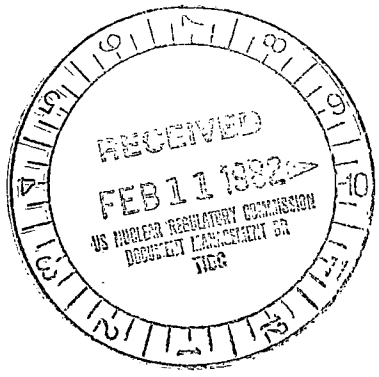
February 08, 1982

Docket No. 50-255
LS05-82- 02-048

SEE Refs.



Mr. David J. VandeWalle
Nuclear Licensing Administrator
Consumers Power Company
1945 W. Parnall Road
Jackson, Michigan 49201

Dear Mr. VandeWalle:

SUBJECT: FORWARDING FINAL EVALUATION REPORT OF SEP TOPIC VI-4, CONTAINMENT ISOLATION SYSTEM FOR THE PALISADES NUCLEAR POWER PLANT

Enclosed is a copy of our final evaluation of SEP Topic VI-4, Containment Isolation System. This assessment compares your facility, as described in Docket No. 50-255, with the criteria currently used by the regulatory staff for licensing new facilities.

In addition it was noted, by the staff during the recent site visit that at least one penetration (Number 19) had a threaded piped connection between the containment and the outer most isolation valve. The staff finds this practice to be unacceptable (See, ASME Code Section 3 NE). It is our position that the containment isolation valve and it's associated piping are to be designed to the same standards as the containment.

SEO4 s 1/1 DSU WE(04) ADD: T. Michaels

With respect to the potential modifications outlined in the conclusion in this report, a determination of the need to actually implement these changes will be made during the same integrated assessment. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic are modified before the integrated assessment is completed.

Sincerely,

Thomas V. Wambach, Project Manager
Operating Reactors Branch No. 5
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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DATE		2/3/82	2/4/82	2/4/82	2/6/82	2/5/82	2/5/82

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981—335-960

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Containment Systems Branch
Evaluation Report on SEP Topic VI-4,
Containment Isolation System for the
Palisades Nuclear Plant, Unit 1
Docket No. 50-255
Revision 1

I Introduction

The Palisades Nuclear Power Plant, Unit 1 began commercial operation in 1971. Since then safety review criteria have changed. As part of the Systematic Evaluation Program (SEP), the containment isolation system for the Palisades plant has been re-evaluated. The purpose of this evaluation is to document the deviations from current safety criteria as they relate to the containment isolation system. The significance of the identified deviations, and recommended corrective measures to improve safety, will be the subject of a subsequent, integrated assesment of the Palisades plant.

II Review Criteria

The safety criteria used in the current evaluation of the containment isolation system for the Palisades plant are contained in the following references:

1) 10 CFR Part 50, Appendix A, General Design Criteria for Nuclear Power Plants (GDC 54, 55, 56 and 57).

2) NUREG-75/087, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (SRP 6.2.4, Containment Isolation System).

3) Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment.

ENCLOSURE

REGULATORY DOCKET FILE COPY

4) Regulatory Guide 1.141, Revision 1, Containment Isolation Provisions for Fluid Systems.

III Related Safety Topics

The review areas identified below are not covered in this report, but are related and essential to the completion of the re-evaluation of the containment isolation system for the Palisades plant. These review areas are included in other SEP topics or ongoing Generic Reviews, as indicated below:

(1) III-1, Classification of Structures, Components and Systems (Seismic and Quality)

(2) III-4.C, Internally Generated Missiles

(3) III-5.A, Effects of Pipe Break on Structures, Systems and Components Inside Containment

(4) III-5.B, Pipe Break Outside Containment

(5) III-6, Seismic Design Considerations

(6) III-12, Environmental Qualification of Safety-Related Equipment

(7) VI-6, Containment Leak Testing

(8) VII-2, Engineered Safety Feature System Control Logic and Design

(9) VIII-2, Onsite Emergency Power Systems - Diesel Generator

(10) VIII-4, Electrical Penetrations of Reactor Containment

(11) NUREG-0737, Clarification of TMI Action Plan Requirements, Item II.E.4.2, Containment Isolation Dependability

(12) NUREG-0660, NRC Action Plan Developed as a Result of the TMI-2 Accident, Item II.E.4.4, Containment Purging and Venting Requirements

IV. Review Guidelines

The containment isolation system of a nuclear power plant is an engineered safety feature that functions to allow the normal or emergency passage of fluids through the containment boundary while preserving the ability of the boundary to prevent or limit the escape of fission products to the environs that may result from postulated accidents. General Design Criteria 54, 55, 56 and 57 of Appendix A to 10 CFR Part 50 pertain to the containment isolation system of a nuclear power plant.

General Design Criterion 54 establishes design and test requirements for the leak detection provisions, the isolation function and the containment capability of the isolation barriers in lines penetrating the primary reactor containment. From the standpoint of containment isolation, leak detection providions should be capable of quickly detecting and responding to a spectrum of postulated pipe break accident conditions. To accomplish this, diverse parameters should be monitored to initiate the containment isolation function. The parameters selected should assure a positive, rapid response to the developing accident condition. This aspect of the containment isolation system review will be addressed during the review of the post-TMI requirements approved for implementation, as stated in NUREG-0737 at Item II.E.4.2.

Leak detection capability should also be provided at the system level to alert the operator of the need to isolate a system train equipped with remote manual isolation valves. SRP 6.2.4, at Item II.11, provides guidance in this regard.

With respect to the design requirements for the isolation function, all non-essential systems should be automatically isolated (with manual valves sealed closed), and valve closure times should be selected to assure rapid isolation of the containment in the event of an accident. The review of the classification of systems as essential or non-essential, and the automatic isolation provisions for non-essential systems by appropriate signals, will be addressed in conjunction with the review of the post-TMI requirements as stated in NUREG-0737 at Item II.E.4.2. The closure time of the containment ventilation system isolation valves will be evaluated in conjunction with the ongoing generic review of purging practices at operating plants (see NUREG-0660 at Item II.E.4.4).

The electrical power supply, instrumentation and controls systems should be designed to engineered safety features criteria to assure accomplishment of the containment isolation function. This aspect of the review is covered under SEP Topics VII-2 and VIII-2. Also, resetting the isolation signal should not result in the automatic re-opening of containment isolation valves. This will be addressed in conjunction with the review of the post-TMI requirements approved for implementation, as stated in NUREG-0737, at Item II.E.4.2.

With respect to the capabilities of containmment isolation barriers in lines penetrating primary containment, the isolation barriers should be designed to engineered safety feature criteria, and protected against missiles, pipe whip and jet impingement. Typical isolation barriers include valves, closed systems and blind flanges. Furthermore, provisions should be made to permit periodic leak testing of the isolation barriers.

The adequacy of the missile, pipe whip and jet impingement protection will be covered under SEP Topics III-4.C, III-5.A and III-5.B. The acceptability of the design criteria originally used in the design of the containment isolation system components will be covered in SEP Topics III-1, III-6 and III-12.

The adequacy of the leak testing program will be covered under SEP Topic VI-6. The acceptability of electrical penetrations will be covered in SEP Topic VIII-4.

GDC 55, 56 and 57 establish explicit requirements for isolation valving in lines penetrating the containment. Specifically, they address the number and location of isolation valves (e.g., redundant valving with one located inside containment and the other located outside containment), valve actuation provisions (e.g., automatic or remote manual isolation valves), valve position (e.g., locked closed, or the position of greater safety in the event of an accident or power failure), and valve type (e.g., a simple check valve is not a permissable automatic isolation valve outside containment). Figures 1 and 2 depict the explicit valve arrangements specified in GDC 55 and 56, and GDC 57, respectively.

GDC 55 and 56 also permit containment isolation provisions for lines penetrating the primary containment boundary that differ from the explicit requirements, provided the basis for acceptability is defined. This proviso is typically invoked when establishing the containment isolation requirements for essential (i.e., safety related) systems, or there is a clear improvement in safety.

GENERAL DESIGN CRITERIA 55 AND 56
ISOLATION VALVE CRITERIA

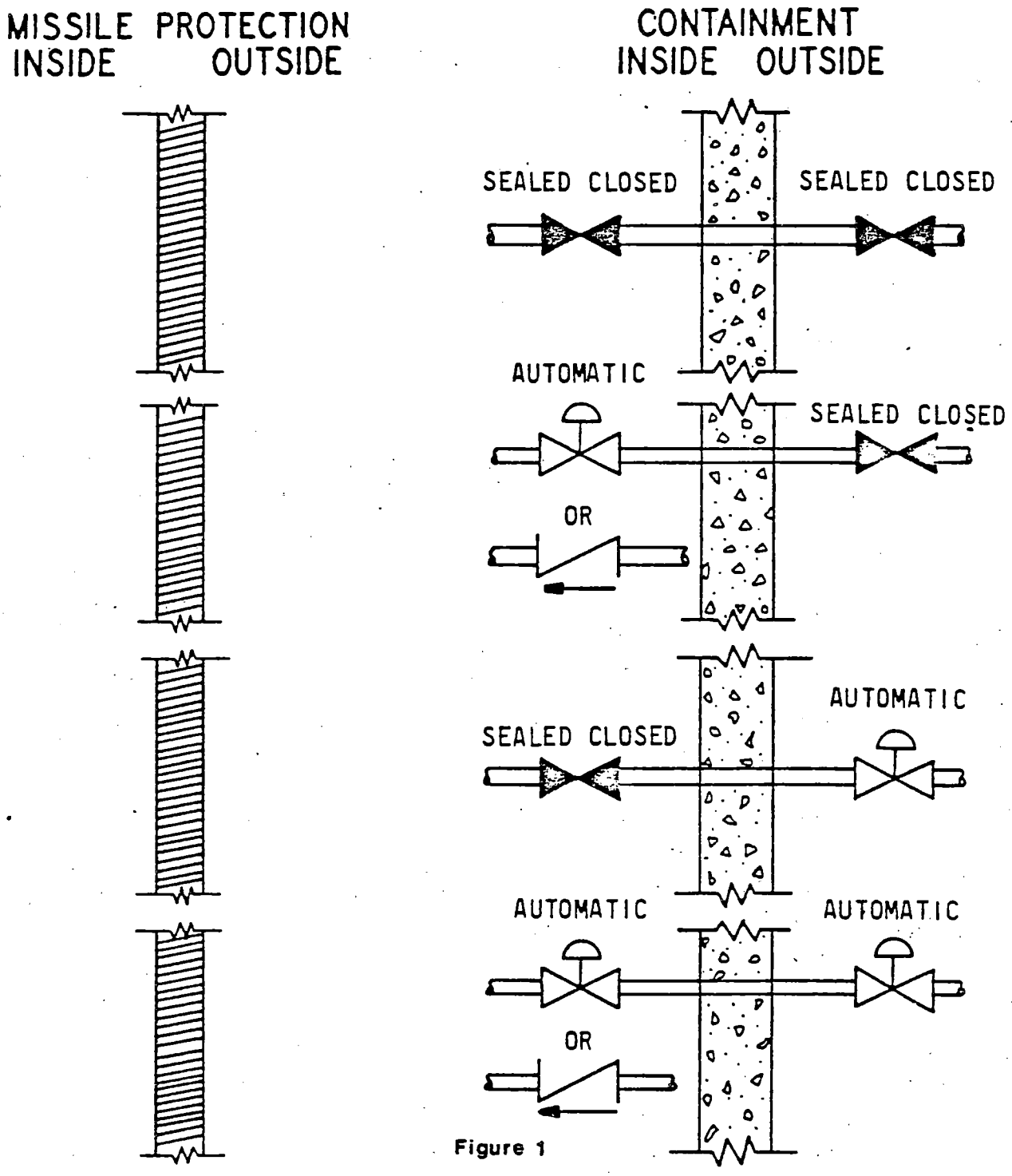


Figure 1

GENERAL DESIGN CRITERION 57
ISOLATION VALVE CRITERIA

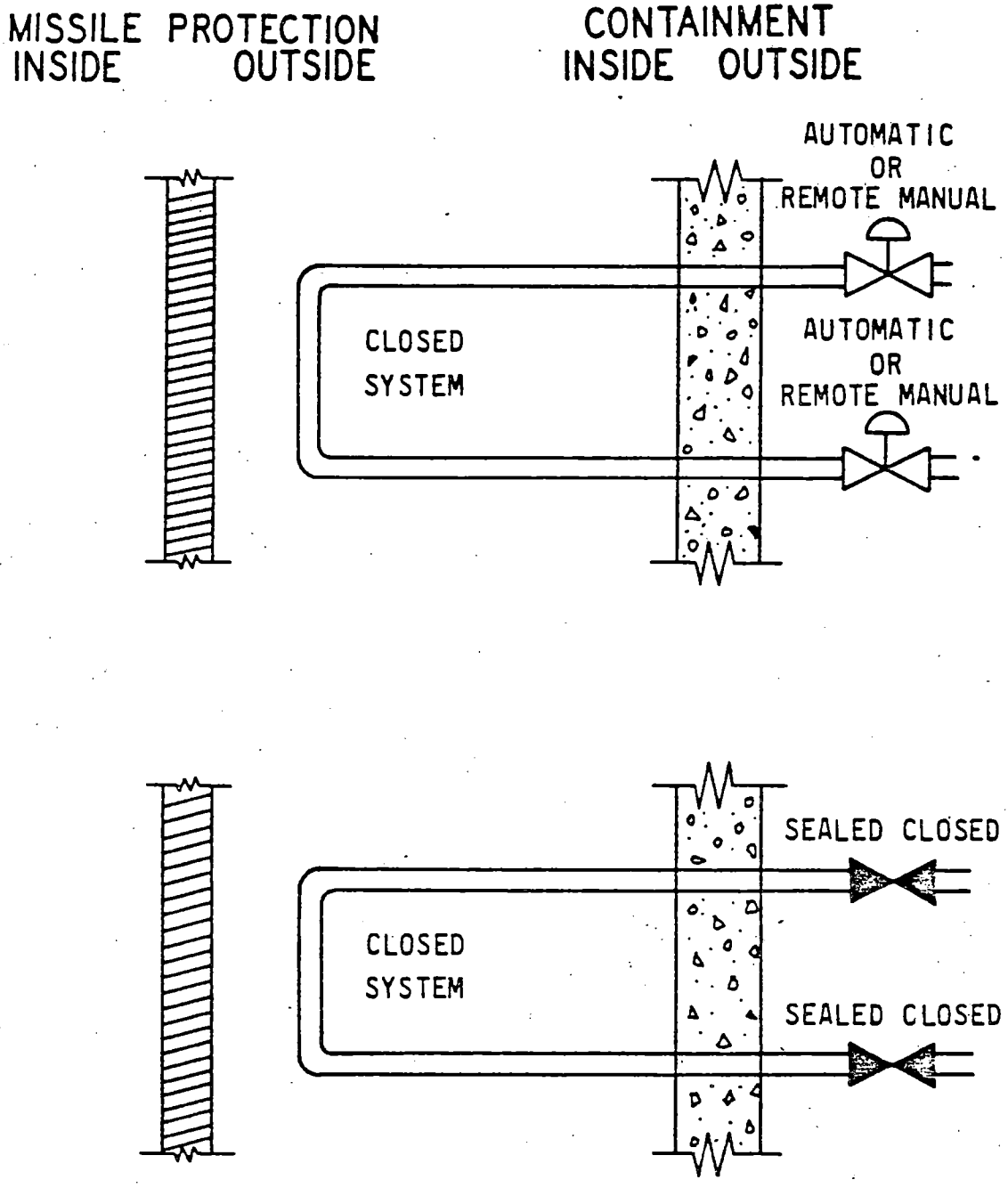


Figure 2

Standard Review Plan (SRP) 6.2.4 at Item II.3 presents guidelines for acceptable alternate containment isolation provisions for certain classes of lines. Containment isolation provisions that are found acceptable on the "other defined basis" represent conformance with the GDC and do not constitute exceptions.

The following evaluation addresses deviations in the containment isolation provisions from the explicit requirements of the GDC.

V Evaluation

The containment isolation provisions for the lines penetrating the primary reactor containment of the Palisades Nuclear Power Plant, Unit 1 are tabulated in Table 1. This information was obtained from the documents referenced in Section VII. The containment isolation provisions, as tabulated in Table 1, were evaluated against the requirements of GDC 54, 55, 56 and 57 (Appendix A to 10 CFR Part 50), and the supplementary guidance of SRP 6.2.4 (Containment Isolation System), where applicable. Deviations from the explicit requirements of GDC 54, 55, 56 and 57, and the acceptance criteria of SRP 6.2.4 are tabulated in Table 2. We have transmitted a draft evaluation to the licensee. As a result, Table 1 was revised and modified by the licensee to reflect changes in the plant. This revised evaluation report takes into account the comments and updated information received from the licensee.

Table 1 gives the licensee's penetration class designation for many of the lines penetrating containment. The isolation valve arrangements for these penetration classes are shown in Figures 3 and 4. The figures were

obtained from Reference 8. Following are evaluations of these penetration classes against GDC 55, 56 and 57.

Penetration Class A1

Penetration Class A1 shows influent and effluent lines open to the containment with two isolation valves in series outside containment. GDC 56 applies to the lines in Penetration Class A1. GDC 56 specifies that one valve should be located inside containment and one valve should be located outside containment. Consequently, the isolation valving arrangement for Penetration Class A1 differs from the explicit requirements of GDC 56 from the standpoint of valve location. Locating both containment isolation valves outside containment may be acceptable if the criteria used in the design of the piping between the containment the first valve are sufficiently conservative to provide adequate assurance of integrity. This matter is discussed under SEP Topiic III-1.

The following containment penetrations are included in Penetration Class A1: 1, 4, 4a, 52 and 68.

Penetration Class A2

Penetration Class A2 shows three isolation configurations that are open to the containment. GDC 56 applies to the lines in Penetration Class A2. One of the isolation configurations (i.e.,, the line having a locked-closed valve inside containment and a locked-closed valve outside containment) satisfies the explicit requirements of GDC 56. The following containment penetrations have this isolation configuration in Penetration Class A2: 64, 66 and 72.

The isolation configuration having a blind flange inside containment and a locked closed valve outside containment differs from the explicit requirements of GDC 56 from the standpoint of isolation barrier type. GDC 56 does not address the use of blind flanges. However, a blind flange is an acceptable isolation barrier in lieu of a valve. The basis for this appears in SRP 6.2.4 at Item II.3. Also, the locked-closed valve could be an automatic isolation valve and still satisfy GDC 56. The following containment penetrations have this isolation configuration in Penetration Class A2: 18, 18a and 27.

With regard to penetration 27 (ILRT fill line), the power operated valve MOV-P1 outside containment is verified closed monthly under surveillance procedure MO 29 of the plant Technical Specifcations. Since the line is flanged and gasket inside containment, the administrative control exercised over the valve is judged to be adequate. Therefore, the valve is a sealed closed isolation valve in accordance with the guidelines of SRP 6.2.4 at Item II.3.

The isolation configuration having both a locked closed valve and a simple check valve outside containment differs from the explicit requirements of GDC 56 from the standpoint of valve location and valve type. GDC 56 specifies that one valve should be located inside containment and one valve should be located outside containment, and that a simple check valve may not be used as an automatic isolation valve outside containment. For this configuration to be acceptable, the check valve should be located inside containment. Also, the locked closed valve could be an automatic isolation valve to satisfy GDC 56.

