



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

December 15, 2010  
U7-C-STP-NRC-100269

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
One White Flint North  
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Rockville, MD 20852-2738

South Texas Project  
Units 3 and 4  
Docket Nos. 52-012 and 52-013  
Supplemental Response to Request for Additional Information

Attached are supplemental responses to NRC staff questions included in Request for Additional Information (RAI) letter number 152 related to Combined License Application (COLA) Part 2, Tier 2, Section 3.9.6. The Attachments provide the supplemental responses to the RAI questions listed below:

03.09.06-5

03.09.06-7

Where there are COLA markups, they will be made at the first routine COLA update following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions regarding this response, please contact me at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

STI 32798955

DOA1  
NRO

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

Executed on 12/15/10



Scott Head  
Manager, Regulatory Affairs  
South Texas Project Units 3 & 4

jep

Attachments:

1. RAI 03.09.06-5, Supplement 1
2. RAI 03.09.06-7, Supplement 1

cc: w/o attachments and enclosure except\*  
(paper copy)

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**RAI 03.09.06-5, Supplement 1****QUESTION:**

ABWR DCD Tier 2, Table 3.9-8 includes Note i1 for the Residual Heat Removal System fill pump, which is referred to as a summary justification for a “code exemption request” to not include flow measurement. The STP COL applicant is requested to discuss this “code exemption request” and its justification for STP Units 3 & 4. See RG 1.206 for guidance on information to support requests for relief from the ASME OM Code.

**SUPPLEMENTAL RESPONSE:**

The following markup to COLA Section 3.9.6.9.3 is being provided as a supplemental response to RAI 03.09.06-5, to provide the requested code exemption request information.

Section 3.9.6.9.3, as shown below, is being added to provide the type of information discussed in NEI White Paper “Standard Format for Requests from Commercial Reactor Licensees Pursuant to 10 CFR 50.55a,” dated June 2004.

**3.9.6.9.3 Relief Requested Pursuant to 10CFR 50.55a(f)(5)(iii) for Testing RHR Fill Pumps.**

OM-2004 Table ISTB-3000-1 requires measurement of flow rate (Q) for all pumps during Group A, Group B and Comprehensive Tests. The three RHR System Fill Pumps (E11-C002) are classified as Group A pumps. STP proposes not to meet the OM-2004 ISTB-3000 requirement to measure flow rate during Group A and Comprehensive Tests for the RHR system fill pumps, as indicated in Note (i1) in Table 3.9-8.

As described in Section 6.3.2, the primary function of the RHR System Fill Pumps is to maintain a water solid condition in the RHR pump discharge piping, and the piping will be maintained full by a small fraction of the pump's flow capacity. The RHR System Fill Pumps are expected to run continuously providing a small makeup flow to compensate for any back leakage through the RHR system. These pumps will provide a low flow rate that is dependent on the piping system leakage characteristics at any given time. Without a constant, explicit, and definable piping system leak rate and path, the system resistance and make up requirements cannot be set. Therefore, the pump flow rate may vary considerably around a small value and these variations likely would exceed the ISTB-5221 Acceptance Criteria, but actually be due to variations in RHR system back leakage rather than the pump's hydraulic performance. Accordingly, it is impractical to perform the measurement of flow rates for the three RHR System Fill Pumps, as designed, to obtain meaningful results.

The RHR System Fill Pump will be designed so that they will normally operate in the flat region of the pump pressure-flow performance curve. The pumps will be designed and analyzed to continuously operate in this low-flow regime without any significant pump degradation. Since the pump will normally be operating on the flat region of the pump

performance curve, the pump differential pressure is the hydraulic parameter of interest in monitoring pump nonperformance. The ISTB-3000 requirement for measuring pump differential pressure as well as peak vibration velocity, as reflected in Table 3.9-8, will assure detection of any significant degradation in the pumps' hydraulic or mechanical performance. In addition, SR 3.5.1.1 in Chapter 16 requires the physical confirmation of a water solid RHR pipeline by opening a high point vent to confirm solid water flow on a 31-day frequency and RHR system pressure is continuously monitored and alarmed in the control room.

In lieu of measuring flow rate, the use of pumps that are designed and analyzed to ensure both that the expected flow rate stays well within the flat portion of the pressure-flow curve and that no significant degradation occurs with the expected continuous low flow operation, combined with the proposed testing and system monitoring, will provide an acceptable level of quality and safety.

**RAI 03.09.06-7, Supplement 1****QUESTION:**

Note (e) in ABWR DCD Tier 2, Table 3.9-8 lists the valve test parameters of the ANSI/ASME OM Standard Part 10. The NRC regulations in 10 CFR 50.55a require that the MOV stroke time testing provisions in the ASME OM Code be supplemented by periodic testing to demonstrate design-basis capability. The STP COL applicant is requested to update the reference to the applicable ASME OM Code to be used in fully describing the IST Program for STP Units 3 & 4. The STP COL applicant is also requested to discuss the "stroke exercise" test parameter and whether its inclusion of stroke time testing and, as applicable, MOV periodic design-basis capability testing.

**SUPPLEMENTAL RESPONSE:**

The following markup to COLA Section 3.9 is being provided as a supplemental response to RAI 03.09.06-7 to provide the correct references to the ASME OM Code. The requested discussion for the "stroke exercise" test parameter was provided in the previous response to RAI 03.09.06-1.

COLA Part 2, Tier 2, Section 3.9S, "Inservice Testing Program (OM-2004)," as shown below, is being added as a new section to incorporate the requirements of OM-2004 and provide the appropriate OM Code references. The new Table 3.9S-1, "Inservice Testing Program Plan," supersedes existing COLA Part 2, Tier 2, Table 3.9-8, "Inservice Testing Safety-Related Pumps and Valves," which will be deleted in its entirety in a future departure.

In response to RAI 03.09.06-8, the revised Note (f) in Table 3.9S-1 herein provides additional justification for the alternative Cold Shutdown and Refuel test frequencies identified in the table. In addition, in response to RAI 03.09.06-9, revised Note (h) in the table provides additional justification for deferring IST for valves where testing might incur valve damage or impact on power operations. Reason h9 under Note (h), "test connection size is insufficient for full flow test during operation," is not utilized and has been revised accordingly.

**3.9S Inservice Testing Program (OM-2004)**

The following site-specific supplement addresses COL License Information Item 3.29.

The Inservice Testing Plan, shown in Table 3.9S-1, has been updated to meet the requirements of ASME OM-2004, and incorporates the testing requirements for MOVs, POVs, and check valves, as well as containment isolation and pressure isolation valves.

Table 3.9S-1, Inservice Testing Program Plan (OM-2004)

MPL	System	Pumps	Valves
B21	Nuclear Boiler		YES
B31	Reactor Recirculation		YES
C12	Control Rod Drive		YES
C41	Standby Liquid Control	YES	YES
C51	Neutron Monitoring (ATIP)		YES
D23	Containment Atmospheric Monitoring		YES
E11	Residual Heat Removal	YES	YES
E22	High Pressure Core Flooder	YES	YES
E31	Leak Detection & Isolation		YES
E51	Reactor Core Isolation Cooling	YES	YES
G31	Reactor Water Cleanup		YES
G41	Fuel Pool Cooling & Cleanup		YES
G51	Suppression Pool Cleanup		YES
K17	Radwaste		YES
P11	Makeup Water (Purified)		YES
P21	Reactor Building Cooling Water	YES	YES
P24	HVAC Normal Cooling Water		YES
P25	HVAC Emergency Cooling Water	YES	YES
P41	Reactor Service Water	YES	YES
P51	Service Air		YES
P52	Instrument Air		YES
P54	High Pressure Nitrogen Gas Supply		YES
P81	Breathing Air System		YES
T22	Standby Gas Treatment		YES
T31	Atmospheric Control		YES
U41	Heating, Ventilating and Air Conditioning		YES
Y52	Oil Storage and Transfer	YES	YES

No.	Qty	Description (h) (i)	Safety Class (a)	Code Category (j)	Test Para (b)	Test Freq (f)	Biennial Comprehensive Tests	Tier 2 Fig. (g)
<b>System Pumps</b>								
C41-C001	2	Standby Liquid Control System Pump	2	B	Q	3 mo	P, Q, Vd or Vv	9.3-1
E11-C001	3	Residual Heat Removal System Pump	2	A	$\Delta P$ , Q, Vv	3 mo	$\Delta P$ , Q, Vv	5.4-10 (Sh. 3, 4, 6)
E11-C002	3	Residual Heat Removal System Fill pump (i1)	2	A	$\Delta P$ , Vv	E10	$\Delta P$ , Vv	5.4-10 (Sh. 3, 4, 6)
E22-C001	2	High Pressure Core Flooder pump	2	B	$\Delta P$ or Q	3 mo	$\Delta P$ , Q, Vd or Vv	6.3-7(Sh. 2)
E51-C001	1	Reactor Core Isolation Cooling pump	2	B	$\Delta P$ or Q, N	3 mo	N, $\Delta P$ , Q, Vd or Vv	5.4-8(Sh. 1)
P21-C001	6	Reactor Building Cooling Water pump	3	A	$\Delta P$ , Q, Vv	E10	$\Delta P$ , Q, Vv	9.2-1 (Sh.1,4,7)
P25-C001	6	HVAC Emergency Cooling Water System pump	3	A	$\Delta P$ , Q, Vv	E10	$\Delta P$ , Q, Vv	9.2-3 (Sh. 1, 2, 3)
P41-C001	6	Reactor Service Water System pump	3	A	$\Delta P$ , Q, Vv	E10	$\Delta P$ , Q, Vv	9.2-7 (Sh. 1, 2, 3)
Y52-C001	6	Standby D/G Fuel Oil Transfer Pump	3	B	$\Delta P$ or Q	3 mo	$\Delta P$ , Q, Vd or Vv	9.5-6



