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May 25, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffery A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-09245

Subject: MHI's Response to US-APWR DCD RAI No. 288-2274

Reference: 1) "Request for Additional Information No. 288-2274 Revision 1, SRP Section: 03.09.06 – Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints, Application Section: 03.09.06," dated 3/25/2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Responses to Request for Additional Information No. 288-2274, Revision 1."

Enclosed are the responses to 48 RAIs contained within Reference 1.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittal. His contact information is provided below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosure:

1. Responses to Request for Additional Information No. 288-2274, Revision 1

CC: J. A. Ciocco
C. K. Paulson

D081
NRO

<u>Contact Information</u>

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Enclosure 1

UAP-HF-09245
Docket No. 52-021

Responses to Request for Additional Information No. 288-2274, Revision 1

May, 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-01:

General Design Criterion 1 requires that structure, systems and components (SSCs) important to safety be designed to quality standards commensurate with the importance of the safety functions to be performed. Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency as necessary to assure a quality product in keeping with the required safety function.

ASME QME-1-2007, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," provides measures and guidelines to ensure that pumps, valves, and dynamic restraints are functionally designed and qualified to perform their safety functions during accident conditions. The staff is addressing QME-1-2007 in a revision to Regulatory Guide 1.100. FSAR Tier 2, Section 3.9.6.1 does not provide a discussion of whether or not all or portions of this standard will be used to functionally qualify safety-related pumps, valves, and dynamic restraints for the US-APWR. FSAR Tier 2 Section 3.10.2 references ASME QME-1-2002 for seismic and dynamic qualification of mechanical equipment, and Section 3.10.2.2 states QME-1-2007 is also used as guidance for valves.

Considering the above, address the following:

1. FSAR Tier 2 Section 3.9.6.1 does not address ASME QME-1-2007. Will the design and qualification requirements with respect to safety-related pumps, valves, and dynamic restraints adhere to the requirements of this standard? If not all, will portions of this standard be applied to the US-APWR?

2. If this standard is not being utilized, provide the bases for what is being proposed in FSAR Tier 2 Sections 3.9.6.1 and 3.10. Provide descriptions and examples of the following:

a) What type of qualification testing will be performed for these components? Will they be qualified by analyses, testing, or some combination of analysis and testing?

b) Describe the proposed functional qualification program and the ASME QME-1-2007 requirements for pumps, valves, and dynamic restraints. Provide a discussion of the differences with QME-1-2007.

ANSWER:

As outlined in DCD Section 3.10, the design and qualification requirements with respect to safety-related pumps, valves, and dynamic restraints will adhere to the requirements of ASME QME-1-2007. Note that any references to ASME QME-1-2002 in DCD Section 3.10 will be corrected to ASME QME-1-2007 as discussed in the response to RAI 216-1749, Rev.1, Question 3.10-6. The US-APWR applies the ASME OM Code for developing the IST Program for safety-related pumps, valves, and dynamic restraints. DCD Subsection 3.9.6.1 will be revised to include a reference of Section 3.10 for the design and qualification requirements.

The design and qualification requirements with respect to safety-related pumps, valves, and dynamic restraints fully adhere to Draft Regulatory Guide DG-1175, which endorses ASME QME-1-2007 with exceptions and clarifications. The US-APWR Equipment Environmental Qualification Program, outlined in Technical Report MUAP-08015(R0), will be used to qualify safety-related pumps, valves, and dynamic restraints in both the general and site-specific designs. Section 3.3 of the report states that the US-APWR Equipment Environmental Qualification Program encompasses the requirements specified in Draft Regulatory Guide DG-1175. Therefore, ASME QME-1-2007, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," will be applied to the US-APWR in conjunction with the exceptions and clarifications set forth in DG-1175, Section 1.2.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the second sentence of the second paragraph in Subsection 3.9.6.1 to the following: "These provisions and requirements are discussed in Section 3.10 of the DCD."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-02:

FSAR Section 3.9.6 refers to Reference 3.9-13 as the basis for developing the USAPWR IST Program for ASME Code, Section III, Class 1, 2 and 3 safety related pumps, valves, and dynamic restraints. This reference specifies the Code for Operation and Maintenance of Nuclear Power Plants, OM, ASME, 1995 Edition through 2003 Addenda. Also, the acceptance criteria section of FSAR Table 3.9-13 states that ASME OM Code 2004 is applied. The US-APWR Design Certification application should reference the latest edition and addenda of the ASME OM Code incorporated by reference in the NRC regulations. Verify which edition and addenda of the Code are to be used in the FSAR as the basis for the IST program.

ANSWER:

MHI agrees the reference in DCD Table 3.9-13 should be to the latest edition and addenda of the ASME OM Code incorporated by reference in the NRC regulations. The acceptance criteria in Table 3.9-13 will be changed to reference the OM Code (Reference 3.9-13).

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the Acceptance Criteria (tenth column) for each row in Table 3.9-13 to the following:

  "Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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US-APWR Design Certification

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-03:

In Section 3.9.6.1 of the FSAR, the reference to the ISI requirement for ASME code Section III class 1, 2 and 3 pumps, valves and dynamic restraints is not clear. Provide additional information and clarify the ISI reference.

ANSWER:

MHI agrees that the reference to the ISI requirement for ASME Code, Section III, Class 1, 2 and 3 pumps, valves and dynamic restraints in the first paragraph of DCD Subsection 3.9.6.1 is not clear. The first paragraph of Subsection 3.9.6.1 will be revised to provide additional information and to remove the ISI reference, which is a typographical error.

Impact on DCD

See Attachment 1 for the mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the first paragraph in Subsection 3.9.6.1 to the following:

  "IST of ASME Code, Section III, Class 1, 2, and 3 pumps, valves, and dynamic restraints is performed in accordance with the ASME OM Code and applicable addenda, as required by 10 CFR 50.55a(f), except where specific relief has been granted by the NRC in accordance with 10 CFR 50.55a(f). The IST program assesses and verifies operational readiness included in various sections of the ASME OM Code as follow:"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-04:

Consistent with GDC 37, 40, 43, and 46 requirements for testing of safety-related systems, provide additional information on provisions for testing pumps and valves at design basis conditions (flow, pressure, temperature). A review of the US-APWR FSAR application could find no evidence the design incorporates the necessary features (flow paths, instrumentation) necessary to perform a full range of design basis testing. Provide additional information to confirm that safety related systems have been provided with the necessary provisions to conduct design basis testing.

ANSWER:

The testing of US-APWR pumps and valves is consistent with GDC 37, 40, 43, and 46 requirements. Conformance of testing to the GDC 37, 40, 43, and 46 requirements is presented in the Subsections 3.1.4.8, 3.1.4.11, 3.1.4.14, 3.1.4.17. The design features (flow paths, instrumentation) necessary for the testing is also presented in the above subsections of the DCD. The detailed information is presented in the several chapters as identified in the above sections.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-05:

Clarify the specification to use ISTC 4.2 for motor-operated valve (MOV) testing. MOV testing is addressed in 50.55a(b) and is further discussed in GL 89-10, GL 96-05 and RIS 2000-03. It is not clear why ISTC 4.2 is being cited as providing the test requirements for MOVs absent the above listed NRC generic communications. Provide additional information and clarify the basis for the use of ISTC 4.2 requirement alone.

ANSWER:

As noted in DCD Subsection 3.9.6.3.1, a IST program for MOVs is established in accordance with the ASME OM Code and taking into account NRC test requirements discussed in GL 89-10 and GL 96-05. MHI also considers RIS 2000-03, Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions, as it relates to MOVs. However, most of the recent staff and industry attention has been focused on AOV performance and therefore consideration of RIS 2000-03 is described in greater detail in the Answer to Question No. RAI 03.09.06-14 and DCD Subsection 3.9.6.3.2.

DCD Subsection 3.9.6.3.5 identifies that MOVs which function as containment isolation valves are tested for leakage in accordance with the provisions in 10 CFR 50.55a(b).

DCD Subsection 3.9.6.1 discusses ASME OM Code sections related to the IST of pumps, valves and dynamic restraints. The second bullet references the location of requirements for ISTC of valves. Therefore the third bullet is not necessary to discuss again for valve requirements, and MHI will delete the third bullet of the Subsection 3.9.6.1 to avoid confusion.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Delete the third bullet of the first paragraph in DCD Section 3.9.6.1: "Requirements for IST of Motor-Operated Valve (MOV) are incorporated in ISTC 4.2."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 2274 REVISION 1**

SRP SECTION: **03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**

APPLICATION SECTION: **03.09.06**

DATE OF RAI ISSUE: **03/25/09**

QUESTION NO. RAI 03.09.06-06:

Discuss the relationship of the IST program to the Technical Specifications. 10 CFR 50.55a requires a commitment to include the IST program in the Technical Specifications. The discussion of the inservice test program in US-APWR Section 3.9.6.1 does not include a reference to the inclusion of the program within the Technical Specifications. Provide a reference or additional information regarding the Technical Specification section where the IST program discussion resides.

ANSWER:

MHI agrees that US-APWR Section 3.9.6.1 does not state that the IST Program will be included in a specific section of Technical Specifications. The reference to Technical Specifications will be added to the US-APWR DCD.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the following as the last sentence in the fourth paragraph in DCD Section 3.9.6.1: "The requirements for the IST Program are included in Technical Specification Subsection 5.5.8 of Section 5.5, Programs and Manuals."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-07:

US-APWR FSAR Tier 2, Section 3.9.6.2, "IST Program for Pumps," provides general information on the IST program for pumps to be used in the USAPWR reactor. Provide a full description of this operational program or specify that the COL applicant will need to supplement the USAPWR FSAR information to provide a full description of the IST program for pumps as part of the COL application.

ANSWER:

As stated in DCD Subsection 3.9.6, the IST Program Plan is developed in accordance with the ASME OM Code. The requirements for IST of the pumps are incorporated from the ASME OM Code, Section ISTB.

DCD Subsection 3.9.6 and COL Item 3.9(8) also indicate the COL Applicant is to administratively control the edition and addenda to be used for the IST program plan for pumps, valves, and dynamic restraints. Further, COL Item 3.9(8) in CPNPP COLA Subsection 3.9.6 states "The requirements of functional testing for pumps, valves, and dynamic restraints will be in accordance with the IST program plan outlined 12 months prior to fuel load."

Therefore, the DCD currently describes the IST program as consistent with the ASME OM Code, and CPNPP has acknowledged the full IST program plan is to be outlined 12 months prior to fuel load. To clarify the intention for COL Applicants to describe the IST program plan, the DCD will add that the COL Applicant is to administratively control the edition and addenda to be used for the IST program, and to provide a full description of their IST program plan for pumps, valves, and dynamic restraints. Since CPNPP currently commits to outline the IST program plan 12 months prior to fuel load, there is no change necessary to the COLA based on this clarification.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the last sentence of the last paragraph in Subsection 3.9.6 to the following: "The COL Applicant is to administratively control the edition and addenda to be used for the IST program plan, and to provide a full description of their IST program plan for pumps, valves, and dynamic restraints."

- Change *COL 3.9(8)* in Subsection 3.9.9 to the following:

  COL 3.9(8) *The COL Applicant is to administratively control the edition and addenda to be used for the IST program plan, and to provide a full description of their IST program plan for pumps, valves, and dynamic restraints.*

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-08:

The US-APWR FSAR Tier 2 discusses the functional design and qualification of safety-related equipment in several sections. The staff reviewed the methods described in the FSAR for establishing and measuring the reference values and IST values for the pump parameters. Figure 6.3-7 on page 6.3-70 of the FSAR does not include the valve arrangement to and from the spent fuel pool (SFP) demineralizer trains. To perform the required testing of Refueling Water Recirculation Pumps A&B, a test flow path and isolation capability of the flow path for each pump will need to be established. The required test flow path for each pump and the test flow path isolation cannot be discerned from Figure 6.3-7. Provide a flow diagram depicting the SFP demineralizer train valve arrangements or provide a written explanation of how each pump test flow path will be established to facilitate the required periodic OM Code pump testing.

ANSWER:

The IST flow paths for refueling water storage system (RWS) pumps start from the refueling water storage pit (RWSP) and flow to containment vessel (CV) isolation valves (motor operated valves), RWS pumps, CV isolation valves (air operated valves and check valves), and eventually return to the RWSP. Test flow rate is controlled by the flow control valve installed between the RWS pump discharge and CV isolation valve (air operated valve). These flow paths and valves are depicted in Figure 6.3-7.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-09:

The staff reviewed the descriptive information in the FSAR covering the IST program for those ASME Code Class 1, 2, and 3 system pumps whose function is required for safety. The US-APWR Section 5.5.8 (Inservice Testing Program) in the Technical Specifications of the FSAR states that the IST program provides controls for inservice testing of ASME Class 1, 2, and 3 components. Table 3.9-13 lists the Class 1, 2, and 3 pumps to be tested. Review of the flow diagrams and other systems information in the FSAR revealed other pumps with those class designations, but not included in the IST program. They are: four Class 2 Safety Injection (SI) Auxiliary Oil Pumps (if separate from the SI pumps), two Class 3 Boric Acid Transfer Pumps, and eight Class 3 Emergency Gas Turbine Fuel Oil Transfer Pumps. Provide additional information and rationale for why these pumps are not included in the IST program.

ANSWER:

The emergency gas turbine fuel oil transfer pumps will be added in Table 3.9-13 of the DCD. The safety injection (SI) auxiliary oil pumps are attached to SI pumps and tested concurrent with the SI pumps, and therefore are not included in Table 3.9-13.

The boric acid transfer pumps are non-safety pumps as identified in Table 3.2-2, Classification of Mechanical and Fluid Systems, Components, and Equipment (page 5 of 53), and therefore are not included in Table 3.9-13.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the following 8 rows at the end of Table 3.9-13:

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
GTS-PPP-001A	A-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-002A	B-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-001B	C-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-002B	D-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-001C	E-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.

GTS-PPP-002C	F-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-001D	G-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-002D	H-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	○	-	○	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-10:

US-APWR FSAR Tier 2, Section 3.9.6.3, "IST Program for Valves," provides general information on the IST program for valves to be used in the USAPWR reactor. For example, this section states that the IST program will conform to the requirements of the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), subsection ISTC, to the extent practical. The section states that guidance from NRC generic letters and industry and utility guidelines is considered in developing the IST program. The section states that the IST program will incorporate the use of non intrusive techniques to periodically assess degradation and performance of selected valves. The section notes that the operability test of safety-related power-operated valves may be either a static or dynamic test. Provide a full description of this operational program or specify that the COL applicant will need to supplement the USAPWR FSAR information to provide a full description of the IST program for valves as part of the COL application.

ANSWER:

As noted in the response to Question No. RAI 03.09.06-07, DCD Subsection 3.9.6 currently describes the IST program, which includes valves, as consistent with the ASME OM Code. The COLA for CPNPP also states the full IST program plan is to be outlined 12 months prior to fuel load. To clarify the intention for COL Applicants to describe the IST program plan, the DCD will add that the COL Applicant is to administratively control the edition and addenda to be used for the IST program, and to provide a full description of their IST program plan for pumps, valves, and dynamic restraints. Since CPNPP currently commits to outline the IST program plan 12 months prior to fuel load, there is no change necessary to the COLA based on this clarification.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Refer to RAI 03.09.06-07, for changes to Subsection 3.9.6 that are applicable to this response for RAI 03.09.06-10.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-11:

If safety-related thermal relief valves are used in the US-APWR design, discuss the testing of thermal relief valves as part of the IST program. The application does not make reference to the inclusion of thermal relief valves in the IST program. It is stated pressure relief valves used for protecting systems or portions of systems that perform a function in shutting down the reactor to a safe shutdown condition, in maintaining a safe-shutdown condition or in mitigating the consequences of an accident are subject to IST. Concern exists that any thermal relief valves may be excluded from the IST program. The OM Code Appendix I and SRP 3.9.6 Section II Acceptance Criteria 3.C.vi discuss the requirement to include safety-related thermal relief valves in the IST program. Provide clarification regarding use of thermal relief valves and whether IST requirements are applied.

ANSWER:

Safety-related thermal relief valves are used in the US-APWR design, and MHI therefore agrees to include the testing of thermal relief valves as part of the IST program. These valves will be added in Table 3.9-14 of the DCD.

Testing of the thermal relief valves is performed in accordance with the following ASME OM code sections:

- **I-1340 Test Frequency, Class 1 Pressure Relief Valves That Are Used for Thermal Relief Application.** Tests shall be performed in accordance with I-1320, Test Frequencies, Class 1 Pressure Relief Valves.
- **I-1390 Test Frequency, Classes 2 and 3 Pressure Relief Devices That Are Used for Thermal Relief Application.** Tests shall be performed on all Class 2 and 3 relief devices used in thermal relief application every 10 years, unless performance data indicate more frequent testing is necessary. In lieu of tests, the relief devices may be replaced at a

frequency of every 10 years, unless performance data indicate more frequent replacements are necessary.

MHI will add the IST requirements of the valves NCS-VLV 406A, 406B, 406C, 406D, NCV-VLV-513, NCS-VLV-533, and NCS-VLV-035A, 035B in DCD Table 3.9-14.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the following 8 rows at the end of Table 3.9-14:

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-406A	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-406B	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-406C	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-406D	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCV-VLV-513	Excess letdown heat exchanger component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCV-VLV-533	Letdown heat exchanger component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-035A	Component cooling water A1/A2 return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-035B	Component cooling water C1/C2 return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-12:

The US-APWR FSAR Table 3.9-14 lists the valves proposed for inclusion in the inservice test (IST) program. The list identifies the valves by tag (identification) number and for each valve includes the following information;

- Description
- Type
- Safety related mission(s)
- Safety function(s)
- ASME IST category
- IST type and frequency
- Any notes identifying unique conditions applicable to the valve

This information is required by the ASME OM Code ISTA-1310 and ISTA-3110. Table 3.9-14 has been reviewed to ensure the information required by the Code is provided and that the information provided in the table is consistent with code requirements and consistent with other portions of the Design Certification documentation. This review has led to the following requests for additional information related to US-APWR Table 3.9-14:

(a) ISTC -3700 requires valves with position indication be regularly tested to verify the function of the position indication. Note 1 to Table 3.9-14 indicates the position indicators for the valves identified by Note 1 will be tested by local inspection without valve exercise. Clarify how the code requirement to verify the function of the position indication system will be satisfied if the testing does not include valve exercising.

(b) Numerous valves in Table 3.9-14 indicate an operability test as part of the IST type. Operability testing is not defined in the table or the text. Operability can be interpreted in many ways and without a clear definition of what is meant by operability it is difficult to determine if this testing is in accordance with code requirements. SRP 3.9.6 Section I.3.D specifies the methods to determine reference and inservice parameters be verified. The definition of what constitutes an operability test is needed to adequately evaluate the method. Define what is meant by an operability test.

(c) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(3) requires the leakage criteria for valves constituting the reactor coolant pressure boundary pressure isolation valves (PIVs) be specified. Valves RCS-MOV-117A, 117B, 116A and 116B are classified as RCS pressure boundary valves yet they are categorized as code class B (no leakage criteria) valves. Provide additional information and clarify why leakage criteria is not established for these valves.

(d) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(3) specifies leakage criteria for RCS PIVs be specified. Note 2 to Table 3.9-14 indicates valves RCS-MOV-119, 118, 002A, 002B, 003A and 003B are maintained closed to preserve the RCS pressure boundary yet no leakage criteria exists for the valves. Provide additional information and clarify why no leakage criteria is specified for these valves.

(e) Section ISTC-3520 of the ASME OM Code requires quarterly exercising of valves within the IST program. Alternate exercise frequencies are acceptable, if justified. It is indicated the following valves cannot be exercised quarterly as their exercising will interrupt necessary utilities leading to undesirable operational consequences. The valves in question are: RCS-AOV-132, 138, 147, and 148. From a review of the service provided by these valves, it is not clear that exercising the valves with the unit on line would have undesirable consequences or that a time could not be found when exercising would not have undesirable consequences. Provide additional information and clarify why quarterly testing of the valves cannot be performed.

(f) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.A indicates that a list of valves should be provided in the IST program, which includes the types of valves. Numerous valves, including CVS-LCV-451, 452, 121B, 121C, 121D, 121E, 121F and 121G, have " remote " listed as the type of valve. Remote is more applicable to the method of operation or control of the valve than the type of valve. Clarify how the designation of remote identifies the valve and actuator type, and provide additional information for the valves listed.

(g) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.v.(2) specifies the leakage criteria for containment isolation valves be established. The following valves are identified as containment isolation valves, yet no leakage criterion has been provided: SIS-MOV-001A, 001B, 001C, 001D, 009A, 009B, 009C, 009D, SIS-VLV-010A, 010B, 010C, 010D. Provide the leakage criteria or explain why no leakage criteria are appropriate.

(h) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(3) requires that RCPB PIVs be identified. Valve SIS-VLV-012A is identified as a pressure isolation valve but is not identified as a RCPB PIV. Provide additional information and explain why the valve should not be classified as a RCPB PIV.

(i) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(3) specifies that allowable leak rates be provided for RCPB PIV. The following valves are identified as being RCPB PIV valves, but no allowable leak rate has been identified: SIS-MOV-014A, 014B, 014C, 014D. Provide the allowable leak rate or provide a justification why not listing an allowable leak rate is appropriate.

(j) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(3) specifies RCPB PIVs be identified with leakage rates provided. The following valves are identified as RCS pressure boundary which are normally closed to maintain the RCPB: SIS-MOV- 031B, 031D, 032B and 032D. No allowable leak rate is specified for the valves. Provide the allowable leak rate or provide a justification why one is not needed for these valves.

(k) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iii discusses the testing of check valves with the recommendation that non-intrusive means be used. Table 3.9-14 indicates valves SIS-VLV-102A, 103A, 102B, 103B, 102C, 103C, 102D and 103D will be tested by alternate (disassembly and inspect) means. Experience has demonstrated valves in this service (accumulator outlet check valves) can be tested using non-intrusive means. Provide additional information and clarify why non-intrusive means of testing cannot be applied to these check valves.

(l) Valves RHS-MOV-002A, 002B, 002C, and 002D in Table 3.9-14 are classified as RCS pressure boundary containment isolation category A valves. It is then stated these valves are not containment isolation leak tested as they are water sealed, in a closed system, and closed when in modes above hot shutdown. The ASME OM Code ISTC-3620 and 3630 discuss leakage requirements including those for containment isolation valves. Provide clarification regarding whether there are no design-basis scenarios where the water seals could be lost such that pressure isolation valve water testing is the only necessary leakage testing for these valves.

(m) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(3) states RCPB PIVs should be identified with allowable leak rates established. Valves RHS-MOV-026A, 026B, 026C and 026D are identified as RCPB PIVs, but no allowable leak rate has been specified. Justify why no allowable leak rates have been established for these valves or provide the allowable leak rates.

(n) Valves EFS-MOV-019A, 019B, 019C, and 019D in Table 3.9-14 are identified as containment isolation valves with seat leakage requirements. The ASME Code ISTC-1300 requires valves with established leakage values are classified as category A valves. The ASME OM Code ISTC-3610 further establishes the leak test requirements of category A valves. These valves are categorized as category B valves in the table. Provide additional information and justify why the valves have been categorized as category B when it has been stated seat leakage requirements apply.

(o) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.v.(2) specifies containment isolation valves and associated seat leakage requirements be identified. Valves NFS-VLV-512A, 512B, 512C, and 512D are identified as containment isolation valves, but are categorized as category B valves. Provide additional information and justify why these containment isolation valves are categorized as category B valves.

(p) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.A specifies valve type be identified. It is not clear from Table 3.9-14 what the valve type is for the following valves: NFS-VLV-512A, 512B, 512C, and 512D. As test requirements are dependent upon valve type, it is necessary to know the valve type when reviewing test requirements. Provide additional information on categorization of the listed valves.

(q) The ASME OM Code ISTA-1500 (f),(g), and (h) require the performance of tests and examinations, recording of required tests and examination results that provide a basis for evaluation and facilitate comparison with the results of subsequent tests or examinations and the evaluation of tests and examination results. Note 11 to Table 3.9-14 states full stroke exercising is not possible with the unit at power, so partial stroke testing will be performed quarterly with full stroke testing at cold shutdown. It is further stated that to avoid potential valve damage, full stroke testing will be done using slow closure operation. This note is applied to valves NFS-VLV-512A, 512B, 512C and 512D. Provide additional information and justify how the proposed testing (partial stroke quarterly, slow full stroke testing at cold shutdown) demonstrates acceptable valve performance and how meaningful performance trends can be established.

(r) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.A specifies that for valves to be included in the IST program, the type of valve be identified. The valve type for NMS-HCV-3625, 3635, 3645 is not readily apparent. To adequately address the specified IST tests, the valve and actuator type must be known. Provide additional information on categorization of the listed valves.

(s) Valves CSS-MOV-004A, 004B, 004C and 004D are identified as containment isolation valves, but are shown as category B valves (no leakage requirement). SRP 3.9.6 section II Acceptance Criterion 3.C.v.(2) specifies leakage requirements be provided for containment isolation valves. Provide additional information and justify why these valves do not have established leakage requirements.

(t) Alternate exercise methods (disassembly and inspect) are specified for valves CSSVLV-005A, 005B, 005C and 005D. SRP 3.9.6 Section II Acceptance Criterion 3.C.(iii) specifies the use of non-intrusive means of verifying check valve performance. Experience has shown valves in service similar to those identified have been successfully tested (using air as test medium) by the application of non-intrusive means. Provide additional information and justify why non intrusive means cannot be used for these valves.

(u) ASME OM Code ISTA-3110 requires that the components to be included in the IST program be identified. For valves EWS-VLV-602A, 602B, 602C and 602D, the function is not identified. The tests appropriate for the valve can depend upon its function, and thus must be identified. Provide additional information and identify the function of these valves.

(v) ASME OM Code ISTC-3510 requires active category A and C check valves be exercised quarterly unless full stroking during operation is not possible. The following valves are sampling system isolation valves which, due to a reluctance to interrupt the process, are scheduled to be tested on a cold shutdown frequency. Normally, sampling systems are not in continuous service, and even for those which are commonly in service, a momentary interruption in the process is not significant. Common practice is to exercise sampling valves quarterly. Provide additional information and justify why the following valves cannot be exercised quarterly:

LMS-AOV-060, 056, 055, 053, 052

LMS-LCV-1000B, 1000A

LMS-AOV-105, 104

PSS-AOV-003

PSS-MOV-006, 013, 023, 031A, 031B, 052A, 052B

PSS-AOV-062B, 062C, 062D, 063, 071

PSS-VLV-072

SGS-AOV-031A, 031B, 031C, 031D.

(w) ASME OM Code ISTC 3522 specifies the exercise requirements for check valves. If exercising at power is not possible, then cold shutdown or refueling interval testing is specified. Valve DWS-VLV-005 is identified as a containment isolation check valve, but no exercise requirement is identified. Provide additional information and identify and include the exercise requirements for this valve in Table 3.9-14.

(x) ASME OM Code ISTC-3510 and ISTC-3521 establish the requirements for exercising of valves in the IST program. Quarterly testing is to be performed unless it is not practical to do so. In that case, cold shutdown exercising is required or refueling exercising if cold shutdown testing is not practical. The following valves control essential chilled water necessary for environmental control to various safety related rooms/areas. The affected valves are VWS-TCV-2845, 2855, 2865, 2875, 2784, 2794,2804, 2814, 2574, 2584, 2594, 2604, 2671, 2676, 2681, 2686, 2721A, 2721B, 2721C, 2721D, 2726A, 2726B, 2726C, 2726D, 2731A, 2731B, 2736A, 2736B, 2741A, 2741B,2746A, 2746B,2331, 2336, 2341, 2346. These valves are specified to be exercised on a cold shutdown frequency based upon a reluctance to interrupt the process flow and potentially impact room environmental conditions. The chilled water is frequently not in continuous service, and further it is not clear how a momentary interruption of chilled water flow would have a significant impact on a room's environment. Provide additional information on the impact of a short duration interruption in essential chilled water flow, and explain how such an interruption would be of such consequence to justify a cold shutdown test interval.

(y) ASME OM Code ISTA-1500(g), ISTC-3510, ISTC-3521 establish the requirements for exercising of valves. ISTA-1500(g) establishes the requirement to record the results of tests and examinations that provide a basis for evaluation and facilitate comparison with results of subsequent tests or examinations while ISTC-3510 and ISTC-3521 establish the requirements for exercising frequency. Note 11 to Table 3.9-14 states for the identified valves, partial stroke tests will be performed quarterly with the unit on line and full stroke testing in the slow closure mode will be conducted at cold shutdowns. A slow stroke is specified to preclude potential damage to components. Provide additional information and justify how the combination of on line partial stroking and cold shutdown slow stroking permits evaluation of valve performance and comparison with past performance to evaluate performance trends.

(z) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.(iii),c(1)(a),(2),(3)(b) discusses the use of non-intrusive means in check valve testing. Note 12 to Table 3.9-14 indicates full stroke testing of the accumulator injection line check valves, containment spray containment isolation check valves, and the main steam line check valves cannot practically be performed, so these valves will be subject to alternate (disassembly and inspect) test methods. ASME OM Code ISTC-5221 recognizes alternate test methods, if other methods are impractical. By the use of non-intrusive means, the industry has been able to exercise and evaluate the performance of containment spray containment isolation valves and accumulator injection check valves. Discuss why non-intrusive means cannot be employed and why alternate test methods are required.

(aa) Valves SIS-MOV-031A, 031B, 031C and 031D and SIS-VLV-032A, 032B, 032C and 032D are identified as reactor pressure boundary isolation valves. SRP 3.9.6 Section II Acceptance Criterion 3.C.(iv)(3) specifies reactor coolant pressure boundary valves are to be identified and allowable leakage rates provided. Contrary to this, these valves are categorized as category B valves. Provide additional information and justify why these valves are not categorized as category A valves with a leakage rate established.

ANSWER:

Refer to following answers to each item of RAI 03.09.06-12.