The following containment penetrations have the above isolation configuration in Penetration Class A2: 10 and 65. A judgment regarding the acceptability of the simple check valve outside containment as a bonafide containment isolation valve will be made in conjunction with the integrated assessment of the plant.

With regard to penetration 65 (instrument air line), the acutation provisions for valve CV 1211 differ from the explicit requirements of GDC 56 in that the valve is remote manually isolated. Since the instrument air line is non-essential, valve CV 1211 should be automatically isolated.

Penetration Class B1

Penetration Class B1 shows two series isolation valves outside containment in a line coming from the reactor coolant system. As shown, one of the valves is an automatic isolation valve and the other is a normally open, manual valve. Depending on the line, however, a simple check valve or remote manual valve is used. GDC 55 applies to the lines in Penetration Class B1. GDC 55 specifies that one valve should be locaed inside containment and one valve should be located outside containment, with the vaves being either locked closed or automatic isolation valves.

The isolation valving arrangement for Penetration Class B1, therefore, differs from the explicit requirements of GDC 55 from the standpoint of valve location, type, and actuation. Locating both itolation valves outside containment may be acceptable if piping and valve design criteria are sufficiently conservative to preclude a breach of integrity. This matter is

discussed under SEP Topic III-1. The use of a local manual valve for containment isolation is not acceptable, and should be upgraded to an automatic isolation valve.

The following containment penetrations are included in Penetration Class B1. 36, 40 and 45.

For penetration 36 (reactor coolant system letdown line), the parallel power operated valves CV 2012 and CV 2122 respond to controls to maintain a prescribed backpressure in the line. Although the valve controls are designed to ramp the valves closed in response to a drop in line pressure (e.g., as caused by a LOCA), the control circuitry is not safety-grade and does not assure valve closure throughout the course of an accident. Therefore, valves CV 2012 and CV 2122 should have automatic isolation capability in response to the sensing of diverse parameters characteristic of postulated accidents. Also, the isolation actuation circuitry should be safety-grade and capable of overriding valve control circuitry for normal plant operation. For penetration 45 (charging pump discharge line), the simple check valve outside containment is an inappropriate automatic isolation valve; a judgment regarding its acceptability will be made in conjunction with the integrated assessment of the plant. Also, the actuation provisions for the air operated valve CV 2111 differ from the explicit requirements of GDC 55 in that the valve is a remote manual isolation valve. A remote manual isolation valve is provided in lieu of an automatic isolation valve because the line has a post-accident safety function (emergency core cooling) which necessitates the valve being open in the event of an accident. Consequently, automatic isolation of

the line is not appropriate. However, the capability does exist to remote manually isolate the line if the need to do so should arise. The actuation provisions for the valve is acceptable based on the guidelines of SRP 6.2.4, at Item II.3.

Penetration Class B2

Penetration Class B2 shows a locked closed valve inside containment and a locked closed valve outside containment in a reactor coolant system effluent line. GDC 55 applies to the lines in Penetration Class B2. The isolation arrangement satisfies the explicit requirements of GDC 55.

The following containment penetration is included in Penetration Class B2: 35.

Penetration 35 shows two relief valves (RV 3164 and RV 0401), located between the two series isolation valves inside containment, which relieve to the containment. Consequently, the relief valves also have a containment isolation function in the reverse flow direction.

Penetration Class C1

Penetration Class C1 shows two types of valve arrangements for closed systems inside containment that are missile protected; namely, a single simple check valve outside containment for influent lines and a single automatic isolation valve outside containment for effluent lines. GDC 57 applies to the lines in Penetration Class C1. GDC 57 specifies that a single automatic, remote manual or locked closed isolation valve outside containment is acceptable, but a simple check valve is not an acceptable automatic isolation valve. The isolation valve arrangement having a

single simple check valve outside containment differs from the explicit requirements of GDC 57 from the standpoint of valve type.

The following containment penetrations are included in Penetration Class C1: 2, 3, 7, 8, 16 and 55.

For Penetrations 7 and 8, the main feedwater isolation valves (18"-N218R-0702 and 18"-N218R-0701, respectively) should be power operated, automatic isolation valves. In this regard, a power operated stop check valve would be acceptable. For penetrations 16 and 55, the containment isolations provisions satisfy the explicit requirements of GDC 57.

Penetration Class C2

Penetration Class C2 shows isolation valve arangements for influent and effluent lines of closed systems inside containment that are not missile protected. The valve arrangements consist of two valves in series, outside containment.

GDC 56 applies to the lines in Penetration Class C2. GDC 56 specifies that one automatic or locked closed valve should be located inside containment and one such valve should be located outside containment; also, a simple check valve may not be used as an automatic isolation valve outside containment.

The valve arrangements of Penetration Class C2 differ from the explicit requirements of GDC 56 from the standpoint of valve location and valve type. All valve arrangements would satisfy the explicit requirements of GDC 56 if one valve was located inside containment, particularly the simple check valve.

GDC 56 permits isolation valve arrangements that differ from the explicit requirements provided the basis for acceptability is defined. With respect to Penetration Class C2, then, locating both isolation valves outside containment may be acceptable since missile protection is not provided inside containment. The acceptability of this is contingent on the criteria used in the design of the piping between the containment and first valve, and the first valve, which must provide adequate assurance of integrity.

The following containment penetrations are included in Penetration Class C2: 5, 6, 11, 14, 15, 25, 26, 37, 38, 40A, 40B, 41, 42, 44, 46, 47, 49, 67 and 69.

For penetrations 11, 14, 26, 27, 41, 42 and 67, the simple check valve is not an appropriate automatic isolation valve outside containment. A power operated automatic isolation valve would be acceptable. However, a judgment decision regarding the acceptability of the simple check valve will be made at the time of the integrated assessment of the plant.

Penetration 25 shows a capped test connection which should be equipped with two locked closed isolation valves in series. Penetration 44 shows a manual isclation valve (3/4"-2084) which is not depicted by the isolation valve arrangements of Penetration Class C2, and which differs from the explicit requirements of GDC 56 from the standpoint of valve actuation; the subject valve should be a power operated valve that is automatically actuated.

Penetration Class C3

Penetration Class C3 shows two, locked closed isolation valves in series, outside containment, for effluent lines from systems that are closed inside containment and not missile protected. GDC 56 applies to the lines in Penetration Class C3. The valve arrangements described above differs from the explicit requirements of GDC 56 from the standpoint of valve location, namely, one valve should be located inside containment. However, locating both valves outside containment may be acceptable, based on the discussion under Penetration Class C2.

The following containment penetration is included in Penetration Class C3: 33.

The following discussion pertains to those containment penetrations not covered by the Penetration Classes discussed above.

a) Penetartions 9, 20, 24, 29, 34, 43, 57, 58, 59, 60, 61, 62, 63, 70, 71 and 73:

   These containment penetrations are spares. Of these, penetrations 21, 29 and 73 show pipe caps and blind flanges being used as isolation barriers. Threaded and/or tack welded pipe caps, and blind flanges without leak testing provisions, are not suitable isolation barriers.

b) Penetrations 12 and 13:

   These containment penetrations satisfy the explicit requirements of GDC 56, and are acceptable. However, with respect to the test, vent and drain lines, pipe caps are not suitable isolation barriers; two locked closed isolation valves in series should be provided for

these lines. Also, the flow element located between the isolation valves at penetration 13 should be moved downstream of the outboard isolation valves, or the licensee should justify that the flow element is an acceptable isolation barrier.

c) Penetrations 17 and 48:

These two containment penetrations serve the containment pressure instrumentation (8 lines). Since signals for the actuation of engineered safety features are derived from this instrumentation, it is imperative that these lines be open and remain open. Consequently, power-operated valves, which could potentially spuriously close, are not provided in these lines.

The instrument lines, however, are provided with test connections that are only capped. Again, pipe caps are not suitable isolation barriers; two locked closed isolation valves in series should be provided in each test line.

d) Penetrations 19, 50 and 51:

These containment penetrations are the personnel air lock, emergency access air lock and equipment hatch, respectively. Several lines are associated with these penetrations that are equipped only with pipe caps for isolation barriers. Pipe caps are not suitable isolation barriers and should be replaced with locked closed manual valves or blind flanges that are leak testable.

rationale for accepting the isolation provisions of the emergency sump recirculation lines appears in SRP 6.2.4, at Item II.3.

h) Penetrations 30 and 31:

With regard to penetrations 30 and 31 (containment spray pump discharge lines), the actuation provisions for the power operated valves CV-3001 (penetration 30) and CV-3002 (penetration 31) differ from the explicit requirements of GDC 56 in that they are remote manual isolation valves. Remote manual isolation valves are provided in lieu of automatic isolation valves because the lines, which are part of the containment spray system, have a post-accident safety function (depressurization of the containment following a pipe break accident) which necessitates their being opened in the event of an accident. Consequently, automatic isolation of these lines is not appropriate. However, the capability does exist to remote manually isolate these lines if the need to do so should arise. The actuation provisions for these valves are acceptable based on the guidelines of SRP 6.2.4, at Item II.3.

i) Penetration 39:

For penetration 39, the simple check valve outside containment is replaced with a blank flange during plant operation. To be an acceptable isolation barrier, the blank flange should be leak testable.

CONTAINMENT ISOLATION SYSTEM PENETRATION CLASSES

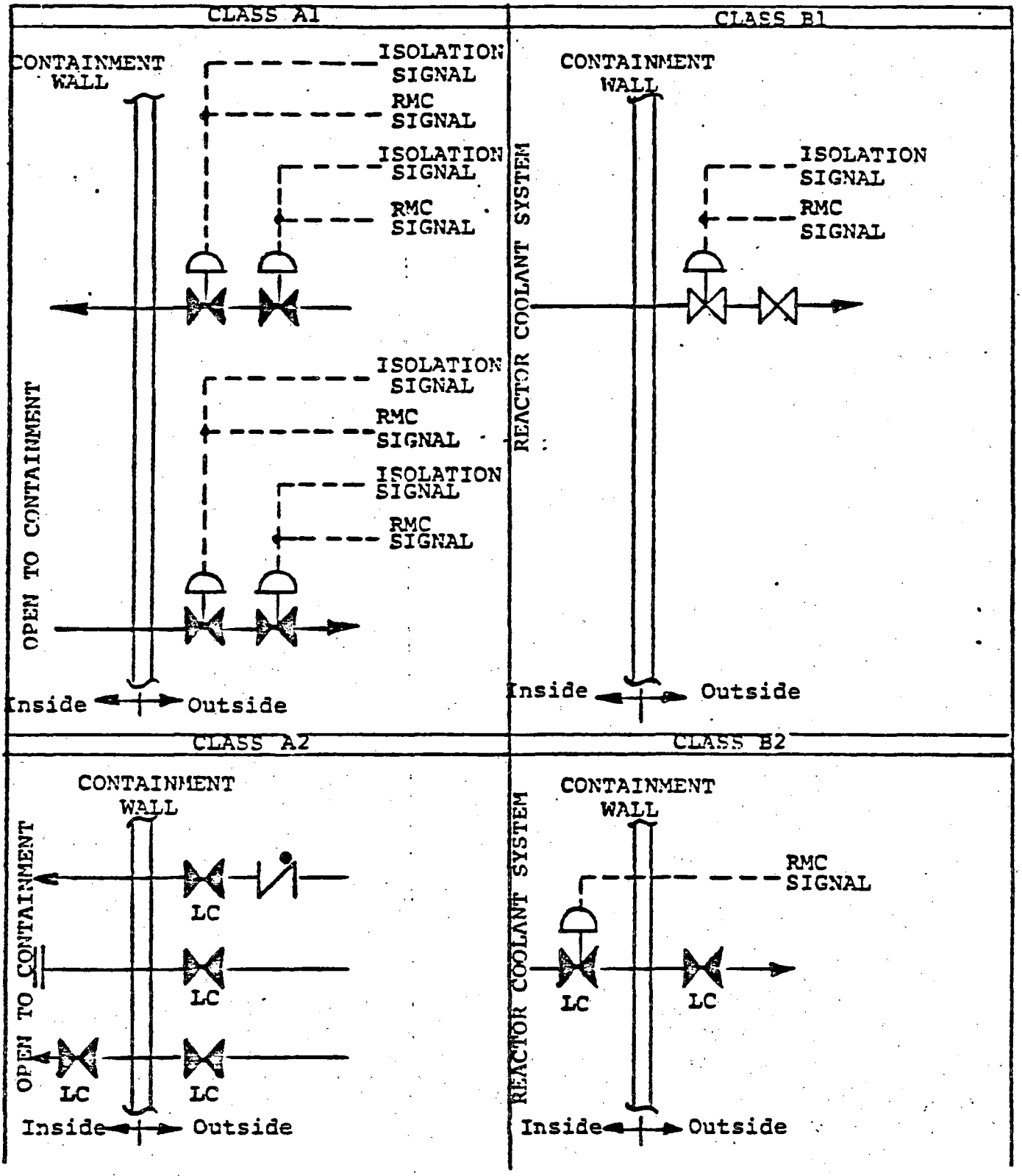
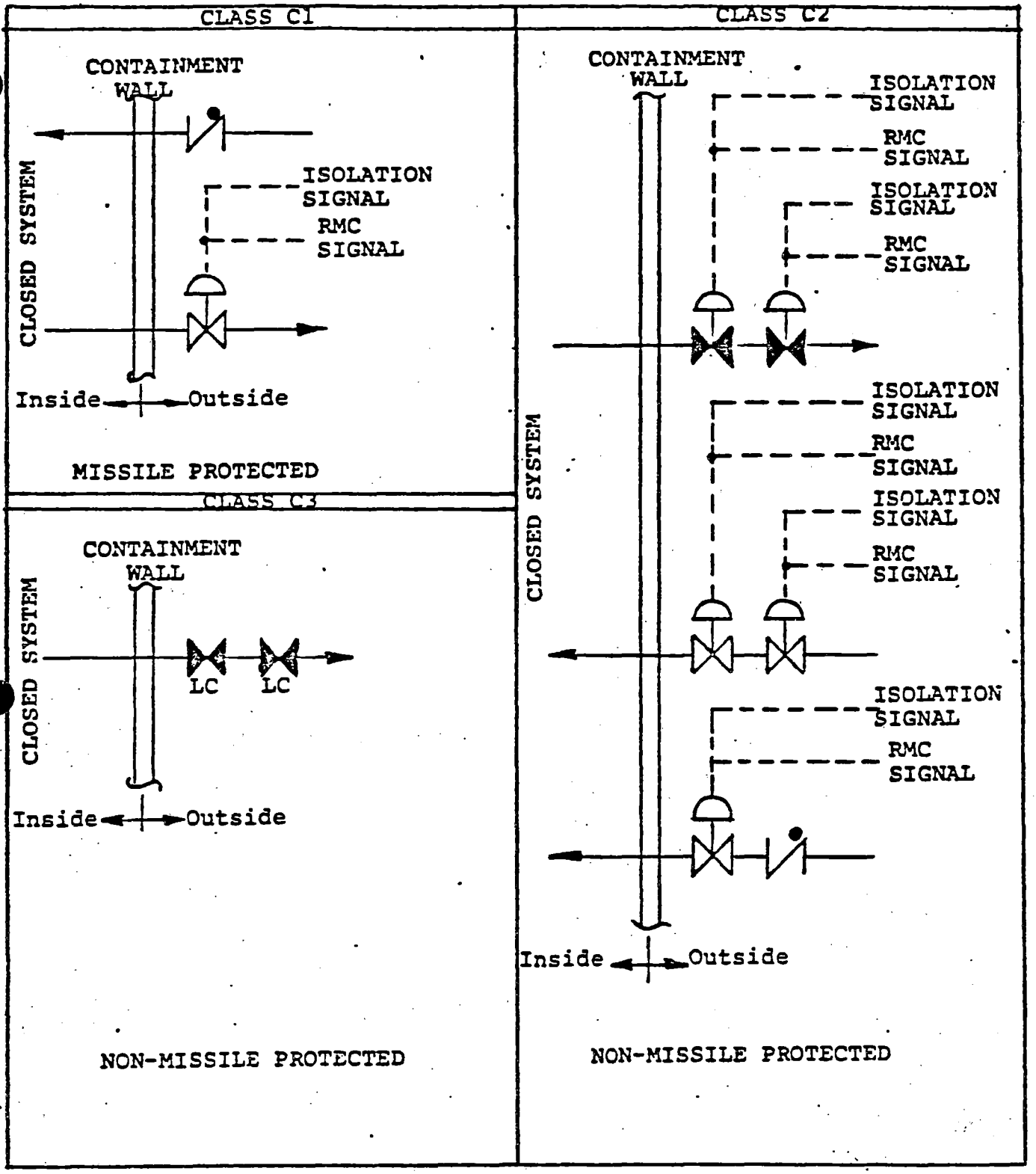


Figure 3

CONTAINMENT ISOLATION SYSTEM PENETRATION CLASSES



LEGEND

- MANUAL VALVE NORMALLY OPEN
- MANUAL VALVE LOCKED CLOSED (LC)
- CHECK VALVE
- BLIND FLANGE
- ISOLATION SIGNAL
- RMC SIGNAL
- AIR OPERATED WITH REMOTE MANUAL CONTROL AND AUTOMATIC ISOLATION

Figure 4

VI Conclusions

The following summarizes the deviations from review guidelines that have been identified and described in Section V of this report:

1. The isolation valving arrangements of the following containment penetrations do not meet the requirements of GDC 55 or 56 from the standpoint of valve location: Penetrations 1, 4, 4a, 10, 11, 21, 21a, 25, 26, 28, 30, 31, 33, 36, 37, 38, 39, 40, 40a, 40b, 41, 42, 44, 45, 46, 47, 48, 49, 52, 52a, 52b, 56, 65, 67, 68 and 69.

   The isolation valves in these penetrations are located outside containment. The acceptability of this is contingent on the acceptability of the piping design criteria. Also, the licensee should discuss the unique characteristics of the valves closest to the containment to terminate valve shaft or bonnet seal leakage, or the provisions in the plant for control of leakage.

2. The isolation valves of the containment penetration numbers listed below differ from the explicit requirements of GDC 55, 56 and 57 from the standpoint of valve type by using one check valve in series with other type isolation valves located outside containment: Penetrations 7, 8, 10, 11, 14, 26, 30, 31, 37, 39, 41, 42, 45, 65 and 67.

   A simple check valve located outside containment is not an appropriate automatic isolation valve. The judgment regarding its acceptability will be made in conjunction with the integrated assessment of the plant.

For penetrations 7 and 8, the main feedwater line, those check valves should be power operated, automatic isolation valves.

3. The isolation barriers in the containment penetrations listed below differ from the explicit requirements of GDC 55, 56 and 57 from the standpoint that pipe caps or blind flanges are used as containment isolation barriers.

Penetrations having pipes or test connections capped outside containment: 13, 17, 17a, 21, 21a, 25, 27, 28, 29, 38, 39, 48 and 73;

Penetrations having blind flanges inside containment: 18, 27, 29 and 73; or outside containment: 1, 4 and 39.

A blind flange inside or outside containmennt is an acceptable isolation barrier in lieu of an isolation valve if the blind flange is leak testable.

