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3.1 REACTIVITY CONTROL SYSTEMS

3.1.9 RCS Boron Limitations < 500°F

LCO 3.1.9 The boron concentration of the Reactor Coolant System (RCS) shall be greater than the all rods out (ARO) critical boron concentration.

APPLICABILITY: MODE 2 with $k_{eff} < 1.0$ with any RCS cold leg temperature < 500°F and with Rod Control System capable of rod withdrawal,
MODE 3 with any RCS cold leg temperature < 500°F and with Rod Control System capable of rod withdrawal,
MODES 4 and 5 with Rod Control System capable of rod withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS boron concentration not within limit.	A.1 Initiate boration to restore RCS boron concentration to within limit.	Immediately
	<u>OR</u>	
	A.2 Initiate action to place the Rod Control System in a condition incapable of rod withdrawal.	Immediately
	<u>OR</u>	
	A.3 ----- NOTE ----- Not applicable in MODES 4 and 5. -----	
	Initiate action to increase all RCS cold leg temperatures to $\geq 500^\circ\text{F}$.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify RCS boron concentration is greater than the ARO critical boron concentration.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Q One 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
	<u>OR</u>	
	Q.2 Be in MODE 3.	30 hours
R One RTB train inoperable.	----- NOTE ----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -----	
	R.1 Restore train to OPERABLE status.	24 hours
	<u>OR</u>	
	R.2 Be in MODE 3.	30 hours
S. One or more required channel(s) inoperable.	S.1 Verify interlock is in required state for existing unit conditions.	1 hour
	<u>OR</u>	
	S.2 Be in MODE 3.	7 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
T. One or more required channel(s) inoperable.	T.1	Verify interlock is in required state for existing unit conditions.	1 hour
	<u>OR</u>		
	T.2	Be in MODE 2.	7 hours
U. One trip mechanism inoperable for one RTB.	U.1	Restore inoperable trip mechanism to OPERABLE status.	48 hours
	<u>OR</u>		
	U.2	Be in MODE 3.	54 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
V. One channel inoperable.	<p>----- NOTE -----</p> <p>The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels.</p> <p>-----</p>	
	V.1 Place channel in trip.	72 hours
	<u>OR</u>	
	V.2.1 Be in MODE 2 with $k_{eff} < 1.0$.	78 hours
	<u>AND</u>	
	V.2.2.1 Initiate action to fully insert all rods.	78 hours
	<u>AND</u>	
	V.2.2.2 Initiate action to place the Rod Control System in a condition incapable of rod withdrawal.	78 hours
	<u>OR</u>	
	V.2.3 Initiate action to borate the RCS to greater than the all rods out (ARO) critical boron concentration.	78 hours
W Not used.		

(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.	72 hours
	<u>OR</u> X.2 Be in MODE 3.	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. <u>OR</u> Two or more channels inoperable.	Z.1.1 Initiate action to fully insert all rods.	Immediately
	<u>AND</u> Z.1.2 Initiate action to place the Rod Control System in a condition incapable of rod withdrawal.	Immediately
	<u>OR</u> Z.2 Initiate action to borate the RCS to greater than the all rods out (ARO) critical boron concentration.	Immediately

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	V	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 $\geq 500^\circ\text{F}$, and RCS boron concentration \leq 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 $\geq 500^\circ\text{F}$, and RCS boron concentration \leq the ARO critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted