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MFN 08-109

Docket No. 52-010

February 11, 2008

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

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 67 Related to ESBWR Design Certification Application – Inservice Testing of Pumps and Valves – RAI Numbers 3.9-159 S01 and 3.9-168 S01**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) originally transmitted via the Reference 1 letter, supplemented by an NRC request for clarification in References 2 and 3. The GEH response to RAI Numbers 3.9-159 S01 and 3.9-168 S01 are addressed in Enclosure 1.

If you have any questions or require additional information, please contact me.

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

References:

1. MFN 06-378, Letter from U.S. Nuclear Regulatory Commission to David H. Hinds, Manager, ESBWR, General Electric Company, *Request For Additional Information Letter No. 67 Related To ESBWR Design Certification Application*, dated October 10, 2006.

2. E-mail from Chandu Patel, U.S. Nuclear Regulatory Commission to John Leatherman dated May 7, 2007. (Adams Accession Numbers ML071620006 and ML071620013).

3. E-Mail from Chandu Patel, U.S. Nuclear Regulatory Commission, to John Leatherman, GE, dated June 13, 2007. (Adams Accession Number ML071650452).

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 67 Related to ESBWR Design Certification Application – Inservice Testing of Pumps and Valves – RAI Numbers 3.9-159 S01 and 3.9-168 S01

cc: AE Cubbage USNRC (with enclosure)
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eDRF 0000-0068-5453, Rev. 0

Enclosure 1

MFN 08-109

Response to Portion of NRC Request for

Additional Information Letter No. 67

Related to ESBWR Design Certification Application

Inservice Testing of Pumps and Valves

RAI Numbers 3.9-159 S01 and 3.9-168 S01

For historical purposes, the original text of RAIs 3.9-159 and 3.9-168 and the GEH response is included, except for any attachments or DCD mark-ups.

NRC RAI 3.9-159

In DCD Tier 2, Table 3.9-8 for IST, refueling outage (RO) test frequency is proposed for certain valves. The vendors for new reactors, for which the final designs are not complete, have sufficient time to include provisions in their valve and piping system designs to allow the Code required quarterly testing. Therefore, the applicant should provide justifications for each valve as to why ESBWR cannot be designed to accommodate the quarterly test.

GE Response

Where the ASME OM Code ISTC-3510 nominal exercise frequency of 3 months is not specified in Table 3.9-8, the referenced notes provide the basis for the alternate frequency. The bases notes are related to location (g1), e.g., inaccessible in containment or for ALARA reasons), or are related to operation (g3 and g4), where valve damage could result or system shutdowns would be necessary. ISTC-3510 references ISTC-3520 which allows testing at shutdowns and refueling outages where exercising during operation at power is not practicable. The quarterly test frequency is only required by ISTC-3510 where such a test frequency is practicable. Redesign of a system to solely for the purpose of increasing the valve test frequency, even where possible, would require adding additional valves (which would require additional testing) and bypass loop piping (which would require inservice inspection). The provisions of the ASME OM Code ISTC-3510 and ISTC-3520 are met by the ESBWR design.

DCD Impact

No DCD changes will be made in response to this RAI.

NRC RAI 3.9-159 S01

Comment on response to RAI 3.9-159 (MFN 06-489):

The applicant is requested to address the staff position that, because final designs for new reactors are not complete, systems can be designed to allow Code-required quarterly testing; and the basis for not designing the ESBWR to accommodate quarterly testing for each component within the scope of the IST program.

GEH Response

DCD Revision 4, Table 3.9-8 identified several exceptions to quarterly valve testing, under Note g. Note g is being changed to provide more detailed justifications for deferrals to cold shutdown and refueling. To the extent possible, the plant will be designed to allow quarterly stroking of IST valves; however, for some valve applications, quarterly testing cannot be performed. For example, the following types of valve applications will not be tested at power.

- Power-operated valves that could cause a plant transient if stroked,
- Check valves for which establishing normal, forward flow could cause a transient, and
- Check valves that physically cannot be opened with flow through normal means (for example, because the downstream pressure is greater than the upstream pressure or because an in-series squib valve blocks flow) and cannot be accessed during normal operation to use a test connection to perform the test.

The justifications are consistent with NUREG 1482, Revision 1.

DCD Impact

DCD Tier 2, Section 3.9.6 and Table 3.9-8 will be revised in Revision 5 as noted in the attached markup.

NRC RAI 3.9-168

Verify that all relief devices which perform a function of providing pressure relief to ensure the integrity of safety-related structures, systems, or components are designed, qualified, and capacity certified to meet all applicable requirements of ASME Section III and are included in the IST program. Specifically, in addition to any other systems which provide a safety-related function, provide this information for the following systems: the reactor coolant system, the main steam system, the facility and auxiliary pool cooling system, the shutdown cooling/standby liquid control system, the control rod drive system, the plant service water system, and the reactor building component cooling water systems.

GE Response

The relief devices, which provide a pressure relief function to ensure the integrity of all safety-related structures, systems and components, are classified in accordance with classifications of structures, systems and components in DCD Table 3.2-1. Based upon the Quality Group classification in Table 3.2-1, the ASME Section III Code Class and design and fabrication requirements are identified in Table 3.2-3. Therefore, these relief devices are designed, manufactured and qualified, including capacity certification, in accordance with all applicable requirements of the ASME Code Section III. For the specific systems identified in this RAI, the principal components, which include relief devices, are classified in accordance with DCD Table 3.2-1. Of these systems, the applicable relief devices that provide a pressure relief function to ensure the integrity of safety-related structures, systems and components are the Nuclear Boiler System Safety Relief Valves (F006 and F003), the Standby Liquid Control System Accumulator Tank Relief Valve (F030A/B) and the Containment Drywell Wetwell Vacuum Breaker Valve (F002). These relief devices are included in the IST program in accordance with DCD Table 3.9-8.

