

CONTAINMENT SYSTEMS

PRIMARY CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

FOR INFORMATION ONLY.  
NOT BEING MODIFIED.

3.6.1.2 Primary containment leakage rates shall be limited to:

- a. An overall integrated leakage rate of:
  1. Less than or equal to  $L_a$ , 0.5 percent by weight of the containment air per 24 hours at  $P_a$ , 49 psig, or
  2. Less than or equal to  $L_p$ , 0.357 percent by weight of the containment air per 24 hours at a reduced pressure of  $P_c$ , 25 psig.
- b. A combined leakage rate of less than or equal to  $0.60 L_a$  for all penetrations and all valves listed in Table 3.6.3-1, except for main steam line isolation valves\*, subject to Type B and C tests when pressurized to  $P_a$ , 49 psig.
- c. \*Less than or equal to 11.5 scf per hour for any one main steam line isolation valve when tested at 25 psig.

APPLICABILITY: When PRIMARY CONTAINMENT INTEGRITY is required per Specification 3.6.1.1.

ACTION:

With:

- a. The measured overall integrated primary containment leakage rate exceeding  $0.75 L_a$  or  $0.75 L_c$ , as applicable, or
- b. The measured combined leakage rate for all penetrations and all valves listed in Table 3.6.3-1, except for main steam line isolation valves\*, subject to Type B and C tests exceeding  $0.60 L_a$ , or
- c. The measured leakage rate exceeding 11.5 scf per hour for any one main steam line isolation valve,

restore:

- a. The overall integrated leakage rate(s) to less than or equal to  $0.75 L_a$  or  $0.75 L_c$ , as applicable, and
- b. The combined leakage rate for all penetrations and all valves listed in Table 3.6.3-1, except for main steam line isolation valves\*, subject to Type B and C tests to less than or equal to  $0.60 L_a$ , and

\* Exemption to Appendix "J" of 10 CFR 50.

## CONTAINMENT SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

#### ACTION (Continued)

- c. The leakage rate to less than or equal to 11.5 scf per hour for any one main steam line isolation valve.

prior to increasing reactor coolant system temperature above 212°F.

#### SURVEILLANCE REQUIREMENTS

4.6.1.2 The primary containment leakage rates shall be demonstrated in accordance with the schedule and criteria specified in 10 CFR 50, Appendix J, as modified by approved exemptions. The provisions of Technical Specification 4.0.2 are not applicable to the test intervals specified in 10 CFR 50, Appendix J.

a. Deleted.

b. Deleted.

c. Deleted.

d. Type B and C tests shall be conducted with gas at P<sub>o</sub> 49 psig, at intervals no greater than 24 months except for tests involving

~~1. Air locks.~~

~~2. Main steam line isolation valves.~~

e. Air locks shall be tested and demonstrated OPERABLE per Surveillance Requirement 4.6.1.3.

f. Main steam line isolation valves shall be leak tested at least once per 18 months.

g. All test leakage rates shall be calculated using observed data converted to absolute values. Error analyses shall be performed to select a balanced integrated leakage measurement system.

~~h. The provisions of Specification 4.0.2 are not applicable to 24 month surveillance intervals.~~

h. Deleted.

in accordance with 10 CFR 50,  
Appendix J, as modified by  
approved exemptions,

(Pages 3/4 6-3A and 3/4 6-3B have been deleted.)

FOR INFORMATION ONLY.  
NOT BEING MODIFIED.

CONTAINMENT SYSTEMS

PRIMARY CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

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3.6.1.3 The primary containment air lock shall be OPERABLE with:

- a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and
- b. An overall air lock leakage rate of less than or equal to  $0.05 L_a$  at  $P_a$ , 49 psig.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2\* and 3.