No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
<b>B21 Nuclear Boiler System Valves</b>									
F001	2	Feedwater line motor-operated valve (MOV)	MOV	2	B	P	P	RO	5.1-3 sh. 4
F002	2	Upstream (First) FW line check valve (k3) (h3.1)	CV	2	A, C	A	L,S	RO, RO	5.1-3 sh. 4
F003	2	FW line outboard check valve-air-operated (AO) (k1) (k2) (h1.1)	AOV/CV	1	A, C	I, A	L, P, S	RO, RO,RO	5.1-3 sh. 4
F004	2	FW line inboard check valve (k1) (h1.1)	CV	1	A, C	I, A	L,S	RO, RO	5.1-3 sh. 4
F005	2	FW line inboard maintenance valve	MN	1	B	P		E1	5.1-3 sh. 4
F006	2	RWCU (or CUW) System injection line check valve (k3) (h1.2)	CV	2	A, C	A	L,S	RO, RO	5.1-3 sh. 4
F007	2	RWCU (or CUW) System injection line MOV	MOV	2	B	P		E1	5.1-3 sh. 4
F008	4	Inboard main Steam isolation valve. (MSIV) (k1) (k2) (h1.3)	AOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.1-3 sh. 3
F009	4	Outboard Main Steam isolation valve (MSIV) (k1) (k2) (h1.3)	AOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.1-3 sh. 3
F010	18	Safety/Relief Valve (SRV) (h1.4) (h2.1) (k2)	AOV	1	A, C	A	R,P,S	5yr, RO, RO	5.1-3 Sh. 2
F011	1	MSL bypass/drain line inboard isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.1-3 sh. 3
F012	1	MSL bypass/drain line outboard isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.1-3 sh. 3
F013	1	MSL warmup line valve	MOV	2	B	P		E1	5.1-3 sh. 3
F016	1	MSL downstream drain line header valve	MOV	2	B	P		E1	5.1-3 sh. 3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F017	1	MSL downstream drain line header bypass (k2)	AOV	2	B	A	P, S	RO, 3mo	5.1-3 sh. 3
F018	1	RPV non-condensable gas removal line	MOV	1	B	P		E1	5.1-3 sh. 2
F019	1	RPV head vent inboard shutoff valve (h1.5)	MOV	1	B	A	P, S	RO, RO	5.1-3 sh. 2
F020	1	RPV head vent outboard shutoff valve (h1.5)	MOV	1	B	A	P, S	RO, RO	5.1-3 sh. 2
F021	18	SRV discharge line vacuum breaker (h1.6)	VB	3	C	A	R,S	RO, RO	5.1-3 sh. 2
F022	18	SRV discharge line vacuum breaker (h1.6)	VB	3	C	A	R,S	RO, RO	5.1-3 sh.2
F024	4	Inboard MSIV nitrogen supply line check valve (h1.7)	CV	3	C	A	S	RO	5.1-3 sh. 3
F025	4	Outboard MSIV air supply line check valve (h1.7)	CV	3	C	A	S	RO	5.1-3 sh. 3
F026	8	SRV ADS pneumatic supply line check valve (k3) (h1.7)	CV	3	A, C	A	L,S	RO, RO	5.1-3 sh. 2
F029	18	SRV pneumatic supply check valve (h1.7)	CV	3	C	A	S	RO	5.1-3 sh. 2
F031	2	Inboard valve on the outboard FW line check valve test line	MN	2	B	P		E1	5.1-3 sh. 4
F033	4	Inboard shutoff valve on the outboard MSIV test line	MN	2	B	P		E1	5.1-3 sh. 3
F035	1	Inboard test line valve for the MSL bypass/drain valve	MN	2	B	P		E1	5.1-3 sh. 3
F039	2	Inboard test line valve for the inboard FW line check valve	MN	2	B	P		E1	5.1-3 sh. 4
F040	2	Outboard test line valve for the FW line check valve	MN	2	B	P		E1	5.1-3 sh. 4
F500	2	Inboard test line valve for the first FW line check valve	MN	2	B	P		E1	5.1-3 sh. 4

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F503	2	Outboard drain line valve for the FW line check valve	MN	2	B	P		E1	5.1-3 sh. 4
F508	4	Inboard MSIV accumulator A001 drain valve	MN	3	B	P		E1	5.1-3 sh. 3
F509	4	Outboard MSIV accumulator A002 drain valve	MN	3	B	P		E1	5.1-3 sh. 3
F510	8	SRV ADS accumulator A003 drain valve	MN	3	B	P		E1	5.1-3 sh. 2
F511	18	SRV accumulator A004 drain valve	MN	3	B	P		E1	5.1-3 sh. 2
F700	4	Manual Isolation valve-RPV water level instrument reference leg line	MN	2	B	P		E1	5.1-3 sh. 5,6
F701	4	Excess flow check valve-RPV water level instrument reference leg line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 5,6
F702	4	Manual isolation valve-RPV narrow range water level instrument sensing line	MN	2	B	P		E1	5.1-3 sh. 5,6
F703	4	Excess flow check valve-RPV narrow range water level instrument sensing line (k4) (h3.2))	CV	2	A, C	I, A	S	RO	5.1-3 sh. 5,6
F704	4	Manual isolation valve-RPV wide range water level instrument sensing line	MN	2	B	P		E1	5.1-3 sh. 5,6
F705	4	Excess flow check valve-RPV wide range water level instrument sensing line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 5,6
F706	1	Root valve-Reactor well water level instrument sensing line	MN	2	B	P		E1	5.1-3 sh. 5
F709	1	Manual isolation valve-RPV shutdown range water level instrument reference leg line	MN	2	B	P		E1	5.1-3 sh. 2
F710	1	Excess flow check valve-RPV shutdown range water level instrument reference leg line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 2
F711	1	Manual isolation valve- RPV head seal leakage instrument line	MN	2	B	P		E1	5.1-3 sh. 8
F712	1	Excess flow check valve to RPV head seal leakage instrument line (k4) (h3.3)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 8

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F713	4	Manual isolation valve- RPV above pump deck instrument line	MN	2	B	P		E1	5.1-3 sh. 7
F714	4	Excess flow check valve-RPV above pump deck instrument line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 7
F715	4	Manual isolation valve-RPV below pump deck instrument line	MN	2	B	P		E1	5.1-3 sh. 7
F716	4	Excess flow check valve-RPV below pump deck instrument line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 7
F717	4	Manual Isolation valve-RPV above core plate instrument line	MN	2	B	P		E1	5.1-3 sh. 7
F718	4	Excess flow check valve-RPV above core plate instrument line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 7
F719	4	Manual isolation valve-RPV below core plate instrument line	MN	2	B	P		E1	5.1-3 sh. 7
F720	4	Excess flow check valve-RPV below core plate instrument line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 7
F723	4	Manual isolation valve-MSL flow restrictor instrument line	MN	2	B	P		E1	5.1-3 sh. 2
F724	4	Excess flow check valve-MSL flow restrictor instrument line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 2
F725	4	Manual isolation valve-MSL flow restrictor instrument line	MN	2	B	P		E1	5.1-3 sh. 2
F726	4	Excess flow check valve-MSL flow restrictor instrument line (k4) (h3.2)	CV	2	A, C	I, A	S	RO	5.1-3 sh. 2
F727	2	MSL PX instrument line inboard root valve	MN	2	B	P		E1	5.1-3 sh. 3
<b>B31 Reactor Recirculation Internal Pump Valves</b>									
F008	10	Excess flow check valve RIP pump motor purge water line (k4) (h3.4)	CV	2	A, C	I, A	S	RO	5.4-4 sh. 2
F010	10	RIP pump motor purge water supply line valve	MN	2	B	P		E1	5.4-4 sh. 1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F011	10	RIP inflatable pressurized water line inboard valve	MN	2	B	P		E1	5.4-4 sh. 1
F013	10	RIP seal equalizing line valve	MN	2	B	P		E1	5.4-4 sh. 1
F015	10	Manual maintenance valve- RIP pump motor purge water line	MN	2	B	P		E1	5.4-4 sh. 2
F500	10	RIP cooling water HX vent line inboard valve	MN	2	B	P		E1	5.4-4 sh. 1
F502	10	RIP drain line inboard valve	MN	2	B	P		E1	5.4-4 sh. 1
F505	10	RIP cooling water HX shell drain line inboard valve	MN	2	B	P		E1	5.4-4 sh. 1
<b>C12 Control Rod Drive System Valves</b>									
F719	4	Root valve charging line header pressure instrument line	MN	2	B	P		E1	4.6-8 sh. 2
F720	4	Root valve charging line header pressure instrument line	MN	2	B	P		E1	4.6-8
<b>C41 Standby Liquid Control System Valves</b>									
F001	2	SLCS storage tank outlet line MOV (k2)	MOV	2	B	A	P, S	RO, 3mo	9.3-1
F002	2	SLCS pump suction line maintenance valve	MN	2	B	P		E1	9.3-1
F003	2	SLCS pump discharge line relief valve	RV	2	C	A	R	10yr	9.3-1
F004	2	SLCS pump discharge line check valve	CV	2	C	A	S	3mo	9.3-1
F005	2	SLCS pump discharge line maintenance valve	MN	2	B	P		E1	9.3-1
F006	2	SLCS pump injection valve MOV	MOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	9.3-1
F007	1	SLCS injection line outboard check valve (h5)	CV	2	A, C	I, A	L, S	2yr, 2yr	9.3-1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F008	1	SLCS injection line inboard check valve (h5)	CV	2	A, C	I, A	L, S	2yr, 2yr	9.3-1
F018	1	SLCS storage tank sample line inboard shutoff valve	MN	2	B	P		E1	9.3-1
F025	1	SLCS injection line test/vent line inboard valve	MN	2	B	P		E1	9.3-1
F500	1	SLCS pump suction line drain line	MN	2	B	P		E1	9.3-1
F501	2	SLCS pump discharge line drain line valve	MN	2	B	P		E1	9.3-1
<b>C51 Neutron Monitoring System Valves</b>									
J004	3	Isolation valve assembly:							
		ATIP ball valve (k1) (k2)	MN	2	A	I, A	L, P, S	RO, RO, 3mo	7.6-1 sh. 3
		Index shear valve	EXP	2	A, D	A	X	RO	7.6-1 sh. 3
J011	1	Purge isolation valve	MN	2	A, C	I, P	L, P	2yr, 2yr	7.6-1 sh. 3
<b>D23 Containment Atmospheric Monitoring System Valves</b>									
F001	2	CAMS drywell pressure instrument line outboard isolation valve (k4) (k2)	SOV	2	A	I, A	P, S	RO, 3mo	7.6-7 sh. 2
F004	2	CAMS drywell sample line outboard containment isolation valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	7.6-7 sh. 2
F005	2	CAMS drywell return line outboard containment isolation valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	7.6-7 sh. 2
F006	2	CAMS wetwell sample line outboard containment isolation valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	7.6-7 sh. 2
F007	2	CAMS wetwell return line outboard containment isolation valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	7.6-7 sh. 2
F008	2	CAMS rack drain line outboard containment isolation valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	7.6-7 sh. 2

