

3.11 CONTAINMENTApplicability:

Applies to the Operation status of the reactor containment.

Objective:

To ensure containment integrity.

Specification:

- A. Containment integrity is designed to be operable when all the following are met:
1. All non-automatic containment isolation valves and blind flanges are closed.
  2. The equipment hatch is properly closed and sealed.
  3. At least one hatch in the personnel air lock is properly closed and sealed.
  4. All automatic containment isolation valves are operable or are locked closed.
  5. The uncontrolled containment leakage satisfied Specification 4.4 and I.B.3.
- B. Containment integrity shall be maintained whenever there is fuel in the reactor and
1. The reactor coolant is above 210°F or
  2. the reactor coolant boron concentration is less than Cold Shutdown Concentration with the reactor vessel head in place, or
  3. the reactor coolant boron concentration is less than refueling concentration with the reactor vessel head removed.

Remedial Action:

With one or more automatic containment isolation valves inoperable, maintain at least one automatic isolation valve operable in each affected penetration that is open, and within 4 hours either:

1. Restore the inoperable valve to operable status or
2. isolate the affected penetration by use of at least one manual or automatic isolation valve locked in the closed position or by use of a blind flange.

Exception: On-line purging of containment is not a breach of containment integrity provided both valves on each line are automatically operable.

C. The reactor shall not be critical if the containment internal pressure exceeds 3 psig.

D. On-line Containment purge. ]

On-line purging of the containment is not allowed under conditions "3.11.B" above, unless all associated valves are functionally tested prior to use and leak tested following use as follows: ]

1. Prior to the depressurization of the containment for on-line purge, the purge supply, exhaust and bypass valves will be cycled to test the automatic closure feature. The operation of the inner and outer supply and exhaust valves will be staggered to maintain containment integrity during this test. ]

2. The containment purge supply, exhaust and bupass valves will be leak tested within 24 hours following the termination of on-line purge. The leak test and acceptance criteria will be in accordance with Specification 4.4, Section II. ]

E. If the containment weight of air monitoring system is not operable when containment integrity is required, then the containment purge supply, exhaust and bypass valves will be leak tested at least once every three months. The leak test and acceptance criteria will be in accordance with Specification 4.4, Section II. ]

F. The resilient seats in the purge supply and exhaust valves will be inspected every five years from date of seat replacement and replaced if there are signs of deterioration. If maintenance is performed on a seating surface, the valve will be leak tested and a test will be performed to verify automatic closure feature of the valve within 24 hours following the maintenance activity, or prior to establishing containment integrity if not established. ]

G. Containment Weight of Air Monitoring System

1. The containment weight of air monitoring system shall be in operation whenever the reactor has been at power for more than 72 hours.

Exception: The system need not be operational during periods of system maintenance or calibration, periods of recharging the containment pressure, or periods of containment on-line purging and 48 hours thereafter.

Remedial Action

If the containment weight of air monitoring system is out of service for more than ten days with the reactor critical, the Commission must be notified of plans to restore the system operability.

2. When the containment weight of air monitoring system indicates a daily air loss greater than the following, an evaluation shall be initiated to determine the validity of the indication.
  - a. Equivalent to 0.15 weight percent per day at 50 psig for seven consecutive days or
  - b. equivalent to 0.5 weight percent per day at 50 psig for four consecutive days or
  - c. equivalent to 1.0 weight percent per day at 50 psig for three consecutive days.
3. The reactor shall be made subcritical within six hours if the evaluation required by G2:
  - a. results in identification of the source of the leak and a determination that the known containment leak rate exceeds the equivalent of 0.15 weight percent per day at 50 psig through the containment integrity boundary or
  - b. fails to identify the source of the leakage within ten days and the Containment Weight of Air Monitoring System indication persists at an average rate in excess of 0.15 weight percent per day at 50 psig.

Basis

Specification A assures that the containment pressure boundary is defined while permitting maintenance of components necessary to integrity. Specification 4.4, Section 1.B.3, limits the uncontrolled containment leakage to assure that public exposure will be maintained well within the guidelines presented in 10CFR100 for the hypothetical accident described in Section 14.18 of the FSAR.

Specification B includes a limit of 210°F on main coolant temperature assures that no steam will be generated in the unlikely event of a main coolant system rupture and hence no driving force to release any fission products from the containment. The shutdown margins are selected based upon the type of activities that are being carried out. The higher value for refueling precludes criticality under all postulated incidents involving fuel movement. The lower value with the head in place will also preclude criticality for all postulated incidents.

There is about a 5 psig margin between the calculated peak accident pressure and the containment design pressure of 55 psig. The 3 psig maximum operating pressure permits a positive containment pressure which is necessary for successful operation of the continuous leakage monitoring system.

Specification D requires that the purge supply, exhaust and bypass valves be tested in the automatic mode prior to initiating containment depressurization for containment purge. The stroking of the inner and outer containment isolation valves is done separately to maintain containment integrity until all valves have been stroked successfully in the automatic mode. This eliminates the possibility of breaking containment integrity with the reactor coolant system above 210°F and having both inner and outer isolation valves inoperable in the automatic mode. ]

Specification E provides for increased leak testing frequency of the containment vent and purge valves if the containment weight of air monitoring system is inoperable. ]

Specification F specifies the maintenance schedule for the containment purge valves. Normally, maintenance will be based on problems found during leak testing or when testing each valve in the automatic mode. If no problems are found which would require seat replacement within a 5-year time interval, the seats will be inspected after five years and replaced if there are signs of deterioration which would jeopardize containment integrity. ]

Specification G provides an added measure of assurance of containment integrity by specifying that the containment weight of air monitoring system be operational while recognizing the limitations of such systems to reliably measure very small changes in air mass and its operational limitations. ]

Individual Leak Detection Tests

## A. Tests

Leak detection tests of the following components shall be performed locally at a pressure of not less than 50 psig, using halogen gas detection, soap bubble, pressure decay, or other methods of equivalent sensitivity. Isolation valves shall also be tested for operability.

1. Containment penetrations with resilient seals, gaskets, or sealant compounds.
2. Air lock and equipment door seals.
3. Fuel transfer tube.
4. Isolation valves on lines penetrating containment.
5. Other containment components, besides II-A.1, 2, 3, which required leak repair following any integrated leakage rate test to meet maximum allowable leakage limit.

## B. Acceptance Criteria

The sum of the leakage from all penetrations and isolation valves shall not exceed  $L_p$  ( $L_p = 0.6 L_a$ ).

## C. Corrective Action

If at any time it is determined that the acceptance criterion of II.B. is exceeded, necessary repairs and retests shall be performed to meet the acceptance criterion.

## D. Testing Schedule

Individual penetrations (except for air locks and fuel transfer tube) shall be leak rate tested at a frequency equivalent to every other reactor shutdown for a major fuel reloading. Air locks shall be tested at 4-month intervals except when air locks are not opened during this interval, in which case tests shall be performed after each opening, but no interval may be longer than one year. The fuel transfer tube shall be tested after each refueling period.

The containment purge supply, exhaust and bypass valves will be tested within 24 hours following the termination of on-line purge. After performing maintenance on the valves seating surfaces, the valves will be tested within 24 hours or prior to establishing containment integrity if not already established.