

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-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 (C71-PS-N002A,B,C,D)	\leq 2 psig	\leq 2 psig
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,B,C,D)	\leq 109 gallons	\leq 109 gallons

TABLE 2.2.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

TABLE NOTATION

* Vessel water levels refer to REFERENCE LEVEL ZERO.

- (1) The Intermediate Range Monitor scram functions are automatically bypassed when the reactor mode switch is placed in the Run position and the Average Power Range Monitors are on scale.
- (2) This Average Power Range Monitor scram function is a fixed point and is increased when the reactor mode switch is placed in the Run position.
- (3) The Average Power Range Monitor scram function is varied, Figure 2.2.1-1, as a function of recirculation loop flow (W). The trip setting of this function must be maintained in accordance with Specification 3.2.2.
- (4) The APRM flow-biased high neutron flux signal is fed through a time constant circuit of approximately 6 seconds. The APRM fixed high neutron flux signal does not incorporate the time constant, but responds directly to instantaneous neutron flux.
- (5) The Main Steam Line Isolation Valve-Closure scram function is automatically bypassed when the reactor mode switch is in other than the Run position.
- (6) These scram functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER.

TABLE 3.3.1-1

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>
1. Intermediate Range Monitors: (C51-IRM-K601A,B,C,D,E,F,G,H)			
a. Neutron Flux - High	2, 5 ^(b) 3, 4	3 2	1 2
b. Inoperative	2, 5 3, 4	3 2	1 2
2. Average Power Range Monitor (C51-APRM-CH.A,B,C,D,E,F)			
a. Neutron Flux - High, 15%	2, 5 ^(b)	2	3
b. Flow Biased Neutron Flux - High	1	2	4
c. Fixed Neutron Flux - High, 120%	1	2	4
d. Inoperative	1, 2, 5	2	5
e. Downscale	1	2	4
f. LPRM	1, 2, 5	(c)	NA
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-NO23A,B,C,D) (B21-PTM-NO23A-1,B-1,C-1,D-1)	1, 2 ^(d)	2	6
4. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1) (B21-LTM-NO17A-1,B-1,C-1,D-1)	1, 2	2	6
5. Main Steam Isolation Valve - Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	1	4	4
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	1, 2 ^(d)	2	7

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-PS-N002A,B,C,D)	1, 2 ^(e)	2	6
8. Scram Discharge Volume Water Level - High (C11-LSH-N013A,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-E3A,B)	1, 2, 3, 4, 5	1	10

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)</u>
1. Intermediate Range Monitors (C51-IRM-K601A,B,C,D,E,F,G,H):	
a. Neutron Flux - High*	NA
b. Inoperative	NA
2. Average Power Range Monitor* (C51-APRM-CH.A,B,C,D,E,F):	
a. Neutron Flux - High, 15%	≤ 0.09
b. Flow-Biased Neutron Flux - High	NA
c. Neutron Flux - High, 120%	≤ 0.09
d. Inoperative	NA
e. Downscale	NA
f. LPRM	NA
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-NO23A,B,C,D) (B21-PTM-NO23A-1,B-1,C-1,D-1)	≤ 0.55
4. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1) (B21-LTM-NO17A-1,B-1,C-1,D-1)	≤ 1.05
5. Main Steam Line Isolation Valve-Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	≤ 0.06
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	NA

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 (C71-PS-N002A,B,C,D)	NA
8. Scram Discharge Volume Water Level - High (C11-LSH-N013A,B,C,D)	NA
9. Turbine Stop Valve - Closure (E4C-SVOS-1X,2X,3X,4X)	<u>< 0.06</u>
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	<u>< 0.08</u>
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

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
1. Intermediate Range Monitors: (C51-IRM-K601A-E,C,D,E,F,G,H)				
a. Neutron Flux - High	D	S/U ^{(b)(c)}	R	2
	D	W	R	3, 4, 5
b. Inoperative	NA	W	NA	2, 3, 4, 5
2. Average Power Range Monitor: (C51-APRM-CH.A,B,C,D,E,F)				
a. Neutron Flux - High 15%	S	S/U ^(b) , W ^(d)	Q	2
	S	W	Q	5
b. Flow-Biased Neutron Flux - High	S	S/U ^(b) , W	W ^{(e)(f)} , Q	1
c. Fixed Neutron Flux - High, 120%	S	S/U ^(b) , W	W ^(e) , Q	1
d. Inoperative	NA	W	NA	1, 2, 5
e. Downscale	NA	W	NA	1
f. LPRM	D	NA	(g)	1, 2, 5
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-NO23A,B,C,D) (B21-PTM-NO23A-1,B-1,C-1,D-1)	NA ^(k) D	NA M	R ⁽¹⁾ M	1, 2 1, 2
4. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1) (B21-LTM-NO17A-1,B-1,C-1,D-1)	NA ^(k) D	NA M	R ⁽¹⁾ M	1, 2 1, 2

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION^(a)</u>	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
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 ⁽¹⁾	R ^(j)	1, 2
7. Drywell Pressure - High (C71-PS-N002A,B,C,D)	NA	M	Q	1, 2
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,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 (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 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

- (a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (b) Within 24 hours prior to startup, if not performed within the previous 7 days.
- (c) The IRM channels shall be compared to the APRM channels and the SRM instruments for overlap during each startup, if not performed within the previous 7 days.
- (d) When changing from CONDITION 1 to CONDITION 2, perform the required surveillance within 12 hours after entering CONDITION 2.
- (e) This calibration shall consist of the adjustment of the APRM readout to conform to the power values calculated by a heat balance during CONDITION 1 when THERMAL POWER \geq 25% of RATED THERMAL POWER.
- (f) This calibration shall consist of the adjustment of the APRM flow-biased setpoint to conform to a calibrated flow signal.
- (g) The LPRMs shall be calibrated at least once per effective full power month (EFPM) using the TIP system.
- (h) This calibration shall consist of a physical inspection and actuation of these position switches.
- (i) Instrument alignment using a standard current source.
- (j) Calibration using a standard radiation source.
- (k) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.
- (l) Transmitters are exempted from the monthly channel calibration.

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>
1. <u>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, 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-PS-N002A,B,C,D)	2, 6	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>
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-PS-N056A,B,C,D)	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
<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 (C71-PS-N002A,B,C,D)	2, 6	2	1, 2, 3	23

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>
c. Reactor Vessel Water Level - Low, Level 2 (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)	1, 3	2	1, 2, 3	23
3. <u>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-NO24 A-1,B-1 and B21-LT-NO25 A-1,B-1) (B21-LTM-NO24 A-1,B-1 and B21-LTM-NO25 A-1,B-1)	1, 3	2	1, 2, 3	24

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>
4. <u>CORE STANDBY COOLING SYSTEMS ISOLATION</u>				
a. High Pressure Coolant Injection System Isolation				
1. HPCI Steam Line Flow - High (E41-dPIS-N004 and E41-dPIS-N005)	4	2	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	2	1, 2, 3	25
7. HPCI Steam Line Area Δ Temp. - High (E51-dTS-N604C,D)	4	2	1, 2, 3	25
8. Emergency Area Cooler Temperature - High (E41-TS-N602A,B)	4	2	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
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-dPIS-N017 and E51-dPIS-N018)	5	2	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
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	2	1, 2, 3	25
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	5	2	1, 2, 3	25
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	5	2	1, 2, 3	25
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	5	2	1, 2, 3	25

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>
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) (B21-LTM-NO17A-1,B-1,C-1,D-1)	2, 6, 8	2	1, 2, 3	27
b. Reactor Steam Dome Pressure- High (B32-PS-NO18A,B)	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-NO17A-1,B-1,C-1,D-1)	$\geq + 162.5$ inches*	$\geq + 162.5$ inches*
2. Low, Level 2 (B21-LTM-NO24A-1,B-1 and B21-LTM-NO25A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*
b. Drywell Pressure - High (C71-PS-NO02A,B,C,D)	≤ 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-NO15A-1,B-1,C-1,D-1)	≥ 825 psig	≥ 825 psig
3. Flow - High (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)	$\leq 140\%$ 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>
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-PS-N056A,B,C,D)	≥ 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. <u>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-PS-N002A,B,C,D)	≤ 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)	$\leq 150^{\circ}\text{F}$	$\leq 150^{\circ}\text{F}$
c. Area Ventilation Temperature Δ 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-NO24A-1,B-1 and B21-LTM-NO25A-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-dPIS-NO04 and E41-dPIS-NO05)	$\leq 300\%$ of rated flow	$\leq 300\%$ of rated flow
2. HPCI Steam Supply Pressure - Low (E41-PSL-NO01A,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)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
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-dPIS-N017 and E51-dPIS-N018)	$\leq 300\%$ 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)	$\leq 175^{\circ}\text{F}$	$\leq 175^{\circ}\text{F}$
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	NA

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>
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	≤ 10 psig	≤ 10 psig
6. RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	$\leq 200^{\circ}\text{F}^*$	$\leq 200^{\circ}\text{F}$
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	$\leq 50^{\circ}\text{F}$	$\leq 50^{\circ}\text{F}$
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	$\leq 175^{\circ}\text{F}$	$\leq 175^{\circ}\text{F}$
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	$\leq 50^{\circ}\text{F}$	$\leq 50^{\circ}\text{F}$
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>		
a. 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*
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	≤ 140 psig	≤ 140 psig

* Vessel water levels refer to REFERENCE LEVEL ZERO.