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F009	2	CAMS drywell pressure instrument line outboard isolation valve (k4)	MN	2	A	I, P		E1	7.6-7 sh. 2
F010	2	CAMS drywell sample line outboard valve (k4)	MN	2	A	I, P		E1	7.6-7 sh. 2
F011	2	CAMS drywell return line outboard valve (k4)	MN	2	A	I, P		E1	7.6-7 sh. 2
F012	2	CAMS wetwell sample line outboard valve (k4)	MN	2	A	I, P		E1	7.6-7 sh. 2
F013	2	CAMS wetwell return line outboard valve (k4)	MN	2	A	I, P		E1	7.6-7 sh. 2
F014	2	CAMS rack drain line outboard containment isolation valve (k4)	MN	2	A	I, P		E1	7.6-7 sh. 2
<b>E11 Residual Heat Removal System Valves</b>									
F001	3	Suppression pool suction valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-10 sh.3,4,6
F002	3	RHR pump discharge line check valve	CV	2	C	A	S	3mo	5.4-10 sh.3,4,6
F003	3	RHR pump discharge line maintenance valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F004	3	Heat Exchanger flow control valve	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh.3,4,6
F005	1	RPV injection valve, Loop A (h6) (k3) (k2)	MOV	2	A	A	L, P, S	RO, RO,CS	5.4-10 sh. 3
F005	2	RPV injection valve, Loop B& C (k3) (k2) (h6)	MOV	1	A	I, A	L, P, S	RO, RO,CS	5.4-10 sh. 5,7
F006	1	RPV injection line check valve, Loop A (k3) (k2)	AOV/CV	2	A, C	A	L, P, S	RO, RO, 3mo	5.4-10 sh. 3
F006	2	RPV injection line check valve, Loop B & C (k3) (k2)	AOV/CV	1	A, C	I, A	L, P, S	RO, RO, 3mo	5.4-10 sh. 5,7
F007	2	RPV injection line inboard maint. valve	MN	1	B	P		E1	5.4-10 sh. 5,7

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F008	3	Suppression pool return line MOV (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-10 sh. 3,4,6
F009	3	Shutdown Cooling suction line maintenance valve	MN	1	B	P		E1	5.4-10 sh. 2
F010	3	Shutdown Cooling suction line inboard isolation valve (k3) (k2) (h6)	MOV	1	A	I, A	L, P, S	RO, RO,CS	5.4-10 sh. 2
F011	3	Shutdown Cooling suction line outboard isolation valve (k3) (k2) (h6)	MOV	1	A	I, A	L, P, S	RO, RO,CS	5.4-10 sh. 2
F012	3	Shutdown Cooling suction line adm. valve	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh.3,4,6
F013	3	Heat exchanger bypass flow control valve	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh.3,4,6
F014	3	Fuel Pool Cooling supply line inboard MOV	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh. 3.5,7
F015	3	Fuel Pool Cooling supply line outboard MOV	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh. 3.5,7
F016	3	Gate valve-line from Fuel Pool Cooling (FPC)	MN	2	B	A	S	RO	5.4-10 sh. 2
F017	2	Drywell spray line inboard valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-10 sh. 5,7
F018	2	Drywell spray line outboard valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-10 sh. 5,7
F019	2	Wetwell spray line MOV-(k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-10 sh. 5,7
F020	3	RHR pump min flow bypass line check valve	CV	2	C	A	S	3mo	5.4-10 sh.3,4,6
F021	3	RHR pump min flow bypass line MOV (k4)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-10 sh.3,4,6
F022	3	Discharge line fill pump suction line valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F023	3	Fill pump discharge line check valve	CV	2	C	A	S	3mo	5.4-10 sh.3,4,6



No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F024	3	Fill pump discharge line stop check valve	CV	2	C	A	S	3mo	5.4-10 sh.3,4,6
F025	3	Fill pump minimum flow line globe valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F026	3	RHR pump suction to High Conductivity Waste (HCW)	MN	2	B	P		E1	5.4-10 sh.3,4,6
F027	3	Bypass line around the check valve MPL E11-F002	MN	2	B	P		E1	5.4-10 sh.3,4,6
F028	3	Heat Exchanger outlet line relief valve	RV	2	C	A	R	5yr	5.4-10 sh.3,4,6
F029	3	Inboard reactor well drain line valve	MOV	2	B	P		E1	5.4-10 sh.3,4,6
F030	3	Drain to radwaste valve	MOV	2	B	P		E1	5.4-10 sh.3,4,6
F031	3	Outboard reactor well drain line valve (to SP) (k4) (k2)	MOV	2	A	I, P	P	RO	5.4-10 sh.3,4,6
F032	3	Shutoff valve-line from MUWC	MN	2	B	P		E1	5.4-10 sh.3,5,7
F033	3	Check valve in the line from MUWC	CV	2	C	A	S	3mo	5.4-10 sh.3,5,7
F034	1	RPV injection line vent/test line inboard valve, Loop A	MN	2	B	P		E1	5.4-10 sh. 3
F034	2	RPV injection line vent/test line inboard valve, Loop B&C	MN	1	B	P		E1	5.4-10 sh. 5,7
F036	1	Press equal valve around check valve E11-F006, Loop A (k3)	AOV	2	A	P	L	RO	5.4-10 sh. 3
F036	2	Press equal valve around check valve E11-F006, Loop B&C (k3) (k2)	AOV	1	A	P	L, P	RO, RO	5.4-10 sh. 5,7
F037	3	Shutdown cooling suction line test line (k3)	MN	1	A	P	L	RO	5.4-10 sh. 2
F039	3	Relief valve around the MOV MPL E11-F011	RV	1	C	A	R	5yr	5.4-10 sh. 2

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F040	3	Shutoff valve-line from MUWC	MN	2	B	P		E1	5.4-10 sh. 2
F041	3	Check valve line from Make-Up Water Condenser (MUWC)	CV	2	C	A	S	3mo	5.4-10 sh. 2
F042	3	Shutdown Cooling Mode suction line relief valve	RV	2	C	A		E1	5.4-10 sh.3,4,6
F043	3	HX outlet to the Sampling System (SS) test inboard valve	SOV	2	B	P		E1	5.4-10 sh.3,4,6
F045	1	HX outlet to the PASS-inboard valve	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh. 3
F046	1	HX outlet to the PASS-outboard valve	MOV	2	B	A	P, S	2yr, 3mo	5.4-10 sh. 3
F047	2	Shutoff -line from MUWC	MN	2	B	P		E1	5.4-10 sh. 5,7
F048	2	Check valve line from MUWC	CV	2	C	P		E1	5.4-10 sh. 5,7
F049	2	Drywell spray line vent & test line inboard valve	MN	2	B	P		E1	5.4-10 sh. 5,7
F051	3	Fill pump discharge line relief valve	RV	2	C	A	R	10yr	5.4-10 sh.3,4,6
F052	1	Drain line for the suppression pool	MN	2	B	P		E1	5.4-10 sh. 4
F101	1	AC independent water addition input valve	MN	2	B	A	S	2yr	5.4-10 sh. 7
F102	1	AC independent water addition input valve	MN	2	B	A	S	2yr	5.4-10 sh. 7
F500	3	Heat exchanger inlet drain line inboard valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F502	3	HX outlet line drain line inboard valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F504	3	RPV injection line vent line inboard valve	MN	2	B	P		E1	5.4-10 sh.3,5,7

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F506	1	RPV injection line drain line inboard valve	MN	2	B	P		E1	5.4-10 sh. 3
F506	2	RPV injection line drain line inboard valve	MN	1	B	P		E1	5.4-10 sh. 5,7
F508	3	Shutdown Cooling suction line vent line valve	MN	2	B	P		E1	5.4-10 sh. 2
F509	2	Vent valve-FPC return line	MN	2	B	P		E1	5.4-10 sh. 5,7
F511	2	Drywell spray line inboard drain line valve	MN	2	B	P		E1	5.4-10 sh. 5,7
F513	2	Drywell spray line inboard drain line valve	MN	2	B	P		E1	5.4-10 sh. 5,7
F515	2	Wetwell spray line inboard drain line valve	MN	2	B	P		E1	5.4-10 sh. 5,7
F517	3	RHR pump min flow line drain line inboard valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F700	3	RHR pump suction line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F701	3	RHR pump suction line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F702	3	RHR pump discharge line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F704	3	RHR pump discharge line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F706	3	RHR pump discharge line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F707	3	RHR pump discharge line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F708	3	FT MPL E11-FT008 instrument line inboard root valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F709	3	FT MPL E11-FT008 instrument line outboard root valve	MN	2	B	P		E1	5.4-10 sh.3,4,6

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F710	3	FT MPL E11-FT008 instrument line inboard root valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F711	3	FT MPL E11-FT008 instrument line outboard root valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F712	3	Shutdown Cooling Mode suction line pressure instrument line	MN	2	B	P		E1	5.4-10 sh.3,4,6
F713	3	Fill pump suction line instrument line valve	MN	2	B	P		E1	5.4-10 sh.3,4,6
F714	1	Discharge to radwaste flow instrument line	MN	2	B	P		E1	5.4-10 sh. 4
F716	1	Discharge to radwaste flow instrument line	MN	2	B	P		E1	5.4-10 sh. 4
F718	3	Fill pump discharge line check valve test point	MN	2	B	P		E1	5.4-10 sh. 3,4,6
F720	3	Fill pump discharge line check valve test point	MN	2	B	P		E1	5.4-10 sh. 3,4,6
<b>E22 High Pressure Core Flooder System Valves</b>									
F001	2	Condensate Storage Tank (CST) suction line MOV	MOV	2	B	A	P, S	2yr, 2yr, 3mo	6.3-7 sh. 2
F002	2	CST suction line check valve	CV	2	C	A	S	3mo	6.3-7 sh. 2
F003	2	HPCF System injection valve (k3) (k2) (h6)	MOV	1	A	I, A	L, P, S	RO, RO,CS	6.3-7 sh. 1
F004	2	HPCF System inboard check valve (k3) (k2)	AOV/CV	1	A, C	I, A	L, P, S	RO, RO, 3mo	6.3-7 sh. 1
F005	2	Pump discharge line inboard maintenance valve	MN	1	B	P		E1	6.3-7 sh. 1
F006	2	Suppression pool suction line MOV (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	6.3-7 sh. 2
F007	2	Suppression pool suction line check valve	CV	2	C	A	S	3mo	6.3-7 sh. 2

