

### 3.6 CONTAINMENT SYSTEMS

#### 3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment inoperable.	A.1 Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.6.1.1 Perform required visual examinations and leakage rate testing except for containment air lock testing, in accordance with the Containment Leakage Rate Testing Program.</p> <p>The maximum allowable leakage rate, <math>L_a</math>, is 0.25% of containment air weight per day at the calculated peak containment pressure, <math>P_a</math>.</p>	<p>-----NOTE----- SR 3.0.2 is not applicable -----</p> <p>In accordance with the Containment Leakage Rate Testing Program.</p>
<p>SR 3.6.1.2 Verify containment structural integrity in accordance with the Containment Tendon Surveillance Program.</p>	<p>In accordance with the Containment Tendon Surveillance Program</p>

### 3.6 CONTAINMENT SYSTEMS

#### 3.6.2 Containment Air Locks

LCO 3.6.2 Two containment air locks shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTIONS

#### NOTES

1. Entry and exit is permissible to perform repairs on the affected air lock components or for emergencies involving personnel safety.
2. Separate Condition entry is allowed for each air lock.
3. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when air lock leakage results in exceeding the overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment air locks with one air lock door inoperable.	<p>-----NOTE-----</p> <ol style="list-style-type: none"> <li>1. Required Actions A.1, A.2, and A.3 are not applicable if both doors in the same air lock are inoperable and Condition C is entered.</li> <li>2. Entry and exit is permissible for 7 days under administrative controls if both air locks are inoperable.</li> </ol>	
	A.1 Verify the OPERABLE door is closed in the affected air lock.	1 hour
	<u>AND</u>	(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Lock the OPERABLE door closed in the affected air lock.	24 hours
	<u>AND</u> A.3 Verify the OPERABLE door is locked closed in the affected air lock.	Once per 31 days
B. One or more containment air locks with containment air lock interlock mechanism inoperable.	<p>-----NOTES-----</p> <p>1. Required Actions B.1, B.2, and B.3 are not applicable if both doors in the same air lock are inoperable and Condition C is entered.</p> <p>2. Entry and exit of containment is permissible under the administrative control of a dedicated individual.</p> <p>-----</p>	
	<p>B.1 Verify an OPERABLE door is closed in the affected air lock.</p> <p><u>AND</u></p>	<p>1 hour</p> <p>(continued)</p>



CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Lock an OPERABLE door closed in the affected air lock.	24 hours
	<u>AND</u> B.3 Verify an OPERABLE door is locked closed in the affected air lock.	Once per 31 days
C. One or more containment air locks inoperable for reasons other than Condition A or B.	-----NOTE----- Successful performance of an overall leakage rate test of the affected air lock may be used to satisfy Required Actions C.1 and C.3 when Condition C is entered as a result of a failure of the door seal leakage rate test. -----	
	C.1 Initiate action to evaluate overall containment leakage rate.	Immediately
	<u>AND</u> C.2 Verify a door is closed in the affected air lock.	1 hour
	<u>AND</u> C.3 Restore air lock to OPERABLE status.	24 hours
		(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	D.2 Be in MODE 5.	36 hours

SURVEILLANCE	FREQUENCY
<p>SR 3.6.2.1</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test.</li> <li>2. Results shall be evaluated against acceptance criteria of SR 3.6.1.1 in accordance with the Containment Leakage Rate Testing Program.</li> </ol> <p>-----</p> <p>Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.</p> <p>The acceptance criteria for air lock testing are:</p> <ol style="list-style-type: none"> <li>a. Overall air lock leakage rate is <math>\leq 0.05 L_a</math> when tested at <math>\geq P_a</math>.</li> <li>b. For each door, leakage rate is <math>\leq 0.01 L_a</math> when tested at <math>\geq 8.0</math> psig.</li> </ol>	<p>-----NOTE-----</p> <p>SR 3.0.2 is not applicable</p> <p>-----</p> <p>In accordance with the Containment Leakage Rate Testing Program.</p>
<p>SR 3.6.2.2</p> <p>-----NOTE-----</p> <p>Only required to be performed when an air lock is used for entry into containment.</p> <p>-----</p> <p>Verify only one door in the air lock can be opened at a time.</p>	<p>184 days</p>

### 3.6 CONTAINMENT SYSTEMS

#### 3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTIONS

#### NOTES

1. Penetration flow paths except for 48 inch purge valve penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for system(s) made inoperable by containment isolation valves.
4. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when purge valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

