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August 7, 1981

NUCLEAR PRODUCTION DEPARTMENT

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
File 0260/0862
Transmittal of Proposed FSAR Changes and Response to NRC Questions
AECM-81/278

References:
1. Containment Systems Branch Questions 21.39, 40, 42, 44 - 53.
2. Procedure & Test Review Branch Question 423.49.
3. Reactor Systems Branch informal questions resulting from meetings held during the week of May 18, 1981.

In response to your request for additional information, Mississippi Power & Light Company is submitting the enclosed materials updating information pertaining to the above referenced item.

This information represents changes to the Grand Gulf Nuclear Station Final Safety Analysis Report (FSAR).

These proposed FSAR changes will be incorporated into the next available amendment to the FSAR. If you have any questions or require further information, please contact this office.

Yours truly,

L. F. Dale
Manager of Nuclear Services

RFL/JGC/JDR:lm

Attachments: (See Next Page)

A0014
S 1/1

AE2F1

Attachments:
1. Question & Response 21.39
2. Question & Response 21.40
3. Question & Response 21.42
4. Question & Response 21.44
5. Question & Response 21.45
6. Question & Response 21.46
7. Question & Response 21.47
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10. Question & Response 21.50
11. Question & Response 21.51
12. Question & Response 21.52
13. Question & Response 21.53
14. Question & Response 423.49
15. Informal Response RSB 5.2.2 (1.2)
16. Revised Table 6.2-44
17. Revised Table 6.2-45

cc: Mr. N. L. Stampley
Mr. R. B. McGehee
Mr. T. B. Conner
Mr. G. B. Rogers

Mr. Victor Stello, Jr., Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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021.39 The design of the containment purge and ventilation system consists of both 20-inch and 6-inch lines. From the discussion in Section 9.4.7.2.2, it is not clear what size lines are going to be used to continuously purge the containment. Provide this information. Also, state your intention to comply with Section B.1.b of BTP CSB 6-4 which provides that on-line purge systems should be limited to one purge line and one vent line.

RESPONSE

The response to this question is given in revised Subsection 9.4.7.2.2.

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9.4.7.2.2 Containment Ventilation and Filtration Systems

The containment ventilation and filtration system is shown in Figure 9.4-11 and 9.4-12. Principal system components ai listed and described in Table 9.4-10.

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The following lines are incorporated into the containment ventilation and filtration system: one 6-inch-diameter supply line, one 20-inch-diameter purge supply line, one 6-inch-diameter exhaust line, one 20-inch-diameter purge exhaust line.

The normal containment ventilation equipment consists of two 100-percent-capacity containment ventilation supply fans; two 100-percent-capacity containment ventilation exhaust fans; one 100-percent-capacity containment exhaust charcoal filter train; and the associated ducting, dampers, and controls required to provide a reliable source of fresh air for the comfort and safety of personnel.

The containment exhaust charcoal filter which train consists of the following components arranged in series with respect to the air flow:

a. Demister
b. Heating coil
c. Prefilter
d. High-efficiency particulate air (HEPA) filter bank
e. Charcoal filter bank
f. HEPA filter bank

Normally, 500cfm of the containment atmosphere is continuously exhausted through one 6-inch diameter exhaust line via the containment exhaust filter train and fan located in the auxilary building. Makeup air is provided through another 6 inch penetration. This ventilation is adequate to provide habitability for personnel accessibility. However, in the event that equipment leakages approach the flow described in Section 12.4, continuous or intermittent operation of the larger 6000 cfm containment purge system will be required to reduce airborne radiation levels to concentrations consistent with ALARA considerations and containment personnel accessibility requirements. The containment purge system utilizes the containment filtration system filter trains and utilizes a single 20 inch diameter exhaust penetration and a single 20 inch diameter makeup penetration. The 6 diameter and 20 inch diameter penetrations will not be open at the same time during power operation. Operation of the purge system during power operation has been analyzed as described in Subsection 6.2.4.3.3.

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A small amount of the containment atmosphere is continuously exhausted during normal operation via the separate containment exhaust charcoal filter train and one of the containment ventilation exhaust fans. The filter train and exhaust fans are located in the auxiliary building.

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The containment filtration system consists of two, 100-percent-capacity containment cooling system charcoal filter trains that continuously recirculate a portion of the containment atmosphere to limit the concentration of airborne radioiodines to an acceptable level during normal operation. Each filtration train consists of the following components arranged in series with respect to the air flow:

a. Demister
b. Heating coil
c. Prefilter
d. High-efficiency particulate air (HEPA) filter bank
e. Charcoal filter bank
f. HEPA filter bank
g. Centrifugal fan

The containment cooling, ventilating, and filtration system has several modes of operation. Manual initiation from the control room is required to shift the system from one mode to another. The modes are as follows:

a. Normal operating mode
b. Containment purge mode
c. Containment cleanup mode
d. Drywell purge mode

Both containment cooling system charcoal filter trains can also be utilized in conjuction with the purge fans to purge the drywell during reactor shutdown. Operation of the drywell purge mode is discussed in Subsection 9.4.8.2.2. In addition, the containment exhaust charcoal filter train may be used by the combustible gas control system during post-accident conditions as described in Subsection 6.2.5.

During normal plant operation, the containment is maintained at 80°F and 60 percent relative humidity by recirculating the air through coolers equipped with chilled-water cooling coils. Two fan coil units operate, with one unit on common standby.

Makeup air, as required for personnel access, is supplied to the containment through one 6-inch diameter supply line by the containment ventilation supply fans at the perimeter of the containment in a quantity approximately equal to that exhausted by the containment ventilation exhaust fans and associated exhaust filter train from the top-center of the containment above the refueling pool. One fan operates with the other on standby. Containment purge mode is also available during normal plant operation, and may be required continuously intermittently to reduced radioactivity levels inside the containment dependent upon equipment leakages and personnel access requirements.

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The closure of the isolation valves will not be affected by debris which might be generated by vent clearing and subsequent suppression pool rise. The isolation valves for the two supply lines (6-inch-diameter and 20-inch-diameter) are located at elevation 173'-3", and the isolation valves for the two exhaust lines (6-inch-diameter and 20-inch-diameter) are located at elevation 177'-9", well above the area of potential turbulence where debris capable of affecting valve closure might be present. In addition, the valve locations are shielded from the turbulent area by intervening concrete floors, or steel grating. As further assurance that the isolation valves will fully close, debris screens are provided. The debris screens are located a minimum of one pipe diameter from the inner side of each inboard isolation valve. The debris screens and piping are seismic Category I and are designed to withstand the LOCA differential pressure. 021.02 021.41

During the containment purge mode, the entire volume of air routed to one or both of the charcoal filter trains is discharged to the atmosphere with no recirculation to the containment through one 20-inch diameter purge exhaust line. The containment ventilation supply and exhaust fans are idle during this mode of operation. The drywell/containment purge fans, located in the auxiliary building, supply the makeup air through one 20-inch diameter purge supply line during this mode of operation. The outside air heating coil tempers the supply air during winter to 65°F. Both charcoal filter trains and purge fans can be utilized to provide additional purge capacity. 021.39 021.39

During the containment cleanup mode, the containment atmosphere is routed through one or both charcoal filtration trains and recirculated to the containment, with no exhaust.

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021.40 In response to Item 021.02, an analysis for the Containment purge and ventilation system was provided that assumed the containment atmosphere was released through two 20-inch lines. However, in addition to the containment purge system, there is a drywell purge system which is used during hot shutdown. State whether or not the drywell purge system was assumed to be operating for the analysis provided in response to Item 021.02. Provide a discussion of why the assumption is conservative.

RESPONSE

The same filter trains, exhaust fans and purge fans are used for containment purge and drywell purge. Containment purging and drywell purging are not performed simultaneously. Therefore, neither the quantity nor the size of the release points changes, if drywell purge is assumed to be operating.

An analysis has been performed for drywell purge operation and is described in revised Subsection 6.2.4.3.3.

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6.2.4.3.3 Evaluation Against Branch Technical Position CSB 6-4

The containment purge system is designed to meet the objectives given in BTP CSB 6-4. Isolation valves in the purge system are capable of isolating the containment within 5 seconds. A description of the system is given in Subsections 6.2.4.1 and 6.2.4.2.

Radiological consequences due to the occurrence of a postulated LOCA when the containment is being purged during normal operation have been examined to determine compliance with the dose criteria set forth in BTP CSB 6-4. The calculated site boundary doses are 0.47 rem and 4.2 millirem for the thyroid and whole body, respectively. These doses are a small fraction of the 10 CFR 100 guideline values. 38

Major assumptions used in the containment purge dose analysis are: 021.40

1. A double-ended guillotine break of the recirculation line is assumed to occur instantaneously. This accident was chosen because it represents the worst break and consequently the highest doses.

2. Closure of the isolation valves in the purge system will isolate the containment within 5 seconds (this includes a valve closure time of 4 seconds as given in Table 6.2-44 and an additional maximum time of 1 second for conservatism). During this period, reactor coolant blowdown was conservatively estimated to be 137,990 lbs (Table 6.2-10). 021.02 311.8

3. Forty percent of the blowdown was assumed to flash into steam. Conservatively, it was assumed that the entire iodine activity in the flashed fraction of the total blowdown was instantaneously released to the containment atmosphere at the instant of the accident. Plating out of iodine was ignored. Furthermore, retention of iodines in the suppression pool was ignored, though in actuality the flashed activity would be at first dumped into the pool and would evolve into the containment only subsequently.

4. Iodine specific activity in the reactor coolant was conservatively assumed to be 4 μCi/g of I-131 dose equivalent, which corresponds to spike conditions.

5. Turbulence resulting from the high blowdown rates and the operation of fan coolers in the containment was assumed to ensure good mixing in the entire containment volume.

6. Containment air was assumed to be released through two 20-inch purge lines for 5 seconds. Constant flow rates through the open purge lines corresponding to the maximum containment pressure of 2.4 psig during the release period (Ref. Fig. 6.2-2) were used to determine a total flow of 812 lbs to the environment. This is conservative, since it ignores lower flow rated due to lower containment pressures and partial closing of the isolation valves at times prior to 5 seconds.

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7. No credit was allowed for iodine removal by 99 percent efficient charcoal adsorbers on the containment exhaust lines.

8. Site boundary X/Q of 1.08×10^{-3} second per cubic meter as given in Table 15.6-12 was used in the dose calculation.

Since the containment purge system will be utilized to purge either the containment or the drywell, a similar radiological analysis was performed to determine the consequences of a postulated LOCA occurring during purging of the drywell. The calculated site boundary doses are 1.1 rem thyroid and 15 mrem whole body gamma. The sum of these doses and the offsite doses due to the containment leakage pathway are less than 50% of the 10 CFR 100 dose limits. Although it is anticipated that drywell purging will be required only during the shutdown, refueling, and startup conditions described in Subsection 9.4.8.2.2, the analysis was performed based on the assumption of a recirculation line break during full power operation which maximizes the amount of energy released to the drywell. Therefore, the analysis is conservative and demonstrates that, if necessary, intermittent operation of the drywell purge mode of the containment purge during power operation would not significantly affect safety of the plant.

Other major assumptions used in the dose analysis for drywell purge operation include:

1. The containment and the drywell will not be purged simultaneously.

2. Initial conditions in the drywell are 14.7 psia and 135°F per Table 6.2-4

3. Mass blowdown rate - Table 6.2-10; Pressure profile - Figure 6.2-2; Temperature profile - Figure 6.2-3.

4. Forty percent of the blowdown is assumed to flash and release the entire iodine inventory of the flashed blowdown into the drywell atmosphere.

5. Mixing occurs in only a fraction of the drywell volume. Complete mixing is not achieved until the end of blowdown at t=99 seconds.

6. Valve closure is with 4 seconds and one second delay is assumed prior to closing of the valve.

7. Drywell air is released through the two 20-inch purge lines for 5 seconds with the size of the openings decreasing as the valves close.

8. Iodine specific activity in the reactor coolant is assumed to be at pre-exiting spike conditions of 4.0 μCi/g of dose equivalent I-131.

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9. No credit was taken for the 99% efficient charcoal filters on the containment exhaust lines.

10. Site boundary x/Q of 1.08×10^{-3} seconds per cubic meter, as given in Table 15.6-12 was used in the dose equivalent.

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21.42 Section 9.4.7.2.2 of the FSAR states that a small amount of the containment atmosphere is continuously exhausted during normal operation. However, we believe that purging/venting should be minimized during reactor operation because the plant is inherently safer with closed purge valves than with open lines requiring valve action to provide containment isolation. In fact, serious consideration should be given to a plant design such that purging/venting is not required during operation. Therefore, provide a detailed discussion of the reasons why the Grand Gulf Station needs to purge, and an estimate of the number of hours per year that purging is expected through each particular valve.

