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USER INFORMATION:

GERLACH\*ROSE M                    EMPL#:028401    CA#: 0363  
Address: NUCSA2  
Phone#: 254-3194

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TO:        GERLACH\*ROSE M            04/10/2007

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ATTENTION: "REPLACE" directions do not affect the Table of Contents, Therefore no TOC will be issued with the updated material.

TRM2 - TECHNICAL REQUIREMENTS MANUAL UNIT 2

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USERS, ELECTRONICALLY REVIEW THE APPROPRIATE DOCUMENTS AND ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX.

# SSES MANUAL

Manual Name: TRM2

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 2

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## 2.0 PLANT PROGRAMS AND SETPOINTS

## 2.2 Instrument Trip Setpoint Table

The Instrument Trip Setpoint Limits in Table 2.2-1 are the Trip Setpoint value limits that were contained in the Instrumentation Setpoint tables for protection systems and other functions important to safety that were included in the scope of the original Standard Technical Specifications. Actual instrument setpoints are established utilizing the Allowable Values specified in the Technical Specifications and Technical Requirements. Allowable Values are established in the Reference LCOs and TROs identified in this Table. TRO references are enclosed in square brackets.

Instrumentation process setpoints for the listed subsystems and trip functions are set consistent with the Trip Setpoint Limit Column of Table 2.2-1. Actual setpoints are established in accordance with engineering procedures.

Alarm setpoints and other non-protection system trip settings as may be found in the Technical Specifications or in the Technical Requirements are not included in this table.

Reference NDAP-QA-1104 Setpoint Change Control

TABLE 2.2-1 (Page 1 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.1	Reactor Protection		
2.2.1.1	3.3.1.1	Intermediate Range Monitor, Neutron Flux - High	$\leq 120/125$ divisions of full-scale
2.2.1.2	3.3.1.1	Average Power Range Monitor, Neutron Flux - High (Setdown)	$\leq 15\%$ of RATED THERMAL POWER
2.2.1.3	3.3.1.1	Average Power Range Monitor, Simulated Thermal Power - High Two Loop Operation	$0.62 \text{ W} + 62.2\%$
2.2.1.4	3.3.1.1	Average Power Range Monitor, Simulated Thermal Power - High Single Loop Operation	$0.62 (\text{W} - \Delta\text{W}) + 62.2\%^{(b)}$
2.2.1.5	3.3.1.1	Average Power Range Monitor, Simulated Thermal Power - High Flow Clamp	$\leq 113.5\%$ of RATED THERMAL POWER
2.2.1.6	3.3.1.1	Average Power Range Monitor, Neutron Flux - High	$\leq 118\%$ of RATED THERMAL POWER
2.2.1.7	3.3.1.1	Reactor Vessel Steam Dome Pressure - High	$\leq 1087$ psig
2.2.1.8	3.3.1.1	Reactor Vessel Water Level - Low, Level 3	$\geq 13.0$ inches <sup>(a)</sup>
2.2.1.9	3.3.1.1	Main Steam Isolation Valve - Closure	$\leq 10\%$ closed
2.2.1.10		This Section Not Used	
2.2.1.11	3.3.1.1	Drywell Pressure - High	$\leq 1.72$ psig
2.2.1.12	3.3.1.1	Scram Discharge Volume Water Level - High - Level Transmitter	$\leq 65$ gallons
2.2.1.13	3.3.1.1	Scram Discharge Volume Water Level - High - Float Switch	$\leq 61$ gallons
2.2.1.14	3.3.1.1	Turbine Stop Valve - Closure	$\leq 5.5\%$ closed
2.2.1.15	3.3.1.1	Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	$\geq 500$ psig

(continued)

<sup>(a)</sup> See Figure 2.2-1.<sup>(b)</sup> For single loop operation, the value of  $\Delta\text{W} = 8.7$ .

TABLE 2.2-1 (Page 2 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.1.16 OPRM Instrumentation			
2.2.1.16.1	3.3.1.1	Sp PBA Amplitude Trip	See COLR – TRO 3.2
2.2.1.16.2	3.3.1.1	Np PBA Successive Confirmation Count Trip	See COLR – TRO 3.2
2.2.1.16.3	[3.3.9]	TOL ( $\epsilon$ ) Period Tolerance	0.10 sec
2.2.1.16.4	[3.3.9]	fc Conditioning Filter Cutoff Frequency	1.50 Hz
2.2.1.16.5	[3.3.9]	Tmin Oscillation Period Lower Time Limit	1.00 sec
2.2.1.16.6	[3.3.9]	Tmax Oscillation Period Upper Time Limit	3.50 sec
2.2.1.16.7	[3.3.9]	LPRMmin Minimum LRPMS/Cell Required for Cell Operability	2
2.2.1.16.8	[3.3.9]	S1 Peak Threshold Setpoint/ABA & GRBA	1.20
2.2.1.16.9	[3.3.9]	S2 Valley Threshold Setpoint/ABA & GRBA	0.85
2.2.1.16.10	[3.3.9]	Smax Amplitude Trip Setpoint/ABA	1.50
2.2.1.16.11	[3.3.9]	DR3 Growth Rate Factor Setpoint/GRBA	1.60
2.2.2 Isolation Actuation Instrumentation			
2.2.2.1 Primary Containment Isolation			
2.2.2.1.1	3.3.6.1	Reactor Vessel Water Level Low, Level 3	$\geq 13.0$ inches <sup>(a)</sup>
2.2.2.1.2	3.3.6.1	Reactor Vessel Water Level Low Low, Level 2	$\geq -38.0$ inches <sup>(a)</sup>
2.2.2.1.3	3.3.6.1	Reactor Vessel Water Level Low Low Low, Level 1	$\geq -129$ inches <sup>(a)</sup>
2.2.2.1.4	3.3.6.1	Drywell Pressure - High	$\leq 1.72$ psig
2.2.2.1.5	3.3.6.1/[3.3.6]	SGTS Exhaust Radiation - High	$\leq 23.0$ mR/hr
2.2.2.1.6	[3.3.6]	Main Steam Line Radiation – High High	$\leq 15$ x full power background without hydrogen injection

(continued)

<sup>(a)</sup> See Figure 2.2-1.

TABLE 2.2-1 (Page 3 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.2.2	Secondary Containment Isolation		
2.2.2.2.1	3.3.6.2	Reactor Vessel Water Level - Low Low, Level 2	$\geq -38.0$ inches <sup>(a)</sup>
2.2.2.2.2	3.3.6.2	Drywell Pressure - High	$\leq 1.72$ psig
2.2.2.2.3	3.3.6.2	Refuel Floor High Exhaust Duct Radiation - High	$\leq 18$ mR/hr
2.2.2.2.4	3.3.6.2	Railroad Access Shaft Exhaust Duct Radiation - High	$\leq 5$ mR/hr
2.2.2.2.5	3.3.6.2	Refuel Floor Wall Exhaust Duct Radiation - High	$\leq 21$ mR/hr
2.2.2.3	Main Steam Line Isolation		
2.2.2.3.1	3.3.6.1	Reactor Vessel Water Level - Low Low Low, Level 1	$\geq -129$ inches <sup>(a)</sup>
2.2.2.3.2	3.3.6.1	Main Steam Line Pressure - Low	$\geq 861$ psig
2.2.2.3.3	3.3.6.1	Main Steam Line Flow - High	$\leq 113$ psid
2.2.2.3.4	3.3.6.1	Condenser Vacuum - Low	$\geq 9.0$ inches Hg vacuum
2.2.2.3.5	3.3.6.1	Reactor Building Main Steam Line Tunnel Temperature - High	$\leq 177^\circ\text{F}$
2.2.2.3.6		This Section Not Used	
2.2.2.3.7	[3.3.6]	Reactor Building Main Steam Line Tunnel $\Delta$ Temperature - High	$\leq 99^\circ\text{F}$
2.2.2.3.8	[3.3.6]	Turbine Building Main Steam Tunnel Temperature - High	$\leq 197^\circ\text{F}$
2.2.2.4	Reactor Water Cleanup System Isolation		
2.2.2.4.1	3.3.6.1	Reactor Vessel Water Level - Low Low, Level 2	$\geq -38$ inches <sup>(a)</sup>
2.2.2.4.2	3.3.6.1	RWCU $\Delta$ Flow - High	$\leq 59$ gpm
2.2.2.4.3	3.3.6.1	RWCU Flow - High	$\leq 462$ gpm
2.2.2.4.4	3.3.6.1	RWCU Penetration Area Temperature - High	$\leq 131^\circ\text{F}$
2.2.2.4.5	[3.3.6]	RWCU Penetration Room Area $\Delta$ Temperature - High	$\leq 69^\circ\text{F}$
2.2.2.4.6	3.3.6.1	RWCU Pump Area Temperature - High	$\leq 147^\circ\text{F}$
2.2.2.4.7	[3.3.6]	RWCU Pump Room Area $\Delta$ Temperature - High	$\leq 69^\circ\text{F}$
2.2.2.4.8	3.3.6.1	RWCU Heat Exchanger Area Temperature - High	$\leq 147^\circ\text{F}$
2.2.2.4.9	[3.3.6]	RWCU Heat Exchanger Room Area $\Delta$ Temperature - High	$\leq 69^\circ\text{F}$

(continued)

<sup>(a)</sup> See Figure 2.2-1.

TABLE 2.2-1 (Page 4 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.2.5	Reactor Core Isolation Cooling System Isolation		
2.2.2.5.1	3.3.6.1	RCIC Steam Line $\Delta$ Pressure - High	$\leq$ 138 inches H <sub>2</sub> O
2.2.2.5.2	3.3.6.1	RCIC Steam Supply Line Pressure - Low	$\geq$ 60 psig
2.2.2.5.3	3.3.6.1	RCIC Turbine Exhaust Diaphragm Pressure - High	$\leq$ 10.0 psig
2.2.2.5.4	3.3.6.1	RCIC Equipment Room Temperature - High	$\leq$ 167°F
2.2.2.5.5	3.3.6.1	RCIC Pipe Routing Area Temperature - High	$\leq$ 167°F
2.2.2.5.6	3.3.6.1	RCIC Emergency Area Cooler Temperature - High	$\leq$ 167°F
2.2.2.5.7	3.3.6.1	Drywell Pressure - High	$\leq$ 1.72 psig
2.2.2.5.8	[3.3.6]	RCIC Equipment Room $\Delta$ Temperature - High	$\leq$ 89°F
2.2.2.5.9	[3.3.6]	RCIC Pipe Routing Area $\Delta$ Temperature - High	$\leq$ 89°F
2.2.2.6	High Pressure Coolant Injection System Isolation		
2.2.2.6.1	3.3.6.1	HPCI Steam Line $\Delta$ Pressure - High	$\leq$ 370 inches H <sub>2</sub> O
2.2.2.6.2	3.3.6.1	HPCI Steam Supply Line Pressure - Low	$\geq$ 104 psig
2.2.2.6.3	3.3.6.1	HPCI Turbine Exhaust Diaphragm Pressure - High	$\leq$ 10 psig
2.2.2.6.4	3.3.6.1	HPCI Equipment Room Temperature - High	$\leq$ 167°F
2.2.2.6.5	3.3.6.1	HPCI Emergency Area Cooler Temperature - High	$\leq$ 167°F
2.2.2.6.6	3.3.6.1	HPCI Pipe Routing Area Temperature - High	$\leq$ 167°F
2.2.2.6.7	3.3.6.1	Drywell Pressure - High	$\leq$ 1.72 psig
2.2.2.6.8	[3.3.6]	HPCI Equipment Room $\Delta$ Temperature - High	$\leq$ 89°F
2.2.2.6.9	[3.3.6]	HPCI Pipe Routing Area $\Delta$ Temperature - High	$\leq$ 89°F
2.2.2.7	Shutdown Cooling/System Isolation		
2.2.2.7.1	3.3.6.1	Reactor Vessel Water Level - Low, Level 3	$\geq$ 13.0 inches <sup>(a)</sup>
2.2.2.7.2	3.3.6.1	Reactor Vessel Steam Dome Pressure - High	$\leq$ 98 psig
2.2.2.7.3	[3.3.6]	RHR Flow - High	$\leq$ 25,000 gpm
2.2.3	ECCS Actuation		
2.2.3.1	Core Spray System		
2.2.3.1.1	3.3.5.1	Reactor Vessel Water Level - Low Low Low, Level 1	$\geq$ -129 inches <sup>(a)</sup>
2.2.3.1.2	3.3.5.1	Drywell Pressure - High	$\leq$ 1.72 psig
2.2.3.1.3	3.3.5.1	Reactor Vessel Steam Dome Pressure - Low injection permissive	$\geq$ 413, $\leq$ 427 psig

(continued)

<sup>(a)</sup> See Figure 2.2-1.

TABLE 2.2-1 (Page 5 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.3.2	LPCI Mode of RHR System		
2.2.3.2.1	3.3.5.1	Reactor Vessel Water Level - Low Low Low, Level 1	$\geq -129$ inches <sup>(a)</sup>
2.2.3.2.2	3.3.5.1	Drywell Pressure - High	$\leq 1.72$ psig
2.2.3.2.3	3.3.5.1	Reactor Vessel Steam Dome Pressure - Low, injection permissive	$\geq 413, \leq 427$ psig
2.2.3.2.4	3.3.5.1	Reactor Vessel Steam Dome Pressure - Low, Recirculation Discharge Valve permissive	$\geq 236$ psig, decreasing
2.2.3.3	HPCI System		
2.2.3.3.1	3.3.5.1	Reactor Vessel Water Level - Low Low, Level 2	$\geq -38$ inches <sup>(a)</sup>
2.2.3.3.2	3.3.5.1	Drywell Pressure - High	$\leq 1.72$ psig
2.2.3.3.3	3.3.5.1	Condensate Storage Tank Level - Low	$\geq 36.0$ inches above tank bottom
2.2.3.3.4	3.3.5.1	Reactor Vessel Water Level - High, Level 8	$\leq 54$ inches
2.2.3.4	Automatic Depressurization System (ADS)		
2.2.3.4.1	3.3.5.1	Reactor Vessel Water Level - Low Low Low, Level 1	$\geq -129$ inches
2.2.3.4.2	3.3.5.1	Drywell Pressure - High	$\leq 1.72$ psig
2.2.3.4.3	3.3.5.1	ADS Timer	$\leq 102$ seconds
2.2.3.4.4	3.3.5.1	Core Spray Pump Discharge Pressure - High	$\geq 135, \leq 155$ psig
2.2.3.4.5	3.3.5.1	Low Pressure Coolant Injection Pump Discharge Pressure - High	$\geq 121, \leq 129$ psig
2.2.3.4.6	3.3.5.1	Reactor Vessel Water Level - Low, Level 3 Confirmatory	$\geq 13$ inches
2.2.3.4.7	3.3.5.1	ADS Drywell Pressure Bypass Timer	$\leq 420$ seconds
2.2.3.5	Loss of Power - ECCS Actuation		
2.2.3.5.1	4.16kv ESS Bus Undervoltage (Loss of Voltage < 20%)		
2.2.3.5.1.1	3.3.8.1	Bus Undervoltage	$\geq 823.2, \leq 856.8$ Volts
2.2.3.5.1.2	3.3.8.1	Time delay	$\geq 0.4, \leq 0.6$ seconds

(continued)

<sup>(a)</sup> See Figure 2.2-1.

