

3.2 POWER DISTRIBUTION LIMITS

3.2.4 Departure From Nucleate Boiling Ratio (DNBR)

- LC0 3.2.4 The DNBR shall be maintained by one of the following methods:
- a. Maintaining Core Operating Limit Supervisory System (COLSS) calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and either one or both Control Element Assembly Calculators (CEACs) are OPERABLE);
  - b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the allowance specified in the COLR (when COLSS is in service and neither CEAC is OPERABLE);
  - c. Operating within the region of acceptable operation specified in the COLR using any OPERABLE Core Protection Calculator (CPC) channel (when COLSS is out of service and either one or both CEACs are OPERABLE); or
  - d. Operating within the region of acceptable operation specified in the COLR using any OPERABLE CPC channel (when COLSS is out of service and neither CEAC is OPERABLE).

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP. (Before CPC Upgrade)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. COLSS calculated core power not within limit.	A.1 Restore the DNBR to within limit.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. DNBR outside the region of acceptable operation when COLSS is out of service.	B.1 Determine trend in DNBR.	Once per 15 minutes
	<u>AND</u> B.2.1 With an adverse trend, restore DNBR to within limit.	1 hour
	<u>OR</u> B.2.2 With no adverse trend, restore DNBR to within limit.	4 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to $\leq$ 20% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.4.1 -----NOTE----- 1. Only applicable when COLSS is out of service. With COLSS in service, this parameter is continuously monitored.  2. Not required to be performed until 2 hours after MODE 1 with THERMAL POWER > 20% RTP. ----- Verify DNBR, as indicated on any OPERABLE DNBR channels, is within the limit of the COLR, as applicable.	2 hours
SR 3.2.4.2 Verify COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR.	31 days

3.2 POWER DISTRIBUTION LIMITS

3.2.4 Departure From Nucleate Boiling Ratio (DNBR)

LCO 3.2.4 The DNBR shall be maintained by one of the following methods:

- a. Core Operating Limit Supervisory System (COLSS) In Service:
  - 1. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR when at least one Control Element Assembly Calculator (CEAC) is OPERABLE in each OPERABLE Core Protection Calculator (CPC) channel; or
  - 2. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the allowance specified in the COLR when the CEAC requirements of LCO 3.2.4.a.1 are not met.
- b. COLSS Out of Service:
  - 1. Operating within the region of acceptable operation specified in the COLR using any OPERABLE Core Protection Calculator (CPC) channel when at least one Control Element Assembly Calculator (CEAC) is OPERABLE in each OPERABLE CPC channel; or
  - 2. Operating within the region of acceptable operation specified in the COLR using any OPERABLE CPC channel (with both CEACs inoperable) when the CEAC requirements of LCO 3.2.4.b.1 are not met.

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP. (After CPC Upgrade)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. COLSS calculated core power not within limit.	A.1 Restore the DNBR to within limit.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. DNBR outside the region of acceptable operation when COLSS is out of service.	B.1 Determine trend in DNBR.	Once per 15 minutes
	<u>AND</u> B.2.1 With an adverse trend, restore DNBR to within limit.	1 hour
	<u>OR</u> B.2.2 With no adverse trend, restore DNBR to within limit.	4 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to $\leq 20\%$ RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.4.1 -----NOTE----- 1. Only applicable when COLSS is out of service. With COLSS in service, this parameter is continuously monitored.  2. Not required to be performed until 2 hours after MODE 1 with THERMAL POWER > 20% RTP. ----- Verify DNBR, as indicated on any OPERABLE DNBR channels, is within the limit of the COLR, as applicable.	2 hours
SR 3.2.4.2 Verify COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR.	31 days

3.3 INSTRUMENTATION

3.3.1 Reactor Protective System (RPS) Instrumentation – Operating

LCO 3.3.1 Four RPS trip and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1. (Before CPC Upgrade)

