

TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUES
1. Intermediate Range Monitor, Neutron Flux - High ⁽¹⁾ (C51-IRM-K601A,B,C,D,E,F,G,H)	\leq 120 divisions of full scale	\leq 120 divisions of full scale
2. Average Power Range Monitor (C51-APRM-CH.A,B,C,D,E,F)		
a. Neutron Flux - High, 15% ⁽²⁾	\leq 15% of RATED THERMAL POWER	\leq 15% of RATED THERMAL POWER
b. Flow-Biased Neutron Flux - High ⁽³⁾⁽⁴⁾	\leq (0.66 W + 54%)	\leq (0.66 W + 54%)
c. Fixed Neutron Flux - High ⁽⁴⁾	\leq 120% of RATED THERMAL POWER	\leq 120% of RATED THERMAL POWER
3. Reactor Vessel Steam Dome Pressure - High (B21-PTM-N023A-1,B-1,C-1,D-1)	\leq 1045 psig	\leq 1045 psig
4. Reactor Vessel Water Level - Low, Level 1 (B21-LTM-N017A-1,B-1,C-1,D-1)	\geq +162.5 inches*	\geq +162.5 inches*
5. Main Steam Line Isolation Valve - Closure ⁽⁵⁾ (B21-F022A,B,C,D; B21-F028A,B,C,D)	\leq 10% closed	\leq 10% closed
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	\leq 3 x full power background	\leq 3.5 x full power background
7. Drywell Pressure - High (C71-PTM-N002A-1,B-1,C-1,D-1)	\leq 2 psig	\leq 2 psig
8. Scram Discharge Volume Water Level - High (C11-LSH-N013A,B,C,D) (C11-LSH-4516A,B,C,D)	\leq 109 gallons	\leq 109 gallons

TABLE 2.2.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
9. Turbine Stop Valve - Closure ⁽⁶⁾ (EHC-SVOS-1X,2X,3X,4X)	<u>< 10% closed</u>	<u>< 10% closed</u>
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low ⁽⁶⁾ (EHC-FSL-1756,1757,1758,1759)	<u>> 500 psig</u>	<u>> 500 psig</u>

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM (a)</u>	<u>ACTION</u>
7. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	1, 2 ^(e)	2	6
8. Scram Discharge Volume Water Level - High (C11-LSH-N013A,B,C,D) (C11-LSH-4516A,B,C,D)	1, 2, 5 ^(f)	2	5
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	1 ^(g)	4	8
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	1 ^(g)	2	8
11. Reactor Mode Switch in Shutdown Position (C71A-51)	1, 2, 3, 4, 5	1	9
12. Manual Scram (C71-A-S3A,B)	1, 2, 3, 4, 5	1	10

TABLE 3.3.1-2 (Continued)

REACTOR PROTECTION SYSTEM RESPONSE TIMES

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
7. In yve-11 Pressure - High (C71-PT-N002A, B, C, D) (C71-PT4-N002A-1, B-1, C-1, D-1)	NA
8. Scram Discharge Volume Water Level - High (C11-LSH-N013A, B, C, D) (C11-LSH-4516A, B, C, D)	NA
9. Turbine Stop Valve - Closure (EHC-SV0S-iX, 2X, 3X, 4X)	≤ 0.06
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756, 1757, 1758, 1759)	≤ 0.08
11. Reactor Mode Switch in Shutdown Position (C71A-S1)	NA
12. Manual Scram (C71A-S3A, B)	NA

* Neutron detectors are exempt from response time testing. Response time shall be measured from detector output or from the input of the first electronic component in the channel.

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION ^(a)	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
5. Main Steam Line Isolation Valve - Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	NA	M	R ^(h)	1
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	S	M ⁽ⁱ⁾	R ^(j)	1, 2
7. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	NA ^(k) D	NA M	R ^(l) M	1, 2 1, 2
8. Scram Discharge Volume Water Level - High (C11-LSH-N013A,B,C,D) (C11-LSH-4516A,B,C,D)	NA	Q	R	1, 2, 5
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	NA	M	R ^(h)	1
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	NA	H	R	1
11. Reactor Mode Switch in Shutdown Position (C71A-S1)	NA	R	NA	1, 2, 3, 4, 5
12. Manual Scram (C71A-S3A,B)	NA	Q	NA	1, 2, 3, 4, 5

TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
1. PRIMARY CONFINEMENT ISOLATION				
a. Reactor Vessel Water Level -				
1. Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	1, 2, 3	20
2. Low, Level 2 (B21-LT-N024A-1,B-1, and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	20
b. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	20
c. Main Steam Line				
1. Radiation - High (d) (D12-RM-K603A,B,C,D)	1	2	1, 2, 3	21
2. Pressure - Low (B21-PT-N015A,B,C,D) (B21-PTM-N015A-1,B-1,C-1,D-1)	1	2	1	22
3. Flow - High (B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D) (B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	1	2/line	1	22

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>VALVE GROUPS OPERATED BY SIGNAL(a)</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)</u>	<u>APPLICABLE OPERATIONAL CONDITION</u>	<u>ACTION</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>				
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D; B21-TS-N013A,B,C,D)	1	2 ^(e)	1, 2, 3	21
e. Condenser Vacuum - Low (B21-PT-N056A,B,C,D) (B21-PTM-N056A-1,B-1,C-1,D-1)	1	2	1, 2 ^(f)	21
f. Turbine Building Area Temperature - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	1	4 ^(e)	1, 2, 3	21

TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>VALVE GROUPS OPERATED BY SIGNAL(a)</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)</u>	<u>APPLICABLE OPERATIONAL CONDITION</u>	<u>ACTION</u>
<u>1. PRIMARY CONTAINMENT ISOLATION</u>				
a. Reactor Vessel Water Level -				
1. Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	1, 2, 3	20
2. Low, Level 2 (B21-LT-N024A-1,B-1, and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	20
b. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	20
c. Main Steam Line				
1. Radiation - High (d) (D12-RM-K603A,B,C,D)	1	2	1, 2, 3	21
2. Pressure - Low (B21-PT-N015A,B,C,D) (B21-PTM-N015A-1,B-1,C-1,D-1)	1	2	1	22
3. Flow - High (B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D) (B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	1	2/line	1	22

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
2. <u>SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	6	1	1, 2, 3, 5, and*	23
b. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	23
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	23
3. <u>REACTOR WATER CLEANUP SYSTEM ISOLATION</u>				
a. A Flow - High (G31-dFS-N603-1A,1B)	3	1	1, 2, 3	24
b. Area Temperature - High (G31-TS-H600A,B,C,D,E,F)	3	2	1, 2, 3	24
c. Area Ventilation Δ Temp. - High (G31-TS-N602A,B,C,D,E,F)	3	2	1, 2, 3	24
d. SLCS Initiation (G41A-S1)	3 (g)	NA	1, 2, 3	24
e. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1) (B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	1, 3 ,,	2	1, 2, 3	24

TABLE 3.3.2-1 (Continued)

TRIP FUNCTION AND INSTRUMENT NUMBER	ISOLATION ACTUATION INSTRUMENTATION			ACTION
	VALVE GROUPS OPERATED BY SIGNAL.(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	
4. CORE STANDBY COOLING SYSTEMS ISOLATION				
a. High Pressure Coolant Injection System Isolation				
1. HPCI Steam Line Flow - High (E41-PDT-N004; E41-PDT-N005) (E41-PDTS-N004-2; E41-PDTS-N005-2)	4	1	1, 2, 3	25
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	4	2	1, 2, 3	25
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488; E41-TS-3489)	4	2	1, 2, 3	25
4. Bus Power Monitor (E41-K55 and E41-K56)	NA ^(h)	1/bus	1, 2, 3	26
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	4	2	1, 2, 3	25
6. HPCI Steam Line Ambient Temperature - High (E41-TS-N603C,D)	4	1	1, 2, 3	25

