3.11 CONTAINMENT

Applicability: Applies to the operating status of reactor containment.

Objective: To insure containment integrity.

Specification: A. Leakage

The reactor shall not be critical if the containment leakage exceeds 0.25 weight percent of the contained air per 24 hours when extrapolated to 40 psig in accordance with Surveillance Standard 4.4.

B. Containment Integrity

(1) Containment integrity shall be maintained whenever the reactor coolant system is above 300 psig and 200°F. The shutdown margin shall be greater than 3% Δ k with all rods inserted when the containment is open.

(2) Containment integrity shall not be violated when the reactor vessel head is removed unless a shutdown margin greater than 8% Δ k is constantly maintained.

(3) Positive reactivity changes shall not be made by rod drive motion or boron dilution whenever the containment integrity is not intact.

C. Internal Pressure

The reactor shall not be critical if the containment internal pressure exceeds 3 psig, or the internal vacuum exceeds 2.0 psig.

D. Air Recirculation System

Three of the four air recirculation units shall be operable whenever the reactor is critical.

E. Containment Spray System

The containment spray system shall be operable whenever the reactor is critical.

F. Containment Venting

(1) Either the containment air particulate monitoring system or the containment purge exhaust system shall be available at all times when the reactor is critical for post accident hydrogen venting.

(2) Containment purge capability may be rendered inoperable when the reactor is critical by placing a blank flange on the 42-inch purge air exhaust penetration inside the reactor containment for a period of seven days. If the blank flange can not be removed within seven days, then the reactor shall be shut down within 24 hours.

G. The containment isolation valves specified in Table 3.11-1 shall be operable while in Modes 1, 2, 3 and 4 or:

With one or more of the isolation valve(s) specified in Table 3.11-1 inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and either:

a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or

b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or

c. Isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange, or

d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Basis: A containment leakage rate of 0.3 weight percent of the contained air per 24 hours at an internal pressure of 40 psig under hypothetical accident conditions with 3 of 4 air recirculation units operating will maintain public exposure well below 10 CFR 100 values. (See Section 10.4 of the FDSA).

The reactor coolant system conditions of 300 psig and 200°F assure that no steam will be formed and hence there would be no pressure buildup in the containment if a reactor coolant system rupture were to occur.

The shutdown margins are selected based on the type of activities that are being carried out. The 8% shutdown margin during refueling precludes criticality under any circumstances, even though fuel is being moved. When the reactor head is not to be removed, the specified shutdown margin of 3% Δ k precludes criticality in any occurrence.

Regarding internal pressure limitations, the containment design pressure of 40 psig would not be exceeded if the internal pressure before a major loss-of-coolant accident were as much as 10 psig (see Figure 3.12-1 of FDSA). However, 3 psig maximum is sufficient for operations of the continuous leakage monitoring system. The containment is designed to withstand an internal vacuum of 7.5 psig. The 2.0 psig vacuum is specified as an operating limit to avoid any difficulties with motor cooling.

The design air recirculation flow rate with 4 fans operating under saturated conditions of 40 psig and 261°F is 200,000 CFM. The system is designed to perform its function with only 3 of 4 units in operation. The air filtration system is discussed in detail in FDSA Section 3.6.

The containment spray system in itself can control the containment pressure. It therefore provides a backup to the air recirculation system.

Containment post accident hydrogen venting can be accomplished by two methods. One uses the containment air particulate monitoring system and the other uses the containment purge exhaust system. These methods are not required in any short time frame after an accident; it is expected that months may elapse. In any event the systems used if not operable for maintenance reasons can be readily made operable providing access into the containment is not required.

Containment purge is utilized as a backup means of venting hydrogen from the containment following a loss-of-coolant accident. The containment air particulate monitoring system provides the primary means of purging because it provides adequate purge flow to prevent an explosive mixture buildup while allowing fine control of the release of radioactivity during purges. When necessary to effect repairs to the containment purge or purge bypass isolation valves, a blank flange must be applied to the 42" purge air exhaust penetration inside the reactor containment so that the containment remains leak tight. This renders the purge system inoperable for a finite time. Seven days in considered a reasonable length of time for repair parts to be received, installed and the system retested for leak tightness and returned to service.

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment. Containment isolation ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

Reference: (1) FDSA Section 3.6

(2) D. C. Switzer (CYAPC.) letter to A. Schwencer (NRC), dated June 27, 1977, Attachment No. 2.

TABLE 3.11-1
CONTAINMENT ISOLATION VALVES

VALVE NUMBER CONTAINMENT ISOLATION	VALVE FUNCTION
LD-AOV-202	Letdown Orifice
LD-AOV-203	Letdown Orifice
LD-AOV-204	Letdown Orifice
SS-TV-950	Drain Header Sample
SS-TV-955	Pzr. Steam Sample
SS-TV-960	Pzr. Liquid Sample
SS-TV-965	Loop 1 TH Sample
WD-HICV-1840	Containment Sump Discharge
WD-TV-1846	Containment Sump Discharge
DH-TV-1842A	Valve Stem Leakoff Hdr.
DH-TV-1843	Vapor Seal Head Tank
DH-AOV-554	Relief Tank Drain
DH-TV-1844	Relief Tank Drain
WG-AOV-558	Relief Tank Vent
WG-TV-1845	Relief Tank Vent
LM-TV-1811A	Containment Leak Monit.

TABLE 3.11-1 (Cont.)
CONTAINMENT ISOLATION VALVES

VALVE NUMBER CONTAINMENT ISOLATION	VALVE FUNCTION
LM-TV-1811B	Containment Leak Monit.
LM-TV-1812	Containment Leak Monit.
CC-FCV-611	Drain Cir. CC Outlet
SG-TV-1312-1	Steam Generator Blowdown
SG-TV-1312-2	Steam Generator Blowdown
SG-TV-1312-3	Steam Generator Blowdown
SG-TV-1312-4	Steam Generator Blowdown
CC-TV-1831	NST Cl_g. Wtr. Return
DH-TV-1841	Drain Header
DH-TV-1847	Drain Header
VS-TV-1848	Air Activity Inlet
SOV-12-1	Air Activity Inlet
MS-TV-1212	Mn. Stm. Line Drn. to B/D Tk.
MS-TV-1213	Mn. Stm. Line Drn. to Cond.
CH-MOV-331	#1 Seal Bypass
DH-TV-1842B	Valve Stem Leakoff