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one automatic RPS trip channel inoperable.	A.1 Place 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 RPS trip channels inoperable.	B.1 -----NOTE----- LCO 3.0.4 is not applicable. ----- 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 bypass removal channel inoperable.</p>	<p>C.1 Disable bypass channel.</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 bypass removal channel 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</p>
<p>D. One or more Functions with two automatic bypass removal channels inoperable.</p>	<p>-----NOTE----- LCO 3.0.4 is not applicable. -----</p> <p>D.1 Disable bypass channels.</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. One or more core protection calculator (CPC) channels with a cabinet high temperature alarm.</p>	<p>E.1 Perform CHANNEL FUNCTIONAL TEST on affected CPC.</p>	<p>12 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One or more CPC channels with three or more autorestarts during a 12 hour period.	F.1 Perform CHANNEL FUNCTIONAL TEST on affected CPC.	24 hours
G. Required Action and associated Completion Time not met.	G.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

-----NOTE-----  
 Refer to Table 3.3.1-1 to determine which SR shall be performed for each RPS Function.  
 -----

SURVEILLANCE	FREQUENCY
SR 3.3.1.1 Perform a CHANNEL CHECK of each RPS instrument channel.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.2 -----NOTE-----                      Not required to be performed until 12 hours                      after THERMAL POWER <math>\geq</math> 70% RTP.                      -----</p> <p>Verify total Reactor Coolant System (RCS)                      flow rate as indicated by each CPC is less                      than or equal to the RCS total flow rate.</p> <p>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.</p>	<p>12 hours</p>
<p>SR 3.3.1.3 Check the CPC autorestart count.</p>	<p>12 hours</p>

(continued)



SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.4 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 20% RTP.</li> <li>2. 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> <p>-----</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> power and CPC nuclear power calculations agree with the calorimetric, if the absolute difference is <math>\geq</math> 2% when THERMAL POWER is <math>\geq</math> 80% RTP. Between 20% and 80% RTP the maximum difference is -0.5% to 10%.</p>	<p>24 hours</p>
<p>SR 3.3.1.5 -----NOTE-----</p> <p>Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 70% RTP.</p> <p>-----</p> <p>Verify total RCS flow rate indicated by each CPC is less than or equal to the RCS flow determined either using the reactor coolant pump differential pressure instrumentation and the ultrasonic flow meter adjusted pump curves or by calorimetric calculations.</p>	<p>31 days</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.6 -----NOTE----- Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 15% RTP. -----</p> <p>Verify linear power subchannel gains of the excore detectors are consistent with the values used to establish the shape annealing matrix elements in the CPCs.</p>	31 days
<p>SR 3.3.1.7 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. The CPC CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC.</li> <li>2. Not required to be performed for logarithmic power level channels until 2 hours after reducing logarithmic power below 1E-4% NRTP.</li> </ol> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST on each channel.</p>	92 days
<p>SR 3.3.1.8 -----NOTE----- Neutron detectors are excluded from the CHANNEL CALIBRATION. -----</p> <p>Perform CHANNEL CALIBRATION of the power range neutron flux channels.</p>	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.9 -----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. -----</p> <p>Perform CHANNEL CALIBRATION on each channel, including bypass removal functions.</p>	<p>18 months</p>
<p>SR 3.3.1.10 Perform a CHANNEL FUNCTIONAL TEST on each CPC channel.</p>	<p>18 months</p>
<p>SR 3.3.1.11 Using the incore detectors, verify 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 3.3.1.12 Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.</p>	<p>Once within 92 days prior to each reactor startup</p>
<p>SR 3.3.1.13 -----NOTE----- Neutron detectors are excluded. -----</p> <p>Verify RPS RESPONSE TIME is within limits.</p>	<p>18 months on a STAGGERED TEST BASIS</p>

