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CHAPTER 3.3

INSTRUMENTATION

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3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One channel or train Inoperable.	C.1	Restore channel or train to OPERABLE status.	48 hours
	OR		
	C.2.1	Initiate action to fully insert all rods.	48 hours
	AND		
	C.2.2	Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One Power Range Neutron Flux - High channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. ----------		
	D.1.1	---------- NOTE ---------- Only required when the Power Range Neutron Flux input to QPTR is inoperable. ---------- Perform SR 3.2.4.2.	12 hours from discovery of THERMAL POWER >75% RTP AND Once per 12 hours thereafter
	AND		
	D.1.2	Place channel in trip.	72 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----------	
	E.1 Place channel in trip.	72 hours OR In accordance with the Risk Informed Completion Time Program
F. One Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6.	24 hours
	OR	
	F.2 Increase THERMAL POWER to > P-10.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. Two Intermediate Range Neutron Flux channels inoperable.	G.1	---------- NOTE ---------- Limited boron concentration changes associated with RCS inventory control or limited plant temperature changes are allowed. ---------- Suspend operations involving positive reactivity additions.	Immediately
	AND		
	G.2	Reduce THERMAL POWER to < P-6.	2 hours
H. One Source Range Neutron Flux channel inoperable.	H.1	---------- NOTE ---------- Limited boron concentration changes associated with RCS inventory control or limited plant temperature changes are allowed. ---------- Suspend operations involving positive reactivity additions.	Immediately
I. Two Source Range Neutron Flux channels inoperable.	I.1	Open reactor trip breakers (RTBs).	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. One Source Range Neutron Flux channel inoperable.	J.1 Restore channel to OPERABLE status. OR J.2.1 Initiate action to fully insert all rods. AND J.2.2 Place the Rod Control System in a condition incapable of rod withdrawal.	48 hours 48 hours 49 hours
K. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---------- K.1 Place channel in trip.	 72 hours OR In accordance with the Risk Informed Completion Time Program
L. Required Action and associated Completion Time of Condition K not met.	L.1 Reduce THERMAL POWER to < P-7.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. One Low Fluid Oil Pressure Turbine Trip channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---------- M.1 Place channel in trip.	72 hours OR In accordance with the Risk Informed Completion Time Program
N. One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable.	N.1 Place channel(s) in trip.	72 hours
O. Required Action and associated Completion Time of Conditions M or N not met.	O.1 Reduce THERMAL POWER to < P-9.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
P. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	P.1 Restore train to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
Q. One RTB train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	Q.1 Restore train to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
R. One or more required channel(s) inoperable.	R.1 Verify interlock is in required state for existing unit conditions.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
S. One or more required channel(s) inoperable.	S.1	Verify interlock is in required state for existing unit conditions.	1 hour
T. Required Action and associated Completion Time of Condition S not met.	T.1	Be in MODE 2.	6 hours
U. One trip mechanism inoperable for one RTB.	U.1	Restore trip mechanism to OPERABLE status.	48 hours OR In accordance with the Risk Informed Completion Time Program
V. Required Action and associated Completion Time of Conditions B, D, E, P, Q, R, or U not met.	V.1	Be in MODE 3.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
W. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----------		
	W.1	Place channel in trip.	72 hours
	OR		
	W.2.1	Be in MODE 2 with $k_{eff} < 1.0$.	78 hours
	AND		
	W.2.2.1	Initiate action to fully insert all rods.	78 hours
	AND		
	W.2.2.2	Initiate action to place the Rod Control System in a condition incapable of rod withdrawal.	78 hours
	OR		
	W.2.3	Initiate action to borate the RCS to greater than the all rods out (ARO) critical boron concentration.	78 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
X. One or more Containment Pressure - Environmental Allowance Modifier channel(s) inoperable.	X.1 Place channel(s) in trip. OR X.2 Be in MODE 3.	72 hours 78 hours
Y. One channel inoperable	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---------- Y.1 Place channel in trip.	 72 hours
Z. Required Action and associated Completion Time of Condition Y not met. OR Two or more channels inoperable.	Z.1.1 Initiate action to fully insert all rods. AND Z.1.2 Initiate action to place the Rod Control System in a condition incapable of rod withdrawal. OR Z.2 Initiate action to borate the RCS to greater than the all rods out (ARO) critical boron concentration.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2	---------- NOTE ---------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculation results exceed power range channel output by more than +2% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.3	---------- NOTE ---------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. --- Compare results of the incore power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 2%.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.4	---------- NOTE ---------- This Surveillance must be performed on the reactor trip bypass breaker for the local manual shunt trip only prior to placing the bypass breaker in service. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.6	---------- NOTE ---------- Not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 75 % RTP. ---------- Calibrate excore channels to agree with incore power distribution measurements.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.7	---------- NOTE ---------- 1. Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. 2. Source range instrumentation shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8	---------- NOTE ---------- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	------- NOTE -------- Only required when not performed within the frequency specified in the Surveillance Frequency Control Program ---------- Prior to reactor startup AND 12 hours after reducing power below P-10 for power and intermediate instrumentation AND Four hours after reducing power below P-6 for source range instrumentation