DCD Impact

No DCD changes will be made in response to this RAI.

NRC RAI 3.9-168 S01

Comment on response to RAI 3.9-168 from MFN 07-021:

Discuss the exclusions and alternatives from the ASME OM Code noted in Item (f) of Table 3.9-8 on Page 3.9-85 of the DCD Tier 2, Revision 3, and the bases for those exclusions and alternatives.

GEH Response

As discussed in the response to RAI 3.9-159 S01, Table 3.9-8 will be revised to provide more detailed justifications for deferring quarterly IST testing to refueling outages or cold shutdown. The reasons used to exclude a valve from quarterly stroke testing will be consistent with guidance in NUREG 1482, Revision 1.

DCD Impact

DCD Tier 2, Table 3.9-8 will be revised in Revision 5 as shown in the response to RAI 3.9-159 S01.

3.9.6 In-Service Testing of Pumps and Valves

3.9.6.1.4 Valve Testing

Based on the valve category, active/passive function(s), and safety-related function(s) identified for each valve, the inservice tests to confirm the capability of the valve to perform these functions are identified in Table 3.9-8. ASME OM Code Table ISTC-3500-1, Inservice Test Requirements, specifies the required tests.

Table ISTC-3500-1 requires four basic valve tests which includes the following:

- exercise tests
- seat leakage tests
- remote position indicator tests
- special tests (i.e., fail-safe tests, explosive valve tests, rupture disc tests)

(1) Valve Exercise Tests

Active Category A valves, Category B valves, and Category C check valves are exercised periodically, except for self-actuated safety and relief valves. The ASME OM Code specifies a quarterly valve exercise frequency for all valves except power-operated safety and relief valves, which are required to be tested once per fuel cycle, and manual valves, as discussed in Section 3.9.6.1.5(2). Where it is not practicable to exercise a valve during normal power operation, the valve exercise test is deferred to either cold shutdown or refueling outages. Valve exercise tests and frequencies are identified in Table 3.9-8. In some cases, quarterly stroke testing is deferred to refueling outages or cold shutdown, as indicated in Table 3.9-8, Note g. The bases for deferral are consistent with NUREG 1482, Revision 1.

During valve exercise tests, the necessary valve obturator movement is determined while observing an appropriate direct indicator, such as indicating lights that signal the required changes of obturator position, or by observing other evidence or positive means, such as changes in system pressure, flow, level, or temperature that reflects change of obturator position.

Valve exercise tests use direct observation or other positive means (ISTC-5221(a)) for verification of valve obturator position.

(2) Valve Leakage Tests

Active and passive Category A containment isolation valves are tested to verify their seat leakage limits in accordance with 10 CFR 50 Appendix J. Frequency of containment isolation valve seat leakage tests are in accordance with the Appendix J requirements. All containment isolation valves and seat leakage tests are identified in Table 3.9-8.

Other Category A valves are required to be seat leakage tested at least once every two years as specified by the ASME OM Code ISTC-3630. ~~The ESBWR design does not include any Category A valves except for containment isolation valves.~~

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
B21 Nuclear Boiler System Valves													
F710	1	Excess flow check valve – RPV shutdown range water level instrument reference leg line (g~~63~~)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L SO SC	App J RO RO
F701	4	Excess flow check valve – RPV water level instrument reference leg line (g~~63~~);	CK	SA	2	A, C	A	O	O/C	N/A	Y	L SO SC	App J RO RO
F703	4	Excess flow check valve – RPV narrow range water level instrument sensing line (g~~63~~);	CK	SA	2	A, C	A	O	O/C	N/A	Y	SO SC L	RO RO App J
F705	4	Excess flow check valve – RPV wide range water level instrument sensing line (g~~63~~);	CK	SA	2	A, C	A	O	O/C	N/A	Y	SO SC L	RO~~0~~ RO App J
F707	4	Excess flow check valve – RPV fuel zone range water level instrument sensing line (g6)	CK	SA	2	A, C	A	O	O/C	N/A	Y	SC SO L	RO RO App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F100	2	FW supply line second outboard shutoff valve (g20)	GT	SA	2	A	A	O	C	C	---	SC FC L	RO RO 2 yrs
F101	2	FW ~~discharge~~ supply line outboard ~~check~~ containment isolation valve (g9~~1~~)	~~GB~~ ~~AF~~CK	PM SA	1	A, C	A	O	O/C	C	Y	L SO SC FC P	App J RO RO RO 2 yrs~~YR~~
F102	2	FW ~~discharge~~ supply line inboard ~~check~~ containment isolation valve (g9~~1~~)	CK ~~GB~~ ~~AF~~	S~~/~~A ~~NMO~~	1	A, C	A	O	O/C	~~N/A~~C	Y	SO SC FC P L	RO RO RO 2 yrs~~YR~~ App J
~~F103~~	~~2~~	~~FW discharge line downstream maintenance valve~~	~~CK~~	~~S/A~~	~~1~~	~~A/C~~	~~A~~	~~O~~	~~C~~	~~N/A~~	~~Y~~	~~SC~~ ~~L~~	~~RO~~ ~~App J~~
F001	4	Inboard main steam isolation valve (MSIV)(g10)	GB ~~GT~~ ~~AF~~ ~~QT~~	NO	1	A	A	O	C	C	Y	L P SC FC	App J 2 yrs~~YR~~ CS CS