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F008	2	Test return line inboard valve	MOV	2	B	A	P, S	2yr, 3mo	6.3-7 sh. 2
F009	2	Test return line outboard valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	6.3-7 sh. 2
F010	2	Pump minimum flow bypass line MOV (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	6.3-7 sh. 2
F011	2	Bypass line shutoff valve around check valve E22-F002	MN	2	B	P		E1	6.3-7 sh. 2
F012	2	HPCI pump suction line drain line to HCW	MN	2	B	P		E1	6.3-7 sh. 2
F014	2	Pump discharge line fill line outboard check valve	CV	2	C	A	S	3mo	6.3-7 sh. 1
F015	2	Pump discharge line fill line outboard check valve	CV	2	C	A	S	3mo	6.3-7 sh. 1
F017	2	Pump discharge line test and vent line inboard valve	MN	1	B	P		E1	6.3-7 sh. 1
F019	2	Pressure equalizing valve around check valve E22-F004	MOV	1	A	P	L, P	RO, RO	6.3-7 sh. 1
F020	2	Suppression pool suction line relief valve	RV	2	C	A	R	10yr	6.3-7 sh. 2
F021	2	Pump discharge check valve	CV	2	C	A	S	3mo	6.3-7 sh. 2
F022	2	Suppression pool suction line test line valve	MN	2	B	P		E1	6.3-7 sh. 2
F023	2	Pump discharge line test line valve	MN	2	B	P		E1	6.3-7 sh. 2
F500	2	Pump discharge line high point vent inboard valve	MN	2	B	P		E1	6.3-7 sh. 1
F502	2	Pump discharge line drywell test line inboard valve	MN	2	B	P		E1	6.3-7 sh. 1
F700	2	Pump suction line pressure instrument line root valve	MN	2	B	P		E1	6.3-7 sh. 2

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F701	2	Pump suction line pressure instrument line root valve	MN	2	B	P		E1	6.3-7 sh. 2
F702	2	Pump discharge line pressure instrument line inboard valve	MN	2	B	P		E1	6.3-7 sh. 2
F704	2	Pump discharge line pressure instrument line inboard valve	MN	2	B	P		E1	6.3-7 sh. 2
F705	2	Pump discharge line pressure instrument line outboard valve	MN	2	B	P		E1	6.3-7 sh. 2
F706	2	Pump discharge line flow instrument line inboard valve	MN	2	B	P		E1	6.3-7 sh. 1
F707	2	Pump discharge line flow instrument line outboard valve	MN	2	B	P		E1	6.3-7 sh. 1
F708	2	Pump discharge line flow instrument line inboard valve	MN	2	B	P		E1	6.3-7 sh. 1
F709	2	Pump discharge line flow instrument line outboard valve	MN	2	B	P		E1	6.3-7 sh. 1
<b>E31 Leak Detection and Isolation System Valves</b>									
F001	1	Drywell fission product monitoring line maintenance valve	MN	2	B	P		E1	5.2-8 sh. 9
F002	1	Drywell fission product monitoring line inboard isolation valve (k1) (k2)	AOV	2	A	I, A	L, P, S	RO, RO, 3mo	5.2-8 sh. 9
F003	1	Drywell fission product monitoring line outboard isolation valve (k1) (k2)	AOV	2	A	I, A	L, P, S	RO, RO, 3mo	5.2-8 sh. 9
F004	1	Drywell fission product monitoring line outboard isolation valve (k1) (k2)	AOV	2	A	I, A	L, P, S	RO, RO, 3mo	5.2-8 sh. 9
F005	1	Drywell fission product monitoring line inboard isolation valve (k1) (k2)	AOV	2	A	I, A	L, P, S	RO, RO, 3mo	5.2-8 sh. 9
F006	1	Drywell fission product monitoring line maintenance valve	MN	2	B	P		E1	5.2-8 sh. 9
F701	4	RCIC instrument line manual maintenance valve	MN	2	B	P		E1	5.2-8 sh. 6

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F702	4	RCIC instrument line isolation excess flow check valve (h3.5) (k4)	CV	2	A, C	I, A	S	RO	5.2-8 sh. 6
F703	4	RCIC instrument line manual maintenance valve	MN	2	B	P		EI	5.2-8 sh. 6
F704	4	RCIC instrument line isolation excess flow check valve (h3.5) (k4)	CV	2	A, C	I, A	S	RO	5.2-8 sh. 6
<b>E51 Reactor Core Isolation Cooling System Valves</b>									
F001	1	Condensate Storage Tank (CST) suction line MOV	MOV	2	B	A	P, S	2yr, 3mo	5.4-8 sh. 1
F002	1	CST suction line check valve	CV	2	C	A	S	3mo	5.4-8 sh. 1
F003	1	RCIC pump discharge line check valve	CV	2	C	A	P, S	2yr, 3mo	5.4-8 sh. 1
F004	1	RCIC System injection valve (k3) (k2) (h6)	MOV	2	A	A	L, P, S	RO, RO, CS	5.4-8 sh. 1
F005	1	RCIC System discharge line testable check valve (k3) (k2)	AOV/CV	2	A, C	A	L, P, S	RO, RO, 3mo	5.4-8 sh. 1
F006	1	Suppression Pool (CSP) suction line MOV (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-8 sh. 1
F007	1	Suppression Pool (CSP) suction line check valve	CV	2	C	A	S	3mo	5.4-8 sh. 1
F008	1	RCIC System suppression pool test return line MOV	MOV	2	B	A	P, S	2yr, 3mo	5.4-8 sh. 1
F009	1	RCIC System suppression pool test return line MOV (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-8 sh. 1
F010	1	RCIC System minimum flow bypass line check valve	CV	2	C	A	P, S	2yr, 3mo	5.4-8 sh. 1
F011	1	RCIC System minimum flow bypass line MOV (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	5.4-8 sh. 1
F017	1	RCIC pump suction line relief valve	RV	2	C	A	R	10yr	5.4-8 sh. 1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F018	1	Valve in the bypass line around check valve E51-F003	MN	2	B	P		E1	5.4-8 sh. 1
F019	1	Pump discharge line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F020	1	Pump discharge line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F021	1	Pump discharge line fill line shutoff valve	MN	2	B	P		E1	5.4-8 sh. 1
F022	1	Pump discharge line fill line check valve	CV	2	C	A	S	3mo	5.4-8 sh. 1
F023	1	Pump discharge line fill line check valve	CV	2	C	A	S	3mo	5.4-8 sh. 1
F024	1	Pump discharge line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F025	1	Pump discharge line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F026	1	Valve in pressure equalizing line around E51-F005	AOV	2	B	P		E1	5.4-8 sh. 1
F027	1	Suppression Pool (S/P) suction line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F028	1	Minimum flow bypass line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F029	1	Minimum flow bypass line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F033	1	Discharge line fill line bypass line shutoff valve	MN	2	B	P		E1	5.4-8 sh. 1
F035	1	Steam supply line isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.4-8 sh. 2
F036	1	Steam supply line isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.4-8 sh. 2
F037	1	Steam admission valve	MOV	2	B	A	P, S	2yr, 3mo	5.4-8 sh. 2



No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F038	1	Turbine exhaust line check valve	CV	2	A, C	I, A	L, S	2yr, 3mo	5.4-8 sh. 1
F039	1	Turbine exhaust line MOV	MOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	5.4-8 sh. 1
F048	1	Steam supply line warm-up line valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.4-8 sh. 2
F049	1	Steam supply line test line valve	MN	2	B	P		E1	5.4-8 sh. 2
F050	1	Steam supply line test line valve	MN	2	B	P		E1	5.4-8 sh. 2
F053	1	Turbine exhaust line test line valve	MN	2	B	P		E1	5.4-8 sh. 1
F054	1	Turbine exhaust line vacuum breaker (h1.8)	VB	2	C	A	R	RO	5.4-8 sh. 1
F055	1	Turbine exhaust line vacuum breaker (h1.8)	VB	2	C	A	R	RO	5.4-8 sh. 1
F056	1	Steam supply line drain pot drain line test line valve	MN	2	B	P		E1	5.4-8 sh. 2
F057	1	Steam supply line drain pot drain line test drain line	MN	2	B	P		E1	5.4-8 sh. 2
F500	1	Pump discharge line vent line valve	MN	2	B	P		E1	5.4-8 sh. 1
F501	1	Pump discharge line vent line valve	MN	2	B	P		E1	5.4-8 sh. 1
F502	1	Pump discharge line drain line valve	MN	2	B	P		E1	5.4-8 sh. 1
F503	1	Pump discharge line drain line valve	MN	2	B	P		E1	5.4-8 sh. 1
F700	1	Pump suction line pressure instrumentation instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F701	1	Pump suction line pressure instrumentation instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F702	1	Pump discharge line pressure instrumentation instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F703	1	Pump discharge line pressure instrumentation instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F704	1	Pump discharge line pressure instrumentation instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F705	1	Pump discharge line pressure instrumentation instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F706	1	Pump discharge line flow instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F707	1	Pump discharge line flow instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F708	1	Pump discharge line flow instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F709	1	Pump discharge line flow instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F710	1	Pump discharge line pressure instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F711	1	Pump discharge line pressure instrument root valve	MN	2	B	P		E1	5.4-8 sh. 1
F716	1	Steam supply line pressure instrument root valve	MN	2	B	P		E1	5.4-8 sh. 2
F717	1	Steam supply line pressure instrument root valve	MN	2	B	P		E1	5.4-8 sh. 2
F718	1	Steam supply line drain pot instrument root valve	MN	2	B	P		E1	5.4-8 sh. 2
F719	1	Steam supply line drain pot instrument root valve	MN	2	B	P		E1	5.4-8 sh. 2
F720	1	Steam supply line drain pot instrument root valve	MN	2	B	P		E1	5.4-8 sh. 2
F721	1	Steam supply line drain pot instrument root valve	MN	2	B	P		E1	5.4-8 sh. 2