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)#
1. <u>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)	<u><13</u>
2. Low, Level 2 (B21-LT-N024A-1,B-1 and B21-LT-NC25A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	<u><1.0**</u>
b. Drywell Pressure - High (C71-PS-N002A,B,C,D)	<u><13</u>
c. Main Steam Line	<u><1.0**</u>
1. Radiation - High* (D12-RM-K603A,B,C,D)	
2. Pressure - Low (B21-PT-N015A,B,C,D) (B21-PTM-N015A-1,B-1,C-1,D-1)	<u><13</u>
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)	<u><0.5**</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)	<u><13</u>
e. Condenser Vacuum - Low (B21-PS-N056A,B,C,D)	<u><13</u>

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>
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
2. <u>SECONDARY CONTAINMENT ISOLATION</u>	
a. Reactor Building Exhaust Radiation - High* (D12-RM-N010A,B)	<13
b. Drywell Pressure - High (C71-PS-N002A,B,C,D)	<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**
3. <u>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 (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)	<1.0**

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME	
TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)#
4. CORE STANDBY COOLING SYSTEMS ISOLATION	
a. High Pressure Coolant Injection System Isolation	
1. HPCI Steam Line Flow - High (E41-dPIS-N004 and E41-dPIS-N005)	<13
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	<13
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)	<13
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-dPIS-N017 and E51-dPIS-N018)	NA
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA
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

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>
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. <u>PRIMARY CONTAINMENT ISOLATION</u>				
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-PS-NO02A,B,C,D)	NA	M	Q	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>
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-PS-N056A,B,C,D)	NA	M	R	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
2. <u>SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	D	M	R	1,2,3,5, and *

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>
b. Drywell Pressure - High (C71-PS-N002A,B,C,D)	NA	M	Q	1, 2, 3
c. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NC24 A-1,B-1 and B21-LT-NO25 A-1,B-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-NO24 A-1,B-1 and B21-LTM-NO25 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-NO24 A-1,B-1 and B21-LT-NO25 A-1,B-1)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-NO24 A-1,B-1 and B21-LTM-NO25 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-dPIS-N004 and E41-dPIS-N005)	D	M	Q	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-S-3388; E41-S-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
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,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>
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-dPIS-N017 and E51-dPIS-N018)	NA	M	Q	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 any turbine stop valve is open.

(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

<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-PS-NO11A,B,C,D)	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. LPCI MODE OF RHR SYSTEM</u>			
a. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	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

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</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
3. <u>HPCI SYSTEM</u>			
a. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO31A,B,C,D) (B21-LTS-NO31A-2,E-2,C-2,D-2)	2	1, 2, 3	30
b. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	2	1, 2, 3	30
c. Condensate Storage Tank Level - Low (E41-LS-NO02, E41-LS-NO03)	2**	1, 2, 3	33
d. Suppression Chamber Water Level - High (E41-LSH-NO15A,B)	2**	1, 2, 3	33
e. Bus Power Monitor# (E41-K55 and E41-K56)	1/bus	1, 2, 3	32
4. <u>ADS</u>			
a. Drywell Pressure - High, coincident with (E11-PS-NO10A,B,C,D)	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

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS	ACTION
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

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 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-PS-NO11A,B,C,D)	≤ 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. LPCI MODE OF RHR SYSTEM</u>			
a. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	≤ 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>
e. RHR Pump Start - Time Delay Relay (STR-1A1,2 and STR-1B1,2)	$9 \leq t \leq 11$ seconds	$9 \leq t \leq 11$ seconds
f. Bus Power Monitor (E11-K106A,B)	NA	NA
3. <u>HPCI 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-PS-NO11A,B,C,D)	≤ 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
4. <u>ADS</u>		
a. Drywell Pressure-High (E11-PS-NO10A,B,C,D)	≤ 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>
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) (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-PS-NO11A,B,C,D)	NA	M	Q	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. LPCI MODE OF RHR SYSTEM</u>				
a. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	NA	M	Q	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
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. HPCI 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-PS-NO11A,B,C,D)	NA	M	Q	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

<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. ADS				
a. Drywell Pressure - High (E11-PS-N010A,B,C,D)	NA	M	Q	1, 2, 3
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTS-N031A-3,B-3,C-3,D-3)	D	M	M	1, 2, 3
c. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N042A,B)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-N042A-1,B-1)	D	M	M	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 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. ADS				
a. Drywell Pressure - High (E11-PS-N010A,B,C,D)	NA	M	Q	1, 2, 3
b. Reactor Vessel Water Level - Low, Level 3 (B21-LT-N031A,B,C,D)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTS-N031A-3,B-3,C-3,D-3)	D	M	M	1, 2, 3
c. Reactor Vessel Water Level - Low, Level 1 (B21-LT-N042A,B)	NA ^(a)	NA	R ^(b)	1, 2, 3
(B21-LTM-N042A-1,B-1)	D	M	M	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 4.3.3-1 (Continued)

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>
5. <u>LOSS OF POWER</u>				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	NA	R	1, 2, 3, 4*, 5*
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	S	M	R	1, 2, 3, 4*, 5*

* Required when ESF equipment is required to be OPERABLE.

- (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.