RPS Instrumentation - Operating (Before CPC Upgrade)  
3.3.1

Table 3.3.1-1 (page 1 of 3)  
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Variable Over Power	1.2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.8 SR 3.3.1.9 SR 3.3.1.13	Ceiling $\leq$ 111.0% RTP Band $\leq$ 9.9% RTP Incr. Rate $\leq$ 11.0%/min RTP Decr. Rate $>$ 5%/sec RTP
2. Logarithmic Power Level - High(a)	2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.12 SR 3.3.1.13	$\leq$ 0.011% NRTP
3. Pressurizer Pressure - High	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	$\leq$ 2388 psia
4. Pressurizer Pressure - Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.12 SR 3.3.1.13	$\geq$ 1821 psia
5. Containment Pressure - High	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	$\leq$ 3.2 psig
6. Steam Generator #1 Pressure - Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Units 1 and 3: $\geq$ 890 psia Unit 2: $\geq$ 955 psia
7. Steam Generator #2 Pressure - Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Units 1 and 3: $\geq$ 890 psia Unit 2: $\geq$ 955 psia

(continued)

(a) Trip may be bypassed when logarithmic power is  $>$  1E-4% NRTP. Bypass shall be automatically removed when logarithmic power is  $\leq$  1E-4% NRTP.

PALO VERDE UNITS 1 AND 3  
PALO VERDE UNIT 2

3.3.1-8

AMENDMENT NO. ~~119~~,150  
AMENDMENT NO. ~~149~~,150

RPS Instrumentation – Operating (Before CPC Upgrade)  
3.3.1

Table 3.3.1-1 (page 2 of 3)  
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8. Steam Generator #1 Level – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 43.7%
9. Steam Generator #2 Level – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 43.7%
10. Steam Generator #1 Level – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 91.5%
11. Steam Generator #2 Level – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 91.5%
12. Reactor Coolant Flow, Steam Generator #1-Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Ramp: ≤ 0.115 psid/sec. Floor: ≥ 12.49 psid Step: ≤ 17.2 psid
13. Reactor Coolant Flow, Steam Generator #2-Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Ramp: ≤ 0.115 psid/sec. Floor: ≥ 12.49 psid Step: ≤ 17.2 psid

(continued)

RPS Instrumentation - Operating (Before CPC Upgrade)  
3.3.1

Table 3.3.1-1 (page 3 of 3)  
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
14. Local Power Density - High(b)	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 3.3.1.7 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	≤ 21.0 kW/ft
15. Departure From Nucleate Boiling Ratio (DNBR) - Low(b)	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 3.3.1.7 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	≥ 1.3 (through operating cycle 10)  ≥ 1.34 (operating cycle 11 and later)

(b) Trip may be bypassed when logarithmic power is < 1E-4% NRTP. Bypass shall be automatically removed when logarithmic power is ≥ 1E-4% NRTP.

3.3 INSTRUMENTATION

3.3.1 Reactor Protective System (RPS) Instrumentation – Operating

LCO 3.3.1 Four RPS trip and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1. (After CPC Upgrade)

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one automatic RPS trip channel inoperable.	A.1 Place 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 RPS trip channels inoperable.	B.1 -----NOTE----- LCO 3.0.4 is not applicable. -----  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 bypass removal channel inoperable.</p>	<p>C.1 Disable bypass channel. <u>OR</u> C.2.1 Place affected automatic trip channel in bypass or trip.  <u>AND</u> C.2.2 Restore bypass removal channel and associated automatic trip channel to OPERABLE status.</p>	<p>1 hour  1 hour  Prior to entering MODE 2 following next MODE 5 entry</p>
<p>D. One or more Functions with two automatic bypass removal channels inoperable.</p>	<p>-----NOTE----- LCO 3.0.4 is not applicable. ----- D.1 Disable bypass channels. <u>OR</u> D.2 Place one affected automatic trip channel in bypass and place the other in trip.</p>	<p>1 hour  1 hour</p>
<p>E. Required Action and associated Completion Time not met.</p>	<p>E.1 Be in MODE 3</p>	<p>6 hours</p>

(continued)