CONDITIONS	REQUIRED ACTIONS	COMPLETION TIME
<p>A. -----NOTE----- Only applicable to penetration flow paths with two containment isolation valves. -----</p> <p>One or more penetration flow paths with one containment isolation valve inoperable (except for purge valve leakage not within limit).</p>	<p>A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.</p> <p><u>AND</u></p>	<p>4 hours</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.2 -----NOTE----- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -----</p> <p>Verify the affected penetration flow path is isolated.</p>	<p>Once per 31 days for isolation devices outside containment</p> <p><u>AND</u></p> <p>Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. -----NOTE----- Only applicable to penetration flow paths with two containment isolation valves or penetration flow paths with one containment isolation valve and no closed system. ----- One or more penetration flow paths with all containment isolation valves inoperable (except for purge valve leakage not within limit).</p>	<p>B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.</p>	1 hour
	<p><u>AND</u></p> <p>B.2 -----NOTE----- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ----- Verify the affected penetration flow path is isolated.</p>	<p>Once per 31 days for isolation devices outside containment</p> <p><u>AND</u></p> <p>Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. -----NOTE----- Only applicable to penetration flow paths with only one containment isolation valve and a closed system. -----</p> <p>One or more penetration flow paths with one containment isolation valve inoperable or the closed system breached.</p>	<p>C.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.</p> <p><u>AND</u></p> <p>C.2 -----NOTE----- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -----</p> <p>Verify the affected penetration flow path is isolated.</p>	<p>4 hours</p> <p>Once per 31 days</p>
<p>D. One or more penetration flow paths with one or more containment purge valves not within purge valve leakage limits.</p>	<p>D.1 Restore purge valve leakage to within limits.</p>	<p>24 hours</p>
<p>E. Required Action and associated Completion Time not met.</p>	<p>E.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>E.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>

ACTIONS (continued)  
SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.3.1    Verify each 48 inch purge valve is sealed closed except for one purge valve in a penetration flow path while in Condition D of the LCO.	31 days
SR 3.6.3.2    Verify each 6 inch purge valve is closed except when the 6 inch purge valves are open for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open.	31 days
SR 3.6.3.3    -----NOTE----- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ----- Verify each containment isolation manual valve and blind flange that is located outside containment and is required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	31 days

(continued)



SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.6.3.4 -----NOTE----- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -----</p> <p>Verify each containment isolation manual valve and blind flange that is located inside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.</p>	<p>Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days</p>
<p>SR 3.6.3.5 Verify the isolation time of each power operated and each automatic containment isolation valve that is not locked, sealed, or otherwise secured in the isolation position, is within limits.</p>	<p>In accordance with the Inservice Testing Program</p>
<p>SR 3.6.3.6 -----NOTE----- Results shall be evaluated against acceptance criteria of SR 3.6.1.1 in accordance with the Containment Leakage Rate Testing Program. -----</p> <p>Perform leakage rate testing for each 48 inch containment purge valve.</p>	<p>Within 92 days after opening the valve</p> <p><u>AND</u></p> <p>24 months</p>

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SURVEILLANCE	FREQUENCY
<p>SR 3.6.3.7 -----NOTE----- Not applicable in MODE 4. -----</p> <p>Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in the isolation position, actuates to the isolation position on an actual or simulated actuation signal.</p>	<p>24 months</p>

5.6.2.20 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak Test Program," dated September 1995.

The peak calculated containment internal pressure for the design basis loss of coolant accident (Pa).

1. The maximum allowable primary containment leakage rate,  $L_a$ , at  $P_a$ , shall be 0.25% of primary containment air weight per day.
2. Air lock testing acceptance criteria are:
  - a. Overall air lock leakage rate is  $\leq 0.05 L_a$  when tested at  $\geq P_a$ .
  - b. For each door, leakage rate is  $\leq 0.01 L_a$  when tested at  $\geq 8.0$  psig.

The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

## B 3.6 CONTAINMENT SYSTEMS

### B 3.6.1 Containment

#### BASES

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##### BACKGROUND

The containment consists of the concrete reactor building (RB), its steel liner, and the penetrations through this structure. The structure is designed to contain water and steam, as well as radioactive material that may be released from the reactor core following a Design Basis Accident (DBA). Additionally, this structure provides shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment is a reinforced concrete structure with a cylindrical wall, a flat foundation mat, and a shallow dome roof. The cylinder wall is prestressed with a post tensioning system in the vertical and horizontal directions, and the dome roof is prestressed using a three way post tensioning system. The inside surface of the containment has a carbon steel liner to ensure a high degree of leak tightness during operating and accident conditions.

The concrete RB is required for structural integrity of the containment under DBA conditions. The steel liner and its penetrations establish the leakage limiting boundary of the containment. Maintaining the containment OPERABLE limits the leakage of fission product radioactivity from the containment to the environment. SR 3.6.1.1 leakage rate requirements comply with 10 CFR 50, Appendix J, Option B (Ref. 1), as modified by approved exemptions.

The isolation devices for the penetrations in the containment boundary are a part of the containment leak tight barrier. To maintain this leak tight barrier:

- a. All penetrations required to be closed during accident conditions are either:
  1. capable of being closed by an OPERABLE automatic containment isolation system, or
  2. closed by manual valves, blind flanges, or de-activated automatic valves secured in their closed positions, except as provided in LCO 3.6.3, "Containment Isolation Valves";

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BASES

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BACKGROUND  
(continued)

- b. Each air lock is OPERABLE, except as provided in LCO 3.6.2, "Containment Air Locks".
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APPLICABLE  
SAFETY ANALYSES

The safety design basis for the containment is that the containment must withstand the pressures and temperatures of the limiting DBA without exceeding the design leakage rate.