RESPONSE

The Mark III Containment Design utilized by Grand Gulf provides for the installation of the majority of components associated with reactor coolant carrying support systems inside the isolable primary containment boundary. These systems are normally in service during reactor power operations and are subject to the routine maintenance requirements, including the repair of wear induced leakages. The location of these components within the containment boundary enhances the safety of the public, because any leakage from these components during normal plant operation or during an accident is released into a structure designed for such releases. This design and the secondary containment design provide a minimum of two barriers between the environment and any leakage from components located within the primary containment which contain reactor coolant. With the majority of reactor coolant containing components located within the primary containment, accessibility by plant personnel must be provided for monitoring, as well as, preventive and corrective maintenance during power plant operation. The containment HVAC design is based on criteria commensurate with enabling access by plant personnel, while meeting ALARA dose considerations and providing protection to the public.

As described in Subsection 9.4.7, during normal operation the containment is continuously ventilated by 500cfm of fresh air entering and leaving the containment via two 6-inch double valved penetrations (one exhaust and one supply). The exhaust air is filtered by the charcoal filter train described in Subsection 9.4.7.2.2 prior to release to the environment. The system is adequate to prevent a containment pressure buildup due to compressed air leakages into the containment and to provide some assistance in maintaining a habitable environment.

During operation of the normal ventilation and cooling system, 3000cfm of the containment atmosphere is recirculated through one of the containment purge filter trains located inside the containment. This mode of operation will minimize airborne particulates and iodine and enable

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routine personnel access without the use of breathing apparatus.

As described in Section 12.4, there are postulated leakages that release noble gases to the containment atmosphere during operation. The normally operating ventilation of 500cfm will decrease the rate of airborne activity buildup, but is not adequate to limit the buildup to concentrations consistent with ALARA considerations. Therefore, if actual leakages approach the postulated leakage of 2000 lb/hr, it will be necessary to continuously operate the 6000cfm capacity purge system described in Subsection 9.4.7. The need to operate the high flow purge system will be determined by airborne radiation levels and personnel access requirements. The purge mode utilizes two 20 inch double valved penetrations (one exhaust and one supply) that will be opened during operation only after the 6" ventilation isolation valves are closed. In addition to the primary containment isolation valves provided for the containment purge and ventilation systems, redundant automatic secondary containment isolation valves are provided at the inlet and exhaust penetrations.

The operation of the high capacity purge system utilizing the 20-inch diameter containment penetrations has been analyzed based on offsite doses, assuming that a DBA occurs with the purge valves open during plant operation. As noted in Subsection 6.2.3.3, the doses attributed to purging during power operation are a small fraction of 10CFR100 guideline valves. This analysis is inherently conservative because of the assumptions described in the referenced Subsection and because no credit was taken for the redundant secondary containment isolation valves provided nor for the transit time through the auxiliary building.

For postulated accidents that do not include a seismic event in the scenario, doses would be even lower than analyzed because any leakages from the exhaust penetrations would pass through the containment charcoal filter trains before any release to the environment. Although elimination of the purge during operation could reduce the already small dose contribution from the purge system penetrations during a low probability accident, utilization of the purge during normal operation would actually contribute to the overall safety of the plant because doses to the operators are minimized while providing maximum utilization of the containment.

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FSAR

21.44 Figures 6.2.76 through 6.2.80 show the arrangement of the various isolation valves listed in Table 6.2.44. Many of the lines penetrating the containment have test lines between the isolation valves. (See, for example, penetration No. 43). Provide justification why these test lines should not be treated as branch lines and included in the containment isolation valve tables and tested in accordance with Appendix J.

RESPONSE

The subject test lines will be treated as branch lines and tested in accordance with 10 CFR 50, Appendix J. See revised Table 6.2-44.

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FSAR

21.45 Table 6.2.49 lists the systems which penetrate the containment and are not vented and drained for the Type A containment leak rate test.

Those systems associated with note 6 do not have to be vented and drained for the Type A test provided they meet the following requirements:

1) The system is protected against missiles and pipe whip.

2) The system is designated seismic Category I.

3) The system is classified Safety Class 2.

4. The system pressure is greater than the containment pressure at all times during the course of the accident.

5. The system will remain full of water for 30 days.

6. Both Items 4 and 5 will be maintained when a single active failure is assumed in the system.

State whether or not these systems meet the above requirements.

RESPONSE

The response to this question is provided in revised Table 6.2-49. The following systems, or applicable portions thereof, meet the above stated requirements and are not vented or drained for the Type A Test: feedwater system, standby service water system, residual heat removal system, reactor core isolation cooling system, high pressure core spray system, and low pressure core spray system. The associated penetration numbers are: 9, 10, 11, 12, 13, 14, 18, 20, 21, 22, 25, 26. 27, 28, 29, 30, 31, 48, 71A, 71B, 77, 89, 90, 91, and 92.

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21.46 Note 16 of Table 6.2.49 is not an acceptable reason for not venting and draining a system for the Type A containment leak rate test. It is our position that all isolation valves should be subjected to Type C testing. Therefore, vent and drain should be provided for the Type A containment leak rate test for these systems or provide acceptable justification for not doing so.

RESPONSE

The response to this question is provided in revised Table 6.2-49 and the responses to Questions 021.45 and 021.47. Those systems, or portions thereof, meeting the requirements stated in Questions 021.45 and 021.47 will not be subject to vent and drain for Type A testing. Additionally, the following penetrations will not be vented or drained due to operational considerations:

1. Chilled water (supply and return), penetration numbers 38 and 39, are required to operate the containment coolers to maintain desired environmental condition during the Type A test.

2. Plant service water (supply and return), penetration numbers 36 and 37, are required to operate the drywell coolers to maintain desired environmental conditions during the Type A test.

The response to Question 021.52 provides the Type C testing information.

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FSAR

21.47 Systems that are associated with containment penetration numbers 11, 12, 13, 23, 24, 25, 27, 28, 29, 30, 32, 46 and 67 have lines that are sealed from the containment atmosphere because their lines terminate below the water level of the suppression pool. Therefore, these systems are not vented and drained for the Type A containment leak rate test. However, to be considered a sealed system, the piping between the suppression pool and isolation valves should meet the following requirements:

1) The piping is protected against missile and pipe whip.

2) The piping is designated seismic Category I.

3) The piping is classified Safety Class 2.

State whether or not the piping between the suppression pool and isolation valves meet the above requirements for the penetration mentioned above. Also, specify the fluid that is used to pressurize the valves to perform the Type C test.

RESPONSE

The response to this question is provided in revised Table 6.2-49. Systems that are associated with containment penetration numbers 11, 12, 13, 14, 25, 27, 28, 29, 30, 48, 69, 71A, 71B, 77, 113, 115, 117, and 119 have lines that are sealed from the containment atmosphere because their lines terminate below the water level of the suppression pool and meet the requirements stated above; therefore, these systems are not vented or drained for the Type A containment leak rate test. The associated valves will be pressurized with water to perform the Type C test.

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21.48 The systems for containment penetration numbers 9, 10, 11, 12, 13, 17, and 22 have branch lines that do not have any isolation valves. It is our position that these branch lines meet the applicable general design criteria for isolations and should be tested in accordance with Appendix J.

RESPONSE

The response to this question is given in revised Tables 6.2-44 and 6.2-49, revised Figure 6.2-77, and new Figure 6.2-79a. The subject branch lines will be tested in accordance with 10 CFR 50, Appendix J.

NOTE: The above referenced figures will be supplied in the next available FSAR amendment.

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21.49 Isolation valves F12F308 for Penetration 14, E51F077- for Penetration 75, and G33F252 for Penetration 87 listed in Table 6.2.44 are not shown in Figures 6.2.77 or 6.2.79. Correct this discrepancy.

RESPONSE

The subject discrepancies have been corrected. See revised Figure 6.2-79, new Figure 6.2-79A, and revised Table 6.2-44.

NOTE: The above referenced figures will be supplied in the next available FSAR amendment.

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021.50 The system for containment penetration numbers 18, 23, 24, 29, 46, 48, 67 and 77 have simple check valves located outside containment for containment isolation valves. Provide justification for locating a simple check valve outside containment as an isolation valve.

RESPONSE

Tables 6.2-44 and 6.2-49 have been revised in regard to containment penetration numbers 18, 23, 24, 29, 46 and 67.

Penetration numbers 48 and 77 each have a branch line which utilizes two check valves in series for isolation. This arrangement provides vacuum relief protection for the relief valve discharge line penetrating containment when the RHR heat exchanger vent is isolated, and therefore must be self-actuating to accomplish the design function. This double check valve arrangement is backed up by a closed system outside containment. Sufficient containment isolation capability is therefore provided.

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21.51 Figures 6.2.76 through 6.2.80 show the isolation valves and the test connections. However, from the figures it is not clear what test connection is going to be used to test which valve. Provide this information. For any valve that is being tested for leakage in which the pressure is applied in the opposite direction as that when the valve would be required to perform its safety function, provide justification that the results from the tests for the pressure applied in a different direction will provide equivalent or more conservative results.

RESPONSE

For Type C testing of containment penetrations, all testing with the exception of the ECCS systems (See Table 6.2-49) will be done in the correct direction unless it can be shown that testing in the reverse direction is equivalent, or more conservative. For Grand Gulf, the correct direction is defined as flow from inside the containment to outside the containment.

All gate valves with the exception of the ECCS systems (for detailed testing description of ECCS valves see Table 6.2-49) will be tested so that any leakage will be from inside the containment to outside the containment or the valve will be pressurized between the valve discs. Testing between the valve discs is conservative because, during the accident, the leakage will bypass the upstream disc (the pressure will lift the disc off the valve seat) and all of the leakage will actually occur past the downstream disc. The test will actually monitor leakage past both valve discs so the measured leakage will not only be the leakage of concern from the accident but it will also include a "penalty" for the leakage past the upstream disc.

The globe valves and angle relief valves will be tested in the correct direction wherever possible. In some cases, a valve must be tested in the reverse direction. These valves are oriented such that the Type C test pressure will actually attempt to lift the valve disc, whereas the accident pressure will attempt to seat the valve disc more firmly. The leakage reported for Type C test results will be higher than the accident leakage. Testing in this manner is, therefore, more conservative.

Butterfly valves are also tested in the correct direction wherever possible. In some cases, testing in the reverse direction is required. Butterfly valves are symmetrical in design. The test pressure and the accident pressure (even though applied in different directions) leakage characteristics are the same due to the valve disc and seat arrangement. Testing in the reverse direction will therefore yield equivalent results.

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21.52 In Table 6.2.44 there are numerous isolation valves listed in which no Type C test will be performed. It is our position that a Type C test should be performed on all isolation valves. Valves should be pressurized with air or nitrogen unless valves are in a sealed system. Then valves should be pressurized with the fluid that forms the seal in the sealed system. State your intention to comply with this position.

RESPONSE

Tables 6.2-44 and 6.2-49 have been revised to indicate that a Type C test will be performed on all containment isolation valves except those associated with the feedwater penetrations. These penetrations are provided with a feedwater leakage control system, as described in subsection 6.7.2, which prevents leakage via these penetrations after a postulated design basis LOCA. The performance of the feedwater leakage control system is tested at the same frequency as Type C testing.

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21.53 The response to Item 021.17 concerning the determination of bypass leakage paths in dual containments is inadequate. The guidelines of BTP CSB 6-3 were not used in considering potential bypass leakage paths around the leakage collection and filtration system of the secondary containment. For example, the fact that lines penetrating the primary and secondary containment has isolation valves does not preclude through-line leakage. Therefore, identify all potential bypass leakage paths using the guidelines of Item 5 of BTP CSB 6-3. Also, provide a realistic leakage rate for these potential bypass leakage paths and a discussion (including drawing) of provisions made to permit pre-operational and periodic leakage rate testing in a manner similar to the Type B or C tests of Appendix J to 10 CFR Part 50 for each bypass leakage path.

RESPONSE

The guidelines of BTP CSB 6-3 were addressed in considering potential bypass leakage paths as described in revised subsection 6.2.3.2.

The main steam and feedwater lines are provided with leakage control systems discussed in Section 6.7 and are not provided with auxiliary building isolation valves.

Lines which penetrate the primary and secondary containment were evaluated for potential bypass leakage paths as summarized in Table 6.2-42. Designs provided to preclude through line leakage are dependent upon the working fluid in the associated system; ie, air or water.

For lines carrying ventilation air, adequate openings are provided in the ductwork between the primary and secondary containment isolation valves to ensure that any leakage through the primary containment isolation valves will be vented into the auxiliary building. The compressed air lines are provided with pressure control valves between the primary and secondary containment isolation valves. These valves vent their lines into the auxiliary building when the pressure inside containment becomes greater than the pressure inside the line. All lines that vent into the auxiliary building will be treated by the SGTS.