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
7. HPCI Steam Line Area Δ Temp. - High (E51-dTS-N604C,D)	4	1	1, 2, 3	25
8. Emergency Area Cooler Temperature - High (E41-TS-N602A,B)	4	1	1, 2, 3	25
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-PDT-N017; E51-PDT-N018) (E51-PDTS-N017-2; E51-PDTS-N018-2)	5	1	1, 2, 3	25
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	5	2	1, 2, 3	25
3. RCIC Steam Line Tunnel Temperature - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	5	2	1, 2, 3	25
4. Bus Power Monitor (E51-K42 and E51-K43)	NA (h)	1/bus	1, 2, 3	26

TABLE 3.3.2-1 (Continued)

TRIP FUNCTION AND INSTRUMENT NUMBER		ISOLATION ACTUATION INSTRUMENTATION			
		VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
5.	RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	5	2	1, 2, 3	25
6.	RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	5	1	1, 2, 3	25
7.	RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	5	1	1, 2, 3	25
8.	RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	5	1	1, 2, 3	25
9.	RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	5	1	1, 2, 3	25
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>					
a.	Reactor Vessel Water Level - Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-H017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	1, 2, 3	27
b.	Reactor Steam Dome Pressure- High (B32-PS-N018A,B)	7, 8	1	1, 2, 3	27

TABLE 3.3.2-2

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. <u>PRIMARY CONTAINMENT ISOLATION</u>		
a. Reactor Vessel Water Level -		
1. Low, Level 1 (B21-LTM-N017A-1,B-1,C-1,D-1)	$\geq + 162.5$ inches*	$\geq + 162.5$ inches*
2. Low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*
b. Drywell Pressure - High (C71-PTM-N002A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
c. Main Steam Line		
1. Radiation - High (D12-RM-K603A,B,C,D)	$\leq 3 \times$ full power background	$\leq 3.5 \times$ full power background
2. Pressure - Low (B21-PTM-N015A-1,B-1,C-1,D-1)	≥ 825 psig	≥ 825 psig
3. Flow - High (B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	$\leq 140\%$ of rated flow	$\leq 140\%$ of rated flow

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>		
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS N012A,B,C,D; B21-TS-N013A,B,C,D)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
e. Condenser Vacuum - Low (B21-PTM-N056A-1,B-1,C-1,D-1)	≥ 7 inches Hg vacuum	≥ 7 inches Hg vacuum
f. Turbine Building Area Temp - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
<u>2. SECONDARY CONTAINMENT ISOLATION</u>		
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	≤ 11 mr/hr	≤ 11 mr/hr
b. Drywell Pressure - High (C71-PTH-N002A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
c. Reactor Vessel Water Level - Low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
<u>3. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>		
a. A Flow - High (G31-dFS-N603-1A,1B)	≤ 53 gal/min	≤ 53 gal/min
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	$\leq 150^{\circ}\text{F}$	$\leq 150^{\circ}\text{F}$
c. Area Ventilation Temperature A Temp - High (G31-TS-N602A,B,C,D,E,F)	$\leq 50^{\circ}\text{F}$	$\leq 50^{\circ}\text{F}$
d. SLCS Initiation (C41A-S1)	NA	NA
e. Reactor Vessel Water Level - Low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*
<u>4. CORE STANDBY COOLING SYSTEMS ISOLATION</u>		
a. High Pressure Coolant Injection System Isolation		
1. HPCI Steam Line Flow - High (E41-PDTS-N004-2; E41-PDTS-N005-2)	$\leq 300\%$ of rated flow	$\leq 300\%$ of rated flow
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	≥ 100 psig	≥ 100 psig
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488; E41-TS-3489)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
4. Bus Power Monitor (E41-K55 and E41-K56)	NA	NA
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	< 10 psig	< 10 psig
6. HPCI Steam Line Ambient Temp - High (E51-TS-N603C,D)	< 200°F	< 200°F
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,D)	< 50°F	< 50°F
8. Emergency Area Cooler Temp - High (E41-TS-N602A,B)	< 175°F	< 175°F
b. Reactor Core Isolation Cooling System Isolation		
1. RCIC Steam Line Flow - High (E51-PDTS-N017-2; E51-PDTS-N018-2)	< 300% of rated flow	< 300% of rated flow
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	< 50 psig	> 50 psig
3. RCIC Steam Line Tunnel Temp - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	< 175°F	< 175°F
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	NA

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
<u>1. PRIMARY CONTAINMENT ISOLATION</u>	
a. Reactor Vessel Water Level -	
1. Low, Level 1	<u><13</u>
(B21-LT-NO17A-1,B-1,C-1,D-1)	
(B21-LTM-NO17A-1,B-1,C-1,D-1)	
2. Low, Level 2	<u><1.0**</u>
(B21-LT-NO24A-1,B-1 and	
B21-LT-NO25A-1,B-1)	
(B21-LTM-NO24A-1,B-1 and	
B21-LTM-NO25A-1,B-1)	
b. Drywell Pressure - High	<u><13</u>
(C71-PT-NO02A,B,C,D)	
(C71-PTM-NO02A-1,B-1,C-1,D-1)	
c. Main Steam Line	<u><1.0**</u>
1. Radiation - High*	
(D12-RM-K603A,B,C,D)	
2. Pressure - Low	<u><13</u>
(B21-PT-NO15A,B,C,D)	
(B21-PTM-NO15A-1,B-1,C-1,D-1)	
3. Flow - High	<u><0.5**</u>
(B21-PDT-NO06A,B,C,D;	
B21-PDT-NO07A,B,C,D;	
B21-PDT-NO08A,B,C,D;	
B21-PDT-NO09A,B,C,D)	
(B21-PDTM-NO06A-1,B-1,C-1,D-1;	
B21-PDTM-NO07A-1,B-1,C-1,D-1;	
B21-PDTM-NO08A-1,B-1,C-1,D-1;	
B21-PDTM-NO09A-1,B-1,C-1,D-1)	
d. Main Steam Line Tunnel Temperature - High	<u><13</u>
(B21-TS-NO10A,B,C,D;	
B21-TS-NO11A,B,C,D;	
B21-TS-NO12A,B,C,D;	
B21-TS-NO13A,B,C,D)	
e. Condenser Vacuum - Low	<u><13</u>
(B21-PT-NO56A,B,C,D)	
(B21-PTM-NO56A-1,B-1,C-1,D-1)	

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>	
f. Turbine Building Area Temperature - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	NA
<u>2. SECONDARY CONTAINMENT ISOLATION</u>	
a. Reactor Building Exhaust Radiation - High* (D12-RM-N010A,B)	<u><13</u>
b. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	<u><13</u>
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	<u><1.0**</u>
<u>3. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>	
a. Δ Flow - High (G31-dFS-N603-1A,1B)	<u><13</u>
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	<u><13</u>
c. Area Ventilation Temperature ΔT - High (G31-TS-N602A,B,C,D,E,F)	<u><13</u>
d. SLCS Initiation (C41A-S1)	NA
e. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1) (B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	<u><1.0**</u>

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
4. <u>CORE STANDBY COOLING SYSTEMS ISOLATION</u>	
a. High Pressure Coolant Injection System Isolation	
1. HPCI Steam Line Flow - High (E41-PDT-N004; E41-PDT-N005) (E41-PDTS-N004-2; E41-PDTS-N005-2)	<u><13</u>
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	<u><13</u>
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488; E41-TS-3489)	<u><13</u>
4. Bus Power Monitor (E41-K55 and E41-K56)	NA
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	NA
6. HPCI Steam Line Ambient Temperature - High (E51-TS-N603C,D)	NA
7. HPCI Steam Line Area (E51-dTS-N604C,D)	NA
8. Emergency Area Cooler Temperature - High - (E41-TS-602A,B)	NA
b. Reactor Core Isolation Cooling System Isolation	
1. RCIC Steam Line Flow - High (E51-PDT-N017; E51-PDT-N018) (E51-PDTS-N017-2; E51-PDTS-N018-2)	NA
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
3. RCIC Steam Line Tunnel Temp - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	NA
4. Bus Power Monitor (E51-K42 and E51-K43)	NA
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	NA
6. RCIC Steam Line Ambient Temperature - High (E51-TS-N603A,B)	NA
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	NA
8. Emergency Area Cooler Temperature - High (E51-TS-N602A,B)	NA
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	NA
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>	
a. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	NA
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	NA

* Radiation monitors are exempt from response time testing. Response time shall be measured from detector output or the input of the first electronic component in the channel.