(a) The position indication sensors of the valves are tested during set-pressure testing required in I-8100 of the ASME OM Code, Mandatory Appendix I. Note 1 of Table 3.9-14 will be clarified.

(b) The term "operability test" means the testing described in Subsection 3.9.6.3.1 of the US-APWR DCD as "MOVs are inservice tested in accordance with the requirements of GL-89-10 (Reference 3.9.55) to permit periodic assessment of valve operability at the prescribed frequency. This MOV program addresses the various requirements, such as, maximum torque and thrust, margins for degraded conditions, degraded voltage, control switch repeatability, load sensitive MOV behavior, etc. The inservice operability testing of some

MOVs rely on non-intrusive diagnostic techniques to permit periodic assessment of valve operability at design basis conditions in accordance with GL-89-10. The COL Applicant is to identify MOVs that require non-intrusive diagnostic testing technique." No change to the DCD is required.

The operability test is also applied to POVs other than MOVs. For those valves, refer to RAI 03.09.06-14.

(c) Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.iv.(1) defines that pressure isolation valves (PIVs) are the two normally closed valves, in series, within the RCPB (defined in 10 CFR Part 50) that isolate the reactor coolant system from an attached low pressure system. PIVs are classified as A or AC in accordance with the provisions of Subsection ISTC-1300 of the OM Code.

ISTC-1300 of ASME OM Code describes that a Category A valve is one for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function(s). ISTC-2000 of ASME OM Code also describes supplemental definitions of reactor coolant system pressure isolation as the function that prevents intersystem over pressurization between the reactor coolant system and connected low pressure system.

RCS-MOV-117A, 117B, 116A and 116B are valves which isolate RCS from an attached system connected to the PRT (pressure relief tank). In the case of leakage occurrence, leakage is discharged to the PRT directly, and no over pressurization occurs due to the function of the PRT.

Therefore, valves RCS-MOV-117A, 117B, 116A and 116B are classified as RCS pressure boundary valves yet they are categorized as code class B (no leakage criteria) valves. No change to the DCD is required.

(d) RCS-MOV- 002A, 002B, 003A and 003B are valves which isolate RCS from an attached system connected to the pressurizer relief tank (PRT). If leakage were to occur, the leakage is discharged directly to the PRT, and no over-pressurization occurs due to the function of the PRT.

RCS-MOV-119, 118 are valves which isolate the RCS from an attached system for the discharge to reactor containment. No over-pressurization occurs due to this condition either.

Therefore, valves RCS-MOV-119, 118, 002A, 002B, 003A and 003B are classified as RCS pressure boundary valves, yet they are categorized as Code Class B (no leakage criteria) valves. No change to the DCD is required.

Refer also to the answer to Question RAI 03.09.06-12(c) for related information.

(e) MHI agrees to change exercising test frequency of the valves RCS-AOV-132, 138, 147, and 148 to quarterly.

(f) To clarify how the designation of remote identifies the valve and actuator type, the third column name in Table 3.9-14 is to be changed from "Valve type" to "Valve/Actuator Type." In addition, the valve and actuator type will be clarified within the list (for example, Remote MO Gate, Check, Relief, Manual, etc.).

(g) MHI agrees to apply the leakage criteria to the valves SIS-MOV-009A, 009B, 009C, 009D, and SIS-VLV-010A, 010B, 010C, 010D. For the valves SIS-MOV-001A, 001B, 001C, 001D, Type C testing is not performed.

The justification for the valve criteria is that the systems are closed systems outside containment, they are designed and constructed to ASME Code, Section III, Class 2 and Seismic Category I requirements, and the piping inside containment is filled with the RWSP water. Should the valves leak slightly when closed, the fluid seal within the pipe or the closed piping system outside containment would preclude release of containment atmosphere to the environment.

(h) Valve SIS-VLV-012A is identified as a RCPB pressure isolation valve. Such information is described in Table 3.9-14 Valve Inservice Test Requirements (Sheet 26 of 138) of US-APWR DCD Tier 2 Revision 1. No change to the DCD is required.

(i) SIS-MOV-014A, 014B, 014C, and 014D are valves which isolate the RCS from an attached safety injection system. In the case of leakage occurrence, leakage is discharged to the refueling water storage pit directly through the minimum flow lines of the safety injection pumps, and no over pressurization occurs because no blocking device exists in the minimum flow lines. Piping configuration of the minimum flow lines is presented clearly in the Figure 6.3-2 of the chapter 6 of the US-APWR DCD Tier 2 Revision 1.

Therefore, valves SIS-MOV-014A, 014B, 014C, and 014D are classified as RCS pressure boundary valves yet they are categorized as code class B (no leakage criteria) valves. No change to the DCD is required.

Refer also to the answer to Question RAI 03.09.06-12(c) for related information.

(j) SIS-MOV-031B, 031D, 032B and 032D are valves which isolate RCS from an attached safety injection system. In the case of leakage occurrence, leakage is discharged to the refueling water storage pit directly through sparger, and no over pressurization occurs because no blocking device exists in the lines. Piping configuration of the lines is presented clearly in Figure 6.3-2 of DCD Chapter 6, Revision 1.

Therefore, valves SIS-MOV-031B, 031D, 032B and 032D are classified as RCS pressure boundary valves yet they are categorized as code class B (no leakage criteria) valves. No change to the DCD is required.

Refer also to the answer to Question RAI 03.09.06-12(c) for related information.

(k) MHI agrees that valves SIS-VLV-102A, 103A, 102B, 103B, 102C, 103C, 102D and 103D will be tested using non-intrusive means.

(l) Containment penetrations and CIVs including valves RHS-MOV-002A, 002B, 002C, and 002D, are tested for ASME IST Category A containment leakage. ASME IST Category C containment leakage testing is not applied to these valves. The justification for the categorization of these valves is that the RHS is a closed system outside containment designed and constructed to ASME III, Class 2 and seismic Category I requirements, and as such they do not constitute a potential containment atmosphere leak path during or following a loss-of-coolant accident with a single active failure of a system component. Should the valves leak slightly when closed, the fluid seal within the pipe or the closed piping system outside containment would preclude release of containment atmosphere to the environs. During post-accident operations, the system is filled with recirculation water. During normal operation, the system is water filled, and degradation of valves or piping is readily detected.

To clarify this justification, Note 10 in Table 3.9-14 will be changed to include the above discussion.

(m) The valves RHS-MOV-026A, 026B, 026C and 026D are isolated from the RCPB by check valves. Check valves RHS-VLV-027A, 027B, 027C and 027D, and RHS-VLV-028A, 028B, 028C and 028D are installed downstream of the RHS-MOV-026A, 026B, 026C and 026D, and therefore isolate the RCS from the RHRS branch. The check valves are identified as PIVs and are classified as the ASME IST Category AC as indicated in Table 3.9-14.

    Therefore, valves RHS-MOV-026A, 026B, 026C and 026D are categorized as code class B (no leakage criteria) valves. No change to the DCD is required.

(n) EFS-MOV-019A, 019B, 019C, and 019D are identified as containment isolation valves. The emergency feed water piping relating to the valves is designed to accommodate periodic leakage rate testing.

    Appendix J to 10 CFR 50, specifies leakage testing requirements for the containment, its penetrations, and isolation valves (Category A, B, and, C tests). The steam generator and associated secondary system piping that form the primary barrier to the outside, much the same as the containment liner plate, are subjected to an ASME IST Type A test. The barriers against fission product release to the environment are the steam generator tubes and piping associated with the steam generators.

    Therefore, EFS-MOV-019A, 019B, 019C, and 019D need not be classified as Category A valves as defined in the ASME OM Code ISTC-1300. No change to the DCD is required.

(o) Valves NFS-VLV-512A, 512B, 512C, and 512D are identified as containment isolation valves. The main feed water piping relating to the valves is designed to accommodate periodic leakage rate testing.

    Similar to the answer to RAI 03.09.06-12(n), the steam generator and associated secondary system piping that form the primary barrier to the outside, much the same as the containment liner plate, are subjected to an ASME IST Type A test. The barriers against fission product release to the environment are the steam generator tubes and piping associated with the steam generators.

    Therefore, NFS-VLV-512A, 512B, 512C, and 512D need not be classified as category A valve defined in the ASME OM Code ISTC- 1300. No change to the DCD is required.

(p) Valves NFS-VLV-512A, 512B, 512C, and 512D are hydraulic-pneumatically actuated gate valves with a sealed pneumatic actuator to close the valve using stored energy. MHI agrees to describe the valve type for these valves in Table 3.9-14.

    The clarify the test requirements of these valves, the inservice testing type and frequency will be changed to be only "Exercise Full Stroke/Cold Shutdown". The exercising of the valves with partial opening is abandoned because it is not practicable.

(q) As stated in the answer of RAI 03.09.06-12(p), the exercise type and frequency of valves NFS-VLV-512A, 512B, 512C, and 512D will be modified. New exercise type and frequency is fully conforming the ASME OM Code requirements.

(r) Valves NMS-HCV-3615, 3625, 3635, and 3645 are air operated globe valves. The valves are hand control type, and their opening is manually actuated from the main control room. Valves will be closed in case of loss of motive power (Fail closed valve).

    As noted in the response to RAI 03.09.06-12(f), the valve and actuator type will be clarified for each valve tag number, as applicable, in the third column of Table 3.9-14.

(s) MHI agrees to apply the leakage criteria to the valves CSS-MOV-004A, 004B, 004C, and 004D.

(t) MHI agrees that valves CSS-VLV-005A, 005B, 005C and 005D will be tested using non-intrusive means.

(u) The function of the valves EWS-VLV-602A, 602B, 602C and 602D is to open and close the ESWP motor cooling water path according to the cooling water supply conditions. Such a function is identified as "Active" in the "Safety Functions" column of DCD Table 3.9-14, and requires a corresponding valve position indication in the "Safety–Related Missions" column. No change to the DCD is required.

(v) The exercising test frequency of the following valves, which is different than the check valve PSS-VLV-072 inside the containment vessel, will be changed to quarterly. IST Note 6 is not applicable for these valves, and will be deleted.

LMS-AOV-060, 056, 055, 053, 052

LMS-LCV-1000B, 1000A

LMS-AOV-105, 104

PSS-AOV-003

PSS-MOV-006, 013, 023, 031A, 031B, 052A, 052B

PSS-AOV-062A, 062B, 062C, 062D, 063, 071

SGS-AOV-031A, 031B, 031C, 031D.

The exercising test frequency of the check valve PSS-VLV-072 is kept as Exercise/Refueling Outage because of impracticable to test it during normal operation in the containment vessel.

(w) Valve DWS-VLV-005 is the containment isolation valve of the demineralized water supply line. The demineralized water supply line is not used during normal operation, but used during a refueling outage for maintenance activity.

The valve is isolated from the remaining system by a locked, closed valve installed in the upper stream of the line during periods requiring its safety function to "Maintain Closed". The ASME OM Code ISTC-3510 requires "Active category A, category B, and category C check valves shall be exercised ---". The valve DWS-VLV-005 has no active safety function, and therefore no exercise test of the valve is anticipated. No change to the DCD is required.

(x) MHI will change exercising test frequency to "Quarterly" for the following valves:

VWS-TCV-2845, 2855, 2865, 2875, 2784, 2794, 2804, 2814, 2574, 2584, 2594, 2604, 2671, 2676, 2681, 2686, 2721A, 2721B, 2721C, 2721D, 2726A, 2726B, 2726C, 2726D, 2731, 2736, 2741A, 2741B, 2746A, 2746B, 2331, 2336, 2341, and 2346.

(y) The inservice testing type and frequency for the main steam isolation valves and main feed water isolation valves were changed in Table 3.9-14 during Revision 1 of the DCD to "Exercise Full Stroke/Cold Shutdown," according to ASME OM Code Sections ISTA-1500(g), ISTC-3510, and ISTC-3521. Note 11 of Table 3.9-14 was modified according to the above inservice testing type and frequency, and no further change to the DCD is required.

(z) MHI agrees that non-intrusive means can be employed to test check valves as discussed in Standard Review Plan 3.9.6 Section II Acceptance Criterion 3.C.(iii),c(1)(a),(2),(3)(b) for the full-stroke exercise of accumulator injection line check valves, containment spray header containment isolation check valves, and turbine driven emergency feedwater pump steam supply line drain line check valves. The change for accumulator injection line check valves is answered by Question 3.9.6-12(k), and the change for containment spray header containment isolation check valves is answered by Question 3.9.6-12(t). The turbine driven emergency feedwater pump steam supply line drain line check valves will be corrected in response to this question.

The main steam check valves cannot be performed during normal operation and is therefore justification for testing during cold shutdown of a refueling outage. During a refueling outage, the generation of main steam is suspended, and therefore no process fluid exists for performing the exercise test for the main steam check valves. Introduction of other motive fluid in the system for the exercise of the main steam check valves is not practicable since no isolation boundary exists both upstream and downstream of the main steam check valves. Therefore, these valves are subject to alternate (disassembly and inspection) test methods.

(aa)Refer to the answers to RAI 03.09.06-12(c) and RAI 03.09.06-12(j). No change to the DCD is required.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- For item (a), change Note 1 of Table 3.9-14 (Sheet 137 of 138) to the following:

  "1. This note applies to the pressurizer safety valves and to the main steam safety valves. Their position indication sensors are tested during set-pressure testing required in I-8100 of the ASME OM Code, Mandatory Appendix I."

- For item (e), change the contents of Inservice Testing Type and Frequency (7th column) in Table 3.9-14 to "Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/Quarterly Operability Test" for the following Valve Tag Numbers:

  RCS-AOV-132 (Sheet 5 of 138)

  RCS-AOV-138 (Sheet 5 of 138)

  RCS-AOV-147 (Sheet 6 of 138)

  RCS-AOV-148 (Sheet 6 of 138)

- For item (f), change the title for the third column of Table 3.9-14, Sheets 1 through 137 of 138, to the following: "Valve/Actuator Type"

- For item (f), the valve and actuator type will be clarified for each valve tag number, as applicable, in the third column of Table 3.9-14. Refer to Attachment 1 for a mark-up of changes to Valve/Actuator Type (column 3) of Table 3.9-14 for applicable valve tag numbers.

- For item (g), change the ASME IST Category (6th column) in Table 3.9-14 to "A" for the following Valve Tag Numbers:

  SIS-MOV-001A (Sheet 22 of 138)

  SIS-MOV-001B (Sheet 22 of 138)

  SIS-MOV-001C (Sheet 22 of 138)

SIS-MOV-001D (Sheet 22 of 138)

SIS-MOV-009A (Sheet 23 of 138)

SIS-MOV-009B (Sheet 23 of 138)

SIS-MOV-009C (Sheet 24 of 138)

SIS-MOV-009D (Sheet 24 of 138)

- For item (g), change the ASME IST Category (6th column) in Table 3.9-14 to "AC" for the following Valve Tag Numbers:

SIS-VLV-010A (Sheet 24 of 138)

SIS-VLV-010B (Sheet 24 of 138)

SIS-VLV-010C (Sheet 24 of 138)

SIS-VLV-010D (Sheet 25 of 138)

- For item (g), change the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 to "Leak Test/ Refueling Outage" for the following Valve Tag Numbers:

SIS-MOV-001A (Sheet 22 of 138)

SIS-MOV-001B (Sheet 22 of 138)

SIS-MOV-001C (Sheet 22 of 138)

SIS-MOV-001D (Sheet 22 of 138)

SIS-MOV-009A (Sheet 23 of 138)

SIS-MOV-009B (Sheet 23 of 138)

SIS-MOV-009C (Sheet 24 of 138)

SIS-MOV-009D (Sheet 24 of 138)

- For item (g), change the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 to "Leak Test/ Refueling Outage" for the following Valve Tag Numbers:

SIS-VLV-010A (Sheet 24 of 138)

SIS-VLV-010B (Sheet 24 of 138)

SIS-VLV-010C (Sheet 24 of 138)

SIS-VLV-010D (Sheet 25 of 138)

- For item (k), change the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 to "Check Exercise /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage", and delete "12" from IST Notes (eighth column) in Table 3.9-14 for the following Valve Tag Numbers:

SIS-VLV-102A (Sheet 32 of 138)

SIS-VLV-103A (Sheet 32 of 138)

SIS-VLV-102B (Sheet 33 of 138)

SIS-VLV-103B (Sheet 33 of 138)

SIS-VLV-102C (Sheet 33 of 138)

SIS-VLV-103C (Sheet 33 of 138)

SIS-VLV-102D (Sheet 34 of 138)

SIS-VLV-103D (Sheet 34 of 138)

- For item (l), change Note 10 of Table 3.9-14 (Sheet 138 of 138) to the following:

  "10. The residual heat removal system hot leg suction containment isolation valves and cold leg discharge containment isolation valves are not containment isolation leak tested."

  The basis for the exception is:

  - Should the valves leak slightly when closed, the fluid seal within the pipe or the closed piping system outside containment would preclude release of containment atmosphere to the environment.
  - During post-accident operations, the system is filled with recirculation water. During normal operation, the system is water filled, and degradation of valves or piping is readily detected.
  - The residual heat removal system is a closed loop system, seismically-designed and designed as Quality Group B with a portion of outside containment.
  - The residual heat removal system valves are closed when the plant is in modes above hot shutdown."

- For item (p), change the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 to "Exercise Full Stroke/Cold Shutdown", for the following Valve Tag Numbers:

  NFS-VLV-512A (Sheet 57 of 138)

  NFS-VLV-512B (Sheet 58 of 138)

  NFS-VLV-512C (Sheet 58 of 138)

  NFS-VLV-512D (Sheet 59 of 138)

- For item (r), the valve and actuator type will be clarified for Valve Tag Numbers NMS-HCV-3615, 3625, 3635, and 3645, as part of the response to RAI 03.09.06-12(f).

- For item (s), insert "Safety Seat Leakage" at the bottom of Safety Functions (fifth column) in Table 3.9-14, change the ASME IST Category (sixth column) in Table 3.9-14 to "A", and add "Leak Test/ Refueling Outage" at the bottom of Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 for the following Valve Tag Numbers:

CSS-MOV-004A	(Sheet 74 of 138)
CSS-MOV-004B	(Sheet 74 of 138)
CSS-MOV-004C	(Sheet 74 of 138)
CSS-MOV-004D	(Sheet 74 of 138)

- For item (t), change the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 to "Check Exercise /Refueling Outage", and delete "12" from IST Notes (eighth column) in Table 3.9-14 for the following Valve Tag Numbers:

CSS-VLV-005A	(Sheet 75 of 138)
CSS-VLV-005B	(Sheet 75 of 138)
CSS-VLV-005C	(Sheet 75 of 138)
CSS-VLV-005D	(Sheet 75 of 138)

- For item (v), change the frequency portion in the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 from "Exercise Full Stroke/Cold Shutdown" to "Exercise Full Stroke/Quarterly," and delete "6" from IST Notes (eighth column) for the following Valve Tag Numbers:

LMS-AOV-060	(Sheet 101 of 138)
LMS-AOV-056	(Sheet 101 of 138)
LMS-AOV-055	(Sheet 102 of 138)
LMS-AOV-053	(Sheet 102 of 138)
LMS-AOV-052	(Sheet 103 of 138)
LMS-LCV-1000B	(Sheet 103 of 138)
LMS-LCV-1000A	(Sheet 103 of 138)
LMS-AOV-105	(Sheet 104 of 138)
LMS-AOV-104	(Sheet 104 of 138)
PSS-AOV-003	(Sheet 105 of 138)
PSS-MOV-006	(Sheet 105 of 138)
PSS-MOV-013	(Sheet 106 of 138)
PSS-MOV-023	(Sheet 106 of 138)
PSS-MOV-031A	(Sheet 107 of 138)
PSS-MOV-031B	(Sheet 107 of 138)
PSS-MOV-052A	(Sheet 107 of 138)
PSS-MOV-052B	(Sheet 108 of 138)
PSS-AOV-062A	(Sheet 108 of 138)
PSS-AOV-062B	(Sheet 108 of 138)
PSS-AOV-062C	(Sheet 109 of 138)
PSS-AOV-062D	(Sheet 109 of 138)

PSS-AOV-063	(Sheet 110 of 138)
PSS-AOV-071	(Sheet 110 of 138)
SGS-AOV-031A	(Sheet 114 of 138)
SGS-AOV-031B	(Sheet 114 of 138)
SGS-AOV-031C	(Sheet 115 of 138)
SGS-AOV-031D	(Sheet 115 of 138)

- For item (x), change the frequency portion in the Inservice Testing Type and Frequency (seventh column) in Table 3.9-14 from "Exercise Full Stroke/Cold Shutdown" to "Exercise Full Stroke/Quarterly" for the following Valve Tag Numbers:

VWS-TCV-2845	(Sheet 125 of 138)
VWS-TCV-2855	(Sheet 125 of 138)
VWS-TCV-2865	(Sheet 125 of 138)
VWS-TCV-2875	(Sheet 125 of 138)
VWS-TCV-2784	(Sheet 126 of 138)
VWS-TCV-2794	(Sheet 126 of 138)
VWS-TCV-2804	(Sheet 126 of 138)
VWS-TCV-2814	(Sheet 126 of 138)
VWS-TCV-2574	(Sheet 127 of 138)
VWS-TCV-2584	(Sheet 127 of 138)
VWS-TCV-2594	(Sheet 127 of 138)
VWS-TCV-2604	(Sheet 127 of 138)
VWS-TCV-2671	(Sheet 128 of 138)
VWS-TCV-2676	(Sheet 128 of 138)
VWS-TCV-2681	(Sheet 128 of 138)
VWS-TCV-2686	(Sheet 129 of 138)
VWS-TCV-2721A	(Sheet 129 of 138)
VWS-TCV-2721B	(Sheet 129 of 138)
VWS-TCV-2721C	(Sheet 130 of 138)
VWS-TCV-2721D	(Sheet 130 of 138)
VWS-TCV-2726A	(Sheet 130 of 138)
VWS-TCV-2726B	(Sheet 130 of 138)
VWS-TCV-2726C	(Sheet 131 of 138)
VWS-TCV-2726D	(Sheet 131 of 138)
VWS-TCV-2731	(Sheet 131 of 138)
VWS-TCV-2736	(Sheet 131 of 138)
VWS-TCV-2741A	(Sheet 132 of 138)

VWS-TCV-2741B	(Sheet 132 of 138)
VWS-TCV-2746A	(Sheet 132 of 138)
VWS-TCV-2746B	(Sheet 133 of 138)
VWS-TCV-2331	(Sheet 133 of 138)
VWS-TCV-2336	(Sheet 133 of 138)
VWS-TCV-2341	(Sheet 133 of 138)
VWS-TCV-2346	(Sheet 134 of 138)

- For item (z), delete "12" from IST Notes (eighth column) in Table 3.9-14 for the following Valve Tag Numbers:

EFS-VLV-109A	(Sheet 56 of 138)
EFS-VLV-109B	(Sheet 56 of 138)

- For item (z), change Note 12 in Table 3.9-14 (Sheet 138 of 138) to the following:

  "12. Full-stroke exercise of main steam check valves can not be practically established. Main steam check valves are tested by alternate method (disassembly) during refueling outage as described in Generic Letter 89-04."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-13:

US-APWR FSAR Tier 2, Section 3.9.6.3.1, "Inservice Testing Program for MOVs," provides general information on the IST program for motor-operated valves (MOVs) to be used in the USAPWR reactor. Describe the IST program to be developed consistent with 10 CFR 50.55a that requires the IST provisions in the ASME OM Code to be supplemented with a program to ensure that MOVs continue to be capable of performing their design-basis safety functions. This section also needs to properly reference the guidance in NRC generic letters, and specify the consideration of temperature effects on MOV output. The section should indicate that MOV operating experience is incorporated such as by discussing the application of the Joint Owners Group Program on MOV Periodic Verification, and the consideration of periodic verification of MOV actuator output. Provide a full description of the MOV testing operational program or specify that the COL applicant will need to supplement the USAPWR FSAR information to provide a full description of the MOV testing program as part of the COL application.

ANSWER:

MHI agrees that Subsection 3.9.6.3.1 of the US-APWR DCD should describe how the IST program is consistent with 10 CFR 50.55a, which requires the IST provisions in the ASME OM Code to be supplemented with a program to ensure that MOVs continue to be capable of performing their design-basis safety functions.

MHI agrees to properly reference the guidance in NRC generic letters, and specify the consideration of temperature effects on MOV output.

MHI agrees that this subsection should discuss how MOV operating experience is incorporated such as by discussing the application of the Joint Owners Group Program on MOV Periodic Verification, and the consideration of periodic verification of MOV actuator output.

Refer to the answer to RAI 03.09.06-07 for clarification of the COL Applicant's responsibilities for IST program, which includes the MOV testing program.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Replace Subsection 3.9.6.3.1 in its entirety with the following:

"**3.9.6.3.1 IST Program for MOVs**

IST of ASME Section III Class 1, 2, and 3, and safety-related motor-operated valves (MOVs) is performed in accordance with the ASME OM Code (Reference 3.9-13) and applicable addenda, as required by 10 CFR 50.55a(f) (Reference 3.9-29). The IST program incorporates the guidance of RG 1.192 (Reference 3.9-44) and NUREG-1482 (Reference 3.9-60). Testing is required except where specific relief has been granted by the NRC. In addition to the above, MOVs are inservice tested in accordance with the requirements of Generic Letter 96-05 (Reference 3.9-54) to permit periodic assessment of valve operability at the prescribed frequency. Generic Letter 96-05 supersedes Generic Letter 89-10 (Reference 3.9-55) and its supplements with regard to MOV periodic performance verification.

The MOV testing program requires either in-plant valve operation or prototype valve testing at system flow and pressure, or system differential pressure to verify correct MOV actuator sizing and control settings. This MOV periodic verification program addresses the various requirements, such as, maximum torque and thrust, margins for degraded conditions, degraded voltage, control switch repeatability, load sensitive MOV behavior, etc. The available motor output is determined based on motor capabilities at design basis conditions. These conditions include, rated motor start torque; minimum voltage conditions; elevated ambient temperature conditions; and operator efficiency. The MOV Program utilizes guidance from Generic Letter 96-05 and the Joint Owners Group MOV Periodic Verification study, MPR 2524-A (November 2006) (Reference 3.9-61).

Prior to power operation, a design basis verification test is performed on each active MOV to verify the capability of each valve to meet its safety-related design basis requirements. The test is performed at conditions that are as close to design basis conditions as practicable. The test results are used along with valve preservice tests to develop the initial (periodic verification) testing frequency for each active MOV.

The preservice test program for MOVs is conducted in accordance with the ASME OM Code (Reference 3.9-13), ISTC 3100, under conditions as near as practical to those expected during subsequent IST. The interval between testing to demonstrate continued design basis capability does not exceed five years or three refueling outages, whichever is longer.

In some cases, the valves are tested on a less frequent basis since it is not practicable to exercise the valve during plant operation. If an exception is taken to performing ASME Code test frequency such as full-stroke exercise testing of a valve, then full-stroke testing is performed during cold shutdown condition on a frequency that is not more often than required by the OM Code (Reference 3.9-13). If testing is not practicable during plant shutdown condition, then the full-stroke testing is performed during refueling outage. The inservice operability testing of some MOVs rely on non-intrusive diagnostic techniques to permit periodic assessment of valve operability at design basis conditions.

The IST program is to identify MOVs that require non-intrusive diagnostic testing techniques. The specified frequency of testing using operability of non-intrusive diagnostic techniques is a maximum of once every 10 years. The initial test frequency is the longest of every three refueling cycles or five years, until sufficient data exists to determine a longer test frequency is appropriate, in accordance with GL 96-05 (Reference 3.9-54)."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-14:

FSAR Tier 2, Section 3.9.6.3.2, "Inservice Testing Program for POVs Other Than MOVs," provides general information on the IST program from power-operated valves (POVs) other than MOVs to be used in the USAPWR reactor. The section does not describe the application of MOV lessons learned in developing the IST program for POVs, such as described in NRC Regulatory Issue Summary (RIS) 2000-03, "Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions." Provide a full description of this operational program or specify that the COL applicant will need to supplement the USAPWR FSAR information to provide a full description of the IST program for POVs as part of the COL application.

ANSWER:

MHI agrees that Subsection 3.9.6.3.2 of the US-APWR DCD should describe the application of MOV lessons learned in developing the IST program for POVs, such as described in NRC Regulatory Issue Summary (RIS) 2000-03, "Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions."

MHI agrees that a full description of the IST program for POVs is required and will specify that the COL Applicant will need to supplement the US-APWR FSAR information to provide a full description of the IST program for POVs as part of the COL application.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Replace the second and third paragraphs in Subsection 3.9.6.3.2 with the following:

"POVs other than active MOVs are exercised quarterly in accordance with ASME OM ISTC. Active and passive POVs upon which operability testing is performed are identified in Table 3.9-14.

Additional testing is performed as part of the air-operated valve (AOV) program, which includes the key elements for an AOV Program as identified in the Joint Owners Group Air Operated Valve Program Document, (Reference 3.9-61) and the Comments on Joint Owners' Group Air Operated Program Document (Reference 3.9-62). The AOV program incorporates the attributes for a successful POV long-term periodic verification program, as discussed in RIS 2000-03, Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions, (Reference 3.9-63), by incorporating lessons learned from previous nuclear power plant operations and research programs as they apply to the periodic testing of air- and other POVs included in the IST program. Key lessons learned that are addressed in the AOV program include:

- Valves are categorized according to their safety significance and risk ranking.
- Setpoints for AOVs are defined based on current vendor information or valve qualification diagnostic testing, such that the valve is capable of performing its design-basis function(s).
- Periodic static testing is performed, at a minimum on high risk (high safety significance) valves, to identify potential degradation, unless those valves are periodically cycled during normal plant operation under conditions that meet or exceed the worst case operating conditions within the licensing basis of the plant for the valve, which would provide adequate periodic demonstration of AOV capability. If required based on valve qualification or operating experience, periodic dynamic testing is performed to re-verify the capability of the valve to perform its required functions.
- Sufficient diagnostics are used to collect relevant data (e.g., valve stem thrust and torque, fluid pressure and temperature, stroke time, operating and/or control air pressure, etc.) to verify the valve meets the functional requirements of the qualification specification. Solenoid operated valves are verified, to the extent practical, to be capable of performing their safety functions for the electrical power supply amperage and voltage at design basis extremes. Test frequency is specified, and is evaluated each refueling outage based on data trends as a result of testing. Frequency for periodic testing is in accordance with References 3.9-61 and 3.9-62, with a minimum of 5 years (or 3 refueling cycles) of data collected and evaluated before extending test intervals. Post-maintenance procedures include appropriate instructions and criteria to ensure baseline testing is re-performed as necessary when maintenance on the valve, valve repair or replacement, have the potential to affect valve functional performance.
- Guidance is included to address lessons learned from other valve programs in procedures and training specific to the AOV program.
- Documentation from AOV testing, including maintenance records and records from the corrective action program are retained and periodically evaluated as a part of the AOV program.

