

March 1, 1994

Docket No. 52-002

Mr. C. B. Brinkman, Acting Director  
Nuclear Systems Licensing  
Combustion Engineering, Inc.  
1000 Prospect Hill Road  
Windsor, Connecticut 06095-0500

Dear Mr. Brinkman:

SUBJECT: COMMENTS ON TECHNICAL SPECIFICATIONS (TS) FOR SYSTEM 80+

The Instrumentation & Controls Branch and the Civil Engineering & Geosciences Branch of the Nuclear Regulatory Commission (NRC) have reviewed the System 80+ TS, and the comments are shown on the markup copy of the affected TS in the enclosure. Provide responses to these comments no later than two weeks from your receipt of this letter to allow us to maintain our review schedule.

This affects nine or fewer respondents, and therefore, is not subject to review by the Office of Management and Budget under P.L. 96-511.

Sincerely,

(Original signed by)

Kristine M. Shembarger, Project Manager  
Standardization Project Directorate  
Associate Directorate for Advanced Reactors  
and License Renewal  
Office of Nuclear Reactor Regulation

Enclosure:  
As stated

cc w/enclosure:  
See next page

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ABB-Combustion Engineering, Inc.

Docket No. 52-002

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ADDITIONAL NOTES CONCERNING SYSTEM 80+ TECH SPECS

- 1) Bases for 3.3.2 should explain that TRCBs are closed for channel functional tests.
- 2) Define TRIP Leg - used on pages 3.3-19 and 3.3-26.
- 3) Explain in Bases reason for Conditions E&F in 3.3.5.
- 4) APS is 2/2 - Change 3.3.8 to no channel in bypass, and 72 hours to repair (consistent with BWRs).
- 5) Table headers should be all caps; and make headers consistent with use of footnote modifiers.

Enclosure

3.3 INSTRUMENTATION

3.3.1 Reactor Protective System (RPS) Instrumentation - Operating

LCO 3.3.1 Four RPS TRIP CHANNELS and operating bypass removal CHANNELS for each Function in Table 3.3.1-1 shall be OPERABLE.

*define*

APPLICABILITY: According to Table 3.3.1-1.

NOTES

1. Separate Condition entry is allowed for each RPS Function.
2. *If a CHANNEL is placed in bypass*, continued operation with the <sup>TRIP</sup> CHANNEL in the bypassed condition for the Completion Time specified by Required Action A.2 or C.2.2 shall be reviewed in accordance with Specification [5.5.1.2.e].

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more Functions <sup>c</sup> with one <del>automatic</del> RPS TRIP CHANNEL inoperable.</p>	<p>A.1 <sup>TRIP</sup> Place <del>CHANNEL</del> in bypass or trip.</p>	1 hour
	<p><u>AND</u></p> <p>A.2 <sup>TRIP</sup> Restore <del>CHANNEL</del> to OPERABLE status.</p>	Prior to entering MODE 2 following next MODE 5 entry
<p>B. One or more Functions <sup>c</sup> with two <del>automatic</del> RPS TRIP CHANNELS inoperable.</p>	<p>NOTE</p> <p>LCO 3.0.4 is not applicable.</p>	
	<p>B.1 <sup>TRIP</sup> Place one <del>CHANNEL</del> in bypass and the other in trip.</p>	1 hour

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One or more Functions with one automatic operating bypass removal CHANNEL inoperable. <i>function</i></p>	<p>-----NOTE----- Applies only to Functions 2, 4, 12, 13, and 14 in Table 3.3.1-1</p> <p>C.1 Verify operating bypass is not in effect. <i>remain function</i> <i>Disable bypass function - see 53</i></p> <p>OR</p> <p>C.2.1 Place affected automatic TRIP CHANNEL in bypass or trip. <i>stop</i></p> <p>AND</p> <p>C.2.2 Restore operating bypass removal CHANNEL and associated automatic TRIP CHANNEL to OPERABLE status.</p>	<p>1 hour</p> <p>AND</p> <p>once per 12 hours thereafter</p> <p>1 hour</p> <p>Prior to entering MODE 2 following next MODE 5 entry</p>
<p>D. One or more Functions with two automatic operating bypass removal CHANNELS inoperable. <i>functions</i></p>	<p>-----NOTES-----</p> <p>1. LCO 3.0.4 is not applicable.</p> <p>2. Applies only to Functions 2, 4, 12, 13, and 14 in Table 3.3.1-1.</p> <p>D.1 Verify operating bypasses are not in effect. <i>stop</i> <i>Disable</i></p> <p>OR</p>	<p>1 hour</p> <p>AND</p> <p>once per 12 hours thereafter</p>

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. (Continued)	D.2 Place one affected automatic trip CHANNEL in bypass and place the other in trip.	1 hour
Deleted		
E. Required Action and associated Completion Time not met.	E.1 Be in Mode 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.1.1 Perform a CHANNEL CHECK of each RPS instrument CHANNEL	12 hours
SR 3.3.1.2  NOTE Not required to be performed until 12 hours after THERMAL POWER $\geq$ 70% RTP.  Verify total Reactor Coolant System (RCS) flow rate as indicated by each CPC is less than or equal to the RCS total flow rate.  If necessary, adjust the CPC addressable constant flow coefficients such that each CPC indicated flow is less than or equal to the RCS flow rate.	12 hours
SR 3.3.1.3 Check the CPC autorestart count is less than three.	12 hours
SR 3.3.1.4 Verify PPS cabinet temperatures are within limits.	12 hours

(Continued)

SURVEILLANCE REQUIREMENTS (Continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.5</p> <p style="text-align: center;">NOTES</p> <ol style="list-style-type: none"> <li>Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 20% RTP.</li> <li>The daily calibration may be suspended during PHYSICS TESTS, provided the calibration is performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.</li> </ol> <hr/> <p><i>not done</i></p> <p>Perform calibration (heat balance only) and adjust the linear Power Level signals and the CPC addressable constant multipliers to make the CPC <math>\Delta T</math> at power and CPC nuclear power calculations agree with the calorimetric, if the absolute difference is <math>\geq</math> [2] %. Then adjust excore nuclear power to agree with CPC nuclear power if the absolute difference is <math>\geq</math> [2%].</p>	<p style="text-align: right;"><i>define in Basis</i></p> <p>[92] days</p>
<p>SR 3.3.1.6</p> <p style="text-align: center;">NOTE</p> <p>Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 70% RTP.</p> <hr/> <p>Verify total RCS flow rate indicated by each CPC is less than or equal to the RCS flow determined by calorimetric calculations.</p>	<p>31 days</p>
<p>SR 3.3.1.7</p> <p style="text-align: center;">NOTE</p> <p>Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 15% RTP.</p> <hr/> <p>Verify linear power <u>SUBCHANNEL</u> gains of the excore detectors are consistent with the values used to establish the shape annealing matrix elements in the CPCs.</p>	<p>31 days</p>

(Continued)

SURVEILLANCE REQUIREMENTS (Continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.8</p> <p style="text-align: center;">NOTES</p> <p>1. The CPC CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC.</p> <p>2. Not required to be performed for logarithmic power level - High CHANNELS until 2 hours after reducing THERMAL POWER below 1E-4% RTP and only if reactor trip circuit breakers (RTCBs) are closed.</p> <p>Perform CHANNEL FUNCTIONAL TEST on each CHANNEL</p>	<p>92 days</p>
<p>SR 3.3.1.9</p> <p style="text-align: center;">NOTE</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>Perform CHANNEL CALIBRATION of the power range neutron flux CHANNELS.</p>	<p>92 days</p>
<p>[SR 3.3.1.10</p> <p>Perform CHANNEL CALIBRATION on A/D Reference Sources</p>	<p>[12] months]</p>
<p>SR 3.3.1.11</p> <p style="text-align: center;">NOTE</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>Perform CHANNEL CALIBRATION on each CHANNEL, including operating bypass removal functions.</p>	<p>[18 months]</p>
<p>SR 3.3.1.12</p> <p>Perform a CHANNEL FUNCTIONAL TEST on each CPC CHANNEL.</p>	<p>[18 months]</p>
<p>SR 3.3.1.13</p> <p>Using the incore detectors, determine the shape annealing matrix elements to be used by the CPCs.</p>	<p>Once after each refueling prior to exceeding 70% RTP</p>
<p>SR 3.3.1.14</p> <p>Perform a CHANNEL FUNCTIONAL TEST on each automatic operating bypass removal function.</p>	<p>Once within 92 days prior to each reactor startup</p>

(Continued)



SURVEILLANCE REQUIREMENTS (Continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.15	<p style="text-align: center;"><del>NOTE</del></p> <p>Neutron detectors are excluded.</p> <hr/> <p>Verify RPS RESPONSE TIME is within limits.</p>	<p>[18] months on a STAGGERED TEST BASIS</p>

Table 3.3.1-1 (Sheet 1 of 3)

**REACTOR PROTECTIVE SYSTEM INSTRUMENTATION - OPERATING**

FUNCTION	APPLICABLE NODES OR OTHER SPECIFIED CONDITION	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Variable Overpower - High	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.5 SR 3.3.1.7 SR 3.3.1.8 SR 3.3.1.9 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15 *	≤ [112.7]% RTP
2. Logarithmic Power Level - High <sup>(a)</sup>	2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.14 SR 3.3.1.15	≤ [0.018]% RTP
3. Pressurizer Pressure - High	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≤ [2370 psia]
4. Pressurizer Pressure - Low	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.14 SR 3.3.1.15	Trip ≥ [1825 psia] Trip Operating Bypass Removal ≥ [500 psia] Step ≤ [400 psia] Floor ≥ [300 psia]
5. Containment Pressure - High	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≤ [2.7] psig
6. Steam Generator #1 Pressure - Low <sup>(b)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≥ [843 psia]
7. Steam Generator #2 Pressure - Low <sup>(b)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≥ [843 psia]

(Continued)

- (a) Trip may be bypassed when THERMAL POWER is > [1E-4]% RTP. Operating bypass shall be automatically removed when THERMAL POWER is ≤ [1E-4]% RTP. Trip may be manually bypassed during physics testing pursuant to LCO 3.4.17, "RCS Loops - Test Exceptions."
- (b) The Steam Generator Pressure - Low trip setpoint may be manually decreased as steam generator pressure is reduced, provided the margin between steam generator pressure and the setpoint is maintained at ≤ 200 psi. The setpoint shall be increased automatically as steam generator pressure is increased.

SYSTEM 80+ *Reconcile footnote 3.3-1 with STS*

\* STS - Footnote b - "When any RTCB is closed"  
\* What about Pressurizer pressure operating bypass?

Table 3.3.1-1 (Sheet 2 of 3)

REACTOR PROTECTIVE SYSTEM INSTRUMENTATION - OPERATING

FUNCTION	APPLICABLE NODES OR OTHER SPECIFIED CONDITION	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8. Steam Generator #1 Level - Low <sup>(c)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≥ (44.2)%
9. Steam Generator #2 Level - Low <sup>(c)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≥ (44.2)%
10. Steam Generator #1 Level - High	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≤ (90.8)%
11. Steam Generator #2 Level - High	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.15	≤ (90.8)%
12. Reactor Coolant Flow - Low <sup>(d)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.8 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.14 SR 3.3.1.15	Rate: ≤ [*] psi/sec. Floor: ≥ [*] psid Step: [*] psi

(Continued)

(c) The Steam Generator Level-Low trip setpoint varies with reactor power and is rate limited with a preset low power value.

(d) The Reactor Coolant Flow-Low trip setpoint varies with reactor power and is rate limited with a preset low power level.

*53 n... about low flow related to*

*explain rate limiting in the bases*

\* Value to be determined by system detail design.

Table 3.3.1-1 (Sheet 3 of 3)

REACTOR PROTECTIVE SYSTEM INSTRUMENTATION - OPERATING

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITION	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
13. Local Power Density - High <sup>(b)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4 SR 3.3.1.5 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.8 SR 3.3.1.9 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.12 SR 3.3.1.13 SR 3.3.1.14 SR 3.3.1.15	≤ [21.0] kW/ft
14. Departure From Nucleate Boiling Ratio (DNBR) - Low <sup>(b)</sup>	1,2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4 SR 3.3.1.5 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.8 SR 3.3.1.9 [SR 3.3.1.10] SR 3.3.1.11 SR 3.3.1.12 SR 3.3.1.13 SR 3.3.1.14 SR 3.3.1.15	≥ [1.24]

(b) Trip may be bypassed when THERMAL POWER IS < [1E-4]% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ [1E-4]% RTP. During testing pursuant to LCO 3.4.17, trip may be bypassed below [5%] RTP. Bypass shall be automatically removed when THERMAL POWER is > [5%] RTP.

*Why, here but not elsewhere in other places?*

3.3 INSTRUMENTATION

3.3.2 Reactor Protective System (RPS) Instrumentation - Shutdown

LCO 3.3.2 Four RPS TRIP CHANNELS and operating bypass removal CHANNELS for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1

NOTES

1. Separate Condition entry is allowed for each RPS Function.
2. If a CHANNEL is placed in bypass, continued operation with the CHANNEL in the bypassed condition for the Completion Time specified by Required Action A.2 or C.2.2 shall be reviewed in accordance with Specification [5.5.1.2.e].

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one automatic RPS TRIP CHANNEL inoperable.	A.1 Place <sup>TRIP</sup> CHANNEL in bypass or trip.	1 hour
	AND A.2 Restore <sup>TRIP</sup> CHANNEL to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
	NOTE LCO 3.0.4 is not applicable.	
B. One or more functions with two automatic RPS TRIP CHANNELS inoperable.	B.1 Place one <sup>L.C.</sup> CHANNEL in bypass and place the other in trip.	1 hour

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One or more functions with one automatic operating bypass removal <u>CHANNELS</u> inoperable. <i>FUNCTIONS</i></p>	<p style="text-align: center;"><u>NOTE</u></p> <p style="text-align: center;">Applies only to Functions 1, 4, 5, and 6 in Table 3.3.2-1</p> <hr/> <p>C.1 Disable operating bypass <del>CHANNEL</del> <i>function</i></p> <p><u>OR</u></p> <p>C.2.1 Place affected automatic TRIP CHANNEL in bypass or trip.</p> <p><u>AND</u></p> <p>C.2.2 Restore operating bypass removal <del>CHANNEL</del> <i>function</i> and associated automatic TRIP CHANNEL to OPERABLE status.</p>	<p>1 hour</p> <p>1 hour</p> <p>Prior to entering MODE 2 following next MODE 5 entry status.</p>
<p>D. One or more functions with two automatic operating bypass removal CHANNELS inoperable.</p>	<p style="text-align: center;"><u>NOTES</u></p> <p>1. LCO 3.0.4 is not applicable.</p> <p>2. Applies only to functions 1, 4, 5 and 6 in Table 3.3.2-1.</p> <hr/> <p>D.1 Disable operating bypass <del>CHANNELS</del> <i>functions</i>.</p> <p><u>OR</u></p> <p>D.2 Place one affected automatic TRIP CHANNEL in bypass and place the other in trip.</p>	<p>1 hour</p> <p>1 hour</p>
<p>E. Required Action and associated Completion Time not met.</p>	<p>E.1 Open all RTCBs.</p>	<p>1 hour</p>

SURVEILLANCE REQUIREMENTS

NOTE

Refer to Table 3.3.2-1 to determine which SR shall be performed for each RPS function.

SURVEILLANCE	FREQUENCY
SR 3.3.2.1 Perform a CHANNEL CHECK of each RPS instrument CHANNEL	12 hours
SR 3.3.2.2 Check the CPC autorestart count is less than three.	12 hours
NOTES-- 1. The CPC CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC.  2. Not required to be performed for logarithmic power level channels until 2 hours after reducing THERMAL POWER below [1E-4%] RTP and only if reactor trip circuit breakers (RTCBs) are closed.	
SR 3.3.2.3 Perform a CHANNEL FUNCTIONAL TEST on each CHANNEL	92 days
SR 3.3.2.4 Verify RPS cabinet temperatures are within limits.	12 hours
SR 3.3.2.5 Perform a CHANNEL FUNCTIONAL TEST on each automatic operating bypass removal function.	92 days
[SR 3.3.2.6 Perform CHANNEL CALIBRATION on A/D Reference Sources.	[12] months]

(Continued)

SURVEILLANCE REQUIREMENTS (Continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.2.7</p> <p><del>NOTE</del></p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <hr/> <p>Perform a CHANNEL CALIBRATION on each TRIP CHANNEL including operating bypass removal function.</p>	<p>[18] months</p>
<p>SR 3.3.2.8</p> <p><del>NOTE</del></p> <p>Neutron detectors are excluded.</p> <hr/> <p>Verify RPS RESPONSE TIME is within limits.</p>	<p>[18] months on a STAGGERED TEST BASIS</p>



TABLE 3.3.2-1

REACTOR PROTECTION INSTRUMENTATION - SHUTDOWN

Function	Applicable Modes or Other Specified Conditions	Surveillance Requirements	Allowable Value
1. Logarithmic Power Level - High <sup>(a)</sup>	3 <sup>(a)</sup> , 4 <sup>(a)</sup> , 5 <sup>(a)</sup> <i>footnote?</i>	SR 3.3.2.1 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6 SR 3.3.2.7 SR 3.3.2.8	≤ [0.018] % RTP
2. Steam Generator Pressure #1 - Low <sup>(c)</sup>	3 <sup>(a)</sup>	SR 3.3.2.1 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.7 SR 3.3.2.8	≥ [843 psia]
3. Steam Generator Pressure #2 - Low <sup>(c)</sup>	3 <sup>(a)</sup>	SR 3.3.2.1 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.7 SR 3.3.2.8	≥ [843 psia]
4. Reactor Coolant Flow - Low <sup>(a)</sup> <i>Basics needs CESSAR reference</i>	3 <sup>(a)</sup> , 4 <sup>(a)</sup> , 5 <sup>(a)</sup> <i>why the footnote?</i>	SR 3.3.2.1 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.7 SR 3.3.2.8	Rate: [°] psi/sec Floor: [°] psid Step: [°] psi
5. Local Power Density - High <sup>(a)</sup>	3 <sup>(a)</sup> , 4 <sup>(a)</sup> , 5 <sup>(a)</sup> <i>footnote?</i>	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6 SR 3.3.2.7 SR 3.3.2.8	≤ [21.0] kw/ft
6. Departure from Nucleate Boiling Ratio - Low <sup>(a)</sup>	3 <sup>(a)</sup> , 4 <sup>(a)</sup> , 5 <sup>(a)</sup> <i>footnote?</i>	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6 SR 3.3.2.7 SR 3.3.2.8	≥ [1.24]

- (a) With any Reactor Trip Circuit Breakers (RTCBS) closed and any Control Element Assembly capable of being withdrawn.
- (b) Trip may be bypassed when THERMAL POWER is > [1E-4] RTP. Operating bypass shall be automatically removed when THERMAL POWER is ≤ [1E-4] RTP. Trip may be manually bypassed during physics testing pursuant to LCO [3.4.17] "RCS Loops - Test Exceptions".
- (c) The Steam Generator Pressure - Low trip setpoint may be manually decreased as steam generator pressure is reduced, provided the margin between steam generator pressure and the setpoint is maintained at ≤ 200 psi. The setpoint shall be increased automatically as steam generator pressure is increased.
- (d) The Reactor Coolant Flow - Low trip setpoints may be manually adjusted when THERMAL POWER is < 10<sup>-4</sup>.
- (e) Trip may be bypassed when THERMAL POWER is < [1E-4] RTP. Operating bypass shall be automatically removed when THERMAL POWER is ≥ [1E-4] RTP. During testing pursuant to LCO 3.4.17, trip may be bypassed below [5%] RTP. Operating bypass shall be automatically removed when THERMAL POWER is > [5%] RTP.

\* Value to be determined by system detail design.

3.3 INSTRUMENTATION

3.3.3 Control Element Assembly Calculators (CEACs)

LCO 3.3.3 Two CEACs shall be OPERABLE.

APPLICABILITY: Modes 1 and 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CEAC inoperable.	A.1 Perform SR 3.1.5.1.	Once per 4 hours
	AND A.2 Restore <del>inoperable</del> CEAC to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.  OR Both CEACs inoperable.	B.1 Ensure the departure from nucleate boiling ratio requirement of LCO 3.2.4, "Departure from Nucleate Boiling Ratio (DNBR)," is met and the Reactor Power Cutback System is disabled.  AND	4 hours

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (Continued)	B.2 Verify all control element assembly (CEA) groups are fully withdrawn and maintained fully withdrawn, except during Surveillance testing pursuant to SR 3.1.5.3 and SR 3.1.5.4 [or for control, when CEA group #6 may be inserted to a maximum of 127.5 inches].	4 hours
	<u>AND</u>	
	B.3 Ensure the "RSPT/CEAC Inoperable" addressable constant in each core protection calculator (CPC) is set to indicate that both CEACs are inoperable.	4 hours
	<u>AND</u>	
	B.4 Verify the CEA Drive Mechanism Control System is placed in "STANDBY" and maintained in "STANDBY," except during CEA motion permitted by Required Action B.2.	4 hours
<u>AND</u>		
	B.5 Perform SR 3.1.5.1.	Once per 4 hours

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.3.1	Perform <del>o</del> CHANNEL CHECK.	12 hours
SR 3.3.3.2	Check the CEAC autorestart count is less than three.	12 hours
SR 3.3.3.3	Verify CEAC cabinet temperatures are within limits.	12 hours
SR 3.3.3.4	Perform <del>o</del> CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.3.5	Perform <del>o</del> CHANNEL CALIBRATION.	92 days
SR 3.3.3.6	Perform <del>o</del> CHANNEL FUNCTIONAL TEST.	[18] months

3.3.4  
LCO

3.3 INSTRUMENTATION

3.3.4 Reactor Protective System (RPS) Logic and Trip Initiation

LCO 3.3.4 Four RPS LOGIC CHANNELS, four CHANNELS of Reactor Trip Circuit Breakers (RTCBs), and four manual TRIP CHANNELS shall be OPERABLE.

APPLICABILITY: MODES 1 and 2, MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>-----NOTE----- RTCBs associated with one inoperable CHANNEL may be closed for up to 1 hour for the performance of an RPS CHANNEL FUNCTIONAL TEST.</p>		
<p>A. One CHANNEL of RTCBs, one MANUAL TRIP CHANNEL, or ONE RPS LOGIC CHANNEL inoperable in MODE 1 or 2.</p>	<p>A.1 Open the affected RTCBs.</p>	<p>1 hour</p>

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>-----NOTE-----                      RTCBs associated with one inoperable CHANNEL may be closed for up to 1 hour for the performance of an RPS CHANNEL FUNCTIONAL TEST.</p> <hr/> <p>B. One CHANNEL of RTCBs, one MANUAL TRIP CHANNEL, or one RPS LOGIC CHANNEL inoperable in MODE 3, 4, or 5.</p>	<p>B.1 Open all RTCBs.</p>	<p>48 hours</p>
<p>C. Two CHANNELS of RTCBs, two MANUAL TRIP CHANNELS, or one RPS LOGIC CHANNEL affecting the same TRIP LEG inoperable.</p>	<p>C.1 Open the affected RTCBs.</p>	<p>Immediately</p>

(Continued)

Define TRIP LEG

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and Associated Completion Time of Condition A or C not met.  <u>OR</u>  One or more Functions with more than one RPS LOGIC CHANNEL, MANUAL TRIP CHANNEL, or RTCB CHANNEL inoperable for reasons other than Condition A or C.	D.1 Be in MODE 3.	6 hours
	<u>AND</u>  D.2 Open all RTCBs.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
*	SR 3.3.4.1 Perform a CHANNEL FUNCTIONAL TEST on each RPS LOGIC CHANNEL and RTCB CHANNEL.	[92] days
†	SR 3.3.4.2 Perform a CHANNEL FUNCTIONAL TEST, including separate verification of the undervoltage and shunt trips, on each RTCB.	[18] months
*	SR 3.3.4.3 Perform a TRIP TEST on each set of RPS MANUAL TRIP CHANNELS.	Once within 7 days prior to each reactor startup

3.3 INSTRUMENTATION

3.3.5 Engineered Safety Features Actuation System (ESFAS) Instrumentation

LCO 3.3.5 Four ESFAS TRIP CHANNELS and operating bypass CHANNELS for each Function in Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5-1.

ACTIONS

NOTES

1. Separate Condition entry is allowed for each ESFAS Function.
2. If a CHANNEL is placed in bypass, continued operation with the CHANNEL in the bypassed condition for the Completion Time specified by Required Action A.2 or C.2.2 shall be reviewed in accordance with Specification [5.5.1.2.e].

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one automatic ESFAS TRIP CHANNEL inoperable.	A.1 Place <sup>TRIP</sup> CHANNEL in bypass or trip.  <u>AND</u> A.2 Restore CHANNEL to OPERABLE status.	1 hour  Prior to entering MODE 2 following next MODE 5 entry.
B. One or more Functions with two automatic ESFAS TRIP CHANNELS inoperable.	<u>NOTE</u> LCO 3.0.4 is not applicable.  <sup>TRIP</sup> B.1 Place one CHANNEL in bypass and the other in trip.	1 hour

(Continued)



ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One or more Functions with one automatic operating bypass removal <del>CHANNEL</del> <i>function</i> inoperable.</p>	<p><i>Disable</i> C.1. <i>Verify</i> operating bypass is <i>not</i> in effect.</p> <p><u>OR</u></p> <p>C.2.1 Place affected <i>automatic</i> TRIP CHANNEL in bypass or trip.</p> <p><u>AND</u></p> <p>C.2.2 Restore operating bypass removal <i>function</i> <del>CHANNEL</del> and associated automatic TRIP CHANNEL to OPERABLE status.</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p> <p>1 hour</p> <p>Prior to entering MODE 2 following next MODE 5 entry.</p>
<p>D. One or more Functions with two automatic operating bypass removal <del>CHANNELS</del> <i>functions</i> inoperable.</p>	<p><u>NOTE</u> LCO 3.0.4 is not applicable.</p> <p><i>Disable</i> D.1 <i>Verify</i> operating bypasses are not in effect.</p> <p><u>OR</u></p> <p>D.2 Place one affected <i>automatic</i> TRIP CHANNEL in bypass and place the other in trip.</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p> <p>1 hour</p>

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. Required Action and associated Completion Time not met.</p>	<p style="text-align: center;"><del>NOTE</del></p> <p><del>Does not apply to Functions 1, 2, 3, and 4 of Table 3.3.5-1.</del>  <i>Applies only to Functions 5 &amp; 6 of Table 3.3.5-1</i></p> <p>E.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>E.2 Be in MODE 4.</p>	<p>6 hours</p> <p>[12] hours</p>
<p>F. Required Action and associated Completion Time not met.</p>	<p style="text-align: center;"><del>NOTE</del></p> <p><del>Does not apply to Functions 5 and 6 of Table 3.3.5-1.</del>  <i>Applies only to Functions 1, 2, 3 and 4</i></p> <p>F.1 Be in MODE 3</p> <p><u>AND</u></p> <p>F.2 Be in MODE 5</p>	<p>6 hours</p> <p>36 hours</p>

*Explain in Bases*

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.5.1 Perform <del>a</del> CHANNEL CHECK of each ESFAS CHANNEL.	12 hours
SR 3.3.5.2 Perform <del>a</del> CHANNEL FUNCTIONAL TEST of each ESFAS CHANNEL, including operating bypass removal functions:	92 days
SR 3.3.5.3 Perform <del>a</del> CHANNEL CALIBRATION of each ESFAS CHANNEL, including operating bypass removal functions.	[18] months
SR 3.3.5.4 Verify ESFAS RESPONSE TIME is within limits.	[18] months on a STAGGERED TEST BASIS
SR 3.3.5.5 Perform <del>a</del> CHANNEL FUNCTIONAL TEST on each automatic operating bypass removal CHANNEL. function	Once within 92 days prior to each reactor startup

Table 3.3.5-1

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	ALLOWABLE VALUE
1. Safety Injection Actuation Signal a. Containment Pressure - High b. Pressurizer Pressure - Low <sup>(a)</sup>	1,2,3,4 1,2,3,4	<del>                             ≤ [2.7] psig #                              Trip ≥ [1825 psia];                              Trip Operating Bypass Removal ≥ [500 psia]; step ≤ [400 psia]; Floor ≥ [300 psia]                         </del>
2. Containment Spray Actuation Signal a. Containment Pressure - High High	1,2,3,4	≤ [8.5 psig]
3. Containment Isolation Actuation Signal a. Containment Pressure - High b. Pressurizer Pressure - Low <sup>(a)</sup>	1,2,3,4 1,2,3,4	≤ [2.7] psig # Trip ≥ [1825 psia]; Trip Operating Bypass Removal ≥ [500 psia]; Step ≤ [400 psia]; Floor ≥ [300 psia]
4. Main Steam Isolation Signal a. Steam Generator Pressure - Low <sup>(b)</sup> b. Containment Pressure - High c. Steam Generator Level - High	1, 2 <sup>(c)</sup> , 3 <sup>(c)</sup> , 4 <sup>(c)</sup> 1, 2 <sup>(c)</sup> , 3 <sup>(c)</sup> , 4 <sup>(c)</sup> 1, 2 <sup>(c)</sup> , 3 <sup>(c)</sup> , 4 <sup>(c)</sup>	≥ [843 psia] ≤ [3.7] psig ≤ [90.8% NR]
5. Emergency Feedwater Actuation Signal SG #1 (EFAS-1) a. Steam Generator Level - Low b. Steam Generator Level - High	1,2,3 1,2,3	≥ [23.4% WR] ≤ [53.4% NR]
6. Emergency Feedwater Actuation Signal SG #2 (EFAS-2) a. Steam Generator Level - Low b. Steam Generator Level - High	1,2,3 1,2,3	≥ [23.4% WR] ≤ [53.4% NR]

- (a) The setpoint may be decreased to a minimum value of [300] psia, as pressurizer pressure is reduced, provided the margin between pressurizer pressure and the setpoint is maintained ≤ [400] psic. Trips may be bypassed when pressurizer pressure is < [400] psia. Bypass shall be automatically removed when pressurizer pressure is ≥ [500] psia. The setpoint shall be automatically increased to the normal setpoint as pressurizer pressure is increased.
- (b) The setpoint may be decreased as steam pressure is reduced, provided the margin between steam pressure and the setpoint is maintained ≤ [200] psig. The setpoint shall be automatically increased to the normal setpoint as steam pressure is increased.
- (c) The Main Steam Isolation Signal (MSIS) Function (Steam Generator Pressure - Low, Containment Pressure - High, and Steam Generator Level - High signals) is not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed and [deactivated].

See Table 3.3.11-1 (Pg 3.3-41)  
 Confirming by holding channel on table

3.3 INSTRUMENTATION

3.3.6 Engineered Safety Features Actuation System (ESFAS) Logic and Manual Initiation

LCO 3.3.6 Four ESFAS LOGIC CHANNELS, four ESFAS MANUAL INITIATION CHANNELS, two divisions of ACTUATION LOGIC and COMPONENT CONTROL LOGIC for CIAS and MSIS, four divisions of ACTUATION LOGIC and COMPONENT CONTROL LOGIC for SIAS, CSAS, EFAS-1, and EFAS-2, and one DIVERSE MANUAL ESF ACTUATION CHANNEL *shall be operable.*

*define or change to LCO*

*for diverse manual ESF actuation initiate to ESF components*

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 or more Functions with one LOGIC CHANNEL or MANUAL INITIATION CHANNEL inoperable.	A.1 Place the affected TRIP LEG in each division in trip.	1 hour
B. One DIVERSE MANUAL ESF ACTUATION CHANNEL inoperable.	B.1 Declare associated ESF Function inoperable.	1 hour
C. One or more Functions with two LOGIC CHANNELS or MANUAL INITIATION CHANNELS affecting the same TRIP LEG inoperable.	C.1 Place the affected TRIP LEG in each division in trip.	Immediately

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more Functions with one or more divisions of ACTUATION LOGIC or COMPONENT CONTROL LOGIC inoperable.	D.1 Declare the associated ESF Function inoperable.	Immediately
E. One or more Functions with two or more LOGIC CHANNELS or MANUAL INITIATION CHANNELS affecting both TRIP LEGS in the associated Function inoperable.	E.1 Declare the associated ESF Function inoperable.	Immediately
F. Required Action and associated Completion Time not met.	<p style="text-align: center;"><del>NOTE</del> Does not apply to Functions 1, 2, 3, 4, or 7 of Table 3.3.6-1.</p> <p>F.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>F.2 Be in MODE 4.</p>	<p>6 hours</p> <p>[12] hours</p>
G. Required Action and associated Completion Time not met.	<p style="text-align: center;"><del>NOTE</del> Does not apply to Functions 5 or 6 of Table 3.3.6-1.</p> <p>G.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>G.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.3.6.1</p> <p style="text-align: center;"><del>NOTE</del></p> <p style="text-align: center;"><i>CAPS</i></p> <p>Testing of <u>Actuation Logic</u> shall include the verification of the proper operation of each initiation circuit.</p> <hr/> <p>Perform <i>✓</i> CHANNEL FUNCTIONAL TEST on each ESFAS LOGIC CHANNEL and on each ESFAS division of ACTUATION LOGIC and COMPONENT CONTROL LOGIC.</p>	<p>[92] days</p>
<p>SR 3.3.6.2</p> <p>Perform <i>✓</i> selective group test on each division of ACTUATION LOGIC and COMPONENT CONTROL LOGIC to verify the OPERABILITY of each <u>selective group</u>.</p>	<p>[18] months</p>
<p>SR 3.3.6.3</p> <p>Perform <i>✓</i> CHANNEL FUNCTIONAL TEST on each ESFAS <u>MANUAL INITIATION CHANNEL</u> and on the DIVERSE MANUAL ESF ACTUATION CHANNEL.</p>	<p>[18] months</p>

TRIP LEG?

Table 3.3.6-1

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM LOGIC AND MANUAL TRIP

FUNCTION	APPLICABLE MODES
1. Safety Injection Actuation Signal (SIAS) a. LOGIC CHANNEL b. ACTUATION LOGIC c. COMPONENT CONTROL LOGIC d. MANUAL INITIATION CHANNEL	1,2,3,4 1,2,3,4 1,2,3,4 1,2,3,4
2. Containment Spray Actuation Signal (CSAS) a. LOGIC CHANNEL b. ACTUATION LOGIC c. COMPONENT CONTROL LOGIC d. MANUAL INITIATION CHANNEL	1,2,3,4 1,2,3,4 1,2,3,4 1,2,3,4
3. Containment Isolation Actuation Signal (CIAS) a. LOGIC CHANNEL b. ACTUATION LOGIC c. COMPONENT CONTROL LOGIC d. MANUAL INITIATION CHANNEL	1,2,3,4 1,2,3,4 1,2,3,4 1,2,3,4
4. Main Steam Isolation Signal (MSIS) a. LOGIC CHANNEL b. ACTUATION LOGIC c. COMPONENT CONTROL LOGIC d. MANUAL INITIATION CHANNEL	1,2,3,4 1,2,3,4 1,2,3,4 1,2,3,4
5. Emergency Feedwater Actuation Signal SG #1 (EFAS-1) a. LOGIC CHANNEL b. ACTUATION LOGIC c. COMPONENT CONTROL LOGIC d. MANUAL INITIATION CHANNEL	1,2,3 1,2,3 1,2,3 1,2,3
6. Emergency Feedwater Actuation Signal SG #2 (EFAS-2) a. LOGIC CHANNEL b. ACTUATION LOGIC c. COMPONENT CONTROL LOGIC d. MANUAL INITIATION CHANNEL	1,2,3 1,2,3 1,2,3 1,2,3
7. Diverse Manual ESF Actuation Interface to ESF Components. a. DIVERSE MANUAL ESF ACTUATION CHANNEL	1,2,3,4

De Time  
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 A



3.3 INSTRUMENTATION

3.3.7 Diesel Generator (DG) - Loss of Voltage Start (LOVS)

LCO 3.3.7 Three CHANNELS of Loss of Voltage Function and three CHANNELS of Degraded Voltage Function auto-initiation instrumentation per DG shall be OPERABLE.

APPLICABILITY: <sup>separate line ↙</sup> MODES 1, and 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
	NOTE LCO 3.0.4 is not applicable.	
A. One or more Functions with one CHANNEL inoperable.	A.1 Place CHANNEL in trip.	1 hour
B. One or more Functions with two CHANNELS inoperable.	B.1 <del>Place one CHANNEL in trip</del> <i>Enter all but one CHANNEL to AND OPERABLE status</i>	<del>Immediately</del> 1 hour
	B.2 Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation.	1 hour
C. Required Action and associated Completion Time of Condition A not met.	C.1 Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation.	Immediately

STS 3.3.5 (D 3.3-44)



*or more*

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
[SR 3.3.7.1] Perform CHANNEL CHECK.	12 hours]
SR 3.3.7.2 Perform CHANNEL FUNCTIONAL TEST.	[92] days
SR 3.3.7.3 Perform CHANNEL CALIBRATION with setpoint Allowable Values as follows: <ul style="list-style-type: none"> <li>a. Degraded Voltage Function <math>\geq</math> [*] V and <math>\leq</math> [*] V                Time delay: <math>\geq</math> [*] seconds and <math>\leq</math> [*] seconds at                [*] V; and</li> <li>b. Loss of Voltage Function <math>\geq</math> [*] V and <math>\leq</math> [*] V                Time delay: <math>\geq</math> [*] seconds and <math>\leq</math> [*] seconds at                [*] V.</li> </ul>	[18] months

\* Value to be determined by system detail design.

3.3 INSTRUMENTATION

3.3.8 Alternate Protection System (APS)

*X* LCO 3.3.8 Two alternate protection System CHANNELS for each function in Table 3.3.8-1 shall be OPERABLE.

*X* APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<i>X</i> A. One or more CHANNELS inoperable.	A.1 Place CHANNEL in bypass.	1 hour
	AND A.2 Restore all CHANNELS to OPERABLE status.	[31 days] <i>72 hours consistent with BURs</i>
<i>X</i> B. Required Action and associated completion time of Condition A not met.	B.1 Be in MODE 3.	6 hours

*No Bypass*

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<i>X</i> SR 3.3.8.1 Perform CHANNEL CHECK on each APS instrument CHANNEL.	12 hours
<i>X</i> SR 3.3.8.2 Perform CHANNEL FUNCTIONAL TEST on each CHANNEL.	92 days
<i>X</i> SR 3.3.8.3 Perform CHANNEL CALIBRATION on each CHANNEL.	[18] months

TABLE 3.3.8-1

ALTERNATE PROJECTION SYSTEM

CDS

Function	Applicable Modes	Allowable Value
1. Pressurizer Pressure - Reactor Trip	1,2	$\geq$ [2420 psia]
2. Steam Generator 1 Level - AFAS	1,2	$\leq$ [23.4]%
3. Steam Generator 2 Level - AFAS	1,2	$\leq$ [23.4]%
4. CEDMCS Bus Under Voltage - Turbine Trip	1,2	$\leq$ [*]

\* Value to be determined by system detail design.

3.3 INSTRUMENTATION

3.3.9 Control Room Intake/Filtration Signal (CRIFS)

LCO 3.3.9 Two CRIFS divisions shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6 during CORE ALTERATIONS; during movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. <del>One</del> CRIFS division inoperable in MODE 1, 2, 3, or 4.	A.1 Close bypass dampers on control room filtration units and start filtration units.  <u>AND</u> A.2 Restore division to OPERABLE status	1 hour   7 days
B. <del>Two</del> CRIFS divisions inoperable in MODE 1, 2, 3, 4 or Required Action and assorted Completion Time of Condition A not met.	B.1 Close bypass dampers on control room filtration units and start the filtration units.  <u>AND</u> B.2 Be in MODE 3  <u>AND</u> B.2 Be in MODE 5	1 hour   6 hours   36 hours
C. <del>One</del> CRIFS division inoperable in MODE 5 or 6 during CORE ALTERATIONS or during movement of irradiated fuel assemblies.	C.1 Close bypass dampers on the control room filtration units and start filtration units.  <u>AND</u> C.2 Restore division to OPERABLE status	1 hour   7 days

(Continued)

More in the CHAS 1.0.0 INOPERABLE in → to page 33-35

ER

SURVEILLANCE REQUIREMENTS (Continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.9.3</p> <p style="text-align: center;"><u>NOTES</u></p> <ol style="list-style-type: none"> <li>1. Surveillance of ACTUATION LOGIC shall include the verification of the proper operation of each subgroup.</li> <li>2. Subgroups associated with plant equipment that cannot be operated during plant operation are required to be tested during each MODE 5 entry exceeding 24 hours unless tested within the previous 6 months.</li> </ol> <hr/> <p>Perform a selective group test on each CRIFS OUTPUT DIVISION which includes ACTUATION LOGIC to verify the OPERABILITY of each selective group.</p>	<p style="text-align: center;"><i>not defined</i></p> <p>[18] months</p>
<p>SR 3.3.9.4</p> <p>Perform CHANNEL CALIBRATION on required CRIFS radiation monitor CHANNELS.</p>	<p>[18] months</p>

*CRIFS CHANNEL not defined in Basis*

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. ✓ Two CRIFS divisions inoperable in MODE 5 or 6, during CORE ALTERATIONS or during movement of irradiated fuel assemblies.	D.1 Close bypass dampers on control room filtration units and start the filtration units.	Immediately
	<u>OR</u>	
	D.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	D.3 Suspend positive reactivity additions.	Immediately
	<u>AND</u>	
	D.4 Suspend CORE ALTERATIONS.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
✗	SR 3.3.9.1 Perform a CHANNEL CHECK on each control room radiation monitor CHANNEL.	12 hours
✓	SR 3.3.9.2 Perform a CHANNEL FUNCTIONAL TEST on each CRIFS LOGIC CHANNEL.  Verify CRIFS high radiation setpoint [Allowable Value] is ≤ [ ] cpm above normal background	[92] days

(Continued)

*SGTR*

3.3 INSTRUMENTATION

3.3.10 Containment Bypass Instrumentation (Steam Generator Tube Rupture) (SGTR)

LCO 3.3.10 The Containment Bypass Instrumentation (SGTR) in Table 3.3.10-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.10-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. 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 or two Functions with two required CHANNELS inoperable.	B.1 Be in MODE 3	6 hours
	<b>AND</b> B.2 Be in MODE 5	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.10.1 Perform a CHANNEL CHECK on each instrument CHANNEL	12 hours
SR 3.3.10.2 Perform a CHANNEL FUNCTIONAL TEST on each instrument CHANNEL.	92 days
SR 3.3.10.3 Perform a CHANNEL CALIBRATION on each instrument CHANNEL.	[18] months



SGTR

TABLE 3.3.10-1

SGTR

CONTAINMENT BYPASS INSTRUMENTATION (STEAM GENERATOR TUBE RUPTURE)

FUNCTION	APPLICABLE MODE OR OTHER SPECIFIED CONDITION	REQUIRED NUMBER OF CHANNELS
1. SG 1 Tube Rupture Identification a. SG1 Blowdown/Steam Line Radiation Monitors b. Main Steam Line 1 N-16 Monitor	1,2,3,4  1 (a)	1  1
2. SG 2 Tube Rupture Identification a. SG2 Blowdown/Steam Line Radiation Monitors b. Main Steam Line 2 N-16 Monitor	1,2,3,4  1 (a)	1  1

→  
[(a) When  $\geq 25\%$  RTP]

3.3 INSTRUMENTATION

3.3.11 Post Accident Monitoring Instrumentation (PAMI)

MEASUREMENT CHANNEL

LCO 3.3.11 The PAMI for each Function in Table 3.3.11-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

NOTES

1. LCO 3.0.4 not applicable.
2. Separate Condition Entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
* A. One or more Functions with one required CHANNEL inoperable. MEASUREMENT	A.1 Restore <sup>MEASUREMENT</sup> 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 5.9.2.c.	Immediately
* C. One or more Functions with two required CHANNELS inoperable. MEASUREMENT	C.1 Restore <sup>MEASUREMENT</sup> 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 3.3.11-1 for the CHANNEL. MEASUREMENT	Immediately

(Continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action D.1 and referenced in Table 3.3.11-1.	E.1 Be in MODE 3.	6 hours
	<u>AND</u> E.2 Be in MODE 4.	12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.11-1.	F.1 Initiate action in accordance with Specification 5.9.2.C.	Immediately

SURVEILLANCE REQUIREMENTS

NOTE

These SRs apply to each PAMI Function in Table 3.3.11-1.

SURVEILLANCE	FREQUENCY
SR 3.3.11.1 Perform CHANNEL CHECK for each required instrumentation CHANNEL that is normally energized. <i>MEASUREMENT</i>	31 days
SR 3.3.11.2 Perform CHANNEL CALIBRATION.	[18] months

Table 3.3.11-1

POST ACCIDENT MONITORING INSTRUMENTATION

FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION E.1
1. Neutron Flux Power Level	2	E
2. Reactor Coolant Outlet Temperature (T-Hot) Wide Range (WR)	2 per loop	E
3. Reactor Coolant Inlet Temperature (T-Cold) WR	2 per loop	E
4. Reactor Coolant System Pressure (WR)	2	E
5. Reactor Vessel Coolant Level	2	[F]
6. Reactor Cavity Level	2	E
7. Containment Pressure (WR) (NR)	2 [2]	E [E]
8. Containment Isolation Valve Position	1 per valve <sup>(a)</sup>	E
9. Containment Area Radiation	2	[F]
10. Containment Hydrogen Concentration	2	E
11. Pressurizer Water Level	2	E
12. Steam Generator (SG) Water Level (WR)	2 per steam generator	E
13. Emergency Feedwater Storage Tank Level	2 Per tank	E
14. Core Exit Temperature - Quadrant [1]	[2 <sup>(b)</sup> ]	E
15. Core Exit Temperature - Quadrant [2]	[2 <sup>(b)</sup> ]	E
16. Core Exit Temperature - Quadrant [3]	[2 <sup>(b)</sup> ]	E
17. Core Exit Temperature - Quadrant [4]	[2 <sup>(b)</sup> ]	E
18. Steam Generator Pressure	2	E
19. Degree of Subcooling	2 <sup>(c)</sup>	E
20. Primary Coolant (T-Hot) Radiation Level	2	E

(a) Not required for isolation valves whose associated penetration is isolated by at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

(b) <sup>MEASUREMENT</sup> A CHANNEL consists of two or more core exit thermocouples. *? radial enthalpy distribution?*

(c) <sup>MEASUREMENT</sup> A CHANNEL consists of one or more Core Exit Temperature, Reactor Coolant Inlet Temperature (T-Cold) Wide Range, Reactor Coolant Outlet Temperature (T-Hot) wide range, and Pressurizer Pressure (High Range, Mid Range, and Low Range).