Lines that penetrate the primary and secondary containment which normally contain water will provide a water seal between the containment and the environment upon primary and secondary isolation valve closure. The volume of water maintained is sufficient to provide at least a 30 day seal. Several of the lines listed in Table 6.2-42 are not seismically qualified within the auxiliary building. However, if a break were to occur in the non-seismic portion of the line, the water would evacuate into the auxiliary building, and any leakage through the failed line would be processed by the SGTS. Therefore, there is no bypass leakage of the secondary containment due to through line leakage. 21.53

Lines which penetrate the primary and secondary containment fall into one or more of the below listed categories:

1. Operate post LOCA at a pressure higher than the primary containment pressure.

2. Provided with leakage control systems.

3. Vented to the secondary containment.

4. Provided with a water seal assessed against primary containment valve leakage characteristics.

Therefore, the primary containment isolation valve leak rate tests and SGTS operability tests are adequate to ensure that bypass leakage will not occur and separate leakage testing of the secondary containment isolation valves is not required.

The design and construction codes, standards and guides applied to the auxiliary and enclosure buildings are discussed in Section 3.8.

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6.2.3.2 (Cont.)

The program for leakage rate testing of the primary containment structure and containment components is described in subsection 6.2.6. Primary containment integrity is verified and assured in accordance with the Technical Specifications, Chapter 16.0.

The primary containment leakage rate will not exceed the value stated in subsection 6.2.1.

To maintain secondary containment integrity and eliminate leakage bypassing the SGTS, all lines 2 1/2 inches and larger, penetrating the secondary containment and not performing a safety function or supplying a source of makeup to the RPV, are provided with redundant, (except as noted below) ASME Code, Section III, Class 3, seismic Category I isolation valves. Plant protection system signals that isolate and/or activate these secondary containment isolation valves are described in subsection 7.6.1.12.

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Lines two inches and smaller penetrating the secondary containment only are properly orificed if their failure could jeopardize functional integrity of the secondary containment by providing a leakage path which exceeds the capacity of the standby gas treatment system.

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Analysis has shown that in addition to building leakage paths and lines smaller than two inches, the SGTS has the capacity to maintain secondary containment negative pressure with a single,

a. 4-inch makeup water supply line

b. 3-inch domestic water supply line

c. 4-inch condensate and refueling water supply

d. 4-inch RHR backwash line

e. 3-inch backwash transfer pump discharge line

f. 3-inch floor and equipment drain line

The single isolation valve for each of the above lines is an air-operated valve which fails closed; in addition, each operator is provided with redundant solenoid valves which receive actuation signals from redundant sources (refer to subsection 7.6.1.12). In this manner, it is ensured that, given any single failure, only one of the above lines will be nonisolated; this is within the capacity of the standby gas treatment system.

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TABLE 6.2-42

EVALUATION OF POTENTIAL SECONDARY CONTAINMENT
BYPASS LEAKAGE PATHS

Primary Ctmt. Penetration	Line Size Penetrating Primary Containment	Bypass Leakage Barrier(1)
1. Main Steam Line "A"	28"	C,V,(2),(4)
2. Main Steam Line "B"	28"	C,V,(2),(4)
3. Main Steam Line "C"	28"	C,V,(2),(4)
4. Main Steam Line "D"	28"	C,V,(2),(4)
5. Feedwater "A"	24"	C,V,(2),P
6. Feedwater "B"	24"	C,V,(2),P
7. Main Stm. Drain to Condenser	3"	C,A,V
8. CRD Pump Disch.	2"	C,L,(2)
9. Supply Air (HVAC)	20"	C,A,V
10. Exhaust Air (HVAC)	20"	C,A,V
11. PSW Return	4"	C,A,L
12. PSW Supply	4"	C,A,L
13. Chilled Water Supply	4"	C,A,L
14. Chilled Water Return	4"	C,A,L
15. Service Air	3"	C,A,V
16. Instrument Air	2 1/2"	C,A,V
17. RWCU to Condenser	4"	C,A,L
18. Post Accident Sample Line	3/4"	C,L,(7)
19. Demin. Wtr. to Upper CTMT Pool	6"	C,A,L
20. FPC&CU to Upper Pool	8"	C,A,L

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TABLE 6.2-42 (Cont.)

Primary Ctmt. Penetration	Line Size Penetrating Primary Containment	Bypass Leakage Barrier(1)
21. Pool Skimmer Tks. to FPC&CU System	8"	C,A,V
22. Aux. Bldg. Floor Drain Transfer Pumps Disch.	4"	C,A,(3),(6)
23. CTMT HVAC Supply	6"	C,A,V
24. CTMT HVAC Exhaust	6"	C,A,V
25. Supp. Pool Drain	12"	C,A,(6)
26. Comp. Air (ADS)	1"	C,A,V
27. Post Accident Sample Line	3/4"	L,(6),(7)***
28. Post Accident Sample Line	3/4"	C,L,(7)
29. Suppression Pool Clean-up	12"	C,A,L
30. Demin. Water	4"**	C,A*,L
31. SSW Supply B	2"	C,(5),(3)
32. SSW Return B	2"	C,(5),(3)
33. SSW Supply A	2"	C,(5),(3)
34. SSW Return A	2"	C,(5),(3)
35. Press. Sensing	3/4"@	-
36. H_2 Analyzing	3/4"@	-
37. Press. Sensing	3/4"	-
38. Fission Prod. Sampling	3/4"	-
39. Post Accident Sample Line	3/4"	C,(7)
40. Post Accident Sample Line	3/4"	C,(7)
41. Post Accident Sample Line	3/4"	C,(7)

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TABLE 6.2-42 (Cont.)

Primary Ctmt. Penetration	Line Size Penetrating Primary Containment	Bypass Leakage Barrier(1)
42. Post Accident Sample	3/4"	L,(6),(7)***

*Single valve, double solenoid

**This is a 2" line that enlarges to 4" for just the penetration

***This sample line that penetrates into the suppression pool has one closed motor-operated valve.

NOTES

(1) Bypass Leakage Barrier.

C - Redundant primary containment isolation valves.

A - Redundant secondary containment isolation valves.

L - Water seal.

V - Vented to secondary containment.

P - Pressurized water seal system (reference subsection 6.7.2).

(2) Third Isolation Valve (remote manual) provided.

(3) Required to operate post-accident; hence, no through-line leakage.

(4) Leakage control system provided (reference subsection 6.7.1).

(5) Auxiliary building isolation valves not provided since entire system is seismic Category I and is operable continuously during a LOCA at a pressure higher than the peak containment pressure.

(6) These lines penetrate containment below the elevation of the suppression pool.

(7) These lines consist of 3/8" O.D. tubing. This tubing runs to the Post-Accident Sample Station that is located inside a room in tne turbine building. This room is vented through a 99% efficient (radioiodine) filter train consisting of HEPA and charcoal filters. Therefore, because of the ventilation system and the size of the tubing, no bypass leakage will occur through these lines. See subsection 7.7.1.11 for a description of the Post-Accident Sampling System.

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423.49 List any tests, or portions of tests, described in Section 14.2.12 which you do not intend to perform on each unit and provide technical justification for deletion of each.

RESPONSE

The following list of tests and portions of tests described in Section 14.2.12 will not be performed on Grand Gulf Unit 2. The list represents tests and portions of tests on systems or functions of systems that are shared between Grand Gulf Units 1 and 2. The elimination of the below listed tests, from the Unit 2 test program, is justified since the system tests are initially performed in accordance with the Unit 1 test program and the systems and/or system functions are subsequently maintained in accordance with approved plant surveillance procedures. An exception is presented in subsection 14.2.12.3.32.

14.2.12.1.19 Process Radiation Monitoring (RPM) System preoperational test.

SUB STEPS

a.2.(e)(3)	Liquid Radwaste effluent
a.2.(h)	Radwaste Building ventilation exhaust subsystem.
a.2.(k)	Control room vent exhaust radiation monitoring subsystem.
c.1.	"...radwaste building vent pipe..."
c.4.	Delete for liquid radwaste effluent. Test of C.4 not applied to LRE due to deletion of a.2.e(3).
c.5.	"...control room vent exhaust subsystems..."

14.2.12.1.40 Liquid Radwaste System Preoperational Test. Total Abstract

14.2.12.1.41 Solid Radwaste System Preoperational Test. Total Abstract

14.2.12.1.51 Security System Preoperational Test.

SUB STEPS

c.6 and d.1.(f)	Security Communications
c.7 and d.1.(g)	Personnel exit radiation detection and special purpose detection.

14.2.12.1.55 Radwaste Building Ventilation System Preoperational Test. Total Abstract

14.2.12.1.58 Fire Protection System Preoperational Test.

SUB STEPS

a.2., C.2., and d.2 Firewater pumps performance

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14.2.12.3.32 Test Number 36 - Isolated Reactor Stability
Test Abstract will not be performed. Justification for this is provided in our response to NRC question 423.14 (paragraph 11). As described therein, the Isolated Reactor Stability test is only done on first-of-a-kind plants, where the purpose is to determine the hynamic stability of the reactor when it is isolated and at higher pressures. The test results are essentially applicable to all reactors of a given model (BWR 6), including Grand Gulf Unit 2.

Overpressurization Protection (5.2.2)*

1.2 The applicant should commit to participation in the GE program (or a similar program) to monitor the performance of safety relief valves at Grand Gulf.

RESPONSE

The following will be added to the Grand Gulf Final Safety Analysis Report (FSAR), subsection 5.2.2.11 Surveillance Program.

A safety/relief valve surveillance program is being developed that will monitor the performance of the safety/relief valves throughout the service life of each valve. The program is commensurate to the program currently under development by the BWR Owners Group and its primary objective will be to collect data to allow the identification of generic safety/relief valve problems.

*This concern was directed to MP&L informally in meetings with the Reactor Systems Branch (RSB) held the week of May 18, 1981. The above referenced FSAR revisions will be incorporated into the next available FSAR amendment. The above statement of the RSB concern and response is provided for information only and will not be incorporated into the FSAR.

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TABLE 6.2-49

PRIMARY REACTOR CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	
1	Equipment hatch	B	Double O-ring	1	-	-	
2	Personnel lock						
	Inner door	B	Double gasket	1	-	-	
	Outer door	B	-	-	Double gasket	1	
	Barrel	B	Inner door	2	Outer door	2	
3	Personnel lock						
	Inner door	B	Double gasket	1	-	-	
	Outer door	B	-	-	Double gasket	1	
	Barrel	B	Inner door	2	Outer door	2	
4	Fuel transfer tube	B	Double O-ring	1	Closure door	-	
		C	-	-	G41F338	3	50
5	Main steam line A	C,A	B21F022A	3,4	B21F028A	4	
					B21F067A-A	-	
					E32F001A-A	-	
					B21F025A	3	50
6	Main steam line B	C,A	B21F022B	3,4	B21F028B	4	
					B21F067B-A	-	
					E32F001B-A	-	
					B21F025B	3	50
7	Main steam line C	C,A	B21F022C	3,4	B21F028C	4	
					B21F067C-A	-	
					E32F001J-A	-	
					B21F025C	3	50
8	Main steam line D	C,A	B21F022D	3,4	B21F028D	4	
					B21F067D-A	-	
					E32F001N-A	-	
					B21F025D	3	
9	Feedwater A	A	B21F010A	6	B21F032A	6	
					B21F065A-A	6	
					E38F001B-B	6	
					E38F001A-A	6	
					E12F053A-A	6	50
					B21F030A	6	
					B21F115A	6	
					B21F136A	6	
					E12F222	6	
					E12F058A	6	

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	
					G33F057	6	021.34
					B21F063A	6	
					E38F008	6	
					E38F006	6	
					E38F004A	6	
					E38F004B	6	
10	Feedwater B	A	B21F010B	6	B21F032B	6	
					B21F065B-A	6	
					E51F213	6	
					B21F115B	6	
					B21F136B	6	
					B21F063B	6	50
					B21F030B	6	
					E12F048	6	
					E12F058B	6	
					E12F329	6	
					E51F013-A	6	
					E12F053B-B	6	
11	RHR pump A suction	A,C	E12F004A-A	6,11,23	Closed system	7	021.34
			E12F017A	6,8,11,23	Closed system	7	
12	RHR pump B suction	A,C	E12F004B-B	6,11,23	Closed system	7	021.34
			E12F017B	6,8,11,23	Closed system	7	
13	RHR pump C suction	A,C	E12F004C-B	6,11,23	Closed system	7	
			E12F017C	6,8,11,23	Closed system	7	
14	RHR shutdown suction	A,C	E12F009-B	6,11	E12F008-A	-	
			E12F308	6,11	E12F002	-	
15	Spare	A	Capped	-	-	-	
16	Spare	A	Capped	-	-	-	
17	Steam supply to RCIC turbine @ RHR heat exchanger	A,C	E51F063-B	-	E51F064-A	-	50
		A,C	E51F076-B	3	E51F072	3	
18	RHR to RPV head spray	A,C	E51F066	6	E12F023-A	-	50
			E12F344	6	E12F342	3	
					E12F061	3	
19	Main steam line drain	C,A	B21F016-B	-	B21F019-A	-	

TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
20	RHR A to LPCI	A,C	E12F042A-A	6	E12F027A-A	-
			E12F025A	6,8		
			E12F044A	6		
			E12F037A-A	3,6		
			E12F028A-A	6		
			E12F107A	3,6		
21	RHR B to LPCI	A,C	E12F042B-B	6	E12F027B-B	-
			E12F025B	6,8		
			E12F044B	6		
			E12F037B-B	3,6		
			E12F028B-B	6		
			E12F107B	3,6		
22	RHR C to LPCI	A,C	E12F041C-B	6	E12F042C-B	-
					E12F056C	3
					E12F234	-
23	RHR A pump test line to suppression pool	A,C	E12F011A-A	3,6,22	Closed system	7
			E12F064A-A	6,22	Closed system	7
			E12F024A-A	6,22	Closed system	7
			E12F290A-A	6,22	Closed system	7
			E12F322	3,6	E12F348	3
			E12F261	6,24	E12F262	24
			E12F259	6,24	E12F260	24
			E12F228	6,24	E12F227	24
			E12F336	3,6	E12F349	3
			E12F338	6	E12F339	-
			Double O-rings	6,19	E12F310	3
			Double O-rings	6,19	E12F303	3
24	RHR C pump test line to suppression pool	A,C	E12F064C-B	6,22	Closed system	7
			E12F021-B	6,22	Closed system	7
			E12F280	6,24	E12F281	24
			Double O-rings	6,19	E12F304	3
			Double O-rings	6,19	E12F311	3
25	HPCS pump suction	A,C	E22F015-C	6,11,23	Closed system	7
			E22F014	6,8,11,23	Closed system	7
26	HPCS pump discharge to RPV	A,C	E22F005	6	E22F004-C	-
			E12F218	3,6	E22F021	3
			E22F201	3,6		

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	
27	HPCS test line to suppression pool	A,C	E22F023-C	6,11,22	Closed system	7	021.34
			E22F035	6,8,11,22	Closed system	7	
			E22F012-C	6,11,22	Closed system	7	
			E22F302	6,11,24	E22F301	24	
			Double 0-rings	6,19	E22F303	3	
			Double 0-rings	6,19	E22F304	3	
28	RCIC pump suction	A,C	E51F031-A	6,11,23	Closed system	7	
29	RCIC turbine exhaust	A,C	E51F068-A	5,6,11	Closed system	7	
30	LPCS pump suction	A,C	E21F001-A	6,11,23	Closed system	7	
			E21F031	6,8,11,23	Closed system	7	
31	LPCS pump discharge to RPV	A,C	E21F006	6	E21F005-A		021.34
			E21F200	3,6	E21F013	3	
			E21F207	3,6			
32	LPCS test line to suppression pool	A,C	E21F012-A	6,22	Closed system	7	
			E21F011-A	6,22	Closed system	7	
			E21F217	6,24	E21F218	24	
			Double 0-rings	6,19	E21F222	3	
			Double 0-rings	6,19	E21F221	3	
33	CRD pump discharge	C,A	C11F122	-	C11F083-A	-	
					C11F128	-	
34	Containment purge supply	C,A	M41F012	12	M41F011	-	
					M41F042	-	
35	Containment purge exhaust	C,A	M41F034	12	M41F035	-	
					M41F051	3	
36	Plant service water return	C	P44F070-B	-	P44F069-A	-	
37	Plant service water supply	C	P44F043	-	P44F053-A	-	
					P44F333	3	
38	Chilled water supply	C	P71F145	17	P71F150	17	021.34
					P71F232	3,17	
39	Chilled water return	C	P71F149	17	P71F148	17	
					P71F246	17	
40	ILRT - Containment pressurization/depressurization	B	Flexitallic gasket	20	Flexitallic gasket	20	
		C	M61F009	3			

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	
41	Service air	A,C	P52F122	-	P52F105	-	021.34
					P52F258	3	
42	Instrument Air	A,C	P53F002	-	P53F001	-	
					P53F036	3	
43	RWCU to main condenser	A,C	G33F028-B	-	G33F034-A	-	
					G33F070	-	
44	Component cooling water supply	C,A	P42F035	-	P42F066-A	-	
					P42F161	3	
45	Component cooling water return	C,A	P42F068-B	-	P42F067-A	-	50
					P42F162	-	
46	RCIC pump minimum flow line	A,C	E51F019-A	6,22	Closed system	7	
			E51F251	6,24	E51F252	24	
47	Reactor recirc. post-accident sampling	A,C	B33F128-B	13	B33F127-A	13	
48	RHR heat exchanger B relief valve discharge to suppression pool	A,C	E12F103B	6,11,21,22	Closed system and E12F104B	7,21,22	021
			E12F073B-B	3,6,11,22	Closed system	7	
			E12F055B	6,8,11,22	Closed system	7	
49	RWCU backwash transfer pump discharge	A,C	G36F106	-	G36F101	-	
50	Drywell and containment equipment drain sump pump discharge	C,A	P45F067	-	P45F068	-	50
51	Drywell and containment floor drain sump pump discharge	C,A	P45F061	-	P45F062	-	50
52	Spare	A	Capped	-	-	-	
53	Spare	A	Capped	-	-	-	
54	Upper containment pool to and from refueling storage tank	C,A	G41F201	-	G41F053	-	50
55	Spare	A	Capped	-	-	-	
56	Condensate makeup to upper containment pool	C,A	P11F004	-	P11F075	-	50
					P11F095	3	

TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	
57	Fuel pool cooling and cleanup system discharge to upper containment pool	C,A	G41F040 G41F340	- 3	G41F028-A	-	021.34 50
58	Fuel pool cooling and cleanup system return from upper containment pool to fuel pool drain tank	C,A	G41F044-B	-	G41F029-A	-	
59	Spare	A	Capped	-	-	-	
60	Return from auxiliary building floor and equipment drain transfer tanks	A,C	P45F274-B P45F275	- 3	P45F273-A P45F290	- 3	50
61	Standby liquid control system mixing tank (future use)	A,C	C41F151	18	C41F150 C41F152	18 3	
62	Spare	A	Capped	-	-	-	
63	Spare	A	Capped	-	-	-	
64	Spare	A	Capped	-	-	-	
65	Containment normal ventilation and combustible gas control purge supply	C,A	E61F010	-	E61F009 E61F017	- -	
66	Containment normal ventilation and combustible gas control purge exhaust	C,A	E61F056	12	E61F057 M41F054	- 3	
67	RHR pump B test line to suppression pool	A,C	E12F011B-B E12F064B-B E12F024B-B E12F290B-B E12F321 E12F249 E12F334 E12F331 E12F276	3,6,22 6,22 6,22 6,22 3,6 6,24 6,24 3,6 6,24	Closed system Closed system Closed system Closed system E12F351 E12F250 E12F335 E12F350 E12F277	7 7 7 7 3 24 24 3 24	021.34 50

TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	
			E12F212	6,24	E12F213	24	021.34
			Double 0-rings	6,19	E12F305	3	
			Double 0-rings	6,19	E12F312	3	
68	Spare	A	Capped	-	-	-	
69	Refueling water transfer pump suction from suppression pool	C,A	P11F130	11	P11F131	-	
					P11F132	3	
70	Instrument air for ADS	C,A	P53F006	-	P53F003-A	-	
					P53F043	3	
71A	LPCS relief valve discharge to suppression pool (2")	A,C	E21F018	6,8,11,22	Closed system	7	50
71B	RHR C relief valve discharge to suppression pool (1") and post-accident sample return	A,C	E21F025C	6,8,11,22	Closed system	7	021.34
			E12F346-B	6,11	Closed system	7	
72	Spare	A	Capped	-	-	-	
73	RHR shutdown relief valve discharge to suppression pool	A,C	E12F036	8,22	Closed system	7	021.34
74	Spare	A	Capped	-	-	-	
75	RCIC pump turbine exhaust vacuum breaker	C,A	E51F078-B	3	E51F077-A	-	
76A	Spare	A	Capped	-	-	-	
76B	RHR shutdown suction relief valve discharge to suppression pool	A,C	E12F005	8,22	Closed system	7	021.34
77	RHR heat exchanger A relief valve discharge to suppression pool	A,C	E12F103A	6,11,21,22	Closed system and E12F104A	7,21	50
			E12F073A-A	3,6,11,22	Closed system	7	
			E12F055A	6,8,11,22	Closed system	7	
78	Spare	A	Capped	-	-	-	
79	Spare	A	Capped	-	-	-	
80	Spare	A	Capped	-	-	-	

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
81	Reactor recirc. post-accident sampling	A,C	B33F126-B	13	B33F125-A	13
82	ILRT - drywell pressurization/depressurization	B C	Flexitallic gasket M61F010	20 3	Flexitallic gasket	20
83	RWCU return to feedwater	C,A	G33F040-B	-	G33F039-A G33F055	- -
84	Drywell and containment chemical waste sump pumps discharge	C,A	P45F098	-	P45F099	-
85	Suppression pool cleanup return	C,A	P60F010-B	-	P60F009-A P60F011 P60F034	- 3 3
86	Demineralized water supply to containment	A,C	P21F018-B	-	P21F017-A	-
87	RWCU pump suction from recirculation loops	C,A	G33F001-B G33F252-A	- -	G33F004-A G33F002	- -
88	RWCU pump discharge to RWCU heat exchanger	C,A	G33F053-B	-	G33F054-A G33F061	- -
89	Standby service water supply A	C	P41F169A	6	P41F159A-A P41F163A	6 3
90	Standby service water return A	C	P41F168A-A	6	P41F160A-A	6
91	Standby service water return B	C	P41F168B-B	6	P41F160B-B	6
92	Standby service water supply B	C	P41F169B	6	P41F159B-B P41F163B	6 3
93 thru 100	Not used					
101A,B	Spare	A	Capped	-	-	-
101C	Drywell pressure instr. (narrow range)	C,A	M71F573-A	13	-	-
101D,E	Spare	A	Capped	-	-	-

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
101F	Drywell pressure instr. (wide range)	C,A	M71F591A-A	13	-	-
102A,B,C	Spare	A	Capped	-	-	-
102D	Drywell pressure instr. (wide range)	C,A	M71F591B-B	13	-	-
102E,F	Spare	A	Capped	-	-	-
103A,B,C	Spare	A	Capped	-	-	-
103D	Containment pressure instr. (wide range)	C,A	M71F592A-A	13	-	-
103E,F	Spare	A	Capped	-	-	-
104A,B,C	Spare	A	Capped	-	-	-
104D	Containment pressure instr. (wide range)	C,A	M71F592B-B	13	-	-
104E,F	Spare	A	Capped	-	-	-
105A	Containment H_2 analyzer sample	C,A	E61F596D	13	E61F596C	13
105B thru F	Spare	A	Capped	-	-	-
106A	Drywell H_2 analyzer sample	C,A	E61F595D	13	E61F595C	13
106B	Drywell H_2 analyzer sample return	C,A	E61F597D	13	E61F597C	13
106C	Spare	A	Capped	-	-	-
106D	Spare	A	Capped	-	-	-
106E	Containment H_2 analyzer sample return	C,A	E61F598D	13	E61F598C	13
106F	Spare	A	Capped	-	-	-
107A	Spare	A	Capped	-	-	-
107B	Containment H_2 analyzer sample return	C,A	E61F598B	13	E61F598A	3

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
107C	Spare	A	Capped	-	-	-
107D	Drywell H_2 analyzer sample	C,A	E61F595B	13	E61F595A	13
107E	Drywell H_2 analyzer sample return	C,A	E61F597B	13	E61F597A	13
107F	Spare	A	Capped	-	-	-
108A	Containment H_2 analyzer sample	C,A	E61F596B	13	E61F596A	13
108B thru F	Spare	A	Capped	-	-	-
109A	Drywell fission product monitor sample	C,A	D23F591-B	13	D23F592-A	13
109B	Drywell fission product monitor sample return	C,A	D23F593-B	13	D23F594-A	13
109C	Spare	A	Capped	-	-	-
109D	Containment pressure instr. (narrow range)	C,A	M71F595-A	13	M71F594-B	13
109E,F	Spare	A	Capped	-	-	-
110A	ILRT drywell pressure instr.	B	Flexitallic gasket	20	-	-
110B	Spare	A	Capped	-	-	-
110C	ILRT verification flow instr.	B	Flexitallic gasket	20	-	-
110D,E	Spare	A	Capped	-	-	-
110F	ILRT containment pressure instr.	B	Flexitallic gasket	20	-	-
111A thru F	Spare	A	Capped	-	-	-
112	Not used					
113	Suppression pool level instr.	C,A	E30F593A-A	9,11,13	-	-