The attributes of the AOV testing program described above, to the extent that they apply to and can be implemented on other safety-related POVs, such as electro-hydraulic valves, are applied to those other POVs.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-15:

The US-APWR FSAR Section 3.9.6.3.2 discusses the test parameters for solenoid valves. It states an acceptable stroke time and fail safe testing normally verify the operability of the valve's solenoid. Other parameters such as voltage and current at their design basis extremes can influence solenoid valve behavior. Stroke time and a fail safe tests by themselves may not be sufficient to demonstrate operability without specifying the electrical parameters as indicated in RIS 2000-03 and SRP 3.9.6 Section II Acceptance Criteria 3.C.ii(3). Provide additional information on solenoid valve testing for POVs.

ANSWER:

MHI agrees that US-APWR FSAR Section 3.9.6.3.2 (IST Program for POVs Other Than MOVs) only states "acceptable stroke time and fail safe testing normally verify the operability of the valve's solenoid" and that this statement does not adequately address NUREG 0800 Standard Review Plan 3.9.6 Section II Acceptance Criteria 3.C.ii(3).

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Impact on DCD for RAI 3.9.6-14 includes the following as the second sentence of the fourth bullet in Subsection 3.9.6.3.2: "Solenoid operated valves are verified, to the extent practical, to be capable of performing their safety functions for the electrical power supply amperage and voltage at design basis extremes."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-16:

The US-APWR FSAR Section 3.9.6.3.3 does not address check valves in series. Consistent with the OM Code ISTC-5223, for check valves in series, identify if the safety analysis requirements apply to the combination of the check valves or to individual valves. If a particular valve has a leakage requirement, that valve must be tested individually. No discussion was found regarding the approach for series check valves. Provide additional information and clarification on the testing requirements for check valves in series.

ANSWER:

The ASME OM Code ISTC-5223 requires "if two check valves are in a series configuration without provisions to verify individual reverse flow closure, the valve pair may be operationally tested closed as pair." US-APWR has the check valves installed in the safety injection system and the residual heat removal system in a series configuration. The function of the valves is transfer open, so ISTC-5223 requirement is not applied to the US-APWR. The valves are also identified as pressure isolation valves. Pressure isolation valve leak testing of these valves is performed individually, no additional description other than described in the Subsection 3.9.6.3.4 is necessary. No change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-17:

The US-APWR FSAR Section 3.9.6.3.3 does not address the allowed leakage rate for category A check valves. The OM Code ISTC-3610 and 10 CFR 52.47 specify requirements on the leakage rates for category A valves. Provide additional information and clarification on whether category A valves meet the leakage rate requirements.

ANSWER:

US-APWR has two types of Category A valves; pressure isolation valves (PIVs) and containment isolation valves (CIVs).

The maximum leakage requirement for PIVs is included in the surveillance requirements for Technical Specification 3.4.14 as presented in Subsection 3.9.6.3.4 of the US-APWR DCD. CIV leak testing is performed in accordance to 10 CFR 50, Appendix J, Type C testing. Therefore, no change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-18:

SRP 3.9.6 Section II Acceptance Criterion 3.c.iii.(1)(d) indicates testing of check valves should include the effects of rapid pump starts and stops as expected for system operating conditions and should include any other reverse flow conditions that may occur during expected system operating conditions. These factors are not included in the discussion of check valve testing requirements in FSAR Section 3.9.6.3.3. Provide additional information on how the check valve testing program will address the above considerations.

ANSWER:

MHI agrees to provide additional information on the check valve testing program based on the SRP 3.9.6, Acceptance criteria 3.C.iii.(1)(d).

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the following sentence at the end of the first paragraph in Subsection 3.9.6.3.3: "The effects of rapid pump starts and stops are considered in the testing, if it is expected for system operating conditions. Any other reverse flow conditions are considered in the testing if it may occur during expected system operating conditions."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-19:

The opening statements of FSAR 3.9.6.3.6 state that safety-related pressure relief devices, "....are specified in accordance with ASME OM Code for IST. The ISTs for these valves are identified ASME OM Code, Appendix I." These statements seem to imply that safety and relief valves for the US-APWR will be tested in accordance with the ASME OM Code Appendix I, but do not positively state that this is the case. The SRP 3.9.6 Section II Acceptance Criteria 3.vi.2 states that safety and relief valves tests should be conducted in accordance with Appendix I to the OM Code. Please provide confirmation that the safety and relief valves will be tested in accordance with the ASME OM Code Appendix I.

ANSWER:

Safety and relief devices for the US-APWR will be tested, not specified, in accordance with the ASME OM Code, Appendix I. This discussion will be clarified in the DCD.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the first sentence of the first paragraph in Subsection 3.9.6.3.6 to the following: "Pressure relief devices that provide a safety-related function in shutting down the reactor, in mitigating the consequence of an accident, and/or in protecting equipment in systems that perform a safety-related function, are tested in accordance with ASME OM Code for IST."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-20:

The US-APWR FSAR Section 3.9.6.3.2 addresses inservice testing of safety and relief valves. It is stated the test frequency for safety and relief valves is every 5 or 10 years. In addition to the 5 or 10 year requirement, it is required by Appendix I of the OM Code that 20% of the valves in a group be tested each interval. The commitment to test 20% of the valves each interval is necessary to verify code compliance. Provide additional information and clarify these requirements for safety and relief valves.

ANSWER:

MHI agrees to add the commitment to test 20% of the valves in a group at each interval.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the following sentence after the second sentence of the second paragraph in Subsection 3.9.6.3.6: "Twenty percent of the valves from each valve group are tested within any 24-month interval for Class 1 and main steam line safety valve, and within any 48-month interval for Class 2 and 3 devices."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-21:

10CFR50.55a(b)(3)(vi) requires exercising of manual valves in the IST program on a 2-year interval. In US-APWR FSAR Table 3.9-14, valve RCS-VLV-140 is identified as the vacuum venting line check valve bypass valve. The valve is a manual containment isolation valve subject to type A testing. No manual exercise of the valve is specified. Provide additional information and justify why a two-year exercise requirement has not been established for this valve.

ANSWER:

ISTC-3510 of the ASME OM Code requires that <u>Active</u> Category A, Category B, Category C check valves shall be exercised at normal frequencies such as every 3 months, etc.

RCS-VLV-140 has no active safety function because the valve is normally controlled as "locked closed" and is opened only to perform a vacuum venting operation during refueling outages. Therefore, an exercise requirement has not been established for this valve.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

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Docket No. 52-021

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-22:

In US-APWR FSAR Table 3.9-14, valves SIS-VLV-114 and DWS-VLV-004 are manual containment isolation valves. Seat leakage criteria have been established for these valves but, contrary to 10CFR50.55a(b)(3)(vi), no manual exercise test has been specified. Provide additional information and justify why these valves should not have a two-year manual exercise requirement.

ANSWER:

Valve SIS-VLV-114 was changed in DCD Revision 1 from a manual valve to a remote valve SIS-AOV-114, and the inservice testing type was correspondingly changed to "Exercise Full Stroke /Cold Shutdown". These changes are reflected on Sheet 34 of 138 in DCD Table 3.9-14, Revision 1.

DWS-VLV-004 has no active safety function because the valve is normally controlled as "locked closed" and is only opened during refueling outages when necessary to supply demineralized water for maintenance, etc. Therefore, the exercise requirement has not been established for this valve.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-23:

FSAR Chapter 6 contains, among other subjects, a description of the containment isolation system. Included is Table 6.2.4-3 which describes the containment penetrations and the isolation means and a schematic of each penetration. The table and schematics have been reviewed against code and regulatory requirements and against other sections in the Design Certification for completeness, accuracy and consistency. The following areas were deemed to need additional information clarification or correction.

(a) SRP 3.9.6 Section II Acceptance Criterion 3.A requires the list of valves in the inservice test program (IST) be provided with the type of valve identified. Table 3.9-14 identifies the following valves as motor-operated valves: NCS-MOV-511, NCS-MOV-517. Table 6.2.4-3 identifies these valves as air-operated valves. Clarify the type of valve and correct the appropriate table.

(b) SRP 3.9.6 Section II Acceptance Criterion 3.A requires the type of valve is to be identified. Table 3.9-14 identifies valve PSS-AOV-071 as an air-operated valve while Table 6.2.4-3 identifies the valve as motor-operated valve PSS-MOV-071. Clarify the type of valve and correct the appropriate table.

(c) FSAR Table 6.2.4-3 identifies the containment isolation valves. Table 3.9-14 identifies the valves to be included in the IST program as required by SRP 3.9.6 Section II Acceptance Criterion 3.A. The following valves are identified as containment isolation valves and are included in Table 6.2.4-3. However, these valves are not included in Table 3.9-14. Explain the function of these valves and why they are not included in both tables. Clarify and correct the appropriate table.

FSS-VLV-003

FSS-VLV-001

FSS-VLV-006

FSS-MOV-004

CAS-VLV-103

CAS-VLV-101

RMS-VLV-005

RMS-MOV-003

RMS-MOV-001

RMS-MOV-002

IGS-AOV-002

IGS-AOV-001

LTS-VLV-002

LTS-VLV-001

(d) SRP 3.9.6 Section II Acceptance Criterion 3.C.v.(2) requires containment isolation valves be identified. Table 6.2.4-3 identifies the following as containment penetrations but provides no information on the isolation means. Provide additional information and clarify the means by which containment isolation is provided for penetrations P262R and P262L.

(e) ASME OM Code ISTC 3300 requires the operating time for containment isolation be provided. Contrary to this requirement, Table 6.2.4-3 does not provide the units for the stroke time of the containment isolation valves. Provide additional information and clarify the units for the isolation times.

(f) SRP 3.9.6 Section I 1.A states that pumps, valves, and dynamic restraints must be designed, manufactured, tested, and installed to perform their applicable safety function. Table 6.2.4-3 identifies the following valves as 36" air-operated butterfly valves. The identified stroke time for these valves is 5 (units presumed to be seconds). Industry experience indicates air-operated valves of this size take considerably longer than 5 seconds to operate. Provide additional information and clarify the operating time (5 seconds?) and discuss how this requirement will be satisfied.

VCS-AOV-305

VCS-AOV-306

VCS-AOV-304

VCS-AOV-307

(g) ASME OM Code ISTC 3300 requires the stroke time for containment isolation valves be provided. Table 6.2.4-3 identifies valves CSS-MOV-004A, 004B, 004C and 004D as motor-operated containment isolation valves, but the valve closure time is indicated as N.A. Provide additional information and justify why valve closure times are not applicable for these valves.

ANSWER:

Refer to following answers to each item of RAI 03.09.06-23.

(a) MHI agrees NCS-MOV-511 and NCS-MOV-517 are motor-operated valves opposed to air-operated valves. The designations of these valves were corrected in Table 6.2.4-3 during Revision 1 of the DCD, and are consistent with their designation in Table 3.9-14. No addition change to the DCD is required.

(b) MHI agrees PSS-MOV-071 is a motor-operated valve opposed to an air-operated valve. The tag number of this valve will be corrected from PSS-AOV-071 to PSS-MOV-071 in Table 3.9-14, and will therefore become consistent with the designation in Table 6.2.4-3. No additional change to the DCD is required.

(c) All valves identified by RAI 03.09.06-23(c) are included in DCD Table 3.9-14, Revision 1. Some of the valves were incorporated into Table 3.9-14 during of Revision 1 of the DCD. No additional change to the DCD is required.

(d) There are no isolation valves for penetrations P262R and P262L since these lines are instrument lines. These sensors are of sealed bellows type and a protective case surrounds the sensor and instrumentation as shown in Figure 6.2.4-1 (sheet 42 of 50). No change to the DCD is required.

(e) The units of valve closure time will be included in Table 6.2.4-3 of the DCD.

(f) The closure time of the 36" air-operated butterfly valves that are VCS-AOV-305, -306, -304, and -307 is five seconds. The closure time of the air-operated valve is dependent on the frictional resistance that is generated by closing and the air discharge capability of an actuator to close valve. The pneumatic actuators are designed in consideration of above, in order that these containment isolation valves will revert to close position within 5 seconds. No change to the DCD is required.

(g) The valve closure time of CSS-MOV-004A, 004B, 004C, 004D is incorrectly noted as N.A. The closure time of these valves is 40 seconds. This information will be corrected in Table 6.2.4-3 of the DCD.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- For item (b), change the Valve Tag Number of PSS-AOV-071 (first column, second row under column title) in Table 3.9-14 (Sheet 110 of 138) to the following: "PSS-MOV-071"

See Attachment 4 for a mark-up of DCD Tier 2, Table 6.2.4-3, changes to be incorporated.

- For item (e), change the first row (table header), twenty-second column (Valve Closure Time) to the following: "Valve Closure Time (seconds)"
- For item (g), change the valve closure time (twenty-second column) to "40" for the following valve numbers (eighth column):

  CSS-MOV-004A (Sheet 4 of 8)

  CSS-MOV-004B (Sheet 4 of 8)

  CSS-MOV-004C (Sheet 4 of 8)

  CSS-MOV-004D (Sheet 4 of 8)

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-24:

FSAR Section 9.2.1 discusses the essential service water system. Figure 9.2.1-1 portrays the schematic of the system and the valves in the system are discussed in Section 9.2.1.2.2.6. In neither the discussion nor the schematic are pressure relief devices discussed or shown. ASME OM Code ISTC-1100, ISTC-5240 and SRP 3.9.6 Section II Acceptance Criterion 3.C.vi specify relief valves are to be identified and tested. Provide additional information and discuss the design and operation of the essential service water system, the use of pressure relief devices, and the inclusion of pressure relief devices installed in the essential service water system in the inservice test program.

ANSWER:

The essential service water system is designed to withstand maximum operating pressure taking into account maximum pump discharge pressure and static head in the system. Therefore, no pressure relief devices are installed in the essential service water system.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

5/23/2009

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Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 288-2274 REVISION 1**

SRP SECTION: **03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**

APPLICATION SECTION: **03.09.06**

DATE OF RAI ISSUE: **03/25/09**

QUESTION NO. RAI 03.09.06-25:

FSAR Section 9.2.2 discusses the component cooling water system. Section 9.2.2.2.2.1.5 states other relief valves are provided to relieve pressure. The location of the valves is not provided in the text nor shown on the schematic. ASME OM Code ISTA-1100, ISTC-5240 and SRP 3.9.6 Section II Acceptance Criterion 3.C.vi provide the requirements for the inservice testing of pressure relief valves. Provide additional information and discuss how the design of the component cooling system satisfies the requirements for inservice testing of pressure relief valves.

ANSWER:

MHI agrees to include the IST requirements of the thermal relief valves in DCD Table 3.9-14. The locations of the above valves are provided in Figure 9.2.2-1, of the US-APWR DCD.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Refer to RAI 03.09.06-11, Impact on DCD, for the addition of IST requirements of the thermal relief valves in the Table 3.9-14 of the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-26:

FSAR Section 9.2.2 discusses the component cooling water system. Section 9.2.2.1.1 states the component cooling water system has the ability to isolate the non-safety related portion of the system. From Figure 9.2.2.-1, it appears valves NCS-MOV-232A, 232B, 233A, 233B, 020A, 020B and NCS-VLV-033A provide the isolation. These valves are shown as category B valves. ASME OM Code ISTA-1300 requires valves be categorized and if leakage is significant to performance, the valve is to be categorized as a category A. Leakage from the safety-related portion to the non-safety related portion or leakage between the separate trains of the system can affect the ability of the system to perform its safety-related function. Provide additional information and discuss the isolation features of the component cooling water system and the significance of leakage between the safety-related trains and between the safety-related and non-safety related portions of the system and the basis for categorization of the valves.

ANSWER:

ASME OM Code defines IST Category A as the valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function.

The function of the valves NCS-MOV-232A, 232B, 233A, and 233B is to establish flow bypass. Normally valves isolate the two CCW supply headers. In case of the failure of one supply line, valves are opened and the RCP seal water is established from an alternate supply line.

The valves and related piping are seismically-designed and designed as Quality Group C. The operating pressure of the CCW system at 200 psig is relatively low. The two valves in the line are installed in series. Therefore, the valves leak slightly when closed. No specific maximum amount seat leakage limit in the closed position is applied to the valves. The valves are therefore categorized as IST Category B valves.

The function of valves NCS-MOV-020A and 020B is to also establish bypass flow. Normally valves are opened and closed to isolate safety trains from non-safety trains during abnormal and accident conditions. The same considerations as described above are applied to these valves. The valves are categorized as IST Category B valves.

Valve NCS-VLV-033A has no safety function relating to IST. Valves NCS-VLV-601, 602, 661A and 662A perform isolation function between seismic Category I portions and non-seismic Category I portions through installation in the downstream side of valve NCS-VLV-033A, as shown in DCD Figure 9.2.2-1. No change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

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Docket No. 52-021

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-27:

FSAR Section 9.3.4 discusses and describes the chemical and volume control system (CVCS). Section 9.3.4.2.6.28 describes relief valves in the CVCS system. Few of these valves are shown on the system schematic Figure 9.3.4(1). ASME OM Code ISTC-1100 and ISTC-5240 requires the identification and testing of pressure relief valves. Identify the pressure relief valves installed in the CVCS system which are to be included in the inservice test program and the commitment to test these valves in accordance with Appendix I.

ANSWER:

Subsection 9.3.4.4 of the DCD references Subsection 3.9.6 for the inservice testing of relief valves. In Subsection 3.9.6, Table 3.9-14, the CVCS relief valves included in the IST program are presented with the valve tag number and description.

The locations of CVCS relief valves included in the IST program are presented in the Figure 9.3.4-1.

The commitment to test safety and relief valves in accordance with Appendix I of ASME OM Code is presented in Subsection 3.9.6.3.6 of the DCD. No change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-28:

FSAR Sections 9.5.4 through 9.5.8 describe and discuss the gas turbine system, which is the source of emergency power, and associated support systems. Included in the discussion, is a description of the lubrication system, the starting air system, and the air intake and exhaust system. The discussion of the systems associated with the gas turbine system indicates the mechanical systems are designed to ASME Section III requirements. Therefore, a number of components in systems associated with the gas turbine generator should be included in the inservice test program.

(a) Figure 9.5.4-1 shows the schematic for the gas turbine generator fuel oil transfer system. Though equipment identification numbers are not assigned, the fuel oil transfer pumps are shown to have discharge check valves. ASME OM Code ISTA-1100 requires components having certain safety functions be included in the inservice test program. The fuel oil transfer pump discharge check valves, if not closed, could compromise the ability of the fuel transfer system to supply fuel to the gas turbine generator. Provide additional information and discuss the inclusion and test requirements for the fuel oil transfer pump discharge check valves.

(b) FSAR Section 9.5.6 discusses the starting air system. Portions of the air start system are designed to ASME Section III requirements. Check valves are shown on the schematic for the starting air system and included in the system description to isolate the compressors from the air receivers so a broken line from a compressor will not affect the air receivers. ASME OM Code ISTA-1100, ISTC-3522 and ISTC-5221 discuss and establish the identification and inservice test requirements for check valves. Provide additional information and discuss how the components in the air starting system are included in the inservice test program. Include a discussion of leakage requirements. The discussion should include check valves and the pressure relief valves included in the air start system.

ANSWER:

Fuel oil transfer pumps of Class 1E gas turbine generators are designed to ASME Code, Section III, requirements. Therefore, IST requirements for fuel oil transfer pumps of Class 1E gas turbine generators are added to the Pump IST table, Table 3.9-13.

(a) The fuel oil transfer pump discharge check valves have a safety function. Therefore, the IST requirement for fuel oil transfer pump discharge check valves are added to DCD Table 3.9-14, Valve Inservice Test Requirements.

(b) The check valves in the starting air system have a safety function to prevent back-leakage into the upstream side due to the stopping of compressors, or in case of a broken line from a compressor. Therefore, the safety function of the valves is transfer close. The IST requirements for valves of starting air system are added to DCD Table 3.9-14, Valve Inservice Test Requirements. The valves are designed and constructed to ASME III, Class 3 and seismic Category I requirements. Should the valves leak slightly when closed, leakage from air receiver can be detected and the air compressor will restore air pressure to the air receiver. Therefore, a leakage requirement is not applied in the air start system.

MHI also agrees to add IST requirement for other valves in the emergency gas turbine auxiliary system into the Valve IST table, Table 3.9-14.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Refer to RAI 03.09.06-09, Impact on DCD, for the addition of IST requirements of the fuel oil transfer pumps in the Table 3.9-13 of the DCD.

- Insert the following at the end of Table 3.9-14 (Sheet 138 of 138) Notes:

  "14. This note applies to the air start pilot valves in the GTG starting system. These valves are operated with specific air source installed in the GTG starting system."

- Insert the following 13 rows at the end of Table 3.9-14:

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
GTS-VLV-001A,B,C,D	Fuel oil storage tank outlet check	Check	Transfer Open	Active	BC	Check Exercise/Quarterly	
GTS-VLV-004A,B,C,D	Fuel oil transfer pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/Quarterly	
GTS-VLV-005A,B,C,D	Fuel oil transfer pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/Quarterly	
GTS-VLV-101A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-VLV-102A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-VLV-103A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-VLV-104A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-SOV-109A,B,C,D	Air start pilot valve	Remote SO 3way	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	
GTS-SOV-110A,B,C,D	Air start pilot valve	Remote SO 3way	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	
GTS-VLV-117A,B,C,D	Air receiver inlet check	Check	Transfer Close	Active	BC	Check Exercise/Quarterly	
GTS-VLV-118A,B,C,D	Air receiver inlet check	Check	Transfer Close	Active	BC	Check Exercise/Quarterly	

GTS-VLV-123A,B,C,D	Air receiver relief valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
GTS-VLV-124A,B,C,D	Air receiver relief valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class2/3 Relief Valve Tests/10 Years and 20% in 4 Years	

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-29:

FSAR Figure 10.4.7-1 shows the schematic of the normal feedwater system. Valves NFS-VLV-511A, 511B, 511C and 511D isolate the normal feedwater system from the emergency feedwater system. These valves are not included in the inservice test program yet it appears they are the principle means by which normal feedwater and emergency feedwater are isolated, and diversion of emergency feedwater is possible if these valves do not function as expected. As such, it would appear these valves should be included in the inservice test program as specified by ASME OM Code ISTA-1100. Provide additional information and discuss the function of these valves and why they should not be included in the inservice test program.

ANSWER:

The IST requirements for valves NFS-VLV-511A, 511B, 511C and 511D will be added in Table 3.9-14. The safety-related mission of these valves are "transfer close" to isolate normal feedwater and emergency feedwater during emergency operations.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Replace the third through fifth row (shown as Deleted) on Sheet 56 of Section 3.9 Table 3.9-14, and first row (shown as Deleted) on Sheet 57 of Table 3.9-14 with the following:

NFS-VLV-511A	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NFS-VLV-511B	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NFS-VLV-511C	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NFS-VLV-511D	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

See Attachment 2 for a mark-up of DCD Tier 1, Section 2.7, changes to be incorporated.

- Insert the following row as the second row below the column titles in Table 2.7.1.9-1:

Main Feedwater Check Valves	Reactor Building

- Insert the following row as the second row below the column titles in Table 2.7.1.9-2:

Main Feedwater Check Valves	NFS-VLV-511 A,B,C,D	3	Yes	No	-	Transfer Closed	-

- Add check valves NFS-VLV-511A, 511B, 511C, and 511D in Figure 2.7.1.9-1.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-30:

FSAR Figure 10.4.9-1 is the schematic of the emergency feedwater system. This schematic shows valves EFS-VLV-018A, 018B, 018C, 018D as isolating the emergency feedwater system from the secondary side of the steam generators. ASME OM Code ISTA-1100 requires that valves which have certain specific functions be included in the inservice test program. The FSAR states that leakage through these valves can potentially result in steam binding of the emergency feedwater pumps. In light of this potential, provide additional information and discuss the safety function of these valves. Provide justification for why these valves should not be categorized at category A valves with leakage values established.

ANSWER:

The ASME OM Code defines Category A as those valves for which seat leakage is limited to a specific maximum amount in the closed position in order to fulfill of their required functions. The function of valves EFS-VLV-018A, 018B, 018C, 018D is to prevent back flow from the steam generator to the EFWS.

The valves and related piping are designed seismically and as Quality Group C. Therefore, the valves are permitted to leak slightly when closed. No specific maximum amount of seat leakage (limit) in the closed position is applied to the valves. The valves are categorized as Category B.

Subsection 10.4.9.2.4 of the US-APWR DCD addresses the leakage issue by stating that "the EFW discharge line temperature upstream of the EFW flow control valves is monitored. A high temperature alarm in the MCR is an indication of the back leakage of the check valve, requiring operator action." Therefore, no change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

RAI NO.: **NO. 288-2274 REVISION 1**

SRP SECTION: **03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**

APPLICATION SECTION: **03.09.06**

DATE OF RAI ISSUE: **03/25/09**

QUESTION NO. RAI 03.09.06-31:

US-APWR FSAR Tier 1 Section 2.7.1.11 addresses the emergency feedwater system. ASME OM Code ISTA-1000 requires that pumps or valves that are required to perform a specific function in shutting down a reactor to the safe shutdown condition, in maintaining the safe shutdown condition or in mitigating the consequences of an accident are to be included in the inservice test (IST) program. Figure 2.7.1.11-1 depicts the emergency feedwater system. Leakage from the steam generators into the emergency feedwater system can potentially disable the emergency feedwater pumps due to voiding and steam binding. Isolation of the emergency feedwater system from the steam generators is therefore necessary. Figure 2.7.1.11-1 does not show an isolation means (check valves) between the steam generators and the emergency feedwater system. Discuss the need for and means of achieving this isolation and whether this information needs to be shown on Figure 2.7.1.11-1. Discuss whether these valves should be classified as category A valves per ISTC-1300.

ANSWER:

The answer to RAI 160-1848, Question 10.4.9-20 has previously noted the addition of valves EFS-VLV-018A, 018B, 018C, 018D to Tier 1, Figure 2.7.1.11-1. The valves EFS-VLV-018A, 018B, 018C, 018D are classified as Category B, as discussed in the response to RAI 03.09.06-30.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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Docket No. 52-021

RAI NO.: **NO. 288-2274 REVISION 1**

SRP SECTION: **03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**

APPLICATION SECTION: **03.09.06**

DATE OF RAI ISSUE: **03/25/09**

QUESTION NO. RAI 03.09.06-32:

US-APWR FSAR Tier 1 Section 2.7.1 addresses the emergency feedwater system. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A specify that the components and function (performance parameters) be identified and included in the IST program. Table 2.7.1 includes valves NMS-HCV-3615, 3625, 3635, and 3645 and provides the safety function as transfer closed. These valves are also included in Tier 2 Table 3.9-14, which provides the list of valves within the IST program, but this table shows the valves' safety function as maintain closed. Provide additional information and discuss the apparent inconsistency in the stated safety function.

ANSWER:

The information in Active Safety Function column of the DCD Tier 1, Table 2.7.1, presents only the active safety function of the valves. Information in the Safety-Related Missions column of DCD Tier 2, Table 3.9-14, presents both active and passive missions, which are necessary to be fully evaluated in the IST program.

Both tables present appropriate information, and no inconsistency exists between the Tier 1 and Tier 2 tables. Other Tier 1 tables include the valves with only passive safety functions (such as ASME Code, Section III, Class 1 valves and containment isolation valves with only passive safety function). For those valves with only passive safety functions, the Active Safety Function in the Equipment Characteristics Table are identified as "-".

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-33:

US-APWR FSAR Tier 1 Section 2.7.3 addresses cooling water systems. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A specify that the components and function (performance parameters) be identified and included in the IST program. Table 2.7.3.1-2 includes valves EWS-MOV-503A, 503B, 503C and 503D and indicates the safety function of the valves is transfer open. These valves are listed in Tier 2 Table 3.9-14, which provides the list of valves within the IST program, with the safety function as transfer open and transfer close. Provide additional information and discuss the inconsistency in the stated safety function.

ANSWER:

The active safety-related mission of valves EWS-MOV-503A, 503B, 503C and 503D is only "transfer open". Table 3.9-14 of the US-APWR DCD, Tier 2, was modified during Revision 1 to resolve the inconsistency noted in the above information. No additional change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-34:

US-APWR FSAR Tier 1 Section 2.7.3 addresses cooling water systems. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A specify that the components and function (performance parameters) be identified and included in the IST program. Valves EWS-VLV-502A, 502B, 502C, 502D and EWS-VLV-602A, 602B, 602C and 602D are contained in Tier 2 Table 3.9-14, which provides the list of valves within the IST program, but are not included in Tier 1 Table 2.7.3.1-2. Provide additional information and discuss the apparent inconsistency in the stated safety function.

ANSWER:

MHI agrees to add necessary information valves EWS-VLV-502A, 502B, 502C, 502D and EWS-VLV-602A, 602B, 602C and 602D in Table 2.7.3.1-2 of DCD Tier 1.

Impact on DCD

See Attachment 2 for a mark-up of DCD Tier 1, Section 2.7, changes to be incorporated.