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.1.8 (continued)		AND In accordance with the Surveillance Frequency Control Program
SR 3.3.1.9	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.10	---------- NOTE ---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.11	---------- NOTE ---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Power and intermediate range detector plateau voltage verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER $\geq$ 95% RTP. ---------- Perform CHANNEL CALIBRATION	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.12	Not used.	
SR 3.3.1.13	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.14	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.15	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	Prior to exceeding the P 9 interlock whenever the unit has been in MODE 3, if not performed in the previous 31 days
SR 3.3.1.16	---------- NOTE ---------- Neutron detectors are excluded from response time testing. ---------- Verify RTS RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

TABLE 3.3.1-1 (PAGE 1 OF 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
1.	Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA
		3[b], 4[b], 5[b]	2	C	SR 3.3.1.14	NA
2.	Power Range Neutron Flux					
	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 112.3% RTP
	b. Low	1[c],2[f]	4	W	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 28.3% RTP
		2[h],3[i]	4	Y, Z	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 28.3% RTP
3.	Power Range Neutron Flux Rate - High Positive Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 6.3 % RTP with time constant ≥ 2 sec
4.	Intermediate Range Neutron Flux	1[c], 2[d]	2	F, G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 35.3% RTP

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 14.a and 14.b (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(c) Below the P-10 (Power Range Neutron Flux) interlock.
(d) Above the P-6 (Intermediate Range Neutron Flux) interlock.
(f) With $k_{eff} \geq 1.0$.
(h) With $k_{eff} < 1.0$, and all RCS cold leg temperatures ≥ 500°F, and RCS boron concentration ≤ the ARO critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(i) With all RCS cold leg temperatures ≥ 500°F, and RCS boron concentration ≤ the ARO critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted

TABLE 3.3.1-1 (PAGE 2 OF 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5.	Source Range Neutron Flux	2[e]	2	H, I	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.6 E5 cps
		3[b], 4[b], 5[b]	2	I, J	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.6 E5 cps
6.	Overtemperature ΔT	1,2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	Refer to Note 1 (at the end of this Table)
7.	Overpower ΔT	1,2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	Refer to Note 2 (at the end of this Table)
8.	Pressurizer Pressure					
	a. Low	1[g]	4	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 1874 psig
	b. High	1,2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 2393 psig

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 14.a and 14.b (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(g) Above the P-7 (Low Power Reactor Trips Block) interlock.

TABLE 3.3.1-1 (PAGE 3 OF 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
9.	Pressurizer Water Level - High	1[g]	3	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 93.8% of instrument span
10.	Reactor Coolant Flow - Low	1[g]	3 per loop	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 88.8% of indicated loop flow
11.	Not Used					
12.	Undervoltage RCPs	1[g]	2/bus	K	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 10105 Vac
13.	Underfrequency RCPs	1[g]	2/bus	K	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 57.1 Hz
14.	Steam Generator (SG) Water Level Low-Low[l]					
	a. Steam Generator Water Level Low-Low (Adverse Containment Environment)	1, 2	4 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 20.6% [q] of Narrow Range Instrument Span

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 14.a and 14.b (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(g) Above the P-7 (Low Power Reactor Trips Block) interlock.
(l) The applicable MODES for these channels in Table 3.3.2-1 are more restrictive.
(m) Not used.
(q) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases

TABLE 3.3.1-1 (PAGE 4 OF 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
14.	Steam Generator (SG) Water Level Low-Low[l]					
	b. Steam Generator Water Level Low-Low (Normal Containment Environment)	1[p],2[p]	4 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 16.6% [q] of Narrow Range Instrument Span
	c. Not used.					
	d. Containment Pressure - Environmental Allowance Modifier	1,2	4	X	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 2.0 psig
15.	Not Used					

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 14.a and 14.b (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(l) The applicable MODES for these channels in Table 3.3.2-1 are more restrictive.
(n) Not used.
(o) Not used.
(p) Except when the Containment Pressure - Environmental Allowance Modifier channels in the same protection sets are tripped.
(q) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases

TABLE 3.3.1-1 (PAGE 5 OF 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
16.	Turbine Trip					
	a. Low Fluid Oil Pressure	1[j]	3	M	SR 3.3.1.10 SR 3.3.1.15	≥ 539.42 psig
	b. Turbine Stop Valve Closure	1[j]	4	N	SR 3.3.1.10 SR 3.3.1.15	≥ 1% open
17.	Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	P	SR 3.3.1.14	NA
18.	Reactor Trip System Interlocks					
	a. Intermediate Range Neutron Flux, P-6	2[e]	2	R	SR 3.3.1.11 SR 3.3.1.13	≥ 6E-11 amp
	b. Low Power Reactor Trips Block, P-7	1	1 per train	S	SR 3.3.1.5	NA
	c. Power Range Neutron Flux, P-8	1	4	S	SR 3.3.1.11 SR 3.3.1.13	≤ 51.3% RTP
	d. Power Range Neutron Flux, P-9	1	4	S	SR 3.3.1.11 SR 3.3.1.13	≤ 53.3% RTP

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 14.a and 14.b (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(j) Above the P-9 (Power Range Neutron Flux) interlock.

TABLE 3.3.1-1 (PAGE 6 OF 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
18.	Reactor Trip System Interlocks					
	e. Power Range Neutron Flux, P-10	1,2	4	R	SR 3.3.1.11 SR 3.3.1.13	≥ 6.7% RTP and ≤ 12.4% RTP
	f. Turbine Impulse Pressure, P-13	1	2	S	SR 3.3.1.10 SR 3.3.1.13	≤ 12.4% turbine power
19.	Reactor Trip Breakers (RTBs)[k]	1,2	2 trains	Q	SR 3.3.1.4	NA
		3[b], 4[b], 5[b]	2 trains	C	SR 3.3.1.4	NA
20.	Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms[k]	1,2	1 each per RTB	U	SR 3.3.1.4	NA
		3[b], 4[b], 5[b]	1 each per RTB	C	SR 3.3.1.4	NA
21.	Automatic Trip Logic	1,2	2 trains	P	SR 3.3.1.5	NA
		3[b], 4[b], 5[b]	2 trains	C	SR 3.3.1.5	NA

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 14.a and 14.b (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(k) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

TABLE 3.3.1-1 (page 7 of 8)
Reactor Trip System Instrumentation

Note 1: Overtemperature ΔT

The Overtemperature ΔT Function Allowable Value shall not exceed the following setpoint by more than 1.23% of ΔT span (1.85% RTP).

$$\Delta T \frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left(\frac{1}{1+\tau_3 s}\right) \leq \Delta T_o \left\{ K_1 - K_2 \left[\frac{(1+\tau_4 s)}{(1+\tau_5 s)} T \frac{1}{1+\tau_6 s} - T' \right] + K_3 (P - P') - f_1(\Delta I) \right\}$$

Where: ΔT is measured RCS ΔT, °F.
ΔT_o is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T′ is the nominal T_{avg} at RTP, ≤ *°F.

P is the measured pressurizer pressure, psig.
P′ is the nominal RCS operating pressure = * psig.

K_1 = *	K_2 = */°F	K_3 = */psig
$\tau_1 \geq$ * sec	$\tau_2 \leq$ * sec	τ_3 = * sec
$\tau_4 \geq$ * sec	$\tau_5 \leq$ * sec	τ_6 = * sec

$f_1(\Delta I)$ =	* {*% + (q_t - q_b)}	when q_t - q_b < * %RTP
	0% of RTP	when * %RTP ≤ q_t - q_b ≤ * %RTP
	* {(q_t - q_b) - *}	when q_t - q_b > * %RTP

where q_t and q_b are percent RTP in the upper and lower halves of the core, respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RTP.

The values denoted with * are specified in the COLR.

TABLE 3.3.1-1 (page 8 of 8)
Reactor Trip System Instrumentation

Note 2: Overpower ΔT

The Overpower ΔT Function Allowable Value shall not exceed the following setpoint by more than 1.21% of ΔT span (1.82% RTP).

$$\Delta T \frac{(1 + \tau_1 s)}{(1 + \tau_2 s)}\left(\frac{1}{1 + \tau_3 s}\right) \leq \Delta T_o \left\{ K_4 - K_5 \frac{(\tau_7 s)}{(1 + \tau_7 s)}\left(\frac{1}{1 + \tau_6 s}\right) T - K_6 \left[T \frac{1}{(1 + \tau_6 s)} - T'' \right] - f_2(\Delta I) \right\}$$

Where: ΔT is measured RCS ΔT, °F.
ΔT_o is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T″ is the nominal T_{avg} at RTP, ≤ *°F.