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F722	1	Turbine exhaust pressure instrument root valve	MN	2	B	P		E1	5.4-8 sh. 3
F723	1	Turbine exhaust pressure instrument root valve	MN	2	B	P		E1	5.4-8 sh. 3
F724	1	Turbine exhaust pressure between rupture disk instrument root valve	MN	2	B	P		E1	5.4-8 sh. 3
F725	1	Turbine exhaust pressure between rupture disk instrument root valve	MN	2	B	P		E1	5.4-8 sh. 3
<b>G31 Reactor Water Cleanup System Valves</b>									
F001	1	Line inside containment from RHR system maintenance valve	MN	1	B	P		E1	5.4-12 sh. 1
F002	1	CUW System suction line inboard isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.4-12 sh. 1
F003	1	CUW System suction line outboard isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.4-12 sh. 1
F017	1	CUW System RPV head spray line outboard isolation valve (k1) (k2)	MOV	1	A	I, A	L, P, S	RO, RO, 3mo	5.4-12 sh. 1
F018	1	CUW System RPV head spray line inboard check valve (k1) (h1.9)	CV	1	A, C	I, A	L, S	RO, RO	5.4-12 sh. 1
F019	1	CUW System bottom head drain line maintenance valve	MN	1	B	P		E1	5.4-12 sh. 1
F026	1	CUW System suction line shutoff valve (k2)	MOV	1	B	P	P	RO	5.4-12 sh. 1
F050	1	Test line off the suction line outboard isolation valve G31-F003	MN	2	B	P		E1	5.4-12 sh. 1
F058	1	Test line off RPV head spray line outboard isolation valve	MN	2	B	P		E1	5.4-12 sh. 1
F060	1	RPV bottom head drain line sample line test line valve	MN	2	B	P		E1	5.4-12 sh. 1
F070	1	RPV bottom head drain line sample line maintenance valve	MN	2	B	P		E1	5.4-12 sh. 1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F071	1	RPV bottom head drain line sample line inboard valve (k1) (k2)	AOV	2	A	I, A	L, P, S	RO, RO, 3mo	5.4-12 sh. 1
F072	1	RPV bottom head drain line sample line outboard valve (k1) (k2)	AOV	2	A	I, A	L, P, S	RO, RO, 3mo	5.4-12 sh. 1
F500	1	CUW System bottom head drain line drain valve	MN	2	B	P		E1	5.4-12 sh. 1
F501	1	CUW System bottom head drain line drain valve	MN	2	B	P		E1	5.4-12 sh. 1
F700	2	CUW System suction line FE upstream instrument manual maintenance valve	MN	2	B	P		E1	5.4-12 sh. 1
F701	2	CUW System suction line FE downstream instrument manual maintenance valve	MN	2	B	P		E1	5.4-12 sh. 1
F702	2	CUW System suction line FE upstream instrument excess flow check valve (k4) (h3.6) (k2)	CV	2	A, C	I, A	S, P	RO, RO	5.4-12 sh. 1
F703	2	CUW System suction line FE downstream instrument excess flow check valve (k4) (h3.6) (k2)	CV	2	A, C	I, A	S, P	RO, RO	5.4-12 sh. 1
<b>G41 Fuel Pool Cooling and Cleanup Valves</b>									
F015	2	FPC system heat exchanger outlet line maintenance valve	MN	3	B	P		E1	9.1-1 sh. 2
F016	1	FPC system discharge line to spent fuel pool check valve	CV	3	C	A	S	3mo	9.1-1 sh. 2
F017	1	FPC system discharge line to spent fuel pool maintenance valve	MN	3	B	P		E1	9.1-1 sh. 2
F018	1	FPC system discharge line to spent fuel pool check valve	CV	3	C	A	S	3mo	9.1-1 sh. 2
F019	2	FPC system discharge line to spent fuel pool valve	MN	3	B	P		E1	9.1-1 sh. 1
F020	2	FPC system discharge line to spent fuel pool check valve	CV	3	C	A	S	3mo	9.1-1 sh. 1
F022	1	FPC system discharge line to reactor well maintenance valve	MN	3	B	P		E1	9.1-1 sh. 2

[illegible]

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F141	1	Outboard isolation valve (kl)	MN	2	A	I, P	L	RO	9.2-5 sh. 2
F142	1	Inboard isolation valve (kl)	CV	2	A, C	I, P	L	RO	9.2-5 sh. 2
<b>P21 Reactor Building Cooling Water System Valves</b>									
F001	6	Pump discharge line check valve	CV	3	C	A	S	E2	9.2-1 sh. 1,4,7
F002	6	Pump discharge line maintenance valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F003	9	Heat exchanger inlet line valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F004	9	Heat exchanger outlet line MOV	MOV	3	B	P	P	2yr	9.2-1 sh. 1,4,7
F005	3	Cold water line to hot/cold water blender	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F006	3	Hot/cold water blender valve- cold water	AOV	3	B	A	S	E2	9.2-1 sh. 1,4,7
F007	3	Hot/cold water blender outlet line valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F008	3	Hot/cold water blender cold water bypass line	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F009	3	Hot water line to hot/cold water blender	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F010	3	Hot/cold water blender valve- hot water	AOV	3	B	A	S	E2	9.2-1 sh. 1,4,7
F011	3	Hot/cold water blender hot water bypass line	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F012	3	Cooling water supply line to RHR System maintenance valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F013	3	Cooling water return line from RHR System MOV	MOV	3	B	A	P, S	2yr, 3mo	9.2-1 sh. 2,5,8

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F014	3	Cooling water return line from RHR Hx maintenance valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F015	6	Pump suction line maintenance valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F016	3	Surge tank outlet line to RCW pump suction	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F017	3	Surge tank makeup water line from SPCU	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F018	3	Surge tank makeup water line from SPCU	MOV	3	B	P	P	2yr	9.2-1 sh. 2,5,8
F019	3	Surge tank makeup water from MUWP	AOV	3	B	P	P	2yr	9.2-1 sh. 2,5,8
F020	3	Surge tank makeup water line from MUWP	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F021	3	Chemical addition tank inlet line valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F022	3	Chemical addition tank outlet line valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F024	6	Cooling water supply line to HECW refrigerator maintenance valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F025	6	Cooling water supply line to HECW refrigerator PCV	MOV	3	B	A	S	E2	9.2-1 sh. 2,5,8
F026	6	Cooling water supply line to HECW refrigerator maintenance valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F027	6	Cooling water line to HECW refrigerator bypass line	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F028	6	Cooling water return line from HECW refrigerator	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F029	2	Cooling water supply line to FPC Hx	MN	3	B	P		E1	9.2-1 sh. 2,5
F030	2	Cooling water return line from FPC Hx	MN	3	B	P		E1	9.2-1 sh. 2,5

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F031	2	Cooling water supply line to FPC pump room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5
F032	2	Cooling water return line from FPC pump room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5
F033	2	Cooling water line to PCV Atmospheric Monitoring System clr	MN	3	B	P		E1	9.2-1 sh. 2,5
F034	2	Return line from PCV Atmospheric Monitoring System clr	MN	3	B	P		E1	9.2-1 sh. 2,5
F035	2	Cooling water supply line to SGTS room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5
F036	2	Cooling water return line from SGTS room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5
F039	3	Cooling water supply line to RHR equipment room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F040	3	Cooling water return line from RHR equipment room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F041	3	Cooling water supply line to RHR pump motor	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F042	3	Cooling water return line from RHR pump motor	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F043	3	Cooling water supply line to RHR pump mechanical seals	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F044	3	Cooling water return line from RHR pump mechanical seals	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F045	1	Cooling water supply line to RCIC equipment room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2
F046	1	Cooling water supply line from RCIC equipment room air conditioner	MN	3	B	P		E1	9.2-1 sh. 2
F047	2	Cooling water supply line to HPCF equipment room air conditioner	MN	3	B	P		E1	9.2-1 sh. 5,8
F048	2	Cooling water supply line from HPCF equipment room air conditioner	MN	3	B	P		E1	9.2-1 sh. 5,8



No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F049	2	Cooling water supply line to HPCF pump motor bearing	MN	3	B	P		E1	9.2-1 sh. 5,8
F050	2	Cooling water return line from HPCF pump motor bearing	MN	3	B	P		E1	9.2-1 sh. 5,8
F051	2	Cooling water supply line to HPCF pump mechanical seals	MN	3	B	P		E1	9.2-1 sh. 5,8
F052	2	Cooling water return from HPCF pump mechanical seals	MN	3	B	P		E1	9.2-1 sh. 5,8
F053	2	Surge tank outlet line to HECW System	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F055	6	Cooling water return line from Emergency Diesel Generator	MOV	3	B	A	P, S	2yr, 3mo	9.2-1 sh. 5,8
F056	3	Cooling water return line from Emergency Diesel Generator maintenance valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F057	2	Cooling water line to PCV Atmospheric Monitoring System	MN	3	B	P		E1	9.2-1 sh. 2,5
F058	2	Return line from PCV Atmospheric Monitoring System air conditioner	MN	3	B	P		E1	9.2-1 sh. 2,5
F061	3	Cooling water line Emergency Diesel Generators	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F071	6	Cooling water supply line-to non-essential coolers	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F072	6	Cooling water supply line-to non-essential coolers	AOV	3	B	A	P, S	2yr, 3mo	9.2-1 sh. 2,5,8
F075	2	Cooling water supply line to PCV outboard isolation valve (k4) (k2) (h3.7)	MOV	2	A	I, A	P, S	RO,CS	9.2-1 sh. 3,6
F076	2	Cooling water supply line to PCV inboard check isolation valve (k4) (h1.10)	CV	2	A, C	I, A	S	RO	9.2-1 sh. 3,6
F080	2	Cooling water return line from PCV inboard isolation valve (k4) (h1.10)	MOV	2	A	I, A	P, S	RO, RO	9.2-1 sh. 3,6
F081	2	Cooling water return line from PCV outboard isolation valve (k4) (k2) (h3.7)	MOV	2	A	I, A	P, S	RO,CS	9.2-1 sh. 3,6

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F083	3	Cooling water return line from non-essential coolers (h4)	CV	3	C	A	S	RO	9.2-1 sh. 2,5,8
F084	3	Cooling water return line from containment bypass line	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F175	3	Cooling water supply to RHR System Hx pressure relief valve	RV	3	C	A	R	10yr	9.2-1 sh. 2,5,8
F195	2	Cooling water supply line to FPC heat exchanger	MOV	3	B	A	P, S	2yr, 3mo	9.2-1 sh. 2,5
F220	9	Bypass line around RCW System outlet line MOV	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F251	2	Cooling water supply line to PCV test line	MN	2	B	P		E1	9.2-1 sh. 3,6
F252	2	Cooling water return line from PCV test line	MN	2	B	P		E1	9.2-1 sh. 3,6
F501	9	Heat exchanger shell side vent line	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F502	9	Heat exchanger shell side drain line	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F503	3	Surge tank drain line to SD	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F601	3	Cooling water supply line to RHR System drain line to SD	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F602	3	Cooling water supply line to RHR System drain line to HCW	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F603	3	Cooling water return line from RHR Hx drain line to SD	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F604	3	Cooling water return line from RHR Hx drain line to HCW	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F701	6	Pump discharge line pressure instrument line	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F702	9	Hx discharge line sample line valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F703	3	Cooling water supply line pressure instrument line	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F704	3	Cooling water supply line sample valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F705	3	Cooling water supply line elbow tap instrument root valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F706	3	Cooling water supply line elbow tap instrument root valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F707	3	Cooling water supply line to RHR System FT instrument root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F708	3	Cooling water supply line to RHR System FT instrument root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F709	3	Cooling water return line from RHR Hx sample valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F710	6	Pump suction line PX instrument root valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F711	6	Pump suction line pressure instrument root valve	MN	3	B	P		E1	9.2-1 sh. 1,4,7
F712	3	Surge tank level instrument root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F713	3	Surge tank level instrument line root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F714	3	Surge tank level instrument line root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F717	3	Cooling water line to DG instrument line	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F718	3	Return water line from DG instrument line	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F719	3	Cooling water line to DG instrument line	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F720	3	Return water line from DG instrument line	MN	3	B	P		E1	9.2-1 sh. 2,5,8

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F721	3	Cooling water supply line to non-essential coolers FT instrument root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
F722	3	Cooling water supply line to non-essential coolers FT instrument root valve	MN	3	B	P		E1	9.2-1 sh. 2,5,8
<b>P24 HVAC Normal Cooling Water System Valves</b>									
F053	1	HNCW supply line outboard isolation valve (k1) (k2)	MOV	2	A	I, A	L, P, S	RO, RO, 3mo	9.2-2
F054	1	HNCW supply line inboard isolation check valve (k1) (h1.11)	CV	2	A, C	I, A	L, S	RO, RO	9.2-2
F141	1	HNCW return inboard isolation valve (k1) (k2) (h1.11)	MOV	2	A	I, A	L, P, S	RO, RO, RO	9.2-2
F142	1	HNCW return outboard isolation valve (k1) (k2)	MOV	2	A	I, A	L, P, S	RO, RO, 3mo	9.2-2
<b>P25 HVAC Emergency Cooling Water System Valves</b>									
F001	6	Pump discharge line check valve	CV	3	C	A	S	E2	9.2-3 sh. 1,2,3
F002	6	Pump discharge line maintenance valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F003	6	Refrigerator outlet line maintenance valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F004	2	Maintenance valve at HECW supply to MCR cooler TCV	MN	3	B	P		E1	9.2-3 sh. 2,3
F005	2	HECW supply to MCR cooler Temperature Control Valve (TCV)	AOV	3	B	A	S	E2	9.2-3 sh. 2,3
F006	2	Maintenance valve at HECW supply to MCR cooler TCV	MN	3	B	P		E1	9.2-3 sh. 2,3
F007	6	Maintenance valve at HECW supply to MCR cooler	MN	3	B	P		E1	9.2-3 sh. 2,3
F008	6	Maintenance valve at HECW return from MCR cooler	MN	3	B	P		E1	9.2-3 sh. 2,3
F009	6	Pump suction line maintenance valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F010	2	TCV bypass at HECW discharge to MCR cooler	MN	3	B	P		E1	9.2-3 sh. 2,3
F011	3	Pump suction line/discharge line PCV maintenance valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F012	3	Pump suction line/discharge line PCV	AOV	3	B	A	S	E2	9.2-3 sh. 1,2,3
F013	3	Pump suction line/discharge line PCV maintenance valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F014	3	Pump suction line/discharge line PCV bypass line	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F015	3	Maintenance valve at HECW supply to C/B Essential Electrical Equipment Room Cooler TCV	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F016	3	HECW supply to C/B Essential Electrical Equipment Room cooler TCV	AOV	3	B	A	S	E2	9.2-3 sh. 1,2,3
F017	3	Maintenance valve at HECW supply to C/B Essential Electrical Equipment Room Cooler TCV	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F018	6	HECW supply to C/B Essential Electrical Equipment Room cooler maintenance valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F019	6	Maintenance valve at HECW return from C/B Essential Electrical Equipment Room Cooler	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F020	3	TCV bypass valve at HECW supply to C/B Essential Electrical Equipment Room cooler	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F021	3	Maintenance valve at HECW supply to DG zone cooler TCV	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F022	3	HECW supply to DG zone cooler TCV	AOV	3	B	A	S	E2	9.2-3 sh. 1,2,3
F023	3	Maintenance valve at HECW supply to DG zone cooler TCV	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F024	6	Maintenance valve at HECW supply to DG zone cooler	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F025	6	Maintenance valve at HECW return from DG zone cooler	MN	3	B	P		E1	9.2-3 sh. 1,2,3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F026	3	TCV bypass valve at HECW supply to DG zone cooler	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F030	3	Chemical addition tank return valve from HECW	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F031	3	Chemical addition tank feed valve to HECW	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F050	2	Make-up Water Purified (MUWP) line to pump suction check valve	CV	3	C	A	S	E2	9.2-3 sh. 1,2,3
F070	6	Pump discharge line drain valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F400	6	Pump drain line valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F401	6	Pump bearing cooling water needle valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F402	3	Refrigerator outlet line sample line valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F700	6	Pump discharge line pressure instrument line root valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F701	6	FE P25-FE003 upstream instrument line root valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F702	6	FE P25-FE003 downstream instrument line root valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F703	6	Pump suction pressure instrument line root valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
F704	6	Pump suction/discharge line Dp instrument line root valve	MN	3	B	P		E1	9.2-3 sh. 1,2,3
<b>P41 Reactor Service Water System Valves</b>									
F001	6	Pump discharge line check valve	CV	3	C	A	S	E2	9.2-7 sh. 1,2,3
F002	6	Pump discharge line maintenance valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F003	9	Service water inlet valve to RCW System heat exchanger	MOV	3	A	A	P, S	2yr, E2	9.2-7 sh. 1,2,3
F004	6	Service water inlet valve to service water strainer	MOV	3	B	P	P	2yr	9.2-7 sh. 1,2,3
F005	9	Service water outlet valve from RCW heat exchanger	MOV	3	A	A	P, S	2yr, E2	9.2-7 sh. 1,2,3
F006	6	Service water strainer blowout valve	MOV	3	B	P	P	2yr	9.2-7 sh. 1,2,3
F007	9	Supply line from Potable Water check valve	CV	3	C	P		E1	9.2-7 sh. 1,2,3
F008	9	Supply line from Potable Water check valve	CV	3	C	P		E1	9.2-7 sh. 1,2,3
F009	9	Supply valve from Potable Water System	AOV	3	B	A	P, S	2yr, E2	9.2-7 sh. 1,2,3
F010	9	RCW Hx tube side (service water side) relief valve	RV	3	C	P	R	10yr	9.2-7 sh. 1,2,3
F011	9	Bypass line around RCW Hx outlet line outlet valve MOV P41-F005	AOV	3	B	P		E1	9.2-7 sh. 1,2,3
F012	9	Service water sampling valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F013	6	Service water strainer outlet valve	MOV	3	B	A	P, S	2yr, E2	9.2-7 sh. 1,2,3
F014	3	Common service water strainer outlet valve	MOV	3	B	A	P, S	2yr, E2	9.2-7 sh. 1,2,3
F015	3	Discharge line to discharge canal MOV	MOV	3	B	A	P, S	E1, E2	9.2-7 sh. 1,2,3
F101	3	RSW line to HVAC Air Conditioning Condenser Manual Isolation Valves	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F102	3	RSW blowdown line to Main Cooling Reservoir MOV	MOV	3	B	A	P, S	2yr, 3mo	9.2-7 sh. 1,2,3
F109	3	RSW cold bypass to cooling tower basin MOV	MOV	3	B	A	P, S	2yr, 3mo	9.2-7 sh. 1,2,3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F110	6	RSW return to cooling water	MOV	3	B	A	P, S	2yr, 3mo	9.2-7 sh. 1,2,3
F113	1	Makeup water to UHS basin manual Isolation Valve	MN	3	B	P		E1	9.2-7 sh. 1
F114	1	Makeup water to UHS basin check valve	CV	3	C	A	S	3mo	9.2-7 sh. 1
F115	1	Makeup water to UHS basin MOV	MOV	3	B	A	P, S	2yr, 3mo	9.2-7 sh. 1,2,3
F116	1	Makeup water to UHS basin manual Isolation Valve	MN	3	B	P		E1	9.2-7 sh. 1
F117	1	Makeup water to UHS basin check valve	CV	3	C	A	S	3mo	9.2-7 sh. 1
F501	9	RCW Hx shell side drain valve to SWSD	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F502	9	RCW Hx shell side vent valve to SWSD	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F503	9	RCW Hx shell side drain valve to SWSD	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F504	9	RCW Hx shell side vent valve to SWSD	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F701	6	Pump discharge line pressure instrument line	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F702	3	Service water supply pressure instrument root valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F703	6	DP across service water strainer upstream instrument root valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F704	6	DP across service water strainer downstream instrument root valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F705	9	Service water DP across RCW Hx upstream instrument root valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3
F706	9	Service water DP across RCW Hx downstream instrument root valve	MN	3	B	P		E1	9.2-7 sh. 1,2,3