TABLE 3.3.5.3-1

POST-ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT AND INSTRUMENT NUMBER</u>	<u>MINIMUM NO. OF OPERABLE INSTRUMENT CHANNELS</u>	
1. Reactor Vessel Pressure (B21-PI-R004A,B; C32-LPR-R608; and C32-PT-N005A,B)	2	
2. Reactor Vessel Water Level (B21-LITS-N026A,B; B21-LR-R615; B21-LI-R604A,B; B21-LT-N037; and B21-LTM-N037-1)	2	
3. Suppression Chamber Water Level (CAC-LT-2601; CAC-LY-2601-1; CAC-LI-2601-3) (CAC-LT-2602; CAC-LR-2602)	2	
4. Suppression Chamber Water Temperature (CAC-TR-1258-14, 21; and C91-P602)	2	
5. Suppression Chamber Atmosphere Temperature (CAC-TR-1258-17 thru 20; and C91-P602)	2	
6. Drywell Pressure (CAC-PI-4176; CAC-PT-4176; CAC-PR-1257-1; and CAC-PT-4175)	2	
7. Drywell Temperature (CAC-TR-1258-1 thru 13, 22, 23, 24; and C91-P602)	2	
8. Drywell Radiation (CAC-AR-1260; CAC-AQH-1260-1, 2, 3; CAC-AR-1261; CAC-AQH-1261-1, 2, 3; CAC-AR-1262; and CAC-AQH-1262-1, 2, 3)	2	
9. Drywell Oxygen (CAC-AT-1259-2; CAC-AR-1259; CAC-AT-1263-2; and CAC-AR-1263)	2	
10. Drywell Hydrogen (CAC-AT-1259-1; CAC-AR-1259; CAC-AT-1263-1; and CAC-AR-1263)	2	
11. Safety Relief Valve Position Indication:	1/valve	
a. Primary - Sonic (B21-FY-4157 thru 4167)		
b. Secondary - Temp. (B21-TR-R614, points 1-11)		

TABLE 4.3.5.3-1

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	
1. Reactor Vessel Pressure (B21-PI-R004A,B; C32-LPR-R608; and C32-PT-N005A,B)	M	R	
2. Reactor Vessel Water Level (B21-LITS-N026A,B; B21-LR-R615; B21-LI-R604A,B; B21-LT-N037; and B21-LTM-N037-1)	M	R	
3. Suppression Chamber Water Level (CAC-LT-2601; CAC-LY-2601-1; CAC-LI-2601-3; CAC-LT-2602; CAC-LR-2602)	M	R	
4. Suppression Chamber Water Temperature (CAC-TR-1258-14, 21; and C91-P602)	M	R	
5. Suppression Chamber Atmosphere Temperature (CAC-TR-1258-17 thru 20; and C91-P602)	M	R	
6. Drywell Pressure (CAC-PI-4176; CAC-PT-4176; CAC-PR-1257-1; and CAC-PT-4175)	M	R	
7. Drywell Temperature (CAC-TR-1258-1 thru 13, 22, 23, 24; and C91-P602)	M	R	
8. Drywell Radiation (CAC-AR-1260; CAC-AQH-1260-1,2,3; CAC-AR-1261; CAC-AQH-1261-1,2,3; CAC-AR-1262; and CAC-AQH-1262-1,2,3)	M	R	
9. Drywell Oxygen Concentration (CAC-AT-1259-2; CAC-AR-1259; CAC-AT-1263-2; and CAC-AR-1263)	M	R	
10. Drywell Hydrogen Concentration (CAC-AT-1259-1; CAC-AR-1259; CAC-AT-1263-1; and CAC-AR-1263)	M	R	
11. Safety Relief Valve Position Indication a. Primary - Sonic (B21-FY-4157 thru 4167) b. Secondary - Temp. (B21-TR-R614, points 1-11)	M M	R R	

TABLE 3.3.6.1-1ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>MINIMUM NUMBER OPERABLE TRIP SYSTEMS PER OPERATING PUMP</u>
1. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO24A-2,B-2 and B21-LT-NO25A-2,B-2) (B21-LTM-NO24A-2,B-2 and B21-LTM-NO25A-2,B-2)	1
2. Reactor Vessel Pressure - High (B21-PS-NO45A,B,C,D)	1

TABLE 3.3.6.1-2

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. Reactor Vessel, Water Level - Low, Level 2 (B21-LTM-NO24A-2,B-2; B21-LTM-NO25A-2,B-2)	<u>> + 112 inches*</u>	<u>> + 112 inches*</u>
2. Reactor Vessel Pressure - High (B21-PS-NO45A,B,C,D)	<u><1120 psig</u>	<u><1120 psig</u>

*Vessel water levels refer to REFERENCE LEVEL ZERO.

TABLE 4.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>
1. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO24A-2,B-2 and B21-LT-NO25A-2,B-2)	NA ^(a)	NA	R ^(b)
(B21-LTM-NO24A-2,B-2 and B21-LTM-NO25A-2,B-2)	D	M	M
2. Reactor Vessel Pressure - High (B21-PS-NO45A, B, C, D)	NA	M	R

(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.