TABLE 2.2-1 (Page 6 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.3.5.2	4.16kV ESS Bus Undervoltage (Degraded Voltage < 65%)		
2.2.3.5.2.1	3.3.8.1	Bus Undervoltage	$\geq 2641.1, \leq 2748.9$ Volts
2.2.3.5.2.2	3.3.8.1	Time delay	$\geq 2.7, \leq 3.3$ seconds
2.2.3.5.3	4.16kV ESS Bus Undervoltage (Degraded Voltage, < 93%)		
2.2.3.5.3.1	3.3.8.1	Bus Undervoltage	$\geq 3829.3, \leq 3906.7$ Volts
2.2.3.5.3.2	3.3.8.1	Time Delay (Non-LOCA)	$\geq 4$ minute, 30 seconds
2.2.3.5.3.4	3.3.8.1	Time Delay (LOCA)	$\leq 5$ minute, 30 seconds $\geq 9, \leq 11$ seconds
2.2.3.5.4	480V ESS Bus 0B565 Undervoltage (Degraded Voltage, < 65%)		
2.2.3.5.4.1	[3.8.5]	480V Basis	$\geq 308.9, \leq 315.1$ Volts
2.2.3.5.4.2	[3.8.5]	Time Delay	$\geq 4.5, \leq 5.5$ seconds
2.2.3.5.5	480V ESS Bus 0B565 Undervoltage (Degraded Voltage, < 92%)		
2.2.3.5.5.1	[3.8.5]	480V Basis	$\geq 437.6, \leq 446.4$ Volts
2.2.3.5.5.2	[3.8.5]	Time Delay	$\geq 9, \leq 11$ seconds
2.2.4	ATWS Alternate Rod Injection and Recirculation Pump Trip		
2.2.4.1	3.3.4.2[3.1.1]	Reactor Vessel, Water Level - Low Low, Level 2	$\geq -38$ inches <sup>(a)</sup>
2.2.4.1	3.3.4.2[3.1.1]	Reactor Vessel Steam Dome Pressure - High	$\leq 1135$ psig
2.2.5	End of Cycle Recirculation Pump Trip		
2.2.5.1	3.3.4.1	Turbine Stop Valve-Closure	$\leq 5.5\%$ closed
2.2.5.2	3.3.4.1	Turbine Control Valve - Fast Closure	$\geq 500$ psig
2.2.6	Reactor Core Isolation Cooling System Actuation		
2.2.6.1	3.3.5.2	Reactor Vessel Water Level - Low Low, Level 2	$\geq -38$ inches <sup>(a)</sup>
2.2.6.2	3.3.5.2	Reactor Vessel Water Level - High, Level 8	$\leq 54$ inches <sup>(a)</sup>
2.2.6.3	3.3.5.2	Condensate Storage Tank Level - Low	$\geq 36.0$ inches above tank bottom

(continued)

<sup>(a)</sup> See Figure 2.2-1.



TABLE 2.2-1 (Page 7 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.7	Control Rod Block		
2.2.7.1	Rod Block Monitor		
2.2.7.1.1	3.3.2	Low Power Range - Upscale	See COLR - TRO 3.2
	3.3.2	Intermediate Power Range - Upscale	See COLR - TRO 3.2
	3.3.2	High Power Range - Upscale	See COLR - TRO 3.2
2.2.7.1.2	3.3.2	Low Power Range Setpoint	See COLR - TRO 3.2
	3.3.2	Intermediate Power Range Setpoint	See COLR - TRO 3.2
	3.3.2	High Power Range Setpoint	See COLR - TRO 3.2
2.2.7.2	APRM		
2.2.7.2.1	[3.1.3]	Simulated Thermal Power-High - Two Loop Operation	0.62 W + 57.7%
2.2.7.2.2	[3.1.3]	Simulated Thermal Power-High - Single Loop Operation	0.62 (W - ΔW) + 57.7% <sup>(c)</sup>
2.2.7.2.3	[3.1.3]	Simulated Thermal Power-High Clamp	≤ 108% of RATED THERMAL POWER
2.2.7.2.4	[3.1.3]	Downscale	≥ 5% of RATED THERMAL POWER
2.2.7.2.5	[3.1.3]	Neutron Flux - High (Setdown)	≤ 12% of RATED THERMAL POWER
2.2.7.3	Source Range Monitors		
2.2.7.3.1	[3.1.3]	Upscale	≤ 2E5 cps
2.2.7.3.2	[3.1.3]	Downscale	≥ 3.0 cps <sup>(b)</sup>
2.2.7.4	Intermediate Range Monitors		
2.2.7.4.1	[3.1.3]	Upscale	≤ 108/125 divisions of full scale
2.2.7.4.2	[3.1.3]	Downscale	≥ 5/125 divisions of full scale
2.2.7.5	Scram Discharge Volume		
2.2.7.5.1	[3.1.3]	Water Level - High	≤ 35.9 gallons
2.2.7.6	Reactor Coolant System Recirculation Flow		
2.2.7.6.1	[3.1.3]	Upscale	114%

(continued)

<sup>(b)</sup> With a signal-to-noise ratio ≥ 2, or within the limits of Figure 2.2-2.<sup>(c)</sup> For single loop operation, the value of ΔW = 8.7.

TABLE 2.2-1 (Page 8 of 8)  
INSTRUMENTATION SETPOINTS

SYSTEM/REFERENCE LCO [TRO]		TRIP FUNCTION	TRIP SETPOINT
2.2.8	CREOASS		
2.2.8.1	3.3.7.1	Main Control Room Outside Air Intake Radiation Monitor	$\leq 5$ mR/hr
2.2.8.1.1	3.3.7.1	Reactor Vessel Water Level - Low Low, Level 2	$\geq -38.0$ inches <sup>(a)</sup>
2.2.8.1.2	3.3.7.1	Drywell Pressure - High	$\leq 1.72$ psig
2.2.8.1.3	3.3.7.1	Refuel Floor High Exhaust Duct Radiation - High	$\leq 18$ mR/hr
2.2.8.1.4	3.3.7.1	Railroad Access Shaft Exhaust Duct Radiation - High	$\leq 5$ mR/hr
2.2.8.1.5	3.3.7.1	Refuel Floor Wall Exhaust Duct Radiation - High	$\leq 21$ mR/hr
2.2.9	Feedwater/Main Turbine Trip System Actuation		
2.2.9.1	3.3.2.2	Reactor Vessel Level - High	$\leq 54.0$ inches <sup>(a)</sup>
2.2.10	MVP Isolation		
2.2.10.1	[3.3.11]	Main Steam Line Radiation - High High	$\leq 15$ x full power background without hydrogen injection

<sup>(a)</sup> See Figure 2.2-1

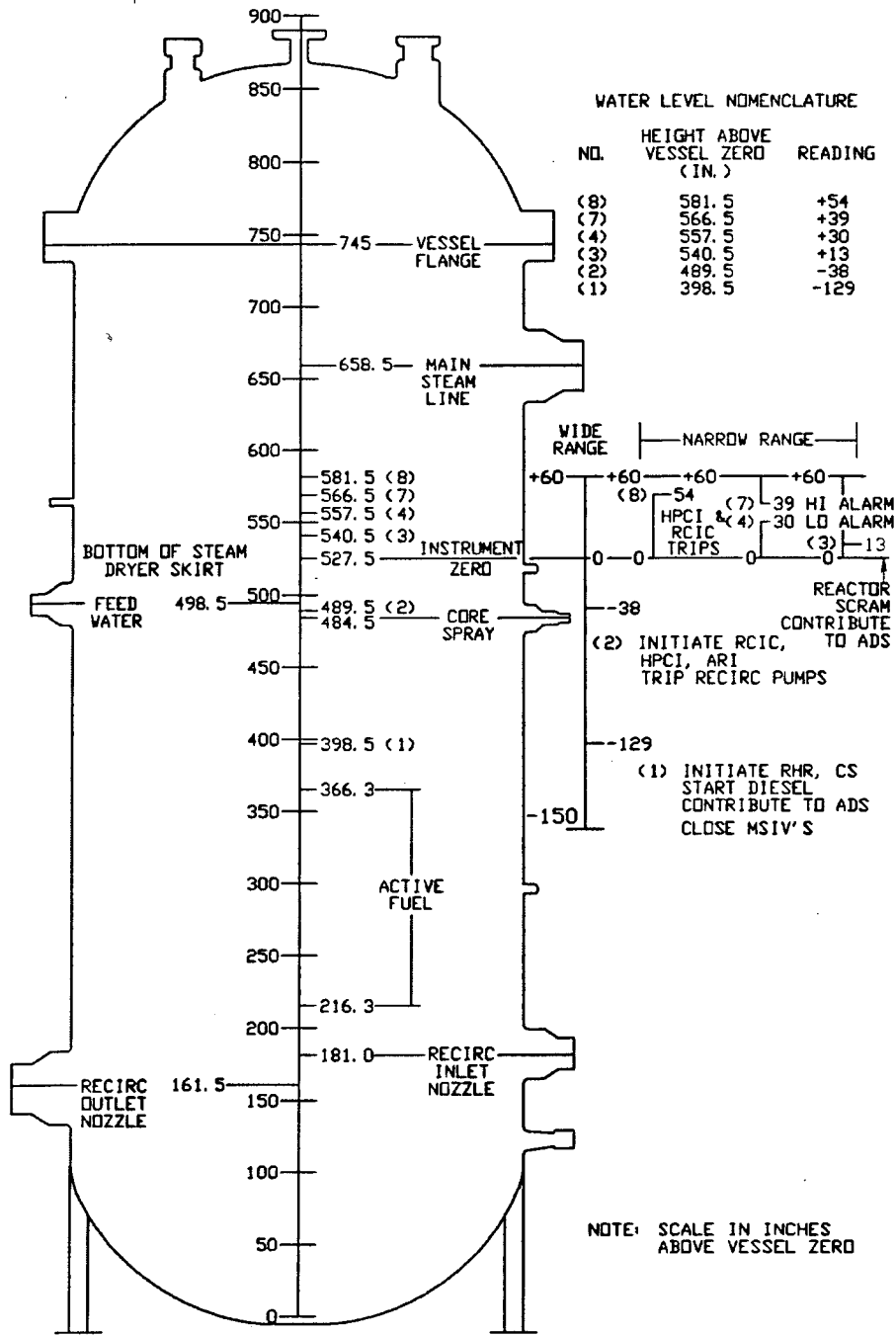


FIGURE 2.2-1  
REACTOR VESSEL WATER LEVEL

Instrument Trip Setpoint Table 2.2

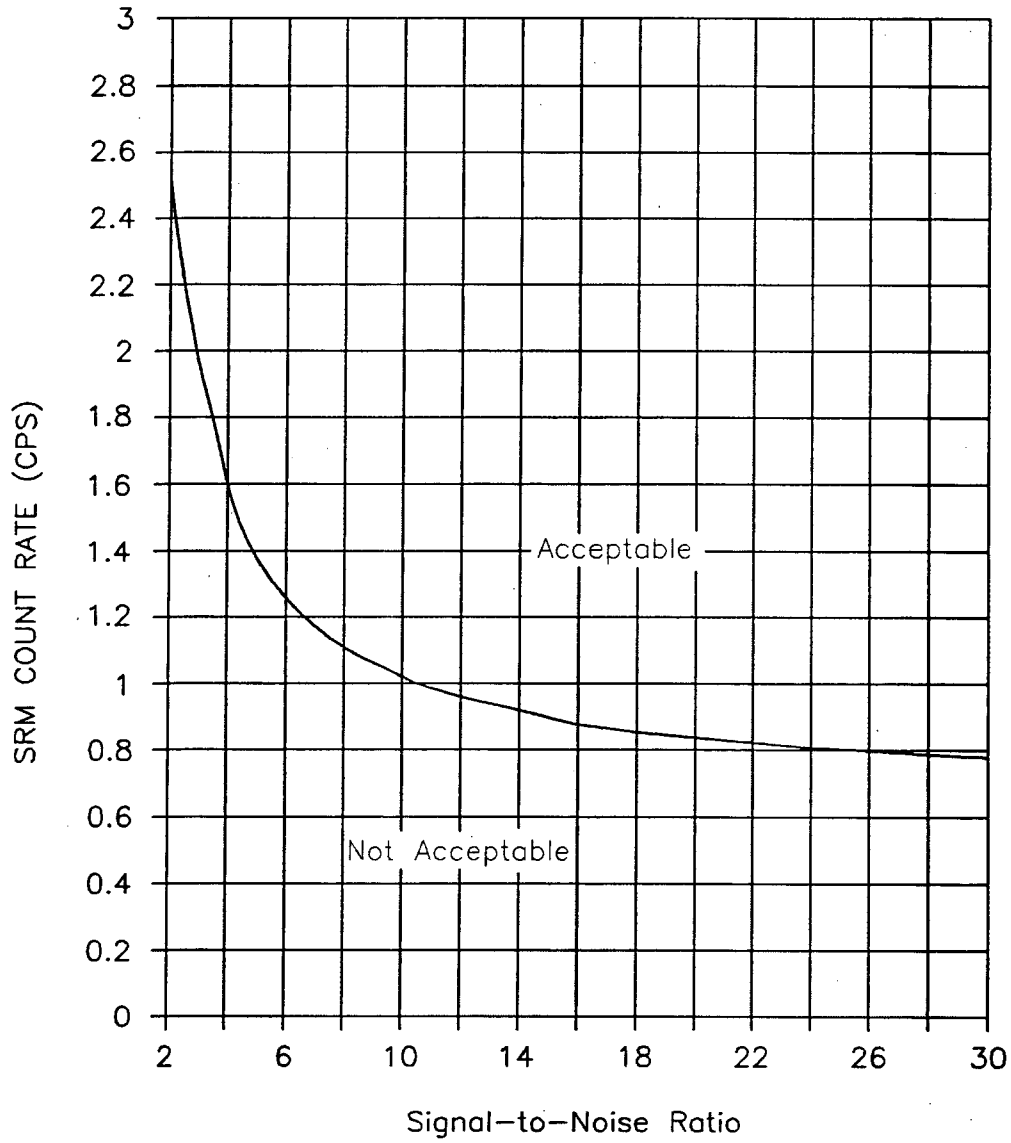


Figure 2.2-2  
Minimum SRM Trip Setpoint Versus Signal-to-Noise Ratio

3.1 Reactivity Control Systems

3.1.3 Control Rod Block Instrumentation

TRO 3.1.3 The control rod block instrumentation for each function in Table 3.1.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.1.3-1

ACTIONS

-----NOTE-----  
Separate condition entry is allowed for each channel  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.1.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.1.3-1.	B.1 Place at least one inoperable channel in the tripped condition.	1 hour from discovery of loss of trip capability
	<u>AND</u> B.2 Place the inoperable channel in the tripped condition.	7 days
C. As required by Required Action A.1 and referenced in Table 3.1.3-1.	C.1 Place the inoperable channel in the tripped condition.	12 hours
D. Required Actions and Completion Time of Conditions B or C not met.	D.1 Suspend Control Rod withdrawal.	Immediately

TECHNICAL REQUIREMENT SURVEILLANCE

-----NOTES-----

1. Refer to Table 3.1.3-1 to determine which TRSs apply for each Control Rod Block Function.
2. Neutron detectors may be excluded from CHANNEL CALIBRATION.
3. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

SURVEILLANCE		FREQUENCY
TRS 3.1.3.1	Perform CHANNEL CHECK	12 hours
TRS 3.1.3.2	-----NOTE----- For Function 1.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ----- Perform CHANNEL FUNCTIONAL TEST	184 days
TRS 3.1.3.3	Perform CHANNEL FUNCTIONAL TEST	7 days
TRS 3.1.3.4	Perform CHANNEL FUNCTIONAL TEST	92 days
TRS 3.1.3.5	Perform CHANNEL CALIBRATION	184 days
TRS 3.1.3.6	-----NOTE----- Neutron Detectors are excluded. ----- Perform CHANNEL CALIBRATION	24 months
TRS 3.1.3.7	Perform LOGIC SYSTEM FUNCTIONAL TEST	24 months

TABLE 3.1.3-1 (Page 1 of 2)  
CONTROL ROD BLOCK INSTRUMENTATION

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. APRM					
a. Neutron Flux - High (Setdown)	2, 5 <sup>(a)</sup>	3	B	TRS 3.1.3.2 TRS 3.1.3.6	≤ 14% RTP
b. Simulated Thermal Power - High	1	3	B	TRS 3.1.3.2 TRS 3.1.3.6	0.62 W + 59.7% <sup>(b)</sup>
c. Downscale	1	3	B	TRS 3.1.3.2 TRS 3.1.3.6	≥ 3% RTP
d. Inop	1, 2	3	B	TRS 3.1.3.2	NA
	5 <sup>(a)</sup>	3	B	TRS 3.1.3.2	NA
2. Source Range Monitors					
a. Detector not full in	2 <sup>(c)</sup>	3	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
	5 <sup>(i)</sup>	2	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
b. Upscale	2 <sup>(d)</sup>	3	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≤ 3.3E5 cps
	5 <sup>(i)</sup>	2	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≤ 3.3E5 cps
c. Inop	2 <sup>(d)</sup>	3	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
	5 <sup>(i)</sup>	2	B	TRS 3.1.3.3 TRS 3.1.3.7	NA