No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
<b>P51 Service Air System Valves</b>									
F131	1	Outboard isolation manual valve (k1)	MN	2	A	I, P	L	RO	9.3-7 sh. 2
F132	1	Inboard isolation check valve (k1) (h1.11)	CV	2	A, C	I, A	L, S	RO, RO	9.3-7 sh. 2
<b>P52 Instrument Air System Valves</b>									
F276	1	Outboard isolation valve (k1) (k2)	MOV	2	A	I, A	L, P, S	RO, RO, 3mo	9.3-6 sh. 1
F277	1	Inboard isolation check valve (k1) (k2) (h1.11)	CV	2	A, C	I, A	L, S	RO, RO	9.3-6 sh. 1
<b>P54 High Pressure Nitrogen Gas Supply System Valves</b>									
F002	4	Nitrogen bottles N2 supply line valve	MN	3	B	P		E1	6.7-1
F003	2	Nitrogen bottles N2 supply line MOV	MOV	3	B	A	P, S	2yr, 3mo	6.7-1
F004	2	N2 bottle supply line PCV maintenance valve	MN	3	B	P		E1	6.7-1
F005	2	N2 bottle supply line PCV	AOV	3	B	A		E1	6.7-1
F006	2	N2 bottle supply line PCV maintenance valve	MN	3	B	P		E1	6.7-1
F007	2	Safety grade N2 supply line isolation valve (k4) (k2)	MOV	2	A	I, A	P, S	RO, 3mo	6.7-1
F008	2	Safety grade N2 supply line isolation check valve (k4) (h1.11)	CV	2	A, C	I, A	S	RO	6.7-1
F009	8	Safety grade N2 supply line to SRV	MN	3	B	P		E1	6.7-1
F010	2	Bypass line around the N2 bottle supply line PCV	MN	3	B	P		E1	6.7-1
F011	2	N2 bottle supply line relief valve	RV	3	C	A	R	10yr	6.7-1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F012	2	MOV at safety/non-safety boundary	MOV	3	A	A	P, S	2yr, 3mo	6.7-1
F200	1	Non-safety N2 supply line isolation valve	MOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	6.7-1
F209	1	Non-safety N2 supply line isolation check valve (k4) (h1.11)	CV	2	A, C	I, A	L, S	RO, RO	6.7-1
<b>P81 Breathing Air System</b>									
F251	1	Outboard isolation manual valve	MN	2	A	I, P	L	RO	9.3-10
F252	1	Inboard isolation manual valve	MN	2	A	I, P	L	RO	9.3-10
<b>T22 Standby Gas Treatment System Valves</b>									
F002	2	Filter train inlet butterfly valve	MOV	3	B	A	P, S	2yr, 3mo	6.5-1 sh. 1
F003	2	Filter train exhaust gravity damper	MN	3	B	A	P, S	2yr, 3mo	6.5-1 sh. 2,3
F004	2	Filter train exhaust butterfly valve	MOV	3	B	A	P, S	2yr, 3mo	6.5-1 sh. 2,3
F005	2	Cooling fan butterfly valve	MOV	3	B	A	P, S	2yr, 3mo	6.5-1 sh. 2,3
F006	2	Filter train R112 injection line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F007	2	Filter train DOP injection line valve to pre HEPA filter	MN	3	B	P		E1	6.5-1 sh. 2,3
F008	2	Filter train DOP sampling line valve downstream of pre HEPA	MN	3	B	P		E1	6.5-1 sh. 2,3
F009	2	Filter train DOP sampling line valve downstream of pre HEPA	MN	3	B	P		E1	6.5-1 sh. 2,3
F010	2	Filter train DOP injection line valve downstream of charcoal absorbent	MN	3	B	P		E1	6.5-1 sh. 2,3
F011	2	Filter train DOP sampling line valve downstream of charcoal absorbent	MN	3	B	P		E1	6.5-1 sh. 2,3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F012	2	Filter train DOP sampling line valve downstream of after HEPA	MN	3	B	P		E1	6.5-1 sh. 2,3
F014	2	SGTS sample line valve	MN	3	B	P		E1	6.5-1 sh. 3
F015	2	PRM discharge to stack valve	MN	3	B	P		E1	6.5-1 sh. 3
F500	2	Filter unit vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F501	2	Filter unit drain line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F504	2	Filter unit vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F505	2	Exhaust fan vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F506	2	Filter train vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F507	2	Filter train vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F508	2	Filter train vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F509	2	Filter train vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F510	2	Filter train vent line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F511	2	Exhaust stack drain line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F700	2	Filter unit demister dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F701	2	Filter unit demister dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F705	2	Filter train prefilter dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F706	2	Filter train prefilter dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F707	2	Filter train preHEPA dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F708	2	Filter train preHEPA dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F709	2	Filter train charcoal absorber dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F710	2	Filter train charcoal absorber dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F711	2	Filter train after HEPA dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F712	2	Filter train after HEPA dp instrument line valve	MN	3	B	P		E1	6.5-1 sh. 2,3
F713	2	Filter train exhaust flow instrument line valve	MN	3	B	P		E1	6.5-1 sh. 1
F714	2	Filter train exhaust flow instrument line valve	MN	3	B	P		E1	6.5-1 sh. 1
<b>T31 Atmospheric Control System Valves</b>									
F001	1	Purge supply line outboard isolation valve (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F002	1	Drywell purge line supply inboard isolation valve (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F003	1	Wetwell purge supply line inboard isolation valve (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F004	1	Drywell purge exhaust line inboard isolation valve (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F005	1	Drywell purge exhaust line bypass line valve	AOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	6.2-39 sh. 1
F006	1	Wetwell purge exhaust line inboard isolation valve (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F007	1	Wetwell overpressure line valve (h2.2)	AOV	2	A	I, P	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F008	1	Containment exhaust line to SGTS (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F009	1	Containment exhaust line to R/B HVAC (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F010	1	Wetwell overpressure line valve (h2.2)	AOV	2	A	I, P	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F011	1	Containment exhaust line to SGTS (h2.2)	AOV	2	A	I, A	L, P, S	2yr, 2yr, RO	6.2-39 sh. 1
F025	1	Purge supply line from outboard containment isolation valve	AOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	6.2-39 sh. 1
F039	1	N2 makeup line from outboard containment isolation valve	AOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	6.2-39 sh. 1
F040	1	N2 makeup line from to drywell inboard isolation valve	AOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	6.2-39 sh. 1
F041	1	N2 makeup line from to wetwell inboard isolation valve	AOV	2	A	I, A	L, P, S	2yr, 2yr, 3mo	6.2-39 sh. 1
F044	8	Drywell/wetwell vacuum breaker valve (k2)	CV	2	C	A	P,R	RO, RO	6.2-39 sh. 2
F050	1	Purge supply line from test line valve	MN	2	B	P		E1	6.2-39 sh. 1
F051	1	Purge exhaust line test line valve	MN	2	B	P		E1	6.2-39 sh. 1
F054	1	Makeup line test line valve	MN	2	B	P		E1	6.2-39 sh. 1
F055	1	Drywell personnel air lock hatch test line valve	MN	2	B	P		E1	6.2-39 sh. 2
F056	1	Wetwell personnel air lock hatch test line valve	MN	2	B	P		E1	6.2-39 sh. 2
F057	1	Overpressure protection test line valve	MN	2	B	P		E1	6.2-39 sh. 1

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F058	1	Overpressure protection test line valve	MN	3	B	P		E1	6.2-39 sh. 1
F059	1	Overpressure protection test line valve	MN	3	B	P		E1	6.2-39 sh. 1
F700	1	FE instrument line valve	MN	2	B	P		E1	6.2-39 sh. 1
F701	1	FE instrument line valve	MN	2	B	P		E1	6.2-39 sh. 1
F702	1	FE instrument line valve	MN	2	B	P		E1	6.2-39 sh. 1
F703	1	FE instrument line valve	MN	2	B	P		E1	6.2-39 sh. 1
F730	1	Drywell pressure instrument line isolation valve	MN	2	B	P		E1	6.2-39 sh. 3
F731	1	Drywell pressure instrument line isolation valve (k4) (k2)	SOV	2	A	I, P	P	RO	6.2-39 sh. 3
F732	2	Drywell pressure instrument line valve	MN	2	B	P		E1	6.2-39 sh. 3
F733	2	Drywell pressure instrument line isolation valve (k4) (k2)	SOV	2	A	I, P	P	RO	6.2-39 sh. 3
F734	4	Drywell pressure instrument line valve	MN	2	B	P		E1	6.2-39 sh. 3
F735	4	Drywell pressure instrument line isolation valve (k4) (k2)	SOV	2	A	I, P	P	RO	6.2-39 sh. 3
F736	2	Wetwell pressure instrument line valve	MN	2	B	P		E1	6.2-39 sh. 3
F737	2	Wetwell pressure instrument line isolation valve (k4) (k2)	SOV	2	A	I, P	P	RO	6.2-39 sh. 3
F738	4	Suppression pool water level instrument line valve	MN	2	B	P		E1	6.2-39 sh. 2
F739	4	Suppression pool water level instrument line isolation valve (k4) (k2)	SOV	2	A	I, P	P	RO	6.2-39 sh. 2

[illegible]

No.	Qty	Description (h) (k)	Valve Type (l)	Safety Class (a)	Code Cat. (c)	Valve Func. (d)	Test Para (e)	Test Freq (f)	Tier 2 Fig. (g)
F001	2	Secondary containment supply isolation valve	AOV	2	B	A	P, S	2yr, 3mo	9.4-3 sh. 1
F002	2	Secondary containment exhaust isolation valve	AOV	2	B	A	P, S	2yr, 3mo	9.4-3 sh. 1
F003	3	Secondary Containment divisional supply isolation valve	MOV	2	B	A	P, S	2yr, 3mo	9.4-3 sh. 1
F004	3	Secondary Containment divisional exhaust isolation valve	MOV	2	B	A	P, S	2yr, 3mo	9.4-3 sh. 1
F007	4	MCR area HVAC bypass line isolation valve	MOV	2	B	A	P, S	2yr, 3mo	9.4-1 sh. 1,2
F008	4	MCR area HVAC supply isolation valve	MOV	2	B	A	P, S	2yr, 3mo	9.4-1 sh. 1,2
F009	4	MCR area HVAC emergency HVAC supply	MOV	2	B	A	P, S	2yr, 3mo	9.4-1 sh. 1,2
F010	4	MCR area HVAC exhaust isolation valve	MOV	2	B	A	P, S	2yr, 3mo	9.4-1 sh. 1,2
<b>Y52 Oil Storage Transfer System Valves</b>									
F001	6	D/G transfer pump discharge line check valve	CV	3	C	A	S	3mo	9.5-6
F002	3	D/G transfer pump discharge line relief valve	RV	3	C	A	R	10yr	9.5-6
F003	3	D/G transfer pump discharge line ball (plug) valve	MN	3	B	P		E1	9.5-6
F004	3	D/G fuel oil day tank return to storage tank valve	MN	3	B	P		E1	9.5-6
F501	3	D/G transfer pump discharge line drain valve	MN	3	B	P		E1	9.5-6
F502	3	D/G transfer pump discharge line vent valve	MN	3	B	P		E1	9.5-6