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-PS-NO02A,B,C,D)	\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 2.2.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

TABLE NOTATION

* Vessel water levels refer to REFERENCE LEVEL ZERO.

- (1) The Intermediate Range Monitor scram functions are automatically bypassed when the reactor mode switch is placed in the Run position and the Average Power Range Monitors are on scale.
- (2) This Average Power Range Monitor scram function is a fixed point and is increased when the reactor mode switch is placed in the Run position.
- (3) The Average Power Range Monitor scram function is varied, Figure 2.2.1-1, as a function of recirculation loop flow (W). The trip setting of this function must be maintained in accordance with Specification 3.2.2.
- (4) The APRM flow-biased high neutron flux signal is fed through a time constant circuit of approximately 6 seconds. The APRM fixed high neutron flux signal does not incorporate the time constant, but responds directly to instantaneous neutron flux.
- (5) The Main Steam Line Isolation Valve-Closure scram function is automatically bypassed when the reactor mode switch is in other than the Run position.
- (6) These scram functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER.

TABLE 3.3.1-1

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>
1. Intermediate Range Monitors: (C51-IRM-K601A,B,C,D,E,F,G,H)			
a. Neutron Flux - High	2, 5 ^(b) 3, 4	3 2	1 2
b. Inoperative	2, 5 3, 4	3 2	1 2
2. Average Power Range Monitor (C51-APRM-CH.A,B,C,D,E,F)			
a. Neutron Flux - High, 15%	2, 5 ^(b)	2	3
b. Flow Biased Neutron Flux - High	1	2	4
c. Fixed Neutron Flux - High, 120%	1	2	4
d. Inoperative	1, 2, 5	2	5
e. Downscale	1	2	4
f. LPRM	1, 2, 5	(c)	NA
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-NO23A,B,C,D) (B21-PTM-NO23A-1,B-1,C-1,D-1)	1, 2 ^(d)	2	6
4. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1) (B21-LTM-NO17A-1,B-1,C-1,D-1)	1, 2	2	6
5. Main Steam Isolation Valve - Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	1	4	4
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	1, 2 ^(d)	2	7

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)</u>
1. Intermediate Range Monitors (C51-IRM-K601A,B,C,D,E,F,G,H):	
a. Neutron Flux - High*	NA
b. Inoperative	NA
2. Average Power Range Monitor* (C51-APRM-CH.A,B,C,D,E,F):	
a. Neutron Flux - High, 15%	≤ 0.09
b. Flow-Biased Neutron Flux - High	NA
c. Neutron Flux - High, 120%	≤ 0.09
d. Inoperative	NA
e. Downscale	NA
f. LPRM	NA
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-NO23A,B,C,D) (B21-PTM-NO23A-1,B-1,C-1,D-1)	≤ 0.55
4. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1) (B21-LTM-NO17A-1,B-1,C-1,D-1)	≤ 1.05
5. Main Steam Line Isolation Valve-Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	≤ 0.06
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	NA

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-PS-N002A,B,C,D)	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-33A,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

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
1. Intermediate Range Monitors: (C51-IRM-K601A,B,C,D,E,F,G,H)				
a. Neutron Flux - High	D	S/U ^{(b)(c)}	R	2
	D	W	R	3, 4, 5
b. Inoperative	NA	W	NA	2, 3, 4, 5
2. Average Power Range Monitor: (C51-APRM-CH.A,B,C,D,E,F)				
a. Neutron Flux - High 15%	S	S/U ^(b) , W ^(d)	Q	2
	S	W	Q	5
b. Flow-Biased Neutron Flux - High	S	S/U ^(b) , W	W ^{(e)(f)} , Q	1
c. Fixed Neutron Flux - High, 120%	S	S/U ^(b) , W	W ^(e) , Q	1
d. Inoperative	NA	W	NA	1, 2, 5
e. Downscale	NA	W	NA	1
f. LPRM	D	NA	(g)	1, 2, 5
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-NO23A,B,C,D) (B21-PTM-NO23A-1,B-1,C-1,D-1)	NA ^(k) D	NA H	R ⁽¹⁾ M	1, 2 1, 2
4. Reactor Vessel Water Level - Low, Level 1 (B21-LT-NO17A-1,B-1,C-1,D-1) (B21-LTM-NO17A-1,B-1,C-1,D-1)	NA ^(k) D	NA M	R ⁽¹⁾ M	1, 2 1, 2

TABLE 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u> ^(a)	<u>OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED</u>
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-PS-N002A,B,C,D)	NA	M	Q	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 4.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

- (a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (b) Within 24 hours prior to startup, if not performed within the previous 7 days.
- (c) The IRM channels shall be compared to the APRM channels and the SRM instruments for overlap during each startup, if not performed within the previous 7 days.
- (d) When changing from CONDITION 1 to CONDITION 2, perform the required surveillance within 12 hours after entering CONDITION 2.
- (e) This calibration shall consist of the adjustment of the APRM readout to conform to the power values calculated by a heat balance during CONDITION 1 when THERMAL POWER \geq 25% of RATED THERMAL POWER.
- (f) This calibration shall consist of the adjustment of the APRM flow-biased setpoint to conform to a calibrated flow signal.
- (g) The LPRMs shall be calibrated at least once per effective full power month (EFPM) using the TIP system.
- (h) This calibration shall consist of a physical inspection and actuation of these position switches.
- (i) Instrument alignment using a standard current source.
- (j) Calibration using a standard radiation source.
- (k) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.
- (l) Transmitters are exempted from the monthly channel calibration.