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
114	Suppression pool level instr.	C,A	E30F592A-A	9,13	-	-
115	Suppression pool level instr.	C,A	E30F594A-A	9,11,13	-	-
116	Suppression pool level instr.	C,A	E30F591A-A	9,13	-	-
117	Suppression pool level instr.	C,A	E30F593B-B	9,11,13	-	-
118	Suppression pool level instr.	C,A	E30F592B-B	9,13	-	-
119	Suppression pool level instr.	C,A	E30F594B-B	9,11,13	-	-
120	Suppression pool level instr.	C,A	E30F591B-B	9,13	-	-
201	Reactor protection system - Div. 1	B	Double O-rings	14	-	-
202	Low voltage power - Div. 1	B	Double 0-rings	14	-	-
203	Instrumentation - BOP 1D	B	Double 0-rings	14	-	-
204	Instrumentation - Div. 1	B	Double 0-rings	14	-	-
205	Neutron monitoring	B	Double 0-rings	14	-	-
206	Low voltage power - Div. 1	B	Double 0-rings	14	-	-
207	Control - BOP/D	B	Double 0-rings	14	-	-
208	Control - Div 1	B	Double 0-rings	14	-	-
209	Low voltage power and Control - Div. 1	B	Double 0-rings	14	-	-
210	Radiation monitoring (BOP/D instr.)	B	Double 0-rings	14	-	-
211	Control - Div. 1	B	Double 0-rings	14	-	-

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
212	Instrumentation - BOP/D	B	Double 0-rings	14	-	-
213	Rod position indication	B	Double 0-rings	14	-	-
214	T.I.P.	B	Double 0-rings	14	-	-
215	6.9 kV power - Reactor recirc. pump A	B	Double 0-rings	14	-	-
216	Spare	A	Capped	-	-	-
217	Low voltage power and control - Div. 1	B	Double 0-rings	14	-	-
218	Neutron monitoring	B	Double 0-rings	14	-	-
219	Instrumentation - BOP/D	B	Double 0-rings	14	-	-
220	Instrumentation - BOP/D (computer)	B	Double 0-rings	14	-	-
221	Spare	A	Capped	-	-	-
222	Reactor protection system - Div. 2	B	Double 0-rings	14	-	-
223	Low voltage power and control - BOP/D	B	Double 0-rings	14	-	-
224	Spare	A	Capped	-	-	-
225	Low voltage power - BOP/E	B	Double 0-rings	14	-	-
226	Control - BOP/E	B	Double 0-rings	14	-	-
227	Instr. - BOP/E (vessel vibration monitoring)	B	Double 0-rings	14	-	-
228	Instrumentation - BOP/E (TIC from RPIS)	B	Double 0-rings	14	-	-
229	Low voltage power and control - Div. 2	B	Double 0-rings	14	-	-
230	Reactor protection system - Div. 2	B	Double 0-rings	14	-	-

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TABLE 6.2-49 (Cont.)

Penetration No.	Description	Type Test	Inboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes	Outboard Isolation Barrier Barrier Description/ Valve No. (Note 15)	Notes
231	Instrumentation - Div. 2	B	Double O-rings	14	-	-
232	Neutron monitoring	B	Double O-rings	14	-	-
233	Rod position indication	B	Double O-rings	14	-	-
234	Spare	A	Capped	-	-	-
235	Neutron monitoring	B	Double O-rings	14	-	-
236	Control - Div. 2	B	Double O-rings	14	-	-
237	Instrumentation - BOP/E (computer)	B	Double O-rings	14	-	-
238	Reactor protection system - Div. 4	B	Double O-rings	14	-	-
239	Control - Div. 2	B	Double O-rings	14	-	-
240	Instrumentation - BOP/E	B	Double O-rings	14	-	-
241	Low voltage power - Div. 2	B	Double O-rings	14	-	-
242	Low voltage power and control - BOP/E	B	Double O-rings	14	-	-
243	Spare	A	Capped	-	-	-
244	Low voltage power - Div. 2	B	Double O-rings	14	-	-
245	Control - BOP/E	B	Double O-rings	14	-	-
246	Radiation monitoring (BOP/D instr.)	B	Double O-rings	14	-	-
247	6.9 kV power - reactor recirc. pump B	B	Double O-rings	14	-	-
248	Spare	A	Capped	-	-	-
249	Instrumentation - BOP/E	B	Double O-rings	14	-	-
250	Grounding rod	A	Solid rod	-	-	-
251	Grounding rod	A	Solid rod	-	-	-

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TABLE 6.2-49 (Cont.)

NOTES

1. Penetration is sealed by a blind flange or door with double 0-ring or double gasket seals. These seals are leakage rate tested by pressurizing between the 0-rings or gaskets.

2. The personnel air lock volume is pressurized to primary containment peak accident pressure and tested periodically as given in Chapter 16. During the air lock test, tie downs are installed on the inner door since normal locking mechanisms are not designed to withstand a differential pressure across the door in the reverse direction in excess of 5 psig. Pressurizing the lock barrel also tests the lock mechanical and electrical penetrations.

3. Globe valve tested in reverse direction. Conservative test; test pressure tends to unseat disc.

4. MSIV seat leakage rate shall not exceed 25 scfh for any valve.

5. Gate valve tested in one direction with air during Type C test. Tested in other direction during Type A test with water. 50

6. System remains water filled and designed to operate post LOCA. Isolation valve tested with water. Isolation valve leakage not included in 0.60 La Type B and C test totals. 021.34

7. The redundant containment isolation provisions for this penetration consist of an isolation valve and a closed system outside containment which is in compliance with 10 CFR 50, Appendix A, GDC 54 and with U.S. NRC Standard Review Plan 6.2.4, Containment Isolation Provisions, Paragraph II.3.e. SRP 6.2.4, Paragraph II.3.e allows the use of a single isolation valve outside containment. A single active failure can be accommodated. The closed system is missile protected, seismic Category 1, Safety Class 2, and has a temperature and pressure rating in excess of that for the containment. Closed system integrity is maintained and verified during periodic Type A test and during system operational tests.

8. Relief valve tested in reverse direction; overpressure device for a closed system. Conservative test; test pressure tends to unseat disc. Tested in correct direction during Type A test. 50

9. Globe valve tested in reverse direction.

10. Deleted. 50

11. System is sealed from the primary containment atmosphere because its line terminated below the water level of the suppression pool, and the isolation is tested with water. Leakage is not included in 0.60 L_a Type B and C test totals. 021.34

12. Butterfly valve tested in reverse direction; leakage characteristics same in both directions.

13. Instrument line isolation valve is tested in accordance with 10 CFR 50, Appendix J, Paragraph III.A.1.D; however, the leakage is not included in 0.60 L_a Type B and C test totals.

14. Modular type electrical penetration with header plate bolted to penetration nozzle. Double 0-rings seals with test connection is provided at interface. Test volume pressurized with dry N_2.

15. Figures 6.2-76 through 6.2-80 show the containment isolation valves and the associated system/valve number in this table.

16. Deleted. 50

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TABLE 6.2-49 (Cont.)

NOTES

17. system is not designed to operate post-LOCA but is required to operate to maintain the plant in a safe condition during the Type A test.

18. Associated line is for future use and has welded caps at both ends. Type C test will check packing gland leakage only.

19. O-ring seals are associated with restriction orifices and will be Type B tested.

20. Penetration is sealed by a blind flange with flexitallic gasket.

21. This branch line provides vacuum relief protection for the line penetrating containment when the RHR heat exchanger vent is isolated, and therefore, it must be self-actuating. The double-check valve arrangement backed up by a closed system outside containment (see Note 7) provides sufficient containment isolation capability.

22. These lines are always filled with water on the outboard side of the containment, thereby forming a water seal. They are maintained at a pressure that is always higher than primary containment pressure by jockey pumps or hydrostatic head; thus precluding any outleakage from primary containment. However, even if outleakage did occur, it would be into an ESF system which forms a closed loop outside primary containment. Thus, any leakage from primary containment would return to primary containment through this closed loop.

Even though a special leakage test is not merited on these valves for the reasons discussed above, a system leakage test to meet the requirements of Type C testing will be performed as described below ensure the leak-tightness of the ECCS and RCIC systems. The systems will be pressurized with water to a minimum p sure of 11.5 psig (peak containment accident pressure) with the system totally isolated from primary containment. A leakage rate for the entire system will then be determined and compared to an acceptance limit. (ECCS subsystem leakage not to exceed 1 gpm times the number of valves in the subsystem tested.)

23. The ECCS and RCIC suction lines are normally filled with water on both the inboard and outboard side of containment, thereby forming a water seal to the containment environment. The valves are open during post-LOCA conditions to supply a water source for the ECCS pumps. Since a break in an ECCS line need not be considered in conjunction with a DBA, the only possible situation requiring one of these valves to be closed during a DBA is an unacceptable leakage in an ECC system. However, because these ECC systems are constantly monitored for excessive leakage, this is not a credible event.

However, to provide further assurance of the leak-tightness of the system, these valves will receive a leakage test as part of the low pressure system leakage test described in Note 22.

24. Hydrostatically tested during system functional tests.

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Revised
TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (5)	Shutdown	Post-Accident	Power Failure (4)				
4	56	Fuel Pool Cooling & Cleanup - Transfer Tube	Pool Water	36	No		Note (14)	F11E015	I	No (Type "B" Test)	11'-0"	Closure Door	Manual	Manual	None	Locked Closed	Open	Locked Closed	N/A	Manual	N/A	N/A	In or Out
				3/4	No			G41F338	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A (Note 1)	None	
5	55	Nuclear Boiler - Main Steam Lines	Primary Coolant	28	Yes		Note (14)	B21F028A	O	Yes	8'-9"	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Minimum	A	Out
				28				B21F022A	I	Yes	N/A	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Minimum	B	
				1½				B21F067A-A	O	Yes	5'-3 3/16"	Globe	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	C,D,E, P,F,N, RM	6.1	A	
				1½				E32F001A-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	U,A-A, B-B,RM	6.1	A	
				3/4				B21F025A	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
6	55	Nuclear Boiler - Main Steam Lines	Primary Coolant	28	Yes	Refer FSAR subsection 6.2.3 for Discussion	Note (14)	B21F028B	O	Yes	9'-9"	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Minimum	A	Out
				28				B21F022B	I	Yes	N/A	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Minimum	B	
				1½				B21F067B-A	O	Yes	5'-2 1/8"	Globe	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	C,D,E, F,P,N, RM	6.1	A	
				1½				E32F001E-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	U,A-A, B-B,RM	6.1	A	
				3/4				B21F025B	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
7	55	Nuclear Boiler Main Steam Lines	Primary Coolant	28	Yes		Note (14)	B21F028C	O	Yes	9'-9"	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Minimum	A	Out

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type C Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post Accident	Power Failure (4)				
				28				B21F022C	I	Yes	N/A	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Mini-mum	B	
				2½				B21F067C-A	O	Yes	5'-9 11/16"	Globe	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	C,D,E, F,?,N, RM	6.1	A	
				1½				E32F001J-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	U,A-A, B-B,RM	6.1	A	
				3/4				B21F025C	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
8	55	Nuclear Boiler - Main Steam Lines	Primary Coolant	28	Yes	Refer FSAR subsection 6.2.3 for Discussion		B21F028D	O	Yes	8'-9"	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,RM	3 Mini-mum	A	Out
				28				B21F022D	I	Yes	N/A	Globe	Pneumatic	Piston	Self	Open	Closed	Closed	Fail Closed	C,D,F, P,E,N, RM	3 Mini-mum	B	
				1½				B21F067D-A	O	Yes	4'-9 3/32"	Globe	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	C,D,F, P,E,N, RM	6.1	A	
				1½				E32F001N-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	U,A-A, B-B,RM	6.1	A	
				3/4				B21F025D	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
9	55	Nuclear Boiler - Feedwater Inlet	Primary Coolant	24	Yes		Note (14)	B21F065A-A	O	No	58'-3"	Gate	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	RM	120	A	In
				24				B21F032A	O	No	N/A	Check	Process	(Note 3)	None	Open	Closed	Closed	Fail Closed	Reverse Flow	N/A	N/A	
				24				B21F010A	I	No	N/A	Check	Process	Process	None	Open	Closed	Closed	N/A	Reverse Flow	N/A	N/A	
				12				E12F053A-A	O	No	112'-7"	Globe	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	M,A,U, RM	24	A	
				1½				E38F001B-B	O	No	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	N/A	N/A	B	

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal(5)	Shutdown	Post Accident	Power Failure (4)				
				1½				E38F001A-A	O	No	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	N/A	N/A	A	
				3/4				B21F030A	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				B21F115A	I	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				B21F136A	I	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F222	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F058A	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				G33F057	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				B21F063A	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E38F008	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E38F006	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E38F004A	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E38F004B	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
10	55	Nuclear Boiler - Feedwater Inlet	Primary Coolant	24	Yes		Note 14	B21F065B-A	O	No	58'-3"	Gate	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	RM	120	A	
				24				B21F032B	O	No	N/A	Check	Process	(3)	Self	Open	Closed	Closed	Fail Closed	Reverse Flow	N/A	N/A	In
				24				B21F010B	I	No	N/A	Check	Process	Process	None	Open	Closed	Closed	N/A	Reverse Flow	N/A	N/A	
				3/4				E51F213	O	No	N/A	Globe	Manual	Manual	None	Closed	Closed	Closed	N/A	None	N/A	None	