** Isolation actuation instrumentation response time only.

Isolation system instrumentation response time specified for the Trip Function actuating each valve group shall be added to isolation time shown in Table 3.6.3-1 and Table 3.6.5.2-1 for valves in each valve group to obtain ISOLATION SYSTEM RESPONSE TIME for each valve.

TABLE 4.3.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level -				
1. Low, Level 1				
(B21-LT-NO17A-1,B-1,C-1,D-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-NO17A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
2. Low, Level 2				
(B21-LT-NO24A-1,B-1 and B21-LT-NO25A-1,B-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-NO24A-1,B-1 and B21-LTM-NO25A-1,B-1)	D	M	M	1, 2, 3
b. Drywell Pressure - High				
(C71-PT-NO02A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(C71-PTM-NO02A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
c. Main Steam Line				
1. Radiation - High				
(D12-RM-K603A,B,C,D)	D	W	R	1, 2, 3
2. Pressure - Low				
(B21-PT-NO15A,B,C,D)	NA ^(a)	NA	R ^(b)	1
(B21-PTM-NO15A-1,B-1,C-1,D-1)	D	M	M	1
3. Flow - High				
(B21-PDT-NO06A,B,C,D; B21-PDT-NO07A,B,C,D; B21-PDT-NO08A,B,C,D; B21-PDT-NO09A,B,C,D)	NA ^(a)	NA	R ^(b)	1
(B21-PDTM-NO06A-1,B-1,C-1,D-1; B21-PDTM-NO07A-1,B-1,C-1,D-1; B21-PDTM-NO08A-1,B-1,C-1,D-1; B21-PDTM-NO09A-1,B-1,C-1,D-1)	D	M	M	1

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>				
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D; B21-TS-N013A,B,C,D)	NA	M	R	1, 2, 3
e. Condenser Vacuum - Low (B21-PT-N056A,B,C,D) (B21-PTM-N056A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2# 1, 2#
f. Turbine Building Area Temp-High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	NA	M	R	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
<u>2. SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	D	M	R	1,2,3,5, and *
b. Drywell Pressure - High (C71-PT-N002A,B,C,D) (C71-PTM-N002A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1) (B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
<u>3. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>				
a. Δ Flow - High (G31-dFS-N603-1A,1B)	D	M	R	1, 2, 3
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	NA	M	R	1, 2, 3
c. Area Ventilation Δ Temp - High (G31-TS-N602A,B,C,D,E,F)	NA	M	R	1, 2, 3
d. SLCS Initiation (C41A-S1)	NA	R	NA	1, 2, 3
e. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1) (B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
4. <u>CORE STANDBY COOLING SYSTEMS ISOLATION</u>				
a. High Pressure Coolant Injection System Isolation				
1. HPCI Steam Line Flow - High (E41-PDT-N004; E41-PDT-N005)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E41-PDTS-N004-2; E41-PDTS-N005-2)	D	M	M	1, 2, 3
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	NA	M	R	1, 2, 3
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3388; E41-TS-3489)	NA	M	Q	1, 2, 3
4. Bus Power Monitor (E41-K55 and E41-K56)	NA	R	NA	1, 2, 3
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	NA	M	Q	1, 2, 3
6. HPCI Steam Line Ambient Temp - High (E51-TS-N603C,D)	NA	M	R	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,D)	NA	M	R	1, 2, 3
8. Emergency Area Cooler Temp - High (E41-TS-N602A,B)	NA	M	Q	1, 2, 3
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-PDT-N017; E51-PDT-N018)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E51-PDTS-N017-2; E51-PDTS-N018-2)	D	M	M	1, 2, 3
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA	M	Q	1, 2, 3
3. RCIC Steam Line Tunnel High Temperature (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	NA	M	R	1, 2, 3
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	R	NA	1, 2, 3
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	NA	M	R	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
6. RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	NA	M	R	1, 2, 3
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	NA	M	R	1, 2, 3
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	NA	M	Q	1, 2, 3
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	NA	M	Q	1, 2, 3
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>				
a. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-NO17A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
b. Reactor Steam Dome Pressure - High (B32-PS-NO18A,B)	NA	S/U ^(c) , M	R	1, 2, 3

* When handling irradiated fuel in the secondary containment.

When reactor steam pressure > 500 psig.

(a) The transmitter channel check is satisfied by the trip unit channel check.

A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

(c) If not performed within the previous 31 days.

TABLE 3.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
1. CORE SPRAY SYSTEM			
a. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D) (B21-LTS-N031A-4,B-4,C-4,D-4)	2	1, 2, 3, 4, 5	30
b. Reactor Steam Dome Pressure - Low (Injection Permissive) (B21-PT-N021A,B,C,D) (B21-PTS-N021A-2,B-2,C-2,D-2)	2	1, 2, 3, 4, 5	31
c. Drywell Pressure - High (E11-PT-N011A,B,C,D) (E11-PTS-N011A-2,B-2,C-2,D-2)	2	1, 2, 3	30
d. Time Delay Relay (E21-K16A,B)	1	1, 2, 3, 4, 5	31
e. Bus Power Monitor# (E21-K1A,B)	1/bus	1, 2, 3, 4, 5	32
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM			
a. Drywell Pressure - High (E11-PT-N011A,B,C,D) (E11-PTM-N011A-1,B-1,C-1,D-1)	2	1, 2, 3	30
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D) (B21-LTS-N031A-4,B-4,C-4,D-4)	2	1, 2, 3, 4*, 5*	30
c. Reactor Vessel Shroud Level (Drywell Spray Permissive) (B21-LT-N036 and B21-LT-N037) (B21-LTM-N036-1 and B21-LTM-N037-1)	1	1, 2, 3, 4*, 5*	31
d. Reactor Steam Dome Pressure - Low (Injection Permissive) (B21-PT-N021A,B,C,D) (B21-PTM-N021A-1,B-1,C-1,D-1) (B21-PTS-N021A-2,B-2,C-2,D-2)			
1. RHR Pump Start and LPCI Injection Valve Actuation	2	1, 2, 3, 4*, 5*	31
2. Recirculation Loop Pump Discharge Valve Actuation	2	1, 2, 3, 4*, 5*	31

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
<u>LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)</u>			
e. RHR Pump Start - Time Delay Relay (STR-1A1,2 and STR-1B1,2)	1	1, 2, 3, 4*, 5*	31
f. Bus Power Monitor# (E11-K106A,B)	1/bus	1, 2, 3, 4*, 5*	32
<u>3. HIGH PRESSURE COOLANT INJECTION SYSTEM</u>			
a. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N031A,B,C,D) (B21-LTS-N031A-2,B-2,C-2,D-2)	2	1, 2, 3	30
b. Drywell Pressure - High (E11-PT-N011A,B,C,D) (E11-PTS-N011A-2,B-2,C-2,D-2)	2	1, 2, 3	30
c. Condensate Storage Tank Level - Low (E41-LS-N002, E41-LS-N003)	2**	1, 2, 3	33
d. Suppression Chamber Water Level - High (E41-LSH-N015A,B)	2**	1, 2, 3	33
e. Bus Power Monitor# (E41-K55 and E41-K56)	1/bus	1, 2, 3	32
<u>4. AUTOMATIC DEPRESSURIZATION SYSTEM</u>			
a. Drywell Pressure - High, coincident with (E11-PT-N010A,B,C,D) (E11-PTM-N010A-1,B-1,C-1,D-1)	2	1, 2, 3	30
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D) (B21-LTS-N031A-3,B-3,C-3,D-3)	2	1, 2, 3	30

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
AUTOMATIC DEPRESSURIZATION SYSTEM (Continued)			
c. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N042A,B) (B21-LTM-N042A-1,B-1)	1	1, 2, 3	30
d. ADS Timer (B21-TDPU-K5A,B)	1	1, 2, 3	31
e. Core Spray Pump Discharge Pressure - High (Permissive) (E21-PS-N008A,B and E21-PS-N009A,B)	2	1, 2, 3	31
f. RHR (LPCI MODE) Pump Discharge Pressure - High (Permissive) (E11-PS-N016A,B,C,D and E11-PS-N020A,B,C,D)	2/pump	1, 2, 3	31
g. Bus Power Monitor# (B21-K1A,B)	1/bus	1, 2, 3	32

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE OPERATIONAL CONDITIONS	ACTION
5. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	1/bus	1/bus	1/bus	1,2,3,4 ^{##} ,5 ^{##}	34
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	3/bus	2/bus	2/bus	1,2,3,4 ^{##} ,5 ^{##}	35

* Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.