K_4 = *
K_5 = */°F for increasing T_{avg}
*/°F for decreasing T_{avg}
K_6 = */°F when T > T″
*/°F when T ≤ T″
$\tau_1 \geq$ * sec
$\tau_2 \leq$ * sec
τ_3 = * sec
τ_6 = * sec
$\tau_7 \geq$ * sec

$f_2(\Delta I)$ = *

The values denoted with * are specified in the COLR.

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	C.1 ---------- NOTE ---------- Only required if Function 3.a.(2) is inoperable. ---------- Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
	AND	
	C.2 Restore train to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----------	
	D.1 Place channel in trip.	72 hours OR ---------NOTE-------- Not applicable to Function 9.b ---------- In accordance with the Risk Informed Completion Time Program
E. One Containment Pressure channel inoperable.	---------- NOTE ---------- One additional channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	E.1 Place channel in bypass.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One channel or train inoperable.	F.1 Restore channel or train to OPERABLE status.	48 hours OR ---------NOTE-------- Not applicable to Function 8.a ---------- In accordance with the Risk Informed Completion Time Program
G. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ---------- G.1 Restore train to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. One or more trains inoperable.	---------- NOTE ---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ---------- H.1 Declare associated Pressurizer PORV(s) inoperable.	Immediately
I. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---------- I.1 Place channel in trip.	72 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels. ----------	
	J.1 Place channel in trip.	24 hours OR In accordance with the Risk Informed Completion Time Program
K. One channel inoperable.	---------- NOTE ---------- An inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----------	
	K.1 Restore channel to OPERABLE status.	72 hours OR In accordance with the Risk Informed Completion Time Program
L. One or more required channel(s) inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
M. Two channels inoperable. AND AFW actuation on Trip of all Main Feedwater Pumps maintained from one actuation train.	M.1	Place channels in trip.	24 hours
N. One or more Containment Pressure - Environmental Allowance Modifier channel(s) inoperable.	N.1	Place channel(s) in trip.	72 hours
O. One channel inoperable.	O.1	Place channel in trip.	24 hours
	AND		
	O.2	Restore channel to OPERABLE status.	During performance of the next required COT
P. One or more channel(s) inoperable.	P.1	Declare associated auxiliary feedwater pump(s) inoperable.	Immediately
	AND		
	P.2	Declare associated steam generator blowdown and sample line isolation valve(s) inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Q. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 2 hours for surveillance testing provided the other train is OPERABLE. ----------	
	Q.1 Restore train to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
R. One or both train(s) inoperable.	R.1 Restore train(s) to OPERABLE status.	48 hours OR ---------NOTE-------- Not applicable when both trains are inoperable ---------- In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
S. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	S.1 Restore train to OPERABLE status.	6 hours OR In accordance with the Risk Informed Completion Time Program
T. Required Action and associated Completion Time of Conditions B, C, or K not met.	T.1 Be in MODE 3. AND	6 hours
	T.2 Be in MODE 5.	36 hours
U. Required Action and associated Completion Time of Conditions D, E, F, G, L, N, Q, R, or S not met.	U.1 Be in MODE 3. AND	6 hours
	U.2 Be in MODE 4.	12 hours
V. Required Action and associated Completion Time of Conditions I, J, or M not met.	V.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.3	---------- NOTE ---------- The continuity check may be excluded from the BOP ESFAS test. --- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.4	Perform MASTER RELAY TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.5	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.6	---------- NOTE ---------- Not applicable to slave relays K602, K622, K624, K630, K740, K741, and K750. ---------- Perform SLAVE RELAY TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.7	---------- NOTE ---------- Verification of relay setpoints not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.8	---------- NOTE ---------- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.9	---------- NOTE ---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.10	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 900 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.11	---------- NOTE ---------- Verification of setpoint not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.12	Perform COT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.13	---------- NOTE ---------- Only applicable to slave relays K602, K622, K624, K630, K740, and K741. ---------- Perform SLAVE RELAY TEST.	In accordance with the Surveillance Frequency Control Program AND Prior to entering MODE 4 when in MODE 5 or 6 > 24 hours, if not performed within the previous 92 days
SR 3.3.2.14	---------- NOTE ---------- Only applicable to slave relay K750. ---------- Perform SLAVE RELAY TEST.	In accordance with the Surveillance Frequency Control Program AND Prior to entering MODE 3 when in MODE 5 or 6 > 24 hours, if not performed within the previous 92 days