ACTION:

- a. With one primary containment air lock door inoperable:
  1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed.
  2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be locked closed at least once per 31 days.
  3. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
  4. The provisions of Specification 3.0.4 are not applicable.
- b. With the primary containment air lock door interlock inoperable:
  1. Lock the inner air lock door closed.
  2. Operation may then continue provided that the inner air lock door is verified to be locked closed at least once per 31 days.
  3. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
  4. The provisions of Specification 3.0.4 are not applicable.
- c. With the primary containment air lock inoperable, except as a result of an inoperable air lock door or interlock, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

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\* See Special Test Exception 3.10.1.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS

4.6.1.3 Each primary containment air lock shall be demonstrated OPERABLE:

a. By verifying the seal leakage rate to be less than or equal to 5 scf per hour when the gap between the door seals is pressurized to 10 psig\*:

1. ~~Within 72 hours following each closing, except when the air lock is being used for multiple entries, then at least once per 72 hours, and~~ As specified in 10 CFR 50, Appendix J, as modified by approved exemptions, and
2. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used and no maintenance has been performed on the air lock, and
3. When the air lock seal has been replaced.

b. By conducting an overall air lock leakage test ~~at P<sub>a</sub>, 49 psig, and by verifying that the overall air lock leakage is within its limit~~

1. ~~At least once per six months<sup>#</sup>, and~~

2. ~~Prior to establishing PRIMARY CONTAINMENT INTEGRITY when maintenance (except for seal replacement) has been performed on the air lock that would affect the air lock sealing capability.\*~~

c. By verification of air lock interlock OPERABILITY: ~~test intervals specified in 10 CFR 50, Appendix J.~~

1. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used, and
2. Prior to and following a drywell entry when PRIMARY CONTAINMENT INTEGRITY is required, and
3. Following the performance of maintenance affecting the air lock interlock.

in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, and prior

\* Exemption to Appendix J of 10 CFR 50.

~~<sup>#</sup> The provisions of Specification 4.0.2 are not applicable.~~

### 3/4.6 CONTAINMENT SYSTEMS

#### BASES

#### 3/4.6.1 PRIMARY CONTAINMENT

##### 3/4.6.1.1 PRIMARY CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

##### 3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

The limitations on primary containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure of 49 psig,  $P_a$ . As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to  $0.75 L_a$  or  $0.75 L_c$ , as applicable, during performance of the periodic tests to account for possible degradation of the containment leakage barriers between leakage tests.

Operating experience with the main steam line isolation valves has indicated that degradation has occasionally occurred in the leak tightness of the valves; therefore, the special requirement for testing these valves.

SEE INSERT (ATTACHED)

~~Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of airlocks after each opening, and leakage calculation methods.~~

Appendix J, paragraph III.A.3 requires that all Type A (Containment Integrated Leak Rate) tests be conducted in accordance with American National Standard (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors," March 16, 1972. In addition to the Total Time and Point-to-Point methods described in that standard, the Mass Point method, when used with a test duration of at least 24 hours, is an acceptable method to use to calculate leakage rates. A typical description of the Mass Point method can be found in ANSI/ANS 56.8-1987, "Containment System Leakage Testing Requirements," January 20, 1987. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1, November 1, 1972 (References 1 and 2).

#### References:

1. CP&L Letter to Mr. D. B. Vassallo, "Integrated Leak Rate Test," October 20, 1983.
2. NRC Letter from Mr. D. B. Vassallo to Mr. E. E. Utley, December 9, 1983.

### 3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

Technical Specification 4.6.1.2.d reflects the leakage rate testing requirements with respect to Type B and C tests, except for tests involving main steam line isolation valves. Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of air locks after each opening, and leakage calculation methods.

The periodic testing frequency for primary containment Type B and C leakage rate tests are required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

## CONTAINMENT SYSTEMS

### BASES

#### 3/4.5.1.3 PRIMARY CONTAINMENT AIR LOCKS

primary

The limitations on closure and leak rate for the containment air locks are required to meet the restrictions on PRIMARY CONTAINMENT INTEGRITY and leak rate given in Specifications 3.5.1.1 and 3.6.1.2. The specification makes allowances for the fact that there may be long periods of time when the air locks will be in a closed and secured position during reactor operation. Only the closed door in each air lock is required to maintain the integrity of the containment. In the event of an inoperable door interlock, locking shut the inner door will ensure containment integrity while permitting access to the lock for maintenance and surveillance testing.

INSERT NEW  
PARAGRAPH  
(ATTACHED)

#### 3/4.5.1.4 PRIMARY CONTAINMENT STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the primary containment steel vessel will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the vessel will withstand the maximum pressure of 49 psig in the event of a LOCA. A visual inspection in conjunction with Type A leakage tests is sufficient to demonstrate this capability.

#### 3/4.5.1.5 PRIMARY CONTAINMENT INTERNAL PRESSURE

The limitations of primary containment internal pressure ensure that the containment peak pressure of 49 psig does not exceed the design pressure of 62 psig during LOCA conditions. The limit of 1.75 psig, for initial positive containment pressure will limit the total pressure to 49 psig, which is less than the design pressure and is consistent with the accident analyses.

#### 3/4.5.1.6 PRIMARY CONTAINMENT AVERAGE AIR TEMPERATURE

The limitation in containment average air temperature ensures that the containment peak air temperature does not exceed the design temperature of 300°F during LOCA conditions and is consistent with the accident analyses.

Maintaining primary containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J, as modified by approved exemptions. Technical Specifications 4.6.1.3.a and 4.6.1.3.b reflect the leakage rate testing requirements with respect to air lock leakage (Type B tests). The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The periodic testing frequency for primary containment air locks is required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.



ENCLOSURE 6

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
NRC DOCKET NOS. 50-325 AND 50-324  
OPERATING LICENSE NOS. DPR-71 AND DPR-62  
REQUEST FOR LICENSE AMENDMENTS  
CONTAINMENT LEAKAGE RATE TESTING

MARKED-UP TECHNICAL SPECIFICATION PAGES - UNIT 2

FOR INFORMATION ONLY.  
NOT BEING MODIFIED.

CONTAINMENT SYSTEMS

PRIMARY CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

3.6.1.2 Primary containment leakage rates shall be limited to:

- a. An overall integrated leakage rate of:
  1. Less than or equal to  $L_a$ , 0.5 percent by weight of the containment air per 24 hours at  $P_a$ , 49 psig, or
  2. Less than or equal to  $L_c$ , 0.357 percent by weight of the containment air per 24 hours at a reduced pressure of  $P_c$ , 25 psig.
- b. A combined leakage rate of less than or equal to  $0.60 L_a$  for all penetrations and all valves listed in Table 3.6.3-1, except for main steam line isolation valves\*, subject to Type B and C tests when pressurized to  $P_a$ , 49 psig.
- c. \*Less than or equal to 11.5 scf per hour for any one main steam line isolation valve when tested at 25 psig.

APPLICABILITY: When PRIMARY CONTAINMENT INTEGRITY is required per Specification 3.6.1.1.

ACTION:

With:

- a. The measured overall integrated primary containment leakage rate exceeding  $0.75 L_a$  or  $0.75 L_c$ , as applicable, or
- b. The measured combined leakage rate for all penetrations and all valves listed in Table 3.6.3-1, except for main steam line isolation valves\*, subject to Type B and C tests exceeding  $0.60 L_a$ , or
- c. The measured leakage rate exceeding 11.5 scf per hour for any one main steam line isolation valve,

restore:

- a. The overall integrated leakage rate(s) to less than or equal to  $0.75 L_a$  or  $0.75 L_c$ , as applicable, and
- b. The combined leakage rate for all penetrations and all valves listed in Table 3.6.3-1, except for main steam line isolation valves\*, subject to Type B and C tests to less than or equal to  $0.60 L_a$ , and

\* Exemption to Appendix "J" of 10 CFR 50.

## CONTAINMENT SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

#### ACTION (Continued)

- c. The leakage rate to less than or equal to 11.5 scf per hour for any one main steam line isolation valve.

prior to increasing reactor coolant system temperature above 212°F.