The DBAs that result in a challenge to containment from high pressures and temperatures are a loss of coolant accident (LOCA), a steam line break, and a rod ejection accident (REA) (Ref. 2). In addition, release of significant fission product radioactivity within containment can occur from a LOCA or REA. In the analyses of DBAs involving release of fission product radioactivity, it is assumed that the containment is OPERABLE so that the release to the environment is controlled by the rate of containment leakage. The containment was designed with an allowable leakage rate of 0.25% of containment air weight per day (Ref. 3). This leakage rate, used in the evaluation of offsite doses resulting from accidents, is defined in 10 CFR 50, Appendix J (Ref. 1), as  $L_a$ : the maximum allowable leakage rate at the calculated maximum peak containment pressure ( $P_a$ ) resulting from the limiting DBA. The allowable leakage rate represented by  $L_a$  forms the basis for the acceptance criteria imposed on all containment leakage rate testing.  $L_a$  is assumed to be 0.25% of containment air weight per day in the safety analysis at  $P_a = 54.2$  psig (Ref. 3).

The acceptance criteria applied to accidental releases of radioactive material to the environment are given in terms of total radiation dose received by a hypothetical member of the general public who is assumed to remain at the exclusion area boundary for two hours following onset of the postulated fission product release. The limits established in 10 CFR 100 (Ref. 5) are a whole body dose of 25 Rem or a 300 Rem dose to the thyroid from iodine exposure.

The containment satisfies Criterion 3 of the NRC Policy Statement.

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BASES (continued)

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LCO                      Containment OPERABILITY is maintained by limiting leakage to less than the acceptance criteria of 10 CFR 50, Appendix J (Ref. 1). Compliance with this LCO will ensure a containment configuration, including equipment hatches, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analysis.

Individual leakage rates specified for the containment air lock (LCO 3.6.2) and purge valves with resilient seals (LCO 3.6.3) are not specifically part of the acceptance criteria of SR 3.6.1.1. Therefore, leakage rates exceeding these individual limits only result in the containment being inoperable when the total leakage exceeds the acceptance criteria of Appendix J.

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APPLICABILITY              In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material into containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, containment is not required to be OPERABLE in MODE 5. The requirements for containment during MODE 6 are addressed in LCO 3.9.3, "Containment Penetrations."

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ACTIONS

A.1

In the event containment is inoperable, containment must be restored to OPERABLE status within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining containment during MODES 1, 2, 3, and 4. This time period also ensures the probability of an accident (requiring containment OPERABILITY) occurring during periods when containment is inoperable is minimal.

B.1 and B.2

If containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be placed in a MODE in which the LCO does not apply. To achieve this

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BASES

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ACTIONS

B.1 and B.2 (continued)

status, the plant must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of 10 CFR 50, Appendix J (Ref. 1), as modified by approved exemptions. Failure to meet air lock and purge valve with resilient seal leakage limits for SR 3.6.2.1 and 3.6.3.6 does not constitute a failure of this Surveillance unless the contribution from these penetrations causes overall Type A, B, and C leakage to exceed limits. SR Frequencies are as required by Appendix J, Option B, as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis.

SR 3.6.1.2

This SR ensures that the structural integrity of the containment will be maintained in accordance with the provisions of the Containment Tendon Surveillance Program. Testing and Frequency are consistent with the recommendations of NRC Regulatory Guide 1.35, Revision 3.

The guidance in Regulatory Guide 1.35 should be followed in the event abnormal degradation of the containment tendons is detected. This includes testing additional tendons and submitting a Special Report to the NRC (Refer to Specification 5.7.2.b). The impact of large-scale tendon degradation should also be evaluated with respect to Containment OPERABILITY. In this context, containment structural integrity is analogous to containment OPERABILITY.

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BASES (continued)

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REFERENCES

1. 10 CFR 50, Appendix J.
  2. FSAR, Sections 14.2.2.
  3. FSAR. 5.2 1.1
  4. Regulatory Guide 1.35, Rev.3, 1990.
  5. 10 CFR 100.
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## B 3.6 CONTAINMENT SYSTEMS

### B 3.6.2 Containment Air Locks

#### BASES

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##### BACKGROUND

Containment air locks form part of the containment pressure boundary and provide a means for personnel access during all MODES of operation.

Each air lock is nominally a right circular cylinder, 10 ft in diameter, with a door at each end. The doors are interlocked to prevent simultaneous opening. During periods when containment is not required to be OPERABLE, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. Each air lock door has been designed and is tested to verify its ability to withstand a pressure in excess of the maximum expected pressure following a Design Basis Accident (DBA) in containment. Therefore, closure of a single door supports containment OPERABILITY. Each of the doors contain two gasketed seals and local leakage rate testing capability to ensure pressure integrity. To effect a leak tight seal, the air lock design uses pressure seated doors (i.e., an increase in containment internal pressure results in increased sealing force on each door).

Each personnel air lock door is provided with limit switches that provide control room indication of door position. Additionally, control room indication is provided to alert the operator whenever an air lock door interlock mechanism is defeated.

The containment air locks form part of the containment pressure boundary. Their integrity and leak tightness is essential for maintaining the containment leakage rate within limit in the event of a DBA. Not maintaining air lock integrity or leak tightness may result in a leakage rate in excess of that assumed in the unit safety analysis. All leakage rate requirements are in conformance with 10 CFR 50, Appendix J, Option B (Ref. 1), as modified by approved exemptions.