Table 3.3.2-1 (page 1 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
1.	Safety Injection					
	a. Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.13	NA
	c. Containment Pressure - High 1	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 4.5 psig
	d. Pressurizer Pressure - Low	1,2,3[b]	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 1834 psig
	e. Steam Line Pressure - Low	1,2,3[b]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 610 psig[c][s]
2.	Containment Spray					
	a. Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 2 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[(a)]
2. Containment Spray					
c. Containment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.13	NA
(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
b. Phase B Isolation					
(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
(3) Contain-ment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

Table 3.3.2-1 (page 3 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
4. Steam Line Isolation					
a. Manual Initiation	1,2[i][k], 3[i][k]	2	F	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2[i][k], 3[i][k]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Automatic Actuation Logic and Actuation Relays (MSFIS)	1, 2[k],3[k]	2 trains[o]	S	SR 3.3.2.3	NA
d. Containment Pressure - High 2	1,2[i][k], 3[i][k]	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.3 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(i) Except when:
1. All MSIVBVs are:
   1.a Closed and de-activated, or
   1.b Closed and isolated by a closed manual valve, or
   1.c Isolated by two closed manual valves.

   AND

   2. All MSLPDIVs are:
   2.a Closed and de-activated, or
   2.b Closed and isolated by a closed manual valve, or
   2.c Isolated by two closed manual valves.

(k) Except when all MSIVs are closed and de-activated.

(o) Each train requires a minimum of two programmable logic controllers to be OPERABLE.

Table 3.3.2-1 (page 4 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
4. Steam Line Isolation					
e. Steam Line Pressure					
(1) Low	1,2 [i][k], 3[b][i][k]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 610 psig[c][s]
(2) Negative Rate - High	3[g][i][k]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 124 psi[h]

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on low steam line pressure is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) Except when:
1. All MSIVBVs are:
1.a Closed and de-activated, or
1.b Closed and isolated by a closed manual valve, or
1.c Isolated by two closed manual valves.
AND
2. All MSLPDIVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve, or
2.c Isolated by two closed manual valves.
(k) Except when all MSIVs are closed and de-activated.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 5 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5.	Turbine Trip and Feedwater Isolation					
	a. Automatic Actuation Logic and Actuation Relays (SSPS)	1[j],2[j], 3[j]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	b. Automatic Actuation Logic and Actuation Relays (MSFIS)	1[l], 2[l], 3[l]	2 trains[o]	S	SR 3.3.2.3	NA
	c. SG Water Level - High High (P-14)	1[j],2[j]	4 per SG	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 91.4%[s] of Narrow Range Instrument Span
	d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements. The Applicability exceptions of Footnote (j) also apply to Function 5.d.				

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(j) Except when:
1. All MFIVs are closed and de-activated:
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(l) Except when all MFIVs are closed and de-activated.

(o) Each train requires a minimum of two programmable logic controllers to be OPERABLE.

(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 6 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Turbine Trip and Feedwater Isolation					
e. Steam Generator Water Level Low-Low[q]					
(1) Steam Generator Water Level Low-Low (Adverse Containment Environment)	$1^{(j)}$, $2^{(j)}$, $3^{(j)}$	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	$\geq$ 20.6%[s] of Narrow Range Instrument Span
(2) Steam Generator Water Level Low-Low (Normal Containment Environment)	$1^{(j)(r)}$, $2^{(j)(r)}$, $3^{(j)(r)}$	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	$\geq$ 16.6%[s] of Narrow Range Instrument Span

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(j) Except when:
1. All MFIVs are closed and de-activated;
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(q) Feedwater isolation only.

(r) Except when the Containment Pressure – Environmental Allowance Modifier channels in the same protection sets are tripped.

(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 7 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Turbine Trip and Feedwater Isolation					
e. Steam Generator Water Level Low-Low[q]					
(3) Not used.					
(4) Containment Pressure - Environmental Allowance Modifier	1[j], 2[j], 3[j]	4	N	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 2.0 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(j) Except when:
1. All MFIVs are closed and de-activated;
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(q) Feedwater isolation only.

Table 3.3.2-1 (page 8 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
6. Auxiliary Feedwater					
a. Manual Initiation	1, 2, 3	1/pump	P	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1,2,3	2 trains	Q	SR 3.3.2.3	NA
d. SG Water Level Low-Low					
(1) Steam Generator Water Level Low-Low (Adverse Containment Environment)	1, 2, 3	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 20.6%[s] of Narrow Range Instrument Span
(2) Steam Generator Water Level Low-Low (Normal Containment Environment)	1[r], 2[r], 3[r]	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 16.6%[s] of Narrow Range Instrument Span

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(r) Except when the Containment Pressure – Environmental Allowance Modifier channels in the same protection sets are tripped.

