May 9, 1997

Mr. W. R. Campbell
Vice President
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461

SUBJECT: ISSUANCE OF AMENDMENT NO. 185 TO FACILITY OPERATING LICENSE NO. DPR-71 AND AMENDMENT NO. 216 TO FACILITY OPERATING LICENSE NO. DPR-62 REGARDING CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION - BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 (TAC NOS. M98178 AND M98179)

Dear Mr. Campbell:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 185 to Facility Operating License No. DPR-71 and Amendment No. 216 to Facility Operating License No. DPR-62 for the Brunswick Steam Electric Plant, Units 1 and 2. The amendments change the Technical Specifications in response to your submittal dated March 5, 1997, as supplemented May 9, 1997.

The amendments incorporate a new Technical Specification (TS) for instrumentation associated with automatic isolation of a pathway for release of non-condensible gases from the main condenser. The TS will require that four channels of the main steam line radiation - high radiation function be capable of tripping the mechanical vacuum pumps and closing an isolation valve in the release pathway. Surveillance requirements are included in the TS to ensure the isolation instrumentation will perform its intended function.

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 Brenda Mozafari for:

David C. Trimble, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-325
and 50-324
Enclosures:
1. Amendment No. 185 to License No. DPR-71
2. Amendment No. 216 to License No. DPR-62
3. Safety Evaluation
cc w/enclosures: See next page
FILENAME - G:\BRUNSWIC\BR98178.AMD

PM:PDII-1	LA:PDII-1	OGC	(A)D:PDII-1
BMozafari	EDunnington		MReinhart
5/9/97	5/9/97	5/1/97	5/14/97
Yes/No	Yes/No	Yes/No	Yes/No

OFFICIAL RECORD COPY

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AMENDMENT NO. 185 TO FACILITY OPERATING LICENSE NO. DPR-71 - BRUNSWICK, UNIT 1
AMENDMENT NO. 216 TO FACILITY OPERATING LICENSE NO. DPR-62 - BRUNSWICK, UNIT 2

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cc: Brunswick Service List

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 185
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 5, 1997, as supplemented May 9, 1997, 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. 185, 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 prior to the next reactor startup requiring operation of the condenser vacuum pump, but no later than the end of refueling outage 11 (B112R1).

FOR THE NUCLEAR REGULATORY COMMISSION

Allen R. Johnson for

Mark Reinhart, Acting 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: May 9, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 185

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
V	V
X	X
-	3/4 3-97
-	3/4 3-98
B3/4 3-6	B3/4 3-6
-	B3/4 3-7
-	B3/4 3-8
-	B3/4 3-9
-	B3/4 3-10

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

BASES

INSTRUMENTATION

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.8 Four channels of the Main Steam Line Radiation-High Function for the condenser vacuum pump isolation shall be OPERABLE with its trip setting set consistent with the required Allowable Value.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2 with a condenser vacuum pump in service.

ACTION:

a. With one or more channel(s) of the Main Steam Line Radiation-High Function for condenser vacuum pump isolation inoperable:

   1. Restore channel to OPERABLE status within 12 hours; or

   *2. Place channel or associated trip system in trip within 12 hours.

   Otherwise; isolate the condenser vacuum pumps, or isolate the main steam lines, or be in HOT SHUTDOWN within the next 12 hours.

b. With condenser vacuum pump isolation capability not maintained:

   1. Isolate the condenser vacuum pumps within 12 hours; or

   2. Isolate the main steam lines within 12 hours; or

   3. Be in HOT SHUTDOWN within 12 hours.

c. When a channel is placed in an inoperable status solely for the performance of required Surveillances, entry into associated Actions may be delayed for up to 6 hours provided condenser vacuum pump isolation capability is maintained.