- Insert the following as the last rows in Table 2.7.3.1-2:

Essential Service Water Pump Discharge Check Valves	EWS-VLV-502A, 502B, 502C, 502D	3	Yes	-	Yes/No	Transfer Open/ Transfer Closed	-
Essential Service Pump Cooling Water Supply Line Check Valves	EWS-VLV-602A, 602B, 602C, 602D	3	Yes	-	Yes/No	Transfer Open/ Transfer Closed	-

- Add valves EWS-VLV-602A, 602B, 602C, and 602D in Figure 2.7.3.1-1.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-35:

US-APWR FSAR Tier 1 Section 2.4.5 addresses the residual heat removal system. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A specify that the components and function (performance parameters) be identified and included in the IST program. Tier 1 Table 2.4.5-2 shows the safety function of valves RHS-VLV- 022A, 022B, 022C and 022D as transfer open. Tier 2 Table 3.9-14, which provides the list of valves within the IST program, shows the safety function of these valves as transfer open and transfer closed. Provide additional information and discuss the reason why the content of the two tables is not consistent.

ANSWER:

Valves RHS-VLV-022A, 022B, 022C and 022D have both transfer open and transfer closed functions. The transfer open condition is for a secure flow path, and the transfer closed condition is for containment isolation.

MHI agrees the active safety function column for the valves RHS-VLV-022A, 022B, 022C and 022D in DCD Tier 1, Table 2.4.5-2 needs to be corrected to align with Table 3.9-14. This clarification will be added to the DCD.

Impact on DCD

See Attachment 3 for a mark-up of DCD Tier 1, Section 2.4, changes to be incorporated.

- Change the Active Safety Function (seventh column) for Tag Nos. RHS-VLV-022A, 022B, 022C, and 022D (eighth row below column headers) in Tier 1, Table 2.4.5-2 (Sheet 1 of 2) to the following:

  "Transfer Open/ Transfer Closed"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

5/23/2009

US-APWR Design Certification

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Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-36:

US-APWR FSAR Tier 1 Section 2.7.3.3 addresses the component cooling water (CCW) system. Figure 2.7.3.3-1 provides the schematic for the CCW system. It appears that the A and B trains of the CCW system may be connected by valves NCS-MOV-237A and B and NCS-MOV-232A and B. Tier 2 Table 3.9-14 shows these valves as category B with no leakage criteria specified. ASME OM Code ISTA-1100 requires the performance parameters of components in the IST program be identified. ASME OM Code ISTC-1300 states valves with specified leakage requirements are classified as category A valves. As leakage from one train of CCW to another may affect the ability of a CCW train to perform its safety function, provide additional information and discuss why these valves should not have leakage criteria specified and be classified as category A valves.

ANSWER:

As stated in answer to RAI 03.09.06-26 above, ASME OM Code defines IST Category A as the valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function.

Valves NCS-MOV-232A and 232B are also discussed in the answer to RAI 03.09.06-26 above.

The function of the valves NCS-MOV-233A and 233B is to establish bypass flow. Normally the valves isolate the two CCW supply headers. In case of the failure of one supply line, valves are opened and the RCP seal water is established from an alternate supply line.

The valves and related piping are seismically-designed and designed as Quality Group C. The operating pressure of the CCW system at 200 psig is relatively low. The two valves in the line are installed in series. Therefore, the valves may slightly leak when closed. No specific maximum amount seat leakage (limit) in the closed position is applied to the valves. The valves are therefore categorized as IST Category B valves. No change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-37:

US-APWR FSAR Tier 1 Section 2.7.1.9 addresses the condensate and feedwater system. ASME OM Code ISTA-1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A requires the components in the IST program be identified, as well as the performance parameters. Tier 1 Figure 2.7.1.9-1 is the schematic of the normal feedwater system and shows valves NFS-VLV-512A, 512B, 512C and 512D as providing isolation between the normal feedwater system and the emergency feedwater system. Not shown are the normal feedwater check valves NFS-VLV-511A, 511B, 511C and 511D. Isolation of normal feedwater from emergency feedwater is necessary to avoid diversion of emergency feedwater from the steam generators through the normal feedwater system. Provide additional information and discuss how isolation between the two systems is provided, particularly if the normally open manual valves are the credited isolation means. If the check valves are credited, discuss whether they should be shown on the schematic. Discuss the IST requirements for the above valves.

ANSWER:

Valves NFS-VLV-511A, 511B, 511C and 511D provide isolation between the normal feedwater system and the emergency feedwater system.

MHI agrees to include IST requirement of valves NFS-VLV-511A, 511B, 511C and 511D in DCD Tier 2, Table 3.9-14, and information in DCD Tier 1 as discussed in the answer to RAI 3.9.6-29.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Refer to RAI 03.09.06-29, Impact on DCD, for the addition of IST requirements in the Table 3.9-14 of the DCD.

See Attachment 2 for a mark-up of DCD Tier 1, Section 2.7, changes to be incorporated.

- Insert the following as the last row in Table 2.7.3.1-1:

Essential service water pump motor cooling water piping and valves	Ultimate heat sink related structures

- Refer to RAI 03.09.06-34, Impact on DCD, for addition of rows in Table 2.7.3.1-2.
- Insert the following as the last row in Table 2.7.3.1-3:

Essential service water pump motor piping and valves	3	Yes

- Refer to RAI 03.09.06-29, Impact on DCD, for addition of check valves NFS-VLV-511A, 511B, 511C, and 511D in Figure 2.7.1.9-1.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-38:

US-APWR FSAR Tier 1 Section 2.7.3.5 addresses essential chilled water systems. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A specify that the components and function (performance parameters) be identified and included in the IST program. Tier 1 Table 2.7.3.5-2 provides equipment characteristics for components in the essential chilled water system. One of the characteristics provided is the safety function. Tier 2 Table 3.9-14 identifies valves in the IST program, and this table also provides the safety function (described as safety mission). Inconsistencies exist in the safety mission/function as identified in Tier 1 Table 2.7.3.5-2 and Tier 2 Table 3.9-14 for the below listed valves. Discuss the safety mission/function for the valves listed below, and correct the appropriate table.

VWS-TCV-2845, 2855, 2865, 2875
Table 2.7.3.5-2; active safety function is transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2784, 2794, 2804, 2814
Table 2.7.3.5-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2574, 2584, 2594, 2604
Table 2.7.3.5-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2671, 2676, 2681, 2868
Table 2.7.5.3-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2721A, 2721B, 2721C, 2721D
Table 2.7.3.5-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2726A, 2726B, 2726C, 2726D
Table 2.7.3.5-2: safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2731A, 2731B, 2731C, 2731D
Table 2.7.3.5-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2741A, 2741B, 2741C, 2741D
Table 2.7.3.5-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

VWS-TCV-2331, 2336, 2341, 2346
Table 2.7.3.5-2; safety function transfer open
Table 3.9-14; transfer open, transfer close

ANSWER:

The safety-related missions of these valves are to transfer open in order to obtain full flow rate of chilled water upon receipt of the high temperature signal when generated by the respective safety related temperature switches. MHI will correct the safety-related missions of the following valves in DCD Tier 2, Table 3.9-14 to correctly coincide with DCD Tier 1, Table 2.7.3.5-2.

> VWS-TCV-2845, 2855, 2865, 2875, 2784, 2794, 2804, 2814, 2574, 2584, 2594, 2604, 2671, 2676, 2681, 2868, 2721A, 2721B, 2721C, 2721D, 2726A, 2726B, 2726C, 2726D, 2731 2736, 2741A, 2741B, 2746A, 2746B, 2331, 2336, 2341, 2346

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the Safety-Related Missions (fourth column) in Table 3.9-14 to "Transfer Open" for the following Valve Tag Numbers:

VWS-TCV-2845	(Sheet 125 of 138)
VWS-TCV-2855	(Sheet 125 of 138)
VWS-TCV-2865	(Sheet 125 of 138)
VWS-TCV-2875	(Sheet 125 of 138)
VWS-TCV-2784	(Sheet 126 of 138)
VWS-TCV-2794	(Sheet 126 of 138)
VWS-TCV-2804	(Sheet 126 of 138)
VWS-TCV-2814	(Sheet 126 of 138)
VWS-TCV-2574	(Sheet 127 of 138)
VWS-TCV-2584	(Sheet 127 of 138)
VWS-TCV-2594	(Sheet 127 of 138)
VWS-TCV-2604	(Sheet 127 of 138)

VWS-TCV-2671	(Sheet 128 of 138)
VWS-TCV-2676	(Sheet 128 of 138)
VWS-TCV-2681	(Sheet 128 of 138)
VWS-TCV-2868	(Sheet 129 of 138)
VWS-TCV-2721A	(Sheet 129 of 138)
VWS-TCV-2721B	(Sheet 129 of 138)
VWS-TCV-2721C	(Sheet 130 of 138)
VWS-TCV-2721D	(Sheet 130 of 138)
VWS-TCV-2726A	(Sheet 130 of 138)
VWS-TCV-2726B	(Sheet 130 of 138)
VWS-TCV-2726C	(Sheet 131 of 138)
VWS-TCV-2726D	(Sheet 131 of 138)
VWS-TCV-2731	(Sheet 131 of 138)
VWS-TCV-2736	(Sheet 131 of 138)
VWS-TCV-2741A	(Sheet 132 of 138)
VWS-TCV-2741B	(Sheet 132 of 138)
VWS-TCV-2746A	(Sheet 132 of 138)
VWS-TCV-2846B	(Sheet 133 of 138)
VWS-TCV-2331	(Sheet 133 of 138)
VWS-TCV-2336	(Sheet 133 of 138)
VWS-TCV-2341	(Sheet 133 of 138)
VWS-TCV-2346	(Sheet 134 of 138)

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-39:

US-APWR FSAR Tier 1 Section 2.7.6.3 addresses the spent fuel pool cooling and purification system. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A requires that components in the IST program and their performance parameters be identified. Tier 1 Table 2.7.6.3-2 identifies valves SFS-VLV-101A, 101B, 133A and 133B as ASME Section III Seismic Category 1 valves that isolate the safety-related spent fuel pool cooling system from the non-code purification system. This is a safety-related function, and these valves should be in the IST program. Provide additional information and discuss the inclusion of these valves in the IST program.

ANSWER:

MHI agrees valves SFS-VLV-101A, 101B, 133A and 133B are to be included in the IST program. The IST requirements for valves SFS-VLV-101A, 101B, 133A and 133B will be added in Tier 2, Table 3.9-14.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the following 4 rows at the end of Table 3.9-14:

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SFS-VLV-101A	Spent fuel pit purification subsystem inlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	
SFS-VLV-101B	Spent fuel pit purification subsystem inlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	
SFS-VLV-133A	Spent fuel pit purification subsystem outlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	
SFS-VLV-133B	Spent fuel pit purification subsystem outlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	

The IST requirements for valves SFS-VLV-101A, 101B, 133A and 133B will be added in Tier 2, Table 3.9-14 of the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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Docket No. 52-021

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-40:

US-APWR FSAR Tier 1 Section 2.7.6.8 addresses the equipment and floor drainage systems. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A requires that components and their performance parameters be included in the IST program. Section 2.7.6.8.1 describes the drainage and flood protection for rooms containing safety equipment. The section states that drain systems from engineered safety feature (ESF) rooms are designed to prevent flooding due to backflow by virtue of a difference in elevation of the ESF equipment rooms and the collective sump. Additionally, isolation valves are also provided on the ESF equipment room drainage piping in order to protect against flooding due to backflow. It is not clear if the elevation difference is sufficient to prevent flooding from backflow or if the installed valves are also credited for preventing backflow-induced flooding. Provide additional information and discuss the credited mean(s) of preventing backflow-induced flooding. If the installed valves in the ESF room drains are credited with backflow prevention, discuss the need to include these valves in the IST program.

ANSWER:

As described in DCD Subsection 3.4.1, ESF equipment rooms have isolation valves installed in drainage piping, thereby preventing in-flow of water into the rooms by way of the floor drain.

Isolation valves are normally closed and active operation is not necessary to perform their function. The valves are designed and constructed to ASME III, Class 3 and seismic Category I requirements. Differential pressure across the valves is low, which is created by a static head of drain water. Therefore, a potential valve leak is slight when the valve is closed.

IST requirements, including leak requirement, is not applied to those valves.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-41:

US-APWR FSAR Tier 1 Section 2.7.6.7 addresses the process and post-accident sampling systems. ASME OM Code ISTA 1100 and SRP 3.9.6 Section II Acceptance Criteria 3.A requires that the components and their performance parameters be included in the IST program. Table 2.7.6.7-1 includes valve PSS-MOV-006, which is identified as a motor-operated valve. This valve is shown to fail closed. Motor-operated valves typically fail as-is. Provide additional information and clarify the failure mode/position for this valve.

ANSWER:

Motor operated valve PSS-MOV-006 included in DCD Tier 1 Table 2.7.6.7-1 is a containment isolation valve located in RCS pressurizer liquid sample pipeline. The valve failure position is "as-is". In the table, it was erroneously noted as "fail closed". The sample from the pressurizer liquid is collected and analyzed during normal plant operation. The system serves no safety function. DCD Tier 1 Table 2.7.6.7-1 will be corrected to show correct valve failure position.

Impact on DCD

See Attachment 2 for a mark-up of DCD Tier 1, Section 2.7, changes to be incorporated.

- Change the Loss of Motive Power Position (eighth column) for Tag No. PSS-MOV-006 (seventh row below column headers) in Tier 1, Table 2.7.6.7-1 to the following: "As Is"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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US-APWR Design Certification

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-42:

US-APWR FSAR Tier 1 Section 2.4.6 addresses the chemical and volume control system (CVCS). ASME OM Code ISTA-1100 and SRP 3.9.6 Section II Acceptance Criterion 3.A requires that components and performance parameters be included in the IST program. Tier 1 Table 2.4.6-2 provides equipment characteristics of components within the CVCS system. Tier 2 Table 3.9-14 provides the list of valves within the IST program. For the valves listed below, inconsistencies in safety function/mission exist between Tier 1 Table 2.4.6-2 and Tier 2 Table 3.9-14. Provide additional information and clarify the safety function/mission of these valves and correct the appropriate table.

CVS-LCV-121D, 121E, 121F, 121G
Table 2.4.6-2; transfer open
Table 3.9-14; transfer open, transfer closed

CVS-VLV-156
Table 2.4.6-2: no active safety function indicated
Table 3.9-14; transfer closed

CVS-AOV-159
Table 2.4.6-2; shows incorrect fail position, active safety function shown as transfer open and transfer closed
Table 3.9-14; safety mission is transfer closed

CVS-VLV-160, 161
Table 2.4.6-2; no active safety function indicated
Table 3.9-14; transfer closed

CVS-VLV-179A, 179B, 179C, 179D
Table 2.4.6-2; no active safety function indicated
Table 3.9-14; transfer closed

CVS-VLV-181A, 181B, 181C, 181D
Table 2.4.6-2; no active safety function indicated
Table 3.9-14; transfer open, transfer closed

CVS-VLV-182A, 182B, 182C, 182D
Table 2.4.6-2; no active safety function indicated
Table 3.9-14; transfer open, transfer closed

ANSWER:

For the valves listed below, inconsistencies in safety function/mission between Tier 1 Table 2.4.6-2 and Tier 2 Table 3.9-14 were corrected in Revision 1 of the US-APWR DCD. No additional change to the DCD is required.

The correct safety functions of the valves are as follows.

Valve Numbers	Active Safety Function (Safety-Related Missions)
CVS-LCV-121D, 121E, 121F, 121G	transfer open, transfer closed
CVS-VLV-156	transfer closed
CVS-AOV-159	transfer open and transfer closed
CVS-VLV-160, 161	transfer closed
CVS-VLV-179A, 179B, 179C, 179D	transfer closed
CVS-VLV-181A, 181B, 181C, 181D	transfer open, transfer closed
CVS-VLV-182A, 182B, 182C, 182D	transfer open, transfer closed

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/23/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-43:

USAPWR FSAR Tier 2, Section 3.9.3.4.2.9, "Snubber Examination and Testing," and Section 3.9.6.4, "Inservice Testing Program for Dynamic Restraints," provide general information on the inservice testing (IST) program for dynamic restraints to be used in the USAPWR reactor. Provide a full description of this operational program or specify that the COL applicant will need to supplement the USAPWR FSAR information to provide a full description of the IST program for dynamic restraints as part of the COL application.

ANSWER:

MHI issued Document UAP-HF-08259, Transmittal of COL Information Update for US-APWR Design Control Document Revision 1, to the NRC on November 7, 2008. Included within this document is supplemental information relating to COL 3.9(6), which currently identifies "The COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with ASME OM Code."

As provided in UAP-HF-08259, the description of the IST Program for Dynamic Restraints is expanded in DCD Subsection 3.9.6.4, including new Subsections 3.9.6.4.1 through 3.9.6.4.4. In addition, COL 3.9(6) in Subsection 3.9.9 will be clarified to state "The COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with Nonmandatory Appendix A of the ASME OM Code." The program description will be incorporated into future DCD revisions. Therefore, no further change to the DCD is required.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-44:

US-APWR FSAR Section 3.9.6.1 in the middle of page 3.9-76 states: "The various provisions for testing pumps, valves, and dynamic restraints are incorporated into the design of the US-APWR. These provisions and requirements are discussed in the respective sections of this DCD where the specific system is described." None of the specific systems which are supposed to contain the provisions and requirements for dynamic restraint testing are identified and listed in FSAR Section 3.9.6 or 3.9.6.4. A review of the systems for the Component Cooling Water, Essential Chilled Water, Non- Essential Chilled Water, Spent Fuel Pool Cooling, and Emergency Core Cooling Systems indicates that the provisions and requirements for inservice testing are not specifically addressed. Some of the systems just refer back to Section 3.9.6 with very limited or no information regarding the IST Program for Dynamic Restraints. SRP 3.9.6 Section II Acceptance Criterion 4.C indicates that the applicant should identify and tabulate all safety-related components that use snubbers in their support systems. The specific systems the FSAR applicant is referring to are not identified or tabulated. Provide additional information on the design provisions and requirements for dynamic restraint inservice testing that apply to each of the specific safety-related systems or clarify that this will be included in an applicable COL item.

ANSWER:

As indicated in the answer to RAI 03.09.06-43, additional information on the design provisions and requirements for dynamic restraint inservice testing is added by UAP-HF-08259. Also as indicated in the answer to RAI 03.09.06-43, the COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with the Nonmandatory Appendix A of the ASME OM Code.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-45:

SRP 3.9.6 states in Subsection I, Areas for Review, "The review should include any other pumps and valves and dynamic restraints not categorized as ASME Code Class 1, 2,or 3 that are safety related". The staff review of the US-APWR FSAR Section 3.9.6 or 3.9.6.4 could not locate where safety related dynamic restraints not categorized as ASME Code Class 1, 2, or 3 are addressed. Provide additional information and clarify whether or not the US-APWR design uses safety related dynamic restraints that are not categorized as ASME Code Class 1, 2, or 3.

ANSWER:

US-APWR design does not use safety related dynamic restraints that are not categorized as ASME Code Class 1, 2, or 3.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

RAI NO.: NO. 288-2274 REVISION 1

SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-46:

US-APWR FSAR Subsection 3.9.6.4 states: "Snubber operability inspections and tests including scope and frequency requirements are specified and controlled in the Components Support Inspection and Testing Program Plan". The "Components Support Inspection and Testing Program Plan" was not available in the US-APWR FSAR documentation. Provide the document titled "Components Support Inspection and Testing Program Plan" to allow for staff review or clarify that this is addressed as a COL item.

ANSWER:

As indicated in the answer to RAI 03.09.06-43, additional information relating to dynamic restraint inservice testing is added by UAP-HF-08259. Also as indicated in the answer to RAI 03.09.06-43, the COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with the Nonmandatory Appendix A of the ASME OM Code, which includes the components support inspection and testing program plan.

To clarify that the components support inspection and testing program plan is not a separate plan, the sentence will be changed from implying the plan in the context of a proper name.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Change the first sentence in the first paragraph of Subsection 3.9.6.4 to the following: "Snubber operability inspections and tests, including scope and frequency requirements, are specified and controlled in the components support inspection and testing program plan."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 288-2274 REVISION 1**
SRP SECTION:	**03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS**
APPLICATION SECTION:	**03.09.06**
DATE OF RAI ISSUE:	**03/25/09**

QUESTION NO. RAI 03.09.06-47:

US-APWR Tier 2, Section 3.9.6.5, "Relief Requests and Alternative Authorizations to the OM Code," states that experience was used in designing and locating pumps, valves, and dynamic restraints to permit access for performing preservice and IST required by ASME OM Code. The applicant states that relief from the testing requirements of the ASME OM Code is requested when full compliance with requirements of the ASME OM Code is not practical. In such cases, specific information will be provided that identifies the applicable Code requirements, justification for the relief request, and the testing method to be used as an alternative. The applicant notes that Tables 3.9-13 and 3.9-14 identify any relief requests for pumps and valves, respectively. The staff review did not find any relief requests in Table 3.9-13 or 3.9-14. US-APWR FSAR Tier 2, Section 3.9.6.1 states that relief requests from any of the applicable ASME OM Code test requirements will be documented in the IST Program Plan, including justification and proposed alternative tests or examinations that assess operational readiness of the impacted pumps, valves or dynamic restraints. The applicant should clarify whether any relief requests are included for the US-APWR IST program and provide the necessary information to justify any such relief.

ANSWER:

The DCD describes that there are no specific relief requests, however such a request may become necessary in the course of elaborating of the IST program.

MHI will change the description of the US-APWR Tier 2, Section 3.9.6.5 to present MHI intention appropriately.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 3.9, changes to be incorporated.

- Insert the paragraph in Subsection 3.9.6.5 to the following:

  "Considerable experience has been used in designing and locating pumps, valves, and dynamic restraints to permit preservice and IST required by ASME OM Code. Deferral of testing to cold shutdown or refueling outages in conformance with the rules of the ASME OM Code (Reference 3.9-13), since during power operation it is not practical, is not considered a relief request. Relief from the testing requirements of the ASME OM Code will be requested when full compliance with requirement of the ASME OM Code is not practical. In such cases, specific information will be provided which identifies the applicable code requirements, justification for the relief request and the testing method to be used as an alternative."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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SRP SECTION: 03.09.06 - FUNCTIONAL DESIGN QUALIFICATION AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

APPLICATION SECTION: 03.09.06

DATE OF RAI ISSUE: 03/25/09

QUESTION NO. RAI 03.09.06-48:

US-APWR Tier 2, Table 1.8-2, "Combined License Information," lists several COL information items related to IST programs for pumps, valves, and dynamic restraints to be used in the US-APWR reactor. Specify COL information items that require the COL applicant to provide a full description of the IST operational program for pumps, valves, and dynamic restraints, and MOV testing operational program.

ANSWER:

The answer to RAI 03.09.06-07 has clarified that the COL Applicant is to provide a full description of their IST program for pumps, valves, and dynamic restraints in accordance with COL 3.9(8). As answered in RAI 03.09.06-13, the IST program includes the MOV testing program.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's responses to the NRC's questions.

readiness as set forth in 10 CFR 50.55a(f) (Reference 3.9-29) and ASME OM Code (Reference 3.9-13).

The pumps covered in the IST Program are those pumps that are provided with an emergency power source and required to perform a specific function in shutting down a reactor to a safe-shutdown condition, in maintaining the safe-shutdown condition, or in mitigating the consequence of an accident.

The US-APWR utilizes ASME OM Code (Reference 3.9-13) for developing the IST Program for ASME Code, Section III, Class 1, 2 and 3 safety-related pumps, valves and dynamic restraints. The COL Applicant is to administratively control the edition and addenda to be used for the IST program plan, and to provide a full description of their IST program plan for pumps, valves, and dynamic restraints.

3.9.6.1 Functional Design and Qualification of Pumps, Valves, and Dynamic Restraints

~~The requirement for ISI for ASME Code, Section III, Class 1, 2 and 3, safety-related pumps, valves and dynamic restraints IST assesses and verifies operational readiness included in various sections of the ASME OM Code as follow:~~ IST of ASME Code, Section III, Class 1, 2, and 3 pumps, valves and dynamic restraints is performed in accordance with the ASME OM Code and applicable addenda, as required by 10 CFR 50.55a(f), except where specific relief has been granted by the NRC in accordance with 10 CFR 50.55a(f). The IST program assesses and verifies operational readiness included in various sections of the ASME OM Code as follow:

- Requirements for IST of pumps are incorporated in ISTB.
- Requirements for IST of valves are incorporated in ISTC.
- ~~Requirements for IST of Motor-Operated Valve (MOV) are incorporated in ISTC 4.2.~~
- Requirements for IST of pressure relief valves are incorporated in Appendix I.
- Requirements for IST of dynamic restraints are incorporated in ISTD.

The various provisions for testing pumps, valves, and dynamic restraints are incorporated into the design of the US-APWR. These provisions and requirements are discussed in ~~the respective sections of this DCD where the specific system is described~~ Section 3.10 of the DCD.

It should be noted that the requirements of system pressure test per ASME Code, Section XI, Section IWA 5000 (Reference 3.9-43) that verify the system pressure boundary integrity are part of the ISI Program and are not part of this IST Program.

As required by the 10 CFR 50.55a(f) (Reference 3.9-29), ASME Code, Section III, Class 1, 2 and 3 safety-related pumps, valves and dynamic restraints are incorporated in 120-month interval IST Program Plan that is in compliance with the requirements of the latest edition and addenda of the OM Code, 12 months before the date of issuance of the operating license and, in compliance with Plant, Technical Specification and this DCD. The requirements for the IST Program are included in Technical Specification Subsection 5.5.8 of Section 5.5, Programs and Manuals.

The ASME IST categories are assigned based on the safety-related valve functions and the valve characteristics. The following criteria are used in assigning the valves IST categories in accordance with the ASME OM Code.

- Category A – safety-related valves with safety-related seat leakage requirements
- Category B – safety-related valves requiring IST, but without safety-related seat leakage requirements
- Category C – safety-related, self-actuated valves (such as check valves and pressure relief valves)
- Category D – safety-related, explosively actuated valves and non-reclosing pressure relief devices

Additionally, valves that are included in the IST Program that have position indication are observed locally during valve exercising to verify proper operation of the position indication. The frequency for this position indication test is in accordance with ASME OM Code. Where local observation is not practicable (such as solenoid valves), other methods are used for verification of valve position indicator operation. The COL Applicant is to provide alternate method of valve position indicator operation and justification for valves in the IST program plan.

3.9.6.3.1 IST Program for MOVs

~~Safety-related ASME Code, Section III, Class 1, 2 and 3 MOVs are inservice tested for operability to the requirements identified in the ASME OM Code. In some cases, the valves are tested on a less frequent basis because it is not practicable to exercise the valve during plant operation. If an exception is taken to performing ASME Code test frequency such as full-stroke exercise testing of a valve, then full-stroke testing is performed during cold shutdown condition on a frequency that is not more often than required by the OM Code. If testing is not practicable during plant shutdown condition, then the full-stroke testing is performed during refueling outage.~~

~~In addition to the above, MOVs are inservice tested in accordance with the requirements of GL-89-10 (Reference 3.9.55) to permit periodic assessment of valve operability at the prescribed frequency. This MOV program addresses the various requirements, such as, maximum torque and thrust, margins for degraded conditions, degraded voltage, control switch repeatability, load sensitive MOV behavior, etc.~~

~~The inservice operability testing of some MOVs rely on non-intrusive diagnostic techniques to permit periodic assessment of valve operability at design basis conditions in accordance with GL-89-10. The COL Applicant is to identify MOVs that require non-intrusive diagnostic testing technique. The specified frequency for operability of non-intrusive diagnostic techniques, testing is a maximum of once every 10 years. The initial test frequency is the longest of every three refueling cycles or five years until sufficient data exists to determine a longer test frequency is appropriate, in accordance with GL 96-05 (Reference 3.9-54).~~

<u>IST of ASME Section III Class 1, 2, and 3, and safety-related motor-operated valves (MOVs) is performed in accordance with the ASME OM Code (Reference 3.9-13) and applicable addenda, as required by 10 CFR 50.55a(f) (Reference 3.9-29). The IST</u>

program incorporates the guidance of RG 1.192 (Reference 3.9-44) and NUREG-1482 (Reference 3.9-60). Testing is required except where specific relief has been granted by the NRC. In addition to the above, MOVs are inservice tested in accordance with the requirements of Generic Letter 96-05 (Reference 3.9-54) to permit periodic assessment of valve operability at the prescribed frequency. Generic Letter 96-05 supersedes Generic Letter 89-10 (Reference 3.9-55) and its supplements with regard to MOV periodic performance verification.

The MOV testing program requires either in-plant valve operation or prototype valve testing at system flow and pressure, or system differential pressure to verify correct MOV actuator sizing and control settings. This MOV periodic verification program addresses the various requirements, such as, maximum torque and thrust, margins for degraded conditions, degraded voltage, control switch repeatability, load sensitive MOV behavior, etc. The available motor output is determined based on motor capabilities at design basis conditions. These conditions include, rated motor start torque; minimum voltage conditions; elevated ambient temperature conditions; and operator efficiency. The MOV Program utilizes guidance from Generic Letter 96-05 and the Joint Owners Group MOV Periodic Verification study, MPR 2524-A (November 2006) (Reference 3.9-61).

Prior to power operation, a design basis verification test is performed on each active MOV to verify the capability of each valve to meet its safety-related design basis requirements. The test is performed at conditions that are as close to design basis conditions as practicable. The test results are used along with valve preservice tests to develop the initial (periodic verification) testing frequency for each active MOV.

The preservice test program for MOVs is conducted in accordance with the ASME OM Code (Reference 3.9-13), ISTC 3100, under conditions as near as practical to those expected during subsequent IST. The interval between testing to demonstrate continued design basis capability does not exceed five years or three refueling outages, whichever is longer.

In some cases, the valves are tested on a less frequent basis since it is not practicable to exercise the valve during plant operation. If an exception is taken to performing ASME Code test frequency such as full-stroke exercise testing of a valve, then full-stroke testing is performed during cold shutdown condition on a frequency that is not more often than required by the OM Code (Reference 3.9-13). If testing is not practicable during plant shutdown condition, then the full-stroke testing is performed during refueling outage. The inservice operability testing of some MOVs rely on non-intrusive diagnostic techniques to permit periodic assessment of valve operability at design basis conditions.