### SURVEILLANCE REQUIREMENTS

4.6.1.2 The primary containment leakage rates shall be demonstrated in accordance with the schedule and criteria specified in 10 CFR 50, Appendix J, as modified by approved exemptions. The provisions of Technical Specification 4.0.2 are not applicable to the test intervals specified in 10 CFR 50, Appendix J.

a. Deleted.

b. Deleted.

c. Deleted.

in accordance with 10 CFR 50,  
Appendix J, as modified by  
approved exemptions,

d. Type B and C tests shall be conducted with gas at  $P_a$ , 49 psig, at intervals no greater than 24 months except for tests involving:

~~1. Air locks.~~

~~2. Main steam line isolation valves.~~

e. Air locks shall be tested and demonstrated OPERABLE per Surveillance Requirement 4.6.1.3.

f. Main steam line isolation valves shall be leak tested at least once per 18 months.

g. All test leakage rates shall be calculated using observed data converted to absolute values. Error analyses shall be performed to select a balanced integrated leakage measurement system.

~~h. The provisions of Specification 4.0.2 are not applicable to 24 month surveillance intervals.~~

**h. Deleted.**

(Page 3/4 6-3A has been deleted.)

FOR INFORMATION ONLY.  
NOT BEING MODIFIED.

CONTAINMENT SYSTEMS

PRIMARY CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

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3.6.1.3 The primary containment air lock shall be OPERABLE with:

- a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and
- b. An overall air lock leakage rate of less than or equal to  $0.05 L_a$  at  $P_a$ , 49 psig.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2\* and 3.

ACTION:

- a. With one primary containment air lock door inoperable:
  1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed.
  2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be locked closed at least once per 31 days.
  3. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
  4. The provisions of Specification 3.0.4 are not applicable.
- b. With the primary containment air lock door interlock inoperable:
  1. Lock the inner air lock door closed.
  2. Operation may then continue provided that the inner air lock door is verified to be locked closed at least once per 31 days.
  3. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
  4. The provisions of Specification 3.0.4 are not applicable.
- c. With the primary containment air lock inoperable, except as a result of an inoperable air lock door or interlock, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

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\* See Special Test Exception 3.10.1.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS

4.6.1.3 Each primary containment air lock shall be demonstrated OPERABLE:

a. By verifying the seal leakage rate to be less than or equal to 5 scf per hour when the gap between the door seals is pressurized to 10 psig\*:

1. ~~Within 72 hours following each closing, except when the air lock is being used for multiple entries, then at least once per 72 hours, and~~ As specified in 10 CFR 50, Appendix J, as modified by approved exemptions, and
2. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used and no maintenance has been performed on the air lock, and
3. When the air lock seal has been replaced.

b. By conducting an overall air lock leakage ~~test at P<sub>a</sub>, 40 psig, and by verifying that the overall air lock leakage is within its limits~~

1. ~~At least once per six months<sup>#</sup>, and~~
2. ~~Prior to establishing PRIMARY CONTAINMENT INTEGRITY when maintenance (except for seal replacement) has been performed on the air lock that could affect the air lock sealing capability.\*~~  
The provisions of Technical Specification 4.0.2 are not applicable to the

c. By verification of air lock interlock OPERABILITY; <sup>test intervals specified in 10 CFR 50, Appendix J.</sup>

1. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used, and
2. Prior to and following a drywell entry when PRIMARY CONTAINMENT INTEGRITY is required, and
3. Following the performance of maintenance affecting the air lock interlock.

test in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, and prior

\* Exemption of Appendix J of 10 CFR 50.

~~<sup>#</sup> The provisions of Specification 4.0.2 are not applicable~~

## 3/4.6 CONTAINMENT SYSTEMS

### BASES

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#### 3/4.6.1 PRIMARY CONTAINMENT

##### 3/4.6.1.1 PRIMARY CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

##### 3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

The limitations on primary containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure of 49 psig,  $P_a$ . As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to  $0.75 L_a$  or  $0.75 L_p$ , as applicable, during performance of the periodic tests to account for possible degradation of the containment leakage barriers between leakage tests.

