TXU Energy
Comanche Peak Steam
Electric Station
PO Box 1002 (E01)
Glen Rose, TX 76043
Tel. 254 897 8920
Fax 254 897 6652
lance terry@txu com

C. Lance Terry
Senior Vice President &
Principal Nuclear Officer

Ref: 10CFR50.90

CPSES-200300335
Log # TXX-03040
File # 00236

March 18, 2003

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
LICENSE AMENDMENT REQUEST (LAR) 02-10
REVISION TO TECHNICAL SPECIFICATION (TS) 3.6.3,
CONTAINMENT ISOLATION VALVES

Gentlemen:

Pursuant to 10CFR50.90, TXU Generation Company LP (TXU Energy) hereby requests an amendment to the CPSES Unit 1 Operating License (NPF-87) and CPSES Unit 2 Operating License (NPF-89) by incorporating the attached change into the CPSES Unit 1 and 2 Technical Specifications. This change request applies to both units.

The proposed amendment will delete two of the Surveillance Requirements (SR) in TS 3.6.3 entitled "Containment Isolation Valves." Specifically, safety injection valves 8809A, 8809B, and 8840 and containment spray valves HV-4776, HV-4777, CT-142, and CT-145 will no longer be leak tested.

Attachment 1 provides a detailed description of the proposed changes, a safety analysis of the proposed changes, TXU Energy's determination that the proposed changes do not involve a significant hazard consideration, a regulatory analysis of the proposed changes and an environmental evaluation. Attachment 2 provides the affected Technical Specification pages marked-up to reflect the proposed changes. Attachment 3 provides proposed changes to the Technical Specification Bases for information only. These Technical Specification Bases changes will be processed per CPSES site procedures. Attachment 4 provides retyped Technical Specification pages which incorporate the requested changes. Attachment 5 provides retyped Technical Specification Bases pages which incorporate the proposed changes. Attachment 6 provides marked-up pages of the Final Safety Analysis Report (FSAR)

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to reflect the proposed changes to the FSAR for information only.

TXU Energy requests approval of the proposed License Amendment by September 15, 2003. The Unit 2 Cycle 7 refueling outage is scheduled for October 4, 2003, and the revised TS will be made effective within 30 days of NRC approval. Although receipt of the Amendment is not required to conduct the outage or to restart the unit following the outage, implementation of the requested TS change prior to the outage will allow planned outage work to proceed in conjunction with critical path activities, thereby shortening the outage. In addition, there will be a significant reduction in radiation exposure to personnel over the life of the plant by deleting these testing requirements.

In accordance with 10CFR50.91(b), TXU Energy is providing the State of Texas with a copy of this proposed amendment.

This communication contains no new or revised commitments.

Should you have any questions, please contact Mr. Jack Hicks at (254) 897-6725.

I state under penalty of perjury that the foregoing is true and correct.

Executed on March 18, 2003.

Sincerely,

TXU Generation Company LP

By: TXU Generation Management Company LLC
Its General Partner

C. L. Terry
Senior Vice President and Principal Nuclear Officer

By: Roger D. Walker
Roger D. Walker
Regulatory Affairs Manager

JCH/jrh

TXU

Attachments
1. Description and Assessment
2. Markup of Technical Specifications Pages
3. Markup of Technical Specifications Bases Pages (for information)
4. Retyped Technical Specifications Pages
5. Retyped Technical Specifications Bases Pages (for information)
6. Markup of Final Safety Analysis Report Pages (for information)

c - E. W. Merschoff, Region IV
W. D. Johnson, Region IV
D. H. Jaffe, NRR
Resident Inspectors, CPSES

Mr. Authur C. Tate
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78704

ATTACHMENT 1 to TXX-03040

DESCRIPTION AND ASSESSMENT

LICENSEE'S EVALUATION

1.0 DESCRIPTION

By this letter, TXU Energy requests an amendment to the CPSES Unit 1 Operating License (NPF-87) and CPSES Unit 2 Operating License (NPF-89) by incorporating the attached change into the CPSES Units 1 and 2 Technical Specifications. Proposed LAR 02-10 is a request to revise Technical Specification (TS) 3.6.3, "Containment Isolation Valves," for CPSES Units 1 and 2.

Implementation of the requested TS change is acceptable because the affected containment penetrations are not a credible containment atmosphere leakage path during and after a LOCA. The surveillances are not commensurate with the design and licensing basis of the plant. Currently, initial conditions for testing require the RCS in Mode 5 with the RHR train to be tested inoperable, isolated, and at ambient temperature. Due to the requirements for ambient conditions, test duration per valve is normally six hours. The average dose received per test is 100-120 mRem. Deletion of these testing requirements will result in a significant reduction in radiation exposure to personnel over the life of the plant. Implementation of the requested TS change would also allow planned outage work to proceed in conjunction with critical path activities, thereby shortening outages.

The CPSES Final Safety Analysis Report (FSAR) (Chapter 6) will be updated as required to reflect this License Amendment Request (LAR). The FSAR will be updated after the LAR has been approved and implemented. See Attachment 6 for the proposed markup of Section 6 of the FSAR.

2.0 PROPOSED CHANGE

The proposed change modifies the Surveillance Requirements for TS 3.6.3, "Containment Isolation Valve".

The proposed change will delete Surveillance Requirements(SR) 3.6.3.12 and 3.6.3.13 for safety injection valves 8809A, 8809B, and 8840 and containment spray valves HV-476, HV-4777, CT-142, and CT-145.

The proposed changes to TS 3.6.3 will make Comanche Peak's Surveillance Requirements consistent with other Westinghouse 4-loop plants.

3.0 BACKGROUND

Supplement 22 of Comanche Peak Safety Evaluation Report (SER) contains the NRC staff's evaluation and acceptance of the CPSES program for local leakage rate testing of containment isolation valves in accordance with Type C testing requirements in Appendix J to 10 CFR Part 50.

Section 6.2.3.1, Elimination of Type C Leakage Tests for Certain Containment Isolation Valves,

item (3), discusses the testing for the following containment isolation valves: HV-4776, HV-4777, CT-142, CT-145, 1-8840, 1-8809A, and 1-8809B.

Containment isolation valves HV-4776, HV-4777, CT-142, and CT-145 on the spray systems are to be leak rate tested with water at a pressure of not less than 1.1 P_a. The justification is that these penetrations have a water-filled loop seal on the containment side of the valves for more than 30 days following the accident. It was noted that the surveillance requirements and acceptance criteria should be included in the plant's Technical Specifications (TS).

In addition, the following three valves were added to be leak rate tested with water: 1-8840, 1-8809A, and 1-8809B of penetrations MIII-23, MIII-4, and MIII-5. These valves are outboard containment isolation valves in the RHR discharge lines, which satisfy the following design criteria:

-The systems are protected against missiles and pipe whip.
-The systems are designed seismic Category 1.
-The systems are classified as ASME safety Class 2.

SSER 22 stated: "At the penetrations, a pressurized water seal will be maintained throughout the entire 30-day accident-mitigation period. The water seal is on the containment side so that the accident pressure will push the water seal against the valves from inside containment towards outside containment. In accordance with paragraph III.C.3 of Appendix J to 10 CFR Part 50, these valves are not required to be Type C tested. Furthermore, the plant's TS include surveillance requirements and acceptance criteria for leak testing. Therefore, the proposed leak testing with water for the valves listed above is acceptable."

TXU has contacted a number of plants whose RHR and Containment Spray system designs are essentially equivalent to Comanche Peak (Westinghouse 4 Loop plants) to ascertain the testing requirements for the valves for which this elimination of testing is being requested.

The Byron/Braidwood Stations, Diablo Canyon Station, and Wolf Creek/Callaway Stations do not perform LLRTs for these RHR and Containment Spray Valves. The technical justification for not performing local leak rate testing of these valves is described in their respective UFSARs. A similar discussion forms the basis for Comanche Peak's request for elimination of these tests.

4.0 TECHNICAL ANALYSIS

The RCS Cold Leg Injection valves (1-8809A, 2-8809A, 1-8809B and 2-8809B) and the RCS Hot Leg Injection valves (1-8840 and 2-8840) are currently required by SR 3.6.3.12 to be leak tested to be within limits with a gas at a pressure not less than P_a, 48.3 psig, or with water at a pressure not less than 1.1 P_a. However, these valves are not a credible containment atmosphere leakage path during and after a LOCA .

Likewise, the Containment Spray injection valves (1-HV-4776, 2-HV-4776, 1-HV-4777, 2-HV-4777, 1-CT-142, 2-CT-142, 1-CT-145, and 2-CT-145) are currently required by SR 3.6.3.13 to be leak tested to be within limits with water at a pressure not less than 1.1 P_a. However, these valves are also not a credible containment atmosphere leakage path during and after a LOCA.

The unit designator 1- and 2- is not used when describing these valves herein similar to the CPSES FSAR when the information is equally applicable to both units. For example, 8809A means "1-8809A AND 2-8809A".

The volume of the inboard water seal for each valve is the basis for the Maximum Allowed Leakage Rate (MALR) defined in the Technical Specification 3.6.3 BASES required to maintain the water seal for 30 days. The surveillance testing is performed with the outboard side drained and vented; however, the maintenance of a water seal for 30 days is assured by a closed system outside containment which is not drained or vented post-LOCA. Containment pressure is significantly reduced in the short term after a LOCA and a water seal is maintained on both sides of these valves during and after a LOCA by a closed system in accordance with Standard Review Plan (SRP) 6.2.4. Therefore, the surveillance testing is not commensurate with the design and safety analysis.

SR 3.6.3.12 and SR 3.6.3.13 are not required to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

4.1 Design Basis and Safety Analysis Consideration

Containment isolation valves 8809A, 8809B, 8840, HV-4776 and HV-4777 valves are motor operated valves (MOVs) located outside reactor containment (ORC). Containment isolation valves CT-142 and CT-145 are check valves located inside reactor containment (IRC). These valves are located in "Essential Penetrations" as defined by Item II.E.4.2 of NUREG-0737. Essential penetrations such as these include remote-manual containment isolation valves. The MOVs are provided with handwheels for local manual operation if required. Automatic isolation is not required to meet GDC-55 and GDC-56 [See CPSES FSAR Section 6.2.4.1.3, Special Containment Isolation Provisions]. The penetrations do not communicate with the containment atmosphere (i.e., do not provide a direct connection between the inside and outside atmospheres of the primary reactor containment under normal operation). Provisions to detect possible leakage from the lines outside containment during normal operation are required by Technical Specification Program 5.5.2 Primary Coolant Sources Outside Containment. A description of this program is provided in Section 4.2 of this Attachment..

The design of the Emergency Core Cooling System (ECCS) and its operation during and after a LOCA is described in CPSES FSAR Section 6.3. The design of the Containment Spray System and its operation during and after a LOCA is described in CPSES FSAR Section 6.2.2. The containment isolation design is described in CPSES FSAR Section 6.2.4. The applicable containment penetrations are listed under Items 35, 36, 54, 55, and 63 in CPSES FSAR Tables 6.2.4-1, 6.2.4-2, 6.2.4-3, 6.2.4-4 and 6.2.4-6(see Attachment 6).

Because these lines are designed to be in service recirculating reactor coolant after a LOCA, the systems are designed as closed systems outside containment (See CPSES FSAR Section 6.2.1.4.5 which is based on SRP 6.2.4, Sections II.6.e and II.6.o).

The RHR and Containment Spray systems which recirculate coolant outside containment meet the following requirements for a closed system outside containment:

- missile protected (from both internal and external missiles),
- Seismic Category I,
- Safety Class 2,
- design temperature and pressure at least equal to containment, and
- tested per the requirements of NUREG-0737, Section III.D.1.

In addition to the NUREG-0737 testing, the closed loops outside containment are tested and inspected in accordance with ASME Section XI.

Thus, the design of these systems ensure an additional containment boundary for protection from leakage in addition to the redundant containment isolation valves.

All Containment piping penetrations, including the closed systems outside containment, are located in radiation controlled areas of the Auxiliary, Fuel and Safeguards buildings which are monitored by radiation monitors for Containment leakage after a LOCA as described in CPSES FSAR Section 7.5. This is consistent with GDC-54 requirements for leak detection.

The Train A injection valves are located in separate penetration rooms from the Train B injection valves. These would be accessible prior to the onset of core damage after a LOCA which is not expected for hours after an accident. With the assumption of a post accident release of radioactivity equivalent to that described in Regulatory Guides 1.3 and 1.4 (i.e., the equivalent of 50% of the core radioiodine, 100% of the core noble gas inventory, and 1% of the core solids are contained in the primary coolant), if the single active failure is loss of a train of power, the associated room would be accessible within 24 hours of the design basis event. [See CPSES Figure 12.3.-6 (rooms 77A and 77B) for Unit 1 and Figure 12.3-23.4 (rooms 77A and 77B) for Unit 2. See CPSES FSAR Response to the NRC Action Plan Section II.B.2 for post accident plant shielding.]