Pipe caps used in lines penetrating containment or test connections are not acceptable isolation barriers and should be replaced with locked closed valves or blind flanges that are leak testable. There are spare penetrations equipped with pipe caps, such as penetrations 21, 29 and 73. To be acceptable, the pipe cap should be fully welded with the same quality as the containment weld, or replaced with a blind flange that is leak testable.

4. The power operated valves CV-3001 (penetration 30) and CV-3002 (penetration 31) of the containment spray pump discharge lines differ from the explicit requirement of GDC 56 from the standpoint of valve actuation. Remote manual isolation valves are provided in lieu of automatic isolation valves because the systems have a post-accident safety function which necessitates their being opened in the event of an accident. The actuation provision for these valves are acceptable based on the guidelines of SRP 6.2.4, at Item II.3.

5. The containment sump suction lines which are part of the ECCS and the containment heat removal system have post-accident safety functions. Therefore, automatic isolation of these lines (penetrations 53 and 54) is not desirable; remote manual isolation valves are acceptable.

6. Penetration 44 shows a manual isolation valve (3/4"-2084) in series with an air operated isolation valve, which differs from the explicit requirements of GDC 56 from the standpoint of valve acuation. This manual valve should be a power operated automatic isolation valve.

7. There are several lines associated with the following penetrations which are equipped with pipe caps: the personnel air lock (penetration 19); emergency access air lock (penetration 50); and equipment hatch (penetration 51).

   These pipe caps are not suitable isolation barriers and should be replaced with locked closed manual valves or blind flanges that are leak testable.

8. GDC 55 and 56 specify that automatic isolation valves should, upon loss of actuating power, take the position that provides greater safety. The position of an isolation valve for normal and shutdown operating conditions, and post-accident conditions, depends on the fluid system function. In the event of power failure to a valve operator, the valve position should be consistent with the line function. In this regard, separate power supplies for isolation valves in series may be required to assure the isolation of non-essential lines. The licensee has provided information (see Table 1) on the position of isolation valves, whether or not the line is essential and the isolation signals for each isolation valve. This information shows that automatic isolation valves assume positions of greater safety on loss of actuating power and, therefore, GDC 55 and 56 are satisfied.

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
1	Purge Air Supply (48"Ø)	A1	CV1807 CV1808 508VAS -	AO BUTF VLV AO BUTF VLV MAN GL TEST VLV TEST CONNECT	X X X X		NC NC LC CAP	O/C O/C C	C C C	C C -	N	CIS CIS -	Blank Flanged; Vent. Syst. Valves Presently Not Used in Modes 1-4
2	Main Stm Line (SGE50A) (36"Ø)	C1	CV0510 MOV0510A	POS CH'K VLV MO BYPASS VLV	X X		NO NC	C C	C C	C C	Y	LOW S/G PRESS RM	Loss of Air, CV-0510 Remains in Position Due to Cross Connections with High Press Air and Accumulators
3	Main Stm Line (SGE50B) (36"Ø)	C1	CV0501 MOV0501A	POS CH'K VLV MO BYPASS VLV	X X		NO NC	C C	C C	C C	Y	LOW S/G PRESS RM	Loss of Air, CV-0501 Remains in Position Due to Cross Connection with High Press Air end Accumulators
4	Purge Air Exhaust (48"Ø)	A1	CV1803 CV1805 CV1806 506VAS	AO BUTF VLV AO BUTF VLV AO BUTF VLV MAN GL TEST VLV	X X X X		NC NC NC LC	O/C O/C O/C C	C C C C	C C C -	N	CIS CIS CIS -	Blank Flanged; Vent. Syst. Valves Presently Not Used in Modes 1-4
4a	Purge Air Exhaust Sample Line (3"Ø)	A1	100VAS 101VAS 507VAS -	MAN GA VLV MAN GA VLV MAN GL TEST VLV TEST CONN /w CAP	X X X X		LC LC LC C	C C C	C C C	- - -	N	- -	
5	SIG (E50A) Bottom Blow Down (2"Ø)	C2	CV0767 CV0771 567MS -	AO ANGLE VLV AO ANGLE VLV MAN GL TEST VLV TEST CONN /w CAP	X X X X		NO NO LC C	C C C	C C C	C C -	N	CIS CIS -	
6	S/G (E50B) Bottom Blow Down (2"Ø)	C2	CV0768 CV0770 568MS -	AO ANGLE VLV AO ANGLE VLV MAN GL TEST TEST CONN /w CAP	X X X X		NO NO LC C	C C C	C C C	C C -	N	CIS CIS -	
7	Feedwater to S/G (E50A) (18"Ø)	C1 6' 10'	746FW N210R-704 N210R-702	MAN GL VLV CHECK VLV CHECK VLV	X X X		LC C O	C C O	C C C	- - -	N Y Y	- REV-P REV-P	 Aux FW Main FW

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
8	Feedwater to S/G (E50B)	C1 18"	747FW	MAN GL DRAIN VLV	X		LC	C	C	-	N	-	
			N210R-701	CHECK VLV	X		O	O	C	-	Y	REV▲P	Main FW
			N210R-703	CHECK VLV	X		C	C	C	-	Y	REV▲P	Aux FW
9	Spare	-											
10	Service Air (2"Ø)	A2	122CAS	MAN GA VLV	X		LC	O/C	C	-	N	-	
			401CAS	CHECK VLV	X		C	O/C	C	-		REV▲P	
			142CA	MAN GL TEST VLV	X		LC	C	C	-			
			T	TEST CONN /w CAP	X		C						
11	Condensate to Shield Cooling Surge Tank (1½"Ø)	C2	CV0939	AO GA VLV	X		NO	O	C	C	N	CIS	
			401CDS	CHECK VLV	X		O	O/C	C	-		REV▲P	
			536CDS	MAN GL TEST VLV	X		LC	C	C	-		-	
			536ACD	MAN GL TEST VLV	X		LC	C	C	-		-	
			T	TEST CONN /w CAP	X		C						
12	Service Water Supply (16"Ø)	X	CV0847	AC BUTF VLV	X		NO	O	O	O	Y	MAN	
			CV0869	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			CV0865	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			CV0862	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			CV0870	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			571SW3	MAN GA VLV		X	LC	C	C	-	N	-	
			570SW	MAN GA VLV		X	LC	C	C	-	N	-	
			508SW	MAN GA VLV		X	LC	C	C	-	N	-	
			560SW	MAN GA VLV		X	LC	C	C	-	N	-	
			266SW	MAN GA VLV		X	LC	C	C	-	N	-	
			265SW	MAN GA VLV		X	LC	C	C	-	N	-	
13	Service Water Return (16"Ø)	X	CV0824	AC BUTF VLV	X		NO	O	O	O	Y	MAN	
			572SW3	MAIN GA TEST VLV	X		LC	C	C	-	N	-	
			CV0867	AC BUTF VLV		X	NC	C	O	O	Y	SIS	SIS Trips Normal Fan Which in Turn Opens Valve
			CV0843	AO GL VLV		X	NO	O	O	C	N	TC	
			CV0864	AC BUTF VLV		X	NC	C	O	O	Y	SIS	
			CV0863	AO GL VLV		X	NO	O	O	C	N	TC	
			CV0861	AC BUTF VLV		X	NC	C	O	O	Y	SIS	
			CV0838	AO GL VLV		X	NO	O	O	C	N	TC	
			CV0873	AC BUTF VLV		X	NC	C	O	O	Y	SIS	
			CV0872	AO GL VLV		X	NO	O	O	I	N	TC	

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14	Component Cooling Water In (10"Ø)	C2	CV0910 257-0910CC 507CC -	AC BUTF VLV CHECK VLV MAN GL TEST VLV TEST CONN /w CAP	X X X X		NO O LC C	NO O LC	C C C	O - -	N	SIS REV-P -	Auto Reopen on SIS Reset
15	Component Cooling Water Out (10"Ø)	C2	CV0911 CV0940 508CC - -	AC BUTF/HD OP AC BUTF/HD OP MAN GL TEST VLV TEST CONN /w CAP TEST CONN /w CAP	X X X X X		NO NO LC C C	O O C	C C C	AI AI -	N	SIS SIS	Auto Reopen on SIS Reset CV-0911 & 0940 has Accumulator for Loss of Air
16	SIG (E50A) Surface Blow Down (2"Ø)	C1	CV0739	AO ANGLE VLV	X		O	O/C	C	C	N	CIS	
17	Containment Pressure Instrumentation (4-½"Ø)	N/A	1802 1802A 1802B 1802C 1804 1804A 1804B 1804C 1812 1812A 1812B 1812C 1814 1814A 1814B 1814C		X X X X X X X X X X X X X X X X		LO LO LC LC LO LO LC LC LO LC LO LC LO LC LC LC	O O C C O O C C O C O C O C C C	O O C C O O C C O C O C O C C C	- - - - - - - - - - - - - - - -	Y		PS-1802 (SIS & CIS Initiation) PS-1802A (SIS & CIS Initiation) PS-1804 (SIS & CIS Initiation) P-S-1804 (SIS & CIS Initiation) PT-1812 PT-1812A PT-1814
17a	Containment Sump Level Instrumentation		1814E 610B-DRW 1814F 1814G TEST /wCAP		X X X X X		LO C LC LC CAP	O C C C	O C C C	- - - -	N		

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
18 & 18a	Fuel Transfer Tube (36"ø)	A2	- - -	MAN GA VLV 36" FLANGE 4" FLANGE	X	 X X	NC	C C C	C C C	- - -	N		Blind Flg w/ 2 O-Ring Seals Inside Ctmt
19	Personnel Lock Outer Door Inner Door	X	P5A - - 	MAN GL TEST VLV PRESS GAGE PRESS TUBE PRESS EQUAL VLV PRESS TUBE PRESS TUBE			LC C CAP NC CAP CAP	O/C	LC	-			
20	Spare			PRESS EQUAL VLV			NC						
21	Hydrogen Monitoring Return Line (½"ø)		SV-2415A SV-2415B MV-WGS731 CAP		X X X X		C C	C C C	O/C O/C C	C C			
21a	Hydrogen Monitoring Supply Line (½"ø)		SV-2413A SV-2413B MV-WGS730 CAP		X X X X		C C CAP	C C C	O/C O/C C	C C			
22	Redundant High Pressure Safety Injection (6"ø)	X	MO3068 3250 MO3066 3251 MO3064 3252 MO3062 3253 RV3264 MO3072 CV3018 CV3036 3265 3265A	MO GL VLV CH'K VLV MO GL VLV CH'K VLV MO GL VLV CH'K VLV MO GL VLV CH'K VLV RELIEF VLV MO GA VLV AO GA VLV AC GA VLV MAN GL VLV MAN GL VLV	 X X X X X	X X X X X X X X X	NC C NC C NC C NC C C NC NC NO NO NO	C C C C C C C C C C C C O O	O O O O O O O O C O/C O/C O O O	AI - AI - AI - AI - - AI C O - -	Y	SIS SIS SIS SIS SIS SIS SIS SIS	ESF Related " PI-0375

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST. LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
23	High Pressure Safety Injection	X	MO3007	MO GL VLV		X	NC	C	O	AI	Y	SIS	
			3104	CH'K VLV		X	C	C	O	-		SIS	ESF Related
			MO3009	MO GL VLV		X	NC	C	O	AI		SIS	Actuation Signal Initiated
			3119	CH'K VLV		X	C	C	O	-		SIS	By Chp or Per/Owp (≥1593Psia)
			MO3011	MO GL VLV		X	NC	C	O	AI		SIS	Actuation Signal Initiated
			3134	CH'K VLV		X	C	C	O	-		SIS	By Chp or Per/Owp (≥1593Psia)
			MO3013	MO GL VLV		X	NC	C	O	AI		SIS	Actuation Signal Initiated By Chp or Per/Owp (≥1593Psia)
			3149	CH'K VLV		X	C	C	O	-			
			RV3165	RELIEF VLV		X	C	C	C	-			
			CV3059	AC GA VLV	X		NO	O	O	O			
			CV3037	AO GA VLV	X		NC	O	O/C	O			
			3337	MAN GL TEST VLV	X		O						SX-3337.
			3337A	MAN GL TEST VLV	X		O	C	O				SX-3337
			3180	MAN GL VLV	X		NO	O	O	-			PT-0318
			3180A	MAN GL VLV	X		NO	O	O	-			PT-0318
24	Spare	-											
25	Clean Waste Receiver Tank Vent to Stack (2"Ø)	C2	CV1064	AO GL VLV	X		NO	O	C	C	N	CIS	
			CV1065	AO GL VLV	X		NO	O	C	C		CIS	
			512CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			647CRW	MAN GL VLV	X		NO	O	O	-			PT-1065
			1358	DRAIN CONN/W CAP	X		C						
26	Nitrogen to Quench Tank	C2	CV1358	AO GA VLV	X		NC	C	C	C	N	CIS	
			400N2	CHECK VLV	X		C	C	C	-			
			581N2	MAN GA TEST VLV	X		LC	C	C	-			
			-	TEST CONNECT			C						
27	Int Leak Rate Test Fill Line (6"Ø)	A2	MOV-P1	MO BUTF VLV	X		NC	C	C	C	N	MAN	Flanged w/Gasket
			604 VAS	MAN GL VLV	X		LC	C	C	-			Inside Containment
			605 VAS	MAN GL VLV	X		LC	C	C	-			Flanged w/Gasket
			-	TEST CONN /W CAP	X		C						Inside Containment

TABLE 1

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PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
28	Containment Air Sample Line (½"Ø)		140 VAS		X		LO	O	O	-	N		
			141 VAS		X		LC	C	C	-			
			142 VAS		X		LC	C	C	-			
			510 VAS		X		LC	C	C	-			
			-	TEST CAP	X		C						
29	Capped Spare	-	-	PIPE FLANGE		X	C				N		
			-	PIPE END /W CAP	X		C						
30	Containment Spray	X	CV3001	AC GL VLV	X		NC	C	O	O	Y	CHP	ESF Related
			3258	MAN GATE VLV	X		LO	O	O	-			Auto Open On Chp
			3226	CHECK VLV	X		C	C	O	-			
			3344ES	GLOBE VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			3227ES	GLOBE VLV	X		LC	C	C	-			
31	Containment Spray	X	CV3002	AC GL VLV	X		NC	C	O	O	Y	CHP	ESF Related
			3259	MAN GA VLV	X		LO	O	O	-			Auto Open on Chp
			3216	CHECK VLV	X		C	C	O	-			
			3217ES	MAN GL VLV	X		LC	C	C	-			
			3346ES	M GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
32	Low Pressure Safety Injection (12"Ø)	X	MO3008	MO GL VLV		X	NC	C	O	AI	Y	SIS	ESF Related
			3103ES	CHECK VLV		X	C	C	O	-		SIS	
			MO3010	MO GL VLV		X	NC	C	O	AI		SIS	
			3110ES	CHECK VLV		X	C	C	O	-		SIS	
			MO3012	MO GL VLV		X	NC	C	O	AI		SIS	
			3133ES	CHECK VLV		X	C	C	O	-		SIS	
			MO3014	MO GL VLV		X	NC	C	O	N		SIS	
			3148ES	CHECK VLV		X	C	C	O	-		SIS	
			3163ES	MAN GA VLV	X		LC	C	C	-			
			3196	MAN GA VLV	X		NO	O	O	-			
			3197	MAN GA VLV	X		NO	O	O	-			
			CV3006	AC GL VLV	X		NO	O	O	O		MAN	
			CV3025	AO GL VLV	X		NC	O	O/C	C		MAN	
			3336	MAN GA VLV	X		C	C	C	-			
			3108ES	MAN GA VLV		X	O	O	O	-			FT-0307
			3107ES	MAN GA VLV		X	O	O	O	-			FT-0307

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PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
32 cont.	Lov Pressure Safety Injection		1155PC	MAN GA VLV		X	C	C	C	-	Y		
			3123ES	MAN GA VLV		X	O	O	O	-			FT-0309
			3122ES	MAN GA VLV		X	O	O	O	-			FT-0309
			1156PC	MAN GA VLV		X	C	C	C	-			
			3130ES	MAN GA VLV		X	O	O	O	-			FT-0311
			3137ES	MAN GA VLV		X	O	O	O	-			FT-0311
			1157PC	MAN GA VLV		X	C	C	C	-			
			3153ES	MAN GA VLV		X	O	O	O	-			FT-0314
			3152ES	MAN GA VLV		X	O	O	O	-			FT-0314
			1158PC	MAN GA VLV		X	C	C	C	-			
			RV-3162	RELIEF		X	C	C	C	-			
33	Safety Injection Tank Drain (2"Ø)	C3	3234ES	MAN GA VLV	X		LC	C	C	-	N		
			3237ES	MAN GA VLV	X		LC	C	C	-			
			3348ES	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			3227ES	MAN GL VLV	X		LC	C	C	-			
			3236ES	MAN GA VLV	X		LC	C	C	-			
			3235ES	M SAMPL LINE GAV	X		LC	C	C	-			
			3217ES	MAN GL VLV	X		LC	C	C	-			
34	Spare	-											
35	Shutdown Cooling Return (14"Ø)	B2	MOV3016	MO GA VLV		X	ELC	O	O/C	C	N	MAN	Manual Control
			MOV3015	MO GA VLV		X	ELC	O	O/C	C			
			RV3164	RELIEF VLV		X	NC	C	C	-			
			RV0401	RELIEF VLV		X	NC	C	C	-			
			3204ES	MAN GL VLV	X		LC	C	C	-			
			3205	MAN GA VLV	X		LC	C	C	-			
			-	PIPE FLANGE	X		C	C	C	-			
			MO-3190	MO GA VLV	X		ELC	O	O	AI			
			MO-3199	MO GL VLV	X		ELC	O	O	AI			
			3163	MAN GA VLV	X		C	C	C	-			
36	Letdown To Purification Ion Exchanger (1½"Ø)	B1	CV2009	AO GL VLV	X		NO	O	C	C	N	CIS	
			2320CVC	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			2010CVC	MAN GA VLV	X		NO	O	O	-			

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36 cont.	Letdown To Purification Ion Exchanger (1½"Ø)	B1	2148A	MAN GA VLV	X		NO	O	O	-	N		
			CV2012	AO GL VLV	X		NO	O	O/C	C			
			2149A	MAN GA VLV	X		NO	O	O	-			
			CV2122	AO GL VLV	X		NC	C	C	C			
37	Primary System Drain Pump Recirc (1½"Ø)	C2	CV1001	AO GL VLV	X		NC	C	C	C	N	CIS	
			403CRW	CHECK VLV	X		C	C	C	C			
			503CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
38	Condensate Return From Steam Heating Units (2"Ø)	C2	CV1501	AO GA VLV	X		NC	O/C	C	C	N	CIS	
			CV1502	AO GA VLV	X		NC	O/C	C	C			
			502VA	MAN GL TEST VLV	X		LC	C	C	-			
			-	VENT CONN /W CAP	X		C						
			-	TEST CONN /W CAP	X		C						
39	Containment Heating System (4"Ø)	X	CV1503	AO GA VLV	X		NC	C	C	C	N	CIS	Check Valve Replaced w/Blank Flange When At Power
			-	CHECK VLV	X								
			503VA	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			-	VENT CONN /W CAP	X		C						
40	Pri-Cooling System Sample Line (½"Ø)	B1	CV1910	AO GL VLV	X		O/C	O/C	C	C	N	CIS	
			CV1911	AO GL VLV	X		O/C	O/C	C	C			
			1170A	MAN GL TEST VLV	X		LC	C	C	-			
			1170B	MAN GL TEST VLV	X		LC	C	C	-			
				TEST CONN /W CAP	X		C						
40a	Hydrogen Monitoring Return Line (Degasifier Room) (½"Ø)		SV-2414A	SOLENOID	X		C	C	O/C	C	N	MAN	
			SV-2414B	SOLENOID	X		C	C	O/C	C		MAN	
			729WGS	MAN GL VLV	X		C	C	C	-			
			-	TEST CONN /W CAP	X		C						
40b	Hydrogen Monitor Supply Line (Degasifier Room) ½"Ø		SV-2412A	SOLENOID	X		C	C	O/C	C			
			SV-2412B	SOLENOID	X		C	C	O/C	C			
			728WGS	MAN GL VLV	X		C	C	C				
			-	TEST CONN /W CAP	X		C						

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41	Degassifier Pump Discharge (3"Ø)	C2	CV1004	AO GL VLV	X		NO	O	C	C	N	CIS	
			407CRW	CHECK VLV	X		O	O	C	-			
			506CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
42	Demineralized Water To Quench Tank (2"Ø)	C2	CV0155	AO GL VLV	X		NC	C	C	C	N	CIS	
			V0155B	CHECK VLV	X		C	C	C	-			
			1126PC	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
43	Spare												
44	Controlled Bleed Off From RCP'S (3/4"Ø)	C2	CV2083	AO GL VLV	X		NO	O	C	C	N	CIS	
			2084	MAN GL VLV	X		NO	O	O	-			
			2083	MAN GA TEST VLV	X		LC	C	C	-			
			2083A	MAN GA TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
45	Charging Pump Discharge (2"Ø)	B1	2110	CHECK VLV	X		O	O	O		Y	-	
			CV2111	AC GL VLV (W/ HD OPERATOR)	X		NO	O	O	O		MAN	
46	Containment Vent Header (4"Ø)	C2	CV1101	AO GL VLV	X		NO	O	C	C	N	CIS	
			CV1102	AO GL VLV	X		NO	O	C	C			
			511WGS	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
47	Primary System Drain Tank Pump Suction	C2	CV1002	AO GL VLV	X		NO	O	C	C	N	CIS	
			CV1007	AO GL VLV	X		NO	O	C	C			
			502CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
48	Containment Pressure Instrumentation (4-½"Ø Lines)	X	V-1801	MAN GA VLV	X		LO	O	O	-			PS-1801 (SIS & CIS Initiation)
			V-1801A	MAN GA VLV	X		LO	O	O	-			PS-1801A (SIS & CIS Initiation)
			V-1801B	MAN GA VLV	X		LC	C	C	-			
			V-1801C	MAN GA VLV	X		LC	C	C	-			
			V-1803	MAN GA VLV	X		LO	O	O	-			PS-1803 (SIS & CIS Initiation)
			V-1803A	MAN GA VLV	X		LO	O	O	-			PS-1803A (SIS & CIS Initiation)

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
48 cont.	Containment Pressure Instrumentation (4-½"ø Lines)	X	V-1803B	MAN GA VLV	X		LC	C	C	-			
			V-1803C	MAN GA VLV	X		LC	C	C	-			
			V-1805	MAN GA VLV	X		LO	O	O	-			PT-1805
			V-1805A	MAN GA VLV	X		LC	C	C	-			
			V-1805B	MAN GA VLV	X		LO	O	O	-			PT-0105A
			V-1805C	MAN GA VLV	X		LC	C	C	-			
			V-1815	MAN GA VLV	X		LO	O	O	-			PT-1815
			V-1815A	MAN GA VLV	X		LC	C	C	-			
			V-1815B	MAN GA VLV	X		LC	C	C	-			
			V-1815C	MAN GA VLV	X		LC	C	C	-			
49	Clean Waste Receiver Tank Circulation Pump Suction (3"ø)	C2	CV1038	AO GL VLV	X		NO	O	C	C	N	AUTO BY CIS	
			CV1036	AO GL VLV	X		NO	O	C	C			
			513CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			514CRW	MAN DRAIN VLV	X		LC	C	C	-			
50	Emergency Access Inside Ctmt	X	-	PRES EQUAL VLV		X	NC				N		
			-	PRESS TUBE		X	CAP						
				PRESS TUBE		X	CAP						
	Outside Ctmt		-	PRESS EQUAL VLV	X		NC						
			-	PRESS GAGE	X		C						
			-	PRESS TUBE	X								
			P6VA	MAN G TEST VLV	X		LC						
			-	TEST CONN /W CAP	X		C						
				O-RING TEST CONN	X		C						
51	Equipment Door	X	-	O-RING TEST CONNECT /W CAP		X	C						¼" Tube Between The Seals Capped
52	Containment Sump Drain to Sump Tank	A1	CV1103	AO GL VLV	X		NC	C	C	C	N	SIS	
			CV1104	AO GL VLV	X		NC	C	C	C		CHR	
			500DRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN VLV	X		C						

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
52a	Containment Sump Level Instrumentation (3/8"Ø)		618DRW 618FDRW 618HDRW 618EDRW 618GDRW 618ADRW 618BDRW 618CDRW 618DDRW -	MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV 3 TEST CONN/WCAP	X X X X X X X X X X		LO LC LC LC LC LO LC LC LC C	O C C C C O C C C	O C C C C O C C C	- - - - - - - - -			LT-0382
52b	Containment Sump Level Instrumentation		619DRW 619FDRW 619HDRW 619EDRW 619GDRW 619ADRW 619BDRW 619CDRW 619DDRW -	MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV 3 TEST CONN/WCAP	X X X X X X X X X X		LO LC LC LC LC LO LC LC LC C	O C C C C O C C C	O C C C C O C C C	- - - - - - - - -			LT-0383
53	Containment Spray Pump Suction	X	CV3029 3102ES -	AIR OP VLV MAN GL TEST VLV TEST CONN /W CAP	X X X		NC LC C	C C	O C	AI -	Y	SIRWT LL	Post Loca Open On Sirw LL
54	Containment Spray Pump Suction	X	CV3030 3167ES -	AIR OP VLV MAN TEST VLV TEST CONN /W CAP	X X X		NC LC C	C C	O C	AI -	Y	SIRWT LL	Post Loca Open On Sirw LL
55	SIG (E50B) Surface Blowdown (2"Ø)	C1	CV0738	AO VLV W/ HAND OPERATOR	X		O	O/C	C	C	N	CIS	
56	Containment Sump Level Instrumentation		606A-VAS 619B-DRW 606B-VAS 606C-VAS -	TEST CONN /W CAP	X X X X X		LO C LC LC C	O C C C	O C C C	- - - -			LT-0383
57	Spare	-											

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
58	Spare	-											
59	Spare	-											
60	Spare	-											
61	Spare	-											
62	Spare	-											
63	Spare	-											
64	Reactor Cavity Fill & Recirc (6"Ø)	A2	121SFP	MAN GA VLV		X	LC	C	C	-			
			120SFP	MAN GA VLV	X		LC	C	C	-			
			514SFP	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
65	Instrument Air (2"Ø)	A2	CV1211	AC GL VLV	X		NO	O	O	-	N	MAN	
			400CAS	CHECK VLV	X		O	O	O	-			
			612CAS	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			611CAS	MAN GA VLV	X		NO	O	O	-			PS1220
66	ILRT Instrument Line (1½"Ø)	X	601VAS	MAN GA VLV		X	LC	C	C	-	N		
			L6VAS	MAN GA VLV	X		LC	C	C	-			
			603VAS	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			602VA	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
67	Clean Waste Receiver Tank Pump Recirc (3"Ø)	C2	CV1037	AO GL VLV	X		NO	O	C	C	N	CIS	
			410-CRW	CHECK VLV	X		O	O	C	-			
			515CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
68	Air Supply To Air Room (12"Ø)	A1	CV1813 CV1814 505VAS -	AO BUTF VLV AO BUTF VLV MAN GL TEST VLV TEST CONN /W CAP	X X X X		LC LC LC C	O/C O/C C	C C C	C C -	N	CIS	Air Supply To CV-1813 & CV-1814 Is Also Tested Under LLRT
69	Clean Waste Receiver Tank Pump Suction (4"Ø)	C2	CV1045 CV1044 518CRW -	AO GL VLV AO GL VLV MAN GL TEST VLV TEST CONN /W CAP	X X X X		NO NO LC C	O O C	C C C	C C -	N	CIS	
70	Spare	-											
71	Spare	-											
72	Reactor Refueling Cavity Drain (8"Ø)	A2	117SFP 118SFP 515SFP -	MAN GA VALVE MAN GA VALVE MAN GL TEST VLV TEST CONN /W CAP	 X X X	X	LC LC LC C	C C C	C C C	- - -	N		
73	Capped Spare	-	- - 509VAS -	PIPE FLANGE PIPE END /W CAP MAN GL TEST VLV TEST CONN /W CAP	 X X X	X	BC C LC C	C C C C	C C C C	- - - -	N		

TABLE 1 NOTES

1. Valve Type or Description - AO means air-to-open and AC means air-to-close.

2. Normal Position - NO - Normally open
   NC - Normally closed
   BC - Bolted Closed (e.g. flange)
   LO - Locked Open
   LC - Locked Closed
   ELO - Electrically Locked Open (key lock switch)
   ELC - Electrically Locked Closed (key lock switch)

3. Shutdown Position - Assumes normal shutdown with the plant on shutdown cooling.

4. Power Failure Position - Position shown is for either loss of power or loss of air unless otherwise noted.

5. Actuation - Signal which automatically causes valve to reposition unless otherwise specified. Symbols are:

   CIS - Containment Isolation Signal
   SIS - Safety Injection Signal
   CHP - Containment High Pressure Signal
   CHR - Containment High Radiation Signal
   MAN - Remotely actuated by Manual Operator action

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS					REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION	
1	PURGE AIR SUPPLY (48"φ)	56	X					
2	MAINSTEAM LINE (SGESOA) (36"φ)	57						
3	MAIN STEAM LINE (SG ESOB) (36"φ)	57						
4	PURGE AIR EXHAUST (48"φ)	56	X					
4a	PURGE AIR EXHAUST SAMPLE LINE (3"φ)	56	X					
5	S/G (ESOA) BOTTOM BLOW DOWN (2"φ)	56						
6	S/G (ESOB) BOTTOM BLOW DOWN (2"φ)	56						
7	FEEDWATER TO S/G (ESOA) (18"φ)	57			X			MFW ISOLATION VALVES SHOULD BE POWER OPERATED. AUTOMATIC ISOLATION VALVES TO SATISFY GDC 57 & AID IN MSLB ACCIDENT MITIGATION.
8	FEEDWATER TO S/G (ESOB)	57			X			" "
9	SPARE	—						
10	SERVICE AIR (2"φ)	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED.
11	CONDENSATE TO SHIELD COOLING SURGE TANK	56	X		X			" "
12	SERVICE WATER SUPPLY (16"φ)	56						

TABLE 2

CONTAINMENT ISOLATION SYSTEM
SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS						REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION		
13	SERVICE WATER RETURN (16"ϕ)	56							PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIERS.
14	COMPONENT COOLING WATER IN (10"ϕ)	56			X				DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED
15	COMPONENT COOLING WATER OUT (10"ϕ)	56							
16	SIG (ESOA) SURFACE BLOW DOWN (2"ϕ)	57							
17	CONTAINMENT PRESSURE INSTRUMENTATION (4½"ϕ)	56		X					PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIER; GDC 56 MET ON SOME OTHER DEFINED BASIS.
17a	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56							NO INFORMATION ON ISOLATION VALVES ARRANGEMENT (SKETCH REQUIRED)
18 & 18a	FUEL TRANSFER TUBE (36"ϕ)	56			X				GDC 56 MET ON SOME OTHER DEFINED BASIS (SEE SRP 6.2.4, ITEM II, 3).
19	PERSONNEL LOCK OUTER DOOR INNER DOOR	—							PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIERS
20	SPARE	—							
21	HYDROGEN MONITORING RETURN LINE (1½"ϕ)	56	X						NO INFORMATION ON ISOLATION VALVES ARRANGEMENT. (SKETCH REQUIRED).
21a	HYDROGEN MONITORING SUPPLY LINE (1½"ϕ)	56	X						" "
22	REDUNDANT HIGH PRESS. SAFETY INJECTION (6"ϕ)	55							
23	HIGH PRESSURE SAFETY INJECTION	55							

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT, UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS					REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION	
24	SPARE	—						
25	CLEAN WASTE RECEIVER TANK VENT TO STACK	56	X					TEST CONNECTION NEEDS TWO L.C. VALVES.
26	NITROGEN TO QUENCH TANK	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED
27	INT. LEAK RATE TEST FILL LINE (6"ϕ)	56						VALVE MOV-P1 IS A SEAL CLOSED ISOLATION BARRIER (SEE SRP 6.2.4, ITEM II, 3).
28	CONTAINMENT AIR SAMPLE LINE (1/2"ϕ)	56	X					PIPE CAP IS NOT ACCEPTABLE ISOLATION BARRIER.
29	CAPPED SPARE	—						BLIND FLANGE MUST BE LEAK TESTABLE; PIPE CAP IS NOT ACCEPTABLE ISOLATION VALVE.
30	CONTAINMENT SPRAY	56	X		X		X	ACTUATION PROVISIONS OF CV-3001 AND CV-3002 MEET GDC 56 ON SOME OTHER DEFINED BASIS (SEE SRP 6.2.4, ITEM II, 3) DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVES OUTSIDE CTMT IS NEEDED.
31	CONTAINMENT SPRAY	56	X		X		X	
32	LOW PRESSURE SAFETY INJECTION	55						
33	SAFETY INJECTION TANK DRAIN	56	X					
34	SPARE	—						
35	SHUTDOWN COOLING RETURN (14"ϕ)	55						
36	LETDOWN TO PURIFICATION ION EXCHANGER (1 1/2"ϕ)	55	X				X	CV-2012 & CV2122 SHOULD BE AUTOMATIC ISOLATION VALVES.

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS: LOCATION	NUMBER	TYPE	POSITION	ACTUATION	REVIEWER'S COMMENTS
37	PRIMARY SYSTEM DRAIN PUMP RECIRC. (1½"ϕ)	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED.
38	CONDENSATE RETURN FROM STM HEATING UNITS	56	X					
39	CONTAINMENT HEATING SYSTEM (4"ϕ)	56	X		X			
40	PRI-COOLING SYSTEM SAMPLE LINE (½"ϕ)	55	X					ISOLATION SIGNALS DO NOT PROVIDE APPROPRIATE DIVERSITY
40a	HYDROGEN MONITORING RETURN LINE (½"ϕ)	56	X				X	NON-ESSENTIAL LINE SHOULD BE AUTOMATICALLY ISOLATED.
40b	HYDROGEN MONITOR SUPPLY LINE (½"ϕ)	56	X				X	" "
41	DEGASSIFIER PUMP DISCHARGE (3"ϕ)	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED
42	DEMINERALIZED WATER TO QUENCH TANK (2"ϕ)	56	X		X			" "
43	SPARE	—						
44	CONTROLLED BLEED OFF FROM RCP'S (3/4"ϕ)	56	X				X	CV-2084 SHOULD BE AN AUTOMATIC ISOLATION VALVE.
45	CHARGING PUMP DISCHARGE (2"ϕ)	55	X		X		X	CV-2111 ACTUATION PROVISIONS MEET GDC55 OR SOME OTHER DEFINED BASIS (SRP G.2.4. ITEM II.3). SIMPLE CHECK VALVE OUTSIDE CIAT IS NOT APPROPRIATE.
46	CONTAINMENT VENT HEADER (4"ϕ)	56	X					
47	PRIMARY SYSTEM DRAIN TANK PUMP SUCTION	56	X					

TABLE

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS: LOCATION	NUMBER	TYPE	POSITION	ACTUATION		REVIEWER'S COMMENTS
48	CONTAINMENT PRESSURE INSTRUMENTATION (4½"ϕ)	56	X						
49	CLEAN WASTE RECEIVER TANK CIRCULATION PUMP SUCTION (3"ϕ)	56	X						
50	EMERGENCY ACCESS INSIDE CTMT OUTSIDE CTMT	—							PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIERS.
51	EQUIPMENT DOOR	—							" "
52	CONTAINMENT SUMP DRAIN TO SUMP TANK	56	X						
52a	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56	X						NO INFOR. ON VALVE ARRANGEMENT (SKETCH REQ'D)
52b	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56	X						" "
53	CONTAINMENT SPRAY PUMP SUCTION	56							MEETS GDC 56 ON SOME OTHER DEFINED BASIS (SEE SRP 6.2.4. ITEM II, 3).
54	CONTAINMENT SPRAY PUMP SUCTION	56							" "
55	SIG (ESOB) SURFACE BLOWDOWN (2"ϕ)	57							
56	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56	X						
57	SPARE	—							
58	SPARE	—							

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS						REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION		
59	SPARE	—							
60	SPARE	—							
61	SPARE	—							
62	SPARE	—							
63	SPARE	—							
64	REACTOR CAVITY FILL & RECIRC. (6"ϕ)	56							
65	INSTRUMENT AIR (2"ϕ)	56	X		X		X		CV-1211 SHOULD BE AN AUTOMATIC I. V. SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NOT APPROPRIATE.
66	ILRT INSTRUMENT LINE (1½"ϕ)	56							
67	CLEAN WASTE RECEIVER TANK PUMP RECIRC. (3"ϕ)	56	X		X				DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED.
68	AIR SUPPLY TO AIR ROOM (12"ϕ)	56	X						
69	CLEAN WASTE RECEIVER TANK PUMP SUCTION (4"ϕ)	56	X						
70	SPARE	—							
71	SPARE	—							

TABLE 2

CONTAINMENT ISOLATION SYSTEM
SEP REVIEW FINDINGS

PLANT: PALISADES PLANT, UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS						REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION		
72	REACTOR REFUELING CAVITY DRAIN (8"ϕ)	56							
73	CAPPED SPARE	—							PIPE CAP IS NOT ACCEPTABLE ISOLATION BARRIER; BLIND FLANGE MUST BE LEAK TESTABLE.

VI. Reference

1. License DPR-20-Palisades Plant - response to SEP Topic VI-4 - Containment Isolation System, 7/14/80.
2. Independent review of containment penetrations, MPR-639, Vol. I & II, MPR Association, Inc, 11/15/79.
3. License DPR-20-Palisades Plant - IE Bulletin 79-06B response update, 8/16/79.
4. DPR-20-Palisades Plant - requirements resulting from review of TMI-2 accident actions taken in response to NRC, 12/27/79.
5. Consumers Power Co. Licensee event report 80-021, Rev. 1, Misaligned containment sump valve, 8/20/80.
6. CE Post-TMI evaluation task 5 - containment isolation, 12/13/79.
7. Palisades plant design drawing: M-201 (rev. 22), M-202(21), M-203(19), M-204(16), M-205(23), M-206(11), M-207(33), M-208(19), M-214(15), M-215(14), M-218(20), M-219(10), M-220(17), M-221(10), M-222(10), M-223(7), M-224(7), M-225(8), M-226(8), E-15(1), E-16(1), E-17(6).
8. Palisades plant #1, Final Safety Analysis Report, Vols. 1, 2 & 3.
9. Letter from R. A. Vincent (Consumers Power Company) to D. M. Crutchfield, dated August 10, 1981, Providing Comments on CSB Evaluation Report on SEP Topic VI-4 for the Palisades Nuclear Plant, Unit 1.
10. Letter from R. A. Vincent (Consumers Power Company) to D. M. Crutchfield, dated January 4, 1982, Providing Information on SEP Topic VI-4 for the Palisades Nuclear Plant, Unit 1.