Operating experience with the main steam line isolation valves has indicated that degradation has occasionally occurred in the leak tightness of the valves; therefore, the special requirement for testing these valves.

( SEE INSERT (ATTACHED) )

~~Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of airlocks after each opening, and leakage calculation methods.~~

Appendix J, paragraph III.A.3 requires that all Type A (Containment Integrated Leak Rate) tests be conducted in accordance with American National Standard (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors," March 16, 1972. In addition to the Total Time and Point-to-Point methods described in that standard, the Mass Point method, when used with a test duration of at least 24 hours, is an acceptable method to use to calculate leakage rates. A typical description of the Mass Point method can be found in ANSI/ANS 56.8-1987, "Containment System Leakage Testing Requirements," January 20, 1987. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1, November 1, 1972 (References 1 and 2).

#### References:

1. CP&L Letter to Mr. D. B. Vassallo, "Integrated Leak Rate Test," October 20, 1983.
2. NRC Letter from Mr. D. B. Vassallo to Mr. E. E. Utley, December 9, 1983.

### 3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

Technical Specification 4.6.1.2.d reflects the leakage rate testing requirements with respect to Type B and C tests, except for tests involving main steam line isolation valves. Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of air locks after each opening, and leakage calculation methods.

The periodic testing frequency for primary containment Type B and C leakage rate tests are required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

## CONTAINMENT SYSTEMS

### BASES

#### 3/4.6.1.3 PRIMARY CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the <sup>primary</sup> containment air locks are required to meet the restrictions on PRIMARY CONTAINMENT INTEGRITY and leak rate given in Specifications 3.6.1.1 and 3.6.1.2. The specification makes allowances for the fact that there may be long periods of time when the air locks will be in a closed and secured position during reactor operation. Only one closed door in each air lock is required to maintain the integrity of the containment. In the event of an inoperable door interlock, locking snut the inner door will ensure containment integrity while permitting access to the lock for maintenance and surveillance testing.

#### 3/4.6.1.4 PRIMARY CONTAINMENT STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the primary containment steel vessel will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the vessel will withstand the maximum pressure of 49 psig in the event of a LOCA. A visual inspection in conjunction with Type A leakage tests is sufficient to demonstrate this capability.

INSERT NEW  
PARAGRAPH  
(ATTACHED)

#### 3/4.6.1.5 PRIMARY CONTAINMENT INTERNAL PRESSURE

The limitations of primary containment internal pressure ensure that the containment peak pressure of 49 psig does not exceed the design pressure of 62 psig during LOCA conditions. The limit of 1.75 psig, for initial positive containment pressure will limit the total pressure to 49 psig, which is less than the design pressure and is consistent with the accident analyses.

#### 3/4.6.1.6 PRIMARY CONTAINMENT AVERAGE AIR TEMPERATURE

The limitation in containment average air temperature ensures that the containment peak air temperature does not exceed the design temperature of 300°F during LOCA conditions and is consistent with the accident analyses.



Maintaining primary containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J, as modified by approved exemptions. Technical Specifications 4.6.1.3.a and 4.6.1.3.b reflect the leakage rate testing requirements with respect to air lock leakage (Type B tests). The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The periodic testing frequency for primary containment air locks is required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

ENCLOSURE 7

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
NRC DOCKET NOS. 50-325 AND 50-324  
OPERATING LICENSE NOS. DPR-71 AND DPR-62  
REQUEST FOR LICENSE AMENDMENTS  
CONTAINMENT LEAKAGE RATE TESTING

TYPED TECHNICAL SPECIFICATION PAGES - UNIT 1

## CONTAINMENT SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

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#### ACTION (Continued)

- c. The leakage rate to less than or equal to 11.5 scf per hour for any one main steam line isolation valve.

prior to increasing reactor coolant system temperature above 212°F.