The valves which are subject to SR 3.6.3.12.and 3.6.3.13 are associated with 5 essential containment penetrations for each Unit. Table 1, in Section 4.3 below, details the containment isolation valves in each of these penetrations. Note 1 designation is for the valves for which this Technical Specification change is being requested. Note 2 is for valves in these penetrations which are not currently required to be leak tested and provides the current licensing basis for not requiring Type C testing (CPSES FSAR Table 6.2.4-2). Test header isolation valves 8890A, 8890B, and 8825 located IRC are currently Type C leak tested and any change thereto is not part of this LAR. Any changes to the LLRT of these valves will be performed under 10 CFR 50.59.

Figure 1 and Figure 2, in Section 4.4 below, show the valve and system arrangement for the Cold and Hot Leg Injection penetrations and Containment Spray penetrations, respectively.

RHR Cold Leg Injection Valves 8809A and 8809B

The ECCS system is required to operate during a design basis accident. The RHR Cold Leg Injection valves (8809A and 8809B) are normally open valves that are required to be open for Cold Leg (CL) Injection and Cold leg Recirculation (CLR). They are procedurally required to be closed when the plant transitions to Hot Leg Recirculation (HLR) Mode. The switchover toCLR and to HLR is described in CPSES FSAR Table 6.3-7. RHR loop cross-tie valves 8716A and B are a back-up to the 8809A and B valves should either 8809A or B fail to close when HLR Mode is required to be entered. Additionally, both 8809A and B are provided with handwheels should a loss of Train A or B electrical power occur and either valve is required to be closed.

As can be seen in Tables 2 and 4 (Section 4.3, below), these valves are open with injection flow provided during CL Injection. Flow through the valve is maintained until the switchover to CLR. During CLR and HLR, either flow through the valves or a closed system boundary is maintained regardless of any single active failure.

On failure of the train related power 8809A (or 8809B) remains open until power is restored or it is closed locally. Leak rate testing is not relevant for this failure as the valve is open and the containment isolation is provided by the check valve and test header isolation valve IRC and the closed system ORC. If manual actions to close 8809A (8809B) are successful, there would be three containment barriers in place. After 8809A (8809B) is closed, 8716B (8716A) can be re-opened to provide seal water on the outboard side of 8809A (8809B).

On a failure of an RHR pump to start in response to ESFAS actuation, flow is maintained through 8809A and 8809B until entry into Cold Leg Recirculation. In this case, 8809A (8809B) can be closed remotely to provide the three containment barriers. 8716A and 8716B could be re-opened during HLR to provide seal water on the outboard side of 8809A (8809B).

Failure of the valve (8809A or 8809B) to close on demand would result in continuation of cold leg injection flow through the failed valve. HLR would be provided by the opposite train pump.

Failure of the test header isolation valves is bounded by the base case of no single active failures.

Therefore, in all design basis cases, 8809A and 8809B are either open or are closed providing a third barrier to containment leakage. A water seal is maintained both inside and outside containment. Therefore, there are three barriers between the containment atmosphere and the outside atmosphere when these valves are closed after a LOCA as opposed to a single barrier assumed for Appendix J leak rate testing.

RHR Hot Leg Injection Valve 8840

RHR HLR valve 8840 is a normally closed valve. As such, either RHR pump can provide upstream pressure on the valve via the loop crosstie header and valves 8716A or B. Upon initiation of HLR Mode, valve 8840 is designed to be opened.

As described in Tables 3 and 4 (Section 4.3 below), a secondary containment boundary is maintained under system operation post accident including single active failures. During CL injection, a pumped water seal is maintained on the outboard side of 8840 regardless of single active failure. When 8716A and 8716B close, they provide the third closed system boundary during CLR.

For loss of Train A power, the third barrier is maintained by the closed system (same as for 8809A, above) until 8809A or 8716A can be closed. Once either 8809A or 8716A are closed, the Train B pump can be used to provide flow through 8840 or to provide a pumped water seal. For loss of Train B power, the third barrier is maintained by the closed system (same as for 8809B, above) until 8809B or 8716B can be closed. Then the Train A pump can be used to provide a pumped water seal.

Failure of the valve to open on demand would result in continuation of cold leg injection flow through 8809A and 8809B. HLR would be provided by the Safety Injection pumps via valve 8835. 8716A or 8716B could be re-opened to provide a pumped water seal on the outboard side.

Failure of the test header isolation valve is bounded by the base case of no single active failures.

Therefore, in all design basis cases, 8840 is either open or is closed providing a third barrier to containment leakage. A water seal is maintained both inside and outside containment. Therefore, there are three barriers between the containment atmosphere and the outside atmosphere when these valves are closed after a LOCA as opposed to a single barrier assumed for Appendix J leak rate testing.

Containment Spray Discharge Header Valves HV-4776, HV-4777, CT-0146, and CT-0147

Similarly, for the Containment Spray Discharge Header Valves HV-4776, HV-4777, CT-0142, and CT-0145, water is applied to both sides of these valves during all modes of operation. These valves are normally closed and open ONLY on a HI-3 Containment Pressure actuation signal. A water filled standpipe located on each spray header inside containment provides a water seal on the downstream (inboard) side of these valves. Each Containment Spray header riser is provided with a pressure switch to alarm in the Control Room if the level in the riser falls below the minimum level required. On the upstream side of the valves, Containment Spray pump discharge pressure is applied (pump is started on a Safety Injection Actuation signal) to the valves prior to the valves opening to perform its safety function. During normal operation, Refueling Water Storage Tank hydrostatic pressure provides a water seal on the valve upstream side. This pressure is greater than the normal Containment Building pressure.

As described in Tables 5 and 6, below, the valves are open during spray injection and recirculation. In the event of a single active failure, the closed system outside containment provides a secondary boundary to the containment isolation valves. Therefore, there are three barriers between the containment atmosphere and the outside atmosphere when these valves are closed after a LOCA as opposed to a single barrier assumed for Appendix J leak rate testing.

Any water leakage from inside containment to the closed system outside containment would pressurize the closed system until the pressures equalized which would stop outleakage. With three barriers in series, it is unlikely that leakage would be significant during 30 days post-LOCA.

Summary

In summary, the deletion of SR 3.6.3.12 and 3.6.3.13 is acceptable because the penetrations are not a credible containment atmosphere leakage path during and after a LOCA. The maintenance of a water seal for 30 days is assured by a closed system outside containment which is not drained or vented post-LOCA. This secondary boundary would be available even in the event of a single active failure. Furthermore, there are three containment isolation barriers between the containment atmosphere and the outside atmosphere when these valves are closed after a LOCA as opposed to a single barrier assumed for Appendix J leak rate testing.

Therefore, the surveillance required by Technical Specifications SR 3.6.3.12 and SR 3.6.3.13 is not commensurate with the design and licensing basis. These surveillance requirements are not required to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

4.2 The Radioactive System Leakage Inspection (RSLI) Program

The overall objective of the RSLI program is to monitor and reduce leakage from those portions of systems outside containment that contain highly radioactive fluids during post accident operation to as low as reasonably achievable levels. Leakage from radioactive systems outside containment are monitored to meet the commitments in CPSES FSAR Section III.D.1.1 (CPSES Response to the NRC Action Plan for the TMI Accident) and the requirements of Section 5.5.2, Primary Coolant Sources Outside Containment of the Technical Specifications.

The RSLI program includes the following:

a. Preventive maintenance and periodic visual inspection requirements; and
b. Integrated leak test requirements for each system at refueling cycle intervals or less.

The leakage criteria for the RSLI Program are as follows: The limiting leakage value based on a cumulative amount from all liquid systems tested under the RSLI Program is 1.0 gpm per unit. An additional criterion for liquid leakage on individual systems is administratively applied.

Leakage greater than 1.0 gpm does not violate a Technical Specification limit and there is no direct impact on system/Unit Operability/operation. The 1.0 gpm is based on accident analysis assumptions for radiological consequences of engineered safety features equipment leakage outside containment [See CPSES FSAR 15.6.5.4]. All abnormal leakage is evaluated and

corrected under the Appendix B corrective action program in accordance with NRC Generic Letter 91-18, Revision 1.

Each RSLI system is inspected at intervals not to exceed each refueling cycle. Testing is performed at normal system operating pressures. In order to have appropriate portions of systems pressurized, inspection of the Containment Spray, Residual Heat Removal, and Safety Injection systems are scheduled to coincide with the operability tests of those systems, when possible.

Operations, Engineering, and Maintenance personnel perform tests, identify/quantify leakage and initiate corrective actions (e.g. work orders, SmartForms) as necessary.

System engineering reviews RSLI test data and other significant leakage data and applicable corrective action documents on RSLI system components to maintain a RSLI Program Leakage Table for each unit. This will ensure that the unit's cumulative leakage for portions of systems covered by this program remain within the leakage criteria.

Maintenance personnel implement corrective actions as soon as reasonably possible identified by RSLI tests or other inspections. These corrective actions include adjusting packing or replacement of seals, gaskets, o-rings, etc. on RSLI system components.

The RSLI program ensures that the closed systems outside containment provide an acceptable secondary containment boundary during and after a LOCA.

4.3 Tables

Table 1
SR 3 6.3.12 and SR 3.6 3.13 CONTAINMENT PENETRATIONS [REF. 1]

PEN. NO.	VALVE NO.	LINE OR SERVICES	GDC	FLUID CONTAINED	FLOW DIAGRAM	LEAK RATE TEST
MII-4	8809A 8818A 8818B 8890A	R.H.R. TO COLD LEG LOOPS NO 1 AND NO. 2	55	WATER	FSAR Fig. 6.3-1 M1(M2)-0263 M1-0263-B M2-0263-A	NOTE 1 NR (NOTE 2) NR (NOTE 2) C
MII-5	8809B 8818C 8818D 8890B	R.H R. TO COLD LEG LOOPS NO. 3 AND NO. 4	55	WATER	FSAR Fig. 6.3-1 M1(M2)-0263 M1-0263-B M2-0263-A	NOTE 1 NR (NOTE 2) NR (NOTE 2) C
MIII-23	8840 8841A 8841B 8825	R.H R. TO HOT LEG LOOPS NO. 2 AND NO. 3	55	WATER	FSAR Fig. 6.3-1 M1(M2)-0263 M2-0263-A M1(M2)-0263-B	NOTE 1 NR (NOTE 3) NR (NOTE 3) C
MIII-15	HV-4776 CT-0142	CONTAINMENT SPRAY TO SPRAY HEADER (TRAIN A)	56	WATER	FSAR Fig. 6.2.2-1 M1(M2)-0232	C (NOTE 1) C (NOTE 1)
MIII-14	HV-4777 CT-0145	CONTAINMENT SPRAY TO SPRAY HEADER (TRAIN B)	56	WATER	FSAR Fig. 6.2.2-1 M1(M2)-0232	C (NOTE 1) C (NOTE 1)

1. These valves are part of closed systems outside containment tested per NUREG-0737 Section III.D.1 which are in service post accident and have a water filled loop seal on the containment side of the valves for a period greater than 30 days following the accident. These valves are currently leakrate tested with water at a pressure of not less than 1.1Pa, as required by SR 3 6.3.12 AND SR 3.6.3.13.

2. This penetration is an engineered safety feature system supplying RHR pump flow (valves opened) to the cold legs of the RCS during cold leg injection and cold leg recirculation modes of operation. During hot leg recirculation this penetration is not in service (valves closed) but is pressurized by the residual heat removal pumps to a pressure in excess of 1.1 times the containment design pressure. In addition, the outside containment motor generated valves are Type C tested, thus any Leakage at the penetration would be contained at the motor operated valves. These valves are therefore not required to be Type C tested.

3. This penetration is an Engineered Safety Feature System supplying RHR pump flow (valves opened) to the hot legs of the RCS during hot leg recirculation mode of operation. During cold leg injection and cold leg recirculation this penetration is not in service (valve closed) but is pressurized by the residual heat removal pumps to a pressure in excess of containment design pressure. In addition, the outside containment motor operated valve is Type C tested, thus any leakage at the penetration would be contained at the motor operated valve. These valves are therefore not required to be Type C tested.