Containment Systems Branch
Evaluation Report on SEP Topic VI-4,
Containment Isolation System for the
Palisades Nuclear Plant, Unit 1
Docket No. 50-255
Revision 1

I Introduction

The Palisades Nuclear Power Plant, Unit 1 began commercial operation in 1971. Since then safety review criteria have changed. As part of the Systematic Evaluation Program (SEP), the containment isolation system for the Palisades plant has been re-evaluated. The purpose of this evaluation is to document the deviations from current safety criteria as they relate to the containment isolation system. The significance of the identified deviations, and recommended corrective measures to improve safety, will be the subject of a subsequent, integrated assesment of the Palisades plant.

II Review Criteria

The safety criteria used in the current evaluation of the containment isolation system for the Palisades plant are contained in the following references:

1) 10 CFR Part 50, Appendix A, General Design Criteria for Nuclear Power Plants (GDC 54, 55, 56 and 57).

2) NUREG-75/087, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (SRP 6.2.4, Containment Isolation System).

3) Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment.

ENCLOSURE

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4) Regulatory Guide 1.141, Revision 1, Containment Isolation Provisions for Fluid Systems.

III Related Safety Topics

The review areas identified below are not covered in this report, but are related and essential to the completion of the re-evaluation of the containment isolation system for the Palisades plant. These review areas are included in other SEP topics or ongoing Generic Reviews, as indicated below:

(1) III-1, Classification of Structures, Components and Systems (Seismic and Quality)

(2) III-4.C, Internally Generated Missiles

(3) III-5.A, Effects of Pipe Break on Structures, Systems and Components Inside Containment

(4) III-5.B, Pipe Break Outside Containment

(5) III-6, Seismic Design Considerations

(6) III-12, Environmental Qualification of Safety-Related Equipment

(7) VI-6, Containment Leak Testing

(8) VII-2, Engineered Safety Feature System Control Logic and Design

(9) VIII-2, Onsite Emergency Power Systems - Diesel Generator

(10) VIII-4, Electrical Penetrations of Reactor Containment

(11) NUREG-0737, Clarification of TMI Action Plan Requirements, Item II.E.4.2, Containment Isolation Dependability

(12) NUREG-0660, NRC Action Plan Developed as a Result of the TMI-2 Accident, Item II.E.4.4, Containment Purging and Venting Requirements

IV. Review Guidelines

The containment isolation system of a nuclear power plant is an engineered safety feature that functions to allow the normal or emergency passage of fluids through the containment boundary while preserving the ability of the boundary to prevent or limit the escape of fission products to the environs that may result from postulated accidents. General Design Criteria 54, 55, 56 and 57 of Appendix A to 10 CFR Part 50 pertain to the containment isolation system of a nuclear power plant.

General Design Criterion 54 establishes design and test requirements for the leak detection provisions, the isolation function and the containment capability of the isolation barriers in lines penetrating the primary reactor containment. From the standpoint of containment isolation, leak detection providions should be capable of quickly detecting and responding to a spectrum of postulated pipe break accident conditions. To accomplish this, diverse parameters should be monitored to initiate the containment isolation function. The parameters selected should assure a positive, rapid response to the developing accident condition. This aspect of the containment isolation system review will be addressed during the review of the post-TMI requirements approved for implementation, as stated in NUREG-0737 at Item II.E.4.2.

Leak detection capability should also be provided at the system level to alert the operator of the need to isolate a system train equipped with remote manual isolation valves. SRP 6.2.4, at Item II.11, provides guidance in this regard.

With respect to the design requirements for the isolation function, all non-essential systems should be automatically isolated (with manual valves sealed closed), and valve closure times should be selected to assure rapid isolation of the containment in the event of an accident. The review of the classification of systems as essential or non-essential, and the automatic isolation provisions for non-essential systems by appropriate signals, will be addressed in conjunction with the review of the post-TMI requirements as stated in NUREG-0737 at Item II.E.4.2. The closure time of the containment ventilation system isolation valves will be evaluated in conjunction with the ongoing generic review of purging practices at operating plants (see NUREG-0660 at Item II.E.4.4).

The electrical power supply, instrumentation and controls systems should be designed to engineered safety features criteria to assure accomplishment of the containment isolation function. This aspect of the review is covered under SEP Topics VII-2 and VIII-2. Also, resetting the isolation signal should not result in the automatic re-opening of containment isolation valves. This will be addressed in conjunction with the review of the post-TMI requirements approved for implementation, as stated in NUREG-0737, at Item II.E.4.2.

With respect to the capabilities of containmment isolation barriers in lines penetrating primary containment, the isolation barriers should be designed to engineered safety feature criteria, and protected against missiles, pipe whip and jet impingement. Typical isolation barriers include valves, closed systems and blind flanges. Furthermore, provisions should be made to permit periodic leak testing of the isolation barriers.

The adequacy of the missile, pipe whip and jet impingement protection will be covered under SEP Topics III-4.C, III-5.A and III-5.B. The acceptability of the design criteria originally used in the design of the containment isolation system components will be covered in SEP Topics III-1, III-6 and III-12.

The adequacy of the leak testing program will be covered under SEP Topic VI-6. The acceptability of electrical penetrations will be covered in SEP Topic VIII-4.

GDC 55, 56 and 57 establish explicit requirements for isolation valving in lines penetrating the containment. Specifically, they address the number and location of isolation valves (e.g., redundant valving with one located inside containment and the other located outside containment), valve actuation provisions (e.g., automatic or remote manual isolation valves), valve position (e.g., locked closed, or the position of greater safety in the event of an accident or power failure), and valve type (e.g., a simple check valve is not a permissable automatic isolation valve outside containment). Figures 1 and 2 depict the explicit valve arrangements specified in GDC 55 and 56, and GDC 57, respectively.

GDC 55 and 56 also permit containment isolation provisions for lines penetrating the primary containment boundary that differ from the explicit requirements, provided the basis for acceptability is defined. This proviso is typically invoked when establishing the containment isolation requirements for essential (i.e., safety related) systems, or there is a clear improvement in safety.

GENERAL DESIGN CRITERIA 55 AND 56
ISOLATION VALVE CRITERIA

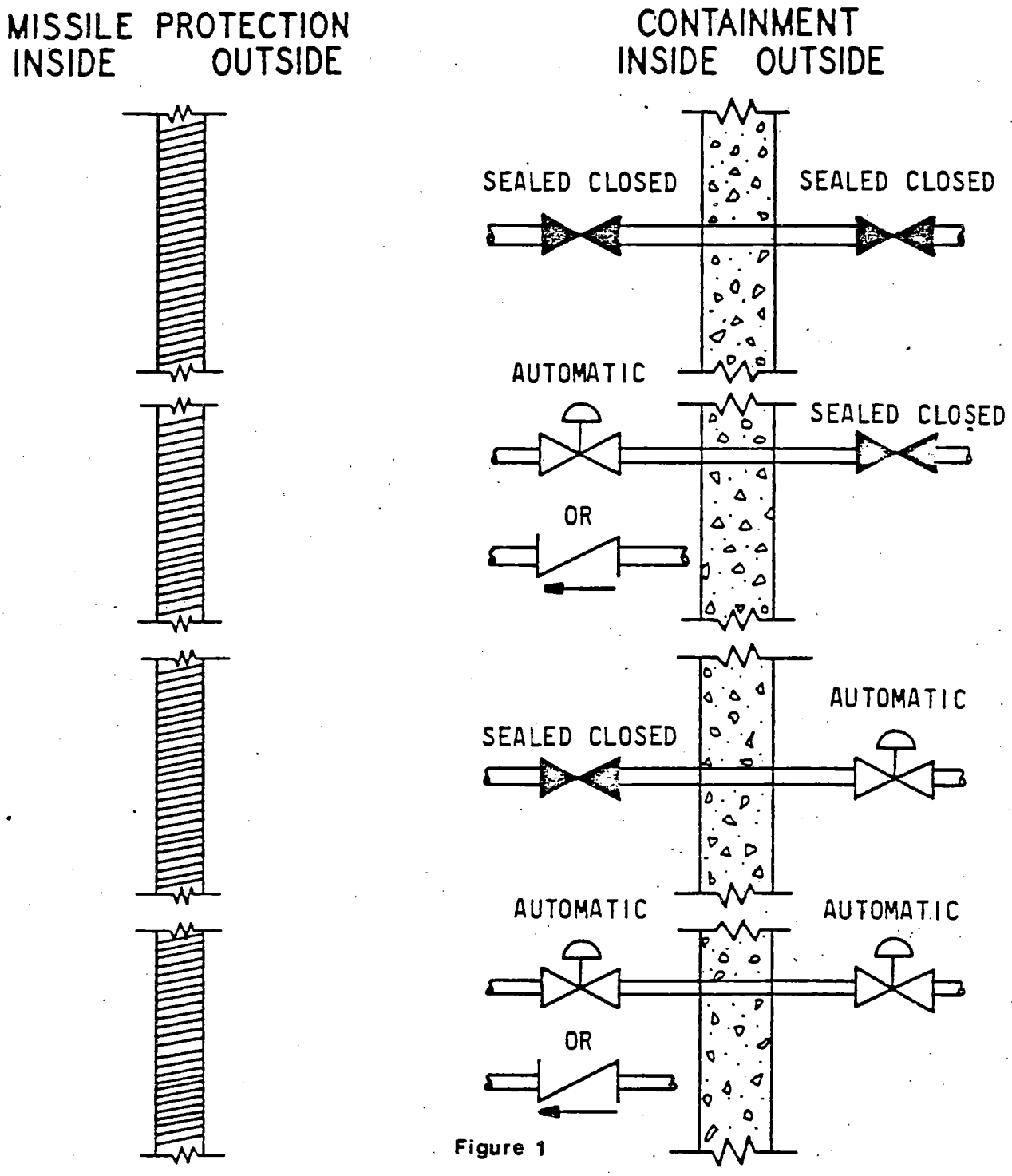


Figure 1

GENERAL DESIGN CRITERION 57
ISOLATION VALVE CRITERIA

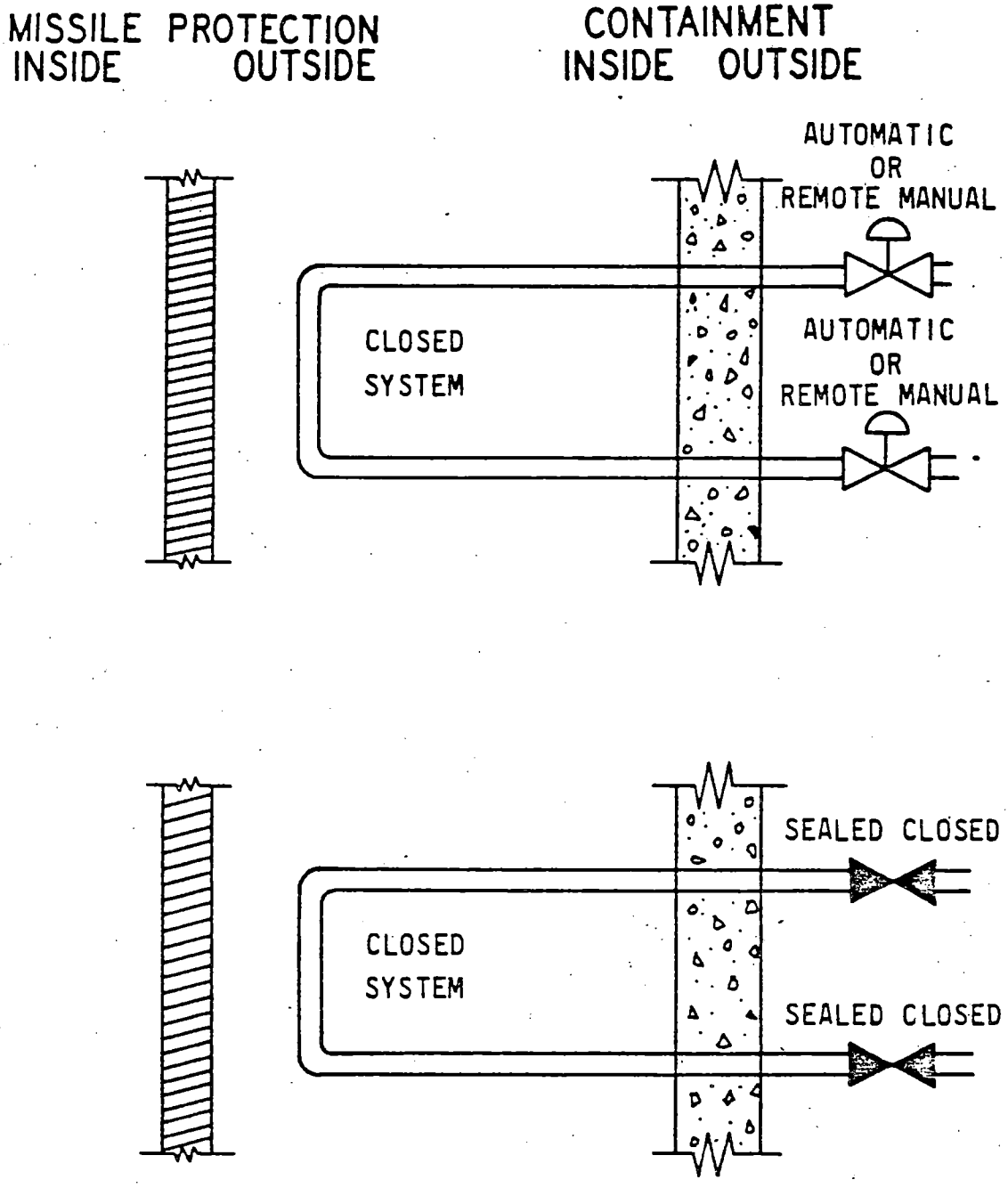


Figure 2

Standard Review Plan (SRP) 6.2.4 at Item II.3 presents guidelines for acceptable alternate containment isolation provisions for certain classes of lines. Containment isolation provisions that are found acceptable on the "other defined basis" represent conformance with the GDC and do not constitute exceptions.

The following evaluation addresses deviations in the containment isolation provisions from the explicit requirements of the GDC.

V Evaluation

The containment isolation provisions for the lines penetrating the primary reactor containment of the Palisades Nuclear Power Plant, Unit 1 are tabulated in Table 1. This information was obtained from the documents referenced in Section VII. The containment isolation provisions, as tabulated in Table 1, were evaluated against the requirements of GDC 54, 55, 56 and 57 (Appendix A to 10 CFR Part 50), and the supplementary guidance of SRP 6.2.4 (Containment Isolation System), where applicable. Deviations from the explicit requirements of GDC 54, 55, 56 and 57, and the acceptance criteria of SRP 6.2.4 are tabulated in Table 2. We have transmitted a draft evaluation to the licensee. As a result, Table 1 was revised and modified by the licensee to reflect changes in the plant. This revised evaluation report takes into account the comments and updated information received from the licensee.

Table 1 gives the licensee's penetration class designation for many of the lines penetrating containment. The isolation valve arrangements for these penetration classes are shown in Figures 3 and 4. The figures were

obtained from Reference 8. Following are evaluations of these penetration classes against GDC 55, 56 and 57.

Penetration Class A1

Penetration Class A1 shows influent and effluent lines open to the containment with two isolation valves in series outside containment. GDC 56 applies to the lines in Penetration Class A1. GDC 56 specifies that one valve should be located inside containment and one valve should be located outside containment. Consequently, the isolation valving arrangement for Penetration Class A1 differs from the explicit requirements of GDC 56 from the standpoint of valve location. Locating both containment isolation valves outside containment may be acceptable if the criteria used in the design of the piping between the containment the first valve are sufficiently conservative to provide adequate assurance of integrity. This matter is discussed under SEP Topiic III-1.

The following containment penetrations are included in Penetration Class A1: 1, 4, 4a, 52 and 68.

Penetration Class A2

Penetration Class A2 shows three isolation configurations that are open to the containment. GDC 56 applies to the lines in Penetration Class A2. One of the isolation configurations (i.e.,, the line having a locked-closed valve inside containment and a locked-closed valve outside containment) satisfies the explicit requirements of GDC 56. The following containment penetrations have this isolation configuration in Penetration Class A2: 64, 66 and 72.

The isolation configuration having a blind flange inside containment and a locked closed valve outside containment differs from the explicit requirements of GDC 56 from the standpoint of isolation barrier type. GDC 56 does not address the use of blind flanges. However, a blind flange is an acceptable isolation barrier in lieu of a valve. The basis for this appears in SRP 6.2.4 at Item II.3. Also, the locked-closed valve could be an automatic isolation valve and still satisfy GDC 56. The following containment penetrations have this isolation configuration in Penetration Class A2: 18, 18a and 27.

With regard to penetration 27 (ILRT fill line), the power operated valve MOV-P1 outside containment is verified closed monthly under surveillance procedure MO 29 of the plant Technical Specifcations. Since the line is flanged and gasket inside containment, the administrative control exercised over the valve is judged to be adequate. Therefore, the valve is a sealed closed isolation valve in accordance with the guidelines of SRP 6.2.4 at Item II.3.

The isolation configuration having both a locked closed valve and a simple check valve outside containment differs from the explicit requirements of GDC 56 from the standpoint of valve location and valve type. GDC 56 specifies that one valve should be located inside containment and one valve should be located outside containment, and that a simple check valve may not be used as an automatic isolation valve outside containment. For this configuration to be acceptable, the check valve should be located inside containment. Also, the locked closed valve could be an automatic isolation valve to satisfy GDC 56.

The following containment penetrations have the above isolation configuration in Penetration Class A2: 10 and 65. A judgment regarding the acceptability of the simple check valve outside containment as a bonafide containment isolation valve will be made in conjunction with the integrated assessment of the plant.

With regard to penetration 65 (instrument air line), the acutation provisions for valve CV 1211 differ from the explicit requirements of GDC 56 in that the valve is remote manually isolated. Since the instrument air line is non-essential, valve CV 1211 should be automatically isolated.

Penetration Class B1

Penetration Class B1 shows two series isolation valves outside containment in a line coming from the reactor coolant system. As shown, one of the valves is an automatic isolation valve and the other is a normally open, manual valve. Depending on the line, however, a simple check valve or remote manual valve is used. GDC 55 applies to the lines in Penetration Class B1. GDC 55 specifies that one valve should be locaed inside containment and one valve should be located outside containment, with the vaves being either locked closed or automatic isolation valves.

The isolation valving arrangement for Penetration Class B1, therefore, differs from the explicit requirements of GDC 55 from the standpoint of valve location, type, and actuation. Locating both itolation valves outside containment may be acceptable if piping and valve design criteria are sufficiently conservative to preclude a breach of integrity. This matter is

discussed under SEP Topic III-1. The use of a local manual valve for containment isolation is not acceptable, and should be upgraded to an automatic isolation valve.

The following containment penetrations are included in Penetration Class B1. 36, 40 and 45.