### SURVEILLANCE REQUIREMENTS

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4.6.1.2 The primary containment leakage rates shall be demonstrated in accordance with the schedule and criteria specified in 10 CFR 50, Appendix J, as modified by approved exemptions. The provisions of Technical Specification 4.0.2 are not applicable to the test intervals specified in 10 CFR 50, Appendix J.

- a. Deleted.
- b. Deleted.
- c. Deleted.
- d. Type B and C tests shall be conducted in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, except for tests involving main steam line isolation valves.
- e. Air locks shall be tested and demonstrated OPERABLE per Surveillance Requirement 4.6.1.3.
- f. Main steam line isolation valves shall be leak tested at least once per 18 months.
- g. All test leakage rates shall be calculated using observed data converted to absolute values. Error analyses shall be performed to select a balanced integrated leakage measurement system.
- h. Deleted.

(Pages 3/4 6-3A and 3/4 6-3B have been deleted.)

## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS

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- 4.6.1.3 Each primary containment air lock shall be demonstrated OPERABLE:
- a. By verifying the seal leakage rate to be less than or equal to 5 scf per hour when the gap between the door seals is pressurized to 10 psig\*:
    1. As specified in 10 CFR 50, Appendix J, as modified by approved exemptions, and
    2. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used and no maintenance has been performed on the air lock, and
    3. When the air lock seal has been replaced.
  - b. By conducting an overall air lock leakage test in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, and prior to establishing PRIMARY CONTAINMENT INTEGRITY when maintenance (except for seal replacement) has been performed on the air lock that could affect the air lock sealing capability.\* The provisions of Technical Specification 4.0.2 are not applicable to the test intervals specified in 10 CFR 50, Appendix J.
  - c. By verification of air lock interlock OPERABILITY:
    1. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used, and
    2. Prior to and following a drywell entry when PRIMARY CONTAINMENT INTEGRITY is required, and
    3. Following the performance of maintenance affecting the air lock interlock.

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\* Exemption to Appendix J of 10 CFR 50.

## 3/4.6 CONTAINMENT SYSTEMS

### BASES

#### 3/4.6.1 PRIMARY CONTAINMENT

##### 3/4.6.1.1 PRIMARY CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

##### 3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

The limitations on primary containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure of 49 psig,  $P_a$ . As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to  $0.75 L_a$  or  $0.75 L_r$ , as applicable, during performance of the periodic tests to account for possible degradation of the containment leakage barriers between leakage tests.

Operating experience with the main steam line isolation valves has indicated that degradation has occasionally occurred in the leak tightness of the valves; therefore, the special requirement for testing these valves.

Technical Specification 4.6.1.2.d reflects the leakage rate testing requirements with respect to Type B and C tests, except for tests involving main steam line isolation valves. Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of air locks after each opening, and leakage calculation methods.

The periodic testing frequency for primary containment Type B and C leakage rate tests are required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

Appendix J, paragraph III.A.3 requires that all Type A (Containment Integrated Leak Rate) tests be conducted in accordance with American National Standard (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors," March 16, 1972. In addition to the Total Time and Point-to-Point methods described in that standard, the Mass Point method, when used with a test duration of at least 24 hours, is an acceptable method to use to calculate leakage rates. A typical description of the Mass Point method can be found in ANSI/ANS 56.8-1987, "Containment System Leakage Testing Requirements," January 20, 1987. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1, November 1, 1972 (References 1 and 2).

#### References:

1. CP&L Letter to Mr. D. B. Vassallo, "Integrated Leak Rate Test," October 20, 1983.
2. NRC Letter from Mr. D. B. Vassallo to Mr. E. E. Utley, December 9, 1983.