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>
1. PRIMARY CONTAINMENT 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, 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-PS-N002A,B,C,D)	2, 6	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>
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-PS-N056A,B,C,D)	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
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 (C72-PS-N002A,B,C,D)	2, 6	2	1, 2, 3	23

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>
c. Reactor Vessel Water Level - Low, Level 2 (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)	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-NO24 A-1,B-1 and B21-LT-NO25 A-1,B-1) (B21-LTM-NO24 A-1,B-1 and B21-LTM-NO25 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-dPIS-N004 and E41-dPIS-N005)	4	2	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	2	1, 2, 3	25
7. HPCI Steam Line Area Δ Temp. - High (E52-dTS-N604C,D)	4	2	1, 2, 3	25
8. Emergency Area Cooler Temperature - High (E41-TS-N602A,B)	4	2	1, 2, 3	25

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>
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-dPIS-N017 and E51-dPIS-N018)	5	2	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
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	2	1, 2, 3	25
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	5	2	1, 2, 3	25
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	5	2	1, 2, 3	25
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	5	2	1, 2, 3	25

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>
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) (B21-LTM-NO17A-1,B-1,C-1,D-1)	2, 6, 8	2	1, 2, 3	27
b. Reactor Steam Dome Pressure- High (B32-PS-NO18A,B)	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-NO17A-1,B-1,C-1,D-1)	$\geq + 162.5$ inches*	$\geq + 162.5$ inches*
2. Low, Level 2 (B21-LTM-NO24A-1,B-1 and B21-LTM-NO25A-1,B-1)	$\geq + 112$ inches*	$\geq + 112$ inches*
b. Drywell Pressure - High (C72-PS-NO02A,B,C,D)	≤ 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-NO15A-1,B-1,C-1,D-1)	≥ 825 psig	≥ 825 psig
3. Flow - High (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)	$\leq 140\%$ of rated flow	$\leq 140\%$ of rated flow
4. Flow - High (B21-PDTS-NO06A-2; B21-PDTS-NO07B-2; B21-PDTS-NO08C-2; B21-PDTS-NO09D-2)	$\leq 40\%$ of rated flow	$\leq 40\%$ 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>
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-PS-N056A,B,C,D)	≥ 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. <u>SECONDARY CONTAINMENT ISOLATION</u>		
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	≤ 11 mr/hr	≤ 11 mr/hr
b. Drywell Pressure - High (C72-PS-N002A,B,C,D)	≤ 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)	\leq 53 gal/min	\leq 53 gal/min
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	\leq 150°F	\leq 150°F
c. Area Ventilation Temperature Δ Temp - High* (G31-TS-N602A,B,C,D,E,F)	\leq 50°F	\leq 50°F
d. SLCS Initiation (C41A-S1)	NA	NA
e. Reactor Vessel Water Level - Low, Level 2 (B21-LTM-NO24A-1,B-1 and B21-LTM-NO25A-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-dPIS-NO04 and E41-dPIS-NO05)	\leq 300% of rated flow	\leq 300% of rated flow
2. HPCI Steam Supply Pressure - Low (E41-PSL-NO01A,B,C,D)	\geq 100 psig	\geq 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°F	\leq 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-dPIS-N017 and E51-dPIS-N018)	$\leq 300\%$ 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)	$\leq 175^{\circ}\text{F}$	$\leq 175^{\circ}\text{F}$
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	NA

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>
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	≤ 10 psig	≤ 10 psig
6. RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	$\leq 200^{\circ}\text{F}$	$\leq 200^{\circ}\text{F}$
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	$\leq 50^{\circ}\text{F}$	$\leq 50^{\circ}\text{F}$
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	$\leq 175^{\circ}\text{F}$	$\leq 175^{\circ}\text{F}$
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N603A,B)	$\leq 50^{\circ}\text{F}$	$\leq 50^{\circ}\text{F}$
5. <u>SHUTDOWN COOLING SYSTEM ISOLATION</u>		
a. 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*
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	≤ 140 psig	≤ 140 psig

* Vessel water levels refer to REFERENCE LEVEL ZERO.