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F002	4	Outboard main steam isolation valve (MSIV) (g1~~0~~)	GB ~~GT~~ ~~AF~~ ~~QT~~	AO	1	A	A	O	C	C	Y	L P SC FC	App J 2 yrs~~YR~~ CS CS
F006	10	Safety-relief valve (SRV) (g1) ~~(g2)~~	RV	SA AO	1	A, C	A	C	O/C	N/A	--	R L ~~SO~~	5 yrs~~YR~~ 2 yrs ~~RO~~
F003	8	Safety Valve (SV) (g1)	RV	SA	1	A, C	A	C	O/C	N/A	--	R L	5 yrs~~YR~~ 2 yrs
F004	4~~8~~	Depressurization valve (DPV) on the stub tube connected to the RPV	SQ	EX	1	D	A	C	O	N/A	--	X P	E2 2 yrs
~~F005~~	4	~~Depressurization valve (DPV) on the line branching from each main steamline~~	~~SQ~~	~~EX~~	~~1~~	~~D~~	~~A~~	~~C~~	~~O~~	~~N/A~~	~~—~~	~~X~~	~~E2~~
F010	1	~~Main steamline (MSL)~~Inboard MSIV upstream drain line inboard containment isolation valve	GT QBL ~~GB~~	NO	1	A	A	O	C	C	Y	L P SC FC	App J -2 yrs~~YR~~ 3 mo 3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F011	1	~~MSL~~ Inboard MSIV upstream drain line outboard containment isolation valve	GT QBL ~~GB~~	AO	1	A	A	O	C	C	Y	L P SC FC	App J -2 yrs~~YR~~ 3 mo 3 mo
F016	4	~~MSL down~~Outboard MSIV upstream drain line outboard containment isolation valve	GT QBL ~~GB~~	N~~M~~O	1	A	A	O	O/C	~~N/A~~C	Y	L P SC SO FC	App J 2 yrs~~YR~~ 3 mo 3 mo 3 mo
F715	4	Excess flow check valve – MSL flow restrictor instrument line (g63)~~, (g4)~~	~~QBL~~ ~~GB~~CK	SA	2	A, C	A	O	O/C	N/A	Y	L~~, S~~ SO SC	App J RO RO
F713	4	Excess flow check valve – MSL flow restrictor instrument line (g63)~~, (g4)~~	~~QBL~~ ~~GB~~CK	SA	2	A, C	A	O	O/C	N/A	Y	L~~, S~~ SO SC	App J RO RO
F026	1	RPV top head vent inboard shutoff valve (g2~~1~~)	QBL~~,~~ GT	~~M~~NO	1	B	A	C	C	~~N/A~~as -is	--	P SC ~~OMN1SC~~	2 yrs~~YR~~ CS~~RO~~ ~~OMN1~~

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F027	1	RPV top head vent outboard shutoff valve (g2)	QBL, GT	MNO	1	B	A	C	C	N/A as-is	--	P SC OMN1 SC	2 yrs YR CS RO OMN1
F007	102	SRV discharge line inboard vacuum breaker (g11)	VB	SA	3	C	A	C	O/C	N/A	--	R SC SO	10 yrs RO RO RO
F008	102	SRV discharge line outboard vacuum breaker (g11)	VB	SA	3	C	A	C	O/C	N/A	--	R SC SO	10 yrs RO RO RO
F035	10	SRV pneumatic supply line check valve (g12)	CK	SA	3	C	A	C	C	N/A	--	SC SO	RO RO
F031	4	Inboard MSIV air supply line check valve (g13)	CK	SA	3	C	A	C	O/C	N/A	--	SO R SC	RO 5 YR RO
F033	4	Outboard MSIV air supply line check valve (g13)	CK	SA	3	C	A	C	C	N/A	--	SC SO	RO RO
F028	18	Rupture Disk	RD	SA	3	D	A	C	O/C	N/A	--	R DR	5 yrs YR

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
B32 Isolation Condenser System Valves													
F001	4	Steam supply line isolation valve	GT QBL	NMO	1	A	A	O	O/C	~~Ai~~as-is	Y	L P SC SO	App J 2 ~~YR~~yrs 3 mo 3 mo
F002	4	Steam supply line isolation valve	GT QBL	N~~M~~MO	1	A	A	O	O/C	~~Ai~~as-is	Y	L P SC SO	App J 2 ~~YR~~yrs 3 mo 3 mo
F003	4	Condensate return line isolation valve	GT QBL	N~~M~~MO	1	A	A	O	O/C	as-is~~AI~~	Y	L P SC SO	App J 2 ~~YR~~yrs 3 mo 3 mo
F004	4	Condensate return line isolation valve	GT QBL	NMO	1	A	A	O	O/C	~~Ai~~as-is	Y	L P SC SO	App J 2 ~~YR~~yrs 3 mo 3 mo
F005	4	Condensate return valve	GT QBL	NMO	1	B	A	C	O	~~Ai~~as-is	--	P SO	2 yrs 3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F006	4	Condensate return bypass valve	QBF GB	NO	1	B	A	C	O	O	--	P SO FO	2 yrs 3 mo 3 mo
F007	4	Condenser upper header vent valve ~~(g5)~~	QBL GB	SO	2	A	A	C	C	C	--Y	L P SC FC	App J 2 ~~YR~~yrs 3 mo 3 mo
F008	4	Condenser upper header vent valve ~~(g5)~~	QBL GB	SO	2	A	A	C	C	C	Y	L P SC FC	App J 2 ~~YR~~yrs 3 mo 3 mo
F009	4	Condenser lower header vent valve ~~(g5)~~	QBL GB	SO	2	A	A	C	C	C	Y	L P SC FC	App J 2 ~~YR~~yrs 3 mo 3 mo
F010	4	Condenser lower header vent valve ~~(g5)~~	QBL GB	SO	2	A	A	C	C	C	Y	L P SC FC	App J 2 ~~YR~~yrs 3 mo 3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F011	4	Bypass lower header vent valve ~~(g5)~~	QBL GB	SO	2	A	A	C	C	C	Y	L P SC FC	App J 2 ~~YR~~yrs 3 mo 3 mo
F012	4	Bypass lower header vent valve ~~(g5)~~	QBL GB	SO	2	A	A	C	C	C	Y	L P SC FC	App J 2 ~~YR~~yrs 3 mo 3 mo
F013	4	Condenser purge line isolation valve	QBL GB	~~N~~SO	1	A	~~P~~A	O	O/C	C	Y	SO SC FC P L	3 mo 3 mo 3 mo 2 ~~YR~~yrs App J
F014	4	Condenser purge line isolation valve (g~~43~~)	~~XFC~~CK	SA	1	A, C	A	~~O~~A	O	~~O~~N/A	Y	L P SO SC	App J 2 ~~YR~~yrs RO RO
F104	4	Dryer/Separator Storage Pool valve	~~QBF,~~ ~~QBL,~~ ~~GT~~SQ	EX	3	D~~B~~	A	C	O	N/A	--	~~S~~X	~~RO~~E2