The IST program is to identify MOVs that require non-intrusive diagnostic testing techniques. The specified frequency of testing using operability of non-intrusive diagnostic techniques is a maximum of once every 10 years. The initial test frequency is the longest of every three refueling cycles or five years, until sufficient data exists to determine a longer test frequency is appropriate, in accordance with GL 96-05 (Reference 3.9-54).

3.9.6.3.2 IST Program for POVs Other Than MOVs

ASME Code, Section III, Class 1, 2 and 3 safety-related POVs (air operated, hydraulic operated, solenoid operated) are subject to operational readiness testing in accordance with the requirements stated in the ASME OM Code. IST of valves assesses operational readiness including actuating, stroke timing, fail safe, and verification of position indicating systems.

~~In some cases, the valves are tested on a less frequent basis because it is not practicable to exercise the valve during plant operation. If an exception is taken to performing ASME Code test frequency such as full stroke exercise testing of a valve, then full-stroke testing is performed during cold shutdown conditions on a frequency that is not more often than required by the OM Code. If testing is not practicable during plant shutdown conditions, then the full-stroke testing is performed during refueling outage.~~

~~The IST requirement for measuring stroke time for valves are completed in conjunction with a valve exercise IST. An acceptable valve stroke time and fail safe testing normally verify the operability of the valve's solenoid(s).~~

POVs other than active MOVs are exercised quarterly in accordance with ASME OM ISTC. Active and passive POVs upon which operability testing is performed are identified in Table 3.9-14.

Additional testing is performed as part of the air-operated valve (AOV) program, which includes the key elements for an AOV Program as identified in the Joint Owners Group Air Operated Valve Program Document, (Reference 3.9-62) and the Comments on Joint Owners' Group Air Operated Program Document (Reference 3.9-63). The AOV program incorporates the attributes for a successful pov long-term periodic verification program, as discussed in RIS 2000-03, Resolution of Generic Safety Issue 158: Performance of Safety-related Power-Operated Valves Under Design Basis Conditions, (Reference 3.9-64), by incorporating lessons learned from previous nuclear power plant operations and research programs as they apply to the periodic testing of air- and other POVs included in the IST program. Key lessons learned that are addressed in the AOV program include:

- Valves are categorized according to their safety significance and risk ranking.
- Setpoints for AOVs are defined based on current vendor information or valve qualification diagnostic testing, such that the valve is capable of performing its design-basis function(s).
- Periodic static testing is performed, at a minimum on high risk (high safety significance) valves, to identify potential degradation, unless those valves are periodically cycled during normal plant operation under conditions that meet or exceed the worst case operating conditions within the licensing basis of the plant for the valve, which would provide adequate periodic demonstration of AOV capability. If required based on valve qualification or operating experience, periodic dynamic testing is performed to re-verify the capability of the valve to perform its required functions.
- Sufficient diagnostics are used to collect relevant data (e.g., valve stem thrust and torque, fluid pressure and temperature, stroke time, operating and/or control air pressure, etc.) to verify the valve meets the functional requirements of the

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qualification specification. Solenoid operated valves are verified, to the extent practical, to be capable of performing their safety functions for the electrical power supply amperage and voltage at design basis extremes. Test frequency is specified, and is evaluated each refueling outage based on data trends as a result of testing. Frequency for periodic testing is in accordance with References 3.9-62 and 3.9-63, with a minimum of 5 years (or 3 refueling cycles) of data collected and evaluated before extending test intervals. Post-maintenance procedures include appropriate instructions and criteria to ensure baseline testing is re-performed as necessary when maintenance on the valve, valve repair or replacement, have the potential to affect valve functional performance.

- Guidance is included to address lessons learned from other valve programs in procedures and training specific to the AOV program.
- Documentation from AOV testing, including maintenance records and records from the corrective action program are retained and periodically evaluated as a part of the AOV program.

The attributes of the AOV testing program described above, to the extent that they apply to and can be implemented on other safety-related POVs, such as electro-hydraulic valves, are applied to those other POVs.

3.9.6.3.3 IST Program for Check Valves

Safety-related check valves identified with specific safety-related functions to open and/or to close are tested periodically. Exercising a check valve confirms the valve capability to move to the position(s) to fulfill the safety-related function(s). The exercise test shows that the check valve opens in response to flow and closes on cessation of flow. Required design flow is provided to fully open the check valve. Either permanently or temporarily installed non-intrusive check valve indication is used for this test. The effects of rapid pump starts and stops are considered in the testing, if it is expected for system operating conditions. Any other reverse flow conditions are considered in the testing if it may occur during expected system operating conditions.

Valves that normally operate at a frequency that satisfies the exercising requirement need not be additionally exercised, provided that the observations required of IST are made and recorded at intervals no greater than that specified in this section.

The ASME Code specifies a quarterly check valve exercise frequency. In some cases, check valves are tested on a less frequent basis because it is not practical to exercise the valve during plant operation. If an exception is taken to performing quarterly exercise testing, then exercise testing is performed during cold shutdown on a frequency not more often than quarterly. If this is not practical, the exercise testing is performed during each refueling outage. If exercise testing during a refueling outage is not practical, then an alternative means is provided. Alternative means include non-intrusive diagnostic techniques or valve disassembly and inspection. Non-intrusive methods may include monitoring an upstream pressure indicator, monitoring tank level, performing a leak test, a system hydrostatic, or pressure test, or radiography.

Check Valve Disassembly and Inspection

The IST program plan identifies which valves require periodic valve disassembly and inspection, and the frequency of inspection is documented in Table 3.9-14.

3.9.6.3.4 Pressure Isolation Valve Leak Testing

Safety-related valves with seat leakage limits are tested to verify their seat leakage. These valves include RCS Isolation Valves - valves that provide isolation of piping that interface with the RCS and other safety systems.

The ASME Code, Section XI (Reference 3.9-43) specifies a test frequency of at least once every two years. The ASME Code, Section XI does not require additional leak testing for valves that demonstrate operability during the course of plant operation. In such cases, the acceptability of the valve performance is recorded during plant operation to satisfy IST requirements. Therefore, a specific IST need not be performed on valves that meet this criterion.

The maximum leakage requirement for pressure isolation valves (PIVs) that provide isolation between high and low pressure systems is included in the surveillance requirements for Technical Specification 3.4.14. The PIVs that require leakage testing are tabulated in Table 3.9-14.

3.9.6.3.5 Containment Isolation Valve Leak Testing

Containment isolation valves that provide isolation for piping systems that penetrate the containment are tested in accordance with 10 CFR 50, Appendix J (Reference 3.9-56). Depending on the function and configuration, some valves are tested during the integrated leak rate testing (Type A), test individually as a part of the 10 CFR 50, Appendix J, Type C testing, or both. The leak rate test frequency for a containment isolation valve is defined in Subsection 6.2.4. The provisions in 10 CFR 50.55a(b)2 (Reference 3.9-29) requires leakage limits and corrective actions for individual containment isolation valves where corrective actions are required by reference to ASME OM Code (Reference 3.9-13). The IST program plan as defined in Subsection 3.9.6.3, identifies scope, exceptions and changes in accordance with 10 CFR 50, Appendix J (Reference 3.9-56).

3.9.6.3.6 IST Program for Safety and Relief Valves

Pressure relief devices that provide a safety-related function in shutting down the reactor, in mitigating the consequence of an accident, and/or in protecting equipment in systems that perform a safety-related function, are ~~specified~~ tested in accordance with ASME OM Code for IST. The ISTs for these valves are identified ASME OM Code, Appendix I.

The periodic IST includes visual inspection, seat tightness determination, set pressure determination, and operational determination of balancing devices, alarms, and position indication as appropriate. The frequency for this IST is every five years for ASME Code, Section III, Class 1 (Reference 3.9-1) and main steam line safety valve, or every 10 years for ASME Code, Section III, Classes 2 and 3 devices. Twenty percent of the valves from each valve group are tested within any 24-month interval for Class 1 and main steam line safety valve, and within any 48-month interval for Class 2 and 3 devices. Non-reclosing pressure relief devices, if existing, are inspected when installed and replaced every five years unless historical data indicate a requirement for more frequent replacements.

3.9.6.3.7 IST Program for Manually Operated Valves

Safety-related active manually operated valves are identified in the IST Program Plan, and exercised periodically in accordance with frequency and requirements specified in the ASME OM Code.

3.9.6.3.8 IST Program for Explosively Activated Valves

Not applicable to US-APWR design.

3.9.6.4 IST Program for Dynamic Restraints

Snubber operability inspections and tests, including scope and frequency requirements, are specified and controlled in the ~~Components Support Inspection and Testing Program Plan~~ components support inspection and testing program plan. The ASME OM Code, 1995 Edition through the 2003 Addenda (Reference 3.9-13) provides ISI methods and requirements for examinations and tests of snubbers at nuclear power plants. Preservice and inservice examinations must be performed using the VT-3 visual examination method described in IWA-2213 of the ASME Code, Section XI, 1995 Edition through the 2003 Addenda (Reference 3.9-43).

The COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with ASME OM Code (Reference 3.9-14).

3.9.6.5 Relief Request and Authorization to ASME OM Code

Considerable experience has been used in designing and locating pumps, valves, and dynamic restraints to permit ~~access for performing~~ preservice and IST required by ASME OM Code. Deferral of testing to cold shutdown or refueling outages in conformance with the rules of the ASME OM Code (Reference 3.9-13), since during power operation it is not practical, is not considered a relief request. Relief from the testing requirements of the ASME OM Code ~~is~~ will be requested when full compliance with requirement of the ASME OM Code is not practical. In such cases, specific information ~~is~~ will be provided which identifies the applicable code requirements, justification for the relief request and the testing method to be used as an alternative. ~~The IST Program Plan in Tables 3.9-13 (for pumps) and 3.9-14 (for valves) identifies the relief requests.~~

3.9.7 [Reserved]

3.9.8 [Reserved]

3.9.9 Combined License Information

COL 3.9(1) *The COL Applicant is to assure snubber functionality in harsh service conditions, including snubber materials (e.g., lubricants, hydraulic fluids, seals).*

COL 3.9(2) *The first COL Applicant is to commit to implement a pre-operational*

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vibration assessment program and to prepare the final report consistent with guidance of RG 1.20 for a prototype. Subsequent COL Applicant need only provide information in accordance with the applicable portion of position C.3 of RG 1.20 for Non-Prototype internals.

COL 3.9(3) *Deleted*

COL 3.9(4) *Deleted*

COL 3.9(5) *Deleted*

COL 3.9(6) *The COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with ASME OM Code.*

COL 3.9(7) *The COL Applicant is to provide alternate method of valve position indicator operation and justification for valves in the IST program plan.*

COL 3.9(8) *The COL Applicant is to administratively control the edition and addenda to be used for the IST program plan, and to provide a full description of their IST program plan for pumps, ~~vavles~~ valves, and dynamic restraints.*

COL 3.9(9) *The COL Applicant is to identify MOVs that require non-intrusive diagnostic testing technique.*

COL 3.9(10) *The COL Applicant is to identify the site-specific active pumps.*

COL 3.9(11) *The COL Applicant is to provide site-specific, safety-related pump IST parameters and frequency.*

COL 3.9(12) *The COL Applicant is to provide type of testing and frequency of site-specific valves subject to IST in accordance with the ASME Code.*

3.9.10 References

3.9-1 Nuclear Power Plant Components, ASME Boiler and Pressure Vessel Code. Section III, Division 1, American Society of Mechanical Engineers. Includes: NCA, NB, NC, ND, NF, NG, Code Cases and Appendices including Appendix I, F, and N, 2001 edition thru 2003 Addenda.[1]

3.9-2 Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants, ANS N5.1.1-1983, American Nuclear Society.

3.9-3 Thermal Stresses in Piping Connected to Reactor Coolant Systems, Generic Communications. Bulletin No. 88-08, U.S. Nuclear Regulatory Commission,

[1] As for the RCL piping the 1992 Edition including 1992 Addenda will be used for ASME Code Section III NB-3200,NB-3600 analyses in accordance with the requirements of 10CFR50.55a(b)(1)(iii).

3.9-46 Technical Evaluation of Generic Issue 113: Dynamic Qualification and Testing of Large Bore Hydraulic Snubbers, NUREG/CR-5416, Nitzel, M.E.; Ware, A.G. EG&G Idaho Inc.; Page J.D. NRC; September 1992 (EGG-2571).

3.9-47 Structural Welding Code – Steel. ANSI/AWS D1.1, American National Standards Institute/American Welding Society.

3.9-48 Pipe Support Base Plate Designs using Concrete Expansion Anchor Bolts. IE Bulletin 79-02, Rev.2, U.S. Nuclear Regulatory Commission, Washington, DC, November 1979.

3.9-49 Threaded Fasteners – ASME Code Class 1, 2, and 3, Design of Structures, Components, Equipment, and Systems, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants. NUREG-0800, SRP 3.13, Rev.0, U.S. Nuclear Regulatory Commission, Washington, DC, June 1996.

3.9-50 Anchoring to Concrete. ACI 349, American Concrete Institute.

3.9-51 Anchoring Components and Structural Supports in Concrete. Regulatory Guide 1.199, Rev.0, U.S. Nuclear Regulatory Commission, Washington, DC, November 2003

3.9-52 Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants. Regulatory Guide 1.26, Rev.4, U.S. Nuclear Regulatory Commission, Washington, DC, March 2007.

3.9-53 Guidance on Developing Acceptable Inservice Testing Program, GL 89-04, U.S. Nuclear Regulatory Commission, Washington, DC, April, 1989.

3.9-54 Periodic Verification of Design Basis Capability of Safety-Related Motor-Operated Valves, GL 96-05, U.S. Nuclear Regulatory Commission, Washington, DC, September, 1996.

3.9-55 Safety-Related Motor-Operated Valves, Testing and Surveillance, GL 89-10, U.S. Nuclear Regulatory Commission, Washington, DC, June 1989.

3.9-56 Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, Domestic Licensing of Production and Utilization Facilities, Energy. Title 10, Code of Federal Regulations, Part 50, Appendix J, U.S. Nuclear Regulatory Commission, Washington, DC.

3.9-57 Summary of Design Transient, Mitsubishi Heavy Industries, January 2009.

3.9-58 Summary of Seismic and Accident Load Conditions for Primary Components and Piping Design, Mitsubishi Heavy Industries, January 2009.

3.9-59 Summary of Stress Analysis Results for Components and Piping, Mitsubishi Heavy Industries, March 2009.

3.9-60 Guidelines for Inservice Testing at Nuclear Power Plants, NUREG-1482, U.S. Nuclear Regulatory Commission, Washington, DC, April 1995.

3.9-61 MOV Periodic Verification (PV) Study, MPR 2524-a, Joint Owners Group (JOG), November 2006.

3.9-62 Joint Owners Group Air Operated Valve Program Document, Revision 1, December 13, 2000.

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3.9-63 Comments on Joint Owners' Group Air Operated Valve Program Document, USNRC Letter from Eugene V. Imbro to Mr. David J. Modeen, Nuclear Energy Institute, October 8, 1999.

3.9-64 Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions, Regulatory Issue Summary RIS 2000-03, U.S. Nuclear Regulatory Commission, Washington, DC, March 15, 2000.

Table 3.9-13 Pump IST (Sheet 1 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
CVS-RPP-001A	A-Charging pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted. ③Biennially, Comprehensive Test is conducted.	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
CVS-RPP-001B	B-Charging pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
SIS-RPP-001A	A-Safety injection pump	Centrifugal	B	○	-	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
SIS-RPP-001B	B-Safety injection pump	Centrifugal	B	○	-	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted.	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
SIS-RPP-001C	C-Safety injection pump	Centrifugal	B	○	-	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.

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Table 3.9-13 Pump IST (Sheet 2 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
SIS-RPP-001D	D-Safety injection pump	Centrifugal	B	○	-	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
RHS-RPP-001A	A-Containment spray/residual heat removal pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
RHS-RPP-001B	B-Containment spray/residual heat removal pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
RHS-RPP-001C	C-Containment spray/residual heat removal pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
RHS-RPP-001D	D-Containment spray/residual heat removal pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
EFS-RPP-001A	A-Emergency feeedwater pump	Turbine Driven Centrifugal	B	○	-	○	○	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.

Table 3.9-13 Pump IST (Sheet 3 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
EFS-RPP-001B	B-Emergency feeedwater pump	Motor Driven Centrifugal	B	○	-	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
EFS-RPP-001C	C-Emergency feeedwater pump	Turbine Driven Centrifugal	B	○	-	○	○	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
EFS-RPP-001D	D-Emergency feeedwater pump	Motor Driven Centrifugal	B	○	-	○	N/A(constant speed induction motor)	①Quarterly, Required Test is conducted ②Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
NCS-RPP-001A	A-Component cooling water pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly , only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
NCS-RPP-001B	B-Component cooling water pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.

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Table 3.9-13 Pump IST (Sheet 4 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
NCS-RPP-001C	C-Component cooling water pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
NCS-RPP-001D	D-Component cooling water pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly ,only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
EWS-OPP-001A	A-Essential service water pump	Vertical Line Shaft Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly ,only flow rate is sampled ②Refueling Phase, Required test is conducted ③Biennially ,Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
EWS-OPP-001B	B-Essential service water pump	Vertical Line Shaft Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly ,only flow rate is sampled ②Refueling Phase, required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.

Table 3.9-13 Pump IST (Sheet 5 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
EWS-OPP-001C	C-Essential service water pump	Vertical Line Shaft Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.
EWS-OPP-001D	D-Essential service water pump	Vertical Line Shaft Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.
SFS-RPP-001A	A-Spent fuel pit pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.
SFS-RPP-001B	B-Spent fuel pit pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.

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Table 3.9-13 Pump IST (Sheet 6 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
RWS-RPP-001A	A-Refueling Water Recirculation Pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
RWS-RPP-001B	B-Refueling Water Recirculation Pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.
VWS-PPP-001A	A-Essential Chilled Water Pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code-~~2004~~ (Reference 3.9-13) is applied.

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Table 3.9-13 Pump IST (Sheet 7 of ~~7~~9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
VWS-PPP-001B	B-Essential Chilled Water Pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.
VWS-PPP-001C	C-Essential Chilled Water Pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.
VWS-PPP-001D	D-Essential Chilled Water Pump	Centrifugal	A	○	○	○	N/A(constant speed induction motor)	①Quarterly, only flow rate is sampled ②Refueling Phase, Required Test is conducted ③Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code~~-2004~~ (Reference 3.9-13) is applied.

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Table 3.9-13 Pump IST (Sheet 8 of 9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
GTS-PPP-001A	A-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-002A	B-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-001B	C-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-002B	D-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-001C	E-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.

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Table 3.9-13 Pump IST (Sheet 9 of 9)

Tag No.	Description	Pump Type	Group	Required Test				Test Frequency	Acceptance Criteria
				Outlet Flow	Differential Pressure	Vibration	Speed		
GTS-PPP-002C	F-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-001D	G-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.
GTS-PPP-002D	H-Emergency Gas Turbine Fuel Oil Transfer Pump	Centrifugal	B	o	-	o	N/A (constant speed induction motor)	① Quarterly, Required Test is conducted ② Biennially, Comprehensive Test is conducted	Table ISTB-5121-1 in ASME OM Code (Reference 3.9-13) is applied.

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-VLV-120	Pressurizer safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	BC	Remote Position Indication, Alternate/ 2 Years Class 1 Relief Valve Tests/5 Years and 20% in 2 Years	1
RCS-VLV-121	Pressurizer safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	BC	Remote Position Indication, Alternate/ 2 Years Class 1 Relief Valve Tests/5 Years and 20% in 2 Years	1
RCS-VLV-122	Pressurizer safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	BC	Remote Position Indication, Alternate/ 2 Years Class 1 Relief Valve Tests/5 Years and 20% in 2 Years	1

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 2 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-VLV-123	Pressurizer safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	BC	Remote Position Indication, Alternate/ 2 Years Class 1 Relief Valve Tests/5 Years and 20% in 2 Years	1
RCS-MOV-117A	Safety depressurization valve	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	2
RCS-MOV-117B	Safety depressurization valve	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	2

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 3 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-MOV-116A	Safety depressurization valve block valve	Remote MO Gate	Maintain Open Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Quarterly Operability Test	
RCS-MOV-116B	Safety depressurization valve block valve	Remote MO Gate	Maintain Open Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Quarterly Operability Test	
(Deleted)							
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Table 3.9-14 Valve Inservice Test Requirements (Sheet 4 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-MOV-002A	Reactor vessel head vent valve	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	2
RCS-MOV-002B	Reactor vessel head vent valve	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	2
RCS-MOV-003A	Reactor vessel head vent valve	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	2
RCS-MOV-003B	Reactor vessel head vent valve	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	2

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 5 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-AOV-132	Nitrogen gas supply line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 6
RCS-VLV-133	Nitrogen gas supply line containment isolation check	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
RCS-AOV-138	Primary makeup water supply line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 6

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 6 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-VLV-139	Primary makeup water supply line containment isolation check	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
RCS-AOV-147	Pressurizer relief tank gas analyzer line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 6
RCS-AOV-148	Pressurizer relief tank gas analyzer line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 6

Table 3.9-14 Valve Inservice Test Requirements (Sheet 7 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RCS-VLV-140	Vacuum venting line check valve bypass	Manual	Maintain Close	Passive Containment Isolation Safety Seat Leakage	A	Containment Isolation Leak Test	5
	Pressurizer relief tank rupture disk	Rupture Disk	Transfer Open	Active	D	Device replacement/ 5 Years	
	Pressurizer relief tank rupture disk	Rupture Disk	Transfer Open	Active	D	Device replacement/ 5 Years	
CVS-AOV-001A	Letdown valve	Remote AO Globe	Transfer Close Maintain Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-AOV-001B	Letdown valve	Remote AO Globe	Transfer Close Maintain Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 8 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-AOV-001C	Letdown valve	Remote AO Globe	Transfer Close Maintain Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-LCV-451	Letdown line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-LCV-452	Letdown line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4

Table 3.9-14 Valve Inservice Test Requirements (Sheet 9 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-AOV-005	Letdown containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	4 5
CVS-AOV-006	Letdown containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	4 5
CVS-MOV-152	Charging line containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	4 5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 10 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-MOV-151	Charging line isolation	Remote MO Gate	Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-VLV-153	Charging line containment isolation check	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
CVS-AOV-155	Auxiliary pressurizer spray line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-VLV-156	Auxiliary pressurizer spray line check	Check	Maintain Close Transfer Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 11 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-AOV-159	Charging line isolation	Remote AO Globe	Maintain Close Transfer Close Transfer Open	Active-to-Fail RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-VLV-161	Charging line check (First)	Check	Maintain Close Transfer Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-160	Charging line check (Second)	Check	Maintain Close Transfer Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-MOV-178A	Reactor coolant pump seal injection line containment isolation	Remote MO Globe	Maintain Close Transfer Close Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	5 7

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 12 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-VLV-179A	Reactor coolant pump seal injection line containment isolation check	Check	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
CVS-MOV-178B	Reactor coolant pump seal injection line containment isolation	Remote MO Globe	Maintain Close Transfer Close Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	5 7
CVS-VLV-179B	Reactor coolant pump seal injection line containment isolation check	Check	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-MOV-178C	Reactor coolant pump seal injection line containment isolation	Remote MO Globe	Maintain Close Transfer Close Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	5 7
CVS-VLV-179C	Reactor coolant pump seal injection line containment isolation check	Check	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
CVS-MOV-178D	Reactor coolant pump seal injection line containment isolation	Remote MO Globe	Maintain Close Transfer Close Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	5 7

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-VLV-179D	RCP seal injection line containment isolation check	Check	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
CVS-AOV-192A	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-AOV-192B	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-AOV-192C	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 15 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-AOV-192D	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-AOV-196A	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-AOV-196B	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-AOV-196C	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-AOV-196D	Reactor coolant pump seal return line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to Fail Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-MOV-203	Reactor coolant pump seal return line containment isolation	Remote MO Globe	Maintain Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	5 7
CVS-MOV-204	Reactor coolant pump seal return line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/Cold Shutdown Operability Test	5 7

Table 3.9-14 Valve Inservice Test Requirements (Sheet 17 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-LCV121B	Volume control tank outlet valve	Remote MO Gate	Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-LCV121C	Volume control tank outlet valve	Remote MO Gate	Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-LCV121D	Charging pump alternate makeup valve	Remote MO Gate	Transfer Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-LCV121E	Charging pump alternate makeup valve	Remote MO Gate	Transfer Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 18 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-LCV121F	Charging pump alternate makeup valve	Remote MO Gate	Transfer Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-LCV121G	Charging pump alternate makeup valve	Remote MO Gate	Transfer Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
CVS-VLV-125	Volume control tank outlet check	Check	Maintain Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-129A	Charging pump minimum flow check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-129B	Charging pump minimum flow check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-595	Charging pump alternate makeup line check	Check	Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-VLV-592	Charging pump alternate makeup line check	Check	Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-131A	Charging pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-131B	Charging pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-181A	Reactor coolant pump seal injection line check (First)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-181B	Reactor coolant pump seal injection line check (First)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-181C	Reactor coolant pump seal injection line check (First)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-181D	Reactor coolant pump seal injection line check (First)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 20 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-VLV-182A	Reactor coolant pump seal injection line check (Second)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-182B	Reactor coolant pump seal injection line check (Second)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-182C	Reactor coolant pump seal injection line check (Second)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-VLV-182D	Reactor coolant pump seal injection line check (Second)	Check	Maintain Open Transfer Open Transfer Close Maintain Close	Active RCS Pressure Boundary	BC	Check Exercise/ Refueling Outage	3
CVS-FCV-218	Primary makeup water supply isolation	Remote MO Gate	Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6

Table 3.9-14 Valve Inservice Test Requirements (Sheet 21 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-FCV-219	Primary makeup water supply isolation	Remote MO Gate	Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
CVS-AOV-221	Excess letdown isolation (First)	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-AOV-222	Excess letdown isolation (Second)	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
CVS-VLV-002	Letdown line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
CVS-VLV-201	Reactor coolant pump seal water return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 22 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-001A	Safety injection pump suction isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	
SIS-MOV-001B	Safety injection pump suction isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	
SIS-MOV-001C	Safety injection pump suction isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-001D	Safety injection pump suction isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 22 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 22 when deleted text is removed.]

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-004A	Safety injection pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
SIS-VLV-004B	Safety injection pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
SIS-VLV-004C	Safety injection pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
SIS-VLV-004D	Safety injection pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
SIS-MOV-009A	Safety injection pump discharge containment isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-009B	Safety injection pump discharge containment isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 23 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 23 when deleted text is removed.]

Table 3.9-14 Valve Inservice Test Requirements (Sheet 24 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-009C	Safety injection pump discharge containment isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	
SIS-MOV-009D	Safety injection pump discharge containment isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	~~B~~ A	~~Remote Position Indication, Exercise/ 2 Years~~ ~~Exercise Full Stroke/Quarterly~~ ~~Operability Test~~ Leak Test/ Refueling Outage	
SIS-VLV-010A	Safety injection pump discharge containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	~~BC~~ AC	~~Check Exercise/~~ Leak Test/ Refueling Outage	3
SIS-VLV-010B	Safety injection pump discharge containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	~~BC~~ AC	~~Check Exercise/~~ Leak Test/ Refueling Outage	3

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-010C	Safety injection pump discharge containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	~~BC~~ AC	~~Check Exercise/~~ Leak Test/ Refueling Outage	3

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 24 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 24 when deleted text is removed.]