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>RESPONSE TIME (Seconds)#</u>
1. <u>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-PS-NO02A,B,C,D)	
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-PS-NO56A,B,C,D)	

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>
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
2. <u>SECONDARY CONTAINMENT ISOLATION</u>	
a. Reactor Building Exhaust Radiation - High* (D12-RM-N010A,B)	<u><13</u>
b. Drywell Pressure - High (C72-PS-N002A,B,C,D)	<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>
3. <u>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)

TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)#
4. CORE STANDBY COOLING SYSTEMS ISOLATION	
a. High Pressure Coolant Injection System Isolation	
1. HPCI Steam Line Flow - High (E41-dPIS-N004 and E41-dPIS-N005)	<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-dPIS-N017 and E51-dPIS-N018)	NA
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA
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

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>
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 (C72-PS-NO02A,B,C,D)	NA	M	Q	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>
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-PS-N056A,B,C,D)	NA	M	R	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
2. <u>SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	D	M	R	1,2,3,5, and *

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>
b. Drywell Pressure - High (C72-PS-N002A,B,C,D)	NA	M	Q	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-dPIS-N004 and E41-dPIS-N005)	D	M	Q	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
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,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>
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-dPIS-NO17 and E51-dPIS-NO18)	NA	M	Q	1, 2, 3
2. RCIC Steam Supply Pressure - Low (E51-PS-NO19A,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-NO12A,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-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	NA ^(a) D	NA M	R ^(b) M	1, 2, 3 1, 2, 3
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	NA	S/U ^(c) , M	R	1, 2, 3

* When handling irradiated fuel in the secondary containment.

When any turbine stop valve is open.

(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

<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-PS-NO11A,B,C,D)	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. LPCI MODE OF RHR SYSTEM</u>			
a. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	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

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</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
3. <u>HPCI 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-PS-N011A,B,C,D)	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
4. <u>ADS</u>			
a. Drywell Pressure - High, coincident with (E11-PS-N010A,B,C,D)	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>
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

<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-PS-NO11A,B,C,D)	≤ 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. LPCI MODE OF RHR SYSTEM</u>		
a. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	≤ 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>
e. RHR Pump Start - Time Delay Relay (STR-2A1,2 and STR-2B1,2)	$9 < t < 11$ seconds	$9 < t < 11$ seconds
f. Bus Power Monitor (E11-K106A,B)	NA	NA
3. <u>HPCI 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-PS-NO11A,B,C,D)	≤ 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
4. <u>ADS</u>		
a. Drywell Pressure-High (E11-PS-NO10A,B,C,D)	≤ 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-TDPG-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>
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

<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) (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-PS-NO11A,B,C,D)	NA	M	Q	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. LPCI MODE OF RHR SYSTEM</u>				
a. Drywell Pressure - High (E11-PS-NO11A,B,C,D)	NA	M	Q	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
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. HPCI 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-PS-NO11A,B,C,D)	NA	M	Q	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

<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. ADS				
a. Drywell Pressure - High (E11-PS-N010A,B,C,D)	NA	M	Q	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 4.3.3-1 (Continued)

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>
5. <u>LOSS OF POWER</u>				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	NA	R	1, 2, 3, 4*, 5*
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	S	M	R	1, 2, 3, 4*, 5*

* Required when ESF equipment is required to be OPERABLE.

- (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.

TABLE 3.3.5.3-1

POST-ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT AND INSTRUMENT NUMBER</u>	<u>MINIMUM NO. OF OPERABLE INSTRUMENT CHANNELS</u>	
1. Reactor Vessel Pressure (B21-PI-RO04A,B; C32-LPR-R608; and C32-PT-NO05A,B)	2	
2. Reactor Vessel Water Level (B21-LITS-NO26A,B; B21-LR-R615; B21-LI-R604A,B; B21-LT-NO37; and B21-LTM-NO37-1)	2	
3. Suppression Chamber Water Level (CAC-LT-2601; CAC-LY-2601-1; CAC-LI-2601-3) (CAC-LT-2602; CAC-LR-2602)	2	
4. Suppression Chamber Water Temperature (CAC-1R-1258-14, 21; and C91-P602)	2	
5. Suppression Chamber Atmosphere Temperature (CAC-TR-1258-17 thru 20; and C91-P602)	2	
6. Drywell Pressure (CAC-PI-4176; CAC-PT-4176; CAC-PR-1257-1; and CAC-PT-4175)	2	
7. Drywell Temperature (CAC-TR-1258-1 thru 13, 22, 23, 24; and C91-P602)	2	
8. Drywell Radiation (CAC-AR-1260; CAC-AQH-1260-1, 2, 3; CAC-AR-1261; CAC-AQH-1261-1, 2, 3; CAC-AR-1262; and CAC-AQH-1262-1, 2, 3)	2	
9. Drywell Oxygen (CAC-AT-1259-2; CAC-AR-1259; CAC-AT-1263-2; and CAC-AR-1263)	2	
10. Drywell Hydrogen (CAC-AT-1259-1; CAC-AR-1259; CAC-AT-1263-1; and CAC-AR-1263)	2	
11. Safety Relief Valve Position Indication: a. Primary - Sonic (B21-FY-4157 thru 4167) b. Secondary - Temp. (B21-TR-R614, points 1-11)	1/valve	