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
~~F015~~	~~4~~	~~High Pressure Nitrogen check valve~~			~~2~~	~~C~~	~~A~~					~~S~~	~~RO~~
~~F016~~	~~4~~	~~High Pressure Nitrogen to F004 check valve~~	~~CK~~	~~SA~~	~~2~~	~~C~~	~~A~~	~~C~~	~~C~~	~~N/A~~	~~--~~	~~SO~~ ~~SC~~	~~RO~~ ~~RO~~
F017	4	High Pressure Nitrogen check valve (g5)	CK	SA	2	C	A	C	C	N/A	--	SO SC	RO RO
F018	4	High Pressure Nitrogen check valve (g5)	CK	SA	2	C	A	C	C	N/A	--	SO SC	RO RO
F701	4	Excess flow check valve – steam supply line differential pressure instrument sensing line ~~(g4)~~ (g~~6~~3)	~~QBL,~~ ~~GT,~~ ~~GB~~CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO
F703	4	Excess flow check valve – steam supply line differential pressure instrument sensing line ~~(g4)~~ (g~~6~~3)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO

Table 3.9-8

In-Service Testing

No.	Qty	Description [g]	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F705	4	Excess flow check valve – steam supply line differential pressure instrument sensing line ~~(g4)~~ (g63)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO
F707	4	Excess flow check valve – steam supply line differential pressure instrument sensing line ~~(g4)~~ (g63)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO
F709	4	Excess flow check valve – condensate return line differential pressure instrument sensing line ~~(g4)~~ (g63)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO
F711	4	Excess flow check valve – condensate return line differential pressure instrument sensing line ~~(g4)~~ (g63)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs~~R~~ RO ~~3 mo~~RO

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F713	4	Excess flow check valve – condensate return line differential pressure instrument sensing line ~~(g4)~~ (g63)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO
F715	4	Excess flow check valve – condensate return line differential pressure instrument sensing line ~~(g4)~~ (g63)	CK	SA	2	A, C	A	O	O/C	N/A	Y	L P SC SO	App J 2 yrs RO ~~3 mo~~RO
C12 Control Rod Drive System Valves													
F022	1	High pressure makeup line check valve (g~~73~~)	CK	SA	2	C	A	O	O/C	N/A	~~Y--~~	SO SC ~~L~~	RO RO ~~App J~~
D005	~~177~~ 269	Ball check valve – CRD drive insert line (g~~73~~)	CK	SA	~~32~~	C	A	O	O/C	N/A	~~Y--~~	SO SC ~~L~~	RO RO ~~App J~~

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
C41 Standby Liquid Control (SLC) System Valves													
F002A/ B/C/D	4	SLC injection line shutoff valve (g17)	QBL~~,~~ GT	AO	2	B	A	O	O/C	~~O~~as-is~~A~~	--	SO SC ~~FO~~ P	~~3 mo~~RO ~~3 mo~~RO ~~3 mo~~ 2 yrs
F003A/ B/C/D	4	SLC injection line squib valve	SQ	EX	1	A, D	A	C	O	N/A	Y	X L	E2 App J
F004A/ B	2	SLC injection line outboard check valve (g14~~5~~)	CK	SA	1	A, C	A	C	O/C	N/A	Y	L SC SO	App J RO RO
F005A/ B	2	SLC injection line inboard check valve (g14~~5~~)	CK	SA	1	A, C	A	C	O/C	N/A	Y	L SC SO	App J RO RO
~~F028A/ B~~	~~2~~	~~SLC accumulator tank nitrogen charging line check valve~~	~~CK~~	~~SA~~	~~2~~	~~C~~	~~A~~	~~C~~	~~C~~	~~N/A~~	~~--~~	~~SO~~ ~~SC~~	~~3 mo~~ ~~3 mo~~