(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 9 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
6. Auxiliary Feedwater					
d. SG Water Level Low-Low					
(3) Not used.					
(4) Containment Pressure - Environmental Allowance Modifier	1, 2, 3	4	N	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 2.0 psig
e. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
f. Loss of Offsite Power	1,2,3	2 trains	R	SR 3.3.2.7 SR 3.3.2.10	NA
g. Trip of all Main Feedwater Pumps	1[(v)],2[(n),(v)]	4[(u),(w)]	J,M	SR 3.3.2.8	NA
h. Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	3	O	SR 3.3.2.1 SR 3.3.2.9 SR 3.3.2.10 SR 3.3.2.12	≥ 20.64 psia

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(n) Trip function may be blocked just before shutdown of the last operating main feedwater pump and restored just after the first main feedwater pump is put into service following performance of its startup trip test.

(u) During startup of the second main feedwater pump, the following exception applies: The requirement for four OPERABLE channels is met if two required channels are OPERABLE on the associated main feedwater pump in operation supplying feedwater to the SGs and two required channels are in the tripped condition on the second main feedwater pump.

(v) During removal of the first of two operating main feedwater pumps from service, the following exception applies:
(1) LCO 3.0.3 is not applicable for up to 1 hour for the channels associated with the first main feedwater pump, OR
(2) The requirement for four OPERABLE channels is met if two required channels are OPERABLE on the associated main feedwater pump in operation supplying feedwater to the SGs and two required channels on the main feedwater pump to be removed from service are in the tripped condition.

(w) During removal of the first of two operating main feedwater pumps from service, the following exception applies: The requirement for four OPERABLE channels is met if two required channels are OPERABLE on the associated main feedwater pump in operation supplying feedwater to the SGs and two required channels on the main feedwater pump to be removed from service are in the tripped condition.

Table 3.3.2-1 (page 10 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[(a)]
7. Automatic Switchover to Containment Sump					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.13	NA
b. Refueling Water Storage Tank (RWST) Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 35.2%
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	2 per train, 2 trains	F	SR 3.3.2.11	NA
b. Pressurizer Pressure, P-11	1,2,3	3	L	SR 3.3.2.5 SR 3.3.2.9	≤ 1981 psig
9. Automatic Pressurizer PORV Actuation					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3	2 trains	H	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.14	NA
b. Pressurizer Pressure – High	1,2,3	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤2350 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

Table 3.3.2-1 (page 11 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
10.	Steam Generator Blowdown and Sample Line Isolation					
	a. Manual Initiation	1(t), 2(t), 3(t)	2 trains (1 per MDAFW pump)	P	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1(t), 2(t), 3(t)	2 trains	Q	SR 3.3.2.3	NA
	c. Safety Injection	1(t), 2(t), 3(t)	Refer to Function 1 (Safety Injection) for initiation functions and requirements.			
	d. Loss of Offsite Power	1(t), 2(t), 3(t)	2 trains	R	SR 3.3.2.7	NA

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(t) Except when all Steam Generator Blowdown and Sample Line Isolation Valves are:
1. Closed and de-activated, or
2. Closed and isolated by a closed manual valve, or
3. Isolated by a combination of closed manual valve(s) and closed de-activated automatic valve(s).

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more Functions with two or more required channels inoperable.	C.1 Restore all but one channel to OPERABLE status.	7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3-1.	F.1 Initiate action in accordance with Specification 5.6.8.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.3-1 (page 1 of 2)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
1.	Neutron Flux	2	E
2.	Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	2	E
3.	RCS Cold Leg Temperature (Wide Range)	2	E
4.	RCS Pressure (Wide Range)	2	E
5.	Reactor Vessel Level Indicating System (RVLIS)	2	F
6.	Containment Normal Sump Water Level	2	E
7.	Containment Pressure (Normal Range)	2	E
8.	Steam Line Pressure	2 per steam generator	E
9.	Containment Radiation Level (High Range)	2	F
10.	Not Used		
11.	Pressurizer Water Level	2	E
12.	Steam Generator Water Level (Wide Range)	4	E
13.	Steam Generator Water Level (Narrow Range)	2 per steam generator	E

(continued)

Table 3.3.3-1 (page 2 of 2)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
14.	Core Exit Temperature - Quadrant 1	2[(a)]	E
15.	Core Exit Temperature - Quadrant 2	2[(a)]	E
16.	Core Exit Temperature - Quadrant 3	2[(a)]	E
17.	Core Exit Temperature - Quadrant 4	2[(a)]	E
18.	Auxiliary Feedwater Flow Rate	4	E
19.	Refueling Water Storage Tank Level	2	E

(a) A channel consists of two core exit thermocouples (CETs).