Refer FSAR subsection 6.2.3 for Discussion

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TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (5)	Shutdown	Post Accident	Power Failure (4)				
				6		Refer FSAR subsection 6.2.3 for Discussion		E51F013-A	O	No	57'-10"	Gate	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	RM	15	A	
				12				E12F053B-B	O	No	37'-8"	Globe	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	M,A,U, RM	24	B	
				3/4				B21F115B	I	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				B21F136B	I	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	50
				3/4				B21F063B	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				B21F030B	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F248	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F058B	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F329	O	No	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
								(See also System E38 valves under Containment Penetration Number 9)																
11	56	RHR Pump - "A" Suction	Suppression Pool Water	24	Yes		Note 14	E12F004A-A	O	Yes	1'-11 3/16"	Gate	Electric Motor	Electric	Manual	Open	Closed	Open	As Is	RM	128	A	Out
				1				E12F017A	O	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	In
12	56	RHR Pump - "B" Suction	Suppression Pool Water	24	Yes		Note 14	E12F004B-B	O	Yes	1'-11 3/16"	Gate	Electric Motor	Electric	Manual	Open	Closed	Open	As Is	RM	128	B	Out
				1				E12F017B	O	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	In
13	56	RHR Pump - "C" Suction	Suppression Pool Water	24	Yes		Note 14	E12F004C-B	O	Yes	5'-1"	Gate	Electric Motor	Electric	Manual	Open	Closed	Open	As Is	RM	128	B	Out
				1				E12F017C	O	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	In
14	55	RHR Reactor Shutdown Cooling Suction	Reactor Water	20	Yes		Note 14	E12F008-A	O	Yes	11'-7"	Gate	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	A,U,M, RM	29	A	Out

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (5)	Shutdown	Post-Accident	Power Failure (4)				
				20			Note 14	E12F009-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	A,U,M, RM	29	B	Out
				3/4			Note 14	E12F308	I	Yes	N/A	Stop-Check	Process	Thermal Relief	None	Closed	Closed	Closed	N/A	N/A	N/A	N/A	Bypass F009-B
				3/4				E12F002	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
17	56	Steam Supply for RHR and RCIC	Steam	10	Yes		Note 14	E51F063-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	J,K,T, F,M,I, RM	20	B	Out
				10			Note 14	E51F064-A	O	Yes	2'-2 3/4"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	J,K,T, F,M,I, RM	20	A	
				1	Yes	Refer FSAR subsection 6.2.3 for Discussion	Note 14	E51F076-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	J,K,T, F,M,I, RM	29	B	
				3/4				E51F072	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
18	55	RHR to Head Spray	Condensate/ Reactor Water	6	Yes		Note 14	E51F066	I	Yes	N/A	Check	Process	Note 3	None	Closed	Closed	Closed	N/A	Reverse Flow	N/A	N/A	
				6				E12F073-B	O	Yes	45'-5 27/32"	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	A,U,M, RM	90	A	
				1				E12F344	I	Yes	N/A	Globe	Manual	Manual	None	Closed	Closed	Closed	N/A	None	N/A	None	
				3/4				E12F342	O	Yes	N/A	Globe	Manual	Manual	None	Closed	Closed	Closed	N/A	None	N/A	None	
				3/4				E12F061	O	Yes	N/A	Globe	Manual	Manual	None	Closed	Closed	Closed	N/A	None	N/A	None	
19	55	Nuclear Boiler - Main Steam Drains	Primary Coolant	3	Yes		Note 14	B21F019-A	O	Yes	5'-6"	Gate	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	C,D,F, P,E,N, RM	15	A	Out
				3				B21F016-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	C,D,F, P,E,N, RM	15	B	
20	55	RHR Heat Exchanger "A" to LPCI	Suppression Pool Water	18	Yes		Note 14	E12F027A-A	O	Yes	6'-0½"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	78	A	

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												Type	Operator (2)	Primary	Secondary	Normal (5)	Shutdown	Post Accident	Power Failure (4)				
				14				E12F042A-A	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	C,G,X, V,RM	22	A	In
				4				E12F044A	I	Yes	37'-11"	Gate	Manual	Manual	None	Locked Closed	Open	Locked Closed	N/A	None	N/A	None	
				1				E12F025A	I	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	
				18				E12F028A-A	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	C,G,X, V,RM	78	A	
				12				E12FC37A-A	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	A,M,U, RM	63	A	
				3/4				E12F107A	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
21	55	RHR Heat Exchanger "B" to LPCI	Suppression Pool Water	18	Yes	Refer FSAR subsection 6.2.3 for Discussion	Note 14	E12F027B-B	O	Yes	8'-4 3/4"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	78	B	
				14				E12F042B-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	C,G,X, V,RM	22	B	In
				1				E12F025B	I	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	
				18				E12F028B-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	C,G,X, V,RM	78	B	
				12				E12F037B-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	A,M,U, RM	63	B	
				4				E12F044B	I	Yes	N/A	Gate	Manual	Manual	None	Locked Closed	Open	Locked Closed	N/A	None	N/A	None	
				3/4				E12F107B	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
22	55	RHR Pump "C" to LPCI	Suppression Pool Water	12	Yes		Note 14	E12F042C-B	O	Yes	2'-4"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	RM	30	B	In
				12				E12F041C-B	I	Yes	N/A	Check	Process	Note 3	None	Closed	----	Open	As Is	Reverse Flow	N/A	N/A	
				3/4				E12F056C	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F234	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
23	56	RHR - "A" Pump Test Line to Suppression Pool	Suppression Pool Water	18	Yes	Refer FSAR subsection 6.2.3 for Discussion	Note 14	E12F024A-A	O	Yes	32'-7½"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	C,G,X, V,RM	93	A	
				4				E12F011A-A	O	Yes	38'-2 5/8"	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	C,G,RM	27	A	In
				4				E12F064A-A	O	Yes	60'-5"	Gate	Electric Motor	Electric	Manual	Open	Closed	Open Or Closed	As Is	C-C,RM	8	A	
				1½				E12F290A-A	O	Yes	84'-8½"	Globe	Electric Motor	Electric	Manual	Open	Closed	Open Or Closed	As Is	B,G,RM	8	A	
				3/4				E12F322	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F259	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F261	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F227	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F228	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F338	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F339	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F336	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N A	None	
				3/4				E12F349	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E12F303	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E12F310	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	

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												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
				3/4				E12F348	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F762	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F260	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
24	56	RHR - "C" Pump Test Line to Suppression Pool	Suppression Pool Water	14	Yes	Refer FSAR subsection 6.2.3 for Discussion	Note 14	E12F021-B	O	Yes	14'-5 3/8"	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	C,G,RM	67	B	In
				4				E12F064C-B	O	Yes	35'-7"	Gate	Electric Motor	Electric	Manual	Open	Closed	Open Or Closed	As Is	C-C, RM	8	B	
				1				E12F280	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F281	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E12F311	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E12F304	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
25	56	HPCS Pump Suction	Suppression Pool Water	24	Yes		Note 14	E22F015-C	O	Yes	7'-4"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	RM	1" per second Stem Stroke Rate	C	Out
				1				E22F014	O	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	
26	55	HPCS Pump Discharge	Condensate/ Suppression Pool Water	12	Yes		Note 14	E22F004-C	O	Yes	12'-5 9/16"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	Q,RM	27	C	In
				14				E22F005	I	Yes	N/A	Check	Process	Note 3	None	Closed	Closed	Open	N/A	Reverse Flow	N/A	N/A	
				1				E22F218	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	

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Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
				3/4				E22F201	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E22F021	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
27	56	HPCS Test Line	Suppression Pool Water	12	Yes		Note 14	E22F023-C	O	Yes	21'-1½"	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	B,G,RM	Note 7	C	In
				4				E22F012-C	O	Yes	12'-7"	Gate	Electric Motor	Electric	Manual	Closed	Open or Closed	Closed	As Is	R,S,RM	5	C	
				1		Refer FSAR subsection 6.2.3 for Discussion		E22F035	O	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	
				1				E22F30	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E22F301	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E22F303	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E22F304	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
28	56	RCIC Pump Suction	Suppression Pool Water	6	Yes		Note 14	E51F031-A	O	Yes	1'-0"	Gate	Electric Motor	Electric	Manual	Closed	Open	Open	As Is	J,K,T, F,M,I, RM	40	A	Out
29	56	RCIC Turbine Exhaust	Steam	20	Yes		Note 14	E51F068-A	O	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	102	A	In
30	56	LPCS Pump Suction	Suppression Pool Water	24	Yes		Note 14	E21F001-A	O	Yes	6'-0"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	100	A	Out
				3/4				E21F031	O	Yes	N/A	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	
31	55	LPCS Pump Discharge	Suppression Pool Water	14	Yes		Note 14	E21F005-A	O	Yes	1'-5 3/4"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	RM	22	A	In
				14				E21F006	I	Yes	N/A	Check	Process	Note 3	None	Closed	Closed	Open	N/A	Reverse Flow	N/A	N/A	
				3/4				E21F013	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	

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												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)					
				3/4				E21F200	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
				1				E21F207	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
32	56	LPCS Test Line	Suppression Pool Water	14	Yes		Note 14	E21F012-A	C	Yes	13'-10	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	C,G,RM	101	A	In	
				4				E21F011-A	O	Yes	17'-10 11/16"	Gate	Electric Motor	Electric	Manual	Open	Open or Closed	Closed	As Is	RM	24	A		
				3/4				E21F217	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
				3/4				E21F218	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
				1/2		Refer FSAR subsection 6.2.3 for Discussion		E21F222	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
				1/2				E21F221	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
33	55	CRD Pump Discharge	Water	2	Yes		Note 14	C11F083-A	O	Yes	5'-2½"	Globe	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	RM	9.3-11.3	A	In	
				2				C11F122	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	N/A		
				3/4				C11F128	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
34	56	Containment Purge and Ventilation Air Supply (5)	Air	20	No		Note 14	M41F011	O	Yes	1'-3½"	Butter-fly	Pneumatic	Piston	Manual	Closed	Open	Closed	Closed	B,G,Z, RM	4	A	Out	
				20				M41F012	I	Yes	N/A	Butter-fly	Pneumatic	Piston	Manual	Closed	Open	Closed	Closed	B,G,Z, RM	4	B		
				3/4				M41F042	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
35	56	Containment Purge and Ventilation Air Exhaust (5)	Air	20	No		Note 14	M41F034	I	Yes	N/A	Butter-fly	Pneumatic	Piston	Manual	Closed	Open	Closed	Closed	B,G,Z, RM	4	B	In	

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												Type	Operator (2)	Primary	Secondary	Normal(6)	Shutdown	Post Accident	Power Failure (4)					
				20		Refer FSAR subsection 6.2.3 for Discussion		M41F035	O	Yes	1'-3½"	Butterfly	Pneumatic	Piston	Manual	Closed	Open	Closed	Closed	B,G,Z, RM	4	A		50
				3/4				M41F051	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
36	56	Plant Service Water Return	Raw Water	4	No		Note 14	P44F070-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	24 Max.	B	Out	25
				4				P44F069-A	O	Yes	1'-0"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	24 Max.	A		
37	56	Plant Service Water Supply	Raw Water	4	No		Note 14	P44F053-A	O	Yes	1'-0"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	24 Max.	A	In	
				4				P44F043	I	Yes	N/A	Check	Process	Process	None	Open	Open	Open	N/A	Reverse Flow	N/A	N/A		
				3/4				P44F333	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		50
38	56	Plant Chilled Water Supply	Water	4	No		Note 14	P71F150	O	Yes	1'-3"	Gate	Pneumatic	Piston	Manual	Open	Closed	Closed	Closed	B,G,RM	30	A	In	35
				4				P71F151	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	N/A	--	25
				3/4				P71F232	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
39	56	Plant Chilled Water Return	Water	4	No		Note 14	P71F148	O	Yes	5'-0"	Gate	Pneumatic	Piston	Manual	Open	Closed	Closed	Closed	B,G,RM	30	A	Out	50
				4				P71F149	I	Yes	N/A	Gate	Pneumatic	Piston	Manual	Open	Closed	Closed	Closed	B,G,RM	30	B		
				3/4				P71F246	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		
40	56	Integrated Leak Rate Test Connection (Containment Pressurization and Depressurization)	Containment Atmosphere	6	No		Note 14	Blind Flange	O	No (Type "B" tests)	N/A												In or Out	
				6				Blind Flange	I		N/A													
				3/4				M61F009	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None		50