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
~~F029A/B~~	~~2~~	~~SLC accumulator tank motor operated nitrogen makeup valve~~	~~QBL, GT, GB~~	~~AO~~	~~2~~	~~B~~	~~A~~	~~C~~	~~C~~	~~C~~	--	~~SC~~ ~~FC~~ ~~P~~	~~3 mo~~ ~~3 mo~~ ~~2 yrs~~
F030A/B	2	SLC accumulator tank relief valve	RV~~F~~	SA	2	C	A	C	O/C	N/A	--	R	10 yrs
F507 A/B	2	SLC accumulator tank inboard ~~solenoid operated~~ vent valve ~~(g3)~~	GB	AO	2	B	A	C	O/C	C	--	P SC SO FC	2 yrs ~~RO~~3 mo ~~RO~~3 mo ~~RO~~3 mo
F508 A/B	2	SLC accumulator tank outboard ~~solenoid operated~~ vent valve ~~(g3)~~	GB	AO	2	B	A	C	O/C	C	--	P SC SO FC	2 yrs ~~RO~~3 mo ~~RO~~3 mo ~~RO~~3 mo
D11 Process Radiation Monitoring System Valves													
F001	1	Drywell Fission Product Monitoring Line Inboard isolation Valve	GB	SO	2	A	A	O	C	C	Y	SC FC P L	-3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F002	1	Drywell Fission Product Monitoring Line Outboard isolation Valve	GB	SO	2	A	A	O	C	C	Y	SC FC P L	-3 mo 3 mo 2 yrs App J
F003	1	Drywell Fission Product Monitoring Line Outboard isolation Valve	GB	SO	2	A	A	O	C	C	Y	SC FC P L	-3 mo 3 mo 2 yrs App J
F004	1	Drywell Fission Product Monitoring Line Inboard isolation Valve	GB	SO	2	A	A	O	C	C	Y	SC FC P L	-3 mo 3 mo 2 yrs App J
T62 Containment Monitoring System Valves													
F007 B/C	2	Gas Sample Return to Drywell	GB ~~,~~QT	SO AO	2	~~C~~A	A	O	O	O	Y	SO ~~SC~~FO L	3 mo 3 mo App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F010 B/C	2	Gas Sample Return to Drywell	GB~~,~~ QT	SO AO	2	~~C~~A	A	O	O	O	Y	SO ~~SC~~FO L	3 mo 3 mo App J
F002 B/C	2	Drywell to Sample Rack	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F004 B/C	2	Drywell to Sample Rack	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F005 B/C	2	Gas Sample Return to Containment	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F006 B/C	2	Gas Sample Return to Wetwell	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F009 B/C	2	Gas Sample Return to Wetwell	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F013 A/B	2	Gas Sample Return from Containment to Sample	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F014 A/B	2	Isolation to Skid for CAM Sample	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F015	1	Isolation for Gas Sample Return to Containment	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F016	1	Isolation for Gas Sample Return to Containment	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F021	1	RCCW Supply to CMS Skid	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F022	1	RCCW Supply to CMS Skid	GB~~,~~ QT	SO AO	2	~~B~~A	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F023	1	RCCW Return from CMS Skid	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y–	SO FO P L	3 mo 3 mo 2 yrs App J
F024	1	RCCW Return from CMS Skid	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F025	1	Liquid Sample Return to Suppression Pool	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F701 A/B/C/ D	4	Suppression Pool Level Narrow Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F703 A/B/C/ D	4	Suppression Pool Level Narrow Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F705 B/C	2	Suppression Pool Level Wide Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F707 B/C	2	Suppression Pool Level Wide Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F709 A/B	2	Drywell Level Isolation	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F711 A/B	2	Drywell Level Isolation	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F713 A/B	2	Drywell/Wetwell Level Isolation	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F715	1	Drywell Level Isolation	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F717 A/B	2	Drywell Level Isolation	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F719 A/B/C/ D	4	Drywell Level Isolation	GB~~,~~ QT	SO AO	2	A~~B~~	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F721 A/B	2	Drywell Level Isolation	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F735 B	1	Containment Flood Level Wide Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F737 B	1	Containment Flood Level Wide Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F765 C	1	Suppression Pool Level Wide Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J
F767 C	1	Suppression Pool Level Wide Range	GB, QT	SO AO	2	AB	A	O	O	O	Y	SO FO P L	3 mo 3 mo 2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
E50 Gravity-Driven Cooling System Valves													
F001	8	GDCS injection line manual shutoff valve	GT, QBL	M	1	B	P	O	O	N/A	--	P	2 yrs
F002	8	GDCS injection squib actuated valve	SQ	EX	1	D	A	C	O	N/A	--	X P	E2 2 yrs
F003	8	GDCS check valve (g~~8~~1)	CK	SA	1	C	A	O	O/C	N/A	--	~~L~~ SC SO P	~~RO~~ RO~~3 mo~~ RO~~3 mo~~ 2 yrs
F004	4	GDCS manual shutoff valve	GT, QBL	M	3	B	P	O	O	N/A	--	P	2 yrs
F005	4	GDCS equalization line manual shutoff valve	GT, QBL	M	1	B	P	O	O	N/A	--	P	2 yrs
F006	4	GDCS equalization squib actuated valve	SQ	EX	1	D	A	C	O	N/A	--	X P	E2 2 yrs

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F007	4	GDCS check valve (g~~81~~)	CK	SA	1	C	A	O	O/C	N/A	--	~~L~~ SO SC P	~~RO~~ RO~~3 mo~~ RO~~3 mo~~ 2 yrs
F008	4	GDCS manual shutoff valve	GT~~,~~ QBL	M	3	B	P	O	O	N/A	--	P	2 yrs
F009	12	GDCS deluge squib valve	SQ	EX	3	D	~~A~~P	C	C~~O~~	N/A	--	X P	E2 2 yrs
F010	~~412~~	GDCS ~~motor operated~~ deluge line isolation valve	QBL~~,~~ GT	~~MO~~ NO	3	B	P	O	O	~~N/A~~as -is	--	~~OMN1SO~~ P	~~OMN1~~ 2 yrs
G21 Fuel and Auxiliary Pools Cooling System (FAPCS) Valves													
F210	1	Emergency makeup spent fuel pool water line check valve ~~(g3)~~	CK	SA	3	C	A	O	O/C	N/A	--	SO SC	~~RO~~3 mo ~~RO~~3 mo
F211	1	Emergency makeup spent fuel pool water line shutoff valve ~~(g3)~~	QBL~~,~~ GT	M	3	B	A	C	O	N/A	--	SO	~~RO~~2 yrs
F212	1	Reactor well drain line containment isolation valve	QBL GT	M	2	A	P	C	C	N/A	Y	P L	2 yrs App J