## CONTAINMENT SYSTEMS

### BASES

#### 3/4.6.1.3 PRIMARY CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the primary containment air locks are required to meet the restrictions on PRIMARY CONTAINMENT INTEGRITY and leak rate given in Specifications 3.6.1.1 and 3.6.1.2. The specification makes allowances for the fact that there may be long periods of time when the air locks will be in a closed and secured position during reactor operation.

Maintaining primary containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J, as modified by approved exemptions. Technical Specifications 4.6.1.3.a and 4.6.1.3.b reflect the leakage rate testing requirements with respect to air lock leakage (Type B tests). The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The periodic testing frequency for primary containment air locks is required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

Only one closed door in each air lock is required to maintain the integrity of the containment. In the event of an inoperable door interlock, locking shut the inner door will ensure containment integrity while permitting access to the lock for maintenance and surveillance testing.

#### 3/4.6.1.4 PRIMARY CONTAINMENT STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the primary containment steel vessel will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the vessel will withstand the maximum pressure of 49 psig in the event of a LOCA. A visual inspection in conjunction with Type A leakage tests is sufficient to demonstrate this capability.

#### 3/4.6.1.5 PRIMARY CONTAINMENT INTERNAL PRESSURE

The limitations of primary containment internal pressure ensure that the containment peak pressure of 49 psig does not exceed the design pressure of 62 psig during LOCA conditions. The limit of 1.75 psig, for initial positive containment pressure will limit the total pressure to 49 psig, which is less than the design pressure and is consistent with the accident analyses.

#### 3/4.6.1.6 PRIMARY CONTAINMENT AVERAGE AIR TEMPERATURE

The limitation in containment average air temperature ensures that the containment peak air temperature does not exceed the design temperature of 300°F during LOCA conditions and is consistent with the accident analyses.

ENCLOSURE 8

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
NRC DOCKET NOS. 50-325 AND 50-324  
OPERATING LICENSE NOS. DPR-71 AND DPR-62  
REQUEST FOR LICENSE AMENDMENTS  
CONTAINMENT LEAKAGE RATE TESTING

TYPED TECHNICAL SPECIFICATION PAGES - UNIT 2

## CONTAINMENT SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

#### ACTION (Continued)

- c. The leakage rate to less than or equal to 11.5 scf per hour for any one main steam line isolation valve.

prior to increasing reactor coolant system temperature above 212°F.

### SURVEILLANCE REQUIREMENTS

4.6.1.2 The primary containment leakage rates shall be demonstrated in accordance with the schedule and criteria specified in 10 CFR 50, Appendix J, as modified by approved exemptions. The provisions of Technical Specification 4.0.2 are not applicable to the test intervals specified in 10 CFR 50, Appendix J.

- a. Deleted.
- b. Deleted.
- c. Deleted.
- d. Type B and C tests shall be conducted in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, except for tests involving main steam line isolation valves.
- e. Air locks shall be tested and demonstrated OPERABLE per Surveillance Requirement 4.6.1.3.
- f. Main steam line isolation valves shall be leak tested at least once per 18 months.
- g. All test leakage rates shall be calculated using observed data converted to absolute values. Error analyses shall be performed to select a balanced integrated leakage measurement system.
- h. Deleted.

(Page 3/4 6-3A has been deleted.)



## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS

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4.6.1.3 Each primary containment air lock shall be demonstrated OPERABLE:

- a. By verifying the seal leakage rate to be less than or equal to 5 scf per hour when the gap between the door seals is pressurized to 10 psig\*:
  1. As specified in 10 CFR 50, Appendix J, as modified by approved exemptions, and
  2. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used and no maintenance has been performed on the air lock, and
  3. When the air lock seal has been replaced.
- b. By conducting an overall air lock leakage test in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, and prior to establishing PRIMARY CONTAINMENT INTEGRITY when maintenance (except for seal replacement) has been performed on the air lock that could affect the air lock sealing capability.\* The provisions of Technical Specification 4.0.2 are not applicable to the test intervals specified in 10 CFR 50, Appendix J.
- c. By verification of air lock interlock OPERABILITY:
  1. Prior to establishing PRIMARY CONTAINMENT INTEGRITY when the air lock has been used, and
  2. Prior to and following a drywell entry when PRIMARY CONTAINMENT INTEGRITY is required, and
  3. Following the performance of maintenance affecting the air lock interlock.