** Provides signal to LPCI pump suction valves only.

Alarm only.

Required when ESF equipment is required to be OPERABLE.

TABLE 3.3.3-2

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>1. CORE SPRAY SYSTEM</u>		
a. Reactor Vessel Water Level - Low, Level 3 (B21-LTS-N031A-4,B-4,C-4,D-4)	$\geq + 2.5$ inches*	$\geq + 2.5$ inches*
b. Reactor Steam Dome Pressure - Low (B21-PTS-N021A-2,B-2,C-2,D-2)	410 ± 15 psig	410 ± 15 psig
c. Drywell Pressure - High (E11-PTS-N011A-2,B-2,C-2,D-2)	≤ 2 psig	≤ 2 psig
d. Time Delay-Relay (E21-K16A,B)	$14 \leq t \leq 16$ secs	$14 \leq t \leq 16$ secs
e. Bus Power Monitor (E21-K1A,B)	NA	NA
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>		
a. Drywell Pressure - High (E11-PTM-N011A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
b. Reactor Vessel Water Level - Low, Level 3 (B21-LTS-N031A-4,B-4,C-4,D-4)	$\geq + 2.5$ inches*	$\geq + 2.5$ inches*
c. Reactor Vessel Shroud Level (B21-LTM-N036-1 and B21-LTM-N037-1)	$\geq - 53$ inches*	$\geq - 53$ inches*
d. Reactor Steam Dome Pressure - Low		
1. RHR Pump Start and LCPI Valve Actuation (B21-PTS-N021A-2,B-2,C-2,D-2)	410 ± 15 psig	410 ± 15 psig
2. Recirculation Pump Discharge Valve Actuation (B21-PTM-N021A-1,B-1,C-1,D-1)	310 ± 15 psig	310 ± 15 psig

TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)</u>		
e. RHR Pump Start - Time Delay Relay (STR-1A1,2 and STR-1B1,2)	$9 < t < 11$ seconds	$9 < t < 11$ seconds
f. Bus Power Monitor (E11-K106A,B)	NA	NA
<u>3. HIGH PRESSURE COOLANT INJECTION SYSTEM</u>		
a. Reactor Vessel Water Level - Low, Level 2 (B21-LTS-N031A-2,B-2,C-2,D-2)	$\geq + 112$ inches*	$\geq + 112$ inches*
b. Drywell Pressure - High (E11-PTS-N011A-2,B-2,C-2,D-2)	≤ 2 psig	≤ 2 psig
c. Condensate Storage Tank Level - Low (E41-LS-N002; E41-LS-N003)	≥ 23 feet 4 inches	≥ 23 feet 4 inches
d. Suppression Chamber Water Level - High (E41-LSH-N015A,B)	≤ -2 feet**	≤ -2 feet**
e. Bus Power Monitor (E41-K55 and E41-K56)	NA	NA
<u>4. AUTOMATIC DEPRESSURIZATION SYSTEM</u>		
a. Drywell Pressure-High (E11-PTM-N010A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
b. Reactor Vessel Water Level - Low, Level 3 (B21-LTS-N031A-3,B-3,C-3,D-3)	$\geq + 2.5$ inches*	$\geq + 2.5$ inches*
c. Reactor Vessel Water Level - Low, Level 1 (B21-LTM-N042A-1,B-1)	$\geq + 162.5$ inches*	$\geq + 162.5$ inches*
d. ADS Timer (B21-TDPU-K5A,B)	≤ 120 seconds	≤ 120 seconds

TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>AUTOMATIC DEPRESSURIZATION SYSTEM (Continued)</u>		
e. Core Spray Pump Discharge Pressure - High (E21-PS-N008A,B and E21-PS-N009A,B)	≥ 100 psig	≥ 100 psig
f. RHR (LPCI MODE) Pump Discharge Pressure - High (E11-PS-N016A,B,C,D and E11-PS-N020A,B,C,D)	≥ 100 psig	≥ 100 psig
g. Bus Power Monitor (B21-K1A,B)	NA	NA
5. <u>LOSS OF POWER</u>		
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)#	a. 4.16 kv Basis - 2940 ± 161 volts b. 120 v Basis - 84 ± 4.6 volts c. ≤ 10 sec. time delay	2940 ± 315 volts 84 ± 9 volts ≤ 10 secs. time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	a. 4.16 kv Basis - 3727 ± 9 volts b. 120 v Basis - 106.5 ± 0.25 volts c. 10 ± 0.5 sec. time delay	3727 ± 21 volts 106.5 ± 0.60 volts 10 ± 1.0 sec. time delay

This is an inverse time delay voltage relay. The voltages shown are the maximum that will not result in a trip. Lower voltage conditions will result in decreased trip times.

* Vessel water levels refer to REFERENCE LEVEL ZERO.

** Suppression chamber water level zero is the torus centerline minus 1 inch.

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
<u>1. CORE SPRAY SYSTEM</u>				
a. Reactor Vessel Water Level - Low, Level 3 (B21-LT-NO31A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3, 4, 5
(B21-LTS-NO31A-4,B-4,C-4,D-4)	D	M	M	1, 2, 3, 4, 5
b. Reactor Steam Dome Pressure - Low (B21-PT-NO21A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3, 4, 5
(B21-PTS-NO21A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3, 4, 5
c. Drywell Pressure - High (E11-PT-NO11A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E11-PTS-NO11A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3
d. Time Delay Relay (E21-K16A,B)	NA	R	R	1, 2, 3, 4, 5
e. Bus Power Monitor (E21-K1A,B)	NA	R	NA	1, 2, 3, 4, 5
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>				
a. Drywell Pressure - High (E11-PT-NO11A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E11-PTM-NO11A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-NO31A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3, 4*, 5*
(B21-LTS-NO31A-4,B-4,C-4,D-4)	D	M	M	1, 2, 3, 4*, 5*
c. Reactor Vessel Shroud Level (B21-LT-NO36 and B21-LT-NO37)	NA ^(a)	NA	R ^(b)	1, 2, 3, 4*, 5*
(B21-LTM-NO36-1 and B21-LTM-NO37-1)	D	M	M	1, 2, 3, 4*, 5*

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)				
d. Reactor Steam Dome Pressure - Low (B21-PT-NO21A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3, 4*, 5*
1. RHR Pump Start and LPCI Injection Valve Actuation (B21-PTS-NO21A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3, 4*, 5*
2. Recirculation Loop Pump Discharge Valve Actuation (B21-PTM-NO21A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3, 4*, 5*
e. RHR Pump Start - Time Delay Relay (STR-1A1,2 and STR-1B1,2)	NA	R	R	1, 2, 3, 4*, 5*
f. Bus Power Monitor (E11-K106A,B)	NA	R	NA	1, 2, 3, 4*, 5*
3. HIGH PRESSURE COOLANT INJECTION SYSTEM				
a. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO31A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTS-NO31A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3
b. Drywell Pressure - High (E11-PT-NO11A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E11-PTS-NO11A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3
c. Condensate Storage Tank Level - Low (E41-LS-NO02; E41-LS-NO03)	NA	M	Q	1, 2, 3
d. Suppression Chamber Water Level - High (E41-LSH-NO15A,B)	NA	M	Q	1, 2, 3
e. Bus Power Monitor (E41-K55 and E41-K56)	NA	R	NA	1, 2, 3

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
4. AUTOMATIC DEPRESSURIZATION SYSTEM				
a. Drywell Pressure - High (E11-PT-N010A,B,C,D) (E11-PTM-N010A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D) (B21-LTS-N031A-3,B-3,C-3,D-3)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
c. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N042A,B) (B21-LTM-N042A-1,B-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
d. ADS Timer (B21-TDPU-K5A,B)	NA	R	R	1, 2, 3
e. Core Spray Pump Discharge Pressure - High (E21-PS-N008A,B and E21-PS-N009A,B)	NA	M	Q	1, 2, 3
f. RHR (LPCI MODE) Pump Discharge Pressure - High (E11-PS-N016A,B,C,D and E11-PS-N020A,B,C,D)	NA	M	Q	1, 2, 3
g. Bus Power Monitor (B21-K1A,B)	NA	R	NA	1, 2, 3

TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
1. Intermediate Range Monitor, Neutron Flux - High ⁽¹⁾ (C51-IRM-K601A,B,C,D,E,F,G,H)	\leq 120 divisions of full scale	\leq 120 divisions of full scale
2. Average Power Range Monitor (C51-APRM-CH.A,B,C,D,E,F)		
a. Neutron Flux - High, 15% ⁽²⁾	\leq 15% of RATED THERMAL POWER	\leq 15% of RATED THERMAL POWER
b. Flow Biased Neutron Flux - High ⁽³⁾⁽⁴⁾	\leq (0.66 W + 54%)	\leq (0.66 W + 54%)
c. Fixed Neutron Flux - High ⁽⁴⁾	\leq 120% of RATED THERMAL POWER	\leq 120% of RATED THERMAL POWER
3. Reactor Vessel Steam Dome Pressure - High (B21-PTM-NO23A-1,B-1,C-1,D-1)	\leq 1045 psig	\leq 1045 psig
4. Reactor Vessel Water Level - Low, Level 1 (B21-LTM-NO17A-1,B-1,C-1,D-1)	\geq +162.5 inches*	\geq +162.5 inches*
5. Main Steam Line Isolation Valve - Closure ⁽⁵⁾ (B21-FO22A,B,C,D; B21-FO28A,B,C,D)	\leq 10% closed	\leq 10% closed
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	\leq 3 x full power background	\leq 3.5 x full power background
7. Drywell Pressure - High (C72-PTM-NO02A-1,B-1,C-1,D-1)	\leq 2 psig	\leq 2 psig
8. Scram Discharge Volume Water Level - High (C12-LSH-NO13A,B,C,D) (C12-LSH-4516A,B,C,D)	\leq 109 gallons	\leq 109 gallons

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM (a)	ACTION
7. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	1, 2 ^(e)	2	6
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,B,C,D) (C12-LSH-4516A,B,C,D)	1, 2, 5 ^(f)	2	5
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	1 ^(g)	4	8
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	1 ^(g)	4	8
11. Reactor Mode Switch in Shutdown Position (C72A-S1)	1, 2, 3, 4, 5	1	9
12. Manual Scram (C72A-S3A,B)	1, 2, 3, 4, 5	1	10

TABLE 3.3.1-2 (Continued)

REACTOR PROTECTION SYSTEM RESPONSE TIMES

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)</u>
7. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	NA
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,B,C,D) (C12-LSH-4516A,B,C,D)	NA
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	≤ 0.06
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	≤ 0.08
11. Reactor Mode Switch in Shutdown Position (C72A-S1)	NA
12. Manual Scram (C72A-S3A,B)	NA

* Neutron detectors are exempt from response time testing. Response time shall be measured from detector output or from the input of the first electronic component in the channel.

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION ^(a)	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
5. Main Steam Line Isolation Valve - Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	NA	M	R ^(h)	1
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	S	M ⁽ⁱ⁾	R ^(j)	1, 2
7. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	NA ^(k) D	NA M	R ^(l) M	1, 2 1, 2
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,B,C,D) (C12-LSH-4516A,B,C,D)	NA	Q	R	1, 2, 5
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	NA	M	R ^(h)	1
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	NA	M	R	1
11. Reactor Mode Switch in Shutdown Position (C72A-S1)	NA	R	NA	1, 2, 3, 4, 5
12. Manual Scram (C72A-S3A,B)	NA	Q	NA	1, 2, 3, 4, 5

TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>VALVE GROUPS OPERATED BY SIGNAL(a)</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)</u>	<u>APPLICABLE OPERATIONAL CONDITION</u>	<u>ACTION</u>
<u>1. PRIMARY CONTAINMENT ISOLATION</u>				
a. Reactor Vessel Water Level -				
1. Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	1, 2, 3	20
2. Low, Level 2 (B21-LT-N024A-1,B-1, and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	20
b. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	20
c. Main Steam Line				
1. Radiation - High (d) (D12-RM-K603A,B,C,D)	1	2	1, 2, 3	21
2. Pressure - Low (B21-PT-N015A,B,C,D) (B21-PTM-N015A-1,B-1,C-1,D-1)	1	2	1	22
3. Flow - High (B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D) (B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	1	2/line	1	22

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>VALVE GROUPS OPERATED BY SIGNAL(a)</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)</u>	<u>APPLICABLE OPERATIONAL CONDITION</u>	<u>ACTION</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>				
4. Flow - High (B21-PDTS-N006A-2; B21-PDTS-N007B-2; B21-PDTS-N008C-2; B21-PDTS-N009D-2)	1	2	2, 3	21
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D; B21-TS-N013A,B,C,D)	1	2 ^(e)	1, 2, 3	21
e. Condenser Vacuum - Low (B21-PT-N056A,B,C,D) (B21-PTM-N056A-1,B-1,C-1,D-1)	1	2	1, 2 ^(f)	21
f. Turbine Building Area Temperature - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	1	4 ^(e)	1, 2, 3	21

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL.(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
<u>2. SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	6	1	1, 2, 3, 5, and*	23
b. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	23
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	23
<u>3. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>				
a. Δ Flow - High (G31-dFS-N603-1A,1B)	3	1	1, 2, 3	24
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	3	2	1, 2, 3	24
c. Area Ventilation Δ Temp. - High (G31-TS-N602A,B,C,D,E,F)	3	2	1, 2, 3	24
d. SLCS Initiation (C41A-S1)	3 (g)	NA	1, 2, 3	24
e. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1) (B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	1, 3 "	2	1, 2, 3	24

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
4. CORE STANDBY COOLING SYSTEMS ISOLATION				
a. High Pressure Coolant Injection System Isolation				
1. HPCI Steam Line Flow - High (E41-PDT-N004; E41-PDT-N005) (E41-PDTS-N004-2; E41-PDTS-N005-2)	4	1	1, 2, 3	25
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	4	2	1, 2, 3	25
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488; E41-TS-3489)	4	2	1, 2, 3	25
4. Bus Power Monitor (E41-K55 and E41-K56)	NA ^(h)	1/bus	1, 2, 3	26
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	4	2	1, 2, 3	25
6. HPCI Steam Line Ambient Temperature - High (E51-TS-N603C,D)	4	1	1, 2, 3	25

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
7. HPCI Steam Line Area Δ Temp. - High (E51-dTS-N604C,D)	4	1	1, 2, 3	25
8. Emergency Area Cooler Temperature - High (E41-TS-N602A,B)	4	1	1, 2, 3	25
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-PDT-N017; E51-PDT-N018) (E51-PDTS-N017-2; E51-PDTS-N018-2)	5	1	1, 2, 3	25
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	5	2	1, 2, 3	25
3. RCIC Steam Line Tunnel Temperature - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	5	2	1, 2, 3	25
4. Bus Power Monitor (E51-K42 and E51-K43)	NA (h)	1/bus	1, 2, 3	26

TABLE 3.3.2-1 (Continued)

TRIP FUNCTION AND INSTRUMENT NUMBER	ISOLATION ACTUATION INSTRUMENTATION				ACTION
	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION		
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	5	2	1, 2, 3	25	
6. RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	5	1	1, 2, 3	25	
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	5	1	1, 2, 3	25	
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	5	1	1, 2, 3	25	
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	5	1	1, 2, 3	25	
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>					
a. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	1, 2, 3	27	
b. Reactor Steam Dome Pressure- High (B32-PS-N018A,B)	7, 8	1	1, 2, 3	27	