TABLE 4.3.5.3-1

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL CALIBRATION
1. Reactor Vessel Pressure (B21-PI-RO04A,B; C32-LPR-R608; and C32-PT-NO05A,B)	M	R
2. Reactor Vessel Water Level (B21-LITS-NO26A,B; B21-LR-R615; B21-LI-R604A,B; B21-LT-NO37; and B21-LTM-NO37-1)	M	R
3. Suppression Chamber Water Level (CAC-LT-2601; CAC-LY-2601-1; CAC-LI-2601-3; CAC-LT-2602; CAC-LR-2602)	M	R
4. Suppression Chamber Water Temperature (CAC-TR-1258-14, 21; and C91-P602)	M	R
5. Suppression Chamber Atmosphere Temperature (CAC-TR-1258-17 thru 20; and C91-P602)	M	R
6. Drywell Pressure (CAC-PI-4176; CAC-PT-4176; CAC-PR-1257-1; and CAC-PT-4175)	M	R
7. Drywell Temperature (CAC-TR-1258-1 thru 13, 22, 23, 24; and C91-P602)	M	R
8. Drywell Radiation (CAC-AR-1260; CAC-AQH-1260-1,2,3; CAC-AR-1261; CAC-AQH-1261-1,2,3; CAC-AR-1262; and CAC-AQH-1262-1,2,3)	M	R
9. Drywell Oxygen Concentration (CAC-AT-1259-2; CAC-AR-1259; CAC-AT-1263-2; and CAC-AR-1263)	M	R
10. Drywell Hydrogen Concentration (CAC-AT-1259-1; CAC-AR-1259; CAC-AT-1263-1; and CAC-AR-1263)	M	R
11. Safety Relief Valve Position Indication a. Primary - Sonic (B21-FY-4157 thru 4167) b. Secondary - Temp. (B21-TR-R614, points 1-11)	M M	R R

TABLE 3.3.6.1-1ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>MINIMUM NUMBER OPERABLE TRIP SYSTEMS PER OPERATING PUMP</u>
1. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO24A-2,B-2 and B21-LT-NO25A-2,B-2) (B21-LTM-NO24A-2,B-2 and B21-LTM-NO25A-2,B-2)	1
2. Reactor Vessel Pressure - High (B21-PS-NO45A,B,C,D)	1

TABLE 3.3.6.1-2

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. Reactor Vessel, Water Level - Low, Level 2 (B21-LTM-NO24A-2,B-2; B21-LTM-NO25A-2,B-2)	<u>> + 112 inches*</u>	<u>> + 112 inches*</u>
2. Reactor Vessel Pressure - High (B21-PS-NO45A,B,C,D)	<u><1120 psig</u>	<u><1120 psig</u>

*Vessel water levels refer to REFERENCE LEVEL ZERO.

TABLE 4.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>
1. Reactor Vessel Water Level - Low, Level 2 (B21-LT-NO24A-2,B-2 and B21-LT-NO25A-2,B-2)	NA ^(a)	NA	R ^(b)
(B21-LTM-NO24A-2,B-2 and B21-LTM-NO25A-2,B-2)	D	M	M
2. Reactor Vessel Pressure - High (B21-PS-NO45A, B, C, D)	NA	M	R

(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.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- d. At least once per 18 months, during shutdown, by verifying that either:
1. The battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for 8 hours when the battery is subjected to a battery service test, or
 2. The battery capacity is adequate to supply a dummy load of the following profile while maintaining the battery terminal voltage ≥ 105 volts.
 - a) During the initial 60 seconds of the test:
 - 1) Battery 2A-1 ≥ 1056.42 amperes,
 - 2) Battery 2A-2 ≥ 1211.90 amperes,
 - 3) Battery 2B-1 ≥ 1089.06 amperes, and
 - 4) Battery 2B-2 ≥ 1042.67 amperes.
 - b) During the remainder of the first 30 minutes of the test:
 - 1) Battery 2A-1 ≥ 243.19 amperes,
 - 2) Battery 2A-2 ≥ 159.10 amperes,
 - 3) Battery 2B-1 ≥ 176.79 amperes, and
 - 4) Battery 2B-2 ≥ 216.67 amperes.
 - c) During the remainder of the 8-hour test:
 - 1) Battery 2A-1 ≥ 89.52 amperes,
 - 2) Battery 2A-2 ≥ 50.34 amperes,
 - 3) Battery 2B-1 ≥ 53.39 amperes,
 - 4) Battery 2B-2 ≥ 75.09 amperes.
 3. At the completion of either of the above tests, the battery charger shall be demonstrated capable of recharging its battery at a rate of at least 200 amperes while supplying normal D.C. loads. The battery shall be charged to at least 95% capacity in ≤ 24 hours.
- e. At least once per 60 months during shutdown by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test and after normal equalizer charge.