REF. 1 FSAR Table 6.2.4-2

Table 2
FAILURE MODES AND EFFECTS ANALYSIS
COLD LEG INJECTION VALVES 8809A and 8809B

VALVE NO. [1] [2]	SINGLE ACTIVE FAILURE	ECCS OPERATION PHASE	EFFECTS
8809A (8809B)	None (Base Case)	Cold Leg Injection	8809A (8809B) is open and ECCS water is being injected by the respective RHR pump.
"	"	Cold Leg Recirculation	8809A (8809B) is open and ECCS water is being injected by the respective RHR pump.
"	"	Hot Leg Recirculation	8809A (8809B) is closed and RHR pump discharge pressure is maintained on the outboard side of the valve by the respective RHR pump.
8809A (8809B)	Loss of Train A related AC power (Loss of Train B related AC power)	Cold Leg Injection	8809A (8809B) is open and injection flow through the valve is provided by the RHR pump in the opposite train.
"	"	Cold Leg Recirculation	8716B (8716A) is manually closed during switchover to separate the RHR pumps to prevent runout due to this single active failure. Check valves inside containment close to provide the first containment isolation boundary. Any leakage past the check valves is contained by the closed system outside containment. When the pressure across the check valve equalizes, leakage is terminated. Manual actions to close 8809A (8809B) would be taken prior to switchover to hot leg recirculation.
"	"	Hot Leg Recirculation	Loss of Train A related AC power: After 8809A is closed, 8716B is opened to provide flow to the hot leg via 8840 and provide RHR pump discharge pressure on the outboard side of valve 8809A by the Train B RHR pump Loss of Train B related AC power: After 8809B is closed, 8716A may be re-opened to provide RHR pump discharge pressure on the outboard side of the valve by the Train A RHR pump (8840 remains closed and Hot leg Recirculation is provided by Train A Safety Injection Pump)
8809A (8809B)	Failure of Associated Pump to start (apply upstream pressure on valve)	Cold Leg Injection	Same as for loss of Train associated power above.
"	"	Cold Leg Recirculation	Same as for loss of Train associated power above.

Table 2 (continued)

"	"	Hot Leg Recirculation	8809A (8809B) is closed, 8716A and 8716B are opened to provide flow to the hot leg via 8840 and provide RHR pump discharge pressure on the outboard side of the valve from the opposite train pump.
8809A (8809B)	Failure of valve to close on demand	Cold Leg Injection	N/A. Valve is required to be open.
"	"	Cold Leg Recirculation	N/A. Valve is required to be open. Injection flow is maintained.
"	"	Hot Leg Recirculation	If 8809A (8809B) failed to close during switchover to HLR, 8716A (8716B) would be closed and the Train A (Train B) RHR pump would remain in Cold Leg Recirculation.
8890A (8890B)	Failure of valve to close on demand	Cold Leg Injection	8809A and 8809B are open and ECCS water is being injected by both RHR pumps.
"	"	Cold Leg Recirculation	8809A and 8809B are open and ECCS water is being injected by both RHR pumps.
"	"	Hot Leg Recirculation	8809A and 8809B are closed. This could result in loss of some of the water seal inside containment; however, RHR pump discharge pressure is maintained on the outboard side of the valves by the RHR pumps.

[1] 8809A is Class 1E Train A powered (8809B is Class 1E Train B powered)
8890A (Train A) and 8890B (Train B) are air operated valves and fail closed on loss of air or power. Both power and air are terminated by safety injection actuation signals.

[2] See Figure 1, Section 4.4.

Table 3
FAILURE MODES AND EFFECTS ANALYSIS
HOT LEG INJECTION VALVE 8840

VALVE NO. [1] [2]	SINGLE ACTIVE FAILURE	ECCS OPERATION PHASE	EFFECTS
8840	None (Base Case)	Cold Leg Injection	8840 is closed and a secondary boundary is being maintained on the outboard side of 8840 by RHR pump discharge pressure in the closed system outside containment.
"	"	Cold Leg Recirculation	8716A and 8716B are closed. 8840 remains closed and a secondary boundary is being maintained by the closed system outside containment. Pump discharge pressure is maintained on the outboard of valves 8716A and 8716B.
"	"	Hot Leg Recirculation	8840 is open and RHR pump hot leg injection is maintained.
8840	Loss of Train A related AC power (Loss of Train B related AC power)	Cold Leg Injection	8840 is closed and a secondary boundary is being maintained by the Train B (Train A) RHR pump discharge pressure in the closed system outside containment.
"	"	Cold Leg Recirculation	Same as for 8809A (8809B) in Table 2.: 8716B (8716A) is closed to separate the RHR pumps 8840 remains closed and a secondary boundary is being maintained by the closed system outside containment. Any leakage past the check valves and 8840 is contained by the closed system outside containment. When the pressure across 8840 equalizes, leakage is terminated.
"	"	Hot Leg Recirculation	Same as for 8809A (8809B) Table 2 above. Loss of Train A related AC power: After 8809A is closed, 8716B is opened to provide flow to the hot leg via 8840 and provide RHR pump discharge pressure on the outboard side of valve 8809A by the Train B RHR pump. Loss of Train B related AC power: After 8809B is closed, 8716A may be re-opened to provide RHR pump discharge pressure on the outboard side of the valve by the Train A RHR pump (8840 remains closed and Hot leg Recirculation is provided by Train A Safety Injection Pump).
8840	Failure of Associated Pump to start	Cold Leg Injection	Same as for loss of Train associated power above.
"	"	Cold Leg Recirculation	Same as for loss of Train associated power above.

Table 3 (continued)

"	"	Hot Leg Recirculation	8840, 8716A and 8716B would be opened and the running pump would provide hot leg injection.
8840	Failure of valve to open on demand	Cold Leg Injection	N/A. Valve is required to be closed.
"	"	Cold Leg Recirculation	N/A. Valve is required to be closed.
"	"	Hot Leg Recirculation	Hot Leg Recirculation is provided by the Safety Injection Pumps. The RHR pumps remain in Cold Leg recirculation. 8840 remains closed and a secondary boundary is being maintained by the closed system outside containment Any leakage past the check valves and 8840 is contained by the closed system outside containment.
8825	Failure of valve to close on demand	Cold Leg Injection	None. 8840 is closed and a secondary boundary is being maintained on the outboard side of 8840 by RHR pump discharge pressure in the closed system outside containment.
"	"	Cold Leg Recirculation	None. 8716A and 8716B are closed. 8840 remains closed and a secondary boundary is being maintained by the closed system outside containment. Pump discharge pressure is maintained on the outboard of valves 8716A and 8716B.
"	"	Hot Leg Recirculation	None. 8840 is open delivering flow from both RHR pumps. Loss of water from the 10" SI header via the 3/4" connection would be negligible. HLR is also being supplied by both SI pumps via 8802A and 8802B.

[1] 8840 is Class 1E Train B powered
8825 (Train A) is air operated valves and fail closed on loss of air or power. Both power and air are terminated by safety injection actuation signals

[2] See Figure 1, Section 4.4.

Table 4
FAILURE MODES AND EFFECTS ANALYSIS
ECCS CLOSED SYSTEM ISOLATION

VALVE NO [1] [2]	SINGLE ACTIVE FAILURE	ECCS OPERATION PHASE	EFFECTS
LCV-0112B (LCV-0112C)	Failure to Auto-close (or Train failure)	Cold Leg Injection	None. VCT is isolated from charging pump suction. LCV-0112B and LCV-0112C are in series Redundant, single active failure isolation is provided.
HV-8220 (HV-8221)	Failure to Auto-close (or Train failure)	Cold Leg Injection	None. Charging pump suction high point vent line is isolated 8220 and 8221 are in series. Redundant, single active failure isolation is provided.
8110 (8111)	Failure to Auto-close (or Train failure)	Cold Leg Injection	None. Charging pump minimum flow line is isolated. 8110 and 8111 are in series. Redundant, single active failure isolation is provided.
8440	Failure to close on demand	Cold Leg Injection	None. Boundary is provided by containment isolation valves 8112 and 8100.
8202A (8202B)	Failure to Auto-close	Cold Leg Injection	None. Charging pump suction stabilizer VCT vent line is isolated. 8202A and 8202B are redundant fail closed solenoid valves in series Redundant, single active failure isolation is provided
8210A (8210B)	Failure to Auto-close	Cold Leg Injection	None. Charging pump suction stabilizer VCT supply line is isolated 8210A and 8210B are redundant fail closed solenoid valves in series. Redundant, single active failure isolation is provided
HV-4178 (HV-4179)	Failure to Auto-close	Cold Leg Injection	None. RHR Sample line can be isolated by remote manual actuation or by local manual valve RH-0026.
HV-4182	Failure to Auto-close	Cold Leg Injection	None. PASS sample line can be isolated by remote manual actuation or by local manual valve PS-0007. [Fig. 9.3-4, M1-0228, M2-0228, Loc. A-4]
8812A (8812B)	Failure to close on demand (or Train failure)	Switchover to Cold Leg Recirculation	None. RWST is isolated from RHR pump suction Check valves 8958A (8958B) is in series. Redundant, single active failure isolation is provided.
8814A & 8814B	Failure to close on demand (or Train A failure)	Switchover to Cold Leg Recirculation	None. RWST is isolated from Safety Injection pump minimum flow lines. 8814A and 8814B are both Train A valves in parallel. 8813 is a Train B isolation valves provided in series. Redundant, single active failure isolation is provided.
8511A (8511B)	Failure to close on demand (or Train failure)	Switchover to Cold Leg Recirculation	None. RWST is isolated from Charging pump alternate minimum flow lines 8512B (8512A) provided in series. Redundant, single active failure isolation is provided.

Table 4 (continued)

LCV-0112D (LCV-0112E)	Failure to close on demand (or Train failure)	Switchover to Cold Leg Recirculation	None. RWST is isolated form Charging pump suction. Check valve 8546 is in series with both valves. Redundant, single active failure isolation is provided.
8806	Failure to close on demand (or Train failure)	Switchover to Cold Leg Recirculation	None. RWST is isolated form Safety Injection Pump suction. Check valve 8926 is in series. Redundant, single active failure isolation is provided.

[1] Valves powered by Class 1E Train A (valves powered by Class 1E Train B)

[2] See CPSES FSAR Figure 6.3-1

Table 5
FAILURE MODES AND EFFECTS ANALYSIS
CONTAINMENT SPRAY VALVES
HV-4776 & CT-142, HV-4777 & CT-145

VALVE NO	SINGLE ACTIVE FAILURE	ECCS OPERATION PHASE	EFFECTS
HV-4776 & CT-142 (HV-4777 & CT-145)	None (Base Case)	Spray Injection	Valves are open and spray water is being injected by the respective spray pump.
"	"	Spray Recirculation	Valves are open and spray water is being injected by the respective spray pump.
HV-4776 & CT-142 (HV-4777 & CT-145)	Loss of Train AC power	Spray Injection	Valves remain closed and a secondary boundary is being maintained by the closed system outside containment (check valves in the pump discharge) Any leakage past the redundant closed valves is contained by the closed system outside containment. When the pressure across HV-4776 (HV-4777) equalizes, leakage is terminated.
"	"	Spray Recirculation	Same as above.
HV-4776 & CT-142 (HV-4777 & CT-145)	Valve fails to open	Spray Injection	Same as for loss of train.
"	"	Spray Recirculation	Same as for loss of train.

[1] HV-4776 powered by Class 1E Train A (HV-4777 powered by Class 1E Train B)

[2] See Figure 2, Section 4 4.

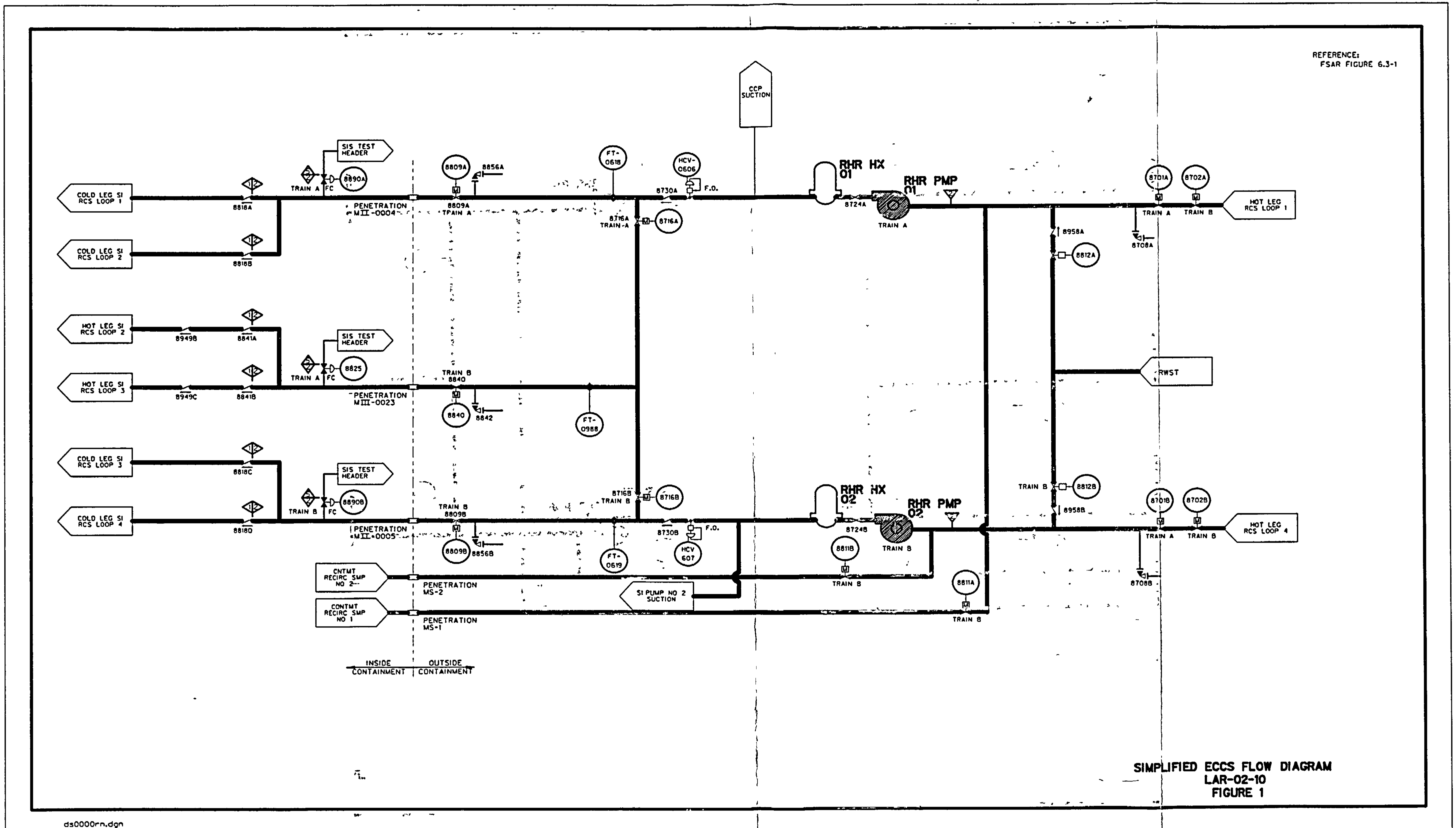
Table 6
FAILURE MODES AND EFFECTS ANALYSIS
CONTAINMENT SPRAY CLOSED SYSTEM ISOLATION