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-010D	Safety injection pump discharge containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	~~BC~~ AC	~~Check Exercise/~~ Leak Test/ Refueling Outage	3
SIS-MOV-011A	Direct vessel safety injection line isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
SIS-MOV-011B	Direct vessel safety injection line isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
SIS-MOV-011C	Direct vessel safety injection line isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 26 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-011D	Direct vessel safety injection line isolation	Remote MO Globe	Maintain Open Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
SIS-VLV-012A	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-013A	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-012B	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-013B	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-012C	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-013C	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-012D	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 28 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-013D	Direct vessel injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-MOV-014A	Hot leg injection line isolation	Remote MO Globe	Maintain Close Transfer Open	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8
SIS-MOV-014B	Hot leg injection line isolation	Remote MO Globe	Maintain Close Transfer Open	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8
SIS-MOV-014C	Hot leg injection line isolation	Remote MO Globe	Maintain Close Transfer Open	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-014D	Hot leg injection line isolation	Remote MO Globe	Maintain Close Transfer Open	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8
SIS-VLV-015A	Hot leg injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-015B	Hot leg injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-VLV-015C	Hot leg injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3

Table 3.9-14 Valve Inservice Test Requirements (Sheet 30 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-015D	Hot leg recirculation line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
SIS-MOV-031B	Emergency letdown line isolation (first)	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	2
SIS-MOV-031D	Emergency letdown line isolation (first)	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	2
SIS-MOV-032B	Emergency letdown line isolation (second)	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	2

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-032D	Emergency letdown line isolation (second)	Remote MO Globe	Maintain Close Transfer Open Transfer Close	Active RCS Pressure Boundary Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	2
SIS-MOV-101A	Accumulator discharge valve	Remote MO Gate	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Hot Shutdown Operability Test	13
SIS-MOV-101B	Accumulator discharge valve	Remote MO Gate	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Hot Shutdown Operability Test	13
SIS-MOV-101C	Accumulator discharge valve	Remote MO Gate	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Hot Shutdown Operability Test	13

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 32 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-101D	Accumulator discharge valve	Remote MO Gate	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Hot Shutdown Operability Test	13
SIS-VLV-102A	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~
SIS-VLV-103A	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 33 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-102B	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~
SIS-VLV-103B	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~
SIS-VLV-102C	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~
SIS-VLV-103C	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~

Table 3.9-14 Valve Inservice Test Requirements (Sheet 34 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-102D	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~
SIS-VLV-103D	Accumulator injection line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise ~~(Alternative method)~~ /Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	~~12~~
SIS-AOV-114	Accumulator nitrogen supply containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication Exercise/2 years Containment Isolation Leak Test Exercise Full Stroke /Cold Shutdown Operability Test	5 6
SIS-VLV-115	Accumulator nitrogen supply containment isolation check	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	5 3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 35 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-116	Accumulator nitrogen supply header safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
SIS-MOV-121A	Accumulator nitrogen discharge valve	Remote MO Globe	Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Quarterly Operability Test	
SIS-MOV-121B	Accumulator nitrogen discharge valve	Remote MO Globe	Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Quarterly Operability Test	
SIS-MOV-125A	Accumulator nitrogen supply line isolation	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	9

Table 3.9-14 Valve Inservice Test Requirements (Sheet 36 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-MOV-125B	Accumulator nitrogen supply line isolation	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	9
SIS-MOV-125C	Accumulator nitrogen supply line isolation	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	9
SIS-MOV-125D	Accumulator nitrogen supply line isolation	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke /Cold Shutdown Operability Test	9
SIS-VLV-126A	Accumulator safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
SIS-VLV-126B	Accumulator safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	

Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SIS-VLV-126C	Accumulator safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
SIS-VLV-126D	Accumulator safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
RHS-MOV-001A	Containment spray/residual heat removal pump hot leg isolation – Inner	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8
RHS-MOV-002A	Containment spray/residual heat removal pump hot leg isolation – Outer	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8 10

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-MOV-001B	Containment spray/residual heat removal pump hot leg isolation - Inner	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8
RHS-MOV-002B	Containment spray/residual heat removal pump hot leg isolation - outer	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8 10

Table 3.9-14 Valve Inservice Test Requirements (Sheet 39 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-MOV-001C	Containment spray/residual heat removal pump hot leg isolation – inner	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8
RHS-MOV-002C	Containment spray/residual heat removal pump hot leg isolation – outer	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8 10

Table 3.9-14 Valve Inservice Test Requirements (Sheet 40 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-MOV-001D	Containment spray/residual heat removal pump hot leg isolation – inner	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8
RHS-MOV-002D	Containment spray/residual heat removal pump hot leg isolation – outer	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active RCS Pressure Boundary Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Pressure Isolation Leak Test/ Refueling Outage Operability Test	8 10
RHS-VLV-003A	Containment spray/residual heat removal pump suction relief	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	10

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-VLV-003B	Containment spray/residual heat removal pump suction relief	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	10
RHS-VLV-003C	Containment spray/residual heat removal pump suction relief	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	10
RHS-VLV-003D	Containment spray/residual heat removal pump suction relief	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	10
RHS-MOV-021A	Containment spray/residual heat removal pump discharge line containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	10

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-MOV-021B	Containment spray/residual heat removal pump discharge line containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	10
RHS-MOV-021C	Containment spray/residual heat removal pump discharge line containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	10
RHS-MOV-021D	Containment spray/residual heat removal pump discharge line containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	10
RHS-VLV-022A	Containment spray/residual heat removal pump discharge line containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise/ Refueling Outage	3 10

Table 3.9-14 Valve Inservice Test Requirements (Sheet 43 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-VLV-022B	Containment spray/residual heat removal pump discharge line containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise/ Refueling Outage	3 10
RHS-VLV-022C	Containment spray/residual heat removal pump discharge line containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise/ Refueling Outage	3 10
RHS-VLV-022D	Containment spray/residual heat removal pump discharge line containment isolation check	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise/ Refueling Outage	3 10
RHS-VLV-023A	Containment spray/residual heat removal heat exchanger outlet relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 44 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-VLV-023B	Containment spray/residual heat removal heat exchanger outlet relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
RHS-VLV-023C	Containment spray/residual heat removal heat exchanger outlet relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
RHS-VLV-023D	Containment spray/residual heat removal heat exchanger outlet relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
RHS-MOV-025A	Containment spray/residual heat removal pump full-flow test line stop	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 45 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-MOV-025B	Containment spray/residual heat removal pump full-flow test line stop	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
RHS-MOV-025C	Containment spray/residual heat removal pump full-flow test line stop	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
RHS-MOV-025D	Containment spray/residual heat removal pump full-flow test line stop	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
RHS-MOV-026A	Residual heat removal flow control	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 46 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-MOV-026B	Residual heat removal flow control	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8
RHS-MOV-026C	Residual heat removal flow control	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8
RHS-MOV-026D	Residual heat removal flow control	Remote MO Globe	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Cold Shutdown Operability Test	8
RHS-VLV-027A	Residual heat removal(RHR) discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 47 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-VLV-027B	RHR discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
RHS-VLV-027C	RHR discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
RHS-VLV-027D	RHR discharge line check	Check	Maintain Close Maintain Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
RHS-VLV-028A	RHR discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 48 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-VLV-028B	RHR discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
RHS-VLV-028C	RHR discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
RHS-VLV-028D	RHR discharge line check	Check	Maintain Close Transfer Open	Active RCS Pressure Boundary Safety Seat Leakage	AC	Check Exercise/Refueling Outage Pressure Isolation Leak Test/ Refueling Outage	3
RHS-VLV-004A	Containment spray/residual heat removal pump suction line check	Check	Maintain Close Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 49 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RHS-VLV-004B	Containment spray/residual heat removal pump suction line check	Check	Maintain Close Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
RHS-VLV-004C	Containment spray/residual heat removal pump suction line check	Check	Maintain Close Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
RHS-VLV-004D	Containment spray/residual heat removal pump suction line check	Check	Maintain Close Transfer Open	Active	BC	Check Exercise/ Refueling Outage	3
EFS-MOV-019A	Emergency feed water isolation	Remote MO Gate	Maintain Open Transfer Open Transfer Close Maintain Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 50 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-MOV-019B	Emergency feed water isolation	Remote MO Gate	Maintain Open Transfer Open Transfer Close Maintain Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-019C	Emergency feed water isolation	Remote MO Gate	Maintain Open Transfer Open Transfer Close Maintain Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-019D	Emergency feed water isolation	Remote MO Gate	Maintain Open Transfer Open Transfer Close Maintain Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-017A	Emergency feed water control	Remote MO Globe	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-MOV-017B	Emergency feed water control	Remote MO Globe	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-017C	Emergency feed water control	Remote MO Globe	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-017D	Emergency feed water control	Remote MO Globe	Maintain Open Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-103A	Turbine driven emergency feed water pump steam inlet	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 52 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-MOV-103B	Turbine driven emergency feed water pump steam inlet	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-101A	Turbine driven emergency feed water pump steam supply line isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-101B	Turbine driven emergency feed water pump steam supply line isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-MOV-101C	Turbine driven emergency feed water pump steam supply line isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-MOV-101D	Turbine driven emergency feed water pump steam supply line isolation	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	B	Remote Position Indication, Exercise/ 2 Years Exercise Full Stroke/Quarterly Operability Test	
EFS-VLV-008A	Emergency feed water pit outlet check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-008B	Emergency feed water pit outlet check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-012A	Emergency feed water pump discharge check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-012B	Emergency feed water pump discharge check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-012C	Emergency feed water pump discharge check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-012D	Emergency feed water pump discharge check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-VLV-020A	Emergency feed water pump minimum flow line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-020B	Emergency feed water pump minimum flow line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-020C	Emergency feed water pump minimum flow line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-020D	Emergency feed water pump minimum flow line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-018A	Emergency feed water feeding line check	Check	Transfer Open Transfer Close	Active	~~BC~~ C	Check Exercise/ Refueling Outage	3
EFS-VLV-018B	Emergency feed water feeding line check	Check	Transfer Open Transfer Close	Active	~~BC~~ C	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 55 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-VLV-018C	Emergency feed water feeding line check	Check	Transfer Open Transfer Close	Active	~~BC~~ C	Check Exercise/ Refueling Outage	3
EFS-VLV-018D	Emergency feed water feeding line check	Check	Transfer Open Transfer Close	Active	~~BC~~ C	Check Exercise/ Refueling Outage	3
EFS-VLV-102A	Emergency feed water pump steam feeding line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-102B	Emergency feed water pump steam feeding line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-102C	Emergency feed water pump steam feeding line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EFS-VLV-102D	Emergency feed water pump steam feeding line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 56 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EFS-VLV-109A	Turbine driven emergency feedwater pump steam supply drain line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	~~1~~2
EFS-VLV-109D	Turbine driven emergency feedwater pump steam supply drain line check	Check	Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	~~1~~2
~~(Deleted)~~ NFS-VLV-511A	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
~~(Deleted)~~ NFS-VLV-511B	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
~~(Deleted)~~ NFS-VLV-511C	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 57 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
~~(Deleted)~~ NFS-VLV-511D	Main feedwater check	Check	Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NFS-VLV-512A	Main feed water isolation	Remote Pneumatic actuated Gate (Sealed pneumatic actuator provides stored energy to close valve)	Maintain Close Transfer Close	Active Active-to-Fail Containment Isolation Remote Position	B	~~Remote Position Indication, Exercise/2 Years~~ Exercise Full Stroke/Cold Shutdown ~~Operability Test~~	11

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NFS-VLV-512B	Main feed water isolation	Remote Pneumatic actuated Gate (Sealed pneumatic actuator provides stored energy to close valve)	Maintain Close Transfer Close	Active Active-to-Fail Containment Isolation Remote Position	B	~~Remote Position Indication, Exercise/2 Years~~ Exercise Full Stroke/Cold Shutdown ~~Operability Test~~	11
NFS-VLV-512C	Main feed water isolation	Remote Pneumatic actuated Gate (Sealed pneumatic actuator provides stored energy to close valve)	Maintain Close Transfer Close	Active Active-to-Fail Containment Isolation Remote Position	B	~~Remote Position Indication, Exercise/2 Years~~ Exercise Full Stroke/Cold Shutdown ~~Operability Test~~	11

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 59 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NFS-VLV-512D	Main feed water isolation	Remote Pneumatic actuated Gate (Sealed pneumatic actuator provides stored energy to close valve)	Maintain Close Transfer Close	Active Active-to-Fail Containment Isolation Remote Position	B	~~Remote Position Indication, Exercise/2 Years~~ Exercise Full Stroke/Cold Shutdown ~~Operability Test~~	11
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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
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(Deleted)							
NMS-MOV-507A	Main steam relief valve block	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NMS-MOV-507B	Main steam relief valve block	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 61 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-MOV-507C	Main steam relief valve block	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NMS-MOV-507D	Main steam relief valve block	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NMS-MOV-508A	Main steam depressurization valve	Remote MO Globe	Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	4
NMS-MOV-508B	Main steam depressurization valve	Remote MO Globe	Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	4

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-MOV-508C	Main steam depressurization valve	Remote MO Globe	Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	4
NMS-MOV-508D	Main steam depressurization valve	Remote MO Globe	Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	4
NMS-AOV-515A	Main steam isolation	Remote AO Check	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	11

Table 3.9-14 Valve Inservice Test Requirements (Sheet 63 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-AOV-515B	Main steam isolation	Remote AO Check	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	11
NMS-AOV-515C	Main steam isolation	Remote AO Check	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	11

Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-AOV-515D	Main steam isolation	Remote AO Check	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	11
NMS-HCV-3615	Main steam bypass isolation	Remote AO Globe	Maintain Close Transfer Close	Active-To-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
NMS-HCV-3625	Main steam bypass isolation valve	Remote AO Globe	Maintain Close Transfer Close	Active-To-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4
NMS-HCV-3635	Main steam bypass isolation	Remote AO Globe	Maintain Close Transfer Close	Active-To-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	4

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 65 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-HCV-3645	Main steam bypass isolation	Remote AO Globe	Maintain Close Transfer Close	Active-To-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	4
NMS-VLV-509A	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-510A	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-511A	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1

Table 3.9-14 Valve Inservice Test Requirements (Sheet 66 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-VLV-512A	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-513A	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-514A	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-509B	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1

Table 3.9-14 Valve Inservice Test Requirements (Sheet 67 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-VLV-510B	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-511B	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-512B	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-513B	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 68 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-VLV-514B	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-509C	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-510C	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-511C	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 69 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-VLV-512C	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-513C	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-514C	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-509D	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1

Table 3.9-14 Valve Inservice Test Requirements (Sheet 70 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-VLV-510D	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-511D	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-512D	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-513D	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1

Table 3.9-14 Valve Inservice Test Requirements (Sheet 71 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-VLV-514D	Main steam safety valve	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position	BC	Remote Position Indication, Alternate/2 Years Class 2/3 Relief Valve Tests/5 Years and 20% in 2 Years	1
NMS-VLV-516A	Main steam check	Check	Maintain Close Transfer Close	Active	B	Check Exercise (Alternative method) /Refueling Outage	12
NMS-VLV-516B	Main steam check	Check	Maintain Close Transfer Close	Active	B	Check Exercise (Alternative method) /Refueling Outage	12
NMS-VLV-516C	Main steam check	Check	Maintain Close Transfer Close	Active	B	Check Exercise (Alternative method) /Refueling Outage	12
NMS-VLV-516D	Main steam check	Check	Maintain Close Transfer Close	Active	B	Check Exercise (Alternative method) /Refueling Outage	12
NMS-MOV-701A	Main steam drain line isolation	Remote MO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 72 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NMS-MOV-701B	Main steam drain line isolation	Remote MO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NMS-MOV-701C	Main steam drain line isolation	Remote MO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NMS-MOV-701D	Main steam drain line isolation	Remote MO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
CSS-MOV-001A	Containment spray/residual heat removal pump suction isolation (refueling water storage pit side)	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 73 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CSS-MOV-001B	Containment spray/residual heat removal pump suction isolation (refueling water storage pit side)	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test	
CSS-MOV-001C	Containment spray/residual heat removal pump suction isolation (refueling water storage pit side)	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test	
CSS-MOV-001D	Containment spray/residual heat removal pump suction isolation (refueling water storage pit side)	Remote MO Gate	Maintain Open Maintain Close Transfer Close	Active Containment Isolation Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 74 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CSS-MOV-004A	Containment spray header containment isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position Safety Seat Leakage	~~B~~ A	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test Leak Test/ Refueling Outage	
CSS-MOV-004B	Containment spray header containment isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position Safety Seat Leakage	~~B~~ A	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test Leak Test/ Refueling Outage	
CSS-MOV-004C	Containment spray header containment isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position Safety Seat Leakage	~~B~~ A	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test Leak Test/ Refueling Outage	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 75 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CSS-MOV-004D	Containment spray header containment isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Remote Position Safety Seat Leakage	~~B~~ A	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Operability Test Leak Test/ Refueling Outage	
CSS-VLV-005A	Containment spray header containment isolation	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise~~(Alternative method)~~ /Refueling Outage	~~12~~
CSS-VLV-005B	Containment spray header containment isolation	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise~~(Alternative method)~~ /Refueling Outage	~~12~~
CSS-VLV-005C	Containment spray header containment isolation	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise~~(Alternative method)~~ /Refueling Outage	~~12~~
CSS-VLV-005D	Containment spray header containment isolation	Check	Maintain Close Transfer Open Transfer Close	Active Containment Isolation	BC	Check Exercise~~(Alternative method)~~ /Refueling Outage	~~12~~

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 76 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-007A	Train return header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7
NCS-MOV-007B	Train return header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7
NCS-MOV-007C	Train return header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7
NCS-MOV-007D	Train return header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-020A	Train supply header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7
NCS-MOV-020B	Train supply header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7
NCS-MOV-020C	Train supply header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7
NCS-MOV-020D	Train supply header separation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Operability Test	7

Table 3.9-14 Valve Inservice Test Requirements (Sheet 78 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-145A	Containment spray/residual heat exchanger component cooling water isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NCS-MOV-145B	Containment spray/residual heat exchanger component cooling water isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NCS-MOV-145C	Containment spray/residual heat exchanger component cooling water isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NCS-MOV-145D	Containment spray/residual heat exchanger component cooling water isolation	Remote MO Gate	Maintain Close Transfer Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 79 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-316A	Charger Pump component cooling water return	Remote MO Gate	Maintain Open	Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NCS-MOV-316B	Charger Pump component cooling water return	Remote MO Gate	Maintain Open	Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly Operability Test	
NCS-MOV-511	Excess letdown heat exchanger component cooling water supply containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/Quarterly Operability Test	5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 80 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-517	Excess letdown heat exchanger component cooling water return containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/Quarterly Operability Test	5
NCS-MOV-531	Letdown heat exchanger component cooling water supply containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	4 5

Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-537	Letdown heat exchanger component cooling water return containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	4 5
NCS-MOV-232A	Cross-connection between A,B-reactor coolant pump and C,D-reactor coolant pump component cooling water return line isolation	Remote MO Gate	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-232B	Cross-connection between A,B-reactor coolant pump and C,D-reactor coolant pump component cooling water return line isolation	Remote MO Gate	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-233A	Cross-connection between A,B-reactor coolant pump and C,D-reactor coolant pump component cooling water return line isolation	Remote MO Gate	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

Table 3.9-14 Valve Inservice Test Requirements (Sheet 83 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-233B	Cross-connection between A,B-reactor coolant pump and C,D-reactor coolant pump component cooling water return line isolation	Remote MO Gate	Maintain Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-234A	A,B-reactor coolant pump return line valve	Remote MO Gate	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-234B	A,B-reactor coolant pump return line valve	Remote MO Gate	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

Table 3.9-14 Valve Inservice Test Requirements (Sheet 84 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-402A	Reactor coolant pump component cooling water supply containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-402B	Reactor coolant pump component cooling water supply containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-VLV-403A	Reactor coolant pump component cooling water supply containment isolation	Check	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise / Refueling Outage	3 5

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-403B	Reactor coolant pump component cooling water supply containment isolation	Check	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise / Refueling Outage	3 5
NCS-MOV-438A	Reactor coolant pump component cooling water return containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-438B	Reactor coolant pump component cooling water return containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 86 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-436A	Reactor coolant pump component cooling water return containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-436B	Reactor coolant pump component cooling water return containment isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-401A	Reactor coolant pump component cooling water supply line isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-401B	Reactor coolant pump component cooling water supply line isolation	Remote MO Gate	Maintain Close Transfer Close Transfer Open Maintain Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-445A	Reactor coolant pump component cooling water supply containment isolation valve bypass	Remote MO Globe	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-445B	Reactor coolant pump component cooling water supply containment isolation valve bypass	Remote MO Globe	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-446A	Reactor coolant pump motor component cooling water inlet side isolation	Remote MO Gate	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-446B	Reactor coolant pump motor component cooling water inlet side isolation	Remote MO Gate	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-446C	Reactor coolant pump motor component cooling water inlet side isolation	Remote MO Gate	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-MOV-446D	Reactor coolant pump motor component cooling water inlet side isolation	Remote MO Gate	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-447A	Reactor coolant pump component cooling water return containment isolation valve(In CV) bypass	Remote MO Globe	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-447B	Reactor coolant pump component cooling water return containment isolation valve(In CV) bypass	Remote MO Globe	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-MOV-448A	Reactor coolant pump component cooling water return containment isolation valve(In CV) bypass	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-MOV-448B	Reactor coolant pump component cooling water Return Containment Isolation Valve(In RB) Bypass Valve	Remote MO Gate	Maintain Close Transfer Close Transfer Open	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 7
NCS-VLV-003A	Component cooling water surge tank relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
NCS-VLV-003B	Component cooling water surge tank relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
NCS-VLV-016A	Component cooling water pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-VLV-016B	Component cooling water pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-VLV-016C	Component cooling water pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-016D	Component cooling water Pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-AOV-601	Auxiliary building component cooling water supply header isolation	Remote AO Butterfly	Maintain Close Transfer Close	Active to Failed Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NCS-AOV-602	Auxiliary building component cooling water supply header isolation	Remote AO Butterfly	Maintain Close Transfer Close	Active to Failed Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NCS-VLV-652	Auxiliary building component cooling water return header check	Check	Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-653	Auxiliary building component cooling water return header check	Check	Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-AOV-661A	Turbine building component cooling water supply header isolation	Remote AO Globe	Maintain Close Transfer Close	Active to Failed Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NCS-AOV-662A	Turbine building component cooling water supply header isolation	Remote AO Globe	Maintain Close Transfer Close	Active to Failed Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NCS-VLV-670A	Turbine building component cooling water supply header check	Check	Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-671A	Turbine building component cooling water supply header check	Check	Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-AOV-661B	Turbine building component cooling water supply header isolation	Remote AO Globe	Maintain Close Transfer Close	Active to Failed Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NCS-AOV-662B	Turbine building component cooling water supply header isolation	Remote AO Globe	Maintain Close Transfer Close	Active to Failed Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
NCS-VLV-670B	Turbine building component cooling water supply header check	Check	Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 94 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-671B	Turbine building component cooling water supply header check	Check	Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-VLV-405A	Reactor coolant pump thermal barrier heat exchanger component cooling water supply check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-VLV-405B	Reactor coolant pump thermal barrier heat exchanger component cooling water supply check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-VLV-405C	Reactor coolant pump thermal barrier heat exchanger component cooling water supply check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-405D	Reactor coolant pump thermal barrier heat exchanger component cooling water supply check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-FCV-1319 A	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-FCV-1320 A	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-FCV-1321 A	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-FCV-1322 A	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-FCV-1319 B	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-FCV-1320B	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-FCV-1321B	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-FCV-1322B	Reactor coolant pump thermal barrier heat exchanger component cooling water return isolation	Remote MO Globe	Maintain Open Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	7
NCS-VLV-435A	Reactor coolant pump component cooling water return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-435B	Reactor coolant pump component cooling water return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
NCS-VLV-439A	Reactor coolant pump component cooling water return line check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
NCS-VLV-439B	Reactor coolant pump component cooling water return line check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
SFS-VLV-006A	Spent fuel pit pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
SFS-VLV-006B	Spent fuel pit pump discharge check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EWS-VLV-502A	Essential service water pump discharge check	Check	Maintain Open Transfer Open Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EWS-VLV-502B	Essential service water pump discharge check	Check	Maintain Open Transfer Open Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EWS-VLV-502C	Essential service water pump discharge check	Check	Maintain Open Transfer Open Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EWS-VLV-502D	Essential service water pump discharge check	Check	Maintain Open Transfer Open Maintain Close Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EWS-MOV-503A	Essential service water pump discharge	Remote MO Butterfly	Maintain Close Maintain Open Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
EWS-MOV-503B	Essential service water pump discharge	Remote MO Butterfly	Maintain Close Maintain Open Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EWS-MOV-503C	Essential service water pump discharge	Remote MO Butterfly	Maintain Close Maintain Open Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
EWS-MOV-503D	Essential service water pump discharge	Remote MO Butterfly	Maintain Close Maintain Open Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
EWS-VLV-602A	Essential service water pump cooling water check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EWS-VLV-602B	Essential service water pump cooling water check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
EWS-VLV-602C	Essential service water pump cooling water check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
EWS-VLV-602D	Essential service water pump cooling water check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
LMS-AOV-060	C/V reactor coolant drain tank nitrogen supply containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
LMS-AOV-056	C/V reactor coolant drain tank vent header containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
LMS-AOV-055	C/V reactor coolant drain tank vent header containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
LMS-AOV-053	C/V reactor coolant drain tank gas analyzer line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
LMS-AOV-052	C/V reactor coolant drain tank gas analyzer line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
LMS-LCV-1000B	C/V reactor coolant drain tank discharge line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
LMS-LCV-1000A	C/V reactor coolant drain tank discharge line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 104 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
LMS-AOV-105	C/V sump discharge line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
LMS-AOV-104	C/V sump discharge line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

Table 3.9-14 Valve Inservice Test Requirements (Sheet 105 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
PSS-AOV-003	Pressurizer gas phase sampling line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-MOV-006	Pressurizer liquid phase sampling line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
PSS-MOV-013	C-loop hot leg sampling line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-MOV-023	B-loop hot leg sampling line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

Table 3.9-14 Valve Inservice Test Requirements (Sheet 107 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
PSS-MOV-031A	Pressurizer and loop sampling line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-MOV-031B	Loop sampling line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-MOV-052A	Containment spray/residual heat removal heat exchanger downstream sampling line isolation	Remote MO Globe	Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	~~6~~

Table 3.9-14 Valve Inservice Test Requirements (Sheet 108 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
PSS-MOV-052B	Containment spray/residual heat removal heat exchanger downstream sampling line isolation	Remote MO Globe	Maintain Close Transfer Close	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	~~6~~
PSS-AOV-062A	Accumulator sampling line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-AOV-062B	Accumulator sampling line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 109 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
PSS-AOV-062C	Accumulator sampling line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-AOV-062D	Accumulator sampling line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 110 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
PSS-AOV-063	Accumulator sampling line containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS - ~~AOV~~ MOV -071	Post accident sampling return line containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
PSS-VLV-072	Post accident sampling return line containment isolation	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/Refueling Outage	3 5

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 111 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SGS-AOV-001A	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6
SGS-AOV-001B	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 112 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SGS-AOV-001C	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6
SGS-AOV-001D	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6
SGS-AOV-002A	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 113 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SGS-AOV-002B	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
SGS-AOV-002C	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6
SGS-AOV-002D	Steam generator blow down isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Cold Shutdown Operability Test	6

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 114 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SGS-AOV-031A	Steam generator blow down sampling line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
SGS-AOV-031B	Steam generator blow down sampling line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 115 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SGS-AOV-031C	Steam generator blow down sampling line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~
SGS-AOV-031D	Steam generator blow down sampling line isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ ~~Cold Shutdown~~ Quarterly Operability Test	5 ~~6~~

Table 3.9-14 Valve Inservice Test Requirements (Sheet 116 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RWS-MOV-004	Refueling water storage pit purification line containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Quarterly Operability Test	5
RWS-MOV-002	Refueling water storage pit purification line containment isolation	Remote MO Gate	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Quarterly Operability Test	5

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 117 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RWS-AOV-022	Refueling water storage pit purification return line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Quarterly Operability Test	5
RWS-VLV-023	Refueling water storage pit purification return line containment isolation	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
DWS-VLV-004	Demineralized water supply containment isolation	Manual	Maintain Close	Passive Containment Isolation Safety Seat Leakage	A	Containment Isolation Leak Test	5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 118 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
DWS-VLV-005	Demineralized water supply containment isolation check	Check	Maintain Close	Passive Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test	3 5
CAS-MOV-002	Instrument air supply outside containment isolation	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/Refueling Outage Operability Test	5 6

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CAS-VLV-003	Instrument air supply containment isolation	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/Refueling Outage	3 5
CAS-VLV-101	Station service air supply line containment isolation	Manual	Maintain Close	Containment Isolation Safety Seat Leakage	A	Containment Isolation Leak Test	5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 120 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CAS-VLV-103	Station service air supply line containment isolation check	Check	Maintain Close	Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test	5
IGS-AOV-001	ICIGS line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shut down Operability Test	5 6
IGS-AOV-002	ICIGS line containment isolation	Remote AO weir type diaphragm	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shut down Operability Test	5 6

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 121 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
LTS-VLV-001	LRTS line containment isolation	Manual	Maintain Close	Containment Isolation Safety Seat Leakage	A	Containment Isolation Leak Test	5
LTS-VLV-002	LRTS line containment isolation	Manual	Maintain Close	Containment Isolation Safety Seat Leakage	A	Containment Isolation Leak Test	5
FSS-AOV-001	FPWSS line to filter unit containment isolation	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shut down Operability Test	5 6
FSS-VLV-003	FPWSS line to filter unit containment Isolation check	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
FSS-MOV-004	FPWSS line to reactor cavity containment isolation	Remote MO Gate	Maintain Close	Containment Isolation Safety Seat Leakage	A	Containment Isolation Leak Test	5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 122 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
FSS-VLV-006	FPWSS line to reactor cavity containment isolation check	Check	Maintain Close	Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test	5
VCS-AOV-304	Containment High Volume Purge Supply Line Containment Isolation Outside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5
VCS-AOV-305	Containment High Volume Purge Supply Line Containment Isolation Inside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/ 2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5

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Table 3.9-14 Valve Inservice Test Requirements
(Sheet 123 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VCS-AOV-306	Containment High Volume Purge Exhaust Line Containment Isolation Inside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5
VCS-AOV-307	Containment High Volume Purge Exhaust Line Containment Isolation Outside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5
VCS-AOV-354	Containment Low Volume Purge Supply Line Containment Isolation Outside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 124 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VCS-AOV-355	Containment Low Volume Purge Supply Line Containment Isolation Inside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5
VCS-AOV-356	Containment Low Volume Purge Exhaust Line Containment Isolation Inside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5
VCS-AOV-357	Containment Low Volume Purge Exhaust Line Containment Isolation Outside of CV	Remote AO Butterfly	Maintain Close Transfer Close	Active-to-Failed Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5

Table 3.9-14 Valve Inservice Test Requirements (Sheet 125 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2845	Main Control Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6
VWS-TCV-2855	Main Control Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6
VWS-TCV-2865	Main Control Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2875	Main Control Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 125 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 125 when deleted text is removed.]

Table 3.9-14 Valve Inservice Test Requirements (Sheet 126 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2784	Class 1E Electrical Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6
VWS-TCV-2794	Class 1E Electrical Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6
VWS-TCV-2804	Class 1E Electrical Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2814	Class 1E Electrical Room Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	6

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 126 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 126 when deleted text is removed.]

Table 3.9-14 Valve Inservice Test Requirements (Sheet 127 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2574	Safeguard Component Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2584	Safeguard Component Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2594	Safeguard Component Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2604	Safeguard Component Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 127 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 127 when deleted text is removed.]

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2671	Emergency Feedwater Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2676	Emergency Feedwater Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2681	Emergency Feedwater Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 129 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2686	Emergency Feedwater Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2721A	Component Cooling Water Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2721B	Component Cooling Water Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 130 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2721C	Component Cooling Water Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2721D	Component Cooling Water Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2726A	Essential Chiller Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2726B	Essential Chiller Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 130 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 130 when deleted text is removed.]

Table 3.9-14 Valve Inservice Test Requirements (Sheet 131 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2726C	Essential Chiller Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2726D	Essential Chiller Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2731	Charging Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
(Deleted)							

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2736	Charging Pump Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
(Deleted)							

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 131 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 131 when deleted text is removed.]