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F213	1	Reactor well drain line containment isolation valve	QBL GT	M	2	A	P	C	C	N/A	Y	P L	2 yrs App J
F303	1	GDCS pool return line outboard isolation valve	GT QBL	AO	2	A	A	C	C	C	Y	SC FC L P	3 mo 3 mo App J 2 yrs
F304	1	GDCS pool return line inboard isolation check valve ~~(g1)~~	CK	SA	2	A, C	A	C	C	N/A	Y	SO SC L	~~RO~~3 mo ~~RO~~3 mo App J
F306A/ B	2	Suppression pool return line outboard isolation valve	GT QBL	NMO	2	A	A	C	C	~~N/A~~as -is	Y	SC L P	3 mo App J 2 yrs
F307A/ B	2	Suppression pool return line inboard isolation check valve ~~(g1)~~	CK	SA	2	A, C	A	C	C	N/A	Y	SO SC L	~~RO~~3 mo ~~RO~~3 mo App J
F309	1	Drywell spray line outboard isolation valve	G~~B~~T QBL	AO	2	A	A	C	C	C	Y	SC FC L P	3 mo 3 mo App J 2 yrs

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F310	1	Drywell spray line inboard isolation check valve (g15)	CK	SA	2	A, C	A	C	C	N/A	Y	SO SC L	RO RO App J
F323	1	GDCS pool suction line inboard isolation valve	~~GT~~QBL GB, AF	AO	2	A	A	C	C	C	Y	SC FC L P	3 mo 3 mo App J 2 yrs
F324	1	GDCS pool suction line outboard isolation valve	GT QBL	NMO	2	A	A	C	C	~~C~~as-is	Y	SC ~~FC~~ L P	3 mo ~~3 mo~~ App J 2 yrs
F321A/B	2	Suppression pool suction line outboard isolation valve	GT QBL	NMO	2	A	A	C	C	~~N/A~~as-is	Y	SC L P	3 mo App J 2 yrs
F322A/B	2	Suppression pool suction line outboard isolation valve	GT QBL	NMO	2	A	A	C	C	~~N/A~~as-is	Y	SC L P	3 mo App J 2 yrs

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F335A/ B	2	LPCI check valve (g16)	CK	SA	2	C	A	C	C	~~C~~N/A	--	SO SC ~~L~~	RO RO ~~App J~~
F333A/ B	2	LPCI testable check valve (g16)	CK	AO	2	A, C	A	C	C	~~N/A~~C	--	SC SO FC L P	RO RO RO 2 yrs 2 yrs
F420	1	Emergency makeup IC/PCC pool water line shutoff valve ~~(g3)~~	QBL~~,~~ GT	M	3	B	A	C	O	N/A	--	SO	2 yrs
F421	1	Emergency makeup IC/PCC pool water line check valve ~~(g3)~~	CK	SA	3	C	A	C	O/C	N/A	--	SO SC	~~RO~~3 mo ~~RO~~3 mo
F426A/ B	2	FPS water makeup valve to IC/PCC pool ~~(g3)~~	QBL~~,~~ GT	M	3	B	A	C	O	N/A	--	SO	2 yrs

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F427A/ B	2	FPS water makeup check valve to IC/PCC pool ~~(g3)~~	CK	SA	3	C	A	C	O/C	N/A	--	SO SC	~~RO~~3 mo ~~RO~~3 mo
F428A/ B	2	FPS water makeup valve to Spent Fuel Pool ~~(g3)~~	QBL~~,~~ GT	M	3	B	A	C	O	N/A	--	SO	2 yrs
F429A/ B	2	FPS water makeup valve to Spent Fuel Pool ~~(g3)~~	CK	SA	3	C	A	C	O/C	N/A	--	SO SC	~~RO~~3 mo ~~RO~~3 mo
G31 Reactor Water Cleanup/Shutdown Cooling System Valves													
F002A/ B	2	RWCU/SDC mid-vessel suction line inboard isolation valve ~~(g1)~~	~~GT~~QBL GB AF	NO	1	A	A	O	C	C	Y	L P SC FC	App J 2 yrs ~~RO~~3 mo ~~RO~~3 mo
F003A/ B	2	RWCU/SDC mid-vessel suction line outboard isolation valve	GT QBL AF	AO	1	A	A	O	C	C	Y	L P SC FC	App J 2 yrs ~~RO~~3 mo ~~RO~~3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F007A/B	2	RWCU/SDC bottom head suction line inboard isolation valve ~~(g1)~~	~~GT~~QBL GB AF	NO	1	A	A	O	C	C	Y	L P SC FC	App J 2 yrs ~~RO~~3 mo ~~RO~~3 mo
F008A/B	2	RWCU/SDC bottom head suction line outboard isolation valve	GT QBL AF	AO	1	A	A	O	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
~~F022~~	~~2~~	~~RWCU/SDC to FW injection line motor-operated valve~~	~~QBL, GT~~	~~MO~~	~~2~~	~~B~~	~~A~~	~~O~~	~~N/A~~	~~N/A~~	~~–~~	~~OMN1SO P~~	~~OMN1 2 yrs~~
~~F023~~	~~2~~	~~RWCU/SDC to FW injection line check valve (g1)~~	~~CK~~	~~SA~~	~~2~~	~~A, C~~	~~A~~	~~O~~	~~C~~	~~N/A~~	~~–~~	~~L SC SO~~	~~2 yrs RO RO~~
~~F024~~	~~2~~	~~RWCU/SDC to FW injection line check valve (g1)~~	~~CK~~	~~SA~~	~~2~~	~~A, C~~	~~A~~	~~O~~	~~C~~	~~N/A~~	~~–~~	~~L SC SO~~	~~2 yrs RO RO~~