VALVE NO. [1]	SINGLE ACTIVE FAILURE	OPERATION PHASE	EFFECTS
FV-4772-1 & FV-4772-2 (FV-4773-1 & FV-4773-2)	Failure to close (Train Failure)	Injection	None. The spray pumps do not start, the containment spray injection valves do not open The secondary containment boundary is maintained by check valves CT-0065 and CT-0094 (CT-0042 and CT-0013) Single active failure proof secondary isolation is provided.
FV-4772-1 & FV-4772-2 (FV-4773-1 & FV-4773-2)	Failure to close on demand	Injection	None. The spray pump minimum flow line must be isolated prior to switchover to recirculation. If either minimum flow line is not isolated, the spray pumps are stopped The secondary containment boundary is maintained by check valves CT-0065 and CT-0094 (CT-0042 and CT-0013) Single active failure proof secondary isolation is provided.
CT-0082 & CT-0072 (CT-0031 & CT-0020)	Failure to close on demand	Injection	None. The spray pump eductor line is not required to be isolated with the pump running. Failure of the check valve is not assumed coincident with any single active failure which requires the pumps to be stopped. Single active failure proof secondary isolation is provided by the check valves in the pump discharge.
HV-4758 (HV-4759)	Failure to close on demand (or Train failure)	Switchover to Recirculation	None. RWST is isolated form spray pump suction. Check valve CT-0077 (CT-0025) is in series. Redundant, single active failure proof secondary isolation is provided

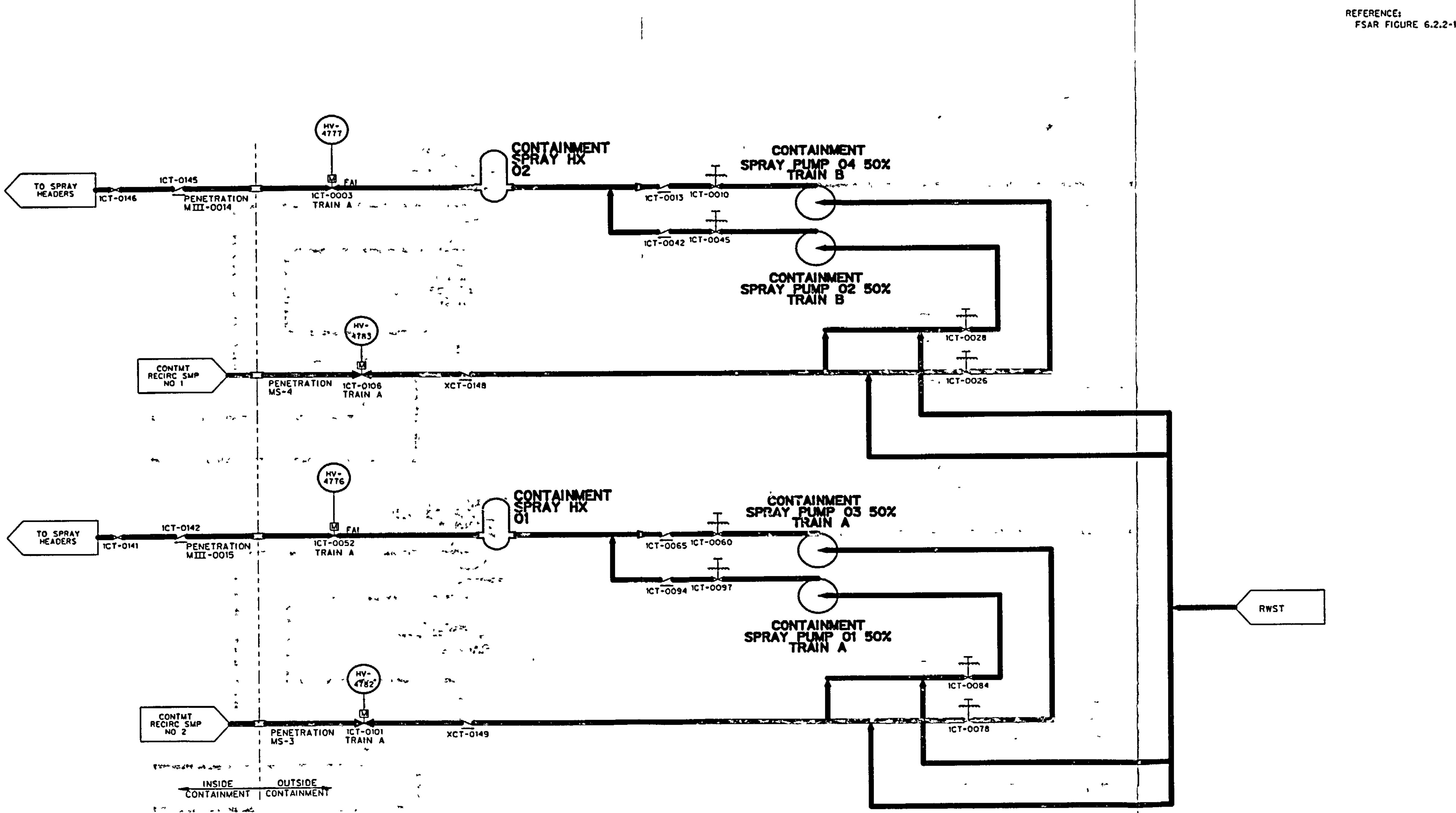
[1] Valves powered by Class 1E Train A (valves powered by Class 1E Train B)

[2] See CPSES FSAR Figure 6 2.2-1

4.4 Figures



SIMPLIFIED ECCS FLOW DIAGRAM
LAR-02-10
FIGURE 1



SIMPLIFIED CONTAINMENT SPRAY DIAGRAM
LAR-02-10
FIGURE 2

ds0000rn.dgn

5.0 REGULATORY SAFETY ANALYSIS

5.1. No Significant Hazards Consideration

TXU Energy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment," as discussed below:

(1) Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

Overall protection system performance will remain within the bounds of the previously performed accident analyses since there are no hardware changes. Protection systems will continue to function in a manner consistent with the plant design basis. All design, material, and construction standards that were applicable prior to the request are maintained.

The probability and consequences of accidents previously evaluated in the FSAR are not adversely affected.

The proposed changes will not involve a significant increase in the probability of any event initiators. There will be no degradation in the performance of, or an increase in the number of challenges imposed on, safety-related equipment assumed to function during an accident situation. There will be no change to normal plant operating parameters or accident mitigation performance.

The proposed changes will not alter any assumptions or change any mitigation actions in the radiological consequence evaluations in the FSAR.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

(2) Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change does not involve any physical alteration of the units. No new equipment is being introduced, and installed equipment is not being operated in a new or different manner. There are no setpoints at which protective or mitigative actions are initiated that are affected by the proposed change. The proposed change will not alter the manner in which equipment operation is initiated, nor will the function demands on credited equipment be changed. No alteration in the procedures, which ensure the unit remains within analyzed limits, is proposed, and no change is being made to procedures relied upon to respond to an off-normal event. As such, no new failure modes are being introduced. The proposed change does not alter

assumptions made in the safety analyses.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

(3) Do the proposed changes involve a significant reduction in a margin of safety?

Response: No

The proposed change will not adversely affect operation of plant equipment and will not result in a change to the setpoints at which protective actions are initiated. None of the acceptance criteria for any accident analysis is changed. There will be no effect on the manner in which safety limits or limiting safety system settings are determined nor will there be any effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling ratio (DNBR) limits, heat flux hot channel factor (F_Q), nuclear enthalpy rise hot channel factor (FDH), loss of coolant accident peak cladding temperature (LOCA PCT), peak local power density, or any other margin of safety. The radiological dose consequence acceptance criteria listed in the Standard Review Plan will continue to be met.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Conclusion:

Based on the above, TXU Energy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/criteria

10 CFR 50, Appendix A, General Design Criteria (GDC) 54, “Systems penetrating containment”

10 CFR 50, Appendix A, General Design Criteria (GDC) 55, “Reactor coolant pressure boundary penetrating containment”

10 CFR 50, Appendix A, General Design Criteria (GDC) 56, “Primary containment isolation”

10 CFR 50, Appendix J, “Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors”

10 CFR 50.36, Technical specifications

NUREG -0737, Section III.D.1.1 Post TMI - Primary Coolant Sources Outside the Containment Structure

CPSES Units 1 and 2 Technical Specifications - Section 5.5.2 Primary Coolant Sources Outside Containment

There have been no changes to the plant design such that any of the regulatory requirements in Section 4.0 would come into question. This amendment application deletes several of the Surveillance Requirements associated with Containment Isolation Valves. The evaluation performed by TXU Energy in Section 5.0 concludes that Comanche Peak will continue to comply with all applicable regulatory requirements.

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

TXU Energy has determined that the proposed amendment would change requirements with respect to the installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. TXU Energy has evaluated the proposed change and has determined that the change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amount of effluent that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22 (c)(9). Therefore, pursuant to 10CFR51.22(b), an environmental assessment of the proposed change is not required.

7.0 REFERENCES

As indicated throughout the Description and Assessment.

ATTACHMENT 2 TO TXX-03040

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARKUP)

Page 3.6-15

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.12	~~Safety injection valves 8809A, 8809B, and 8840 shall be leak tested to be within limits with a gas at a pressure not less than P_a, 48.3 psig, or with water at a pressure not less than 1.1 P_a.~~ Not used.	~~In accordance with the Containment Leakage Rate Testing Program~~
SR 3.6.3.13	~~Containment spray valves HV-4776, HV-4777, CT-142, and CT-145 shall be leak tested to be within limits with water at a pressure not less than 1.1 P_a.~~ Not used.	~~In accordance with the Containment Leakage Rate Testing Program~~

ATTACHMENT 3 TO TXX-03040

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES (MARKUP)

(For Information Only)

Page B 3.6-29

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.10

Not used.

SR 3.6.3.11

Not used.

SR 3.6 3.12 and SR 3.6.3 13

For specific system configurations, credit may be taken for a 30 day water seal that will be maintained to prevent containment atmosphere leakage through the penetration to the environment. The following is a list of the containment isolation valves that meet this system configurationand the Maximum Allowed Leakage Rate (MALR) required to maintain the water seal for 30 days.

Valve No	MALR (cc/hr)
1-8809A	77
1-8809B	77
2-8809A	75
2-8809B	73
1-8840	2577
2-8840	2382
CT-142	4734
CT-145	4734
HV-4776	4734
HV-4777	4734

The surveillance testing for measuring leakage rates, as specified in the Containment Leakage Rate Testing Program, is consistent with Reg. Guide 1.163, 1995 (Ref. 11) and the requirements of Option B of 10CFR50 Appendix J (Ref. 10).
Not used.

SR 3.6.3.13

Not used.

(continued)

ATTACHMENT 4 TO TXX-03040

RETYPED TECHNICAL SPECIFICATION CHANGES

Page 3.6-15

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.6.3.12 Not used.	
SR 3.6.3.13 Not used.	

ATTACHMENT 5 TO TXX-03040

RETYPED TECHNICAL SPECIFICATION BASES CHANGES

(For Information Only)

Page B 3.6-29

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.10

Not used.

SR 3.6.3.11

Not used.

SR 3.6.3.12

Not used.

SR 3 6 3.13

Not used.