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BASES (continued)

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APPLICABLE  
SAFETY ANALYSES

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident (LOCA), a steam line break, and a rod ejection accident (Ref. 2). In the analysis of each of these accidents, it is assumed that containment is OPERABLE so that release of fission products to the environment is controlled by the rate of containment leakage. The containment was designed with an allowable leakage rate of 0.25% of containment air weight per day (Ref. 3). This leakage rate is defined in 10 CFR 50, Appendix J (Ref. 1), as  $L_a$ : the maximum allowable containment leakage rate at the calculated maximum peak containment pressure ( $P_a$ ) following a DBA. This allowable leakage rate forms the basis for the acceptance criteria imposed on the SRs associated with the air lock.  $L_a$  is 0.25% of containment air weight per day and  $P_a$  is 54.2 psig, resulting from the limiting design basis LOCA.

The acceptance criteria applied to DBA releases of radioactive material to the environment are given in terms of total radiation dose received by a member of the general public who remains at the exclusion area boundary for two hours following onset of the postulated fission product release. The limits established in 10 CFR 100 (Ref. 4) are a whole body dose of 25 Rem or a 300 Rem dose to the thyroid from iodine exposure.

The containment air locks satisfy Criterion 3 of the NRC Policy Statement.

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LCO

Each containment air lock forms part of the containment pressure boundary. As a part of containment, the air lock safety function is related to control of the containment leakage rate resulting from a DBA. Thus, each air lock's structural integrity and leak tightness are essential to the successful mitigation of such an event.

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BASES

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LCO  
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Each air lock is required to be OPERABLE. For the air lock to be considered OPERABLE, the air lock interlock mechanism must be OPERABLE, the air lock must be in compliance with the Type B air lock leakage test, and both air lock doors must be OPERABLE. The interlock allows only one air lock door of an air lock to be opened at one time. This provision ensures that a gross breach of containment does not exist when containment is required to be OPERABLE. Closure of a single door in each air lock is sufficient to provide a leak tight barrier following postulated events. Nevertheless, both doors are kept closed when the air lock is not being used for normal entry into and exit from containment.

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APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the containment air locks are not required in MODE 5 to prevent leakage of radioactive material from containment. The requirements for the containment air locks during MODE 6 are addressed in LCO 3.9.3, "Containment Penetrations."

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ACTIONS

The ACTIONS are modified by a Note that allows entry and exit to perform repairs on the affected air lock component or for emergencies involving personnel safety. If the outer door is inoperable, then it may be easily accessed to repair. If the inner door is the one that is inoperable, however, then a short time exists when the containment boundary is not intact (during access through the outer door). In this context, repairs include follow-up actions to an initial failure of the air lock door seal SR in order to determine which air lock door(s) is faulty. There are circumstances where an at-power containment entry would be required during the period of time that one air lock was inoperable. In this case, entry would be made through the OPERABLE air lock if ALARA conditions permit. However, the

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BASES

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ACTIONS  
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containment is a harsh environment with bulk average temperatures typically in excess of 120 F and self-contained breathing apparatus may be required with the reactor at power. In the event something was to happen to the individual who had entered containment, plant personnel would proceed through the most expeditious rescue path in order to get that individual out and provide medical care. Thus, the Note allows entry and exit through the inoperable door for personnel safety reasons when the quickest path to the person happens to be through the inoperable door. The ability to open the OPERABLE door, even if it means the containment boundary is temporarily not intact, is acceptable due to the low probability of an event that could pressurize the containment during the short time in which the OPERABLE door is expected to be open. After each entry and exit the OPERABLE door must be immediately closed. If ALARA conditions permit, entry and exit should be via an OPERABLE air lock.

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each air lock.

In the event the air lock leakage results in exceeding the overall containment leakage rate, Note 3 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1, "Containment."

A.1, A.2, and A.3

With one air lock door inoperable in one or more containment air locks, the OPERABLE door must be verified closed (Required Action A.1) in each affected containment air lock.

This ensures that a leak tight containment barrier is maintained by the use of an OPERABLE air lock door. This action must be completed within 1 hour. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires containment be restored to OPERABLE status within 1 hour.

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BASES

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ACTIONS

A.1, A.2 and A.3 (continued)

In addition, the affected air lock penetration must be isolated by locking closed the remaining OPERABLE air lock door within the 24 hour Completion Time. The 24 hour Completion Time is considered reasonable for locking the OPERABLE air lock door, considering the OPERABLE door of the affected air lock is being maintained closed.

Required Action A.3 verifies that an air lock with an inoperable door has been isolated by the use of a locked and closed OPERABLE air lock door. This ensures that an acceptable containment leakage boundary is maintained. The Completion Time of once per 31 days is based on engineering judgment and is considered adequate in view of the low likelihood of a locked door being mispositioned and other administrative controls.

The Required Actions have been modified by two Notes. Note 1 clarifies that only the Required Actions and associated Completion Times of Condition C are required if both doors in the same air lock are inoperable. With both doors in the same air lock inoperable, an OPERABLE door is not available to be closed. Required Actions C.1 and C.2 are the appropriate remedial actions. Note 2 allows use of the air lock for entry and exit for 7 days under administrative controls. Containment entry may be required to perform Technical Specifications (TS) Surveillances and Required Actions, as well as other activities on equipment inside containment that are required by TS or activities on equipment that support TS-required equipment. This Note is not intended to preclude performing other activities (i.e., non-TS-required activities) if the containment was entered, using the inoperable air lock, to perform an allowed activity listed above. This allowance is acceptable due to the low probability of an event that could pressurize the containment during the short time that the OPERABLE door is expected to be open.