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F038A/B	2	RWCU/SDC bottom head suction line sample line inboard isolation valve ~~(g1)~~	GB	SO	1	A	A	C	O/C	C	Y	L P SO SC FC	App J 2 yrs ~~RO~~3 mo ~~RO~~3 mo ~~RO~~3 mo
F039A/B	2	RWCU/SDC bottom head suction line sample line outboard isolation valve	GB	SO	1	A	A	C	O/C	C	Y	L P SO SC FC	App J 2 yrs 3 mo 3 mo 3 mo
U50 Equipment and Floor Drain System Valves													
F	1	~~EFDS~~ Drywell equipment drain (LCW) sump discharge line inboard isolation valve	QBL~~,~~ GB AF~~T~~	NO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F	1	Drywell equipment drain (LCW) sump discharge line outboard isolation valve	QBL~~,~~ GT	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F	1	Drywell floor drain (HCW) sump discharge line inboard isolation valve	QBL~~,~~ GB AF~~T~~	NO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F	1	Drywell floor drain (HCW) sump discharge line outboard isolation valve	QBL~~,~~ GT	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
P10 Makeup Water System													
F016	1	Demin water drywell distribution system inboard containment isolation valve	CK	SA	2	A	P	C	C	N/A	Y	L P	App J 2 yrs
F015	1	Demin water drywell distribution system outboard containment isolation valve	GT QBL	M	2	A	P	C	C	N/A	Y	L P	App J 2 yrs
P25 Chilled Water System Valves													
F023A/ B	2	Chilled water supply line to drywell cooler outboard isolation valve (g183)	GT~~B~~ QBL	SO	2	A	A	O~~C~~	C	C	Y	L P SC FC	App J 2 yrs CS CS

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F024A/ B	2	Chilled water supply line to drywell cooler inboard isolation valve (g18~~1~~)	QBL GB AF	NO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs RO RO
F025A/ B	2	Chilled water return line from drywell cooler inboard isolation valve (g18~~1~~)	QBL GB AF	NO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs RO RO
F026A/ B	2	Chilled water return line from drywell cooler outboard isolation valve (g18~~3~~)	GT~~B~~ QBL	SO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs CS CS
P51 Service Air System													
F		Service air system inboard containment isolation valve	GB, QBL	M	2	A	P	C	C	N/A	Y	L P	App J 2 yrs
F		Service air system outboard containment isolation valve	GB QBL	M	2	A	P	C	C	N/A	Y	L P	App J 2 yrs

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
P54 High Pressure Nitrogen Supply System Valves													
F026	1	N2 supply line outboard isolation valve to MSIV and other uses	QBL QBF~~T~~	AO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F027	1	N2 supply line inboard check valve ~~(h)~~ to MSIV and other uses (g5)	CK	SA	2	A, C	A	O/C	C	N/A	Y	L SC SO	App J RO RO
F009	1	N2 supply line outboard isolation valve to ADS, SRV and ICIV accumulator	QBL QBF~~T~~	AO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F010	1	N2 supply line inboard isolation check valve to ADS, SRV and ICIV accumulator ~~(h)~~(g5)	CK	SA	2	A, C	A	O/C	C	N/A	Y	L SC SO	App J RO RO

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
T10 Containment													
F001	3	Drywell wetwell vacuum breaker isolation valve	QBF QBL~~T~~	NO, SO	2	~~B~~A	A	O	~~C~~/O/C	~~A~~as-is	--	P L SO SC	2 yrs 2 yrs 3 mo 3 mo
F002	3	Drywell wetwell vacuum breaker valve	~~CK~~VB	~~VB~~ SA	2	A, C	A	C	O/C	N/A	--	SO SC L P R	3 mo 3 mo 2 yrs 2 yrs ~~E3~~10 yrs
T31 Containment Inerting System Valves													
F012	1	Suppression pool exhaust line outboard isolation valve (g19)	QBF QBL	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs RO RO
F007	1	Air/N2 supply line to suppression pool outboard isolation valve (g19)	QBF QBL	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs RO RO

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F008	1	Air/N2 supply line to outboard isolation valve (g19)	QBF QBL	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs RO RO
F009	1	Air/N2 supply line to upper drywell outboard isolation valve (g19)	QBF QBL	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs RO RO
F023	1	N2 makeup line outboard isolation valve	~~G~~QBF QBL	AO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F024	1	N2 makeup line to suppression pool outboard isolation valve	~~G~~QBF QBL	AO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs ~~RO~~3 mo ~~RO~~3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F025	1	N2 makeup line to upper drywell outboard isolation valve	~~G~~QBF QBL	AO	2	A	A	O	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F010	1	Lower drywell exhaust line outboard isolation valve	QBF QBL	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F011	1	Containment atmospheric exhaust line outboard isolation valve	QBF QBL	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo
F014	1	Containment atmospheric bleed line outboard isolation valve	QBL GB	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs ~~RO~~3 mo ~~RO~~3 mo

Table 3.9-8

In-Service Testing

No.	Qty	Description (g)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
F015	1	Containment atmospheric bleed line outboard isolation valve	QBL GB	AO	2	A	A	C	C	C	Y	L P SC FC	App J 2 yrs 3 mo 3 mo

Notes:

a) 1, 2 or 3 – ASME Section III Code classes per, Section 3.2.

b) Valve actuators:

AO Air operated

EX Explosively actuated

NO Nitrogen operated

NMO Nitrogen motor operated

M Manually operated

MO Motor operated

SA Self-actuated

SO Solenoid operated

~~SQ — Squib. This valve is a one-time-use valve designed as a single machined forging with a breakaway outlet cap. The valve is open by a pyrotechnic actuator that drives a shear plunger against the edge of the cap.~~

~~VB — Vacuum Breaker. Valves that provide pressure relief when a set pressure value is exceeded or when a set differential pressure is exceeded across the valve.~~

c) A, B, C or D – Valve category per ASME OM Code –Subsection ISTC-1300.

d) Valve Function:

A or P – Active or passive per ASME OM Code – Paragraph ISTC-1300.

e) Valve test parameters per ASME OM Code – Subsection ISTC and Appendix I:

L Seat leakage rate (Paragraph ISTC-3600 and DCD Tier 2 Subsection 6.2.6.3

~~OMN1SC — Full cycle exercise and stroke closed design basis verification tests in accordance with ASME Code Case OMN-1~~

~~OMN1SO — Closure exercise and design basis verification tests in accordance with ASME Code Case OMN-1~~

P Valve position verification (Paragraph ISTC-3700)

R Safety and relief test including visual examination, set pressure and seat tightness testing in accordance Paragraph ISTC-3000, -5230, -5240, Table ISTC-3500-1, Note (2), and Appendix I). Category A and B requirements for safety and relief valves of ISTC-3500 and ISTC-3700 are excluded per ISTC-1200.