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
41	56	Service Air Supply	Air	3 4" diam sleeve	No	Refer FSAR subsection 6.2.3 for Discussion	Note 14	P52F105	O	Yes	2'-3 3/16"	Gate	Pneumatic	Piston	None	Open	Open	Closed	Closed	B,G,RM	4	A	In
				3				P52F122	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	N/A	
				3/4				P52F258	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
42	56	Instrument Air Supply	Air	2½ 3" diam sleeve	No		Note 14	P53F001	O	Yes	2'-2 7/8"	Gate	Pneumatic	Piston	None	Open	Open	Closed	Closed	B,G,RM	4	A	In
				2½				P53F002	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	N/A	
				3/4				P53F036	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
43	55	RWCU to Main Condenser	Reactor Water	4	No		Note 14	G33F034-A	O	Yes	2'-2 11/16"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	B,F,L,H,W,Y,RM	20.4	A	Out
				4				G33F028-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	B,F,L,H,Y,RM	22.2	B	
				3/4				G33F070	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
44	56	Component Cooling Water Supply	Water	10	No		Note 14	P42F066-A	O	Yes	1'-0"	Gate	Electric Motor	Electric	Manual	Open	Open	As Is	As Is	RM	54	A	In
				10				P42F035	I	Yes	N/A	Check	Process	Process	None	Open	Open	Reverse Flow	N/A	N/A	N/A	N/A	
				3/4				P42F161	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
45	56	Component Cooling Water Return	Water	10	No		Note 14	P42F067-A	O	Yes	1'-0"	Gate	Electric Motor	Electric	Manual	Open	Open	As Is	As Is	RM	54	A	Out
				10				P42F068-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	As Is	As Is	RM		B	

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
				3/4				P42F162	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
46	56	RCIC Pump Discharge Min.-Flow Bypass	Water	2	Yes			E51F019-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Open	Open or Closed	As Is	O,RM	5	A	In
				1				E51F251	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E51F252	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
47	56	Reactor Recirc. Post Accident Sampling	Reactor Water	3/4	No	Refer FSAR subsection 6.2.3 for Discussion	Note 14	B33F128-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed or Open	As Is	RM	10	B	Out
				3/4				B33F127-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed or Open	As Is	RM	10	A	
48	56	RHR Heat Exchanger "B" Relief Valve Vent. Header to Suppression Pool	Non-Condensables	6	Yes		Note 14	E12F055B	O	Yes	66'-7½"	Relief	Process	Process	None	Closed	Closed	Closed	N/A	None	N/A	None	In
				2				E12F073B-B	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	RM	11.3	B	
				1½				E12F103B	O	Yes	N/A	Check	Process	Process	None	Closed	Closed	Open	N/A	Reverse Flow	N/A	N/A	
				1½				E12F104B	O	Yes	31'-9 7/16"	Check	Process	Process	None	Closed	Closed	Open	N/A	Reverse Flow	N/A	N/A	
49	55	RWCU Back-wash Transfer Pump to Spent Resin Tank	R.A. Water 0.8% Suspended Solids by Wt.	4	No		Note 14	G36F106	I	Yes	N/A	Gate	Pneumatic	Piston	None	Closed	Closed	Closed	Closed	B,G,RM	30	B	Out
				4				G36F101	O	Yes	2'-0"	Gate	Pneumatic	Piston	None	Closed	Closed	Closed	Closed	B,G,RM	30	A	
50	56	Drywell & Containment Equipment Drain Sump Pump Discharge	Water Equipment Drains	6	No		Note 14	P45F067	I	Yes	N/A	Gate	Pneumatic	Piston	None	Open	Closed	Closed	Closed	B,G,RM	4	B	Out

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 13)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (5)	Shutdown	Post-Accident	Power Failure (4)				
				6				P45F068	O	Yes	5'-6"	Gate	Pneumatic	Piston	None	Open	Closed	Closed	Closed	B,G,RM	4	A	
51	56	Drywell & Containment Floor Drain Sump Pumps Discharges	Water Floor Drains	6	No		Note 14	P45F061	I	Yes	N/A	Gate	Pneumatic	Piston	None	Open	Closed	Closed	Closed	B,G,RM	4	B	Out
				6				P45F062	O	Yes	6'-6 1/16"	Gate	Pneumatic	Piston	None	Open	Closed	Closed	Closed	B,G,RM	4	A	
54	56	To & From Refueling Water Storage Tank-Upper Containment Pool	Pool Water	12	No		Note 14	G41F053	O	Yes	1'-2½"	Gate	Manual	Manual	None	Locked Closed	Open	Locked Closed	N/A	Manual	N/A	N/A	In or Out
				12				G41F201	I	Yes	N/A	Gate	Manual	Manual	None	Locked Closed	Open	Locked Closed	N/A	Manual	N/A	N/A	
56	56	Condensate Supply to Containment	Condensate	6	No		Note 14	P11F075	O	Yes	1'-6"	Gate	Pneumatic	Piston	None	Open	Open	Closed	Fail Closed	B,G,RM	30	A	In
				6				P11F004	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	N/A	
				3/4				P11F095	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
57	56	To Upper Containment Pool From Fuel Pool Cooling & Cleanup System	Fuel Pool Water	8	No	Refer FSAR subsection 6.2.3 for Discussion	Note 14	G41F028-A	O	Yes	2'-3 3/4"	Globe	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,G,RM	44	A	In
				8				G41F040	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	N/A	
				3/4				G41F340	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
58	56	From Upper Containment Pool to Fuel Pool Drain Tank	Fuel Pool Water	8	No		Note 14	G41F029-A	O	Yes	2'-8 3/4"	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,G,RM	40	A	Out
				8				G41F044-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,G,RM	40	B	

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (5)	Shutdown	Post-Accident	Power Failure (4)				
60	56	From Auxiliary Building Floor and Equipment Drain Transfer Tanks to Suppression Pool	Water	4	No	Refer FSAR subsection 6.2.3 for Discussion		P45F273-A	O	Yes	6'-4"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Closed or Open	As Is	B,G,RM	23	A	In
				4				P45F274-B	O	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Closed	Closed or Open	As Is	B,G,RM	23	B	
				3/4				P45F275	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				P45F290	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
61	56	From Standby Liquid Control System Mixing Tank (Future Use)	Borated Water	2	Yes		Note 14	C41F151	I	Yes (Note 15)	N/A	Check	Process	Process	None	Locked Open	Locked Open	Locked Open	N/A	N/A	N/A	None	
				3				C41F150	O	Yes (Note 15)	N/A	Gate	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	N/A	N/A	None	
				3/4				C41F152	O	Yes (Note 15)	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
65	56	Combustible Gas Control Containment Purge (Outside Air Supply)	Air	6	No		Note 14	E61F009	O	Yes	2'-0½"	Butterfly	Pneumatic	Piston	Manual	Open	Closed	Closed	Fail Closed	B,G,Z, RM	5	A	In
				6				E61F010	I	Yes	N/A	Butterfly	Pneumatic	Piston	Manual	Open	Closed	Closed	Fail Closed	B,G,Z, RM	5	B	
				3/4				E61F017		Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
66	56	From Purge Radiation Air Detection System to Containment Exhaust Charcoal Filter Train	Air	6	No		Note 14	E61F056	I	Yes	N/A	Butterfly	Pneumatic	Piston	Manual	Open	Closed	Closed	Closed	B,G,Z, RM	4	B	Out

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 18)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (8)	Shutdown	Post-Accident	Power Failure (4)				
				6				E61F057	O	Yes	1'-3½"	Butterfly	Pneumatic	Piston	Manual	Open	Closed	Closed	Closed	B,G,Z,RM	4	A	
				3/4				M41F054	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
67	56	RHR Pump "B" Test Line to Suppression Pool	Suppression Pool Water	18	Yes	See FSAR subsection 6.2.3 for Discussion	Note 14	E12F024B-B	O	Yes	28'-5 3/4"	Gate	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	C,G,X,V,RM	93	B	
				4				E12F011B-B	O	Yes	30'-11½"	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	C,G,RM	27	B	In
				4				E12F064B-B	O	Yes	60'-7"	Gate	Electric Motor	Electric	Manual	Open	Closed	Open or Closed	As Is	C-C,RM	8	B	
				1½				E12F290B-B	O	Yes	80'-4 3/4"	Globe	Electric Motor	Electric	Manual	Open	Closed	Open or Closed	As Is	B,G,RM	8	B	
				3/4				E12F321	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F351	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F276	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F277	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F212	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F213	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F249	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F250	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1				E12F334	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal(5)	Shutdown	Post-Accident	Power Failure (4)				
				1				E12F335	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F331	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				E12F350	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E12F312	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				1/2				E12F305	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
69	56	Refueling Water Transfer Pump Suction	Refueling Water	12	No	See FSAR subsection 6.2.3 for Discussion	Note 14	P11F130	O	Yes	N/A	Butterfly	Pneumatic	Piston	None	Open	Open	Closed	Fail Closed	B,G,RM	4	B	Out
				12				P11F131	O	Yes	12'-1½"	Butterfly	Pneumatic	Piston	None	Open	Open	Closed	Fail Closed	B,G,RM	4	A	
				3/4				P11F132	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
70	56	Instrument Air Supply to ADS Receivers	Air	1	Yes		Note 14	P53F003-A	O	Yes	5'-5"	Globe	Electric Motor	Electric	Manual	Open	Open	Closed	Closed	B,G,RM	4	A	In
				1				P53F006	I	Yes	N/A	Check	Process	Process	None	Open	Open	Closed	N/A	Reverse Flow	N/A	None	
				3/4				P53F043	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
71A	56	LPCS Relief Valve Vent Header to Suppression Pool	Non-Condensable	1½			Note 14	E21F018	O	Yes	53'-2"	Relief	Process	Process	None	Closed	Closed	Closed	N/A	N/A	N/A	N/A	
71B	56	RHR "" Relief Valve Vent Header to Suppression Pool & Post-Accident Sample Return	Non-Condensable	1½	No			E12F025C	O	Yes	10'-3"	Relief	Process	Process	None	Closed	Closed	Closed	N/A	N/A	N/A	N/A	
				1				E12F346-B	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Open	As Is	RM	10	B	

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/Outside Containment	Type C Tests (26)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
73	56	RHR Shutdown Vent Header to Suppression Pool	Condensate	4	Yes	See FSAR subsection 6.2.3 for Discussion	Note 14	E12F036	O	Yes	29'-11 5/16"	Relief	Process	Process	None	Closed	Closed	Closed	N/A	N/A	N/A	N/A	In
75	56	RCIC Turbine Exhaust Vacuum Breaker	Steam	1½	No		Note 14	E51F078-B	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	G,J,RM	6.5		Out
				2½				E51F077-A	O	Yes	34'-4"	Gate	Electric Motor	Electric	Manual	Open	Open	Open	As Is	G,J,RM	18	A	
76B	56	RHR Shutdown Suction Relief Valve Discharge	Non-Condensable	1	Yes		Note 14	E12F005	O	Yes	108'-0"	Relief	Process	Process	None	Closed	Closed	Closed	N/A	N/A	N/A	N/A	In
77	56	RHR Heat Exchanger "A" Relief Valve Vent Header to Suppression Pool	Non-Condensable	6	Yes		Note 14	E12F055A	O	Ye	65'-8 7	Relief	Process	Process	None	Closed	Closed	Closed	N/A	N/A	N/A	N/A	In
				2				E12F073A-A	O	Yes	73'-1½"	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed	As Is	[illegible]	11.3	A	In
				1½				E12F104A	O	Yes	30' 9 ,16"	Check	Process	Process	None	Closed	Closed	Closed	N/A	Reverse Flow	N/A	N/A	
				1½				E12F103A	O	Yes	N/A	Check	Process	Process	None	Closed	Closed	Closed	N/A	Reverse Flow	N/A	N/A	
81	56	Reactor Recirc Post Accident Sampling	Reactor Water	3/4	No		Note 14	B33F126-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed or Open	As Is	RM	10	B	Out
				3/4				B33F125-A	O	Yes	N/A	Globe	Electric Motor	Electric	Manual	Closed	Closed	Closed or Open	As Is	RM	10	A	
82	56	Integrated Leak Rate Test Connection (Drywell Pressurization and Depressurization)	Containment Atmosphere	5	No		Note 14	Blind Flange	O	No	N/A												In or Out
								Blind Flange	I	(Type B Test)													
				3/4				M61F010	I	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	

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CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
83	56	RWCU Line From Regen. Heat Exchanger to Feedwater	Reactor Water	6	No	See FSAR subsection 6.2.3 for Discussion	Note 14	G33F040-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,F,H, Y,L,RM	30	B	Out
				6				G33F039-A	O	Yes	2'-0 3/16"	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	F,B,H, Y,L,W, RM	28.6	A	
				3/4				G33F055	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
84	56	Chemical Waste Sump Pump Discharge	Water	3	No		Note 14	P45F093	I	Yes	N/A	Gate	Pneumatic	Piston	None	Open	Closed	Closed	Closed	B,G,RM	4	B	
				3				P45F099	O	Yes	6'-3 1/8"	Gate	Pneumatic	Piston	None	Open	Closed	Closed	Closed	B,G,RM	4	A	Out
85	56	Suppression Pool Cleanup Return	Suppression Pool Water	12	No		Note 14	P60F009-A	O	Yes		Gate	Pneumatic	Piston	None	Open	Open	Closed	Fail Closed	B,G,RM	4	A	In
				12				P60F010-B	O	Yes	N/A	Gate	Pneumatic	Piston	None	Open	Open	Closed	Fail Closed	B,G,RM	4	B	
				3/4				P60F011	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
				3/4				P60F034	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
86	56	Demineralized Water Supply to Containment	Demineralized Water	2	No		Note 14	P21F017-A	O	Yes	1'-6"	Globe	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,G,RM	10	A	In
				2				P21F018-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,G,RM	10	B	
87	56	RWCU Pump Suction	Reactor Water	6	No		Note 14	G33F001-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Closed	Open	Closed	As Is	B,F,Y, H,L, RM	30	B	
				6				G33F252-A	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Closed	Closed	As Is	B,F,RM, Y,H,L	30	A	Out
				6				G33F004-A	O	Yes	1'-11 27/32"	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	W,Y,H, L,B,F, RM	29.5	A	