SURVEILLANCE REQUIREMENTS

-----NOTE-----  
Refer to Table 3.3.1-1 to determine which SR shall be performed for each RPS Function.  
-----

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform a CHANNEL CHECK of each RPS instrument channel.	12 hours
SR 3.3.1.2	<p>-----NOTE----- Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 70% RTP. -----</p> <p>Verify total Reactor Coolant System (RCS) flow rate as indicated by each CPC is less than or equal to the RCS total flow rate.</p> <p>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.</p>	12 hours
SR 3.3.1.3	Check the CPC System Event Log.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.4 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 20% RTP.</li> <li>2. 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> <p>-----</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> power and CPC nuclear power calculations agree with the calorimetric, if the absolute difference is <math>\geq</math> 2% when THERMAL POWER is <math>\geq</math> 80% RTP. Between 20% and 80% RTP the maximum difference is -0.5% to 10%.</p>	<p>24 hours</p>
<p>SR 3.3.1.5 -----NOTE-----</p> <p>Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 70% RTP.</p> <p>-----</p> <p>Verify total RCS flow rate indicated by each CPC is less than or equal to the RCS flow determined either using the reactor coolant pump differential pressure instrumentation and the ultrasonic flow meter adjusted pump curves or by calorimetric calculations.</p>	<p>31 days</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.6 -----NOTE----- Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 15% RTP. -----</p> <p>Verify linear power subchannel 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>
<p>SR 3.3.1.7 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. The CPC CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC.</li> <li>2. Not required to be performed for logarithmic power level channels until 2 hours after reducing logarithmic power below 1E-4% NRTP.</li> </ol> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST on each channel.</p>	<p>92 days</p>
<p>SR 3.3.1.8 -----NOTE----- Neutron detectors are excluded from the CHANNEL CALIBRATION. -----</p> <p>Perform CHANNEL CALIBRATION of the power range neutron flux channels.</p>	<p>92 days</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	<p>-----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. -----</p> <p>Perform CHANNEL CALIBRATION on each channel, including bypass removal functions.</p>	18 months
SR 3.3.1.10	Perform a CHANNEL FUNCTIONAL TEST on each CPC channel.	18 months
SR 3.3.1.11	Using the incore detectors, verify the shape annealing matrix elements to be used by the CPCs.	Once after each refueling prior to exceeding 70% RTP
SR 3.3.1.12	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	Once within 92 days prior to each reactor startup
SR 3.3.1.13	<p>-----NOTE----- Neutron detectors are excluded. -----</p> <p>Verify RPS RESPONSE TIME is within limits.</p>	18 months on a STAGGERED TEST BASIS

RPS Instrumentation – Operating (After CPC Upgrade)  
3.3.1

Table 3.3.1-1 (page 1 of 3)  
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Variable Over Power	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.8 SR 3.3.1.9 SR 3.3.1.13	Ceiling $\leq$ 111.0% RTP Band $\leq$ 9.9% RTP Incr. Rate $\leq$ 11.0%/min RTP Decr. Rate $>$ 5%/sec RTP
2. Logarithmic Power Level – High(a)	2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.12 SR 3.3.1.13	$\leq$ 0.011% NRTP
3. Pressurizer Pressure – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	$\leq$ 2388 psia
4. Pressurizer Pressure – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.12 SR 3.3.1.13	$\geq$ 1821 psia
5. Containment Pressure – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	$\leq$ 3.2 psig
6. Steam Generator #1 Pressure – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Units 1 and 3: $\geq$ 890 psia Unit 2: $\geq$ 955 psia
7. Steam Generator #2 Pressure – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Units 1 and 3: $\geq$ 890 psia Unit 2: $\geq$ 955 psia

(continued)

(a) Trip may be bypassed when logarithmic power is  $>$  1E-4% NRTP. Bypass shall be automatically removed when logarithmic power is  $\leq$  1E-4% NRTP.

RPS Instrumentation – