent valves:

a. Close within 30 seconds after receipt of a signal for control rods to scram, and

b. Open when the scram signal is reset or the scram discharge volume trip is bypassed.

*These valves may be closed intermittently for testing under administrative control.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD MAXIMUM SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.2 The maximum scram insertion time of each control rod from the fully withdrawn position to notch position 6, based on de-energization of the scram pilot valve solenoids as time zero, shall not exceed 7.0 seconds.

APPLICABILITY: CONDITIONS 1 and 2.

ACTION:

With the maximum scram insertion time of one or more control rods exceeding 7.0 seconds, operation may continue and the provisions of Specification 3.0.4 are not applicable provided that:

a. The control rod with the slow insertion time is declared inoperable,

b. The requirements of Specification 3.1.3.1 are satisfied, and

c. If within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied, and

d. The Surveillance Requirements of Specification 4.1.3.2.c are performed at least once per 92 days when operation is continued with three or more control rods with slow scram insertion times;

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 The maximum scram insertion time of the control rods shall be demonstrated through measurement:

a. For all control rods prior to THERMAL POWER exceeding 40% of RATED THERMAL POWER following CORE ALTERATIONS or after a reactor shutdown that is greater than 120 days,

b. For specifically affected individual control rods following maintenance on or modification to the control rod or rod drive system which could affect the scram insertion time of those specific control rods, and

c. For 10% of the control rods, on a rotating basis, at least once per 120 days of operation.

FOUR CONTROL ROD GROUP SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.4 The average scram insertion time, from the fully withdrawn position, for the three fastest control rods in each group of four control rods arranged in a two-by-two array, based on deenergization of the scram pilot valve solenoids as time zero, shall not exceed any of the following:

Position Inserted From Fully Withdrawn	Average Scram Insertion Time (Seconds)
46	0.33
36	1.12
26	1.93
6	3.58

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With the average scram insertion times of control rods exceeding the above limits, operation may continue and the provisions of Specification 3.0.4 are not applicable provided:

a. The control rods with the slower than average scram insertion times are declared inoperable,

b. The requirements of Specification 3.1.3.1 are satisfied, and

c. If within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied, and

d. The Surveillance Requirements of Specification 4.1.3.2.c are performed at least once per 92 days when operation is continued with three or more control rods with slow scram insertion times.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.4 All control rods shall be demonstrated OPERABLE by scram time testing from the fully withdrawn position as required by Surveillance Requirement 4.1.3.2.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD SCRAM ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.1.3.5 All control rod scram accumulators shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 5*.

ACTION:

a. In OPERATIONAL CONDITION 1 or 2 with one control rod scram accumulator inoperable, the provisions of Specification 3.0.4 are not applicable and operation may continue, provided that within 8 hours:

   1. The inoperable accumulator is restored to OPERABLE status, or

   2. The control rod associated with the inoperable accumulator is declared inoperable, and the requirements of Specification 3.1.3.1 are satisfied.

   3. And, if within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied.

   Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. In OPERATIONAL CONDITION 5* with a withdrawn control rod scram accumulator inoperable, fully insert the affected control rod and electrically disarm the directional control valves within one hour. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.5 The control rod scram accumulators shall be determined OPERABLE:

a. At least once per 7 days by verifying that the pressure and leak detectors are not in the alarmed condition, and

b. At least once per 18 months by performance of a:

   1. CHANNEL FUNCTIONAL TEST of the leak detectors, and

   2. CHANNEL CALIBRATION of the pressure detectors.

*At least the accumulator associated with each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

CONTROL ROD DRIVE COUPLING

LIMITING CONDITION FOR OPERATION

3.1.3.6 All control rods shall be coupled to their drive mechanisms.

APPLICABILITY: CONDITIONS 1, 2, and 5*.

ACTION:

a. In CONDITION 1 or 2 with one control rod not coupled to its associated drive mechanism, the provisions of Specification 3.0.4 are not applicable and operation may continue provided:

   1. Within the preset power level of the RWM, the control rod is declared inoperable and fully inserted until recoupling can be attempted with THERMAL POWER above the preset power level of the RWM and the requirements of Specification 3.1.4.1.d are satisfied.

   2. Above the preset power level of the RWM, the control rod drive is inserted to accomplish recoupling. If recoupling is not accomplished on the first attempt, declare the control rod inoperable, fully insert the control rod, and electrically disarm the directional control valves.

   3. The requirements of Specification 3.1.3.1 are satisfied.

b. In CONDITION 5*, with a withdrawn control rod not coupled to its associated drive mechanism, insert the control rod to accomplish recoupling. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The coupling integrity of a control rod shall be demonstrated by withdrawing the control rod to the fully withdrawn position and verifying that the rod does not go to the overtravel position:

a. Prior to reactor criticality after completing CORE ALTERATIONS that could have affected the control rod drive coupling integrity,

*At least each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD POSITION INDICATION

LIMITING CONDITION FOR OPERATION

3.1.3.7 All control rod reed switch position indicators shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2, and 5*.

ACTION:

a. In CONDITION 1 or 2: With one or more control rod reed switch position indicators inoperable, including "Full-in" or "Full-out" indication, the provisions of Specification 3.0.4 are not applicable and operation may continue, provided that within one hour:

   1) The position of the control rod is determined by an alternate method, or

   2) The control rod is moved to a position with an OPERABLE reed switch position indicator, or

   3) The control rod with the inoperable reed switch position indicator is declared inoperable and the requirements of Specification 3.1.3.1 are satisfied;

   4) And, if within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are satisfied;

   Otherwise, be in at least HOT SHUTDOWN within 12 hours.

b. In CONDITION 5* with a withdrawn control rod reed switch position indicator inoperable, fully insert the withdrawn control rod. The provisions of Specification 3.0.3 are not applicable.

*At least each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

SURVEILLANCE REQUIREMENTS

4.1.3.7 The control rod reed switch position indicators shall be determined OPERABLE by verifying:

a. At least once per 24 hours, that the position of the control rod is indicated,

b. That the indicated control rod position changes during the movement of the control rod when performing Surveillance Requirement 4.1.3.1.2, and

c. That the control rod reed switch position indicator corresponds to the control rod position indicated by the "Full-out" reed switches when performing Surveillance Requirement 4.1.3.6.b.

3/4 1.4 CONTROL ROD PROGRAM CONTROLS

ROD WORTH MINIMIZER

LIMITING CONDITION FOR OPERATION

3.1.4.1 The Rod Worth Minimizer (RWM) shall be OPERABLE when THERMAL POWER is less than 10% of RATED THERMAL POWER.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2*.

ACTION:

a. With the RWM inoperable after the first 12 control rods have been fully withdrawn on a startup, operation may continue provided that control rod movement and compliance with the prescribed BPWS control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff.

b. With the RWM inoperable before the first 12 control rods are withdrawn on a startup, one startup per calender year may be performed provided that control rod movement and compliance with the prescribed BPWS control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff.

c. With RWM inoperable on a shutdown, shutdown may continue provided that control rod movement and compliance with the prescribed BPWS control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff.

d. With RWM operable but individual control rod(s) declared inoperable, operation and control rod movement below the present power level of the RWM may continue provided:

   1. No more than three (3) control rods are declared inoperable in any one BWS group, and,

   2. The inoperable control rod(s) is bypassed on the RWM and control rod movement of the bypassed rod(s) is verified by a second licensed operator or qualified member of the plant technical staff.

e. With RWM inoperable, the provisions of Specification 3.0.4 are not applicable.

*Entry into OPERATIONAL CONDITION 2 and withdrawal of selected control rods is permitted for the purpose of determining the OPERABILITY of the RWM prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

SURVEILLANCE REQUIREMENTS

4.1.4.1.1 The RWM shall be demonstrated OPERABLE in OPERATIONAL CONDITION 2, prior to withdrawal of control rods for the purpose of making the reactor critical and in OPERATIONAL CONDITION 1 when the RWM is initiated during control rod insertion when reducing THERMAL POWER by:

a. Verifying proper annunciation of the selection error of at least one out-of-sequence control rod, and

b. Verifying the rod block function of the RWM by moving an out-of-sequence control rod.

4.1.4.1.2 The RWM shall be demonstrated OPERABLE by verifying the control rod Banked Position Withdrawal Sequence input to the RWM computer is correct following any loading of the sequence program into the computer.

Pages 3/4 1-15 through 3/4 1-16 have been deleted.

3/4.10.2 ROD SEQUENCE CONTROL SYSTEM

Page 3/4 10-2 has been deleted.

CONTROL RODS (Continued)

on a scram than has been analyzed even though control rods with inoperable accumulators may still be inserted with normal drive water pressure. Operability of the accumulator ensures that there is a means available to insert the control rods even under the most unfavorable depressurization of the reactors.

Control rod coupling integrity is required to ensure compliance with the analysis of the rod drop accident in the FSAR. The overtravel position feature provides the only positive means of determining that a rod is properly coupled and, therefore, this check must be performed prior to achieving criticality after each refueling. The subsequent check is performed as a backup to the initial demonstration.

In order to ensure that the control rod patterns can be followed and therefore that other parameters are within their limits, the control rod position indication system must be OPERABLE.

The control rod housing support restricts the outward movement of a control rod to less than 3 inches in the event of a housing failure. The amount of rod reactivity which could be added by this small amount of rod withdrawal is less than a normal withdrawal increment and will not contribute to any damage to the primary coolant system. The support is not required when there is no pressure to act as a driving force to rapidly eject a drive housing.

The required surveillance intervals are adequate to determine that the rods are OPERABLE and not so frequent as to cause excessive wear on the system components.

3/4.1.4 CONTROL ROD PROGRAM CONTROLS

Control rod withdrawal and insertion sequences are established to assure that the maximum in sequence individual control rod or control rod segments which are withdrawn at any time during the fuel cycle could not be worth enough to result in a peak fuel enthalpy greater than 280 cal/gm in the event of a control rod drop accident. The specified sequences are characterized by homogeneous, scattered patterns of control rod withdrawal. When THERMAL POWER is greater than or equal to 10% of RATED THERMAL POWER, there is no possible rod worth which, if dropped at the design rate of the velocity limiter, could result in a peak enthalpy of 280 cal/gm. Thus, requiring the RWM to be OPERABLE when THERMAL POWER is less than 10% of RATED THERMAL POWER provides adequate control.

Use of the Banked Position Withdrawal Sequence (BPWS) ensures that in the event of a control rod drop accident the peak fuel enthalpy will not be greater than 280 cal/gm (Reference 4).

CONTROL ROD PROGRAM CONTROLS (Continued)

The RWM as a backup to procedural control provides an automatic control rod pattern monitoring function to ensure adherence to the BPWS control movement sequences from 100% control rod density to 10% RATED THERMAL POWER and, thus, eliminates the postulated control rod drop accident from resulting in a peak fuel enthalpy greater than 280 cal/gm (Reference 5).

The requirement that RWM be operable for the withdrawal of the first 12 control rods on a startup is to ensure that the RWM system maintains a high degree of availability.

Deviation from the BPWS control rod pattern may be allowed for the performance of Shutdown Margin Demonstration tests.

The analysis of the rod drop accident is presented in Section 15.4.6 of the Updated FSAR and the techniques of the analysis are presented in a topical report (Reference 1) and two supplements (References 2 and 3).

The RBM is designed to automatically prevent fuel damage in the event of erroneous rod withdrawal from locations of high power density during high power operation. Two channels are provided. Tripping one of the channels will block erroneous rod withdrawal soon enough to prevent fuel damage. This system backs up the written sequence used by the operator for withdrawal of control rods.

3/4.1.5 STANDBY LIQUID CONTROL SYSTEM

The standby liquid control system provides a backup capability for maintaining the reactor subcritical in the event that insufficient rods are inserted in the core when a scram is called for. The volume and weight percent of poison material in solution is based on being able to bring the reactor to the subcritical condition as the plant cools to ambient condition. The temperature requirement is necessary to keep the sodium pentaborate in solution. Checking the volume and temperature once each 24 hours assures that the solution is available for use.

With redundant pumps and a highly reliable control rod scram system, operation of the reactor is permitted to continue for short periods of time with the system inoperable or for longer periods of time with one of the redundant components inoperable.

Surveillance requirements are established on a frequency that assures a high reliability of the system. Once the solution is established, boron concentration will not vary unless more boron or water is added, thus a check on the temperature and volume once each 24 hours assures that the solution is available for use.

Replacement of the explosive charges in the valves at regular intervals will assure that these valves will not fail because of deterioration of the charges.

References:

1. C. J. Paone, R. C. Stirn, and J. A. Woodley, "Rod Drop Accident Analysis for Large BWRs " G. E. Topical Report NEDO-10527, March 1972.

2. C. J. Paone, R. C. Stirn, and R. M. Yound, Supplement 1 to NEDO-10527, July 1972.

3. J. A. Haum, C. J. Paone, and R. C. Stirn, addendum 2 "Exposed Cores" supplement 2 to NEDO-10527, January 1973.

4. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel," Revision 6, Amendment 12.

5. NEDE-20411-P-A, "General Electric Standard Application for Reactor Fuel," Revision 8, Amendment 17.

3/4.10 SPECIAL TEST EXCEPTIONS

BASES

3/4.10.1 PRIMARY CONTAINMENT INTEGRITY

The requirement for PRIMARY CONTAINMENT INTEGRITY is removed during the period when open vessel tests are being performed during low power PHYSICS TESTS.

3/4.10.2 ROD SEQUENCE CONTROL SYSTEM (DELETED)

3/4.10.3 SHUTDOWN MARGIN DEMONSTRATIONS

Performance of shutdown margin demonstrations with the vessel head removed requires additional restrictions in order to ensure that criticality does not occur. These additional restrictions are specified in this LCO.

3/4.10.4 RECIRCULATION LOOPS

This special test exception permits reactor criticality under no flow conditions and is required to perform certain start-up and PHYSICS TESTS while at low THERMAL POWER levels.

3/4.10.5 PLANT SERVICE WATER

This Special Test Exception permits securing the Service Water System conventional header when the nuclear header is out of service and is required to permit flange installation in service water system header cross-connect piping.

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. 175
License No. DPR-62

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

   A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated March 14, 1990, as supplemented August 9 and 29, 1990, 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. 175, 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

Original Signed By:

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 11, 1990

OFC	:LA:PD21:DRPR	:PM:PD21:DRPR	:OGC	:D:PD21:DRPR	:	:	:
NAME	: PAnderson	:NLe:sw	: LBachman	: EAdensam	:	:	:
DATE	: 7/6/90	: 7/6/90	: 7/17/90	: 8/17/90	:	:	:

OFFICIAL RECORD COPY

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 175, 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

Original Signed By:

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 11, 1990

OFC	:LA:PD21:DRPR	:PM:PD21:DRPR	:OGC	:D:PD21:DRPR	:	:	:
NAME	: PAnderson	:NLe:sw	: LBachman	: EAdensam	:	:	:
DATE	: 7/6/90	:7/6/90	:7/17/90	: 8/17/90	:	:	:

OFFICIAL RECORD COPY

ATTACHMENT TO LICENSE AMENDMENT NO. 175

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
IV	IV
IX	IX
XII	XII
3/4 1-4	3/4 1-4
3/4 1-5	3/4 1-5
3/4 1-7	3/4 1-7
3/4 1-8	3/4 1-8
3/4 1-9	3/4 1-9
3/4 1-11	3/4 1-11
3/4 1-12	3/4 1-12
3/4 1-14	3/4 1-14
	3/4 1-14a
3/4 1-15	3/4 1-15
3/4 1-16	
3/4 10-2	3/4 10-2
B 3/4 1-3	B 3/4 1-3
B 3/4 1-4	B 3/4 1-4
B 3/4 1-5	B 3/4 1-5
B 3/4 10-1	B 3/4 10-1

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

BASES

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

2. If the inoperable control rod(s) is inserted:

   a) Within one hour disarm the associated directional control valves either:

      1) Electrically, or

      2) Hydraulically by closing the drive water and exhaust water isolation valves.

   b) Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

c. With more than 8 control rods inoperable, be in at least HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The scram discharge volume drain and vent valves shall be demonstrated OPERABLE at least once per 31 days by:*

a. Verifying each valve to be open.

b. Cycling each valve at least one complete cycle of full travel.

4.1.3.1.2 All withdrawn control rods not required to have their directional control valves disarmed electrically or hydraulically shall be demonstrated OPERABLE by moving each control rod at least one notch:

a. At least once per 7 days when above the preset power level of the RWM and

b. At least once per 24 hours when above the preset power level of the RWM and any control rod is immovable as a result of excessive friction or mechanical interference.

4.1.3.1.3 All withdrawn control rods shall be determined OPERABLE by demonstrating the scram discharge volume drain and vent valves OPERABLE, when the reactor protection system logic is tested per Specification 4.3.1.2, by verifying that the drain and vent valves:

a. Close within 30 seconds after receipt of a signal for control rods to scram, and

b. Open when the scram signal is reset or the scram discharge volume trip is bypassed.

*These valves may be closed intermittently for testing under administrative control.

CONTROL ROD MAXIMUM SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.2 The maximum scram insertion time of each control rod from the fully withdrawn position to notch position 6, based on de-energization of the scram pilot valve solenoids as time zero, shall not exceed 7.0 seconds.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With the maximum scram insertion time of one or more control rods exceeding 7.0 seconds, operation may continue and the provisions of Specification 3.0.4 are not applicable provided that:

a. The control rod with the slow insertion time is declared inoperable,

b. The requirements of Specification 3.1.3.1 are satisfied, and

c. If within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied, and

d. The Surveillance Requirements of Specification 4.1.3.2.c are performed at least once per 92 days when operation is continued with three or more control rods with slow scram insertion times;

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 The maximum scram insertion time of the control rods shall be demonstrated through measurement:

a. For all control rods prior to THERMAL POWER exceeding 40% of RATED THERMAL POWER following CORE ALTERATIONS or after a reactor shutdown that is greater than 120 days,

b. For specifically affected individual control rods following maintenance on or modification to the control rod or rod drive system which could affect the scram insertion time of those specific control rods, and

c. For 10% of the control rods, on a rotating basis, at least once per 120 days of operation.

FOUR CONTROL ROD GROUP SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.4 The average scram insertion time, from the fully withdrawn position, for the three fastest control rods in each group of four control rods arranged in a two-by-two array, based on deenergization of the scram pilot valve solenoids as time zero, shall not exceed any of the following:

Position Inserted From Fully Withdrawn	Average Scram Insertion Time (Seconds)
46	0.33
36	1.12
26	1.93
6	3.58

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With the average scram insertion times of control rods exceeding the above limits, operation may continue and the provisions of Specification 3.0.4 are not applicable provided:

a. The control rods with the slower than average scram insertion times are declared inoperable,

b. The requirements of Specification 3.1.3.1 are satisfied, and

c. If within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied, and

d. The Surveillance Requirements of Specification 4.1.3.2.c are performed at least once per 92 days when operation is continued with three or more control rods with slow scram insertion times.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.4 All control rods shall be demonstrated OPERABLE by scram time testing from the fully withdrawn position as required by Surveillance Requirement 4.1.3.2.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD SCRAM ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.1.3.5 All control rod scram accumulators shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 5*.

ACTION:

a. In OPERATIONAL CONDITION 1 or 2 with one control rod scram accumulator inoperable, the provisions of Specification 3.0.4 are not applicable and operation may continue, provided that within 8 hours:

   1. The inoperable accumulator is restored to OPERABLE status, or

   2. The control rod associated with the inoperable accumulator is declared inoperable, and the requirements of Specification 3.1.3.1 are satisfied.

   3. And, if within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied.

   Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. In OPERATIONAL CONDITION 5* with a withdrawn control rod scram accumulator inoperable, fully insert the affected control rod and electrically disarm the directional control valves within one hour. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.5 The control rod scram accumulators shall be determined OPERABLE:

a. At least once per 7 days by verifying that the pressure and leak detectors are not in the alarmed condition, and

b. At least once per 18 months by performance of a:

   1. CHANNEL FUNCTIONAL TEST of the leak detectors, and

   2. CHANNEL CALIBRATION of the pressure detectors.

*At least the accumulator associated with each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

CONTROL ROD DRIVE COUPLING

LIMITING CONDITION FOR OPERATION

3.1.3.6 All control rods shall be coupled to their drive mechanisms.

APPLICABILITY: CONDITIONS 1, 2, and 5*.

ACTION:

a. In CONDITION 1 or 2 with one control rod not coupled to its associated drive mechanism, the provisions of Specification 3.0.4 are not applicable and operation may continue provided:

   1. Within the preset power level of the RWM, the control rod is declared inoperable and fully inserted until recoupling can be attempted with THERMAL POWER above the preset power level of the RWM and the requirements of Specification 3.1.4.1.d are satisfied.

   2. Above the preset power level of the RWM, the control rod drive is inserted to accomplish recoupling. If recoupling is not accomplished on the first attempt, declare the control rod inoperable, fully insert the control rod, and electrically disarm the directional control valves.

   3. The requirements of Specification 3.1.3.1 are satisfied.

b. In CONDITION 5*, with a withdrawn control rod not coupled to its associated drive mechanism, insert the control rod to accomplish recoupling. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The coupling integrity of a control rod shall be demonstrated by withdrawing the control rod to the fully withdrawn position and verifying that the rod does not go to the overtravel position:

*At least each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

CONTROL ROD POSITION INDICATION

LIMITING CONDITION FOR OPERATION

3.1.3.7 All control rod reed switch position indicators shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2, and 5*.

ACTION:

a. In CONDITION 1 or 2: With one or more control rod reed switch position indicators inoperable, including "Full-in" or "Full-out" indication, the provisions of Specification 3.0.4 are not applicable and operation may continue, provided that within one hour:

   1) The position of the control rod is determined by an alternate method, or

   2) The control rod is moved to a position with an OPERABLE reed switch position indicator, or

   3) The control rod with the inoperable reed switch position indicator is declared inoperable and the requirements of Specification 3.1.3.1 are satisfied;

   4) And, if within the preset power level of the RWM, the requirements of Specification 3.1.4.1.d are also satisfied;

   Otherwise, be in at least HOT SHUTDOWN within 12 hours.

b. In CONDITION 5* with a withdrawn control rod reed switch position indicator inoperable, fully insert the withdrawn control rod. The provisions of Specification 3.0.3 are not applicable.

*At least each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

SURVEILLANCE REQUIREMENTS

4.1.3.7 The control rod reed switch position indicators shall be determined OPERABLE by verifying:

a. At least once per 24 hours, that the position of the control rod is indicated,

b. That the indicated control rod position changes during the movement of the control rod when performing Surveillance Requirement 4.1.3.1.2, and

c. That the control rod reed switch position indicator corresponds to the control rod position indicated by the "Full-out" reed switches when performing Surveillance Requirement 4.1.3.6.b.

REACTIVITY CONTROL SYSTEMS

3/4 1.4 CONTROL ROD PROGRAM CONTROLS

ROD WORTH MINIMIZER

LIMITING CONDITION FOR OPERATION

3.1.4.1 The Rod Worth Minimizer (RWM) shall be OPERABLE when THERMAL POWER is less than 10% of RATED THERMAL POWER.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2*.

ACTION:

a. With the RWM inoperable after the first 12 control rods have been fully withdrawn on a startup, operation may continue provided that control rod movement and compliance with the prescribed BPWS control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff.

b. With the RWM inoperable before the first 12 control rods are withdrawn on a startup, one startup per calender year may be performed provided that control rod movement and compliance with the prescribed BPWS control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff.

c. With RWM inoperable on a shutdown, shutdown may continue provided that control rod movement and compliance with the prescribed BPWS control rod pattern are verified by a second licensed operator or qualified member of the plant technical staff.

d. With RWM operable but individual control rod(s) declared inoperable, operation and control rod movement below the preset power level of the RWM may continue provided:

   1. No more than three (3) control rods are declared inoperable in any one BWS group, and,

   2. The inoperable control rod(s) is bypassed on the RWM and control rod movement of the bypassed rod(s) is verified by a second licensed operator or qualified member of the plant technical staff.

e. With RWM inoperable, the provisions of Specification 3.0.4 are not applicable.

*Entry into OPERATIONAL CONDITION 2 and withdrawal of selected control rods is permitted for the purpose of determining the OPERABILITY of the RWM prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

SURVEILLANCE REQUIREMENTS

4.1.4.1.1 The RWM shall be demonstrated OPERABLE in OPERATIONAL CONDITION 2, prior to withdrawal of control rods for the purpose of making the reactor critical and in OPERATIONAL CONDITION 1 when the RWM is initiated during control rod insertion when reducing THERMAL POWER by:

a. Verifying proper annunciation of the selection error of at least one out-of-sequence control rod, and

b. Verifying the rod block function of the RWM by moving an out-of-sequence control rod.

4.1.4.1.2 The RWM shall be demonstrated OPERABLE by verifying the control rod Banked Position Withdrawal Sequence input to the RWM computer is correct following any loading of the sequence program into the computer.

Pages 3/4 1-15 through 3/4 1-16 have been deleted.

3/4.10.2 ROD SEQUENCE CONTROL SYSTEM

Page 3/4 10-2 has been deleted.

CONTROL RODS (Continued)

on a scram than has been analyzed even though control rods with inoperable accumulators may still be inserted with normal drive water pressure. Operability of the accumulator ensures that there is a means available to insert the control rods even under the most unfavorable depressurization of the reactors.

Control rod coupling integrity is required to ensure compliance with the analysis of the rod drop accident in the FSAR. The overtravel position feature provides the only positive means of determining that a rod is properly coupled and therefore this check must be performed prior to achieving criticality after each refueling. The subsequent check is performed as a backup to the initial demonstration.

In order to ensure that the control rod patterns can be followed and therefore that other parameters are within their limits, the control rod position indication system must be OPERABLE.

The control rod housing support restricts the outward movement of a control rod to less than 3 inches in the event of a housing failure. The amount of rod reactivity which could be added by this small amount of rod withdrawal is less than a normal withdrawal increment and will not contribute to any damage to the primary coolant system. The support is not required when there is no pressure to act as a driving force to rapidly eject a drive housing.

The required surveillance intervals are adequate to determine that the rods are OPERABLE and not so frequent as to cause excessive wear on the system components.

3/4.1.4 CONTROL ROD PROGRAM CONTROLS

Control rod withdrawal and insertion sequences are established to assure that the maximum in sequence individual control rod or control rod segments which are withdrawn at any time during the fuel cycle could not be worth enough to result in a peak fuel enthalpy greater than 280 cal/gm in the event of a control rod drop accident. The specified sequences are characterized by homogeneous, scattered patterns of control rod withdrawal. When THERMAL POWER is greater than or equal to 10% of RATED THERMAL POWER, there is no possible rod worth which, if dropped at the design rate of the velocity limiter, could result in a peak enthalpy of 280 cal/gm. Thus, requiring the RWM to be OPERABLE when THERMAL POWER is less than 10% of RATED THERMAL POWER provides adequate control.

Use of the Banked Position Withdrawal Sequence (BPWS) ensures that in the event of a control rod drop accident the peak fuel enthalpy will not be greater than 280 cal/gm (Reference 4).

CONTROL ROD PROGRAM CONTROLS (Continued)

The RWM as a backup to procedural control provides an automatic control rod pattern monitoring function to ensure adherence to the BPWS control movement sequences from 100% control rod density to 10% RATED THERMAL POWER and, thus, eliminates the postulated control rod drop accident from resulting in a peak fuel enthalpy greater than 280 cal/gm (Reference 5).

The requirement that RWM be operable for the withdrawal of the first 12 control rods on a startup is to ensure that the RWM system maintains a high degree of availability.

Deviation from the BPWS control rod pattern may be allowed for the performance of Shutdown Margin Demonstration tests.

The analysis of the rod drop accident is presented in Section 15.4.6 of the Updated FSAR and the techniques of the analysis are presented in a topical report (Reference 1) and two supplements (References 2 and 3).

The RBM is designed to automatically prevent fuel damage in the event of erroneous rod withdrawal from locations of high power density during high power operation. The RBM is only required to be operable when the limiting condition described in Specification 3.1.4.3 exists. Two channels are provided. Tripping one of the channels will block erroneous rod withdrawal soon enough to prevent fuel damage. This system backs up the written sequence used by the operator for withdrawal of control rods. Further discussion of the RBM system is provided in Reference 5.

3/4.1.5 STANDBY LIQUID CONTROL SYSTEM

The standby liquid control system provides a backup capability for maintaining the reactor subcritical in the event that insufficient rods are inserted in the core when a scram is called for. The volume and weight percent of poison material in solution is based on being able to bring the reactor to the subcritical condition as the plant cools to ambient condition. The temperature requirement is necessary to keep the sodium pentaborate in solution. Checking the volume and temperature once each 24 hours assures that the solution is available for use.

With redundant pumps and a highly reliable control rod scram system, operation of the reactor is permitted to continue for short periods of time with the system inoperable or for longer periods of time with one of the redundant components inoperable.

Surveillance requirements are established on a frequency that assures a high reliability of the system. Once the solution is established, boron concentration will not vary unless more boron or water is added, thus a check on the temperature and volume once each 24 hours assures that the solution is available for use.

Replacement of the explosive charges in the valves at regular intervals will assure that these valves will not fail because of deterioration of the charges.

References:

1. C. J. Paone, R. C. Stirn, and J. A. Woodley, "Rod Drop Accident Analysis for Large BWRs " G. E. Topical Report NEDO-10527, March 1972.

2. C. J. Paone, R. C. Stirn, and R. M. Yound, Supplement 1 to NEDO-10527, July 1972.

3. J. A. Haum, C. J. Paone, and R. C. Stirn, addendum 2 "Exposed Cores" supplement 2 to NEDO-10527, January 1973.

4. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel," Revision 6, Amendment 12.

5. NEDC-31654P, "Maximum Extended Operating Domain Analysis for Brunswick Steam Electric Plant, " February 1989.

6. NEDE-20411-P-A, "General Electric Standard Application for Reactor Fuel," Revision 8, Amendment 17.

3/4.10 SPECIAL TEST EXCEPTIONS

BASES

3/4.10.1 PRIMARY CONTAINMENT INTEGRITY

The requirement for PRIMARY CONTAINMENT INTEGRITY is removed during the period when open vessel tests are being performed during low power PHYSICS TESTS.

3/4.10.2 ROD SEQUENCE CONTROL SYSTEM (DELETED)

3/4.10.3 SHUTDOWN MARGIN DEMONSTRATIONS

Performance of shutdown margin demonstrations with the vessel head removed requires additional restrictions in order to ensure that criticality does not occur. These additional restrictions are specified in this LCO.

3/4.10.4 RECIRCULATION LOOPS

This special test exception permits reactor criticality under no flow conditions and is required to perform certain start-up and PHYSICS TESTS while at low THERMAL POWER levels.

3/4.10.5 PLANT SERVICE WATER

This Special Test Exception permits securing the Service Water System conventional header when the nuclear header is out of service and is required to permit flange installation in service water system header cross-connect piping.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 144 TO FACILITY OPERATING LICENSE NO. DPR-71

AND AMENDMENT NO. 175 TO FACILITY OPERATING LICENSE NO. DPR-62

CAROLINA POWER & LIGHT COMPANY, et al.

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated March 14, 1990, as supplemented August 9, 1990, and August 29, 1990 (Reference 1), the Carolina Power & Light Company (the licensee) requested an amendment to Facility Operating License Nos. DPR-71 and DPR-62 for the Brunswick Steam Electric Plant (Brunswick), Units 1 and 2, in accordance with the 10 CFR 50.90 and 2.101. The proposed amendment would change Technical Specifications (TS) 3/4.1, 3/4.10 and the associated Bases to permit the removal of the rod sequence control system (RSCS) and reduce the rod worth minimizer (RWM) low power setpoint.

The August 9, 1990 and August 29, 1990 letters provided supplemental information that did not alter the staff's intial determination of no significant hazards consideration published in the Federal Register.

2.0 DISCUSSION

The rod sequence control system restricts rod movement to minimize the individual worth of control rods to lessen the consequences of a rod drop accident (RDA). Control rod movement is restricted through the use of rod select, insert, and withdrawal blocks. The RSCS is a hardwired (as opposed to a computer controlled), redundant backup to the RWM. It is independent of the RWM in terms of inputs and outputs, but the two systems are compatible. The RSCS is designed to monitor and block, when necessary, operator control rod selection, withdrawal and insertion actions and, thus, assist in preventing significant control rod pattern errors which could lead to a control rod with a high reactivity worth (if dropped). A significant pattern error is one of several abnormal events, all of which must occur to have an RDA, which might exceed fuel energy density limit criteria for the accident. The RSCS was designed only for possible mitigation of the RDA and is active only during low power operation (currently, generally less than 20 percent power) when an RDA might be significant. It provides rod blocks on detection of a significant pattern error. It does not prevent an RDA. A similar pattern control function is also performed by the RWM, a computer controlled system. All reactors having an RSCS also have an RWM.

In August 1986, the BWR Owners' Group (BWROG), in cooperation with General Electric Company, proposed an Amendment 17 (Reference 2) to GESTAR II (Reference 3) which would eliminate the requirement for the RSCS and retain the RWM but lower the setpoint for turn off (during startup) or turn on (during shutdown) from 20 to 10 percent. The NRC staff review concluded that the proposed changes were acceptable and approved Amendment 17, but the staff imposed several additional requirements which would be necessary to implement the changes. The staff safety analysis and additional requirements were presented and discussed in an attachment to Reference 4. (This review and approval is also available in Reference 3, page US.C-379.)

The additional requirements were:

(1) The TS should require provisions for minimizing operations without the RWM system operable.

(2) The occasional necessary use of a second operator replacement should be strengthened by a utility review of relevant procedures, related forms and quality control to assure that the second operator provides an effective and truly independent monitoring process. A discussion of this review should accompany the request for RSCS removal.

(3) Rod patterns used should be at least equivalent to banked position withdrawal sequence (BPWS) patterns.

3.0 EVALUATION

The licensee has proposed changes to the Brunswick, Units 1 and 2, TS to (1) permit the removal of RSCS, and (2) reduce the RWM cutoff setpoint from 20 percent rated thermal power to 10 percent rated thermal power. These proposed amendments are reflected in the proposed TS 3/4.1, 3/4.10 and Bases.

The NRC staff review and basis for approval of the removal of the RSCS and lowering of the setpoint for the RWM, as proposed by the licensee in its submittal, are provided in Reference 3. The proposed changes fall within the scope of that staff review and approval. The present staff review of the proposed TS changes that implement these operational changes concludes that they are appropriate, clearly stated and are acceptable.

The licensee has increased the administrative control of the RWM, as required in the staff review of RSCS removal. The proposed revised TS require the RWM to be operable at the beginning of each startup, with only one exception per calendar year with the RWM out of service prior to or during the withdrawal of the first 12 control rods. These have been found to provide the desired improvement in reliability for the system. Also, as required, the TS and procedures for the use of a second operator or technically qualified staff member (when the RWM is inoperable) have been reviewed and improved, where necessary, have been discussed in the submittal, and appear to provide a suitable independent check on the rod patterns. Finally, as required, the revised TS prescribe the use of rod

patterns equivalent to the BPWS patterns (per TS 4.1.4.1.2) approved by previous staff reviews to maintain low control rod reactivity worths. The changes and reviews are in accord with the staff requirements of Reference 4 and are acceptable, and the proposed changes to TS 3/4.1, 3/4.10 and Bases appropriately implement the changes.

4.0 SUMMARY

We have reviewed the reports submitted by the licensee for Brunswick proposing TS changes relating to the removal of the RSCS and the reduction of RWM cut off setpoint from 20 to 10 percent rated thermal power. Based on this review, we have concluded that appropriate documentation was submitted and the proposed TS changes satisfy staff positions and requirements in these areas. Operation in the modes proposed for Brunswick is acceptable.

5.0 ENVIRONMENTAL CONSIDERATIONS

These amendments change a requirement with respect to installation or use of a facility component located within the restricted areas as defined in 10 CFR Part 20 and change the surveillance requirements. The staff has determined that these amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

6.0 CONCLUSION

The Commission made a proposed determination that these amendments involve no significant hazards consideration which was published in the Federal Register (55 FR 14501) on April 18, 1990, 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Letter and enclosures from A. B. Cutter, CP&L, to USNRC, dated March 14, 1990, "Request for License Amendment Rod Sequence Control System/Rod Worth Minimizer."

2. Letter and enclosures from T. A. Pickens, BWR Owners' Group to G. Lainas, NRC, dated August 15, 1986, "Amendment 17 to GE Licensing Topical Report NEDE-24011-P-A."

3. NEDE-24011-P-A-9, September 1988, "General Electric Standard Application for Reactor Fuel," (GESTAR II).

4. Letter from A. Thadani, NRC, to J. Charnley, General Electric Company, dated December 27, 1987, "Acceptance for Referencing of Licensing Topical Report NEDE-24011-P-A, Revision 8, Amendment 17."

Dated: September 11, 1990

Principal Contributor: T. Huang