(continued)

ATTACHMENT 6 TO TXX-03040

FINAL SAFETY ANALYSIS REPORT PAGES (MARKUP)

(For Information Only)

Pages	6.2-57	
	Table 6.2.4-1 (Sheet 4)	No Change
	Table 6.2.4-1 (Sheet 5)	No Change
	Table 6.2.4-2 (Sheet 3)	
	Table 6.2.4-2 (Sheet 4)	
	Table 6.2.4-2 (Sheet 5)	
	Table 6.2.4-2 (Sheet 6)	
	Table 6.2.4-2 (Sheet 10)	
	Table 6.2.4-2 (Sheet 11)	
	Table 6.2.4-3 (Sheet 4 of 13)	No Change
	Table 6.2.4-3 (Sheet 6 of 13)	No Change
	Table 6.2.4-3 (Sheet 7 of 13)	No Change
	Table 6.2.4-4	No Change
	Table 6.2.4-6 (Sheet 7)	No Change
	Table 6.2.4-6 (Sheet 9)	No Change
	Table 6.2.4-6 (Sheet 10)	No Change
	Figure 6.3-2, Sheet 1	No Change
	Figure 6.3-2, Sheet 2	No Change
	Notes to Figure 6.3-2 (Sheet 1 of 16)	No Change
	Notes to Figure 6.3-2 (Sheet 2 of 16)	No Change
	Notes to Figure 6.3-2 (Sheet 3 of 16)	
	Notes to Figure 6.3-2 (Sheet 4 of 16)	No Change

function of the Containment isolation barriers (i.e., Containment isolation valves) assuming a "P" signal has occurred.

6.2.4.4 Tests and Inspections

A rigorous program of tests and inspections is performed in accordance with 10 CFR Part 50, Appendix J, Option B, to ensure Containment Isolation System pressure integrity, leakage rate, and reliability of operation. Subsection 6.2.6 gives a detailed description. These tests ensure that the leakages from the Containment Isolation System are held within allowable Appendix J, Option B leakage rate limits. Furthermore, these tests verify the operability of the Containment isolation valving. Detailed test procedures utilized and results of tests performed are provided following completion of the tests.

Table 6.2.4-2 list the isolation valves provided for each penetration and indicates the direction in which the isolation valves will be tested. The testing arrangement for containment isolation valves will be controlled via administrative procedures and as described in FSAR Section 6.2.4 and 6.2.6.

All containment penetrations that utilize expansion bellows can be tested at P_a. Table 6.2.4-2 lists all the containment penetrations which are part of fluid system process and instrumentation piping and shows the type of local leakage testing for each penetration. Typical electrical penetration assembly is shown in Figure 3.8-8. List of all electrical penetration assemblies is shown on Figure 8.3-16. Testing of electrical penetration assemblies is described in Section 6.2.6.

Type C tests are performed on Containment isolation valves as indicated in Table 6.2.4-2. Specific exemptions from Type C testing are provided as footnotes to the table. In general these justifications include but are not limited to:

- closed systems meeting the requirements of NUREG-0800 Section 6.2.4, II.6 paragraph ~~0~~ e and o.
- valves in systems which are inservice post accident at a pressure in excess of containment design pressure.
- valves in systems which are water filled for a period of 30 days following an accident.

Figure 6.2.4-1 shows the arrangement of test connections and test vent which permit the isolation valves to be leak tested. During testing the test vent (TV) connection is open and the pressure is applied through the test connection (TC). Test gas is applied at each test connection to establish a test volume in the piping so that the valve is exposed to gas at Containment calculated peak internal pressure. Equipment is laid out in order to minimize the size of the test volume. When necessary, test vents are supplied to ensure that the side of the valve opposite to the test gas is at ambient pressure during the test. Valves are tested in the direction of leakage from the Containment, i.e., from the center of the Containment outwards, with the following exceptions:

FOR INFORMATION ONLY

TABLE 6 2 4-1

(Sheet 4)

CONTAINMENT ISOLATION VALVING APPLICATION

Item	Penetration Number	System	Line or Service	Line Size (Inches)	NRC General Design Criterion or Reg Guide Met	Isolation Valving Arrangement (Fig 6 2 4-1)	Fluid Contained	Engineered Safeguard Feature	FSAR Figure Number
33	MII-2	RH	R H R From Hot Leg Loop #4	12	55	11	Water	No	5 4-6
34	MII-3	RH	R H R From Hot Leg Loop #1	12	55	11	Water	No	5 4-6
35	MII-4	SI	R H R to Cold Leg Loops #1 and #2	10	55	8	Water	Yes	6 3-1
36	MII-5	SI	R.H.R To Cold Leg Loops #3 and #4	10	55	8	Water	Yes	6.3-1
37	MII-6	-	Spare	12	50	-	-	-	-
38	MII-7	-	Spare	24	50	-	-	-	-
39	MII-8	-	Spare	24	50	-	-	-	-
40a	MII-9(A)	-	Maintenance Penetration	2	56	31	Air	No	9 4-6
40b	MII-9(B)	-	Maintenance Penetration	1 1/2	56	31	Air	No	9 4-6
40c	MII-9(C)	-	Maintenance Penetration	2	56	31	Air	No	9 4-6
41	MIII-1	RC	Reactor Make Up Water to Pressurizer Relief Tank & R C Pump Stand Pipe	3	56	4	Water	No	5 1-1
41a	MIII-1	RC	Penetration Thermal Relief	3/4	56	4	Water	No	5.1-1
42	MIII-2	SI	S.I. To Cold Leg Loops #1, #2, #3, & #4	3	55	9	Water	Yes	6 3-1
43	MIII-3	SI	S I to R C System Hot Leg Loops #2 & #3	4	55	8	Water	Yes	6 3-1
44	MIII-4	SI	S I. To R C System Hot Leg Loops #1 & #4	4	55	8	Water	Yes	6.3.1 (Sh. 3)
45	MIII-5	SI	S I To R C. System Cold Leg Loops #1, #2, #3 & #4	4	55	33	Water	Yes	6 3-1
46	MIII-6	CS	Charging Line to Regenerative Heat Exchanger	3	55	25	Water	No	9.3-10
47	MIII-7	CS	Seal Injection to R C. Pump (Loop #1)	2	55	15	Water	No	9 3-10
48	MIII-8	CS	Seal Injection to R C. Pump (Loop #2)	2	55	15	Water	No	9 3-10
49	MIII-9	CS	Seal Injection to R C Pump (Loop #3)	2	55	15	Water	No	9 3-10
50	MIII-10	CS	Seal Injection to R.C. Pump (Loop #4)	2	55	15	Water	No	9 3-10
51	MIII-11	CS	Seal Water Return And Excess Letdown	2	55	24	Water	No	9 3-10

TABLE 6.2.4-1

(Sheet 5)

CONTAINMENT ISOLATION VALVING APPLICATION

Item	Penetration Number	System	Line or Service	Line Size (Inches)	NRC General Design Criterion or Reg Guide Met	Isolation Valving Arrangement (Fig 6 2 4-1)	Fluid Contained	Engineered Safeguard Feature	FSAR Figure Number
52	MIII-12	WP	R C D T Heat Exchanger To Waste Hold Up Tank	3	56	27	Water	No	11.2-2
52a	MIII-12	WP	Penetration Thermal Relief	3/4	56	27	Water	No	11 2-2
53	MIII-13	-	Spare	10	50	-	-	-	-
54	MIII-14	CT	Containment Spray To Spray Header (TR. B)	16	56	25	Water	Yes	6 2 2-1
55	MIII-15	CT	Containment Spray to Spray Header (TR. A)	16	56	25	Water	Yes	6 2 2-1
56	MIII-16	SF	Refueling Water Purification to Refueling Cavity	4	56	14	Air*	No	9 1-13
57	MIII-17	LT	Containment Leak Rate Test	10	56	31	Air	No	9 4-6
58	MIII-18	VA	Hydrogen Purge Supply	12	56	20	Air	No	9 4-6
59	MIII-19	VA	Hydrogen Purge Exhaust	12	56	21	Air	No	9.4-6
60	MIII-20	DD	Demineralized Water Supply	3	56	5	Water	No	9 2-5
60a	MIII-20	DD	Penetration Thermal Relief	3/4	56	5	Water	No	9.2-5
61	MIII-21	VD	Containment Sump Pump Discharge	4	56	22	Water	No	9 3-5
61a	MIII-21	VD	Penetration Thermal Relief	3/4	56	22	Water	No	9 3-5
62	MIII-22	CI	Instrument Air To Containment	3	56	7	Air	No	9 3-1
63	MIII-23	SI	R H R To Hot Leg Loops #2& #3	10	55	8	Water	Yes	6 3-1 (Sh. 3)
64	MIII-24	-	Spare	12	50	-	-	-	-
65	MIII-25	-	Spare	12	50	-	-	-	-
66	MIII-26	-	Spare	12	50	-	-	-	-
67	MIII-27	SF	Refueling Cavity To Refueling Water Purification Pump	4	56	14	Air*	No	9.1-13
68	MIII-28	-	Spare	12	50	-	-	-	-
69	MIII-29	-	Spare	12	50	-	-	-	-
70	MIII-30	LT	Containment Leak Rate Test Pressurization	12	56	31	Air	No	9 4-6
71	MIII-31	SF	Refueling Cavity Skimmer Pump Discharge (System no longer used)	3	56	14	Air	No	9 1-13
72	MIII-32	-	Spare	12	50	-	-	-	-
73	MIV-1(a)	MS	Sample From Steam Generator #1	3/4	57	35	Sat. Water	No	10 3-1

TABLE 6 2.4-2

(Sheet 3)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 8)

Item	Isolation Valve No (Note 6)	Location in Relation to Containment	Type of Leakage Rate Test	Direction of Test (Note 10)	Length of Pipe U1/U2 to Outermost Isolation Valve (ft)	Valve Type/Operator	Method of Actuation Primary	Secondary
	HV-2492B	Outside	Note 1	N/A	50'/54'-7"	Gate/Motor	Remote Manual	Local Manual
22b	FW-104	Outside	Note 1	N/A	-	Globe/Manual	Local Manual	N/A
22c	FV-2194	Outside	Note 1	N/A	29'-6"/30'-9"	Globe/Air	Auto close	Remote Manual
22d	HV-2186	Outside	Note 1	N/A	12'-8"/11'-8"	Globe/Air	Auto close	Remote Manual
23	HV-2136	Outside	Note 1	N/A	10'/15'-4"	Gate/Hydr. N_2 Actuator	Auto close	Remote Manual
24a	HV-2493A	Outside	Note 1	N/A	50'/50'-5"	Gate/Motor	Remote Manual	Local Manual
	HV-2493B	Outside	Note 1	N/A	50'/53'-5"	Gate/Motor	Remote Manual	Local Manual
24b	FW-102	Outside	Note 1	N/A	-	Globe/Manual	Local Manual	N/A
24c	FV-2195	Outside	Note 1	N/A	30'-9"/33'-0"	Globe/Air	Auto close	Remote Manual
24d	HV-2187	Outside	Note 1	N/A	12'-8"/11'-9"	Globe/Air	Auto close	Remote Manual
25	HV-2137	Outside	Note 1	N/A	10'/15'-3"	Gate/Hydr. N_2 Actuator	Auto close	Remote Manual
26	-	-	-	-	-	-	-	-
26a	HV-2494A	Outside	Note 1	N/A	50'/50'-4"	Gate/Motor	Remote Manual	Local Manual
	HV-2494B	Outside	Note 1	N/A	50'/53'8"	Gate/Motor	Remote Manual	Local Manual
26b	FW-108	Outside	Note 1	N/A	-	Globe/Manual	Local Manual	N/A
26c	FV-2196	Outside	Note 1	N/A	31'-10"/33'-1"	Globe/Air	Auto close	Remote Manual
26d	HV-2188	Outside	Note 1	N/A	12'-8"/11'-9"	Globe/Air	Auto close	Remote Manual
27	HV-2399	Outside	Note 1	N/A	17'/16'-6"	Globe/Air	Auto close	Remote Manual
28	HV-2398	Outside	Note 1	N/A	17'/16'-2"	Globe/Air	Auto close	Remote Manual
29	HV-2397	Outside	Note 1	N/A	17'/16'-0"	Globe/Air	Auto close	Remote Manual
30	HV-2400	Outside	Note 1	N/A	17'/16'-8"	Globe/Air	Auto close	Remote Manual
31	-	-	A	N/A	-	-	-	-
32	8152	Outside	C	YES	7'/7'-7"	Globe/Air	Auto close	Remote Manual
	8160	Inside	C	YES	-	Globe/Air	Auto close	Remote Manual
33	8701B	Inside	Note 17	N/A	N/A	Gate/Motor	Remote Manual	Remote Manual
	8708B	Inside	Note 17	N/A	N/A	Relief	Self-Actuated	N/A
34	8701A	Inside	Note 17	N/A	N/A	Gate/Motor	Remote Manual	Local Manual
	8708A	Inside	Note 17	N/A	N/A	Relief	Self-Actuated	N/A
35	8809A	Outside	Note 3	~~YES~~N/A	8'/9'-11"	Gate/Motor	Remote Manual	Local Manual
	8818A	Inside	Note 11	N/A	-	Check	Self-Actuated	N/A
	8818B	Inside	Note 11	N/A	-	Check	Self-Actuated	N/A