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System Functions in Table 3.3.4-1 and the required auxiliary shutdown panel (ASP) controls shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function and required ASP control.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions inoperable. OR One or more required ASP controls inoperable.	A.1 Restore required Function and required ASP controls to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2	---------- NOTE ---------- Only required to be performed in MODES 1 and 2 for the turbine-driven AFW pump. ----------	
	Verify each required auxiliary shutdown panel control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.3	---------- NOTE ---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor trip breaker and RCP breaker position indications are excluded from CHANNEL CALIBRATION. ----------	
	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program

Table 3.3.4-1 (page 1 of 1)
Remote Shutdown System Functions

FUNCTION	REQUIRED CHANNELS
1. Source Range Neutron Flux[(a)]	1
2. Reactor Trip Breaker Position	1 per trip breaker
3. Pressurizer Pressure	1
4. RCS Wide Range Pressure	1
5. RCS Hot Leg Temperature	1
6. RCS Cold Leg Temperature	1
7. SG Pressure	1 per SG
8. SG Level	1 per SG
9. AFW Flow Rate	1
10. RCP Breaker Position	1 per pump
11. AFW Suction Pressure	1
12. Pressurizer Level	1

(a) Not required OPERABLE in MODE 1 or in MODE 2 above the P-6 setpoint.

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 Four channels per 4.16-kV NB bus of the loss of voltage Function and four channels per 4.16-kV NB bus of the degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per bus inoperable.	A.1 ---------- NOTE ---------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ---------- Place channel in trip.	6 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more Functions with two or more channels per bus inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Declare associated load shedder and emergency load sequencer (LSELS) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	Tie breakers between 480 Vac buses NG01 and NG03 and between 480 Vac buses NG02 and NG04 shall be verified open.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2	---------- NOTE ---------- Verification of time delays is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3	Perform CHANNEL CALIBRATION with nominal Trip Setpoint and Allowable Value as follows: a. Loss of voltage Allowable Value 83 +0, -8.3V (120V Bus) with a time delay of 1.0 + 0.2, -0.5 sec. Loss of voltage nominal Trip Setpoint 83V (120V Bus) with a time delay of 1.0 sec. b. Degraded voltage Allowable Value 107.47 $\pm$ 0.38V (120V Bus) with a time delay of 119 $\pm$ 11.6 sec. Degraded voltage nominal Trip Setpoint 107.47V (120V Bus) with a time delay of 119 sec.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.4	Verify LOP DG Start ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.6 Containment Purge Isolation Instrumentation

LCO 3.3.6 The Containment Purge Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One radiation monitoring channel inoperable.	A.1 Restore the affected channel to OPERABLE status.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------- NOTE ---------- Only applicable in MODE 1, 2, 3, or 4. ---------- One or more Functions with one or more manual channels or automatic actuation trains inoperable. <u>OR</u> Both radiation monitoring channels inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	---------- NOTE ---------- Containment mini-purge supply and exhaust valves closed to satisfy Required Action B.1 may be opened intermittently under administrative controls, provided Table 3.3.6-1 Functions 2 and 4 are OPERABLE. ---------- B.1 Place and maintain containment purge supply and exhaust valves in closed position.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ---------- NOTE ---------- Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ---------- One or more manual channels inoperable.	C.1 Place and maintain containment purge supply and exhaust valves in closed position. OR C.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust valves made inoperable by isolation instrumentation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Purge Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2	---------- NOTE ---------- The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.4	---------- NOTE ---------- Verification of setpoint is not required. --- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.6	Verify Containment Purge Isolation ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

TABLE 3.3.6-1 (PAGE 1 OF 1)
Containment Purge Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, (a), (b)	2	SR 3.3.6.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4	2 trains	SR 3.3.6.2 SR 3.3.6.6	NA
3.	Containment Purge Exhaust Radiation - Gaseous	1, 2, 3, 4	2	SR 3.3.6.1 SR 3.3.6.3 SR 3.3.6.5	(c)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) Set to ensure ODCM limits are not exceeded.

3.3 INSTRUMENTATION

3.3.7 Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation

LCO 3.3.7 The CREVS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ---------- NOTE ---------- Not applicable to Function 3. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1	Place one CREVS train in CRVIS mode.	Immediately
	AND		
	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)", for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.	Immediately
	OR		
	B.2	Place both trains in CRVIS mode.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.	Immediately
	AND		
	C.1.2	Place one CREVS train in CRVIS mode.	1 hour
	OR		
	C.2	Place both trains in CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions A, B, or C not met in MODE 1, 2, 3, or 4.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Conditions A, B, or C not met during CORE ALTERATIONS or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.7-1 to determine which SRs apply for each CREVS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.3	---------- NOTE ---------- The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.4	---------- NOTE ---------- Verification of setpoint is not required. --- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.6	---------- NOTE ---------- Radiation monitor detectors are excluded from response time testing. ---------- Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits	In accordance with the Surveillance Frequency Control Program