(continued)

<sup>(a)</sup> When performing Shutdown Margin Demonstration per Technical Specification 3.10.8.<sup>(b)</sup>  $0.62 (W - \Delta W) + 59.7\%$  when reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating." For single loop operation, the value of  $\Delta W = 8.7$ .<sup>(c)</sup> When not automatically bypassed with SRM counts  $\geq 100$  cps or the IRM channels on range 3 or higher.<sup>(d)</sup> When not automatically bypassed with IRM channels on range 8 or higher.<sup>(i)</sup> With any control rod withdrawn from a core cell containing one or more fuel assemblies.

TABLE 3.1.3-1 (Page 2 of 2)  
CONTROL ROD BLOCK INSTRUMENTATION

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
d. Downscale	2 <sup>(e)</sup>	3	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≥ 1.8 cps <sup>(f)</sup>
	5 <sup>(i)</sup>	2	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≥ 1.8 cps <sup>(f)</sup>
3. Intermediate Range Monitors					
a. Detector not full in	2, 5 <sup>(i)</sup>	6	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
b. Neutron Flux - High	2, 5 <sup>(i)</sup>	6	B	TRS 3.1.3.1 TRS 3.1.3.3 TRS 3.1.3.5 TRS 3.1.3.7	≤ 110/125 divisions of full scale
c. Inop	2, 5 <sup>(i)</sup>	6	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
d. Downscale	2 <sup>(g)</sup> 5 <sup>(i)</sup>	6	B	TRS 3.1.3.1 TRS 3.1.3.3 TRS 3.1.3.5 TRS 3.1.3.7	3/125 divisions of full scale
4. Scram Discharge Volume Water Level-High	1, 2, 5 <sup>(h)</sup>	2	C	TRS 3.1.3.4 TRS 3.1.3.6	≤ 36.5 gallons
5. Reactor Coolant System Recirculation Flow					
a. Upscale	1	3	C	TRS 3.1.3.2 TRS 3.1.3.6	≤ 117/125 divisions of full scale

- (e) When not automatically bypassed with IRMs on range 3 or higher.
- (f) With a signal-to-noise ratio ≥ 2, or within the limits of TS Figure 3.3.1.2-1.
- (g) When not automatically bypassed with IRM channels on range 1.
- (h) When more than one control rod is withdrawn. Not applicable to control rods removed per Technical Specification 3.10.5 or 3.10.6.
- (i) Not required when eight or fewer fuel assemblies (adjacent to the SRMs) are in the core.
- (j) With any control rod withdrawn from a core cell containing one or more fuel assemblies.



3.3 Instrumentation

3.3.9 OPRM Instrumentation Configuration

TRO 3.3.9 Oscillation Power Range Monitor (OPRM) supporting setpoints and settings shall be within the specified limits.

APPLICABILITY: Thermal POWER  $\geq 25\%$  RTP

ACTIONS

-----NOTE-----

1. Separate Condition entry is allowed for each channel
- 

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. OPRM Setpoints and Settings not in accordance with Table 3.3.9-1	A.1 Enter the condition referenced in Table 3.3.9-1 for the parameter	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.9.1	B.1 Declare affected OPRM channel inoperable.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.9-1	C.1 Restore the OPRM Setpoints and Settings to within the specified limits.  <u>OR</u> C.2 Declare affected OPRM channel inoperable.	120 days  Immediately
D. Alternate method to detect and suppress thermal hydraulic instability oscillations required by LCO 3.3.1.1 Required Action I.1	D.1 Initiate monitoring to detect entry into Conditions E, F, and/or G.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. -----NOTE----- Only applicable as required by Required Action D.1 -----</p> <p>Total core flow as a function of THERMAL POWER within Region I of the Power Flow map as specified in the COLR.</p> <p><u>OR</u></p> <p>Total core flow as a function of THERMAL POWER within Region II of the Power Flow map as specified in the COLR and less than 50% of required LPRM upscale alarms OPERABLE</p>	<p>E.1 Place reactor mode switch in the shutdown position.</p>	<p>Immediately</p>
<p>F. -----NOTE----- Only applicable as required by Required Action D.1 and when in Region II of the Power Flow map as specified in the COLR. -----</p> <p>Two or more APRM readings oscillating with one or more oscillating <math>\geq 10\%</math> of RTP peak-to-peak</p> <p><u>OR</u></p>	<p>F.1 Place the reactor mode switch in the shutdown position.</p>	<p>Immediately</p>

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>F. (continued)</p> <p>Two or more LPRM upscale alarms activating and deactivating with a period <math>\geq 1</math> second and <math>\leq 5</math> seconds.</p> <p><u>OR</u></p> <p>Sustained LPRM oscillations <math>&gt; 10 \text{ W/cm}^2</math> peak-to-peak with a period <math>\geq 1</math> second and <math>\leq 5</math> seconds.</p>		
<p>G. -----NOTE----- Only applicable as required by Required Action D.1. -----</p> <p>Total core flow as a function of THERMAL POWER is within Region II of the Power Flow map as specified in the COLR.</p>	<p>G.1 Initiate action to restore total core flow as a function of THERMAL POWER outside of Region II.</p>	<p>Immediately</p>
<p>H. Less than 50% of the required LPRM Upscale Alarms are OPERABLE</p>	<p>H.1 Post sign on the reactor control panel that less than 50% of the LPRM Upscale Alarms are OPERABLE.</p>	<p>1 hour</p>