## Notes:

- (a) 1, 2, or 3—Safety Classification, Subsection 3.2.3.
- (b) Pump test parameters per ASME OM-2004, Table ISTB-3000-1:
  - N - Speed
  - P- Discharge Pressure
  - $\Delta P$  - Differential Pressure
  - Q - Flow Rate
  - Vd -Peak-to-peak vibration displacement
  - Vv -Peak vibration velocity
- (c) A, B, C or D—Valve category per ASME OM-2004, ISTC-1300.
- (d) Valve function:
  - I - Primary containment isolation, Subsection 6.2.4
  - A or P - Active or passive per ASME OM-2004, ISTA-2000
- (e) Valve test parameters per ASME Code in (c) above:
  - L - Leakage rate (ISTC-3600)
  - P - Local position verification (ISTC-3700)
  - R - Relief valve test including visual examination, set pressure and seat tightness testing (Mandatory Appendix I)
  - S - Stroke exercise Category A or B (ISTC-3510 and -3521)
  - Category C (ISTC-3510, -3522, and -5221)
  - X - Explosive charge test (ISTC-5260)
- (f) Pump or valve test exclusions, alternatives and frequency per ASME code in (b) or (c) above or Appendix I:
  - CS - Cold shutdown (ISTC-3521 (c))
  - RO - Refueling outage and/or no case greater than two years. (ISTC 3521 (e))
  - E1 - Used for operating convenience (i.e., passive vent, drain, instrument test, maintenance valves, or a system control valve). Tests are not required (ISTC-1200).
  - E2 - In regular use. Test frequency is not required provided the test parameters are analyzed and recorded at an operation interval not exceeding three months. (ISTC-3550)
  - E3 - Not Used.
  - E10 - In regular use. Test frequency is not required provided the test parameters are recorded at least once every three months of operation (ISTB-3410)
  - E11 Not Used.
- (g) Piping and instrument symbols and abbreviations are defined in Figure 1.7-1. Figure page numbers are shown in parenthesis.

(h) Reasons for code defined testing exceptions (ISTC-3521 and -3522).

- (h1.1) Per code the S (stroke) testing is to be performed every 3 months. High flow rate through the valve is required to ensure proper plant operation. The flow cannot be reduced or disrupted since it will impact plant operation. Therefore to fully stroke this valve, the test is performed during refueling outages to avoid disruption in normal power operations.
- (h1.2) Per code the S (stroke) testing is to be performed every 3 months. This test cannot be performed during power operations because RWCU is always operational, disrupting it will impact plant operation. Therefore this test is scheduled to be performed during refueling outages.
- (h1.3) Per code the S (stroke) testing is to be performed every 3 months. A partial stroke test during initial startup can be performed. This valve can only be fully stroked during refueling outage. Therefore, position test and full stroke test is scheduled to be performed during refueling outages, with partial stroke testing can be done every three months.
- (h1.4) Per code the S (stroke) testing is to be performed every 3 months. Performing stroke test at full plant power would impact power operations and add significant heat to the primary containment. Therefore, position test and full stroke test is scheduled to be performed during refueling outages.
- (h1.5) Per code the S (stroke) testing is to be performed every 3 months. Stroking this valve can result in depressurizing of the RPV and impact power operation. Therefore, position and stroke test is to be performed during refueling outage.
- (h1.6) Per code the S (stroke) testing is to be performed every 3 months. Performing this test at full plant power is not possible because this valve is in drywell area and is inaccessible. Therefore, the R (relief valve test) and stroke test is to be performed during refueling outage.
- (h1.7) Per code the S (stroke) testing is to be performed every 3 months. Performing this test at full plant power is not possible because this valve is inaccessible. Therefore, the stroke test is to be performed during refueling outage.
- (h1.8) Relief valve test including visual examination, set pressure and seat tightness testing. These tests can only be performed during refueling outages due to inaccessibility to the valve during power operation.
- (h1.9) Per code the S (stroke) testing is to be performed every 3 months. Performing stroke test on this valve during normal power operation might cause depressurization and will impact plant operation. Therefore to fully stroke this valve, the test is to be performed during refueling outages to avoid disruption in normal power operations.
- (h1.10) Per code the S (stroke) testing is to be performed every 3 months. Testing this valve while the plant is operating would cause cooling flow to cease to the Reactor Internal Pump (RIP) heat exchangers. The RIP equipment requires cooling water to the heat exchanger (HX). Stopping the cooling flow would require the RIPs to be stopped. Therefore, stroke test is to be performed during refueling outages to avoid disruption in normal power operations.

- (h1.11) Per code the S (stroke) testing is to be performed every 3 months. Performing this test at full plant power is not possible because this valve is inaccessible due to inerted containment. Therefore, the stroke test is to be performed during refueling outage.
- (h2.1) Avoids valve damage and impacts on power operations. The R (relief valve) test meets OM Code Mandatory Appendix I at 5 years. The S (stroke) test is normally performed every 3 months per code. This test is typically performed at low power during initial startup. Performing this test at full plant power would impact power operations and add significant heat to the primary containment.
- (h2.2) Avoids valve damage and impacts on power operations. These isolation valves are required to maintain inert primary containment vessel atmosphere integrity during all plant modes of operation except during plant shutdown for refueling. Therefore, these valves shall be stroke tested during refueling outages.
- (h3.1) Avoids impacts on power operations. The S (stroke) test is normally performed every 3 months per code. However this test cannot be done while the plant is in power operations since stroking the valve during operation would require reducing feedwater flow, which places an undesirable transient on the plant. Therefore to be able to fully stroke this valve, the test is done during refueling outages to avoid impact on power operations.
- (h3.2) Avoids impacts on power operations. Per the OM 2004 code, the stroke test is normally performed every 3 months. Performing IST on this valve during operations would require isolation of critical instrumentation required for reactor operations. This excess flow check valve has no external means of repositioning the valve. Flow must be induced to close the valve and a path to the secondary containment must be opened to induce that flow. Therefore due to the impact on power operations, the Stroke test has been changed to refueling outages.
- (h3.3) Avoids impacts on power operations. This excess flow check valve has no external means of repositioning the valve. Flow must be induced to close the valve and a path to the secondary containment must be opened to induce that flow. Therefore due to the impact on power operations, the Stroke test has been changed to refueling outages.
- (h3.4) Avoids impacts on power operations. Due to the common header configuration to test one check valve F008 (CHKV-0006), Recirculation Motor Purge (RMP) subsystem would need to be isolated. Operation without RMP flow for extended period of time would require shutting down the Recirculation Internal Pump (RIP). Operation of the plant at power requires the RIPs to be in operation therefore due to the impact on power operations, the Stroke test has been changed to refueling outages.
- (h3.5) Avoids impacts on power operations. Performing IST on this valve during operations would require isolation of instrumentation that controls the RCIC system. This excess flow check valve has no external means of repositioning the valve. Flow must be induced to close the valve and a path to the secondary containment must be opened to induce that flow. Therefore due to the impact on power operations, the Stroke test has been changed to refueling outages.

- (h3.6) Avoids impacts on power operations. Performing IST on this valve during operations would require isolation of instrumentation that controls the RWCU system. This excess flow check valve has no external means of repositioning the valve. Flow must be induced to close the valve and a path to the secondary containment must be opened to induce that flow. Therefore due to the impact on power operations, the Stroke test has been changed to refueling outages.
- (h3.7) Avoids impacts on power operations. Testing this valve while the plant is operating would cause cooling flow to cease to the RIP heat exchangers. The RIP equipment requires cooling water to the HX. Stopping the cooling flow would require the RIPs to be stopped. Reactor power would be impacted due to stopping the RIPs. Therefore due to the impact on power operations, the Stroke test frequency has been changed to cold shutdown.
- (h4) A temporary crosstie is necessary to carry the ongoing cooling loads. A permanent crosstie would violate divisional separation.
- (h5) Avoids cold/hot water injection to RPV during power operations.
- (h6) Maintain pressure isolation during normal operation.
- (h7) Inventory available only during refueling outage.
- (h8) Not Used
- (h9) Not Used
- (i) Summary justification for code exemption request (ISTB-5120, -5220, and -5320).
  - (i1) The piping is maintained full by a small fraction of the pump's flow capacity. These pumps may be a constant speed centrifugal type with a cooling by-pass loop. Normal operation will be near minimum flow in the flat or constant region of the pressure/flow performance curve. Therefore, a flow measurement would not be useful. The pumps will be designed and analyzed to withstand low flow operation without significant degradation.
- (j) Group A or Group B—Pump category per ASME OM-2004, ISTB-1300
  - Group A – pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations.
  - Group B - pumps in standby systems that are not operated routinely except for testing.
- (k) Test/frequency bases:
  - (k1) L (leakage): Per ISTC-3620 and Table 6.2-7, 10CFR50 Appendix J, Type C tests Section III.D.3 states "tests shall be performed during each reactor shutdown for refueling but in no case at intervals greater than 2 years".
  - (k2) P (position): Per ISTC-3700 the test frequency is 2 years.
  - (k3) L (leakage): Per ISTC-3630, for other than Containment Isolation valves, shall be conducted at least once every 2 years is specified.
  - (k4) Appendix J Type C Leak Test not required as noted in Table 6.2-7.

(l) Valve type:

AOV: Air Operated Valve

CV: Check Valve

EXP: Explosive Valve

MN: Manual Valve

MOV: Motor Operated Valve

RPD: Rupture Disk

RV: Relief Valve

SOV: Solenoid Operated Valve

VB: Vacuum Breaker