*Not applicable if the inoperable channel is the result of an inoperable condenser vacuum pump trip breaker or isolation valve.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

4.3.8 Each channel of the Main Steam Line Radiation-High Function for condenser vacuum pump isolation shall be demonstrated OPERABLE by:

a. Performance of a CHANNEL CHECK at least once per 24 hours;

b. Performance of a CHANNEL FUNCTIONAL TEST at least once per 92 days;

c. Performance of a CHANNEL CALIBRATION at least once per 18 months, the Allowable Value shall be ≤ 6 x background; and

d. Performance of a LOGIC SYSTEM FUNCTIONAL TEST, including condenser vacuum pump trip breaker and isolation valve actuation, at least once per 18 months.

3/4.3.6 ATWS RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The ATWS recirculation pump trip system has been added at the suggestion of ACRS as a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within the envelope of study events given in General Electric Company Tropical Report NEDO-10349, dated March, 1971.

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

3/4.3.7 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

The reactor core isolation cooling system actuation instrumentation is provided to initiate actions to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without providing actuation of any of the emergency core cooling equipment.

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-2P-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

Background

The condenser vacuum pump isolation instrumentation initiates a trip of the respective condenser vacuum pump and the common isolation valve following events in which the main steam line radiation monitor(s) exceed a predetermined value. The condenser vacuum pump isolation instrumentation initiates an isolation of the condenser vacuum pump(s) to limit main control room doses resulting from fuel cladding failure in the event of a control rod drop accident (CRDA). The isolation logic consists of two independent trip systems, with two channels of the Main Steam Line Radiation-High Function in each trip system. Each trip system is a one-out-of-two logic for this Function. Thus, either channel of the Main Steam Line Radiation-High Function in each trip system are needed to trip a trip system. The outputs of the channels are arranged in a logic so that both trip systems must trip to result in an isolation signal.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION (continued)

LCO

The OPERABILITY of the condenser vacuum pump isolation is dependent on the OPERABILITY of the individual Main Steam Line Radiation-High Function instrument channels, which must have its setpoint within the specified Allowable Value of Surveillance Requirement 4.3.8.c. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Channel OPERABILITY also includes the condenser vacuum pump trip breaker and isolation valve.

Applicability

The condenser vacuum pump isolation is required to be OPERABLE in OPERATIONAL CONDITIONS 1 and 2 when a condenser vacuum pump is in service, to mitigate the consequences of a postulated control rod drop accident. In this condition, fission products released during a control rod drop accident could be discharged directly to the environment. Therefore, the condenser vacuum pump isolation is necessary to assure conformance with the radiological evaluation of the control rod drop accident. In OPERATIONAL CONDITIONS 3, 4, or 5, the consequences of a control rod drop are insignificant and are not expected to result in any fuel damage or fission product releases. When a condenser vacuum pump is not in operation in OPERATIONAL CONDITIONS 1 or 2, fission product releases via this pathway would not occur.

ACTION a.

With one or more channels inoperable, but with condenser vacuum pump isolation capability maintained (refer to ACTION b. Bases), the condenser vacuum pump isolation instrumentation is capable of performing the intended function. However, the reliability and redundancy of the condenser vacuum pump isolation instrumentation is reduced, such that a single failure in one of the remaining channels could result in the inability of the condenser vacuum pump isolation instrumentation to perform the intended function. Therefore, only a limited time is allowed to restore the inoperable channels to OPERABLE status. Because of the low probability of extensive numbers of inoperabilities affecting multiple channels, and the low probability of an event requiring the initiation of condenser vacuum pump isolation, 12 hours has been shown to be acceptable (Ref. 1) to permit restoration of any inoperable channel to OPERABLE status (ACTION a.1). Alternately, the inoperable channel, or associated trip system, may be placed in trip (ACTION a.2), since this would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. As noted, placing the channel in trip with no further restrictions is not allowed if the inoperable channel is the result of an inoperable condenser vacuum pump trip breaker or isolation valve, since this may not adequately compensate for the

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

ACTION a. (continued)

inoperable condenser vacuum pump trip breaker or isolation valve (e.g., the trip breaker may be inoperable such that it will not trip). If it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel would result in loss of condenser vacuum), or if the inoperable channel is the result of an inoperable condenser vacuum pump trip breaker or isolation valve, the plant must be brought to an operating condition in which the Limiting Condition for Operation does not apply. To achieve this status, the plant must be brought to at least OPERATIONAL CONDITION 3 within 12 hours. Alternately, the associated condenser vacuum pump(s) may be removed from service since this performs the intended function of the instrumentation. An additional option is provided to isolate the main steam lines, which may allow operation to continue. Isolating the main steam lines effectively provides an equivalent level of protection by precluding fission product transport to the condenser. This isolation is accomplished by isolation of all main steam lines and main steam line drains which bypass the main steam isolation valves.

The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach OPERATIONAL CONDITION 3 from full power conditions, or to remove the condenser pump from service, or to isolate the main steam lines, in an orderly manner and without challenging plant systems.

ACTION b.

ACTION b. is intended to ensure appropriate actions are taken if multiple, inoperable, untripped channels result in the Function not maintaining condenser vacuum pump isolation capability. The Function is considered to be maintaining condenser vacuum pump isolation capability when sufficient channels are OPERABLE or in trip such that the condenser vacuum pump isolation instruments will generate a trip signal from a valid Main Steam Line Radiation-High signal, and the condenser vacuum pumps will trip. This requires one channel of the function in each trip system to be OPERABLE or in trip and the condenser vacuum pump trip breakers to be OPERABLE. With condenser vacuum pump isolation capability not maintained, the unit must be brought to an operating condition in which the Limiting Condition for Operation does not apply. Therefore, to achieve this, the unit must be placed in OPERATIONAL CONDITION 3 within 12 hours (ACTION b.3). Alternatively, the condenser vacuum pump can be removed from service since this performs the intended function of the instrumentation (ACTION b.1). An additional option is provided to isolate the main steam lines (ACTION b.2). Isolation of the main steam lines effectively provides an equivalent level of protection by precluding fission product transport to the condenser. This isolation is accomplished by isolation of all main steam lines and main steam line drains which bypass the main steam isolation valves.

An allowed completion time of 12 hours is reasonable, based on operating experience, to reach OPERATIONAL CONDITION 3 from full power conditions, or to remove the condenser pump from service, or to isolate the main steam lines, in an orderly manner and without challenging plant systems.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION (continued)

ACTION c.

ACTION c. allows that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into the associated Actions may be delayed for up to 6 hours provided the associated Function maintains condenser vacuum pump isolation trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the condenser vacuum pumps will isolate when necessary.

Surveillance Requirement 4.3.8.a

Performance of the CHANNEL CHECK once every 24 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Surveillance Requirement 4.3.8.b

A CHANNEL FUNCTIONAL TEST is performed to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The 92 day frequency is based on the reliability analysis of Reference 1.

Surveillance Requirement 4.3.8.c

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The 18 month frequency is conservative with respect to the assumption of the calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

For the purposes of this surveillance, background is the dose level experienced at 100% rated thermal power with hydrogen water chemistry at the maximum injection rate. Under these conditions, an Allowable Value of 6 x background will ensure that General Design Criterion 19 limits will not be exceeded in the control room in the event of a control rod drop accident.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION (continued)

Surveillance Requirement 4.3.8.d

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump trip breakers and actuation of the associated isolation valve are included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating or isolation valves incapable of actuating, the instrument channel would be inoperable.

The 18 month frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

Reference

1. NEDC-30851P-A Supplement 2, Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation, March 1989.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 216
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 5, 1997, as supplemented May 9, 1997, 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. 216, 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 prior to the next reactor startup requiring operation of the condenser vacuum pump, but no later than the end of refueling outage 12 (B213R1).

FOR THE NUCLEAR REGULATORY COMMISSION

Allen R. Johnson for

Mark Reinhart, Acting 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: May 9, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 216

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
V	V
X	X
-	3/4 3-104
-	3/4 3-105
B3/4 3-7	B3/4 3-7
-	B3/4 3-8
-	B3/4 3-9
-	B3/4 3-10
-	B3/4 3-11

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LIMITING CONDITION FOR OPERATION

3.3.8 Four channels of the Main Steam Line Radiation-High Function for the condenser vacuum pump isolation shall be OPERABLE with its trip setting set consistent with the required Allowable Value.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2 with a condenser vacuum pump in service.

ACTION:

a. With one or more channel(s) of the Main Steam Line Radiation-High Function for condenser vacuum pump isolation inoperable:

   1. Restore channel to OPERABLE status within 12 hours; or

   *2. Place channel or associated trip system in trip within 12 hours.

   Otherwise; isolate the condenser vacuum pumps, or isolate the main steam lines, or be in HOT SHUTDOWN within the next 12 hours.

b. With condenser vacuum pump isolation capability not maintained:

   1. Isolate the condenser vacuum pumps within 12 hours; or

   2. Isolate the main steam lines within 12 hours; or

   3. Be in HOT SHUTDOWN within 12 hours.

c. When a channel is placed in an inoperable status solely for the performance of required Surveillances, entry into associated Actions may be delayed for up to 6 hours provided condenser vacuum pump isolation capability is maintained.

*Not applicable if the inoperable channel is the result of an inoperable condenser vacuum pump trip breaker or isolation valve.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

4.3.8 Each channel of the Main Steam Line Radiation-High Function for condenser vacuum pump isolation shall be demonstrated OPERABLE by:

a. Performance of a CHANNEL CHECK at least once per 24 hours;

b. Performance of a CHANNEL FUNCTIONAL TEST at least once per 92 days;

c. Performance of a CHANNEL CALIBRATION at least once per 18 months, the Allowable Value shall be ≤ 6 x background; and

d. Performance of a LOGIC SYSTEM FUNCTIONAL TEST, including condenser vacuum pump trip breaker and isolation valve actuation, at least once per 18 months.

3/4.3.7 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

The reactor core isolation cooling system actuation instrumentation is provided to initiate actions to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without providing actuation of any of the emergency core cooling equipment.

Specified surveillance intervals and allowed out-of-service times were established based on the reliability analyses documented in GE report GENE-770-06-2P-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

Background

The condenser vacuum pump isolation instrumentation initiates a trip of the respective condenser vacuum pump and the common isolation valve following events in which the main steam line radiation monitor(s) exceed a predetermined value. The condenser vacuum pump isolation instrumentation initiates an isolation of the condenser vacuum pump(s) to limit main control room doses resulting from fuel cladding failure in the event of a control rod drop accident (CRDA). The isolation logic consists of two independent trip systems, with two channels of the Main Steam Line Radiation-High Function in each trip system. Each trip system is a one-out-of-two logic for this Function. Thus, either channel of the Main Steam Line Radiation-High Function in each trip system are needed to trip a trip system. The outputs of the channels are arranged in a logic so that both trip systems must trip to result in an isolation signal.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION (continued)

LCO

The OPERABILITY of the condenser vacuum pump isolation is dependent on the OPERABILITY of the individual Main Steam Line Radiation-High Function instrument channels, which must have its setpoint within the specified Allowable Value of Surveillance Requirement 4.3.8.c. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Channel OPERABILITY also includes the condenser vacuum pump trip breaker and isolation valve.

Applicability

The condenser vacuum pump isolation is required to be OPERABLE in OPERATIONAL CONDITIONS 1 and 2 when a condenser vacuum pump is in service, to mitigate the consequences of a postulated control rod drop accident. In this condition, fission products released during a control rod drop accident could be discharged directly to the environment. Therefore, the condenser vacuum pump isolation is necessary to assure conformance with the radiological evaluation of the control rod drop accident. In OPERATIONAL CONDITIONS 3, 4, or 5, the consequences of a control rod drop are insignificant and are not expected to result in any fuel damage or fission product releases. When a condenser vacuum pump is not in operation in OPERATIONAL CONDITIONS 1 or 2, fission product releases via this pathway would not occur.

ACTION a.

With one or more channels inoperable, but with condenser vacuum pump isolation capability maintained (refer to ACTION b. Bases), the condenser vacuum pump isolation instrumentation is capable of performing the intended function. However, the reliability and redundancy of the condenser vacuum pump isolation instrumentation is reduced, such that a single failure in one of the remaining channels could result in the inability of the condenser vacuum pump isolation instrumentation to perform the intended function. Therefore, only a limited time is allowed to restore the inoperable channels to OPERABLE status. Because of the low probability of extensive numbers of inoperabilities affecting multiple channels, and the low probability of an event requiring the initiation of condenser vacuum pump isolation, 12 hours has been shown to be acceptable (Ref. 1) to permit restoration of any inoperable channel to OPERABLE status (ACTION a.1). Alternately, the inoperable channel, or associated trip system, may be placed in trip (ACTION a.2), since this would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. As noted, placing the channel in trip with no further restrictions is not allowed if the inoperable channel is the result of an inoperable condenser vacuum pump trip breaker or isolation valve, since this may not adequately compensate for the

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION

ACTION a. (continued)

inoperable condenser vacuum pump trip breaker or isolation valve (e.g., the trip breaker may be inoperable such that it will not trip). If it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel would result in loss of condenser vacuum), or if the inoperable channel is the result of an inoperable condenser vacuum pump trip breaker or isolation valve, the plant must be brought to an operating condition in which the Limiting Condition for Operation does not apply. To achieve this status, the plant must be brought to at least OPERATIONAL CONDITION 3 within 12 hours. Alternately, the associated condenser vacuum pump(s) may be removed from service since this performs the intended function of the instrumentation. An additional option is provided to isolate the main steam lines, which may allow operation to continue. Isolating the main steam lines effectively provides an equivalent level of protection by precluding fission product transport to the condenser. This isolation is accomplished by isolation of all main steam lines and main steam line drains which bypass the main steam isolation valves.

The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach OPERATIONAL CONDITION 3 from full power conditions, or to remove the condenser pump from service, or to isolate the main steam lines, in an orderly manner and without challenging plant systems.

ACTION b.

ACTION b. is intended to ensure appropriate actions are taken if multiple, inoperable, untripped channels result in the Function not maintaining condenser vacuum pump isolation capability. The Function is considered to be maintaining condenser vacuum pump isolation capability when sufficient channels are OPERABLE or in trip such that the condenser vacuum pump isolation instruments will generate a trip signal from a valid Main Steam Line Radiation-High signal, and the condenser vacuum pumps will trip. This requires one channel of the function in each trip system to be OPERABLE or in trip and the condenser vacuum pump trip breakers to be OPERABLE. With condenser vacuum pump isolation capability not maintained, the unit must be brought to an operating condition in which the Limiting Condition for Operation does not apply. Therefore, to achieve this, the unit must be placed in OPERATIONAL CONDITION 3 within 12 hours (ACTION b.3). Alternatively, the condenser vacuum pump(s) can be removed from service since this performs the intended function of the instrumentation (ACTION b.1). An additional option is provided to isolate the main steam lines (ACTION b.2). Isolation of the main steam lines effectively provides an equivalent level of protection by precluding fission product transport to the condenser. This isolation is accomplished by isolation of all main steam lines and main steam line drains which bypass the main steam isolation valves.

An allowed completion time of 12 hours is reasonable, based on operating experience, to reach OPERATIONAL CONDITION 3 from full power conditions, or to remove the condenser pump from service, or to isolate the main steam lines, in an orderly manner and without challenging plant systems.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION (continued)

ACTION c.

ACTION c. allows that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into the associated Actions may be delayed for up to 6 hours provided the associated Function maintains condenser vacuum pump isolation trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the condenser vacuum pumps will isolate when necessary.

Surveillance Requirement 4.3.8.a

Performance of the CHANNEL CHECK once every 24 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Surveillance Requirement 4.3.8.b

A CHANNEL FUNCTIONAL TEST is performed to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The 92 day frequency is based on the reliability analysis of Reference 1.

Surveillance Requirement 4.3.8.c

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The 18 month frequency is conservative with respect to the assumption of the calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

For the purposes of this surveillance, background is the dose level experienced at 100% rated thermal power with hydrogen water chemistry at the maximum injection rate. Under these conditions, an Allowable Value of 6 x background will ensure that General Design Criterion 19 limits will not be exceeded in the control room in the event of a control rod drop accident.

3/4.3.8 CONDENSER VACUUM PUMP ISOLATION INSTRUMENTATION (continued)

Surveillance Requirement 4.3.8.d

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump trip breakers and actuation of the associated isolation valve are included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating or isolation valves incapable of actuating, the instrument channel would be inoperable.

The 18 month frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

Reference

1. NEDC-30851P-A Supplement 2, Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation, March 1989.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 185 TO FACILITY OPERATING LICENSE NO. DPR-71

AND AMENDMENT NO. 216 TO FACILTY OPERATING LICENSE NO. DPR-62

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated March 5, 1997, as supplemented May 9, 1997, the Carolina Power & Light Company (the licensee) submitted a request for changes to the Brunswick Steam Electric Plant, Units 1 and 2, Technical Specifications (TS). The requested changes would incorporate a new TS for instrumentation associated with automatic isolation of a pathway for release of non-condensible gases from the main condenser. At power levels of 5 percent or less, mechanical vacuum pumps are used to remove non-condensible gases from the condenser using a pathway to the release stack that bypasses the normal holdup and filter train. The proposed TS will require that four channels of the main steam line radiation - high radiation function be capable of tripping the mechanical vacuum pumps and closing an isolation valve in the release pathway. Surveillance requirements are included in the TS to ensure the isolation instrumentation will perform its intended function.

By letter dated September 30, 1994, and supplemented March 24, 1995, the licensee requested elimination of the main steam line radiation monitor trip signal to the condenser vacuum pumps and closure of the associated isolation valves. This request was based on the General Electric Company Licensing Topical Report NEDO-31400 which was approved by the NRC staff by the Safety Evaluation dated May 15, 1991. Further, a plant-specific calculation by NUS (NUS Calculation 8T12-M-02) demonstrated that in the event of a CRDA the radiation level in the control room would be below the permissible levels of General Design Criterion 19 and Standard Review Plan (SRP), Section 6.4. By letter dated March 31, 1995, the NRC approved the change request for Brunswick, eliminating the above signal.

On December 19, 1996, the licensee determined that the NUS calculation was in error, and in the event of a CRDA without isolation of the condenser vacuum pumps, the doses in the main control room would exceed the SRP, Section 6.4 guidance. To resolve this deficiency, the licensee proposes to restore to the original plant design and reinstall the main steam high radiation signal to trip the condenser vacuum pump and close the associated isolation valves.