TECHNICAL REQUIREMENT SURVEILLANCE

SURVEILLANCE	FREQUENCY
<p>TRS 3.3.9.1</p> <p>-----NOTE-----                      Only required to be met when an alternate method to detect and suppress thermal hydraulic instability oscillations is required by LCO 3.3.1.1 Required Action I.1.                      -----</p> <p>Verify total core flow as a function of THERMAL POWER is outside of Region I and II of the Power Flow map as specified in the COLR.</p>	<p>24 hours</p>
<p>TRS 3.3.9.2</p> <p>Perform CHANNEL CALIBRATION on the LPRM Upscale alarm</p>	<p>24 months</p>
<p>TRS 3.3.9.3</p> <p>Verify OPRM parameter setpoints and settings are within limits</p>	<p>24 months</p>

Table 3.3.9-1  
OPRM SETPOINTS AND SETTINGS

OPRM PARAMETER	DESCRIPTION	CONDITIONS REFERENCE D FROM REQUIRED ACTION A.1	VALUE
1. TOL ( $\epsilon$ )	Period Tolerance	B	$\geq 0.10$ and $\leq 0.30$ sec
2. fc	Conditioning Filter Cutoff Frequency	B	1.5 Hz
3. Tmin	Oscillation Period Lower Time Limit	B	$\geq 1.0$ and $\leq 1.2$ sec
4. Tmax	Oscillation Period Upper Time Limit	B	3.5 sec
5. LPRMmin	Minimum LRPMS/Cell Required for Cell Operability	B	$\geq 2$
6. S1	Peak Threshold Setpoint/ABA & GRBA	C	$\geq 1.10$ and $\leq 1.20$
7. S2	Valley Threshold Setpoint/ABA & GRBA	C	$\geq 0.85$ and $\leq 0.95$
8. Smax	Amplitude Trip Setpoint/ABA	C	$\geq 1.30$ and $\leq 1.50$
9. DR3	Growth Rate Factor Setpoint/GRBA	C	$\geq 1.30$ and $\leq 1.60$

3.10 Miscellaneous

3.10.2 Shutdown Margin Test RPS Instrumentation

TRO 3.10.2 The Shutdown Margin Test RPS instrumentation for each Function in Table 3.10.2-1 shall be OPERABLE with "shorting links" removed.

APPLICABILITY: MODE 5, During shutdown margin demonstrations per LCO 3.1.1

ACTIONS

NOTES

Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable	A.1 Enter the Condition referenced in Table 3.10.2-1 for the channel	Immediately
B. As required by Required Action A.1 and referenced in Table 3.10.2-1	B.1 Suspend all operations involving CORE ALTERATIONS and initiate actions to insert all insertable control rods	Immediately
C. As required by Required Action A.1 and referenced in Table 3.10.2-1	C.1 Restore RPS trip capability <u>AND</u> C.2 Place channel in trip	1 hour  12 hours
D. Required Action and associated Completion Times of Condition C not met  <u>OR</u> Requirements of the TRO otherwise not met	D.1 Suspend all operations involving CORE ALTERATIONS and initiate actions to insert all insertable control rods	Immediately

TECHNICAL REQUIREMENT SURVEILLANCE

-----NOTES-----

1. Refer to Table 3.10.2-1 to determine which TRSs apply for each TRM RPS Instrumentation function.
  2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the trip function is maintained.
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SURVEILLANCE		FREQUENCY
TRS 3.10.2.1	Verify SRM is OPERABLE per LCO 3.3.1.2 "Source Range Monitor (SRM) Instrumentation"	12 hours
TRS 3.10.2.2	Verify that the RPS circuitry "shorting links" have been removed	12 hours
TRS 3.10.2.3	Perform CHANNEL FUNCTIONAL TEST	7 days
TRS 3.10.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST with "shorting links" removed	184 days
TRS 3.10.2.5	Perform CHANNEL CALIBRATION	24 months
TRS 3.10.2.6	Perform LOGIC SYSTEM FUNCTIONAL TEST	24 months

TABLE 3.10.2-1  
TRM RPS INSTRUMENTATION

FUNCTION		REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1.	Source Range Monitor	(a)	B	TRS 3.10.2.1 TRS 3.10.2.2 TRS 3.10.2.3 TRS 3.10.2.4 TRS 3.10.2.5	≤ 3.3E5 CPS
2.	Intermediate Range Monitor				
a.	Neutron Flux-High	6	C	TRS 3.10.2.2 TRS 3.10.2.4	(b)
b.	Inop	6	C	TRS 3.10.2.2 TRS 3.10.2.4	N/A
3.	Average Power Range Monitor <sup>(1)</sup>				
a.	Neutron Flux-High (Setdown)	(b)	C	TRS 3.10.2.2 TRS 3.10.2.6	(b)
b.	Inop	(b)	C	TRS 3.10.2.2 TRS 3.10.2.6	N/A
c.	2-Out-of-4 Voter	(b)	C	TRS 3.10.2.2 TRS 3.10.2.6	N/A

<sup>(1)</sup> APRM not required for Mode 5 as per LCO 3.3.1.1, but is required for other conditions during shutdown margin demonstrations required per LCO 3.1.1

(a) As specified in LCO 3.3.1.2

(b) As specified in LCO 3.3.1.1