For penetration 36 (reactor coolant system letdown line), the parallel power operated valves CV 2012 and CV 2122 respond to controls to maintain a prescribed backpressure in the line. Although the valve controls are designed to ramp the valves closed in response to a drop in line pressure (e.g., as caused by a LOCA), the control circuitry is not safety-grade and does not assure valve closure throughout the course of an accident. Therefore, valves CV 2012 and CV 2122 should have automatic isolation capability in response to the sensing of diverse parameters characteristic of postulated accidents. Also, the isolation actuation circuitry should be safety-grade and capable of overriding valve control circuitry for normal plant operation. For penetration 45 (charging pump discharge line), the simple check valve outside containment is an inappropriate automatic isolation valve; a judgment regarding its acceptability will be made in conjunction with the integrated assessment of the plant. Also, the actuation provisions for the air operated valve CV 2111 differ from the explicit requirements of GDC 55 in that the valve is a remote manual isolation valve. A remote manual isolation valve is provided in lieu of an automatic isolation valve because the line has a post-accident safety function (emergency core cooling) which necessitates the valve being open in the event of an accident. Consequently, automatic isolation of

the line is not appropriate. However, the capability does exist to remote manually isolate the line if the need to do so should arise. The actuation provisions for the valve is acceptable based on the guidelines of SRP 6.2.4, at Item II.3.

Penetration Class B2

Penetration Class B2 shows a locked closed valve inside containment and a locked closed valve outside containment in a reactor coolant system effluent line. GDC 55 applies to the lines in Penetration Class B2. The isolation arrangement satisfies the explicit requirements of GDC 55.

The following containment penetration is included in Penetration Class B2: 35.

Penetration 35 shows two relief valves (RV 3164 and RV 0401), located between the two series isolation valves inside containment, which relieve to the containment. Consequently, the relief valves also have a containment isolation function in the reverse flow direction.

Penetration Class C1

Penetration Class C1 shows two types of valve arrangements for closed systems inside containment that are missile protected; namely, a single simple check valve outside containment for influent lines and a single automatic isolation valve outside containment for effluent lines. GDC 57 applies to the lines in Penetration Class C1. GDC 57 specifies that a single automatic, remote manual or locked closed isolation valve outside containment is acceptable, but a simple check valve is not an acceptable automatic isolation valve. The isolation valve arrangement having a

single simple check valve outside containment differs from the explicit requirements of GDC 57 from the standpoint of valve type.

The following containment penetrations are included in Penetration Class C1: 2, 3, 7, 8, 16 and 55.

For Penetrations 7 and 8, the main feedwater isolation valves (18"-N218R-0702 and 18"-N218R-0701, respectively) should be power operated, automatic isolation valves. In this regard, a power operated stop check valve would be acceptable. For penetrations 16 and 55, the containment isolations provisions satisfy the explicit requirements of GDC 57.

Penetration Class C2

Penetration Class C2 shows isolation valve arangements for influent and effluent lines of closed systems inside containment that are not missile protected. The valve arrangements consist of two valves in series, outside containment.

GDC 56 applies to the lines in Penetration Class C2. GDC 56 specifies that one automatic or locked closed valve should be located inside containment and one such valve should be located outside containment; also, a simple check valve may not be used as an automatic isolation valve outside containment.

The valve arrangements of Penetration Class C2 differ from the explicit requirements of GDC 56 from the standpoint of valve location and valve type. All valve arrangements would satisfy the explicit requirements of GDC 56 if one valve was located inside containment, particularly the simple check valve.

GDC 56 permits isolation valve arrangements that differ from the explicit requirements provided the basis for acceptability is defined. With respect to Penetration Class C2, then, locating both isolation valves outside containment may be acceptable since missile protection is not provided inside containment. The acceptability of this is contingent on the criteria used in the design of the piping between the containment and first valve, and the first valve, which must provide adequate assurance of integrity.

The following containment penetrations are included in Penetration Class C2: 5, 6, 11, 14, 15, 25, 26, 37, 38, 40A, 40B, 41, 42, 44, 46, 47, 49, 67 and 69.

For penetrations 11, 14, 26, 27, 41, 42 and 67, the simple check valve is not an appropriate automatic isolation valve outside containment. A power operated automatic isolation valve would be acceptable. However, a judgment decision regarding the acceptability of the simple check valve will be made at the time of the integrated assessment of the plant.

Penetration 25 shows a capped test connection which should be equipped with two locked closed isolation valves in series. Penetration 44 shows a manual isclation valve (3/4"-2084) which is not depicted by the isolation valve arrangements of Penetration Class C2, and which differs from the explicit requirements of GDC 56 from the standpoint of valve actuation; the subject valve should be a power operated valve that is automatically actuated.

Penetration Class C3

Penetration Class C3 shows two, locked closed isolation valves in series, outside containment, for effluent lines from systems that are closed inside containment and not missile protected. GDC 56 applies to the lines in Penetration Class C3. The valve arrangements described above differs from the explicit requirements of GDC 56 from the standpoint of valve location, namely, one valve should be located inside containment. However, locating both valves outside containment may be acceptable, based on the discussion under Penetration Class C2.

The following containment penetration is included in Penetration Class C3: 33.

The following discussion pertains to those containment penetrations not covered by the Penetration Classes discussed above.

a) Penetartions 9, 20, 24, 29, 34, 43, 57, 58, 59, 60, 61, 62, 63, 70, 71 and 73:

   These containment penetrations are spares. Of these, penetrations 21, 29 and 73 show pipe caps and blind flanges being used as isolation barriers. Threaded and/or tack welded pipe caps, and blind flanges without leak testing provisions, are not suitable isolation barriers.

b) Penetrations 12 and 13:

   These containment penetrations satisfy the explicit requirements of GDC 56, and are acceptable. However, with respect to the test, vent and drain lines, pipe caps are not suitable isolation barriers; two locked closed isolation valves in series should be provided for

these lines. Also, the flow element located between the isolation valves at penetration 13 should be moved downstream of the outboard isolation valves, or the licensee should justify that the flow element is an acceptable isolation barrier.

c) Penetrations 17 and 48:

These two containment penetrations serve the containment pressure instrumentation (8 lines). Since signals for the actuation of engineered safety features are derived from this instrumentation, it is imperative that these lines be open and remain open. Consequently, power-operated valves, which could potentially spuriously close, are not provided in these lines.

The instrument lines, however, are provided with test connections that are only capped. Again, pipe caps are not suitable isolation barriers; two locked closed isolation valves in series should be provided in each test line.

d) Penetrations 19, 50 and 51:

These containment penetrations are the personnel air lock, emergency access air lock and equipment hatch, respectively. Several lines are associated with these penetrations that are equipped only with pipe caps for isolation barriers. Pipe caps are not suitable isolation barriers and should be replaced with locked closed manual valves or blind flanges that are leak testable.

rationale for accepting the isolation provisions of the emergency sump recirculation lines appears in SRP 6.2.4, at Item II.3.

h) Penetrations 30 and 31:

With regard to penetrations 30 and 31 (containment spray pump discharge lines), the actuation provisions for the power operated valves CV-3001 (penetration 30) and CV-3002 (penetration 31) differ from the explicit requirements of GDC 56 in that they are remote manual isolation valves. Remote manual isolation valves are provided in lieu of automatic isolation valves because the lines, which are part of the containment spray system, have a post-accident safety function (depressurization of the containment following a pipe break accident) which necessitates their being opened in the event of an accident. Consequently, automatic isolation of these lines is not appropriate. However, the capability does exist to remote manually isolate these lines if the need to do so should arise. The actuation provisions for these valves are acceptable based on the guidelines of SRP 6.2.4, at Item II.3.

i) Penetration 39:

For penetration 39, the simple check valve outside containment is replaced with a blank flange during plant operation. To be an acceptable isolation barrier, the blank flange should be leak testable.

CONTAINMENT ISOLATION SYSTEM PENETRATION CLASSES

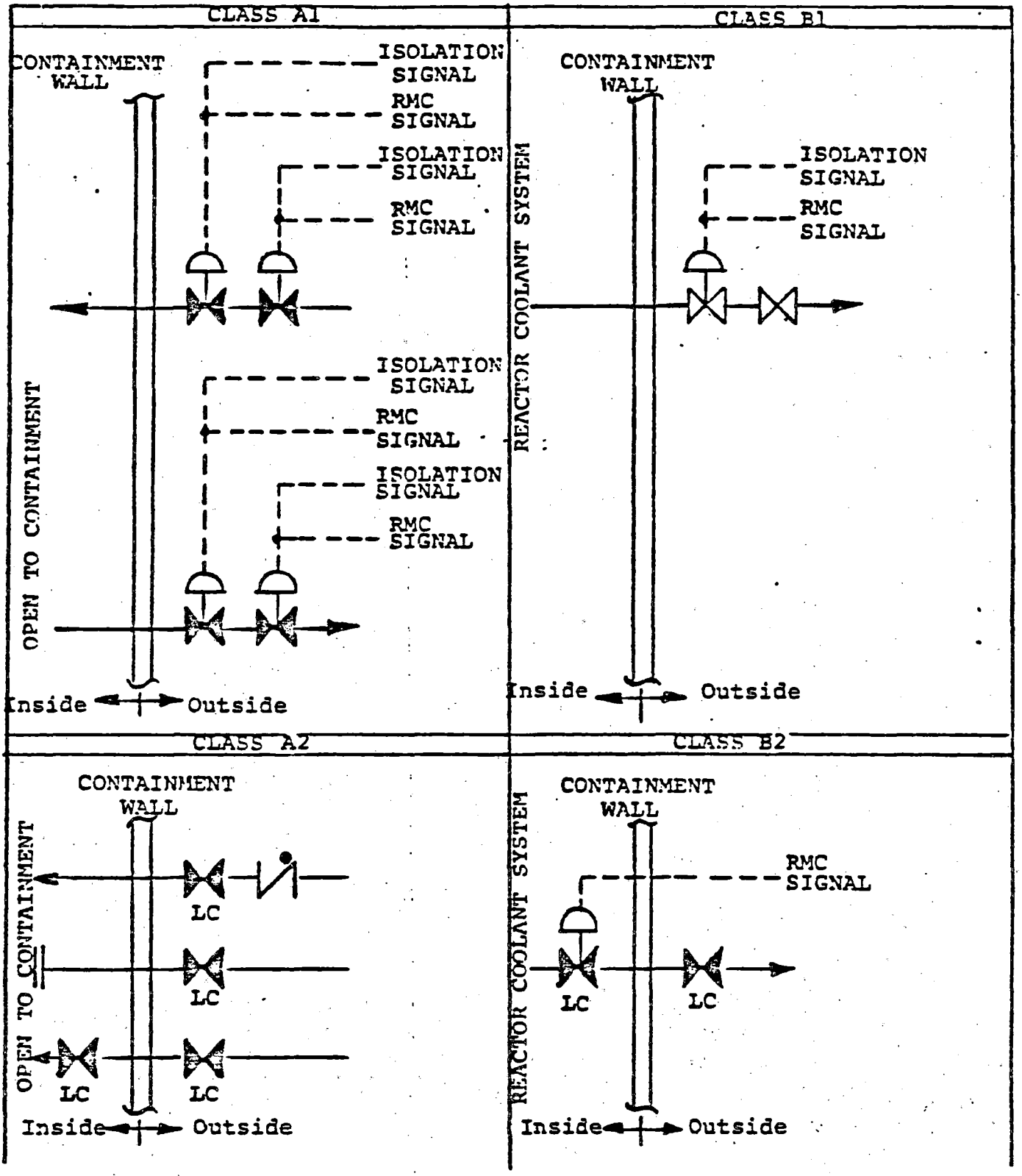
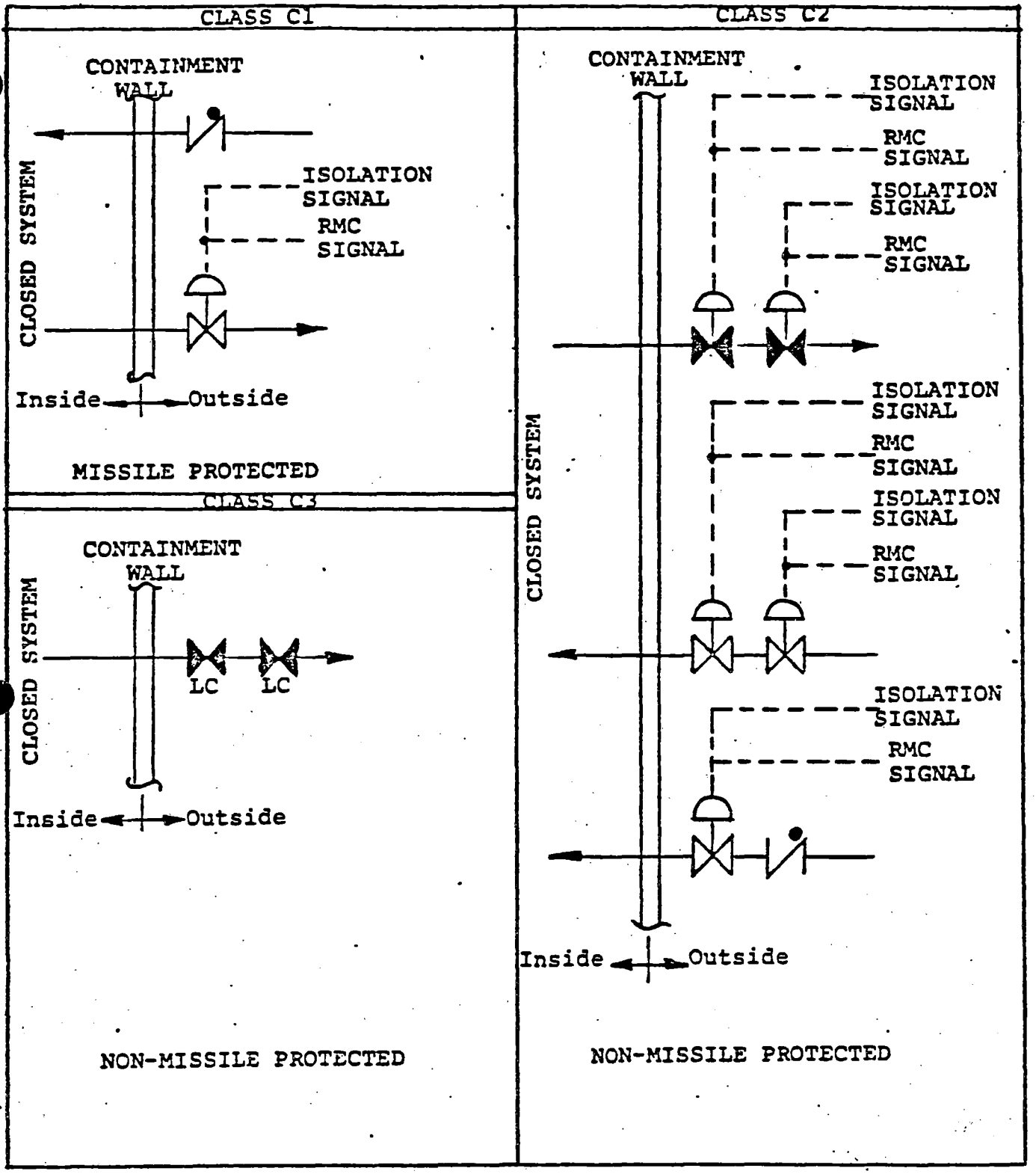


Figure 3

CONTAINMENT ISOLATION SYSTEM PENETRATION CLASSES



LEGEND

- MANUAL VALVE NORMALLY OPEN
- MANUAL VALVE LOCKED CLOSED (LC)
- CHECK VALVE
- BLIND FLANGE
- ISOLATION SIGNAL
- RMC SIGNAL
- AIR OPERATED WITH REMOTE MANUAL CONTROL AND AUTOMATIC ISOLATION

Figure 4

VI Conclusions

The following summarizes the deviations from review guidelines that have been identified and described in Section V of this report:

1. The isolation valving arrangements of the following containment penetrations do not meet the requirements of GDC 55 or 56 from the standpoint of valve location: Penetrations 1, 4, 4a, 10, 11, 21, 21a, 25, 26, 28, 30, 31, 33, 36, 37, 38, 39, 40, 40a, 40b, 41, 42, 44, 45, 46, 47, 48, 49, 52, 52a, 52b, 56, 65, 67, 68 and 69.

   The isolation valves in these penetrations are located outside containment. The acceptability of this is contingent on the acceptability of the piping design criteria. Also, the licensee should discuss the unique characteristics of the valves closest to the containment to terminate valve shaft or bonnet seal leakage, or the provisions in the plant for control of leakage.

2. The isolation valves of the containment penetration numbers listed below differ from the explicit requirements of GDC 55, 56 and 57 from the standpoint of valve type by using one check valve in series with other type isolation valves located outside containment: Penetrations 7, 8, 10, 11, 14, 26, 30, 31, 37, 39, 41, 42, 45, 65 and 67.

   A simple check valve located outside containment is not an appropriate automatic isolation valve. The judgment regarding its acceptability will be made in conjunction with the integrated assessment of the plant.

For penetrations 7 and 8, the main feedwater line, those check valves should be power operated, automatic isolation valves.

3. The isolation barriers in the containment penetrations listed below differ from the explicit requirements of GDC 55, 56 and 57 from the standpoint that pipe caps or blind flanges are used as containment isolation barriers.

Penetrations having pipes or test connections capped outside containment: 13, 17, 17a, 21, 21a, 25, 27, 28, 29, 38, 39, 48 and 73;

Penetrations having blind flanges inside containment: 18, 27, 29 and 73; or outside containment: 1, 4 and 39.

A blind flange inside or outside containmennt is an acceptable isolation barrier in lieu of an isolation valve if the blind flange is leak testable.

Pipe caps used in lines penetrating containment or test connections are not acceptable isolation barriers and should be replaced with locked closed valves or blind flanges that are leak testable. There are spare penetrations equipped with pipe caps, such as penetrations 21, 29 and 73. To be acceptable, the pipe cap should be fully welded with the same quality as the containment weld, or replaced with a blind flange that is leak testable.

4. The power operated valves CV-3001 (penetration 30) and CV-3002 (penetration 31) of the containment spray pump discharge lines differ from the explicit requirement of GDC 56 from the standpoint of valve actuation. Remote manual isolation valves are provided in lieu of automatic isolation valves because the systems have a post-accident safety function which necessitates their being opened in the event of an accident. The actuation provision for these valves are acceptable based on the guidelines of SRP 6.2.4, at Item II.3.

5. The containment sump suction lines which are part of the ECCS and the containment heat removal system have post-accident safety functions. Therefore, automatic isolation of these lines (penetrations 53 and 54) is not desirable; remote manual isolation valves are acceptable.

6. Penetration 44 shows a manual isolation valve (3/4"-2084) in series with an air operated isolation valve, which differs from the explicit requirements of GDC 56 from the standpoint of valve acuation. This manual valve should be a power operated automatic isolation valve.

7. There are several lines associated with the following penetrations which are equipped with pipe caps: the personnel air lock (penetration 19); emergency access air lock (penetration 50); and equipment hatch (penetration 51).

   These pipe caps are not suitable isolation barriers and should be replaced with locked closed manual valves or blind flanges that are leak testable.