TABLE 3.3.2-2

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>1. PRIMARY CONTAINMENT ISOLATION</u>		
a. Reactor Vessel Water Level -		
1. Low, Level 1 (B21-LTM-N017A-1,B-1,C-1,D-1)	$\geq + 162.5$ inches*	$\geq + 162.5$ inches*
2. Low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*
b. Drywell Pressure - High (C72-PTM-N002A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
c. Main Steam Line		
1. Radiation - High (D12-RM-K603A,B,C,D)	≤ 3 x full power background	≤ 3.5 x full power background
2. Pressure - Low (B21-PTM-N015A-1,B-1,C-1,D-1)	≥ 825 psig	≥ 825 psig
3. Flow - High (B21-PDTH-N006A-1,B-1,C-1,D-1; B21-PDTH-N007A-1,B-1,C-1,D-1; B21-PDTH-N008A-1,B-1,C-1,D-1; B21-PDTH-N009A-1,B-1,C-1,D-1)	$\leq 140\%$ of rated flow	$\leq 140\%$ of rated flow
4. Flow - High (B21-PDTS-N006A-2; B21-PDTS-N007B-2; B21-PDTS-N008C-2; B21-PDTS-N009D-2)	$\leq 40\%$ of rated flow	$\leq 40\%$ of rated flow

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
PRIMARY CONTAINMENT ISOLATION (Continued)		
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS N012A,B,C,D; B21-TS-N013A,B,C,D)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
e. Condenser Vacuum - Low (B21-PTM-N056A-1,B-1,C-1,D-1)	≥ 7 inches Hg vacuum	≥ 7 inches Hg vacuum
f. Turbine Building Area Temp - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
2. SECONDARY CONTAINMENT ISOLATION		
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	≤ 11 mr/hr	≤ 11 mr/hr
b. Drywell Pressure - High (C72-PTH-N002A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
c. Reactor Vessel Water Level - Low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>3. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>		
a. Δ Flow - High (G31-dFS-N603-1A,1B)	≤ 53 gal/min	≤ 53 gal/min
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	≤ 150°F	≤ 150°F
c. Area Ventilation Temperature Δ Temp - High (G31-TS-N602A,B,C,D,E,F)	≤ 50°F	≤ 50°F
d. SLCS Initiation (C41A-S1)	NA	NA
e. Reactor Vessel Water Level - Low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	≥ + 112 inches*	≥ + 112 inches*
<u>4. CORE STANDBY COOLING SYSTEMS ISOLATION</u>		
a. High Pressure Coolant Injection System Isolation		
1. HPCI Steam Line Flow - High (E41-PDTS-N004-2; E41-PDTS-N005-2)	≤ 300% of rated flow	≤ 300% of rated flow
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	≥ 100 psig	≥ 100 psig
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488; E41-TS-3489)	≤ 200°F	≤ 200°F

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
4. Bus Power Monitor (E41-K55 and E41-K56)	NA	NA
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	≤ 10 psig	≤ 10 psig
6. HPCI Steam Line Ambient Temp - High (E51-TS-N603C,D)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,D)	$\leq 50^{\circ}\text{F}$	$\leq 50^{\circ}\text{F}$
8. Emergency Area Cooler Temp - High (E41-TS-N602A,B)	$\leq 175^{\circ}\text{F}$	$\leq 175^{\circ}\text{F}$
b. Reactor Core Isolation Cooling System Isolation		
1. RCIC Steam Line Flow - High (E51-PDTS-N017-2; E51-PDTS-N018-2)	$\leq 300\%$ of rated flow	$\leq 300\%$ of rated flow
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	≥ 50 psig	≥ 50 psig
3. RCIC Steam Line Tunnel Temp - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	$\leq 175^{\circ}\text{F}$	$\leq 175^{\circ}\text{F}$
7. Bus Power Monitor (E51-K42 and E51-K43)	NA	NA

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
<u>1. PRIMARY CONTAINMENT ISOLATION</u>	
a. Reactor Vessel Water Level -	
1. Low, Level 1	<u><13</u>
(B21-LT-NO17A-1,B-1,C-1,D-1)	
(B21-LTM-NO17A-1,B-1,C-1,D-1)	
2. Low, Level 2	<u><1.0**</u>
(B21-LT-NO24A-1,B-1 and	
B21-LT-NO25A-1,B-1)	
(B21-LTM-NO24A-1,B-1 and	
B21-LTM-NO25A-1,B-1)	
b. Drywell Pressure - High	<u><13</u>
(C72-PT-NO02A,B,C,D)	
(C72-PTM-NO02A-1,B-1,C-1,D-1)	
c. Main Steam Line	<u><1.0**</u>
1. Radiation - High*	
(D12-RM-K603A,B,C,D)	
2. Pressure - Low	<u><13</u>
(B21-PT-NO15A,B,C,D)	
(B21-PTM-NO15A-1,B-1,C-1,D-1)	
3. Flow - High	<u><0.5**</u>
(B21-PDT-NO06A,B,C,D;	
B21-PDT-NO07A,B,C,D;	
B21-PDT-NO08A,B,C,D;	
B21-PDT-NO09A,B,C,D)	
(B21-PDTM-NO06A-1,B-1,C-1,D-1;	
B21-PDTM-NO07A-1,B-1,C-1,D-1;	
B21-PDTM-NO08A-1,B-1,C-1,D-1;	
B21-PDTM-NO09A-1,B-1,C-1,D-1)	
4. Flow - High	<u><0.5**</u>
(B21-PDTS-NO06A-2;	
B21-PDTS-NO07B-2;	
B21-PDTS-NO08C-2;	
B21-PDTS-NO09D-2)	
d. Main Steam Line Tunnel Temperature - High	<u><13</u>
(B21-TS-NO10A,B,C,D;	
B21-TS-NO11A,B,C,D;	
B21-TS-NO12A,B,C,D;	
B21-TS-NO13A,B,C,D)	
e. Condenser Vacuum - Low	<u><13</u>
(B21-PT-NO56A,B,C,D)	
(B21-PTM-NO56A-1,B-1,C-1,D-1)	

TABLE 3.3.2-3 (Continued)

<u>ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME</u>	
<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>	
f. Turbine Building Area Temperature - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	NA
<u>2. SECONDARY CONTAINMENT ISOLATION</u>	
a. Reactor Building Exhaust Radiation - High* (D12-RM-N010A,B)	<13
b. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	<13
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	<1.0**
<u>3. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>	
a. Δ Flow - High (G31-dFS-N603-1A,1B)	<13
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	<13
c. Area Ventilation Temperature ΔT - High (G31-TS-N602A,B,C,D,E,F)	<13
d. SLCS Initiation (G41A-S1)	NA
e. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1) (B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	<1.0**

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
4. <u>CORE STANDBY COOLING SYSTEMS ISOLATION</u>	
a. High Pressure Coolant Injection System Isolation	
1. HPCI Steam Line Flow - High (E41-PDT-N004; E41-PDT-N005) (E41-PDTS-N004-2; E41-PDTS-N005-2)	<u><13</u>
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	<u><13</u>
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488; E41-TS-3489)	<u><13</u>
4. Bus Power Monitor (E41-K55 and E41-K56)	NA
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	NA
6. HPCI Steam Line Ambient Temperature - High (E51-TS-N603C,D)	NA
7. HPCI Steam Line Area (E51-dTS-N604C,D)	NA
8. Emergency Area Cooler Temperature - High (E41-TS-602A,B)	NA
b. Reactor Core Isolation Cooling System Isolation	
1. RCIC Steam Line Flow - High (E51-PDT-N017; E51-PDT-N018) (E51-PDTS-N017-2; E51-PDTS-N018-2)	NA
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
3. RCIC Steam Line Tunnel Temp - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	NA
4. Bus Power Monitor (E51-K42 and E51-K43)	NA
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	NA
6. RCIC Steam Line Ambient Temperature - High (E51-TS-N603A,B)	NA
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	NA
8. Emergency Area Cooler Temperature - High (E51-TS-N602A,B)	NA
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	NA
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>	
a. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	NA
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	NA

* Radiation monitors are exempt from response time testing. Response time shall be measured from detector output or the input of the first electronic component in the channel.