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BASES

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ACTIONS  
(continued)

B.1, B.2, and B.3

With an air lock interlock mechanism inoperable in one or more air locks, the Required Actions and associated Completion Times are consistent with those specified for Condition A.

The Required Actions have been modified by two Notes. Note 1 clarifies that only the Required Actions and associated Completion Times of Condition C are required if both doors in the same air lock are inoperable. With both doors in the same air lock inoperable, an OPERABLE door is not available to be closed. Required Actions C.1 and C.2 are the appropriate remedial actions. Note 2 allows entry into and exit from the containment under the control of a dedicated individual stationed at the air lock to ensure that only one door is opened at a time (i.e., the individual performs the function of the interlock).

C.1, C.2, and C.3

With one or more air locks inoperable for reasons other than those described in Condition A or B, Required Action C.1 requires action to be immediately initiated to evaluate previous combined leakage rates using current air lock test results. An evaluation is acceptable since it is overly conservative to immediately declare the containment inoperable if both doors in an air lock have failed a seal test or if the overall air lock leakage is not within limits. In many instances (e.g., only one seal per door has failed), containment remains OPERABLE, yet only 1 hour (per LCO 3.6.1) would be provided to restore the air lock door to OPERABLE status prior to requiring a plant shutdown. In addition, even with both doors failing the seal test, the overall containment leakage rate can still be within limits.

This Condition is entered whenever the air lock fails to meet either leakage rate acceptance criteria specified in SR 3.6.2.1 (the individual air lock door or the overall). The reason this condition is initially applicable to the failed air lock door SR is due to the design of the CR-3 air lock door leakage test configuration. Common piping is used to simultaneously leak rate test both air lock doors. When there is excessive leakage indicated during performance of

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BASES

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ACTIONS

C.1, C.2, and C.3 (continued)

the SR, it is not initially possible to identify which door (or both) is leaking in excess of the allowable limit. Therefore, the conservative action is to consider both doors inoperable and enter Condition C until the air lock, or at a minimum one door, can be determined to be OPERABLE. Once this has been done, Condition C may be exited and plant operation continue in accordance with the LCO or the Required Actions of Condition A, as applicable. Completion Times for Condition A begin when the determination has been made that Condition A can be entered.

Required Action C.2 requires that one door in the affected containment air lock must be verified to be closed. This action must be completed within the 1 hour Completion Time. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires that containment be restored to OPERABLE status within 1 hour.

Additionally, the affected air lock(s) must be restored to OPERABLE status within the 24 hour Completion Time. The specified time period is considered reasonable for restoring an inoperable air lock to OPERABLE status assuming that at least one door is maintained closed in each affected air lock.

The Required Actions have been modified by a note indicating performance of an overall air lock leakage test may be used to satisfy Required Actions C.1 and C.3 when Condition C is entered as a result of failure of the individual door seal test. The overall leakage test is performed at a test pressure of  $P_a$ , allowing direct evaluation of air lock leakage results against the overall containment leakage rate limit. Direct application of individual door seal leakage results to the overall limit is not technically justified since the individual test is performed at significantly less than  $P_a$  and the results cannot be extrapolated. Additionally, the test pressure applied to the outer door is in the non-accident direction.

Reliance on a successful performance of the overall leakage rate test for the purposes of declaring the air lock OPERABLE, even with one door not meeting its acceptance

(continued)

BASES

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ACTIONS

C.1, C.2, and C.3 (continued)

criteria, is acceptable when considering the historical intent of the overall/individual door seal, air lock leakage rate tests. The overall test has historically been the true measure of an air lock's ability to perform its DBA function. Periodic Containment airlock tests should be performed at not less than  $P_A$  at a frequency of at least once per 30 months. Containment airlock test methods should be performed in accordance with ANSI/ANS 56.8-1994. Containment airlock door seals should be tested within 7 days of opening. For periods of multiple containment entries where the airlock doors are routinely used for access more frequently than once every 7 days (e.g., shift or daily inspection tours of the containment), door seals may be tested once per 30 days during this time period. Door seals are not required to be tested when containment integrity is not required, however they must be tested prior to reestablishing containment integrity. Door seals shall be tested at a pressure stated in the plant Technical Specifications.

D.1 and D.2

If the inoperable containment air lock cannot be restored to OPERABLE status within the required Completion Time, the plant must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J, Option B (Ref. 1), as modified by approved exemptions. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during initial air lock and containment testing. The

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BASES (continued)

SURVEILLANCE  
REQUIREMENTS

SR 3.6.2.1 (continued)

periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by Appendix J, as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply.

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable, since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria of SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the overall containment leakage rate.

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since the inner and outer doors of an air lock are both designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is only challenged when containment is entered, this test is only required to be performed upon entering containment but is not required more frequently than every 184 days. The 184 day Frequency is based on engineering judgment and is considered adequate in view of other indications of door and interlock mechanism status available to operations personnel.

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BASES (continued)

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REFERENCES

1. 10 CFR 50, Apperidix J.
2. FSAR, Sections 14.2.2.
3. FSAR, 5.2.1.1
4. 10 CFR 100.
5. FSAR Section 5.2.5.2.3.1.
6. ANSI/ANS 56.8-1994.