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2741A	Annulus Emergency Exhaust Filtration Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2741B	Annulus Emergency Exhaust Filtration Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2746A	Annulus Emergency Exhaust Filtration Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 133 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2746B	Annulus Emergency Exhaust Filtration Unit Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2331	Penetration Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-TCV-2336	Penetration Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2341	Penetration Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	

[Note to RAI 288-2274 Attachment 1: Roll-over of last row of Sheet 133 occurred due to DCD mark-up of deleted text in rows. This last row will return to Sheet 133 when deleted text is removed.]

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-TCV-2346	Penetration Area Air Handling Unit Cooling Coil Chilled Water Control	Remote MO 3-way	Transfer Open ~~Transfer Close~~	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/ Quarterly ~~Cold Shutdown~~ Operability Test	
VWS-VLV-005A	Essential Chilled Water Pump Discharge Check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
VWS-VLV-005B	Essential Chilled Water Pump Discharge Check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
VWS-VLV-005C	Essential Chilled Water Pump Discharge Check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
VWS-VLV-005D	Essential Chilled Water Pump Discharge Check	Check	Maintain Open Transfer Open Transfer Close	Active	BC	Check Exercise/ Refueling Outage	3
VWS-VLV-253A	Essential Chilled Water Compression Tank Relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	

Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-VLV-253B	Essential Chilled Water Compression Tank Relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
VWS-VLV-253C	Essential Chilled Water Compression Tank Relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
VWS-VLV-253D	Essential Chilled Water Compression Tank Relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
VWS-MOV-403	Containment Fan Cooler Chilled Water Inlet Containment Isolation Outside of CV	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6

Table 3.9-14 Valve Inservice Test Requirements
(Sheet 136 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
VWS-MOV-407	Containment Fan Cooler Chilled Water Outlet Containment Isolation Outside of CV	Remote MO Gate	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6
RMS-MOV-001	Containment Air Sampling Line Containment Isolation Inside of CV	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6
RMS-MOV-002	Containment Air Sampling Line Containment Isolation Outside of CV	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 137 of ~~138~~ 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
RMS-MOV-003	Containment Air Sampling Return Line Containment Isolation Outside of CV	Remote MO Globe	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/ Cold Shutdown Operability Test	5 6
RMS-VLV-005	Containment Air Sampling Return Line Containment Isolation Check Inside of CV	Check	Maintain Close Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Check Exercise/ Refueling Outage	3 5
NCS-VLV-406A	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-406B	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-406C	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 138 of 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-406D	Reactor coolant pump component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCV-VLV-513	Excess letdown heat exchanger component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCV-VLV-533	Letdown heat exchanger component cooling water outlet line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-035A	Component cooling water A1/A2 return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
NCS-VLV-035B	Component cooling water C1/C2 return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 139 of 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
NCS-VLV-035B	Component cooling water C1/C2 return line relief	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class 2/3 Relief Valve Tests/10 Years	
GTS-VLV-001A,B,C,D	Fuel oil storage tank outlet check	Check	Transfer Open	Active	BC	Check Exercise/Quarterly	
GTS-VLV-004A,B,C,D	Fuel oil transfer pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/Quarterly	
GTS-VLV-005A,B,C,D	Fuel oil transfer pump discharge check	Check	Transfer Open	Active	BC	Check Exercise/Quarterly	
GTS-VLV-101A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-VLV-102A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-VLV-103A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14
GTS-VLV-104A,B,C,D	Air start valve	Remote AO Globe	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	14

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Table 3.9-14 Valve Inservice Test Requirements (Sheet 140 of 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
GTS-SOV-109A,B,C,D	Air start pilot valve	Remote SO 3way	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	
GTS-SOV-110A,B,C,D	Air start pilot valve	Remote SO 3way	Transfer Open	Active	B	Exercise Full Stroke/Quarterly	
GTS-VLV-117A,B,C,D	Air receiver inlet check	Check	Transfer Close	Active	BC	Check Exercise/Quarterly	
GTS-VLV-118A,B,C,D	Air receiver inlet check	Check	Transfer Close	Active	BC	Check Exercise/Quarterly	
GTS-VLV-123A,B,C,D	Air receiver relief valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
GTS-VLV-124A,B,C,D	Air receiver relief valve	Relief	Maintain Close Transfer Open Transfer Close	Active	BC	Class2/3 Relief Valve Tests/10 Years and 20% in 4 Years	
SFS-VLV-101A	Spent fuel pit purification subsystem inlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	
SFS-VLV-101B	Spent fuel pit purification subsystem inlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	

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Table 3.9-14 Valve Inservice Test Requirements
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Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
SFS-VLV-133A	Spent fuel pit purification subsystem outlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	
SFS-VLV-133B	Spent fuel pit purification subsystem outlet isolation	Manual	Transfer Close	Active	B	Exercise Full Stroke/ 5 Years	
DS-VLV-001A	A-Safeguard component area floor drain isolation valve	Manual	Maintain Close	Passive Safety Seat Leakage	A	Seat Leak Test by Water Addition or Pressurized Air /Refueling outage	
DS-VLV-001B	B-Safeguard component area floor drain isolation valve	Manual	Maintain Close	Passive Safety Seat Leakage	A	Seat Leak Test by Water Addition or Pressurized Air /Refueling outage	

Table 3.9-14 Valve Inservice Test Requirements (Sheet 142 of 143)

Valve Tag Number	Description	Valve/Actuator Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
DS-VLV-001C	C-Safeguard component area floor drain isolation valve	Manual	Maintain Close	Passive Safety Seat Leakage	A	Seat Leak Test by Water Addition or Pressurized Air /Refueling outage	
DS-VLV-001D	D-Safeguard component area floor drain isolation valve	Manual	Maintain Close	Passive Safety Seat Leakage	A	Seat Leak Test by Water Addition or Pressurized Air /Refueling outage	

Notes:

1. This note applies to the pressurizer safety valves and to the main steam safety valves. ~~Since these valves are not exercised for in service testing, their~~ Their position indication sensors are tested ~~by local inspection without valve exercise~~ during set-pressure testing required in I-8100 of the ASME OM Code, Mandatory Appendix I.
2. These valves are normally closed to maintain the reactor coolant system pressure boundary. These valves are tested during cold shutdowns when the reactor coolant system pressure is reduced to atmospheric pressure so that an opening of this valve during this IST will not cause a LOCA.
3. The check valve exercise test is performed during refueling outage. Valves in the inaccessible primary containment can not be tested during power operation. Test of valves in operating systems may cause impact of power operation. Simultaneous testing of valves in the same system group will be considered.
4. Test of these valves at power will result in an undesirable transient on the reactor coolant system or the steam generator secondary system. Therefore, exercise testing will be performed at cold shutdown to avoid impact on power operation.
5. Containment isolation valves leakage test frequency will be conducted in accordance with the " primary containment leakage rate test program" in accordance with 10 CFR 50 Appendix J.

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Table 3.9-14 Valve Inservice Test Requirements (Sheet ~~138~~ 143 of ~~138~~ 143)

6. Exercising these valves would stop necessary line for operation such as utilities etc. Therefore, exercise testing will be performed at cold shutdown to avoid impact on power operation.
7. Exercising these valves would stop seal injection/ return water or cooling water of the reactor coolant pumps. Such stop of water may result in damage to the reactor coolant pump or reactor trip. These valves are exercised during cold shutdowns when these components do not require the water flow.
8. These valves isolate the low pressure system from the high pressure the reactor coolant system. Opening during normal operation may result in damage of equipment or reactor trip. These valves are exercised during cold shutdowns.
9. Exercising these valves during power operation would cause a loss of necessary safety function for power operation that needs big efforts to recover it. These valves will be exercised during cold shutdowns.
10. The residual heat removal system hot leg suction containment isolation valves and cold leg discharge containment isolation valves are not containment isolation leak tested.
    The basis for the exception is:
    ~~-The valve is water sealed with recirculation water during post-accident operations which prevents the release of the containment atmosphere radioactive gas or aerosol.~~
    - Should the valves leak slightly when closed, the fluid seal within the pipe or the closed piping system outside containment would preclude release of containment atmosphere to the environment.
    - During post-accident operations, the system is filled with recirculation water. During normal operation, the system is water filled, and degradation of valves or piping is readily detected.
    - The residual heat removal system ~~are~~ is a closed loop system, seismically-designed and designed as Quality Group B with a portion of outside containment.
    - The residual heat removal system valves are closed when the plant is in modes above hot shutdown.
11. This note applies to the main steam isolation valves and main feed water isolation valves. The valves are not full stroke tested quarterly at power since full valve stroking will result in a plant transient during normal power operation. These valves will be exercised during cold shutdown.
12. Full-stroke exercise of ~~accumulator injection line check valves, containment spray header containment isolation check valves,~~ main steam check valves~~, and turbine driven emergency feedwater pump steam supply line drain line check valves~~ can not be practically established. ~~These~~ Main steam check valves are tested by ~~alternative~~ alternate method (disassembly) during refueling outage as described in the Generic Letter 89-04.
13. Exercising these valves during power operation would cause a loss of necessary safety function for power operation that needs big efforts to recover it. These valves will be exercised during hot shutdown before cooling down for refueling outage.
14. This note applies to the air start pilot valves in the GTG starting system. These valves are operated with specific air source installed in the GTG starting system.

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Interface Requirements

There are no safety-related interfaces with systems outside of the certified design.

Numeric Performance Values

When necessary to demonstrate satisfaction of a design commitment, numeric performance values for selected components have been specified as ITAAC acceptance criteria in Table 2.7.1.9-5. Key parameters of the CFS design that are used in the safety analysis and which are included in the Table 2.7.1.9-5 are main feedwater isolation.

2.7.1.9.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.1.9-5 describes the ITAAC for the CFS.

Table 2.7.1.9-1 Condensate and Feedwater System Location of Equipment and Piping

System and Components	Location
Main Feedwater Isolation Valves	Reactor Building
Main Feedwater Check Valves	Reactor Building
The portion of the FWS piping from the SGs inlets outward through the containment up to and including the MFIVs.	Containment and Reactor Building
The piping upstream of MFIVs to the first piping restraint at the interface between the reactor building and turbine building.	Reactor Building

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Table 2.7.1.9-2 Condensate and Feedwater System Equipment Characteristics

System Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated Valve	Class 1E/ Qual. For Harsh Envir.	Active Safety Function	Loss of Motive Power Position
Main Feedwater Isolation Valves	NFS-VLV-512 A,B,C,D	2	Yes	Yes	Yes/Yes	Transfer Closed	Closed
Main Feedwater Check Valves	NFS-VLV-511 A,B,C,D	3	Yes	No	-	Transfer Closed	-
Steam Generator Water Level (Narrow Range)	NFS-LT-460, 461, 462, 463, 470, 471, 472, 473, 480, 481, 482, 483, 490, 491, 492, 493,	-	Yes	-	Yes/ Yes	-	-
Steam Generator Water Level (Wide Range)	NFS-LT-464, 474, 484, 494	-	Yes	-	Yes/ Yes	-	-

Note: Dash (-) indicates not applicable

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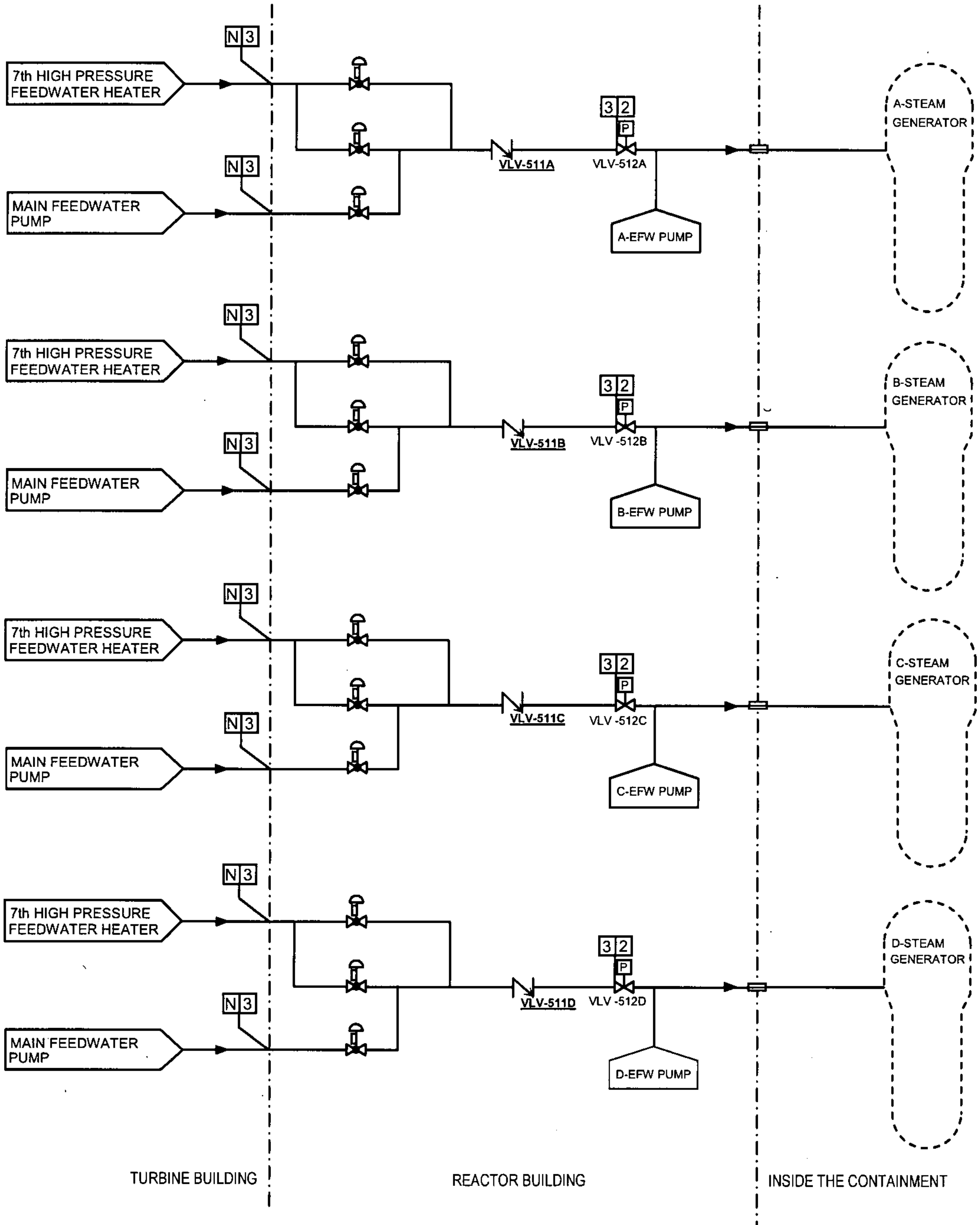

REMARK
System name of valve number is omitted in this drawing.

~~NFS-###-+++~~

Figure 2.7.1.9-1 Feedwater System

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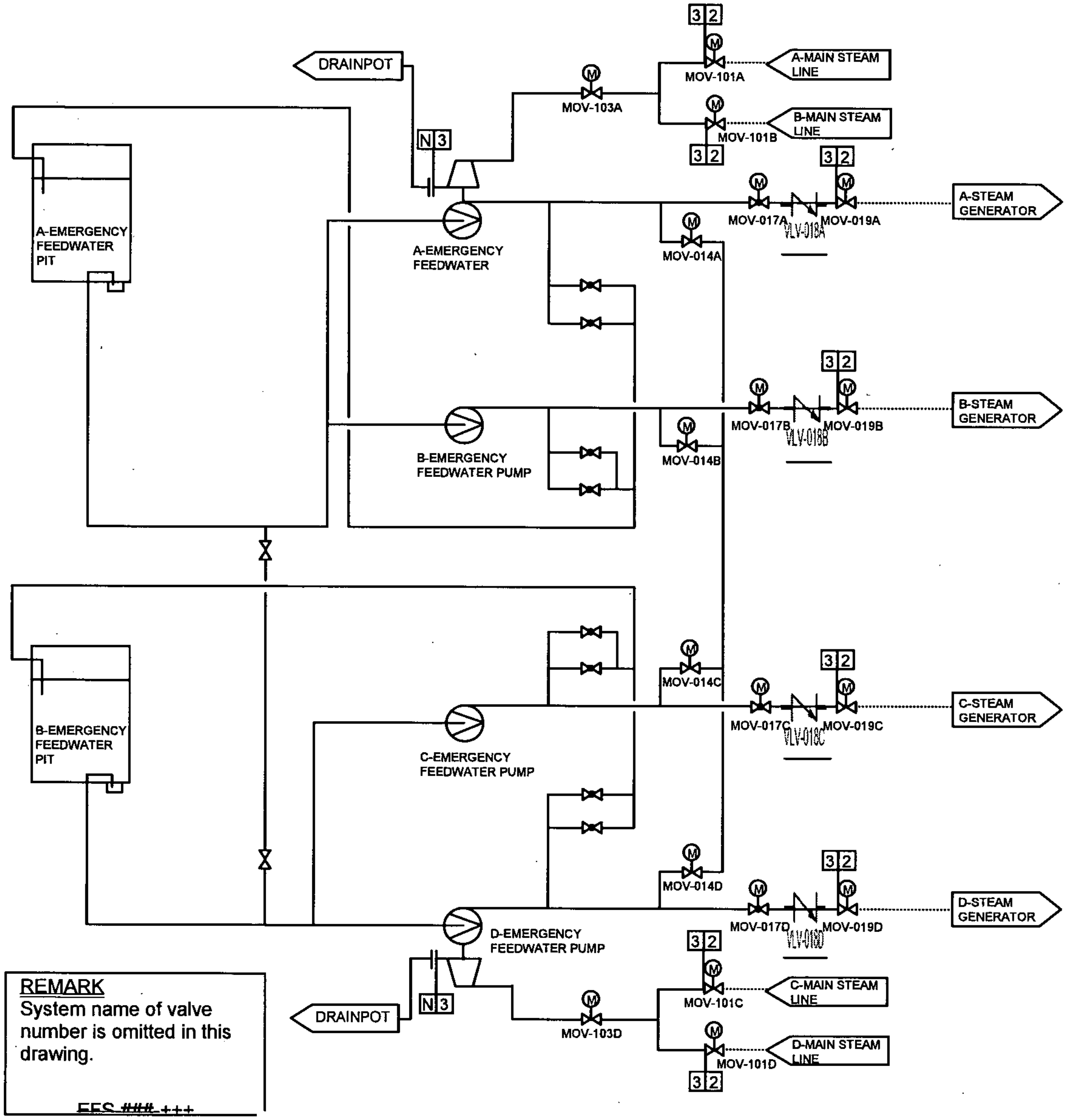

Figure 2.7.1.11-1 Emergency Feedwater System

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Table 2.7.3.1-1 Essential Service Water System Location of Equipment and Piping

System and Components	Location
Essential service water pumps	Ultimate heat sink related structures
Essential service water supply header piping and valves	Ultimate heat sink related structures and essential service water pipe tunnel
Essential service water return header piping and valves	Ultimate heat sink related structures and essential service water pipe tunnel
Essential service water supply line piping and valves to component cooling water heat exchangers	Reactor Building and essential service water pipe tunnel
Essential service water return line piping and valves from component cooling water heat exchangers	Reactor Building and essential service water pipe tunnel
Essential service water supply line piping and valves to essential chiller units	Power Source Building and essential service water pipe tunnel
Essential service water return line piping and valves from essential chiller units	Power Source Building and essential service water pipe tunnel
Essential service water pump motor cooling water piping and valves	Ultimate heat sink related structures

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Table 2.7.3.1-2 Essential Service Water System Equipment Characteristics

Equipment Name	Tag No.	ASME Section III Class	Seismic Category I	Remotely Operated Valve	Class 1E/ Qual. For Harsh Envir.	Active Safety Function	Loss of Motive Power Position
Essential service water pumps	EWS-OPP-001 A, B, C, D	3	Yes	-	Yes/No	Start	-
Essential service water pump discharge valves	EWS-MOV-503 A, B, C, D	3	Yes	Yes	Yes/No	Transfer Open	As Is
Component Cooling Water Heat Exchanger Essential Service Water Flow	EWS-FT-2024, 2025, 2026, 2027	-	Yes	-	Yes/ No	-	-
Essential Service Water Header Pressure	EWS-PT-2005, 2006, 2007, 2008	-	Yes	-	Yes/ No	-	-
Essential Service Water Pump Discharge Check Valves	EWS-VLV-502A, 502B, 502C, 502D	3	Yes	-	Yes/No	Transfer Open/ Transfer Closed	-
Essential Service Pump Cooling Water Supply Line Check Valves	EWS-VLV-602A, 602B, 602C, 602D	3	Yes	-	Yes/No	Transfer Open/ Transfer Closed	-

NOTE:
Dash (-) indicates not applicable

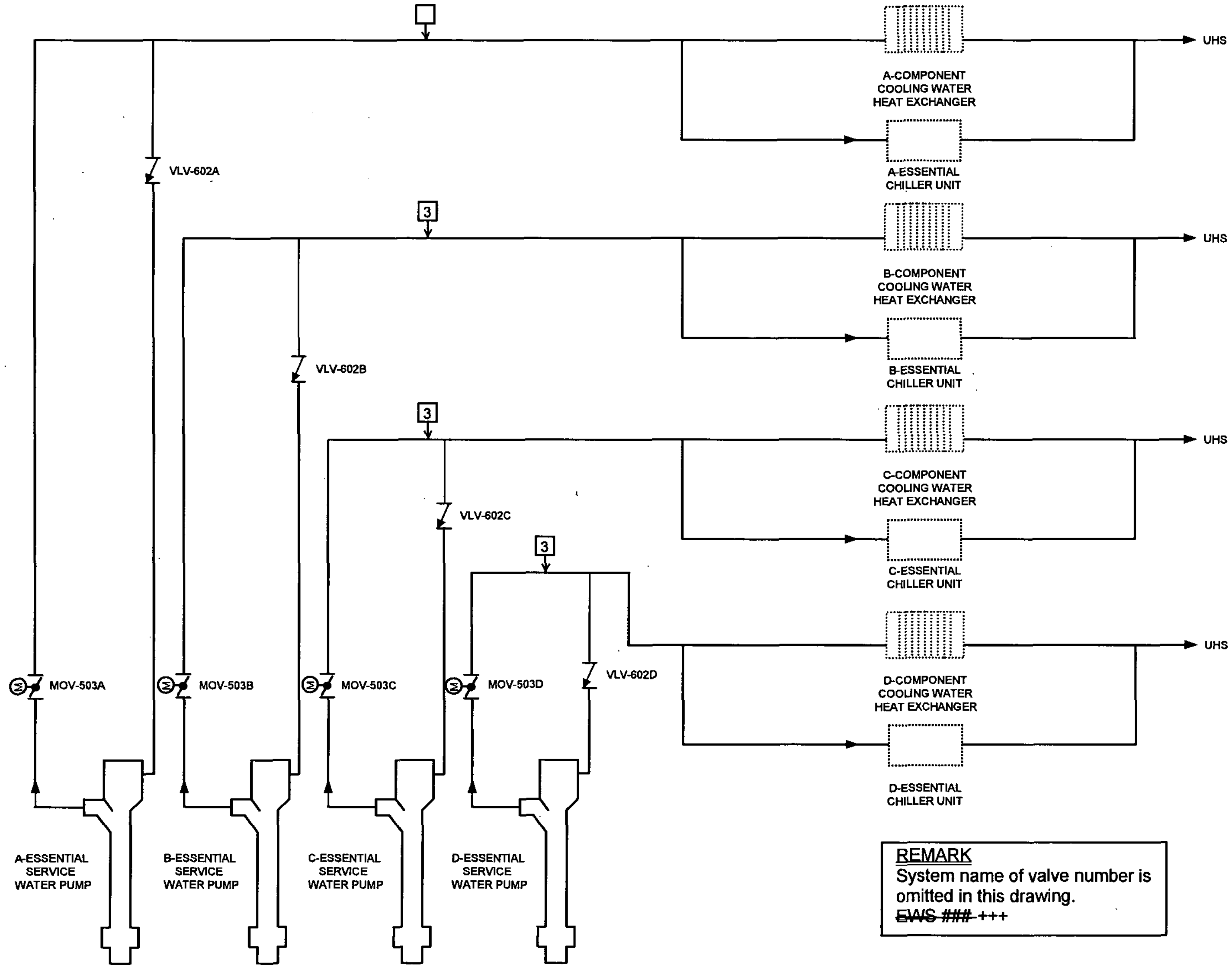

Figure 2.7.3.1-1 Essential Service Water System

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Table 2.7.3.1-3 Essential Service Water System Piping Characteristics

Pipe Line Name	ASME Code Section III Class	Seismic Category I
Essential service water supply header piping and valves	3	Yes
Essential service water return header piping and valves	3	Yes
Essential service water supply line piping and valves to component cooling water heat exchangers	3	Yes
Essential service water return line piping and valves from component cooling water heat exchangers	3	Yes
Essential service water supply line piping and valves to essential chiller units	3	Yes
Essential service water return line piping and valves from essential chiller units	3	Yes
Essential service water pump motor piping and valves	3	Yes

Table 2.7.3.1-4 Essential Service Water System Equipment Alarms, Displays, and Control Functions

Equipment/Instrument Name	MCR Alarm	MCR Display	Control Function	RSC Display
Essential service water pumps EWS-OPP-001A, B, C, D	No	Yes	Yes	Yes
Essential service water pump discharge valves EWS-MOV-503A, B, C, D	No	Yes	Yes	Yes
Essential service water header pressure EWS-PT-2005, 2006, 2007, 2008	Yes	Yes	No	Yes
Component cooling water heat exchanger essential service water flow EWS-FT-2024, 2025, 2026, 2027	Yes	Yes	No	Yes

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Table 2.7.6.7-1 Process and Post-accident Sampling System Equipment Characteristics

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated Valve	Class 1E/ Qual. For Harsh Envir.	Active Safety Function	Loss of Motive Power Position
Isolation valves on RHR down stream of containment spray and residual heat removal heat exchanger	PSS-MOV-052A,B	2	Yes	Yes	Yes / No	Transfer Closed	As Is
Containment isolation valves inside CV on sample from RCS Hot Leg	PSS-MOV-013,023	2	Yes	Yes	Yes/Yes	Transfer Closed	As Is
Containment isolation valves outside containment on sample from RCS Hot Leg	PSS-MOV-031A,B	2	Yes	Yes	Yes/ No	Transfer Closed	As Is
Containment isolation valve outside CV on post-accident liquid sample return to containment sump	PSS-MOV-071	2	Yes	Yes	Yes/ No	Transfer Closed	As Is
Containment isolation valve inside CV on post-accident liquid sample return to containment sump	PSS-VLV-072	2	Yes	No	— / —	Transfer Closed	—
Containment isolation valve inside CV on gas sample from Pressurizer	PSS-AOV-003	2	Yes	Yes	Yes/Yes	Transfer Closed	Closed
Containment isolation valve inside CV on liquid sample from Pressurizer	PSS-MOV-006	2	Yes	Yes	Yes/Yes	Transfer Closed	~~Closed~~ <u>As Is</u>
Containment isolation valves inside CV on sample from Accumulator	PSS-AOV-062A,B,C,D	2	Yes	Yes	Yes /Yes	Transfer Closed	Closed
Containment isolation valve outside CV on sample from Accumulator	PSS-AOV-063	2	Yes	Yes	Yes /No	Transfer Closed	Closed

Note: Dash (-) indicates not applicable

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Table 2.4.5-2 Residual Heat Removal System Equipment Characteristics (Sheet 1 of 2)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated Valve	Class 1E/ Qual. For Harsh Envir.	Active Safety Function	Loss of Motive Power Position
CS/RHR Pumps	RHS-RPP-001 A, B, C, D	2	Yes	-	Yes/-	Start	-
CS/RHR Heat Exchangers - tube side	RHS-RHX-001 A, B, C, D	2	Yes	-	-/-	-	-
CS/RHR Heat Exchangers - CCW side		3	Yes	-	-/-	-	-
1st CS/RHR Pump Hot Leg Isolation Valves	RHS-MOV-001A, B, C, D	1	Yes	Yes	Yes/Yes	Transfer Closed/ Transfer Open	As Is
2nd CS/RHR Pump Hot Leg Isolation Valves	RHS-MOV-002A, B, C, D	1	Yes	Yes	Yes/Yes	Transfer Closed/ Transfer Open	As Is
CS/RHR Pump Suction Relief Valves	RHS-VLV-003A, B, C, D	2	Yes	No	-/-	-	-
RHR Discharge Line Containment Isolation Valves outside containment	RHS-MOV-021A, B, C, D	2	Yes	Yes	Yes/No	Transfer Closed/ Transfer Open	As Is
RHR Discharge Line Containment Isolation Valves inside containment	RHS-VLV-022A, B, C, D	2	Yes	No	-/-	Transfer Open/ Transfer Closed	-
CS/RHR Pump Full-Flow Test Line Stop Valves	RHS-MOV-025A, B, C, D	2	Yes	Yes	Yes/Yes	Transfer Open	As Is
RHR Flow Control Valves	RHS-MOV-026A, B, C, D	2	Yes	Yes	Yes/Yes	Transfer Open	As Is
2nd RHR Discharge Line Check Valves	RHS-VLV-027A, B, C, D	1	Yes	No	-/-	Transfer Open	-
1st RHR Discharge Line Check Valves	RHS-VLV-028A, B, C, D	1	Yes	No	-/-	Transfer Open	-
Containment Spray / Residual Heat Removal Pump Discharge Flow	RHS-FT-601, 611, 621, 631	—	Yes	—	Yes/No	—	—
Containment Spray / Residual Heat Removal Pump Minimum Flow	RHS-FT-604, 614, 624, 634	—	Yes	—	Yes/No	—	—

Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 1 of 8)

Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arragmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Valve: Type	Valve: Operator	Actuation Mode: Primary	Actuation Mode: Secondary	Valve Position: Normal	Valve Position: Shutdown	Valve Position: Post-Accident	Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
P247	56	RCS	Nitrogen Gas	1	No	Sht. 2	RCS-VLV-133	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				1			RCS-AOV-132	Out			6.5 ft	Dia	Air	Auto	RM	O	C	C	FC	T	15	1E
				3/4			RCS-VLV-167	In			-	Dia	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P260	56	RCS	Demi. Water	3	No	Sht. 3	RCS-VLV-139	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				3			RCS-VLV-140	In			-	Dia	Manual	Manual	None	C	C	C	NA	NA	NA	NA
				3			RCS-AOV-138	Out			6.5 ft	Globe	Air	Auto	RM	O	C	C	FC	T	15	1E
				3/4			RCS-VLV-171	In			-	Dia	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P276L	56	RCS	Nitrogen Gas	3/4	No	Sht. 4	RCS-AOV-147	In	C	Y	-	Globe	Air	Auto	RM	O	C	C	FC	T	15	1E
				3/4			RCS-AOV-148	Out			7.5 ft	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
P277	55	CVCS	Primary Coolant	4	No	Sht. 5	CVS-AOV-005	In	C	Y	-	Globe	Air	Auto	RM	O	O	C	FC	T	20	1E
				4			CVS-AOV-006	Out			13.0 ft	Globe	Air	Auto	RM	O	O	C	FC	T	20	1E
P278	55	CVCS	Primary Coolant	4	No	Sht. 6	CVS-VLV-153	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				4			CVS-MOV-152	Out			13.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	S	20	1E
				3/4			CVS-VLV-653	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P279	56	CVCS	Primary Coolant	1 1/2	No	Sht. 7	CVS-VLV-179B	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				1 1/2			CVS-MOV-178B	Out			13.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			CVS-VLV-667B	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P280	56	CVCS	Primary Coolant	1 1/2	No	Sht. 7	CVS-VLV-179D	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				1 1/2			CVS-MOV-178D	Out			13.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			CVS-VLV-667D	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P281	56	CVCS	Primary Coolant	1 1/2	No	Sht. 7	CVS-VLV-179A	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				1 1/2			CVS-MOV-178A	Out			13.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			CVS-VLV-667A	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P282	56	CVCS	Primary Coolant	1 1/2	No	Sht. 7	CVS-VLV-179C	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				1 1/2			CVS-MOV-178C	Out			13.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			CVS-VLV-667C	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P283	55	CVCS	Primary Coolant	3	No	Sht. 8	CVS-MOV-203	In	C	Y	-	Globe	Motor	Auto	RM	O	O	C	FAI	P,T+UV	15	1E
				3			CVS-MOV-204	Out			7.0 ft	Globe	Motor	Auto	RM	O	O	C	FAI	P,T+UV	15	1E
				3/4			CVS-VLV-202	In			-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
P236	56	SIS	Nitrogen Gas	1	No	Sht. 9	SIS-VLV-115	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				1			SIS-AOV-114	Out			6.5 ft	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
				3/4			SIS-VLV-156	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P210	55	SIS	Borated Water	4	Yes	Sht. 10	SIS-VLV-010A	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				4			SIS-MOV-009A	Out			7.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	20	1E
				3/4			SIS-VLV-058A	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P227	55	SIS	Borated Water	4	Yes	Sht. 10	SIS-VLV-010B	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				4			SIS-MOV-009B	Out			7.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	20	1E
				3/4			SIS-VLV-058B	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P258	55	SIS	Borated Water	4	Yes	Sht. 10	SIS-VLV-010C	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				4			SIS-MOV-009C	Out			7.0 ft	Globe	Motor	RM	Manual	O	O	O	FAI	RM	20	1E
				3/4			SIS-VLV-058C	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA

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Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 2 of 8)

Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arragmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Valve: Type	Valve: Operator	Actuation Mode: Primary	Actuation Mode: Secondary	Valve Position: Normal	Valve Position: Shutdown	Valve Position: Post-Accident	Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
P274	55	SIS	Borated Water	4 4 3/4	Yes	Sht. 10	SIS-VLV-010D SIS-MOV-009D SIS-VLV-058D	In Out In	C	Y	- 7.0 ft -	Check Globe Globe	Self Motor Manual	Auto RM Manual	None Manual None	- O C	- O C	- O C	NA FAI NA	NA RM NA	NA 20 NA	NA 1E NA
P152	56	SIS	Borated Water	10	Yes	Sht. 11	SIS-MOV-001A	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	O	O	FAI	RM	50	1E
P153	56	SIS	Borated Water	10	Yes	Sht. 11	SIS-MOV-001B	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	O	O	FAI	RM	50	1E
P156	56	SIS	Borated Water	10	Yes	Sht. 11	SIS-MOV-001C	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	O	O	FAI	RM	50	1E
P157	56	SIS	Borated Water	10	Yes	Sht. 11	SIS-MOV-001D	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	O	O	FAI	RM	50	1E
P209	55	RHRS	Borated Water	10 6 3/4	No	Sht. 12	RHS-MOV-002A RHS-VLV-003A SIS-VLV-225A	In In In	A	N	- - -	Gate Relief Globe	Motor Self Manual	RM Auto Manual	Manual None None	C C C	O C C	C C C	FAI NA NA	RM NA NA	50 NA NA	1E NA NA
P226	55	RHRS	Borated Water	10 6 3/4	No	Sht. 12	RHS-MOV-002B RHS-VLV-003B SIS-VLV-225B	In In In	A	N	- - -	Gate Relief Globe	Motor Self Manual	RM Auto Manual	Manual None None	C C C	O C C	C C C	FAI NA NA	RM NA NA	50 NA NA	1E NA NA
P257	55	RHRS	Borated Water	10 6 3/4	No	Sht. 12	RHS-MOV-002C RHS-VLV-003C SIS-VLV-225C	In In In	A	N	- - -	Gate Relief Globe	Motor Self Manual	RM Auto Manual	Manual None None	C C C	O C C	C C C	FAI NA NA	RM NA NA	50 NA NA	1E NA NA
P273	55	RHRS	Borated Water	10 6 3/4	No	Sht. 12	RHS-MOV-002D RHS-VLV-003D SIS-VLV-225D	In In In	A	N	- - -	Gate Relief Globe	Motor Self Manual	RM Auto Manual	Manual None None	C C C	O C C	C C C	FAI NA NA	RM NA NA	50 NA NA	1E NA NA
P212	55	RHRS	Borated Water	8 8 3/4	Yes	Sht. 13	RHS-VLV-022A RHS-MOV-021A RHS-VLV-062A	In Out In	C	Y	- 7.0 ft -	Check Gate Globe	Self Motor Manual	Auto RM Manual	None Manual None	- C C	- O C	- O C	NA FAI NA	NA RM NA	NA 40 NA	NA 1E NA
P225	55	RHRS	Borated Water	8 8 3/4	Yes	Sht. 13	RHS-VLV-022B RHS-MOV-021B RHS-VLV-062B	In Out In	C	Y	- 7.0 ft -	Check Gate Globe	Self Motor Manual	Auto RM Manual	None Manual None	- C C	- O C	- O C	NA FAI NA	NA RM NA	NA 40 NA	NA 1E NA
P259	55	RHRS	Borated Water	8 8 3/4	Yes	Sht. 13	RHS-VLV-022C RHS-MOV-021C RHS-VLV-062C	In Out In	C	Y	- 7.0 ft -	Check Gate Globe	Self Motor Manual	Auto RM Manual	None Manual None	- C C	- O C	- O C	NA FAI NA	NA RM NA	NA 40 NA	NA 1E NA
P272	55	RHRS	Borated Water	8 8 3/4	Yes	Sht. 13	RHS-VLV-022D RHS-MOV-021D RHS-VLV-062D	In Out In	C	Y	- 7.0 ft -	Check Gate Globe	Self Motor Manual	Auto RM Manual	None Manual None	- C C	- O C	- O C	NA FAI NA	NA RM NA	NA 40 NA	NA 1E NA
P501	57	FWS	Secondary Coolant	16 3	Yes	Sht. 14	NFS-VLV-512A EFS-MOV-019A	Out Out	A	N	35.0 ft -	Gate Gate	P/H Motor	Auto Auto	RM RM	O O	O O	C O	FC FAI	S,RCPS RCPS	5 15	1E 1E
P502	57	FWS	Secondary Coolant	16 3	Yes	Sht. 14	NFS-VLV-512B EFS-MOV-019B	Out Out	A	N	32.0 ft -	Gate Gate	P/H Motor	Auto Auto	RM RM	O O	O O	C O	FC FAI	S,RCPS RCPS	5 15	1E 1E
P503	57	FWS	Secondary Coolant	16 3	Yes	Sht. 14	NFS-VLV-512C EFS-MOV-019C	Out Out	A	N	32.0 ft -	Gate Gate	P/H Motor	Auto Auto	RM RM	O O	O O	C O	FC FAI	S,RCPS RCPS	5 15	1E 1E
P504	57	FWS	Secondary Coolant	16 3	Yes	Sht. 14	NFS-VLV-512D EFS-MOV-019D	Out Out	A	N	35.0 ft -	Gate Gate	P/H Motor	Auto Auto	RM RM	O O	O O	C O	FC FAI	S,RCPS RCPS	5 15	1E 1E

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Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 3 of 8)

Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arragmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Valve: Type	Valve: Operator	Actuation Mode: Primary	Actuation Mode: Secondary	Valve Position: Normal	Valve Position: Shutdown	Valve Position: Post-Accident	Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
P509	57	MSS	Secondary Coolant	32	Yes	Sht. 15	NMS-AOV-515A	Out	A	N	65.5 ft	Check	Air	Auto	RM	O	C	C	FC	RCPS	5	1E
				6			NMS-MOV-507A	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			EFS-MOV-101A	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			NMS-VLV-509A	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-510A	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-511A	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-512A	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-513A	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-514A	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				4			NMS-HCV-3615	Out			-	Globe	Air	Auto	RM	C	C	C	FC	RCPS	20	1E
				2			NMS-MOV-701A	Out			-	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			NMS-VLV-533A	Out			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P510	57	MSS	Secondary Coolant	32	Yes	Sht. 15	NMS-AOV-515B	Out	A	N	62.5 ft	Check	Air	Auto	RM	O	C	C	FC	RCPS	5	1E
				6			NMS-MOV-507B	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			EFS-MOV-101B	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			NMS-VLV-509B	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-510B	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-511B	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-512B	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-513B	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-514B	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				4			NMS-HCV-3625	Out			-	Globe	Air	Auto	RM	C	C	C	FC	RCPS	20	1E
				2			NMS-MOV-701B	Out			-	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			NMS-VLV-533B	Out			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P511	57	MSS	Secondary Coolant	32	Yes	Sht. 15	NMS-AOV-515C	Out	A	N	62.5 ft	Check	Air	Auto	RM	O	C	C	FC	RCPS	5	1E
				6			NMS-MOV-507C	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			EFS-MOV-101C	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			NMS-VLV-509C	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-510C	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-511C	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-512C	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-513C	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-514C	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				4			NMS-HCV-3635	Out			-	Globe	Air	Auto	RM	C	C	C	FC	RCPS	20	1E
				2			NMS-MOV-701C	Out			-	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			NMS-VLV-533C	Out			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA

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Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 4 of 8)

Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arragmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Valve: Type	Valve: Operator	Actuation Mode: Primary	Actuation Mode: Secondary	Valve Position: Normal	Valve Position: Shutdown	Valve Position: Post-Accident	Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
P512	57	MSS	Secondary Coolant	32	Yes	Sht. 15	NMS-AOV-515D	Out	A	N	65.5 ft	Check	Air	Auto	RM	O	C	C	FC	RCPS	5	1E
				6			NMS-MOV-507D	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			EFS-MOV-101D	Out			-	Gate	Motor	RM	Manual	O	O	O	FAI	RM	30	1E
				6			NMS-VLV-509D	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-510D	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-511D	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-512D	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-513D	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				6			NMS-VLV-514D	Out			-	Relief	Self	Auto	None	C	C	C	NA	NA	NA	NA
				4			NMS-HCV-3645	Out			-	Globe	Air	Auto	RM	C	C	C	FC	RCPS	20	1E
				2			NMS-MOV-701D	Out			-	Globe	Motor	RM	Manual	O	O	O	FAI	RM	15	1E
				3/4			NMS-VLV-533D	Out			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P214	56	CSS	Borated Water	8	Yes	Sht. 16	CSS-VLV-005A	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				8			CSS-MOV-004A	Out			7.0 ft	Gate	Motor	Auto	RM	C	C	O	FAI	P	~~NA~~ 40	1E
				3/4			CSS-VLV-023A	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P224	56	CSS	Borated Water	8	Yes	Sht. 16	CSS-VLV-005B	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				8			CSS-MOV-004B	Out			7.0 ft	Gate	Motor	Auto	RM	C	C	O	FAI	P	~~NA~~ 40	1E
				3/4			CSS-VLV-023B	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P261	56	CSS	Borated Water	8	Yes	Sht. 16	CSS-VLV-005C	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				8			CSS-MOV-004C	Out			7.0 ft	Gate	Motor	Auto	RM	C	C	O	FAI	P	~~NA~~ 40	1E
				3/4			CSS-VLV-023C	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P271	56	CSS	Borated Water	8	Yes	Sht. 16	CSS-VLV-005D	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				8			CSS-MOV-004D	Out			7.0 ft	Gate	Motor	Auto	RM	C	C	O	FAI	P	~~NA~~ 40	1E
				3/4			CSS-VLV-023D	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P151	56	CSS	Borated Water	14	Yes	Sht. 18	CSS-MOV-001A	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	C	O	FAI	RM	60	1E
P154	56	CSS	Borated Water	14	Yes	Sht. 18	CSS-MOV-001B	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	C	O	FAI	RM	60	1E
P155	56	CSS	Borated Water	14	Yes	Sht. 18	CSS-MOV-001C	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	C	O	FAI	RM	60	1E
P158	56	CSS	Borated Water	14	Yes	Sht. 18	CSS-MOV-001D	Out	A	N	37.5 ft	Gate	Motor	RM	Manual	O	C	O	FAI	RM	60	1E
P220	56	CSS	Silicone Oil	3/4	Yes	Sht. 17	-	-	A	N	-	-	-	-	-	-	-	-	-	-	-	-
P222	56	CSS	Silicone Oil	3/4	Yes	Sht. 17	-	-	A	N	-	-	-	-	-	-	-	-	-	-	-	-
P416	56	CSS	Silicone Oil	3/4	Yes	Sht. 17	-	-	A	N	-	-	-	-	-	-	-	-	-	-	-	-
P417	56	CSS	Silicone Oil	3/4	Yes	Sht. 17	-	-	A	N	-	-	-	-	-	-	-	-	-	-	-	-
P405L	56	CSS	Silicone Oil	3/4	No	Sht. 17	-	-	A	N	-	-	-	-	-	-	-	-	-	-	-	-
P234	55	CCWS	Water with corrosion inhibitor	8	Yes	Sht. 19	NCS-VLV-403A	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				8			NCS-MOV-402A	Out			7.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	P	40	1E
				4			NCS-MOV-445A	Out				Globe	Motor	Manual	None	C	C	O	FAI	NA	20	1E
				3/4			NCS-VLV-452A	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P249	55	CCWS	Water with corrosion inhibitor	8	Yes	Sht. 19	NCS-VLV-403B	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				8			NCS-MOV-402B	Out			7.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	P	40	1E
				4			NCS-MOV-445B	Out				Globe	Motor	Manual	None	C	C	O	FAI	NAI	20	1E
				3/4			NCS-VLV-452B	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA

Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 5 of 8)

												Valve		Actuation Mode		Valve Position						
Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arragmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Type	Operator	Primary	Secondary	Normal	Shutdown	Post-Accident	Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
P232	55	CCWS	Water with	8	Yes	Sht. 20	NCS-MOV-436A	In	C	Y	-	Gate	Motor	Auto	RM	O	O	C	FAI	P	40	1E
			corrosion	8			NCS-MOV-438A	Out			7.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	P	40	1E
			inhibitor	4			NCS-MOV-447A	In				Globe	Motor	Manual	None	C	C	O	FAI	NA	20	1E
				4			NCS-MOV-448A	Out				Globe	Motor	Manual	None	C	C	O	FAI	NA	20	1E
				3/4			NCS-VLV-437A	In			-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
P251	55	CCWS	Water with	8	Yes	Sht. 20	NCS-MOV-436B	In	C	Y	-	Gate	Motor	Auto	RM	O	O	C	FAI	P	40	1E
			corrosion	8			NCS-MOV-438B	Out			7.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	P	40	1E
			inhibitor	4			NCS-MOV-447B	In			-	Globe	Motor	Manual	None	C	C	O	FAI	NA	20	1E
				4			NCS-MOV-448B	Out			-	Globe	Motor	Manual	None	C	C	O	FAI	NA	20	1E
				3/4			NCS-VLV-437B	In			-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
P233	57	CCWS	Water with	4	No	Sht. 21	NCS-MOV-511	Out	A	N	6.5 ft	Gate	Motor	Auto	RM	O	O	C	FAI	T	20	1E
P235	57	CCWS	corrosion	4	No	Sht. 21	NCS-MOV-517	Out	A	N	6.5 ft	Gate	Motor	Auto	RM	C	C	C	FAI	T	20	1E
P252	57	CCWS	inhibitor	8	No	Sht. 22	NCS-MOV-531	Out	A	N	7.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	T	40	1E
P250	57	CCWS		8	No	Sht. 22	NCS-MOV-537	Out	A	N	7.0 ft	Gate	Motor	Auto	RM	O	O	C	FAI	T	40	1E
P276R	56	WMS	Gas	3/4	No	Sht. 23	LMS-AOV-052	In	C	Y	-	Dia	Air	Auto	RM	O	O	C	FC	T	15	1E
				3/4			LMS-AOV-053	Out			9.5 ft	Dia	Air	Auto	RM	C	C	C	FC	T	15	1E
P284	56	WMS	Gas	2	No	Sht. 24	LMS-AOV-055	In	C	Y	-	Dia	Air	Auto	RM	O	O	C	FC	T	15	1E
				2			LMS-AOV-056	Out			13.5 ft	Dia	Air	Auto	RM	O	O	C	FC	T	15	1E
				2			LMS-AOV-060	Out			-	Dia	Air	Auto	RM	O	O	C	FC	T	15	1E
P205	56	WMS	Borated	3	No	Sht. 25	LMS-LCV-1000A	In	C	Y	-	Dia	Air	Auto	RM	C	C	C	FC	T	15	1E
			Water	3			LMS-LCV-1000B	Out			6.5 ft	Dia	Air	Auto	RM	O	O	C	FC	T	15	1E
P207	56	WMS	Primary	2	No	Sht. 26	LMS-AOV-104	In	C	Y	-	Dia	Air	Auto	RM	C	C	C	FC	T	15	1E
			Coolant	2			LMS-AOV-105	Out			6.5 ft	Dia	Air	Auto	RM	C	C	C	FC	T	15	1E
P267L	55	PSS	Primary	3/4	No	Sht. 27	PSS-AOV-003	In	C	Y	-	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
			Coolant	3/4			PSS-MOV-006	In			-	Globe	Motor	Auto	RM	O	O	C	FAI	T	15	1E
				3/4			PSS-MOV-013	In			-	Globe	Motor	Auto	RM	C	C	C	FAI	T	15	1E
				3/4			PSS-MOV-031A	Out			10.5 ft	Globe	Motor	Auto	RM	O	O	C	FAI	T	15	1E
P269R	55	PSS	Primary	3/4	No	Sht. 28	PSS-MOV-023	In	C	Y	-	Globe	Motor	Auto	RM	O	O	C	FAI	T	15	1E
			Coolant	3/4			PSS-MOV-031B	Out			10.0 ft	Globe	Motor	Auto	RM	O	O	C	FAI	T	15	1E
P267R	56	PSS	Borated	3/4	No	Sht. 29	PSS-AOV-062A	In	C	Y	-	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
			Water	3/4			PSS-AOV-062B	In			-	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
				3/4			PSS-AOV-062C	In			-	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
				3/4			PSS-AOV-062D	In			-	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
				3/4			PSS-AOV-063	Out			9.5 ft	Globe	Air	Auto	RM	O	O	C	FC	T	15	1E
P270	56	PSS	Containment	3/4	No	Sht. 30	PSS-VLV-072	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
			Atmosphere	3/4			PSS-VLV-091	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
				3/4			PSS-MOV-071	Out			7.0 ft	Globe	Motor	RM	Manual	C	C	C	FAI	RM	15	1E
P237R	57	SGBDS	Secondary	3/4	No	Sht. 31	SGS-AOV-031A	Out	A	N	10.0 ft	Globe	Air	Auto	RM	O	O	C	FC	T	15	1E
P237L	57	SGBDS	Coolant	3/4	No	Sht. 31	SGS-AOV-031B	Out	A	N	10.5 ft	Globe	Air	Auto	RM	O	O	C	FC	T	15	1E

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Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 6 of 8)

Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arrgmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Valve		Actuation Mode		Valve Position			Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
												Type	Operator	Primary	Secondary	Normal	Shutdown	Post-Accident				
P239R	57	SGBDS	Secondary	3/4	No	Sht. 31	SGS-AOV-031C	Out	A	N	9.0 ft	Globe	Air	Auto	RM	O	O	C	FC	T	15	1E
P239L	57	SGBDS	Coolant	3/4	No	Sht. 31	SGS-AOV-031D	Out	A	N	9.5 ft	Globe	Air	Auto	RM	O	O	C	FC	T	15	1E
P505	57	SGBDS	Secondary	4	No	Sht. 31	SGS-AOV-001A	Out	A	N	20.0 ft	Globe	Air	Auto	RM	O	O	C	FC	T	20	1E
P506	57	SGBDS	Coolant	4	No	Sht. 31	SGS-AOV-001B	Out	A	N	23.5 ft	Globe	Air	Auto	RM	O	O	C	FC	T	20	1E
P507	57	SGBDS		4	No	Sht. 31	SGS-AOV-001C	Out	A	N	23.5 ft	Globe	Air	Auto	RM	O	O	C	FC	T	20	1E
P508	57	SGBDS		4	No	Sht. 31	SGS-AOV-001D	Out	A	N	20.0 ft	Globe	Air	Auto	RM	O	O	C	FC	T	20	1E
P161	56	RWS	Borated	6	No	Sht. 32	RWS-MOV-002	In	C	Y	-	Gate	Motor	Auto	RM	O	O	C	FAI	T	30	1E
			Water	6			RWS-MOV-004	Out			16.5 ft	Gate	Motor	Auto	RM	O	O	C	FAI	T	30	1E
				3/4			RWS-VLV-003	In			-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
P162	56	RWS	Borated	4	No	Sht. 33	RWS-VLV-023	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
			Water	4			RWS-AOV-022	Out			28.5 ft	Dia	Air	Auto	RM	O	O	C	FC	T	20	1E
				3/4			RWS-VLV-073	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P253	56	PMWS	Deminrralized	2	No	Sht. 34	DWS-VLV-005	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
			Water	2			DWS-VLV-004	Out			6.5 ft	Dia	Manual	Manual	None	C	C	C	NA	NA	NA	NA
				3/4			DWS-VLV-006	In			-	Dia	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P245	56	IAS	Compressed	2	No	Sht. 35	CAS-VLV-003	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
			Air	2			CAS-MOV-002	Out			7.0 ft	Globe	Motor	Auto	RM	O	O	C	FAI	P	15	1E
				3/4			CAS-VLV-004	In			-	Globe	Manual	Manual	None	O	O	C	NA	NA	NA	NA
P248	56	FSS	Fire Water	3	No	Sht. 36	FSS-VLV-003	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				3			FSS-AOV-001	Out			6.5 ft	Globe	Air	Auto	RM	C	C	C	FC	T	15	1E
				3/4			FSS-VLV-002	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P238	56	FSS	Fire Water	6	No	Sht. 37	FSS-VLV-006	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
				6			FSS-MOV-004	Out			7.0 ft	Gate	Motor	Auto	RM	C	C	C	FAI	RM	30	1E
				3/4			FSS-VLV-005	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P230	56	SSAS	Compressed	2	No	Sht. 38	CAS-VLV-103	In	C	Y	-	Check	Self	Auto	None	-	-	-	NA	NA	NA	NA
			Air	2			CAS-VLV-101	Out			6.5 ft	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
				3/4			CAS-VLV-102	In			-	Globe	Manual	Manual	None	C	C	C	NA	NA	NA	NA
P200	-	-	(Fuel Transfer Tube)	22	No	Sht. 39	-	-	B	N	-	Flange	NA	-	-	C	C	C	NA	NA	NA	NA
P451	56	HVAC	Containment	36	No	Sht. 40	VCS-AOV-305	In	C	Y	-	B-fly	Air	Auto	RM	C	O	C	FC	V	5	1E
			Atmosphere	36			VCS-AOV-304	Out			11.0 ft	B-fly	Air	Auto	RM	C	O	C	FC	V	5	1E
P452	56	HVAC	Containment	36	No	Sht. 40	VCS-AOV-306	In	C	Y	-	B-fly	Air	Auto	RM	C	O	C	FC	V	5	1E
			Atmosphere	36			VCS-AOV-307	Out			7.0 ft	B-fly	Air	Auto	RM	C	O	C	FC	V	5	1E
P410	56	HVAC	Containment	8	No	Sht. 41	VCS-AOV-356	In	C	Y	-	B-fly	Air	Auto	RM	C	C	C	FC	V	5	1E
			Atmosphere	8			VCS-AOV-357	Out			7.0 ft	B-fly	Air	Auto	RM	C	C	C	FC	V	5	1E
P401	56	HVAC	Containment	8	No	Sht. 41	VCS-AOV-355	In	C	Y	-	B-fly	Air	Auto	RM	C	C	C	FC	V	5	1E
			Atmosphere	8			VCS-AOV-354	Out			7.0 ft	B-fly	Air	Auto	RM	C	C	C	FC	V	5	1E
P262R	56	HVAC	Silicone Oil	3/4	No	Sht. 42	-	-	A	N		-	-	-		-	-	-	-	-	-	-
P262L	56	HVAC	Silicone Oil	3/4	No	Sht. 42	-	-	A	N		-	-	-		-	-	-	-	-	-	-

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Table 6.2.4-3 List of Containment Penetrations and System Isolation Positions (Sheet 7 of 8)

Pen NO.	GDC	System Name	Fluid	Line Size (in.)	ESF or Support System	Valve Arragmt Figure 6.2.4-1	Valve Number	Location of Valve	Type Tests	Type C Test	Length of Pipe (Note 1)	Valve		Actuation Mode		Valve Position			Power Failure	Actuation Signal	Valve Closure Time (seconds)	Power Source (Note 2)
												Type	Operator	Primary	Secondary	Normal	Shutdown	Post-Accident				
P408	57	VWS	Chilled Water	10	No	Sht. 43	VWS-MOV-403	Out	A	N	6.5 ft	Gate	Motor	Auto	RM	O	C	C	FAI	T	60	1E
P409	57	VWS	Chilled Water	10	No	Sht. 43	VWS-MOV-407	Out	A	N	6.5 ft	Gate	Motor	Auto	RM	O	C	C	FAI	T	60	1E
P265	56	RMS	Containment Atmosphere	1 1 3/4	No	Sht. 44	RMS-VLV-005 RMS-MOV-003 RMS-VLV-004	In Out in	C	Y	- 6.5 ft -	Check Globe Globe	Self Motor Manual	Auto Auto Manual	None RM None	- O C	- O C	- C C	NA FAI NA	NA T NA	NA 15 NA	NA 1E NA
P266	56	RMS	Containment Atmosphere	1 1	No	Sht. 44	RMS-MOV-001 RMS-MOV-002	In Out	C	Y	- 6.5 ft	Globe Globe	Motor Motor	Auto Auto	RM RM	O O	O O	C C	FAI FAI	T T	15 15	1E 1E
P231	56	ICIGS	Carbon Dioxide	3/4 3/4	No	Sht. 45	IGS-AOV-002 IGS-AOV-001	In Out	C	Y	- 6.5 ft	Dia Dia	Air Air	Auto Auto	RM RM	C C	C C	C C	FC FC	T T	15 15	1E 1E
P405R	56	LTS	Containment Atmosphere	3/4	No	Sht. 47	LTS-VLV-002 LTS-VLV-001	In Out	C	Y	- 6.5 ft	Globe Globe	Manual Manual	Manual Manual	None None	C C	C C	C C	NA NA	NA NA	NA NA	NA NA
P223	56	LTS	Containment Atmosphere	3/4	No	Sht. 47	- -	In Out	B	N	- -	Flange Flange	NA NA	Manual Manual	None None	C C	C C	C C	NA NA	NA NA	NA NA	NA NA
P216	56	LTS	Containment Atmosphere	3/4	No	Sht. 46	- -	In Out	B	N	- -	Flange Flange	NA NA	Manual Manual	None None	C C	C C	C C	NA NA	NA NA	NA NA	NA NA
P218	56	LTS	Containment Atmosphere	3/4	No	Sht. 46	- -	In Out	B	N	- -	Flange Flange	NA NA	Manual Manual	None None	C C	C C	C C	NA NA	NA NA	NA NA	NA NA
P418R	56	RLS	Containment Atmosphere	1 1/2	No	Sht. 48	- -	In Out	B	N	- -	Flange Flange	NA NA	Manual Manual	None None	C C	C C	C C	NA NA	NA NA	NA NA	NA NA
P418L	56	RLS	Containment Atmosphere	1 1/2	No	Sht. 48	- -	In Out	B	N	- -	Flange Flange	NA NA	Manual Manual	None None	C C	C C	C C	NA NA	NA NA	NA NA	NA NA
P520	56	-	-	-	-	Sht. 49	-	NA	B	N	-	None	None	Manual	Manual	C	C	C	NA	NA	NA	NA
P530	56	-	-	-	-	Sht. 49	-	NA	B	N	-	None	None	Manual	Manual	C	C	C	NA	NA	NA	NA
P540	56	-	-	-	-	Sht. 50	-	NA	B	N	-	None	None	Manual	Manual	C	C	C	NA	NA	NA	NA
P208	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P213	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P215	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P246	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P254	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P268	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P269L	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P275	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P285	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P301	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P406	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P407	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P419	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
P420	-	(Spare)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-