** Isolation actuation instrumentation response time only.

Isolation system instrumentation response time specified for the Trip Function actuating each valve group shall be added to isolation time shown in Table 3.6.3-1 and Table 3.6.5.2-1 for valves in each valve group to obtain ISOLATION SYSTEM RESPONSE TIME for each valve.

TABLE 4.3.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level -				
1. Low, Level 1				
(B21-LT-N017A-1,B-1,C-1,D-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-N017A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
2. Low, Level 2				
(B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	D	M	M	1, 2, 3
b. Drywell Pressure - High				
(C72-PT-N002A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(C72-PTM-N002A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
c. Main Steam Line				
1. Radiation - High	D	W	R	1, 2, 3
(D12-RM-K603A,B,C,D)				
2. Pressure - Low				
(B21-PT-N015A,B,C,D)	NA ^(a)	NA	R ^(b)	1
(B21-PTM-N015A-1,B-1,C-1,D-1)	D	M	M	1
3. Flow - High				
(B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D)	NA ^(a)	NA	R ^(b)	1
(B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	D	M	M	1

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
<u>PRIMARY CONTAINMENT ISOLATION (Continued)</u>				
4. Flow - High (B21-PDTS-N006A-2; B21-PDTS-N007B-2; B21-PDTS-N008C-2; B21-PDTS-N009D-2)	D	M	M	2, 3
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D; B21-TS-N013A,B,C,D)	NA	M	R	1, 2, 3
e. Condenser Vacuum - Low (B21-PT-N056A,B,C,D) (B21-PTM-N056A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2# 1, 2#
f. Turbine Building Area Temp-High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	NA	M	R	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
2. <u>SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	D	M	R	1,2,3,5, and *
b. Drywell Pressure - High (C72-PT-N002A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(C72-PTM-N002A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	D	M	M	1, 2, 3
3. <u>REACTOR WATER CLEANUP SYSTEM ISOLATION</u>				
a. Δ Flow - High (G31-dFS-N603-1A,1B)	D	M	R	1, 2, 3
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	NA	M	R	1, 2, 3
c. Area Ventilation Δ Temp - High (G31-TS-N602A,B,C,D,E,F)	NA	M	R	1, 2, 3
d. SLCS Initiation (C41A-S1)	NA	R	NA	1, 2, 3
e. Reactor Vessel Water Level - Low, Level 2 (B21-LT-N024 A-1,B-1 and B21-LT-N025 A-1,B-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-N024 A-1,B-1 and B21-LTM-N025 A-1,B-1)	D	M	M	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
4. <u>CORE STANDBY COOLING SYSTEMS ISOLATION</u>				
a. High Pressure Coolant Injection System Isolation				
1. HPCI Steam Line Flow - High (E41-PDT-NO04; E41-PDT-NO05)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E41-PDTS-NO04-2; E41-PDTS-NO05-2)	D	M	M	1, 2, 3
2. HPCI Steam Supply Pressure - Low (E41-PSL-NO01A,B,C,D)	NA	M	R	1, 2, 3
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3388; E41-TS-3489)	NA	M	Q	1, 2, 3
4. Bus Power Monitor (E41-K55 and E41-K56)	NA	R	NA	1, 2, 3
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-NO12A,B,C,D)	NA	M	Q	1, 2, 3
6. HPCI Steam Line Ambient Temp - High (E51-TS-N603C,D)	NA	M	R	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,D)	NA	M	R	1, 2, 3
8. Emergency Area Cooler Temp - High (E41-TS-N602A,B)	NA	M	Q	1, 2, 3
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-PDT-N017; E51-PDT-N018)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E51-PDTM-N017-2; E51-PDTM-N018-2)	D	M	M	1, 2, 3
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA	M	Q	1, 2, 3
3. RCIC Steam Line Tunnel High Temperature (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355; E51-TS-3487)	NA	M	R	1, 2, 3
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	R	NA	1, 2, 3
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	NA	M	R	1, 2, 3

TABLE 3.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</u>
<u>1. CORE SPRAY SYSTEM</u>			
a. Reactor Vessel Water Level - Low, Level 3 (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-4,B-4,C-4,D-4)	2	1, 2, 3, 4, 5	30
b. Reactor Steam Dome Pressure - Low (Injection Permissive) (B21-PT-NO21A,B,C,D) (B21-PTS-NO21A-2,B-2,C-2,D-2)	2	1, 2, 3, 4, 5	31
c. Drywell Pressure - High (E11-PT-NO11A,B,C,D) (E11-PTS-NO11A-2,B-2,C-2,D-2)	2	1, 2, 3	30
d. Time Delay Relay (E21-K16A,B)	1	1, 2, 3, 4, 5	31
e. Bus Power Monitor# (E21-K1A,B)	1/bus	1, 2, 3, 4, 5	32
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>			
a. Drywell Pressure - High (E11-PT-NO11A,B,C,D) (E11-PTM-NO11A-1,B-1,C-1,D-1)	2	1, 2, 3	30
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-4,B-4,C-4,D-4)	2	1, 2, 3, 4*, 5*	30
c. Reactor Vessel Shroud Level (Drywell Spray Permissive) (B21-LT-NO36 and B21-LT-NO37) (B21-LTM-NO36-1 and B21-LTM-NO37-1)	1	1, 2, 3, 4*, 5*	31
d. Reactor Steam Dome Pressure - Low (Injection Permissive) (B21-PT-NO21A,B,C,D) (B21-PTM-NO21A-1,B-1,C-1,D-1) (B21-PTS-NO21A-2,B-2,C-2,D-2)			
1. RHR Pump Start and LPCI Injection Valve Actuation	2	1, 2, 3, 4*, 5*	31
2. Recirculation Loop Pump Discharge Valve Actuation	2	1, 2, 3, 4*, 5*	31

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
<u>LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)</u>			
e. RHR Pump Start - Time Delay Relay (STR-2A1,2 and STR-2B1,2)	1	1, 2, 3, 4*, 5*	31
f. Bus Power Monitor# (E11-K106A,B)	1/bus	1, 2, 3, 4*, 5*	32
<u>3. HIGH PRESSURE COOLANT INJECTION SYSTEM</u>			
a. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-2,B-2,C-2,D-2)	2	1, 2, 3	30
b. Drywell Pressure - High (E11-PT-NO11A,B,C,D) (E11-PTS-NO11A-2,B-2,C-2,D-2)	2	1, 2, 3	30
c. Condensate Storage Tank Level - Low (E41-LS-N002, E41-LS-N003)	2**	1, 2, 3	33
d. Suppression Chamber Water Level - High (E41-LSH-N015A,B)	2**	1, 2, 3	33
e. Bus Power Monitor# (E41-K55 and E41-K56)	1/bus	1, 2, 3	32
<u>4. AUTOMATIC DEPRESSURIZATION SYSTEM</u>			
a. Drywell Pressure - High, coincident with (E11-PT-NO10A,B,C,D) (E11-PTH-NO10A-1,B-1,C-1,D-1)	2	1, 2, 3	30
b. Reactor Vessel Water Level - Low, Level 3, (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-3,B-3,C-3,D-3)	2	1, 2, 3	30

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</u>
<u>AUTOMATIC DEPRESSURIZATION SYSTEM (Continued)</u>			
c. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO42A,B) (B21-LTM-NO42A-1,B-1)	1	1, 2, 3	30
d. ADS Timer (B21-TDPU-K5A,B)	1	1, 2, 3	31
e. Core Spray Pump Discharge Pressure - High (Permissive) (E21-PS-NO08A,B and E21-PS-NO09A,B)	2	1, 2, 3	31
f. RHR (LPCI MODE) Pump Discharge Pressure - High (Permissive) (E11-PS-NO16A,B,C,D and E11-PS-NO20A,B,C,D)	2/pump	1, 2, 3	31
g. Bus Power Monitor# (B21-K1A,B)	1/bus	1, 2, 3	32

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</u>
5. <u>LOSS OF POWER</u>					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	1/bus	1/bus	1/bus	1,2,3,4 ^{##} ,5 ^{##}	34
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	3/bus	2/bus	2/bus	1,2,3,4 ^{##} ,5 ^{##}	35

* Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.

** Provides signal to HPCI pump suction valves only.

Alarm only.

Required when ESF equipment is required to be OPERABLE.

TABLE 3.3.3-2

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>1. CORE SPRAY SYSTEM</u>		
a. Reactor Vessel Water Level - Low, Level 3 (B21-LTS-NO31A-4, B-4, C-4, D-4)	$\geq + 2.5$ inches*	$\geq + 2.5$ inches*
b. Reactor Steam Dome Pressure - Low (B21-PTS-NO21A-2, B-2, C-2, D-2)	410 ± 15 psig	410 ± 15 psig
c. Drywell Pressure - High (E11-PTS-NO11A-2, B-2, C-2, D-2)	≤ 2 psig	≤ 2 psig
d. Time Delay-Relay (E21-K16A, B)	$14 \leq t \leq 16$ secs	$14 \leq t \leq 16$ secs
e. Bus Power Monitor (E21-K1A, B)	NA	NA
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>		
a. Drywell Pressure - High (E11-PTM-NO11A-1, B-1, C-1, D-1)	≤ 2 psig	≤ 2 psig
b. Reactor Vessel Water Level - Low, Level 3 (B21-LTS-NO31A-4, B-4, C-4, D-4)	$\geq + 2.5$ inches*	$\geq + 2.5$ inches*
c. Reactor Vessel Shroud Level (B21-LTM-NO36-1 and B21-LTM-NO37-1)	$\geq - 53$ inches*	$\geq - 53$ inches*
d. Reactor Steam Dome Pressure - Low		
1. RHR Pump Start and LCPI Valve Actuation (B21-PTS-NO21A-2, B-2, C-2, D-2)	410 ± 15 psig	410 ± 15 psig
2. Recirculation Pump Discharge Valve Actuation (B21-PTM-NO21A-1, B-1, C-1, D-1)	310 ± 15 psig	310 ± 15 psig

TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)</u>		
e. RHR Pump Start - Time Delay Relay (STR-2A1,2 and STR-2B1,2)	$9 \leq t \leq 11$ seconds	$9 \leq t \leq 11$ seconds
f. Bus Power Monitor (E11-K106A,B)	NA	NA
<u>3. HIGH PRESSURE COOLANT INJECTION SYSTEM</u>		
a. Reactor Vessel Water Level - Low, Level 2 (B21-LTS-NO31A-2,B-2,C-2,D-2)	$\geq + 112$ inches*	$\geq + 112$ inches*
b. Drywell Pressure - High (E11-PTS-NO11A-2,B-2,C-2,D-2)	≤ 2 psig	≤ 2 psig
c. Condensate Storage Tank Level - Low (E41-LS-NO02; E41-LS-NO03)	≥ 23 feet 4 inches	≥ 23 feet 4 inches
d. Suppression Chamber Water Level - High (E41-LSH-NO15A,B)	≤ -2 feet**	≤ -2 feet**
e. Bus Power Monitor (E41-K55 and E41-K56)	NA	NA
<u>4. AUTOMATIC DEPRESSURIZATION SYSTEM</u>		
a. Drywell Pressure-High (E11-PTM-NO10A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
b. Reactor Vessel Water Level - Low, Level 3 (B21-LTS-NO31A-3,B-3,C-3,D-3)	$\geq + 2.5$ inches*	$\geq + 2.5$ inches*
c. Reactor Vessel Water Level - Low, Level 1 (B21-LTM-NO42A-1,B-1)	$\geq + 162.5$ inches*	$\geq + 162.5$ inches*
d. ADS Timer (B21-TDPU-K5A,B)	≤ 120 seconds	≤ 120 seconds

TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
<u>AUTOMATIC DEPRESSURIZATION SYSTEM (Continued)</u>		
e. Core Spray Pump Discharge Pressure - High (E21-PS-N008A,B and E21-PS-N009A,B)	≥ 100 psig	≥ 100 psig
f. RHR (LPCI MODE) Pump Discharge Pressure - High (E11-PS-N016A,B,C,D and E11-PS-N020A,B,C,D)	≥ 100 psig	≥ 100 psig
g. Bus Power Monitor (B21-K1A,B)	NA	NA
5. <u>LOSS OF POWER</u>		
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)#	a. 4.16 kv Basis - 2940 ± 161 volts b. 120 v Basis - 84 ± 4.6 volts c. < 10 sec. time delay	2940 ± 315 volts 84 ± 9 volts < 10 sec. time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	a. 4.16 kv Basis - 3727 ± 9 volts b. 120 v Basis - 106.5 ± 0.25 volts c. 10 ± 0.5 sec. time delay	3727 ± 21 volts 106.5 ± 0.60 volts 10 ± 1.0 sec. time delay

This is an inverse time delay voltage relay. The voltages shown are the maximum that will not result in a trip. Lower voltage conditions will result in decreased trip times.

* Vessel water levels refer to REFERENCE LEVEL ZERO.

** Suppression chamber water level zero is the torus centerline minus 1 inch.

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low, Level 3 (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-4,B-4,C-4,D-4)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3, 4, 5 1, 2, 3, 4, 5
b. Reactor Steam Dome Pressure - Low (B21-PT-NO21A,B,C,D) (B21-PTS-NO21A-2,B-2,C-2,D-2)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3, 4, 5 1, 2, 3, 4, 5
c. Drywell Pressure - High (E11-PT-NO11A,B,C,D) (E11-PTS-NO11A-2,B-2,C-2,D-2)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
d. Time Delay Relay (E21-K16A,B)	NA	R	R	1, 2, 3, 4, 5
e. Bus Power Monitor (E21-K1A,B)	NA	R	NA	1, 2, 3, 4, 5
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Drywell Pressure - High (E11-PT-NO11A,B,C,D) (E11-PTM-NO11A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-4,B-4,C-4,D-4)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3, 4*, 5* 1, 2, 3, 4*, 5*
c. Reactor Vessel Shroud Level (B21-LT-NO36 and B21-LT-NO37) (B21-LTM-NO36-1 and B21-LTM-NO37-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3, 4*, 5* 1, 2, 3, 4*, 5*

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM (Continued)				
d. Reactor Steam Dome Pressure - Low (B21-PT-NO21A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3, 4*, 5*
1. RHR Pump Start and LPCI Injection Valve Actuation (B21-PTS-NO21A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3, 4*, 5*
2. Recirculation Loop Pump Discharge Valve Actuation (B21-PTM-NO21A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3, 4*, 5*
e. RHR Pump Start - Time Delay Relay (STR-2A1,2 and STR-2B1,2)	NA	R	R	1, 2, 3, 4*, 5*
f. Bus Power Monitor (E11-K106A,B)	NA	R	NA	1, 2, 3, 4*, 5*
3. HIGH PRESSURE COOLANT INJECTION SYSTEM				
a. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO31A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTS-NO31A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3
b. Drywell Pressure - High (E11-PT-NO11A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(E11-PTS-NO11A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3
c. Condensate Storage Tank Level - Low (E41-LS-N002; E41-LS-N003)	NA	M	Q	1, 2, 3
d. Suppression Chamber Water Level - High (E41-LSH-N015A,B)	NA	M	Q	1, 2, 3
e. Bus Power Monitor (E41-K55 and E41-K56)	NA	R	NA	1, 2, 3

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
4. AUTOMATIC DEPRESSURIZATION SYSTEM				
a. Drywell Pressure - High (E11-PT-N010A,B,C,D) (E11-PTM-N010A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D) (B21-LTS-N031A-3,B-3,C-3,D-3)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
c. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N042A,B) (B21-LTM-N042A-1,B-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
d. ADS Timer (B21-TDPU-K5A,B)	NA	R	R	1, 2, 3
e. Core Spray Pump Discharge Pressure - High (E21-PS-N008A,B and E21-PS-N009A,B)	NA	M	Q	1, 2, 3
f. RHR (LPCI MODE) Pump Discharge Pressure - High (E11-PS-N016A,B,C,D and E11-PS-N020A,B,C,D)	NA	M	Q	1, 2, 3
g. Bus Power Monitor (B21-K1A,B)	NA	R	NA	1, 2, 3