## B 3.6 CONTAINMENT SYSTEMS

### B 3.6.3 Containment Isolation Valves

#### BASES

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##### BACKGROUND

The general design basis governing isolation valve requirements is leakage through fluid penetrations not serving accident-consequence-limiting systems is minimized by a double barrier so that no single, credible failure or malfunction of an active component can result in loss of isolation or intolerable leakage. The installed double barriers take the form of closed piping systems, both inside and outside the reactor building, and various types of isolation valves (Ref. 1).

Containment isolation occurs upon receipt of a high containment pressure or diverse containment isolation signal. The containment isolation signal closes automatic containment isolation valves in fluid penetrations not required for operation of engineered safeguard systems to prevent leakage of radioactive material. Upon actuation of high pressure injection, automatic containment valves also isolate systems not required for containment or Reactor Coolant System (RCS) heat removal. Other penetrations are isolated by the use of valves in the closed position or blind flanges. As a result, the containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated in the event of a release of radioactive material to containment atmosphere from the RCS following a Design Basis Accident (DBA).

OPERABILITY of the containment isolation valves (and blind flanges) supports containment OPERABILITY during accident conditions.

The OPERABILITY requirements for containment isolation valves help ensure that containment is isolated within the time limits assumed in the safety analysis. Therefore, the OPERABILITY requirements provide assurance that containment leakage rates assumed in the safety analysis will not be exceeded.

The Reactor Building Purge System is part of the Reactor Building Ventilation System. The Purge System was designed for intermittent operation, providing a means of removing

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BASES

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BACKGROUND  
(continued)

airborne radioactivity caused by minor leakage from the RCS prior to personnel entry into containment. The Containment Purge System consists of one 48 inch line for exhaust and one 48 inch line for supply, with supply and exhaust fans capable of purging the containment atmosphere at a rate of approximately 50,000 ft<sup>3</sup>/min. The containment purge supply and exhaust lines each contain two isolation valves that receive an isolation signal on a unit vent high radiation condition. Each of the purge lines is provided with two 48 inch diameter butterfly valves, one inside and one outside of containment. The valves inside containment are electric motor operated, designed to close within five seconds, while the outboard isolation valves are pneumatically opened-spring closed, designed to close within two seconds of demand (Ref. 5). Each of these valves was intended to be capable of closing against a differential pressure of 55 psig (the containment design pressure), such that closure would be assured in the event a loss of coolant accident (LOCA) occurred while containment purging was in progress.

Failure of the purge valves to close following a design basis event would cause a significant increase in the radioactive release because of the large containment leakage path introduced by these 48 inch purge lines. Failure of the purge valves to close would result in leakage considerably in excess of the containment design leakage rate of 0.25% of containment air weight per day ( $L_a$ ) (Ref. 2). Because of their large size, the 48 inch purge valves are not qualified for automatic closure from their open position under DBA conditions. Therefore, the 48 inch purge valves are maintained sealed closed (SR 3.6.3.1) in MODES 1, 2, 3, and 4.

The 6 inch containment minipurge valves operate to:

- a. Reduce the concentration of noble gases within containment prior to and during personnel access; and
- b. Equalize internal and external pressures.

Since the minipurge valves are designed to meet the requirements for automatic containment isolation valves, these valves may be opened as needed in MODES 1, 2, 3, and 4.

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(continued)

BASES (continued)

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APPLICABLE  
SAFETY ANALYSES

The containment isolation valve LCO was derived from the requirements related to the control of leakage from containment during major accidents. This LCO is intended to ensure the containment leakage rates do not exceed the values assumed in the safety analysis. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness of the containment. Therefore, the safety analysis of any event requiring containment isolation is applicable to this LCO.

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident (LOCA), a main steam line break, and a rod ejection accident (Ref. 3). In the analysis for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential leakage paths to the environment through containment isolation valves (including containment purge valves) are minimized.

The acceptance criteria applied to accidental releases of radioactive material to the environment are given in terms of total radiation dose received by a member of the general public who remains at the exclusion area boundary for two hours following the onset of the postulated fission product release. The limits established in 10 CFR 100 (Ref. 8) are a whole body dose of 25 Rem or a 300 Rem dose to the thyroid from iodine exposure.

The DBA analysis assumes that, within 60 seconds after the accident, isolation of the containment is complete and leakage terminated except for the design leakage rate,  $L_a$ . The containment isolation total response time of 60 seconds includes signal delay, diesel generator startup (for loss of offsite power), and containment isolation valve stroke times. SR 3.3.5.4 addresses the response time testing requirements.

The single-failure criterion required in the safety analyses was considered in the original design of the containment purge valves. Two valves in a series on each purge line provide assurance that both the supply and exhaust lines could be isolated even if a single failure occurred. The

(continued)

BASES

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APPLICABLE  
SAFETY ANALYSES  
(continued)

inboard and outboard isolation valves on each line are provided with diverse power sources, motor operated and pneumatically operated spring closed, respectively. This arrangement was designed to preclude common mode failures from disabling both valves on a purge line.

The purge valves may be unable to close in the environment following a LOCA. Therefore, each of the purge valves is required to remain sealed closed during MODES 1, 2, 3, and 4. In this case, the single-failure criterion remains applicable to the containment purge valves because of failure in the control circuit associated with each valve. Again, the purge system valve design prevents a single failure from compromising containment OPERABILITY as long as the system is operated in accordance with the subject LCO.

The containment isolation valves satisfy Criterion 3 of the NRC Policy Statement.

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LCO

Containment isolation valves form a part of the containment boundary. The containment isolation valve safety function is related to control of containment leakage rates during a DBA.

The automatic power operated isolation valves are required to have isolation times within limits and to actuate on an automatic isolation signal. The 48 inch purge valves must be maintained sealed closed in MODES 1, 2, 3 and 4. The valves covered by this LCO are listed along with their associated stroke times in the FSAR (Ref. 4).

The normally closed isolation valves are considered OPERABLE when manual valves are closed, check valves have flow through the valve secured, blind flanges are in place, and closed systems are intact.

Purge valves with resilient seals must meet additional leakage rate requirements addressed as part of this Specification. All other containment isolation valve leakage rate testing is addressed by LCO 3.6.1, "Containment," as part of Type C testing.

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BASES

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LCO  
(continued)      This LCO provides assurance that the containment isolation valves and purge valves will perform their designated safety functions to control leakage from the containment during accidents.

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APPLICABILITY      In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the containment isolation valves are not required to be OPERABLE in MODE 5. The requirements for containment isolation valves during MODE 6 are addressed in LCO 3.9.3, "Containment Penetrations."

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ACTIONS      The following terms are defined for the purpose of implementing this Specification:

- penetration flowpath: The piping which passes through the RB liner such that a portion of the system inside the RB can communicate with the portion outside the RB. A penetration passes through the imaginary plane established by the RB liner.
- unisolated: The state of a penetration flowpath whereby the operating fluid (liquid or gas) of the system is capable of passing freely through the imaginary plane established by the RB liner.

The ACTIONS are modified by a Note allowing penetration flow paths, except for 48 inch purge valve penetration flow paths, to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Due to the size of the containment purge line penetration and the fact that those penetrations exhaust directly from the containment atmosphere to the environment, the penetration flow paths containing these valves may not be opened under

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BASES

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ACTIONS  
(continued)

administrative controls. A single purge valve in a penetration flow path may be opened to effect repairs to an inoperable valve, as allowed by SR 3.6.3.1.

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each penetration flow path.

The ACTIONS are further modified by a third Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable containment isolation valve.

In the event purge valve leakage results in exceeding the overall containment leakage rate, Note 4 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1.

A.1 and A.2

In the event one containment isolation valve in one or more penetration flow paths is inoperable (except for purge valve leakage not within limit), the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. For a penetration isolated in accordance with Required Action A.1, the valve used to isolate the penetration should be the closest available one to containment. Required Action A.1 must be completed within the 4 hour Completion Time. The specified time period is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4.

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour Completion Time and that have been isolated in accordance with Required Action A.1, the affected penetration flow paths must be verified to be isolated on a periodic basis. This periodic

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BASES

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ACTIONS

A.1 and A.2 (continued)

verification is necessary to ensure that containment penetrations required to be isolated following an accident and no longer capable of being automatically isolated will be in the isolation position should an event occur. This Required Action does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices capable of being mispositioned are in the correct position. The Completion Time of "once per 31 days for isolation devices outside containment" is appropriate considering the fact that the valves are operated under administrative controls and the probability of their misalignment is low. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

Condition A has been modified by a Note indicating this Condition is only applicable to those penetration flow paths with two containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides appropriate actions.

Required Action A.2 is modified by a Note that applies to valves and blind flanges located in high radiation areas and allows the devices to be verified by use of administrative means. Allowing verification by administrative means is considered acceptable since access to these areas is typically restricted. Therefore, the probability of misalignment of these devices, once they have been verified to be in the proper position, is small.

B.1 and B.2

With all containment isolation valves in one or more penetration flow paths inoperable (except for purge valve leakage not within limit), the affected penetration flow path must be isolated within 1 hour. The method of isolation must include the use of at least one isolation

(continued)

BASES

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ACTIONS

B.1 and B.2 (continued)

barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1. In the event the affected penetration is isolated in accordance with Required Action B.1, the affected penetration must be verified to be isolated on a periodic basis per Required Action B.2. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days for verifying each affected penetration flow path is isolated is appropriate considering the fact that the valves are operated under administrative controls and the probability of their misalignment is low.

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two containment isolation valves or those with one containment isolation valve and no closed system. Condition A of this Specification addresses the condition of one containment isolation valve inoperable in a penetration flow path with two containment isolation valves.

Required Action B.2 is modified by a Note that applies to valves and blind flanges located in high radiation areas and allows the devices to be verified by use of administrative means. Allowing verification by administrative means is considered acceptable since access to these areas is typically restricted. Therefore, the probability of misalignment of these devices, once they have been verified to be in the proper position, is small.

C.1 and C.2

With one or more penetration flow paths with one containment isolation valve inoperable or the closed system breached, the inoperable valve must be restored to OPERABLE status or the affected penetration flow path must be isolated. The method of isolation must include the use of at least one

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BASES

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ACTIONS

C.1 and C.2 (continued)

isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. A check valve may not be used to isolate the affected penetration. Required Action C.1 must be completed within the 4 hour Completion Time. The specified time period is reasonable, considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4. In the event the affected penetration is isolated in accordance with Required Action C.1, the affected penetration flow path must be verified to be isolated on a periodic basis. This periodic verification is necessary to assure leak tightness of containment and that containment penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days for verifying that each affected penetration flow path is isolated is appropriate considering the fact that the valves are operated under administrative controls and the probability of their misalignment is low.

Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths with only one containment isolation valve and a closed system. This Note is necessary since this Condition is written to specifically address those penetration flow paths utilizing a closed system.

Required Action C.2 is modified by a Note that applies to valves and blind flanges located in high radiation areas and allows these devices to be verified by use of administrative means. Allowing verification by administrative means is considered acceptable since access to these areas is typically restricted. Therefore, the probability of misalignment of these devices, once verified to be in the proper position, is small.

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BASES

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ACTIONS  
(continued)

D.1

In the event one or more containment purge valves in one or more penetration flow paths are not within the purge valve leakage limits, purge valve leakage must be restored to within limits within 24 hours. The specified time is a reasonable period for restoring the valve leakage to within limits, provided overall containment leakage rate remains within limits. With the purge valve seal degraded such that leakage exceeds the limits, there is an increased potential for the same mechanism that caused the initial degradation to cause further degradation. If left unchecked, this could result in a loss of containment OPERABILITY. Thus, the 24 hour Completion Time is necessary to limit the length of time the plant can operate in this condition.

E.1 and E.2

If the Required Actions and associated Completion Times are not met, the plant must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.3.1

Each 48 inch containment purge valve is required to be verified sealed closed at 31 day intervals. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a containment purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to maintain offsite doses to within licensing basis limits. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A containment purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.3.1 (continued)

the source of electric power or by removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. The Frequency is a result of an NRC initiative, Generic Issue B-24 (Ref. 6), related to containment purge valve use during unit operations. In the event purge valve leakage requires entry into Condition D, the Surveillance permits opening one purge valve in a penetration flow path to perform repairs.

SR 3.6.3.2

This SR ensures that the minipurge valves are closed as required or, if open, open for an allowable reason. The SR is not required to be met when the minipurge valves are open for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The minipurge valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency for verifying valve position is consistent with other containment isolation valve requirements discussed in SR 3.6.3.3.

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange located outside containment and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment are capable of being mispositioned are in the correct position. Since verification of valve position for valves outside containment is relatively easy, a 31 day Frequency, based on engineering judgment was chosen to provide added assurance

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.3.3 (continued)

of the correct positions. The SR specifies that valves open under administrative controls are not required to meet the SR during the time the valves are open.

A Note modifies this SR and applies to valves and blind flanges located in high radiation areas allowing these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3, and 4 for ALARA reasons. Therefore, the probability of misalignment of these valves, once they have been verified to be in the proper position, is low.

SR 3.6.3.4

This SR requires verification that each containment isolation manual valve and blind flange that is located inside containment and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. For valves inside containment, the Frequency of "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is appropriate, since these valves and flanges are typically inaccessible during reactor operation, are operated under administrative controls and the probability of their misalignment is low. The SR specifies that valves open under administrative controls are not required to meet the SR during the time they are open.

The Note allows valves and blind flanges located in high radiation areas to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the access to these areas is typically restricted during MODES 1, 2, 3, and 4 for ALARA reasons. Therefore, the probability of misalignment of these valves, once they have been verified to be in their proper position, is small.

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BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.6.3.5

Verifying that the isolation time of each power operated and automatic containment isolation valve that is not locked, sealed, or otherwise secured in the isolation position is within limits is required to demonstrate OPERABILITY. The isolation time test ensures the valve will isolate in a time period less than or equal to that assumed in the safety analyses. The isolation time and Frequency of this SR are in accordance with the Inservice Testing Program.

SR 3.6.3.6

For 48 inch containment purge valves, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, is required to ensure OPERABILITY. Operating experience has demonstrated that this type of valve seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), additional purge valve testing was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 7).

The specified Frequencies are based on plant-specific as-found/as-left leakage rate data for these valves. The data indicates the CR-3 purge valve resilient seals do not degrade during the operating cycle with the valves in the sealed closed position. The 92 day Frequency after opening the valves recognizes the seals are prone to excessive leakage following use and is consistent with the NRC resolution of B-20.

A Note to this SR requires the results to be evaluated against the acceptance criteria of SR 3.6.1.1. This ensures that excessive containment purge valve leakage is properly accounted for in determining the overall containment leakage rate to verify containment OPERABILITY.

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BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.6.3.7

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures each automatic containment isolation valve that is not locked, sealed, or otherwise secured in the isolation position, will actuate to its isolation position on an actual or simulated actuation signal. The 24 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. Operating experience has shown that these components usually pass this Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

The SR is modified by a note indicating the SR is not applicable in the identified MODE. This is necessary in order to make the requirements for automatic system response consistent with those for the actuation instrumentation.

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REFERENCES

1. FSAR, Section 5.3.1.
  2. FSAR, Section 5.2.1.1
  3. FSAR, Sections 14.2.2.
  4. FSAR, Table 5-4.
  5. FSAR, Section 5.3.3.1
  6. Generic Issue B-24.
  7. Generic Issue B-20.
  8. 10 CFR 100.
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