3.3 INSTRUMENTATION

3.3.12 Remote Shutdown Instrumentation and Controls

LCO 3.3.12 The Remote Shutdown Instrumentation and Control Functions in Table 3.3.12-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

NOTE

1. LCO 3.0.4 is not applicable.

Clarity use of "Division" vs "CHANNEL"

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One division with one or more Required Functions inoperable.	A.1 Restore required division to OPERABLE status.	92 days
B. Two divisions with one or more required Functions inoperable.	B.1 Restore one division to OPERABLE status.	31 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Be in MODE 4.	[12] hours

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3.3.12

TABLE 3.3.12-1

(Sheet 1 of 4)

REMOTE SHUTDOWN INSTRUMENTATION AND CONTROLS

FUNCTION (INSTRUMENT OR CONTROL PARAMETER)	REQUIRED NUMBER OF DIVISIONS
<u>Instrumentation and Controls for Hot Standby (MODE 3)</u>	
<u>NSSS Instrumentation</u>	
1. Neutron Logarithmic Power	2
2. Hot Leg Temperature	1 per loop
3. Cold Leg Temperature	1 per loop
4. Pressurizer Pressure	<del>2</del> 2
5. Pressurizer Level	2
6. Pressurizer RCGV Position	1 per valve
7. Steam Generator (SG) No. 1 Pressure	2
8. Steam Generator No. 1 Level	2
9. Steam Generator No. 2 Pressure	2
10. Steam Generator No. 2 Level	2
11. CVCS Charging Flow	1
12. CVCS Charging Pressure	1
13. Boric Acid Storage Tank Level	1
14. In-Containment Refueling Water Storage Tank (IRWST) Level	2
15. SIS Pump Discharge Flow	2 <sup>(a)</sup>
16. SIS Pump Discharge Header Pressure	2 <sup>(a)</sup>
17. EFW Pump Discharge Pressure (SG No. 1)	2 <sup>(b)</sup>
18. EFW Pump Discharge Pressure (SG No. 2)	2 <sup>(b)</sup>
19. EFW Pump Suction Pressure and Low Pressure Alarm (SG No. 1)	2 <sup>(b)</sup>

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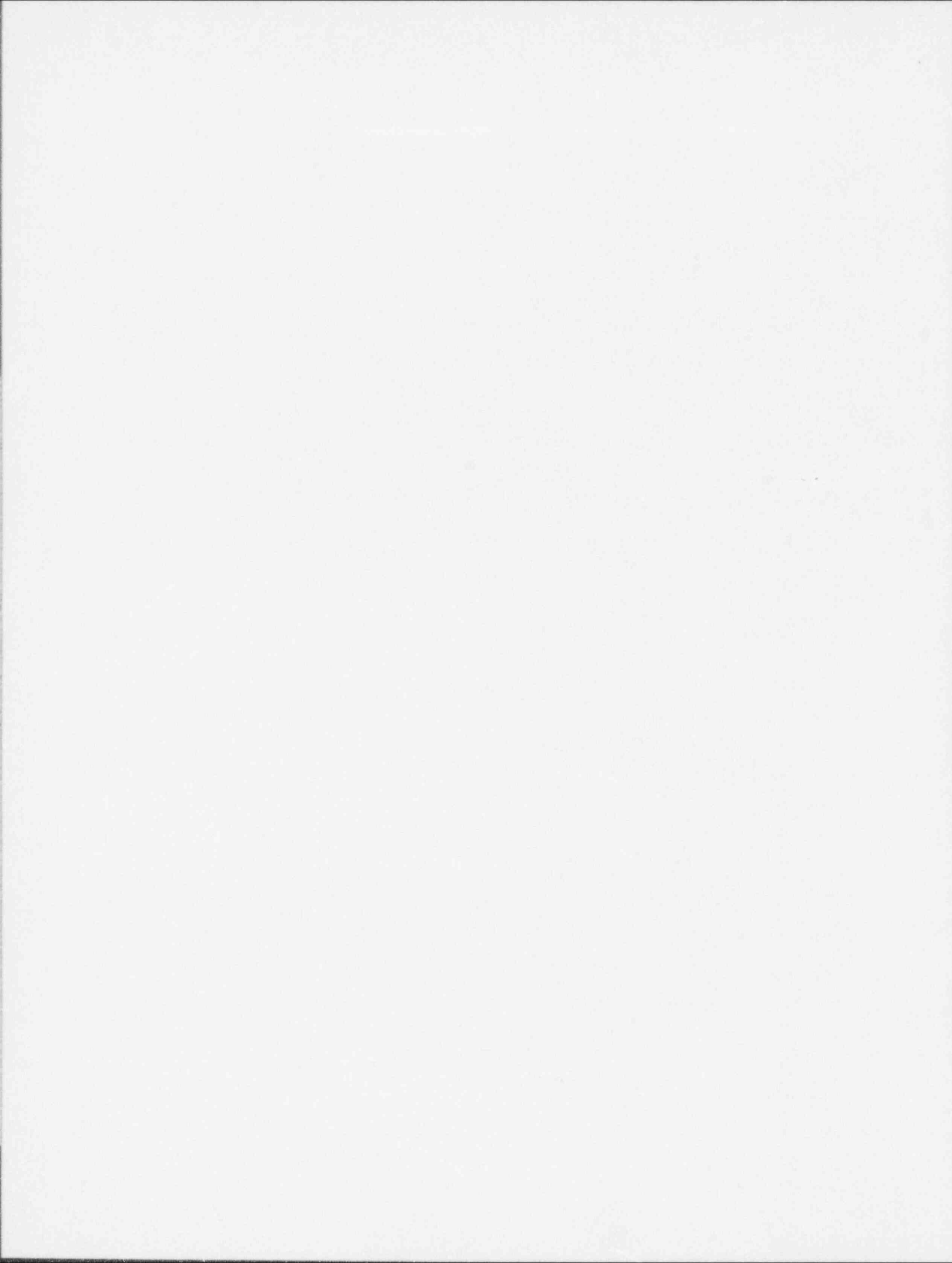
TABLE 3.3.12-1 (Continued)

(Sheet 3 of 4)

REMOTE SHUTDOWN INSTRUMENTATION AND CONTROLS

FUNCTION (INSTRUMENT OR CONTROL PARAMETER)	REQUIRED NUMBER OF DIVISIONS
<u>Instrumentation and Controls for Hot Standby (MODE 3)</u>	
<u>NSSS Instrumentation (Cont'd)</u>	
33. Atmospheric Steam Dump Valve and ADV Block Valve <sup>CONTROLS</sup> (SG No. 2)	2
34. Pressurizer Auxiliary Spray Valve Controls	1
35. Pressurizer Reactor Gas Vent (RCGV) Valve Controls	1 per valve
36. Charging Pump Controls	1
37. Letdown Isolation Valve Controls	1 per valve
38. Reactor Coolant Pump Seal Bleedoff Valve Controls	1 per valve
39. SIS Pump Controls	2 <sup>(a)</sup>
40. SIS Header Valve Controls	2 <sup>(a)</sup>
41. Manual Reactor Trip Switches	1 <sup>(d)</sup>
42. MSIS Actuation Switches	1
43. EFW Pump Controls (SG No. 1)	2 <sup>(b)</sup>
44. EFW Pump Controls (SG No. 2)	2 <sup>(b)</sup>
45. EFW Isolation Valves (SG No. 1)	2 <sup>(b)</sup>
46. EFW Isolation Valves (SG No. 2)	2 <sup>(b)</sup>
47. EFW Flow Control Valves (SG No. 1)	2 <sup>(b)</sup>





SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.12.1 Perform CHANNEL CHECK for each required instrumentation CHANNEL that is normally energized.	31 days
SR 3.3.12.2 Verify each required indicator, control circuit, and transfer switch is capable of performing the intended function.	[18] months
SR 3.3.12.3 <u>NOTE</u> Neutron detectors are excluded from the CHANNEL CALIBRATION.  Perform CHANNEL CALIBRATION for each required MEASUREMENT CHANNEL.	[18] months

TABLE 3.3.12-1

(Sheet 1 of 3)

**REMOTE SHUTDOWN INSTRUMENTATION AND CONTROLS**

FUNCTION (INSTRUMENT OR CONTROL PARAMETER)	REQUIRED NUMBER OF DIVISIONS
<u>Instrumentation and Controls for Hot Standby (MODE 3)</u>	
<u>NSSS Instrumentation</u>	
1. Neutron Logarithmic Power	2
2. Hot Leg Temperature	1 per loop
3. Cold Leg Temperature	1 per loop
4. Pressurizer Pressure	2
5. Pressurizer Level	2
6. Pressurizer RCGV Position	1 per valve
7. Steam Generator (SG) No. 1 Pressure	2
8. Steam Generator No. 1 Level	2
9. Steam Generator No. 2 Pressure	2
10. Steam Generator No. 2 Level	2
11. In-Containment Refueling Water Storage Tank (IRWST) Level	2
12. SIS Pump Discharge Flow	2 <sup>(a)</sup>
13. SIS Pump Discharge Header Pressure	2 <sup>(a)</sup>
14. EFW Pump Discharge Pressure (SG No. 1)	2 <sup>(b)</sup>
15. EFW Pump Discharge Pressure (SG No. 2)	2 <sup>(b)</sup>
16. EFW Pump Suction Pressure and Low Pressure Alarm (SG No. 1)	2 <sup>(b)</sup>
17. EFW Pump Suction Pressure and Low Pressure Alarm (SG No. 2)	2 <sup>(b)</sup>
18. EFW Steam Motive Power Instrumentation (SG No. 1)	1 <sup>(b)(c)</sup>
19. EFW Steam Motive Power Instrumentation (SG No. 2)	1 <sup>(b)(c)</sup>
20. EFW Pump Flow (SG No. 1)	2 <sup>(b)</sup>
21. EFW Pump Flow (SG No. 2)	2 <sup>(b)</sup>
22. EFW Pump Recirculation Flow (SG No. 1)	2 <sup>(b)</sup>

(Continued)

TABLE 3.3.12-1  
(Sheet 2 of 3)

REMOTE SHUTDOWN INSTRUMENTATION AND CONTROLS

FUNCTION (INSTRUMENT OR CONTROL PARAMETER)	REQUIRED NUMBER OF DIVISIONS
<u>Instrumentation and Controls for Hot Standby (MODE 3)</u>	
<u>NSSS Instrumentation (Cont'd)</u>	
23. EFW Pump Recirculation Flow (SG No. 2)	2 <sup>(b)</sup>
24. EFW Storage Tank Level and Low Alarm	1 per tank
<u>BOP Instrumentation</u>	
25. Ultimate Heat Sink Status Indication	1
26. Emergency Diesel Generator (DG) Status Indication	1 per DG
<u>NSSS Controls</u>	
27. Reactor Coolant Pump (RCP) Trip Pushbutton	1 per RCP
28. Backup Heater Control	1
29. Atmospheric Steam Dump Valve (ADV) and ADV Block Valve Controls (SG No. 1)	2
30. Atmospheric Steam Dump Valve and ADV Block Valve Controls (SG No. 2)	2
31. Pressurizer Reactor Gas Vent (RCGV) Valve Controls	1 per valve
32. Reactor Coolant Pump Seal Bleedoff Valve Controls	1 per valve
33. SIS Pump Controls	2 <sup>(a)</sup>
34. SIS Header Valve Controls	2 <sup>(a)</sup>
35. Manual Reactor Trip Switches	1 <sup>(d)</sup>
36. MSIS Actuation Switches	1
37. EFW Pump Controls (SG No. 1)	2 <sup>(b)</sup>
38. EFW Pump Controls (SG No. 2)	2 <sup>(b)</sup>
39. EFW Isolation Valves (SG No. 1)	2 <sup>(b)</sup>
40. EFW Isolation Valves (SG No. 2)	2 <sup>(b)</sup>

(Continued)

TABLE 3.3.12-1

(Sheet 3 of 3)

REMOTE SHUTDOWN INSTRUMENTATION AND CONTROLS

FUNCTION (INSTRUMENT OR CONTROL PARAMETER)	REQUIRED NUMBER OF DIVISIONS
<u>Instrumentation and Controls for Hot Standby (MODE 3)</u>	
<u>NSSS Instrumentation (Cont'd)</u>	
41. EFW Flow Control Valves (SG No. 1)	2 <sup>(b)</sup>
42. EFW Flow Control Valves (SG No. 2)	2 <sup>(b)</sup>
43. EFW Steam Motive Power Controls (SG No. 1)	1 <sup>(b)(e)</sup>
44. EFW Steam Motive Power Controls (SG No. 2)	1 <sup>(b)(e)</sup>
<u>BOP Controls</u>	
45. Ultimate Heat Sink Controls	1

- (a) SIS Train No. 3 for Division I, SIS Train No. 4 for Division II
- (b) Steam Driven Pump Instrumentation and Controls for Division I, Motor Driven Pump Instrumentation and Controls for Division II
- (c) Includes Steam-Driven Pump Turbine Inlet Pressure, Steam-Driven Pump Turbine Speed, Turbine Trip and Throttle (Stop) Valves Open/Close Position and Close Position Alarm, to Division I Steam Motive Power, No Instrumentation for Division II Motive Power.
- (d) A division consists of two Manual Reactor Trip Switches in opposite TRIP LEGS to meet the selective two-out-of-four logic for a reactor trip.
- (e) Includes EFW Steam Supply Bypass Valves, EFW Steam Supply Isolation Valves, EFW Turbine Trip and Throttle (Stop) Valves Trip/Reset Control, and EFW Turbine Speed Control for Division I, No Steam Motive Power Controls for Division II.
- (f) SCS Train No. 1 for Division I, SCS Train No. 2 for Division II

3.3 INSTRUMENTATION

3.3.13 Logarithmic Power Monitoring CHANNELS

LCO 3.3.13 Two CHANNELS of logarithmic power level monitoring instrumentation shall be OPERABLE.

APPLICABILITY: MODES 3, 4, and 5 with the reactor trip circuit breakers open or Control Element Assembly (CEA) Drive System not capable of CEA withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required CHANNEL(S) inoperable.	A.1 Suspend all operations involving positive reactivity additions.	Immediately
	<p><u>AND</u></p> A.2 Perform SDM verification in accordance with SR 3.1.1.1, if $T_{avg} > 200^{\circ}\text{F}$ . or SR 3.1.2.1, if $T_{avg} \leq 200^{\circ}\text{F}$ .	4 hours  <u>AND</u> Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.13.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.13.2	Perform CHANNEL FUNCTIONAL TEST.	[92] days
SR 3.3.13.3	<p style="text-align: center;">NOTE</p> Neutron detectors are excluded from CHANNEL CALIBRATION. Perform CHANNEL CALIBRATION.	[18] months

Revisions Tech Spec

Containment (Atmospheric and Dual)  
3.6.1

Reviewed by ECFB

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.6.1.1 Perform required visual examinations and leakage rate testing except for containment air lock testing, in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions.</p> <p>The maximum allowable leakage rate, <math>L_a</math>, is [ ]% of containment air weight per day at the calculated peak containment pressure, <math>P_a</math>.</p>	<p>-----NOTE----- SR 3.0.2 is not applicable -----</p> <p>In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions</p>
<p>SR 3.6.1.2 Verify containment structural integrity in accordance with the Containment Tendon Surveillance Program.</p>	<p>In accordance with the Containment Tendon Surveillance Program</p>

*Handwritten note:* verify SR 3.6.1.2

*Provide requirements to verify structural integrity of steel containment, particularly in the anchorage area at the base of the steel containment.*