The May 9, 1997, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

In the March 5, 1997, letter the licensee stated that with the proposed changes, the probability of the vacuum pumps discharging contaminated steam into the main stack is very low for several reasons. First, the condenser vacuum pumps are used for a limited time period when the plant is below 5 percent power in Operational Condition 1 and 2. When a condenser vacuum pump is not in operation, fission product release through this path would not occur. Second, the isolation of the vacuum pump system is required only when there is a CRDA. The licensee stated that a highly improbable combination of events have to happen for a CRDA to occur. These events include erroneous selection and withdrawal of an out-of-sequence rod by an operator, a failure of the rod worth minimizer to block withdrawal of the out-of-sequence rod, and failure of the rod-to-drive coupling. The licensee probabilistic safety analysis indicates that the probability of a CRDA is below 1E-6 per reactor over a 40-year time period. Third, in the event of a CRDA, the high radiation monitors in the main steam lines are designed to trip the condenser vacuum pumps and close the associated isolation valves in 5 seconds. In other words, the condenser vacuum pumps can discharge contaminants only for 5 seconds. Fourth, the safety-related main steam line radiation monitors provide a highly reliable means to automatically trip the respective condenser vacuum pump and close the associated isolation valve. The main steam line radiation-high logic consists of two independent trip systems, each with two channels operating on one-out-of-two logic. Furthermore, both trip systems must operate to generate the isolation signal. This logic design is consistent with the original approved plant design. Fifth, in the event of a CRDA resulting in a high radiation level in the main steam lines, the main steam isolation valves are required to close in 5 seconds in compliance with the TS requirements.

The licensee's submittal includes a calculation of main control room doses in the event of a CRDA, assuming that the main steam line radiation monitors isolate the condenser vacuum pumps in conformance to the SRP, Section 15.4.9. The calculation indicates that the operator doses from a postulated CRDA are 23.2 rem thyroid and 0.05 rem whole body in the main control room area. GDC-19/SRP Section 6.4 permits 30 rem thyroid and 5 rem whole body. Doses of 0.16 rem thyroid and 0.015 rem whole body were calculated in the 2-hour exclusion area, and 1 rem thyroid in the low population zone. The calculated control room doses meet the indicated acceptance criteria, and the offsite doses are well below the acceptance criteria in the SRP and 10 CFR Part 100.

The amendment proposes a 12-hour time limit for the following Actions in new proposed TS 3/4.3.8, Condenser Vacuum Pump Isolation Instrumentation:

a. With one or more channels of the Main Steam Line Radiation-High Function for condenser vacuum pumps inoperable, restore the inoperable channel to operable status or place the inoperable channel or associated trip system in trip or isolate the condenser vacuum pumps or isolate the main steam lines or be in hot shutdown.

b. With condenser vacuum pump isolation capability not maintained, isolate the condenser vacuum pumps or isolate the main steam lines or be in hot shutdown.

It further states that when a channel is placed in an inoperable status solely for the surveillance tests, entry into associated actions may be delayed for up to 6 hours provided the condenser vacuum pump isolation capability is maintained.

The amendment also proposed surveillance requirements which state that each channel of the Main Steam Line Radiation-High Function for condenser vacuum pump isolation shall be demonstrated operable by:

a. Performance of a channel check at least once per 24 hours

b. Performance of a channel functional test at least once per 92 days

c. Performance of a channel calibration and logic system functional test at least once per 18 months

These requirements are in conformance with the original plant design for Brunswick Steam Electric Plant, Units 1 and 2, which included the condenser vacuum pump trip, and NEDC-30851P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to Reactor Protection System and Emergency Core Cooling System Instrumentation," dated March 1989, which was previously approved by the NRC staff.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the Surveillance Requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (62 FR 17224). Accordingly, the 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 the amendments.

The NRC staff has reviewed the licensee's evaluation and justification for reinstating the main steam radiation monitor signal to isolate the condenser vacuum pump and to close the associated isolation valves. Based on that review, the staff concludes that the licensee has performed a plant-specific calculation which confirms that reestablishment of the original plant design, which includes the above feature, will maintain the worst-case plant CRDA release below the acceptance criteria in the SRP and 10 CFR Part 100. The NRC

release below the acceptance criteria in the SRP and 10 CFR Part 100. The NRC staff further concludes that the proposed TS changes for the condenser vacuum pump trip and isolation are consistent with the BWR improved Standard TS and are, therefore, acceptable.

5.0 CONCLUSION

The Commission 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.

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Date: May 9, 1997