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\* Exemption of Appendix J of 10 CFR 50.

## 3/4.6 CONTAINMENT SYSTEMS

### BASES

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#### 3/4.6.1 PRIMARY CONTAINMENT

##### 3/4.6.1.1 PRIMARY CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

##### 3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

The limitations on primary containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure of 49 psig,  $P_a$ . As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to  $0.75 L_a$  or  $0.75 L_r$ , as applicable, during performance of the periodic tests to account for possible degradation of the containment leakage barriers between leakage tests.

Operating experience with the main steam line isolation valves has indicated that degradation has occasionally occurred in the leak tightness of the valves; therefore, the special requirement for testing these valves.

Technical Specification 4.6.1.2.d reflects the leakage rate testing requirements with respect to Type B and C tests, except for tests involving main steam line isolation valves. Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of air locks after each opening, and leakage calculation methods.

The periodic testing frequency for primary containment Type B and C leakage rate tests are required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

Appendix J, paragraph III.A.3 requires that all Type A (Containment Integrated Leak Rate) tests be conducted in accordance with American National Standard (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors," March 16, 1972. In addition to the Total Time and Point-to-Point methods described in that standard, the Mass Point method, when used with a test duration of at least 24 hours, is an acceptable method to use to calculate leakage rates. A typical description of the Mass Point method can be found in ANSI/ANS 56.8-1987, "Containment System Leakage Testing Requirements," January 20, 1987. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1, November 1, 1972 (References 1 and 2).

#### References:

1. CP&L Letter to Mr. D. B. Vassallo, "Integrated Leak Rate Test," October 20, 1983.
2. NRC Letter from Mr. D. B. Vassallo to Mr. E. E. Utley, December 9, 1983.

## CONTAINMENT SYSTEMS

### BASES

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#### 3/4.6.1.3 PRIMARY CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the primary containment air locks are required to meet the restrictions on PRIMARY CONTAINMENT INTEGRITY and leak rate given in Specifications 3.6.1.1 and 3.6.1.2. The specification makes allowances for the fact that there may be long periods of time when the air locks will be in a closed and secured position during reactor operation.

Maintaining primary containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J, as modified by approved exemptions. Technical Specifications 4.6.1.3.a and 4.6.1.3.b reflect the leakage rate testing requirements with respect to air lock leakage (Type B tests). The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The periodic testing frequency for primary containment air locks is required by 10 CFR 50, Appendix J, as modified by approved exemptions. Thus, Technical Specification 4.0.2 (which allows surveillance interval extensions) does not apply.

Only one closed door in each air lock is required to maintain the integrity of the containment. In the event of an inoperable door interlock, locking shut the inner door will ensure containment integrity while permitting access to the lock for maintenance and surveillance testing.

#### 3/4.6.1.4 PRIMARY CONTAINMENT STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the primary containment steel vessel will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the vessel will withstand the maximum pressure of 49 psig in the event of a LOCA. A visual inspection in conjunction with Type A leakage tests is sufficient to demonstrate this capability.

#### 3/4.6.1.5 PRIMARY CONTAINMENT INTERNAL PRESSURE

The limitations of primary containment internal pressure ensure that the containment peak pressure of 49 psig does not exceed the design pressure of 62 psig during LOCA conditions. The limit of 1.75 psig, for initial positive containment pressure will limit the total pressure to 49 psig, which is less than the design pressure and is consistent with the accident analyses.

#### 3/4.6.1.6 PRIMARY CONTAINMENT AVERAGE AIR TEMPERATURE

The limitation in containment average air temperature ensures that the containment peak air temperature does not exceed the design temperature of 300°F during LOCA conditions and is consistent with the accident analyses.