SO Open stroke tests for Category A and B valves (Paragraph ISTC-3521) and Category C valves (Paragraph ISTC-3522)

SC Closure stroke tests for Category A and B valves (Paragraph ISTC-3521) and Category C valves (Paragraph ISTC-3522)

FO Fail open tests for Category A and B valves (Paragraph ISTC-3560)

FC Fail closed tests for Category A and B valves (Paragraph ISTC-3560)

X Explosively actuated valve tests (Paragraph ISTC-5260)

~~Visual~~RDR ~~Visual examination~~5-year replacement of rupture disk (Paragraph I-3340 and I-3360)

f) Valve test frequency for the specified test parameter including summary of exclusions and alternatives per ASME OM Code – Subsection ISTC and Appendix I:

CS Cold shutdown

RO Refueling outages. For position verification: refueling outages, but in no case greater than two years.

~~E1 Valves used only for operating convenience, i.e., passive vent, drain, instrument, test, maintenance and system control valves. These valves are not required for primary containment isolation. Tests are not required per Paragraph ISTC-1200 (i.e., the valves are exempt per the criteria given in ISTC-1200).~~

E2 Fired and replaced per Paragraph ISTC-5260.

~~E3 Test scheduled per Appendix I, Paragraph I-3000.~~

~~OMN1 Exercise and performance based test frequencies in accordance with ASME Code Case OMN-1~~

App J Per Appendix J requirements

g) ~~Summary j~~Justifications for code defined testing exceptions or alternatives as allowed by Paragraphs ISTC-3510 for exercising tests and ISTC-3630 for seat leakage rate tests are as follows.

g1) Paragraph ISTC-3600 (leak testing requirements) is not applicable to these valves since they function in the course of plant operation in a manner that demonstrates functionally adequate seat leak-tightness.
g2) Although these valves could be tested one at a time at power, there is a risk of depressurizing the reactor.
g3) Not used.
g4) These valves cannot be tested at power because a reverse flow cannot be established.
g5) These valves are installed in nitrogen supply lines to nitrogen-operated valves. If the main valve is tested quarterly, the opening function of the check valve will be tested as part of that test. Otherwise the check valve cannot be tested without potentially stroking the main valve. The closing function cannot be tested at power because a reverse flow cannot be established.
g6) These valves are installed in sensing lines. Valve opening is verified by the continued operation of the sensor. High flow cannot be established through these valves at power to verify valve closure.
g7) These valves cannot be tested for opening at power because of the potential for moving the control rods and cannot be tested for closing at power because a reverse flow cannot be established.
g8) There are squib valves in series with these valves; therefore, normal flow cannot be established through the line. Since the valves are inside containment, an alternate test method using test connections cannot be used.

g9) Valve opening is verified during normal plant operation. Valve closing cannot be verified without stopping feedwater flow in the train.
g10) These valves cannot be stroked without interrupting main steam flow.
g11) Normal flow through these valves cannot be established at power without lifting an SRV. Since the valves are inside containment, an alternate test method using test connections cannot be used.
g12) These valves cannot be tested at power without potentially operating an SRV.
g13) These valves cannot be tested at power without potentially operating an MSIV.
g14) There are squib valves in series with these valves; therefore, normal flow cannot be established through the line. There is a test connection upstream of the valves; however, using this connection to test at power would inject cold water into the reactor.
g15) Normal flow cannot be established without initiating Drywell Spray. Since the valves are inside containment, an alternate test method using test connections cannot be used.
g16) Normal flow cannot be established because RWCU/SDC system pressure exceeds FAPCS system pressure.
g17) These valves are the SLC injection line shutoff valves. If this test is performed on-line and the valve fails in a non-conservative position (i.e., closed), a total loss of system function would occur.
g18) These valves are the chilled water system isolation valves. Since both trains are required to be operable during plant operation, failure of one of these valves during a test would render the system out-of-service.
g19) Although these valves could be tested one-at-a-time during power operation, there is a risk of purging/venting the containment during this test.
g20) These valves cannot be tested at power without interrupting feedwater flow.

~~g1) Inaccessible inerted containment and/or steam tunnel radiation during power operations.~~

~~g2) Avoid valve damage during power operations.~~

~~g3) Avoid impacts on power operations.~~

~~g4) May not be Category C tested, but is subject to the periodic Category A test per DCD Tier 2 Subsection 6.2.6.3 for instrument lines that penetrate containment.~~

~~g5) These lines are subject to periodic Category A test for verifying their leak tight integrity and may not be Category C tested.~~

~~g6) These lines terminate below the drywell sumps water level and are sealed from the containment atmosphere. No Category C leakage rate test is required.~~

h) General Note on Check Valves: To satisfy the requirement for position verification of ISTC-3700 for check valves, where local observation is not possible, other indications are used for verification of valve operation.

i) Valve Types (See Table 6.2-15 for a more detailed description of valve types):

GT Gate valve

GB Globe valve

QT Quarter-turn valve

QBL Quarter-turn ball valve

QBF Quarter-turn butterfly valve

AF Axial-flow valve

CK Check valve

RD Rupture ~~D~~disk

RV Safety and ~~R~~relief valve

SQ Squib valve

VB Vacuum ~~B~~breaker