8. GDC 55 and 56 specify that automatic isolation valves should, upon loss of actuating power, take the position that provides greater safety. The position of an isolation valve for normal and shutdown operating conditions, and post-accident conditions, depends on the fluid system function. In the event of power failure to a valve operator, the valve position should be consistent with the line function. In this regard, separate power supplies for isolation valves in series may be required to assure the isolation of non-essential lines. The licensee has provided information (see Table 1) on the position of isolation valves, whether or not the line is essential and the isolation signals for each isolation valve. This information shows that automatic isolation valves assume positions of greater safety on loss of actuating power and, therefore, GDC 55 and 56 are satisfied.

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
1	Purge Air Supply (48"Ø)	A1	CV1807 CV1808 508VAS -	AO BUTF VLV AO BUTF VLV MAN GL TEST VLV TEST CONNECT	X X X X		NC NC LC CAP	O/C O/C C	C C C	C C -	N	CIS CIS -	Blank Flanged; Vent. Syst. Valves Presently Not Used in Modes 1-4
2	Main Stm Line (SGE50A) (36"Ø)	C1	CV0510 MOV0510A	POS CH'K VLV MO BYPASS VLV	X X		NO NC	C C	C C	C C	Y	LOW S/G PRESS RM	Loss of Air, CV-0510 Remains in Position Due to Cross Connections with High Press Air and Accumulators
3	Main Stm Line (SGE50B) (36"Ø)	C1	CV0501 MOV0501A	POS CH'K VLV MO BYPASS VLV	X X		NO NC	C C	C C	C C	Y	LOW S/G PRESS RM	Loss of Air, CV-0501 Remains in Position Due to Cross Connection with High Press Air end Accumulators
4	Purge Air Exhaust (48"Ø)	A1	CV1803 CV1805 CV1806 506VAS	AO BUTF VLV AO BUTF VLV AO BUTF VLV MAN GL TEST VLV	X X X X		NC NC NC LC	O/C O/C O/C C	C C C C	C C C -	N	CIS CIS CIS -	Blank Flanged; Vent. Syst. Valves Presently Not Used in Modes 1-4
4a	Purge Air Exhaust Sample Line (3"Ø)	A1	100VAS 101VAS 507VAS -	MAN GA VLV MAN GA VLV MAN GL TEST VLV TEST CONN /w CAP	X X X X		LC LC LC C	C C C	C C C	- - -	N	- -	
5	SIG (E50A) Bottom Blow Down (2"Ø)	C2	CV0767 CV0771 567MS -	AO ANGLE VLV AO ANGLE VLV MAN GL TEST VLV TEST CONN /w CAP	X X X X		NO NO LC C	C C C	C C C	C C -	N	CIS CIS -	
6	S/G (E50B) Bottom Blow Down (2"Ø)	C2	CV0768 CV0770 568MS -	AO ANGLE VLV AO ANGLE VLV MAN GL TEST TEST CONN /w CAP	X X X X		NO NO LC C	C C C	C C C	C C -	N	CIS CIS -	
7	Feedwater to S/G (E50A) (18"Ø)	C1 6' 10'	746FW N210R-704 N210R-702	MAN GL VLV CHECK VLV CHECK VLV	X X X		LC C O	C C O	C C C	- - -	N Y Y	- REV-P REV-P	 Aux FW Main FW

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
8	Feedwater to S/G (E50B)	C1 18"	747FW	MAN GL DRAIN VLV	X		LC	C	C	-	N	-	
			N210R-701	CHECK VLV	X		O	O	C	-	Y	REV▲P	Main FW
			N210R-703	CHECK VLV	X		C	C	C	-	Y	REV▲P	Aux FW
9	Spare	-											
10	Service Air (2"Ø)	A2	122CAS	MAN GA VLV	X		LC	O/C	C	-	N	-	
			401CAS	CHECK VLV	X		C	O/C	C	-		REV▲P	
			142CA	MAN GL TEST VLV	X		LC	C	C	-			
			T	TEST CONN /w CAP	X		C						
11	Condensate to Shield Cooling Surge Tank (1½"Ø)	C2	CV0939	AO GA VLV	X		NO	O	C	C	N	CIS	
			401CDS	CHECK VLV	X		O	O/C	C	-		REV▲P	
			536CDS	MAN GL TEST VLV	X		LC	C	C	-		-	
			536ACD	MAN GL TEST VLV	X		LC	C	C	-		-	
			T	TEST CONN /w CAP	X		C						
12	Service Water Supply (16"Ø)	X	CV0847	AC BUTF VLV	X		NO	O	O	O	Y	MAN	
			CV0869	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			CV0865	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			CV0862	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			CV0870	AC BUTF VLV		X	NO	O	O	O	Y	MAN	
			571SW3	MAN GA VLV		X	LC	C	C	-	N	-	
			570SW	MAN GA VLV		X	LC	C	C	-	N	-	
			508SW	MAN GA VLV		X	LC	C	C	-	N	-	
			560SW	MAN GA VLV		X	LC	C	C	-	N	-	
			266SW	MAN GA VLV		X	LC	C	C	-	N	-	
			265SW	MAN GA VLV		X	LC	C	C	-	N	-	
13	Service Water Return (16"Ø)	X	CV0824	AC BUTF VLV	X		NO	O	O	O	Y	MAN	
			572SW3	MAIN GA TEST VLV	X		LC	C	C	-	N	-	
			CV0867	AC BUTF VLV		X	NC	C	O	O	Y	SIS	SIS Trips Normal Fan Which in Turn Opens Valve
			CV0843	AO GL VLV		X	NO	O	O	C	N	TC	
			CV0864	AC BUTF VLV		X	NC	C	O	O	Y	SIS	
			CV0863	AO GL VLV		X	NO	O	O	C	N	TC	
			CV0861	AC BUTF VLV		X	NC	C	O	O	Y	SIS	
			CV0838	AO GL VLV		X	NO	O	O	C	N	TC	
			CV0873	AC BUTF VLV		X	NC	C	O	O	Y	SIS	
			CV0872	AO GL VLV		X	NO	O	O	I	N	TC	

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
14	Component Cooling Water In (10"Ø)	C2	CV0910 257-0910CC 507CC -	AC BUTF VLV CHECK VLV MAN GL TEST VLV TEST CONN /w CAP	X X X X		NO O LC C	NO O LC	C C C	O - -	N	SIS REV-P -	Auto Reopen on SIS Reset
15	Component Cooling Water Out (10"Ø)	C2	CV0911 CV0940 508CC - -	AC BUTF/HD OP AC BUTF/HD OP MAN GL TEST VLV TEST CONN /w CAP TEST CONN /w CAP	X X X X X		NO NO LC C C	O O C	C C C	AI AI -	N	SIS SIS	Auto Reopen on SIS Reset CV-0911 & 0940 has Accumulator for Loss of Air
16	SIG (E50A) Surface Blow Down (2"Ø)	C1	CV0739	AO ANGLE VLV	X		O	O/C	C	C	N	CIS	
17	Containment Pressure Instrumentation (4-½"Ø)	N/A	1802 1802A 1802B 1802C 1804 1804A 1804B 1804C 1812 1812A 1812B 1812C 1814 1814A 1814B 1814C		X X X X X X X X X X X X X X X X		LO LO LC LC LO LO LC LC LO LC LO LC LO LC LC LC	O O C C O O C C O C O C O C C C	O O C C O O C C O C O C O C C C	- - - - - - - - - - - - - - - -	Y		PS-1802 (SIS & CIS Initiation) PS-1802A (SIS & CIS Initiation) PS-1804 (SIS & CIS Initiation) P-S-1804 (SIS & CIS Initiation) PT-1812 PT-1812A PT-1814
17a	Containment Sump Level Instrumentation		1814E 610B-DRW 1814F 1814G TEST /wCAP		X X X X X		LO C LC LC CAP	O C C C	O C C C	- - - -	N		

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
18 & 18a	Fuel Transfer Tube (36"ø)	A2	- - -	MAN GA VLV 36" FLANGE 4" FLANGE	X	 X X	NC	C C C	C C C	- - -	N		Blind Flg w/ 2 O-Ring Seals Inside Ctmt
19	Personnel Lock Outer Door Inner Door	X	P5A - - 	MAN GL TEST VLV PRESS GAGE PRESS TUBE PRESS EQUAL VLV PRESS TUBE PRESS TUBE			LC C CAP NC CAP CAP	O/C	LC	-			
20	Spare			PRESS EQUAL VLV			NC						
21	Hydrogen Monitoring Return Line (½"ø)		SV-2415A SV-2415B MV-WGS731 CAP		X X X X		C C	C C C	O/C O/C C	C C			
21a	Hydrogen Monitoring Supply Line (½"ø)		SV-2413A SV-2413B MV-WGS730 CAP		X X X X		C C CAP	C C C	O/C O/C C	C C			
22	Redundant High Pressure Safety Injection (6"ø)	X	MO3068 3250 MO3066 3251 MO3064 3252 MO3062 3253 RV3264 MO3072 CV3018 CV3036 3265 3265A	MO GL VLV CH'K VLV MO GL VLV CH'K VLV MO GL VLV CH'K VLV MO GL VLV CH'K VLV RELIEF VLV MO GA VLV AO GA VLV AC GA VLV MAN GL VLV MAN GL VLV	 X X X X X	X X X X X X X X X	NC C NC C NC C NC C C NC NC NO NO NO	C C C C C C C C C C C C O O	O O O O O O O O C O/C O/C O O O	AI - AI - AI - AI - - AI C O - -	Y	SIS SIS SIS SIS SIS SIS SIS SIS	ESF Related " PI-0375

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST. LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
23	High Pressure Safety Injection	X	MO3007	MO GL VLV		X	NC	C	O	AI	Y	SIS	
			3104	CH'K VLV		X	C	C	O	-		SIS	ESF Related
			MO3009	MO GL VLV		X	NC	C	O	AI		SIS	Actuation Signal Initiated
			3119	CH'K VLV		X	C	C	O	-		SIS	By Chp or Per/Owp (≥1593Psia)
			MO3011	MO GL VLV		X	NC	C	O	AI		SIS	Actuation Signal Initiated
			3134	CH'K VLV		X	C	C	O	-		SIS	By Chp or Per/Owp (≥1593Psia)
			MO3013	MO GL VLV		X	NC	C	O	AI		SIS	Actuation Signal Initiated By Chp or Per/Owp (≥1593Psia)
			3149	CH'K VLV		X	C	C	O	-			
			RV3165	RELIEF VLV		X	C	C	C	-			
			CV3059	AC GA VLV	X		NO	O	O	O			
			CV3037	AO GA VLV	X		NC	O	O/C	O			
			3337	MAN GL TEST VLV	X		O						SX-3337.
			3337A	MAN GL TEST VLV	X		O	C	O				SX-3337
			3180	MAN GL VLV	X		NO	O	O	-			PT-0318
			3180A	MAN GL VLV	X		NO	O	O	-			PT-0318
24	Spare	-											
25	Clean Waste Receiver Tank Vent to Stack (2"Ø)	C2	CV1064	AO GL VLV	X		NO	O	C	C	N	CIS	
			CV1065	AO GL VLV	X		NO	O	C	C		CIS	
			512CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			647CRW	MAN GL VLV	X		NO	O	O	-			PT-1065
			1358	DRAIN CONN/W CAP	X		C						
26	Nitrogen to Quench Tank	C2	CV1358	AO GA VLV	X		NC	C	C	C	N	CIS	
			400N2	CHECK VLV	X		C	C	C	-			
			581N2	MAN GA TEST VLV	X		LC	C	C	-			
			-	TEST CONNECT			C						
27	Int Leak Rate Test Fill Line (6"Ø)	A2	MOV-P1	MO BUTF VLV	X		NC	C	C	C	N	MAN	Flanged w/Gasket
			604 VAS	MAN GL VLV	X		LC	C	C	-			Inside Containment
			605 VAS	MAN GL VLV	X		LC	C	C	-			Flanged w/Gasket
			-	TEST CONN /W CAP	X		C						Inside Containment

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
28	Containment Air Sample Line (½"Ø)		140 VAS		X		LO	O	O	-	N		
			141 VAS		X		LC	C	C	-			
			142 VAS		X		LC	C	C	-			
			510 VAS		X		LC	C	C	-			
			-	TEST CAP	X		C						
29	Capped Spare	-	-	PIPE FLANGE		X	C				N		
			-	PIPE END /W CAP	X		C						
30	Containment Spray	X	CV3001	AC GL VLV	X		NC	C	O	O	Y	CHP	ESF Related
			3258	MAN GATE VLV	X		LO	O	O	-			Auto Open On Chp
			3226	CHECK VLV	X		C	C	O	-			
			3344ES	GLOBE VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			3227ES	GLOBE VLV	X		LC	C	C	-			
31	Containment Spray	X	CV3002	AC GL VLV	X		NC	C	O	O	Y	CHP	ESF Related
			3259	MAN GA VLV	X		LO	O	O	-			Auto Open on Chp
			3216	CHECK VLV	X		C	C	O	-			
			3217ES	MAN GL VLV	X		LC	C	C	-			
			3346ES	M GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
32	Low Pressure Safety Injection (12"Ø)	X	MO3008	MO GL VLV		X	NC	C	O	AI	Y	SIS	ESF Related
			3103ES	CHECK VLV		X	C	C	O	-		SIS	
			MO3010	MO GL VLV		X	NC	C	O	AI		SIS	
			3110ES	CHECK VLV		X	C	C	O	-		SIS	
			MO3012	MO GL VLV		X	NC	C	O	AI		SIS	
			3133ES	CHECK VLV		X	C	C	O	-		SIS	
			MO3014	MO GL VLV		X	NC	C	O	N		SIS	
			3148ES	CHECK VLV		X	C	C	O	-		SIS	
			3163ES	MAN GA VLV	X		LC	C	C	-			
			3196	MAN GA VLV	X		NO	O	O	-			
			3197	MAN GA VLV	X		NO	O	O	-			
			CV3006	AC GL VLV	X		NO	O	O	O		MAN	
			CV3025	AO GL VLV	X		NC	O	O/C	C		MAN	
			3336	MAN GA VLV	X		C	C	C	-			
			3108ES	MAN GA VLV		X	O	O	O	-			FT-0307
			3107ES	MAN GA VLV		X	O	O	O	-			FT-0307

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
32 cont.	Lov Pressure Safety Injection		1155PC	MAN GA VLV		X	C	C	C	-	Y		
			3123ES	MAN GA VLV		X	O	O	O	-			FT-0309
			3122ES	MAN GA VLV		X	O	O	O	-			FT-0309
			1156PC	MAN GA VLV		X	C	C	C	-			
			3130ES	MAN GA VLV		X	O	O	O	-			FT-0311
			3137ES	MAN GA VLV		X	O	O	O	-			FT-0311
			1157PC	MAN GA VLV		X	C	C	C	-			
			3153ES	MAN GA VLV		X	O	O	O	-			FT-0314
			3152ES	MAN GA VLV		X	O	O	O	-			FT-0314
			1158PC	MAN GA VLV		X	C	C	C	-			
			RV-3162	RELIEF		X	C	C	C	-			
33	Safety Injection Tank Drain (2"Ø)	C3	3234ES	MAN GA VLV	X		LC	C	C	-	N		
			3237ES	MAN GA VLV	X		LC	C	C	-			
			3348ES	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			3227ES	MAN GL VLV	X		LC	C	C	-			
			3236ES	MAN GA VLV	X		LC	C	C	-			
			3235ES	M SAMPL LINE GAV	X		LC	C	C	-			
			3217ES	MAN GL VLV	X		LC	C	C	-			
34	Spare	-											
35	Shutdown Cooling Return (14"Ø)	B2	MOV3016	MO GA VLV		X	ELC	O	O/C	C	N	MAN	Manual Control
			MOV3015	MO GA VLV		X	ELC	O	O/C	C			
			RV3164	RELIEF VLV		X	NC	C	C	-			
			RV0401	RELIEF VLV		X	NC	C	C	-			
			3204ES	MAN GL VLV	X		LC	C	C	-			
			3205	MAN GA VLV	X		LC	C	C	-			
			-	PIPE FLANGE	X		C	C	C	-			
			MO-3190	MO GA VLV	X		ELC	O	O	AI			
			MO-3199	MO GL VLV	X		ELC	O	O	AI			
			3163	MAN GA VLV	X		C	C	C	-			
36	Letdown To Purification Ion Exchanger (1½"Ø)	B1	CV2009	AO GL VLV	X		NO	O	C	C	N	CIS	
			2320CVC	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			2010CVC	MAN GA VLV	X		NO	O	O	-			

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
36 cont.	Letdown To Purification Ion Exchanger (1½"Ø)	B1	2148A	MAN GA VLV	X		NO	O	O	-	N		
			CV2012	AO GL VLV	X		NO	O	O/C	C			
			2149A	MAN GA VLV	X		NO	O	O	-			
			CV2122	AO GL VLV	X		NC	C	C	C			
37	Primary System Drain Pump Recirc (1½"Ø)	C2	CV1001	AO GL VLV	X		NC	C	C	C	N	CIS	
			403CRW	CHECK VLV	X		C	C	C	C			
			503CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
38	Condensate Return From Steam Heating Units (2"Ø)	C2	CV1501	AO GA VLV	X		NC	O/C	C	C	N	CIS	
			CV1502	AO GA VLV	X		NC	O/C	C	C			
			502VA	MAN GL TEST VLV	X		LC	C	C	-			
			-	VENT CONN /W CAP	X		C						
			-	TEST CONN /W CAP	X		C						
39	Containment Heating System (4"Ø)	X	CV1503	AO GA VLV	X		NC	C	C	C	N	CIS	Check Valve Replaced w/Blank Flange When At Power
			-	CHECK VLV	X								
			503VA	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			-	VENT CONN /W CAP	X		C						
40	Pri-Cooling System Sample Line (½"Ø)	B1	CV1910	AO GL VLV	X		O/C	O/C	C	C	N	CIS	
			CV1911	AO GL VLV	X		O/C	O/C	C	C			
			1170A	MAN GL TEST VLV	X		LC	C	C	-			
			1170B	MAN GL TEST VLV	X		LC	C	C	-			
				TEST CONN /W CAP	X		C						
40a	Hydrogen Monitoring Return Line (Degasifier Room) (½"Ø)		SV-2414A	SOLENOID	X		C	C	O/C	C	N	MAN	
			SV-2414B	SOLENOID	X		C	C	O/C	C		MAN	
			729WGS	MAN GL VLV	X		C	C	C	-			
			-	TEST CONN /W CAP	X		C						
40b	Hydrogen Monitor Supply Line (Degasifier Room) ½"Ø		SV-2412A	SOLENOID	X		C	C	O/C	C			
			SV-2412B	SOLENOID	X		C	C	O/C	C			
			728WGS	MAN GL VLV	X		C	C	C				
			-	TEST CONN /W CAP	X		C						