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, (a), and (c)	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, (a), and (c)	2 trains	SR 3.3.7.3	NA
		(a)	2 trains	SR 3.3.7.6	NA
3.	Control Room Radiation - Control Room Air Intakes	1, 2, 3, 4, and (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.5	(b)
		(a)	2	SR 3.3.7.6	(b)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			
5.	Fuel Building Exhaust Radiation-Gaseous	Refer to LCO 3.3.8, "EES Actuation Instrumentation," for all initiation functions and requirements.			

(a) During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.
(b) Nominal Trip Setpoint concentration value ($\mu Ci/cm^3$) shall be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.
(c) During movement of irradiated fuel assemblies in the fuel building.

3.3 INSTRUMENTATION

3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

LCO 3.3.8 The EES actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

---------- NOTES ----------
1. LCO 3.0.3 is not applicable.

2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1	Place one EES train in the Fuel Building Ventilation Isolation Signal (FBVIS) mode.	7 days
	AND		
	A.2	Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ---------- NOTE ---------- Not applicable to Function 3. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	Immediately
	AND		
	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable and enter applicable Conditions and Required Actions of LCO 3.7.13, “Emergency Exhaust System (EES),” for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately
	OR		
	B.2	Place both EES trains in the FBVIS mode and both CREVS trains in the CRVIS mode.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable and enter applicable Conditions and Required Actions of LCO 3.7.13, “Emergency Exhaust System (EES),” for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately
	AND		
	C.1.2	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	1 hour
	OR		
	C.2	Place both EES trains in the FBVIS mode and both CREVS trains in the CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions A, B, or C not met during movement of irradiated fuel assemblies in the fuel building.	D.1	Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.8-1 to determine which SRs apply for each EES Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.3	---------- NOTE ---------- The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.4	---------- NOTE ---------- Verification of setpoint is not required. --- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.6	---------- NOTE ---------- Radiation monitor detectors are excluded from response time testing. ---------- Verify Fuel Building Ventilation Exhaust ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

Table 3.3.8-1 (page 1 of 1)
EES Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	(a)	2	SR 3.3.8.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	(a)	2 trains	SR 3.3.8.3 SR 3.3.8.6	NA
3.	Fuel Building Exhaust Radiation - Gaseous	(a)	2	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.5 SR 3.3.8.6	(b)

(a) During movement of irradiated fuel assemblies in the fuel building.
(b) Nominal Trip Setpoint concentration value ($\mu Ci/cm^3$) shall be established such that the actual submersion dose rate would not exceed 4 mR/hr in the fuel building.

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Mitigation System (BDMS)

LCO 3.3.9 Two trains of the BDMS shall be OPERABLE and one RCS loop shall be in operation.

APPLICABILITY: MODES 2 (below P-6 (Intermediate Range Neutron Flux) interlock), 3, 4, and 5.

---------- NOTE ----------
The boron dilution flux multiplication signal may be blocked:

1. During subcritical physics testing;
2. During control bank movement in MODE 2 (below P-6 (Intermediate Range Neutron Flux) interlock);
3. During control bank movement in MODE 3;
4. During shutdown bank movement in MODE 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One train inoperable.	A.1 Restore train to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two trains inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1	---------- NOTE ---------- Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. ---------- Suspend operations involving positive reactivity additions.	Immediately
	AND		
	B.2	Perform SR 3.1.1.1.	1 hour AND Once per 12 hours thereafter
	AND		
	B.3.1	Close and secure unborated water source isolation valves.	4 hours
	AND		
	B.3.2	Verify unborated water source isolation valves are closed and secured.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. No RCS loop in operation.	C.1	Close and secure unborated water source isolation valves.	4 hours
	AND		
	C.2	Verify unborated water source isolation valves are closed and secured.	Once per 31 days

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.9.2	---------- NOTE ---------- Only required to be performed in MODE 5. ---------- Verify BGV0178 is secured in the closed position.	In accordance with the Surveillance Frequency Control Program
SR 3.3.9.3	---------- NOTE ---------- Not required to be performed until 4 hours after reducing power below P-6 interlock. ---------- Perform COT and verify nominal flux multiplication setpoint of 1.7.	In accordance with the Surveillance Frequency Control Program
SR 3.3.9.4	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.9.5	Verify the centrifugal charging pump suction valves from the RWST open and the CVCS volume control tank discharge valves close in less than or equal to 30 seconds on a simulated or actual actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.3.9.6	Verify one RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program