TABLE 6 2 4-2

(Sheet 4)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 8)

Item	Isolation Valve No (Note 6)	Location in Relation to Containment	Type of Leakage Rate Test	Direction of Test (Note 10)	Length of Pipe U1/U2 to Outermost Isolation Valve (ft)	Valve Type/Operator	Method of Actuation Primary	Secondary
	8890A	Inside	C	YES	-	Globe/Air	Auto close	Remote Manual
36	8809B	Outside	Note 3	~~YES~~N/A	3'/5'-9"	Gate/Motor	Remote Manual	Local Manual
	8818C	Inside	Note 11	N/A	-	Check	Self-Actuated	N/A
	8818D	Inside	Note 11	N/A	-	Check	Self-Actuated	N/A
	8890B	Inside	C	YES	-	Globe/Air	Auto close	Remote Manual
37	-	-	A	N/A	-	-	-	-
38	-	-	A	N/A	-	-	-	-
39	-	-	A	N/A	-	-	-	-
40a	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A
40b	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A
40c	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A
41	8046	Inside	C	YES	-	Check	Self-Actuated	N/A
	8047	Outside	C	YES	16'/18'-1"	Diaphragm/Air	Auto close	Remote Manual
41a	RC-036	Outside	C	YES	-	Relief	Self-Actuated	N/A
42	8815	Inside	Note 2	N/A	-	Check	Self-Actuated	N/A
	8801A	Outside	Note 7	N/A	13'/16'-1"	Gate/Motor	Remote Manual	N/A
	8801B	Outside	Note 7	N/A	13'/16'-1"	Gate/Motor	Remote Manual	N/A
	8843	Inside	Note 2	N/A	-	Globe/Air	Auto close	Remote Manual
43	8802A	Outside	Note 12	N/A	11'/13'-0"	Gate/Motor	Remote Manual	Local Manual
	SI-8905B	Inside	Note 12	N/A	-	Check	Self-Actuated	N/A
	SI-8905C	Inside	Note 12	N/A	-	Check	Self-Actuated	N/A
	8881	Inside	Note 12	N/A	-	Globe/Air	Auto close	Remote Manual
44	8802B	Outside	Note 12	N/A	12'/13'-9"	Gate/Motor	Remote Manual	Local Manual
	SI-8905A	Inside	Note 12	N/A	-	Check	Self-Actuated	N/A
	SI-8905D	Inside	Note 12	N/A	-	Check	Self-Actuated	N/A
	8824	Inside	Note 12	N/A	-	Globe/Air	Auto close	Remote Manual
45	8835	Outside	Note 13	N/A	16'/19'-1"	Gate/Motor	Remote Manual	Local Manual
	SI-8819A	Inside	Note 13	N/A	-	Check	Self-Actuated	N/A
	SI-8819B	Inside	Note 13	N/A	-	Check	Self-Actuated	N/A
	SI-8819C	Inside	Note 13	N/A	-	Check	Self-Actuated	N/A
	SI-8819D	Inside	Note 13	N/A	-	Check	Self-Actuated	N/A
	8823	Inside	Note 13	N/A	-	Globe/Air	Auto close	Remote Manual
46	8105	Outside	C	YES	3'/10'-7"	Gate/Motor	Auto close	Remote Manual

TABLE 6 2 4-2

(Sheet 5)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 8)

Item	Isolation Valve No (Note 6)	Location in Relation to Containment	Type of Leakage Rate Test	Direction of Test (Note 10)	Length of Pipe U1/U2 to Outermost Isolation Valve (ft)	Valve Type/Operator	Method of Actuation Primary	Secondary
	8381	Inside	C	YES	-	Check	Self-Actuated	N/A
47	CS-8368A	Inside	Note 4	N/A	-	Check	Self-Actuated	N/A
	8351A	Outside	Note 4	N/A	6'/15'-7"	Globe/Motor	Remote Manual	Local Manual
48	CS-8368B	Inside	Note 4	N/A	-	Check	Self-Actuated	N/A
	8351B	Outside	Note 4	N/A	7'/9'-9"	Globe/Motor	Remote Manual	Local Manual
49	CS-8368C	Inside	Note 4	N/A	-	Check	Self-Actuated	N/A
	8351C	Outside	Note 4	N/A	2'/11'-11"	Globe/Motor	Remote Manual	Local Manual
50	CS-8368D	Inside	Note 4	N/A	-	Check	Self-Actuated	N/A
	8351D	Outside	Note 4	N/A	10'/10'-3"	Globe/Motor	Remote Manual	Local Manual
51	8100	Outside	C	YES	7'/7'-1"	Globe/Motor	Auto close	Remote Manual
	8112	Inside	C	YES	-	Globe/Motor	Auto close	Remote Manual
	CS-8180	Inside	C	YES	-	Check	Self-Actuated	N/A
52	7136	Inside	C	YES	-	Diaph /Air	Auto close	Remote Manual
	LCV-1003	Outside	C	YES	30'/23'-11"	Globe/Air	Auto close	Remote Manual
	7135	Outside	C	YES	30'/24'-2"	Diaph /Manual	Local Manual	N/A
52a	WP-7176	Outside	C	YES	-	Relief	Self-Actuated	N/A
53	-	-	A	N/A	-	-	-	-
54	HV-4777	Outside	Note 3	~~YES~~N/A	15'/16'-7"	Gate/Motor	Remote Manual	N/A
	CT-145	Inside	Note 3	~~YES~~N/A	-	Check	Self-Actuated	N/A
55	HV-4776	Outside	Note 3	~~YES~~N/A	9'/16'-9"	Gate/Motor	Remote Manual	N/A
	CT-142	Inside	Note 3	~~YES~~N/A	-	Check	Self-Actuated	N/A
56	SF-011	Outside	C	YES	11'/18'-6"	Diaphragm/Man.	Local Manual	N/A
	SF-012	Inside	C	YES	-	Diaphragm/Man	Local Manual	N/A
57	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A
58	HV-5542	Outside	C	YES	5'-6"/1'-5"	Butterfly/Motor	Auto close	Remote Manual
	HV-5543	Inside	C	NO	-	Butterfly/Motor	Auto close	Remote Manual
	HV-5563	Inside	C	NO	-	Butterfly/Motor	Auto close	Remote Manual
59	HV-5540	Outside	C	YES	5'-6"/5'-10"	Butterfly/Motor	Auto close	Remote Manual
	HV-5541	Inside	C	NO	-	Butterfly/Motor	Auto close	Remote Manual
	HV-5562	Inside	C	NO	-	Butterfly/Motor	Auto close	Remote Manual
60	HV-5365	Outside	C	YES	12'/14'-8"	Globe/Air	Auto close	Remote Manual
	HV-5366	Inside	C	YES	-	Globe/Air	Auto close	Remote Manual

TABLE 6 2 4-2

(Sheet 6)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 8)

Item	Isolation Valve No (Note 6)	Location in Relation to Containment	Type of Leakage Rate Test	Direction of Test (Note 10)	Length of Pipe U1/U2 to Outermost Isolation Valve (ft)	Valve Type/Operator	Method of Actuation Primary	Secondary
60a	DD-430	Outside	C	YES	-	Relief	Self-Actuated	N/A
61	HV-5157	Outside	C	YES	14'/16'-2"	Diaphragm/Air	Auto close	Remote Manual
	HV-5158	Inside	C	NO	-	Diaphragm/Air	Auto close	Remote Manual
61a	1VD-907 (2VD-0896)	Outside	C	YES	-	Relief	Self-Actuated	N/A
62	HV-3487	Outside	C	YES	14'/17'-3"	Globe/Air	Auto close	Remote Manual
	CI-030	Inside	C	YES	-	Check	Self-Actuated	N/A
63	8840	Outside	Note 3	~~YES~~N/A	26'/27'-8"	Gate/Motor	Remote Manual	Local Manual
	8825	Inside	C	YES	-	Globe/Air	Auto close	Remote Manual
	8841A	Inside	Note 14	N/A	-	Check	Self-Actuated	N/A
	8841B	Inside	Note 14	N/A	-	Check	Self-Actuated	N/A
64	-	-	A	N/A	-	-	-	-
65	-	-	A	N/A	-	-	-	-
66	-	-	A	N/A	-	-	-	-
67	SF-021	Inside	C	YES	-	Diaphragm/Man.	Local Manual	N/A
	SF-022	Outside	C	YES	11'/8'-2"	Diaphragm/Man	Local Manual	N/A
68	-	-	A	-	-	-	-	-
69	-	-	A	-	-	-	-	-
70	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A
71	1SF-053 (2SF-055)	Inside	C	YES	-	Diaphragm/Man	Local Manual	N/A
	1SF-054 (2SF-056)	Outside	C	YES	7'/4'-10"	Diaphragm/Man	Local Manual	N/A
72	-	-	A	N/A	-	-	-	-
73	HV-2405	Outside	Note 1	N/A	5'-3"/11'-8"	Globe/Air	Auto close	Remote Manual
74	HV-4170	Outside	C	YES	6'-0"/8'-0"	Angle/Air	Auto close	Remote Manual
	HV-4168	Inside	C	YES	-	Angle/Air	Auto close	Remote Manual
	HV-4169	Inside	C	YES	-	Angle/Air	Auto close	Remote Manual
74a	PS-503	Outside	C	YES	-	Relief	Self-Actuated	N/A
75	-	-	A	N/A	-	-	-	-
76	HV-2406	Outside	Note 1	N/A	5'-6"/12'-11"	Globe/Air	Auto close	Remote Manual
77	HV-4167	Outside	C	YES	3'-8"/8'-1"	Angle/Air	Auto close	Remote Manual
	HV-4166	Inside	C	YES	-	Angle/Air	Auto close	Remote Manual

TABLE 6 2 4-2

(Sheet 10)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 8)

Item	Isolation Valve No (Note 6)	Location in Relation to Containment	Type of Leakage Rate Test	Direction of Test (Note 10)	Length of Pipe U1/U2 to Outermost Isolation Valve (ft)	Valve Type/Operator	Method of Actuation Primary	Secondary
129	Bellows	N/A	B	N/A	N/A	N/A	N/A	N/A
	Flange	N/A	B	N/A	N/A	N/A	N/A	N/A
130	1BS-0016	Outside	Note 1	N/A	1	Globe/Manual	Local Manual	N/A
	1BS-0017	Outside	Note 1	N/A	1	Globe/Manual	Local Manual	N/A
131	1BS-0030	Inside	C	No	1	Ball/Hydraulic	Local Hydraulic	N/A
	1BS-0025	Inside	C	Yes	1	Ball/Hydraulic	Local Hydraulic	N/A
131a	1BS-0056	Inside	C	No	1	Ball/Manual	Local Manual	N/A
	1BS-0044	Inside	C	No	1	Ball/Manual	Local Manual	N/A
	1BS-0029	Inside	C	Yes	1	Ball/Manual	Local Manual	N/A
	1BS-0015	Outside	C	Yes	1	Ball/Manual	Local Manual	N/A
132	BS-0202	Inside	C	No	1	Ball/Manual	Local Manual	N/A
	BS-0203	Inside	C	Yes	1	Ball/Manual	Local Manual	N/A
133	2BS-0016	Inside	C	No	1	Globe/Manual	Local Manual	N/A
	2BS-0017	Inside	C	No	1	Globe/Manual	Local Manual	N/A
	2BS-0039	Inside	C	Yes	1	Globe/Manual	Local Manual	N/A
	2BS-0040	Inside	C	Yes	1	Globe/Manual	Local Manual	N/A
134	2BS-0030	Inside	C	No	1	Ball/Hydraulic	Local Hydraulic	N/A
	2BS-0025	Outside	C	Yes	1	Ball/Hydraulic	Local Hydraulic	N/A
134a	2BS-0056	Inside	C	No	1	Relief/Spring Closed	Local Manual	N/A
	2BS-0044	Inside	C	No	1	Relief/Spring Closed	Local Manual	N/A
	2BS-0029	Inside	C	Yes	1	Relief/Spring Closed	Local Manual	N/A
	2BS-0015	Outside	C	Yes	1	Relief/Spring Closed	Local Manual	N/A

NOTES

1. These are closed systems which meet the requirements of NUREG-0800, Section 6 2 4, II 6, paragraph o. These valves are therefore not required to be tested.

2 These valves inside containment are part of closed systems outside containment which are in service post-accident at a pressure in excess of containment design pressure and satisfy single active failure criteria These valves are therefore not required to be tested

3 These are closed systems outside containment which are in service post-accident and have a water filled loop seal on the containment side of the valves. ~~for a period greater than 30 days following the accident.~~ These valves are either open or are closed providing a third barrier to containment leakage. A water seal is maintained both inside and outside containment. These valves are therefore not required to be leakrate tested, ~~with water at a pressure of not less than 1.1 P_a or air at a pressure of P_a.~~

4. These ESF valves are normally open and remain open during post-accident conditions Post-accident they are continually pressurized in excess of containment pressure from an ESF source which meets the single active failure criteria These valves are therefore not to be tested

TABLE 6 2 4-2

(Sheet 11)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 8)

5. This valve is not required to be leakage tested per 10 CFR 50 Appendix J since the downstream pressure indicator sensing element is dead-ended, and is hydrostatically tested to 1 5 times the design pressure of the pipe, thus providing a leaktight barrier similar to vent and drain connections having capped ends and under administrative controls.

6 Unit 1 and Unit 2 Tag Numbers are generally the same except for the prefix or as otherwise noted.

7. These are parallel ESF valves that are normally closed, but are designed to open during post-accident conditions. Failure of one valve to open will not prevent system pressurization on both sides of both valves in excess of containment pressure. These valves are therefore not required to be tested

8 Table does not list local vent, drain and test connections as they are a special class of containment isolation valve per FSAR Section 6 2 4 1 3 These valves are locked closed and capped to meet containment isolation criteria if located within the pressure boundary These valves do not require Type C testing

9. These penetrations are normally closed and upon initial ESF actuation remain closed with a water seal from the RWST. During the ESF recirculation phases, the RHR and Containment Spray suction side isolation valves are open and supplying water to their respective ESF pumps Water in the containment sump provides a seal between the containment atmosphere (post-accident) and these valves

10. "YES" signifies that the isolation valve test pressure is applied in the same direction as the pressure existing when the valve is required to perform its containment isolation function

"NO" signifies that the isolation valve test pressure is not applied in the same direction as the pressure existing when the valve is required to perform its safety function.

11. This penetration is an engineered safety feature system supplying RHR pump flow (valves opened) to the cold legs of the RCS during cold leg injection and cold leg recirculation modes of operation During hot leg recirculation this penetration is not in service (valves closed) but is pressurized by the residual heat removal pumps to a pressure in excess of 1.1 times the containment design pressure. ~~In addition, the outside containment motor generated valves are Type C tested, thus any Leakage at the penetration would be contained at the motor operated valves.~~ The outside containment motor operated valve and the closed system ouside containment provide two boundaries in addition to this valve. These valves are therefore not required to be Type C tested.

12. This penetration is an Engineered Safety Feature System supplying SI pump flow (valves opened) to the hot legs of the RCS during hot leg recirculation mode of operation During cold leg injection and cold leg recirculation this penetration is not in service (valves closed) but is pressurized by the safety injection pumps to a pressure in excess of 1.1 times the containment design pressure This ensures that leakage path for containment atmosphere does not exist during a LOCA Therefore, these valves are not required to be Type C tested

13. This penetration is an Engineered Safety Feature System supplying SI pump flow (valves opened) to the cold legs of the RCS during cold leg injection and cold leg recirculation modes of operation. During hot leg recirculation this penetration is not in service (valves closed) but is pressurized by the safety injection pumps to a pressure in excess of containment design pressure This ensures that a leakage path for containment atmosphere does not exist during a LOCA. Therefore, these valves are not required to be Type C tested.

14. This penetration is an Engineered Safety Feature System supplying RHR pump flow (valves opened) to the hot legs of the RCS during hot leg recirculation mode of operation. During cold leg injection ~~and cold leg recirculation~~ this penetration is not in service (valve closed) but is pressurized by the residual heat removal pumps to a pressure in excess of containment design pressure ~~In addition, the outside containment motor operated valve is Type C tested, thus any leakage at the penetration would be contained at the motor operated valve.~~ During cold leg recirculation, this penetration is not in service but is isolated by a minimum of two additional valves outside containment. These valves are therefore not required to be Type C tested

15. Due to the piping arrangement, these valves cannot be tested individually; as such the leak test will result in a combined leak rate for both isolation valves under test conditions.

16. These valves function as local manual isolation for penetrations MI-1, MI-4 following exhaustion of air accumulators for HV-2452-1, -2 (see FSAR Section 9.3.1.2 discussion regarding accumulators for main steam supply to AFW pump turbine)

17. These valves do not require Appendix J Type C leak rate testing. An effective fluid seal on these penetrations is provided by the suction sources to the residual heat removal pumps during and following an accident In addition, these containment isolation valves are non-automatic, are not required to operate post-accident and are located inside containment. See Section 6.2.4.1.3, items 3 and 5 for details

FOR INFORMATION ONLY

TABLE 6 2 4-3

(Sheet 4 of 13)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 1)

Item	Containment Isolation Signal	Valve Position: Normal	Valve Position: Shutdown	Valve Position: Post-Accident	Valve Power Failure	Valve Closure Time (Sec)	Power Source	Remarks
28	Phase A	Opened	Closed	Closed	Closed	5	A/B	Remote Manual Isolation Satisfies CDC-57
29	Phase A	Opened	Closed	Closed	Closed	5	A/B	Remote Manual Isolation Satisfies CDC-57
30	Phase A	Opened	Closed	Closed	Closed	5	A/B	Remote Manual Isolation Satisfies CDC-57
31	-	-	-	-	-	-	-	
32	Phase A	Opened	Closed	Closed	Closed	10	B	
	Phase A	Opened	Closed	Closed	Closed	10	A	
33	-	Closed/Opened	Opened	Closed	FAI	N/A	B	Relief valve is
		Closed	Closed	Closed	N/A	N/A	-	closed in backflow direction at all times
34	-	Closed/Opened	Opened	Closed	FAI	N/A	A	Relief valve is
		Closed	Closed	Closed	N/A	N/A	-	closed in backflow direction at all times
35	-	Opened	Opened	Opened/Closed	FAI	N/A	A	
	-	Closed	Closed	Opened/Closed	-	-	-	Check Valve
	Phase A	Closed	Closed	Closed	Closed	15	A	Air operated valve on test line
36	-	Opened	Opened	Opened	FAI	-	B	
	Closed	Closed	Opened/Closed	-	-	-		Check Valve
	Phase A	Closed	Closed	Closed	Closed	15	B	Air operated valve on test line
37	-	-	-	-	-	-	-	
38	-	-	-	-	-	-	-	
39	-	-	-	-	-	-	-	
40(a)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Flanged
40(b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Flanged
40(c)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Flanged
41	-	Closed	Closed	Closed	-	-	-	Check Valve
	Phase A	Closed	Closed	Closed	Closed	10	B	

FOR INFORMATION ONLY

TABLE 6 2 4-3

(Sheet 6 of 13)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 1)

Item	Containment Isolation Signal	Valve Position Normal	Shutdown	Post-Accident	Valve Power Failure	Valve Closure Time (Sec)	Power Source	Remarks
49	-	Opened	Opened/Closed	Opened	-	-	-	Check Valve
	-	Opened	Opened/Closed	Open	FAI	N/A	B	
50	-	Opened	Opened/Closed	Opened	-	-	-	Check Valve
	-	Opened	Opened/Closed	Open	FAI	N/A	B	
51	Phase A	Opened	Opened/Closed	Closed	FAI	10	B (8100)	
	Phase A	Opened	Opened/Closed	Closed	FAI	10	A (8112)	
	-	Closed	Closed	Open/Closed	-	-	-	Thermal Relief Check Valve
52	Phase A	Opened	Opened	Closed	Closed	10	B	
	Phase A	Opened	Opened	Closed	Closed	10	A	
	-	Closed	Closed	Closed	N/A	N/A	-	Manual Valve
52a	-	Closed	Closed	Open/Closed	N/A	N/A	-	Thermal Relief Valve
53	-	-	-	-	-	-	-	
54	-	Closed	Closed	Closed/Opened	FAI	N/A	B	
	-	Closed	Closed	Closed/Open	-	-	-	Check Valve
55	-	Closed	Closed	Closed/Opened	FAI	-	A	
	-	Closed	Closed	Closed/Open	-	-	-	Check Valve
56	-	Closed	Closed	Closed	N/A	N/A	-	
	-	Closed	Opened/Closed	Closed	N/A	N/A	-	
57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
58	Containment Vent. Isolation	Closed	Closed	Closed/Open	FAI	N/A	B (HV-5542)	(Note 3)
	Containment Vent Isolation	Closed	Closed	Closed/Open	FAI	N/A	A (HV-5543)	(Note 3)
	Containment Vent. Isolation	Closed	Closed	Closed/Open	FAI	N/A	B (HV-5563)	(Note 3)

FOR INFORMATION ONLY

TABLE 6 2 4-3

(Sheet 7 of 13)

CONTAINMENT ISOLATION VALVING APPLICATION (Note 1)

Item	Containment Isolation Signal	Valve Position Normal	Shutdown	Post-Accident	Valve Power Failure	Valve Closure Time (Sec)	Power Source	Remarks
59	Containment Vent Isolation	Closed	Closed	Closed/Open	FAI	N/A	B (HV-5540)	(Note 3)
	Containment Vent Isolation	Closed	Closed	Closed/Open	FAI	N/A	A (HV-5541)	(Note 3)
	Containment Vent Isolation	Closed	Closed	Closed/Open	FAI	N/A	B (HV-5562)	(Note 3)
60	Phase A	Closed	Opened	Closed	Closed	5	B	Provides automatic fire protection water
	Phase A	Closed	Opened	Closed	Closed	5	A	
60a	-	Closed	Closed	Open/Closed	N/A	N/A	-	Thermal Relief Valve
61	Phase A	Open	Closed	Closed	Closed	5	B	
	Phase A	Open	Closed	Closed	Closed	5	A	
61a	-	Closed	Closed	Open/Closed	N/A	N/A	-	Thermal Relief Valve
62	Phase A	Open	Open	Closed/Open	Closed	5	B	
	-	Open	Open	Closed/Open	-		-	Check Valve
63	-	Closed	Closed	Closed/Opened	FAI	A/N	B	
	Phase A	Closed	Closed	Closed	Closed	15	A	Air operated valve on test line
	-	Closed	Closed	Closed/Opened	-	-	-	Check Valve
	-	Closed	Closed	Closed/Opened	-	-	-	Check Valve
64	-	-	-	-	-	-	-	
65	-	-	-	-	-	-	-	
66	-	-	-	-	-	-	-	
67	-	Closed	Closed	Closed	N/A	N/A	-	
	-	Closed	Closed	Closed	N/A	N/A	-	
68	-	-	-	-	-	-	-	
69	-	-	-	-	-	-	-	
70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
71	-	Closed	Closed	Closed	N/A	N/A	-	
	-	Closed	Closed	Closed	N/A	N/A	-	

TABLE 6.2.4-4

PENETRATIONS THAT ARE NOT DRAINED AND VENTED DURING CONTAINMENT INTEGRATED LEAKAGE RATE (TYPE A) TEST **

Item	Penetration No.	System
33	MII-2	RHR
34	MII-3	RHR
35	MII-4	SI
36	MII-5	SI
42	MIII-2	SI
43	MIII-3	SI
44	MIII-4	SI
45	MIII-5	SI
47*	MIII-7	CS
48*	MIII-8	CS
49*	MIII-9	CS
50*	MIII-10	CS
54	MIII-14	CT
55	MIII-15	CT
63	MIII-23	SI
92	MIV-7 (b)	VA
95	MIV-8 (b)	VA
98	MIV-9 (b)	VA
101	MIV-10 (b)	VA
120*	MV-12	CH
120a*	MV-13	CH
121*	MV-13	CH
121a	MV-13	CH
125	MS-1	SI
126	MS-2	SI
127	MS-3	CT
128	MS-4	CT

* Items maybe water filled during Type A testing but are not necessarily water filled post-accident.

** Type C penetrations, conforming to GDC-57, are not necessarily drained or vented during the Type A test. See Table 6.2.4-1, Items 1 to 30, 73, 76, 79, 82, 111, 112, 130

In addition other penetrations not shown on this table may not be vented and drained as discussed in section 6.2.6.1.

FOR INFORMATION ONLY

TABLE 6.2.4-6

(Sheet 7)

CLASSIFICATION OF SYSTEMS PATHS PENETRATION CONTAINMENT WALL

Item	Penetration Number	System	Normal Operating Function	Classification	Post-Accident Function
32	MII-1	CS	Letdown Line to Letdown Heat Exchanger	non-essential	None
33	MII-2	RH	R.H.R. From Hot Leg Loop #4	non-essential	None
34	MII-3	RH	R.H.R. From Hot Leg Loop #1	non-essential	None
35	MII-4	SI	None	essential	Injection of cooling water into the cold leg loops #1 and #2
36	MII-5	SI	None	essential	Injection of cooling water into the cold leg loops #3 and #4
37	MII-6	-	Spare	-	-
38	MII-7	-	Spare	-	-
39	MII-8	-	Spare	-	-
40a	MII-9A	-	Maintenance Penetration	non-essential	None
40b	MII-9B	-	Maintenance Penetration	non-essential	None
40c	MII-9C	-	Maintenance Penetration	non-essential	None

FOR INFORMATION ONLY

TABLE 6.2.4-6

(Sheet 9)

CLASSIFICATION OF SYSTEMS PATHS PENETRATION CONTAINMENT WALL

Item	Penetration Number	System	Normal Operating Function	Classification	Post-Accident Function
48	MIII-8	CS	Seal Injection to R.C. Pump (Loop #2)	Essential (Note 2)	Seal Water Injection
49	MIII-9	CS	Seal Injection to R.C. Pump (Loop #3)	Essential (Note 2)	Seal Water Injection
50	MIII-10	CS	Seal Injection to R.C. Pump (Loop #4)	Essential (Note 2)	Seal Water Injection
51	MIII-11	CS	Seal Water Return to R.C. Excess Letdown	non-essential	none
52	MIII-12	WP	R.C.D.T. Heat Exchanger To Waste Hold Up Tank	non-essential	
52a	MIII-12	WP	None	non-essential	none
53	MIII-13	-	Spare	-	-
54	MIII-14	CT	None	essential	Containment Spray To Spray Header (Train B)
55	MIII-15	CT	None	essential	Containment Spray To Spray Header (Train A)

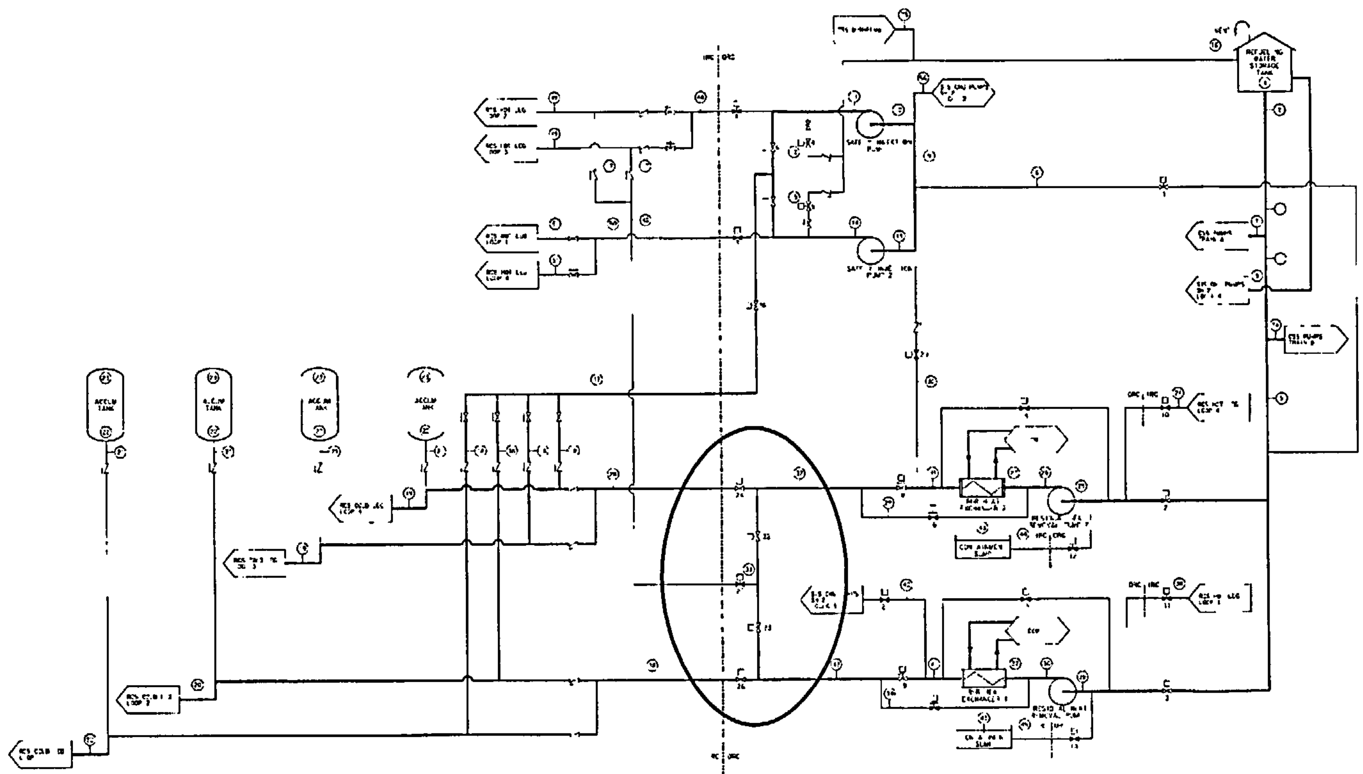
FOR INFORMATION ONLY

TABLE 6.2.4-6

(Sheet 10)

CLASSIFICATION OF SYSTEMS PATHS PENETRATION CONTAINMENT WALL

Item	Penetration Number	System	Normal Operating Function	Classification	Post-Accident Function
56	MIII-16	SF	Refueling Water Purification to Refueling Cavity	non-essential	none
57	MIII-17	LT	None	non-essential	none
58	MIII-18	VA	None	non-essential	none
59	MIII-19	VA	None	non-essential	none
60	MIII-20	DD	Demineralized Water Supply	non-essential	none
60a	MIII-20	DD	None	non-essential	none
61	MIII-21	VD	Containment Sump Pump Discharge	non-essential	none
61a	MIII-21	VD	None	non-essential	none
62	MIII-22	CI	Instrument Air to Containment	non-essential	Post-Accident Sampling
63	MIII-23 #2 & #3	SI	R.H.R. To Hot Leg Loops	essential	Core Cooling
64	MIII-24	-	Spare	-	-

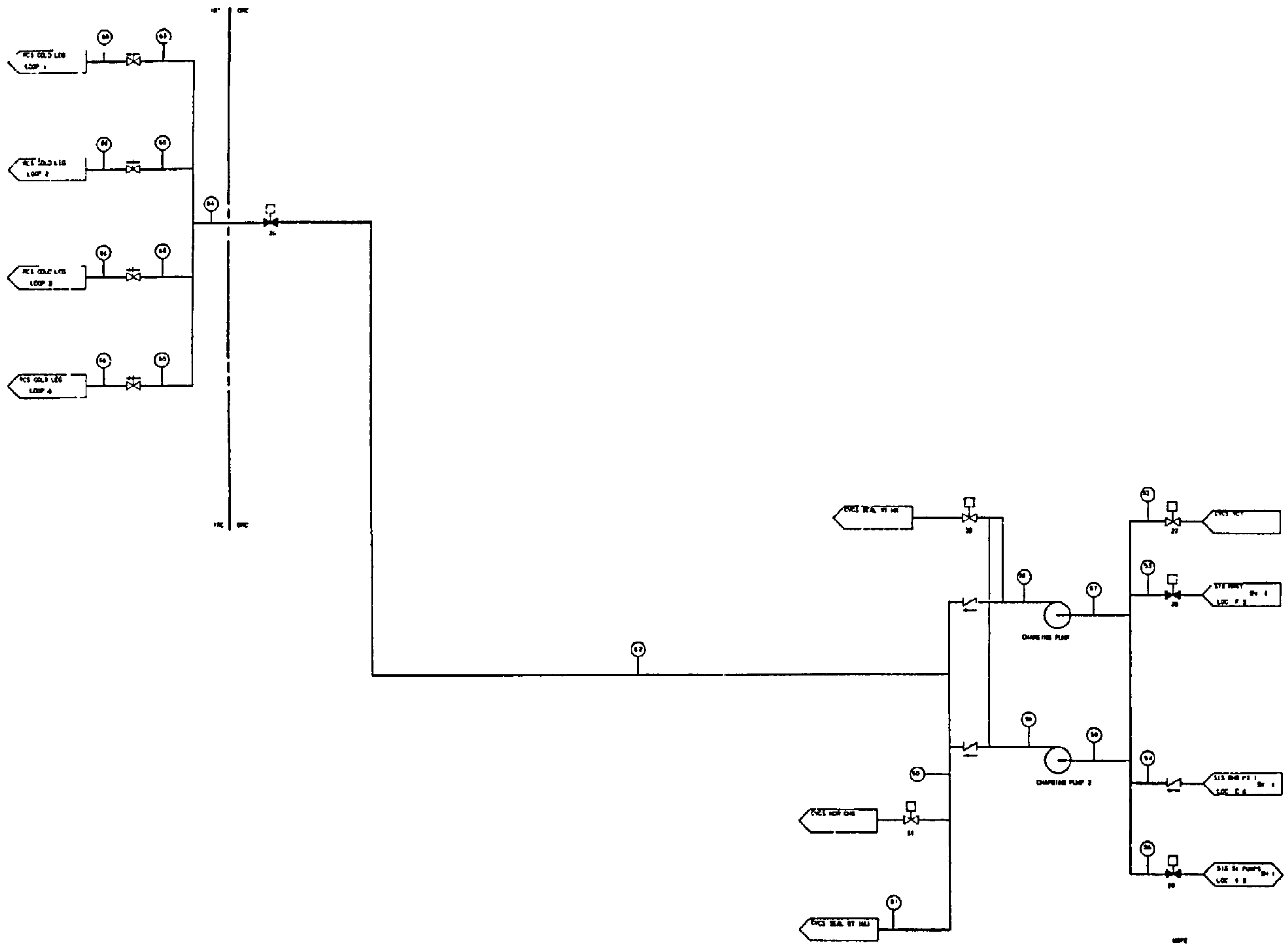


FOR INFORMATION ONLY

COMANCHE PEAK S.E.S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

SAFETY INJECTION/RESIDUAL
HEAT REMOVAL SYSTEM
PROCESS FLOW DIAGRAM

6 3 2, SH 1



FOR INFORMATION ONLY

AMENDMENT 16
MARCH 31, 1981

COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Safety Injection/Residual
Heat Removal System
Process Flow Diagram

FIGURE 6.3-2, Sheet 2

FOR INFORMATION ONLY

MODES OF OPERATION

Mode A – Injection

This mode presents the process conditions for the case of maximum safeguards, i.e., all pumps operating, following accumulator delivery. Two residual heat removal (RHR) pumps, two safety injection (SI) pumps, and two centrifugal charging (CC) pumps operate, taking suction from the refueling water storage tank and delivering to the reactor through the cold leg connections. Note that the flow from each pump is less than its maximum runout since the pump discharge piping is shared by the two pumps of each subsystem. Note also that the SI pump branch connections to the residual lines are assumed very close to their discharge into the accumulator lines, thereby eliminating any increase in RHR branch line head loss due to the combined flows of the RHR and SI pumps. The RHR line resistance was assumed to be the minimum of the allowable band presented in the limiting pressure drop and elevation head design requirements, allowing maximum RHR injection flow.

Mode B – Cold Leg Recirculation

This mode presents the process conditions for the case of cold leg recirculation assuming RHR pump number 2 operating, SI pumps numbers 1 and 2 operating, and CC pumps numbers 1 and 2 operating.

In this mode the safeguards pumps operate in series, with only the RHR pump capable of taking suction from the containment sump. Thye recirculation coolant is then delivered by the RHR pump to both of the SI pumps

Which deliver to the reactor through their cold leg connections and to both of the CC pumps which deliver to the reactor through their cold leg connections. The RHR pump also delivers flow directly to the reactor through two cold legs since the RHR discharge cross connect valves are closed when making the transfer from injection to recirculation.

Mode C – Hot Leg Recirculation

This mode presents the process conditions for the case of hot leg recirculation, assuming RHR pump number 1 operating, CC pumps numbers 1 and 2 operating, and SI pumps numbers 1 and 2 operating.

In this mode, the safeguards pumps again operate in series with only the RHR pump taking suction from the containment sump. The recirculated coolant is then delivered by the RHR pump to both of the CC pumps which continue to deliver to the reactor through their cold leg connections and to both of the SI pumps which deliver to the reactor through their hot leg connections. The RHR pump also delivers directly to the reactor through two hot leg connections.

NOTES TO FIGURE 6.3-2 (Sheet 3 of 16)

VALVE ALIGNMENT CHART

	Operational Modes		
Valve No.	A	B	C
1	O	C	C
2	O	C	C
3	O	C	C
4	O	C	C
5	O	C	C
6	O	O	O *
7	O	O	C *
8	C	C	O
9	C	C	O
10	C	C	C
11	C	C	C
12	C	O	O
13	C	O	O
14	C	C	C
15	C	C	C
16	C	C	C
17	C	C	C
18	O	O	O
19	O	O	O
20	C	O	O
21	C	O	O
22	O	C	~~C~~ O
23	O	C	O
24	O	O	C
25	C	C	O

O = OPEN

C = CLOSED

* During Mode C one valve to remain open – one closed, no preference, between valves 6 & 7.

FOR INFORMATION ONLY

VALVE ALIGNMENT CHART (Cont' d)

	Operational Modes		
Valve No.	A	B	C
26	O	O	C
27	C	C	C
28	O	C	C
29	C	O	O
30	C	C	C
31	C	C	C
35	O	O	O
36	O	O	C