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA.	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
41	Degassifier Pump Discharge (3"Ø)	C2	CV1004	AO GL VLV	X		NO	O	C	C	N	CIS	
			407CRW	CHECK VLV	X		O	O	C	-			
			506CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
42	Demineralized Water To Quench Tank (2"Ø)	C2	CV0155	AO GL VLV	X		NC	C	C	C	N	CIS	
			V0155B	CHECK VLV	X		C	C	C	-			
			1126PC	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
43	Spare												
44	Controlled Bleed Off From RCP'S (3/4"Ø)	C2	CV2083	AO GL VLV	X		NO	O	C	C	N	CIS	
			2084	MAN GL VLV	X		NO	O	O	-			
			2083	MAN GA TEST VLV	X		LC	C	C	-			
			2083A	MAN GA TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
45	Charging Pump Discharge (2"Ø)	B1	2110	CHECK VLV	X		O	O	O		Y	-	
			CV2111	AC GL VLV (W/ HD OPERATOR)	X		NO	O	O	O		MAN	
46	Containment Vent Header (4"Ø)	C2	CV1101	AO GL VLV	X		NO	O	C	C	N	CIS	
			CV1102	AO GL VLV	X		NO	O	C	C			
			511WGS	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
47	Primary System Drain Tank Pump Suction	C2	CV1002	AO GL VLV	X		NO	O	C	C	N	CIS	
			CV1007	AO GL VLV	X		NO	O	C	C			
			502CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
48	Containment Pressure Instrumentation (4-½"Ø Lines)	X	V-1801	MAN GA VLV	X		LO	O	O	-			PS-1801 (SIS & CIS Initiation)
			V-1801A	MAN GA VLV	X		LO	O	O	-			PS-1801A (SIS & CIS Initiation)
			V-1801B	MAN GA VLV	X		LC	C	C	-			
			V-1801C	MAN GA VLV	X		LC	C	C	-			
			V-1803	MAN GA VLV	X		LO	O	O	-			PS-1803 (SIS & CIS Initiation)
			V-1803A	MAN GA VLV	X		LO	O	O	-			PS-1803A (SIS & CIS Initiation)

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
48 cont.	Containment Pressure Instrumentation (4-½"ø Lines)	X	V-1803B	MAN GA VLV	X		LC	C	C	-			
			V-1803C	MAN GA VLV	X		LC	C	C	-			
			V-1805	MAN GA VLV	X		LO	O	O	-			PT-1805
			V-1805A	MAN GA VLV	X		LC	C	C	-			
			V-1805B	MAN GA VLV	X		LO	O	O	-			PT-0105A
			V-1805C	MAN GA VLV	X		LC	C	C	-			
			V-1815	MAN GA VLV	X		LO	O	O	-			PT-1815
			V-1815A	MAN GA VLV	X		LC	C	C	-			
			V-1815B	MAN GA VLV	X		LC	C	C	-			
			V-1815C	MAN GA VLV	X		LC	C	C	-			
49	Clean Waste Receiver Tank Circulation Pump Suction (3"ø)	C2	CV1038	AO GL VLV	X		NO	O	C	C	N	AUTO BY CIS	
			CV1036	AO GL VLV	X		NO	O	C	C			
			513CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			514CRW	MAN DRAIN VLV	X		LC	C	C	-			
50	Emergency Access Inside Ctmt	X	-	PRES EQUAL VLV		X	NC				N		
			-	PRESS TUBE		X	CAP						
				PRESS TUBE		X	CAP						
	Outside Ctmt		-	PRESS EQUAL VLV	X		NC						
			-	PRESS GAGE	X		C						
			-	PRESS TUBE	X								
			P6VA	MAN G TEST VLV	X		LC						
			-	TEST CONN /W CAP	X		C						
				O-RING TEST CONN	X		C						
51	Equipment Door	X	-	O-RING TEST CONNECT /W CAP		X	C						¼" Tube Between The Seals Capped
52	Containment Sump Drain to Sump Tank	A1	CV1103	AO GL VLV	X		NC	C	C	C	N	SIS	
			CV1104	AO GL VLV	X		NC	C	C	C		CHR	
			500DRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN VLV	X		C						

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PLANT: PALISADES NDP UNIT #1

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52a	Containment Sump Level Instrumentation (3/8"Ø)		618DRW 618FDRW 618HDRW 618EDRW 618GDRW 618ADRW 618BDRW 618CDRW 618DDRW -	MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV 3 TEST CONN/WCAP	X X X X X X X X X X		LO LC LC LC LC LO LC LC LC C	O C C C C O C C C	O C C C C O C C C	- - - - - - - - -			LT-0382
52b	Containment Sump Level Instrumentation		619DRW 619FDRW 619HDRW 619EDRW 619GDRW 619ADRW 619BDRW 619CDRW 619DDRW -	MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV MAN GA VLV 3 TEST CONN/WCAP	X X X X X X X X X X		LO LC LC LC LC LO LC LC LC C	O C C C C O C C C	O C C C C O C C C	- - - - - - - - -			LT-0383
53	Containment Spray Pump Suction	X	CV3029 3102ES -	AIR OP VLV MAN GL TEST VLV TEST CONN /W CAP	X X X		NC LC C	C C	O C	AI -	Y	SIRWT LL	Post Loca Open On Sirw LL
54	Containment Spray Pump Suction	X	CV3030 3167ES -	AIR OP VLV MAN TEST VLV TEST CONN /W CAP	X X X		NC LC C	C C	O C	AI -	Y	SIRWT LL	Post Loca Open On Sirw LL
55	SIG (E50B) Surface Blowdown (2"Ø)	C1	CV0738	AO VLV W/ HAND OPERATOR	X		O	O/C	C	C	N	CIS	
56	Containment Sump Level Instrumentation		606A-VAS 619B-DRW 606B-VAS 606C-VAS -	TEST CONN /W CAP	X X X X X		LO C LC LC C	O C C C	O C C C	- - - -			LT-0383
57	Spare	-											

TABLE 1

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PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
58	Spare	-											
59	Spare	-											
60	Spare	-											
61	Spare	-											
62	Spare	-											
63	Spare	-											
64	Reactor Cavity Fill & Recirc (6"Ø)	A2	121SFP	MAN GA VLV		X	LC	C	C	-			
			120SFP	MAN GA VLV	X		LC	C	C	-			
			514SFP	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
65	Instrument Air (2"Ø)	A2	CV1211	AC GL VLV	X		NO	O	O	-	N	MAN	
			400CAS	CHECK VLV	X		O	O	O	-			
			612CAS	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			611CAS	MAN GA VLV	X		NO	O	O	-			PS1220
66	ILRT Instrument Line (1½"Ø)	X	601VAS	MAN GA VLV		X	LC	C	C	-	N		
			L6VAS	MAN GA VLV	X		LC	C	C	-			
			603VAS	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
			602VA	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						
67	Clean Waste Receiver Tank Pump Recirc (3"Ø)	C2	CV1037	AO GL VLV	X		NO	O	C	C	N	CIS	
			410-CRW	CHECK VLV	X		O	O	C	-			
			515CRW	MAN GL TEST VLV	X		LC	C	C	-			
			-	TEST CONN /W CAP	X		C						

TABLE 1

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS
PLANT: PALISADES NDP UNIT #1

PENE-TRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION OC	LOCATION IC	POSITION NOR-MAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESS-EN-TIAL	ACTUA-TION	REMARKS
68	Air Supply To Air Room (12"Ø)	A1	CV1813 CV1814 505VAS -	AO BUTF VLV AO BUTF VLV MAN GL TEST VLV TEST CONN /W CAP	X X X X		LC LC LC C	O/C O/C C	C C C	C C -	N	CIS	Air Supply To CV-1813 & CV-1814 Is Also Tested Under LLRT
69	Clean Waste Receiver Tank Pump Suction (4"Ø)	C2	CV1045 CV1044 518CRW -	AO GL VLV AO GL VLV MAN GL TEST VLV TEST CONN /W CAP	X X X X		NO NO LC C	O O C	C C C	C C -	N	CIS	
70	Spare	-											
71	Spare	-											
72	Reactor Refueling Cavity Drain (8"Ø)	A2	117SFP 118SFP 515SFP -	MAN GA VALVE MAN GA VALVE MAN GL TEST VLV TEST CONN /W CAP	 X X X	X	LC LC LC C	C C C	C C C	- - -	N		
73	Capped Spare	-	- - 509VAS -	PIPE FLANGE PIPE END /W CAP MAN GL TEST VLV TEST CONN /W CAP	 X X X	X	BC C LC C	C C C C	C C C C	- - - -	N		

TABLE 1 NOTES

1. Valve Type or Description - AO means air-to-open and AC means air-to-close.

2. Normal Position - NO - Normally open
   NC - Normally closed
   BC - Bolted Closed (e.g. flange)
   LO - Locked Open
   LC - Locked Closed
   ELO - Electrically Locked Open (key lock switch)
   ELC - Electrically Locked Closed (key lock switch)

3. Shutdown Position - Assumes normal shutdown with the plant on shutdown cooling.

4. Power Failure Position - Position shown is for either loss of power or loss of air unless otherwise noted.

5. Actuation - Signal which automatically causes valve to reposition unless otherwise specified. Symbols are:

   CIS - Containment Isolation Signal
   SIS - Safety Injection Signal
   CHP - Containment High Pressure Signal
   CHR - Containment High Radiation Signal
   MAN - Remotely actuated by Manual Operator action

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS					REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION	
1	PURGE AIR SUPPLY (48"φ)	56	X					
2	MAINSTEAM LINE (SGESOA) (36"φ)	57						
3	MAIN STEAM LINE (SG ESOB) (36"φ)	57						
4	PURGE AIR EXHAUST (48"φ)	56	X					
4a	PURGE AIR EXHAUST SAMPLE LINE (3"φ)	56	X					
5	S/G (ESOA) BOTTOM BLOW DOWN (2"φ)	56						
6	S/G (ESOB) BOTTOM BLOW DOWN (2"φ)	56						
7	FEEDWATER TO S/G (ESOA) (18"φ)	57			X			MFW ISOLATION VALVES SHOULD BE POWER OPERATED. AUTOMATIC ISOLATION VALVES TO SATISFY GDC 57 & AID IN MSLB ACCIDENT MITIGATION.
8	FEEDWATER TO S/G (ESOB)	57			X			" "
9	SPARE	—						
10	SERVICE AIR (2"φ)	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED.
11	CONDENSATE TO SHIELD COOLING SURGE TANK	56	X		X			" "
12	SERVICE WATER SUPPLY (16"φ)	56						

TABLE 2

CONTAINMENT ISOLATION SYSTEM
SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS						REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION		
13	SERVICE WATER RETURN (16"ϕ)	56							PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIERS.
14	COMPONENT COOLING WATER IN (10"ϕ)	56			X				DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED
15	COMPONENT COOLING WATER OUT (10"ϕ)	56							
16	SIG (ESOA) SURFACE BLOW DOWN (2"ϕ)	57							
17	CONTAINMENT PRESSURE INSTRUMENTATION (4½"ϕ)	56		X					PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIER; GDC 56 MET ON SOME OTHER DEFINED BASIS.
17a	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56							NO INFORMATION ON ISOLATION VALVES ARRANGEMENT (SKETCH REQUIRED)
18 & 18a	FUEL TRANSFER TUBE (36"ϕ)	56			X				GDC 56 MET ON SOME OTHER DEFINED BASIS (SEE SRP 6.2.4, ITEM II, 3).
19	PERSONNEL LOCK OUTER DOOR INNER DOOR	—							PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIERS
20	SPARE	—							
21	HYDROGEN MONITORING RETURN LINE (1½"ϕ)	56	X						NO INFORMATION ON ISOLATION VALVES ARRANGEMENT. (SKETCH REQUIRED).
21a	HYDROGEN MONITORING SUPPLY LINE (1½"ϕ)	56	X						" "
22	REDUNDANT HIGH PRESS. SAFETY INJECTION (6"ϕ)	55							
23	HIGH PRESSURE SAFETY INJECTION	55							

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT, UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS					REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION	
24	SPARE	—						
25	CLEAN WASTE RECEIVER TANK VENT TO STACK	56	X					TEST CONNECTION NEEDS TWO L.C. VALVES.
26	NITROGEN TO QUENCH TANK	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED
27	INT. LEAK RATE TEST FILL LINE (6"ϕ)	56						VALVE MOV-P1 IS A SEAL CLOSED ISOLATION BARRIER (SEE SRP 6.2.4, ITEM II, 3).
28	CONTAINMENT AIR SAMPLE LINE (1/2"ϕ)	56	X					PIPE CAP IS NOT ACCEPTABLE ISOLATION BARRIER.
29	CAPPED SPARE	—						BLIND FLANGE MUST BE LEAK TESTABLE; PIPE CAP IS NOT ACCEPTABLE ISOLATION VALVE.
30	CONTAINMENT SPRAY	56	X		X		X	ACTUATION PROVISIONS OF CV-3001 AND CV-3002 MEET GDC 56 ON SOME OTHER DEFINED BASIS (SEE SRP 6.2.4, ITEM II, 3) DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVES OUTSIDE CTMT IS NEEDED.
31	CONTAINMENT SPRAY	56	X		X		X	
32	LOW PRESSURE SAFETY INJECTION	55						
33	SAFETY INJECTION TANK DRAIN	56	X					
34	SPARE	—						
35	SHUTDOWN COOLING RETURN (14"ϕ)	55						
36	LETDOWN TO PURIFICATION ION EXCHANGER (1 1/2"ϕ)	55	X				X	CV-2012 & CV2122 SHOULD BE AUTOMATIC ISOLATION VALVES.

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS: LOCATION	NUMBER	TYPE	POSITION	ACTUATION	REVIEWER'S COMMENTS
37	PRIMARY SYSTEM DRAIN PUMP RECIRC. (1½"ϕ)	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED.
38	CONDENSATE RETURN FROM STM HEATING UNITS	56	X					
39	CONTAINMENT HEATING SYSTEM (4"ϕ)	56	X		X			
40	PRI-COOLING SYSTEM SAMPLE LINE (½"ϕ)	55	X					ISOLATION SIGNALS DO NOT PROVIDE APPROPRIATE DIVERSITY
40a	HYDROGEN MONITORING RETURN LINE (½"ϕ)	56	X				X	NON-ESSENTIAL LINE SHOULD BE AUTOMATICALLY ISOLATED.
40b	HYDROGEN MONITOR SUPPLY LINE (½"ϕ)	56	X				X	" "
41	DEGASSIFIER PUMP DISCHARGE (3"ϕ)	56	X		X			DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED
42	DEMINERALIZED WATER TO QUENCH TANK (2"ϕ)	56	X		X			" "
43	SPARE	—						
44	CONTROLLED BLEED OFF FROM RCP'S (3/4"ϕ)	56	X				X	CV-2084 SHOULD BE AN AUTOMATIC ISOLATION VALVE.
45	CHARGING PUMP DISCHARGE (2"ϕ)	55	X		X		X	CV-2111 ACTUATION PROVISIONS MEET GDC55 OR SOME OTHER DEFINED BASIS (SRP G.2.4. ITEM II.3). SIMPLE CHECK VALVE OUTSIDE CIAT IS NOT APPROPRIATE.
46	CONTAINMENT VENT HEADER (4"ϕ)	56	X					
47	PRIMARY SYSTEM DRAIN TANK PUMP SUCTION	56	X					

TABLE

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS: LOCATION	NUMBER	TYPE	POSITION	ACTUATION		REVIEWER'S COMMENTS
48	CONTAINMENT PRESSURE INSTRUMENTATION (4½"ϕ)	56	X						
49	CLEAN WASTE RECEIVER TANK CIRCULATION PUMP SUCTION (3"ϕ)	56	X						
50	EMERGENCY ACCESS INSIDE CTMT OUTSIDE CTMT	—							PIPE CAPS ARE NOT ACCEPTABLE ISOLATION BARRIERS.
51	EQUIPMENT DOOR	—							" "
52	CONTAINMENT SUMP DRAIN TO SUMP TANK	56	X						
52a	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56	X						NO INFOR. ON VALVE ARRANGEMENT (SKETCH REQ'D)
52b	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56	X						" "
53	CONTAINMENT SPRAY PUMP SUCTION	56							MEETS GDC 56 ON SOME OTHER DEFINED BASIS (SEE SRP 6.2.4. ITEM II, 3).
54	CONTAINMENT SPRAY PUMP SUCTION	56							" "
55	SIG (ESOB) SURFACE BLOWDOWN (2"ϕ)	57							
56	CONTAINMENT SUMP LEVEL INSTRUMENTATION	56	X						
57	SPARE	—							
58	SPARE	—							

TABLE 2

CONTAINMENT ISOLATION SYSTEM SEP REVIEW FINDINGS

PLANT: PALISADES PLANT UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS						REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION		
59	SPARE	—							
60	SPARE	—							
61	SPARE	—							
62	SPARE	—							
63	SPARE	—							
64	REACTOR CAVITY FILL & RECIRC. (6"ϕ)	56							
65	INSTRUMENT AIR (2"ϕ)	56	X		X		X		CV-1211 SHOULD BE AN AUTOMATIC I. V. SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NOT APPROPRIATE.
66	ILRT INSTRUMENT LINE (1½"ϕ)	56							
67	CLEAN WASTE RECEIVER TANK PUMP RECIRC. (3"ϕ)	56	X		X				DECISION ON ACCEPTABILITY OF SIMPLE CHECK VALVE OUTSIDE CONTAINMENT IS NEEDED.
68	AIR SUPPLY TO AIR ROOM (12"ϕ)	56	X						
69	CLEAN WASTE RECEIVER TANK PUMP SUCTION (4"ϕ)	56	X						
70	SPARE	—							
71	SPARE	—							

TABLE 2

CONTAINMENT ISOLATION SYSTEM
SEP REVIEW FINDINGS

PLANT: PALISADES PLANT, UNIT 1

PENETRATION NUMBER	LINE SERVICE	APPLICABLE GDC	EXCEPTIONS						REVIEWER'S COMMENTS
			LOCATION	NUMBER	TYPE	POSITION	ACTUATION		
72	REACTOR REFUELING CAVITY DRAIN (8"ϕ)	56							
73	CAPPED SPARE	—							PIPE CAP IS NOT ACCEPTABLE ISOLATION BARRIER; BLIND FLANGE MUST BE LEAK TESTABLE.

VI. Reference

1. License DPR-20-Palisades Plant - response to SEP Topic VI-4 - Containment Isolation System, 7/14/80.
2. Independent review of containment penetrations, MPR-639, Vol. I & II, MPR Association, Inc, 11/15/79.
3. License DPR-20-Palisades Plant - IE Bulletin 79-06B response update, 8/16/79.
4. DPR-20-Palisades Plant - requirements resulting from review of TMI-2 accident actions taken in response to NRC, 12/27/79.
5. Consumers Power Co. Licensee event report 80-021, Rev. 1, Misaligned containment sump valve, 8/20/80.
6. CE Post-TMI evaluation task 5 - containment isolation, 12/13/79.
7. Palisades plant design drawing: M-201 (rev. 22), M-202(21), M-203(19), M-204(16), M-205(23), M-206(11), M-207(33), M-208(19), M-214(15), M-215(14), M-218(20), M-219(10), M-220(17), M-221(10), M-222(10), M-223(7), M-224(7), M-225(8), M-226(8), E-15(1), E-16(1), E-17(6).
8. Palisades plant #1, Final Safety Analysis Report, Vols. 1, 2 & 3.
9. Letter from R. A. Vincent (Consumers Power Company) to D. M. Crutchfield, dated August 10, 1981, Providing Comments on CSB Evaluation Report on SEP Topic VI-4 for the Palisades Nuclear Plant, Unit 1.
10. Letter from R. A. Vincent (Consumers Power Company) to D. M. Crutchfield, dated January 4, 1982, Providing Information on SEP Topic VI-4 for the Palisades Nuclear Plant, Unit 1.