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source (Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
				3/4				G33F002	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
88	55	RWCU Pump Discharge	Reactor Water	4	No		Note 14	G33F053-B	I	Yes	N/A	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,Y,L,d,F,RM	21.7	B	In
				4				G33F054-A	O	Yes	2'-0"	Gate	Electric Motor	Electric	Manual	Open	Open	Closed	As Is	B,W,Y,L,H,F,RM	21.4	A	
				3/4				G33F061	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
89	56	Standby Service Water Supply "A"	Treated Water	2	Yes	See FSAR subsection 6.2.3 for Discussion	Note 14	P41F159A-A	O	Yes	2'-7 13/16"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	7.5	A	In
				2				P41F169A	I	Yes	N/A	Check	Process	Process	Manual	Open	Open	Open	N/A	N/A	N/A	N/A	
				3/4				P41F163A	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
90	56	Standby Service Water Return "A"	Treated Water	2	Yes		Note 14	P41F168A-A	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	7.5	A	Out
				2				P41F160A-A	O	Yes	1'-7 13/16"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	7.5	A	
91	56	Standby Service Water Return "B"	Treated Water	2	Yes		Note 14	P41F168B-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	7.5	B	Out
				2				P41F160B-B	O	Yes	1'-7 3/16"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	7.5	B	
92	56	Standby Service Water Supply "B"	Treated Water	2	Yes		Note 14	P41F159B-B	O	Yes	2'-7 13/16"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	7.5	B	In
				2				P41F169B	I	Yes	N/A	Check	Process	Process	Manual	Open	Open	Open	N/A	N/A	N/A	N/A	
				3/4				P41F163B	O	Yes	N/A	Globe	Manual	Manual	None	Locked Closed	Locked Closed	Locked Closed	N/A	None	N/A	None	
101C	RG1.11	Drywell Pressure Instrument (Narrow Range)	Air	3/4	No		Note 14	M71F593-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow	
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post Accident	Power Failure (4)					
101F	RG1.11	Drywell Pressure Instrument (Wide Range)	Air	3/4	Yes	See FSAR subsection 6.2.3 for Discussion	Note 14	M71F591A-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None	50
102D	RG1.11	Drywell Pressure Instrument (Wide Range)	Air	3/4	Yes		Note 14	M71F591B-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	None	
103D	RG1.11	Containment Pressure Instrument (Wide Range)	Air	3/4	Yes		Note 14	M71F592A-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None	
104D	RG1.11	Containment Pressure Instrument (Wide Range)	Air	3/4	Yes		Note 14	M71F592B-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	None	
106A	56	Drywell Hydrogen Analyzer Sample	Air	3/4	Yes		Note 14	E61F595C	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	Out	
				3/4	Yes		Note 14	E61F595D	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		25
106B	56	Drywell Hydrogen Analyzer Sample Return	Air	3/4	Yes		Note 14	E61F597C	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	In	
				3/4	Yes		Note 14	E61F597D	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		25
105A	56	Containment Hydrogen Analyzer Sample	Air	3/4	Yes		Note 14	E61F596C	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	Out	50
				3/4	Yes		Note 14	E61F596D	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		25
106E	56	Containment Hydrogen Analyzer Sample Return		3/4	Yes		Note 14	E61F598C	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	In	
				3/4	Yes		Note 14	E61F598D	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		25
108A	56	Containment Hydrogen Analyzer Sample	Air	3/4	Yes		Note 14	E61F596A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	Out	
				3/4	Yes		Note 14	E61F596B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		25

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
107B	56	Containment Hydrogen Analyzer Sample Return	Air	3/4	Yes	See FSAR subsection 6.2.3 for Discussion	Note 14	E61F598A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	In
				3/4	Yes			E61F598B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		50
107D	56	Drywell Hydrogen Analyzer Sample	Air	3/4	Yes		Note 14	E61F595A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	Out
				3/4	Yes		Note 14	E61F595B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		
107E	56	Drywell Hydrogen Analyzer Sample Return	Air	3/4	Yes		Note 14	E61F597A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	In
				3/4	Yes			E61F597B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		50
109A	56	Drywell Fission Product Monitor Sample	Air	3/4	No		Note 14	D23F592-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	Out	50
				3/4	No			D23F591-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		50
109B	56	Drywell Fission Product Monitor Sample Return	Air	3/4	No		Note 14	D23F594-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	In
				3/4	No			D23F593-B	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B		50
109D	RG1.11	Containment Pressure Instrument (Narrow Range) - Post Accident Sample	Air	3/4	Yes		Note 14	M71F594-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	Out	50
				3/4	Yes			M71F595-A	I	Yes	N/A	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A		
110A	56	Integrated Leak Rate Test Drywell Pressure Instrument	Containment Atmosphere	3/4	No		Note 14	Blind Flange	I	No (Type B test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		In or Out	25 50 021.10

TABLE 6.2-44

CONTAINMENT ISOLATION VALVE INFORMATION

Containment Penetration Number (Note 10)	Applicable General Design Criteria or Regulatory Guide	System Name	Fluid	Line Size (Inch)	Engineered Safety Feature System	Through Line Leakage Classification	FSAR Figure Number for Valve Arrangement Reference	System Number and Isolation Valve Number (Note 14)	Location Inside/ Outside Containment	Type "C" Tests (16)	Length of Pipe from Containment to Outermost Isolation Valve	Valve		Valve Actuation Mode		Valve Position				Isolation Signal	Valve Closure Time (Sec.)	Power Source 1E Bus A or B or C	Normal Direction of Flow
												Type	Operator (2)	Primary	Secondary	Normal (6)	Shutdown	Post-Accident	Power Failure (4)				
110C	56	Integrated Leak Rate Test Verification Flow Instrument	Containment Atmosphere	3/4	No		Note 14	Blind Flange	I	No (Type B test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		In or Out
110F	56	Integrated Leak Rate Test Containment Pressure Instrument	Containment Atmosphere	3/4	No		Note 14	Blind Flange	I	No (Type B test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		In or Out
113	RG1.11	Suppression Pool Level Instruments	Water	3/4	Yes	See FSAR subsection 6.2.3 for Discussion	Note 14	E30F593A-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None
114	RG1.11	Suppression Pool Level Instruments	Air	3/4	Yes		Note 14	E30F592A-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None
115	RG1.11	Suppression Pool Level Instruments	Water	3/4	Yes		Note 14	E30F594A-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None
116	RG1.11	Suppression Pool Level Instruments	Air	3/4	Yes		Note 14	E30F591A-A	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	A	None
117	RG1.11	Suppression Pool Level Instruments	Water	3/4	Yes		Note 14	E30F593B-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	None
118	RG1.11	Suppression Pool Level Instruments	Air	3/4	Yes		Note 14	E30F592B-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	None
119	RG1.11	Suppression Pool Level Instruments	Water	3/4	Yes		Note 14	E30F594B-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	None
120	RG1.11	Suppression Pool Level Instruments	Air	3/4	Yes		Note 14	E30F591B-B	O	Yes	3'-0"	Globe	Electric Motor	Electric	Manual	Open	Open	Open	As Is	RM	28.4	B	None

021.30
50

TABLE 6.2-44 (Cont.)

NOTES

These notes are keyed by number to correspond to numbers in parentheses, in Table 6.2-44.

1. Main steam isolation valves require that both solenoid pilots be de-energized to close valves. Accumulator air pressure plus spring act together to close valves when both pilots are de-energized. Voltage failure at only one pilot does not cause valve closure. The valves are designed to close fully in 5.5 seconds and a minimum closure time of 3 seconds.

2. Ac motor-operated valves required for isolation functions are powered from the ac standby power buses. Dc-operated isolation valves are powered from the station batteries.

3. Testable check valves are designed for remote opening with zero differential pressure across the valve seat. The valves will close on reverse flow even though the test switches may be positioned for opening. The valves open when pump pressure exceeds reactor pressure even though the test switch may be positioned for closing.

4. All motor-operated isolation valves remain in the last position upon failure of valve power. All air-operated valves close on motive air failure.

5. Containment and drywell vent exhaust high radiation (Signal Z) is generated by two trip systems. This requires two high radiation or inoperative trips on one trip system and two high radiation or inoperative trips on second trip system to initiate isolation.

6. Normal status position of valve (open or closed) is position during normal power operation of the reactor (see Normal valve position column).

7. The standard minimum closing rate for automatic electric motor operated isolation gate valves is based on a nominal line size of 12 inches. Using the standard closing rate, a 12-inch line is isolated in 60 seconds. Conversion to closing time can be made on this basis, using the actual size of line in which the valve is installed. Air operated isolation valves will have a maximum closing time of 5 seconds. For globe valves the closing time is based on 4 inches per minute. 50

TABLE 6.2-44 NOTES (Cont.)

8. Specified closure rates are as required for containment isolation only.

9. The auxiliary building is part of the boundary for the Standby Gas Treatment System (SGTS). To maintain auxiliary building integrity, isolation is provided on all lines larger than 2 inches not performing a safety function or supplying a source of makeup to the RPV. The valves will be seismic Category I and ASME Section III, Class 3. Lines 2 inches and smaller will be properly orificed so that, if failure of the line would occur, the failure will not jeopardize SGTS operation. (Refer to subsection 6.2.3 for details.)

10. Penetrations not listed are "spare" and are capped, except numbers 1, 2 & 3 which are used for equipment hatch and personnel air locks. Penetration numbers 93 through 100 and 112 are not used. (Penetration numbers 201 through 251 are electrical.)

11. Abbreviations noted in table are as follows:

I	-	Location inside the containment
O	-	Location outside the containment
N/A	-	Not applicable
Process	-	Actuated by fluid pressure
RG	-	NRC regulatory guides

12. The column for engineered safety feature system includes support systems required for shutdown.

13. Deleted.

14. Refer to Figures 6.2-76 through 6.2-80 for containment isolation valve arrangements. System number and isolation valve number are indicated on these figures.

15. Penetration is for future use, with welded caps on both ends.

16. Refer to Table 6.2-49 for a description of how Type "C" testing is performed. 50

TABLE 6.2-44 (Cont.)

ISOLATION SIGNAL CODES

Signal	Description
A*	Reactor vessel low water level - level 3. (A scram occurs at this level also. This is the highest of the three isolation low water level signals.)
B*	Reactor vessel low water level - level 2. (This is the second of the three low water level signals. (The RCIC and HPCS systems are initiated at this level.
C*	Reactor vessel low water level - level 1. (This is the lowest of the three water level signals, and main steam line isolation occurs at this level. The LPCS and LPCI systems are also initiated at this level.
D*	High radiation - main steam line
E*	Line break - main steam line (steam line high steam flow)
F*	Line break in main steam tunnel (steam line tunnel high space temperature or differential temperature 50
G*	High drywell pressure
H*	Line break in reactor water cleanup system - (high space temperature of differential temperature) 50
I*	Line break - RCIC/RHR steam line (steam line high steam flow)
J*	Line break in RCIC system steam line to turbine (low steam line pressure)
K*	Line break in RCIC system steam line to turbine (high steam line space temperature or differential temperature) 50
L*	High differential flow in the reactor water cleanup system
M*	Line break in RHR shutdown and head cooling (high space temperature or differential temperature) 50

TABLE 6.2-44 (Cont.)

ISOLATION SIGNAL CODES

Signal	Description	
N*	Low main condenser vacuum	
O	RCIC pump discharge flow - high	50
P*	Low main steam line pressure at inlet to turbine (RUN mode only)	
Q	Reactor vessel high water level	
R	HPCS pump discharge flow - high	50
S	HPCS discharge pressure - low	
T	High pressure RCIC turbine exhaust diaphragm	
U	High reactor vessel pressure	50
V	Containment spray system actuated	
W	High temperature at outlet of cleanup system non-regenerative heat exchanger	
X	High containment pressure	50
Y	Standby liquid control system actuated	
Z*	High radiation, containment and drywell ventilation exhaust	
RM*	Remote manual switch from control room (All automatic initiated isolation valves are capable of remote manual operation from the control room.)	
A-A	MSIV leakage excessive (high main steam line pressure)	
B-B	MSIV leakage excessive (high main steam line flow)	50
C-C	RHR pump discharge flow - normal	

* These are the isolation functions of the containment, and reactor vessel isolation control system; other functions are given for information only.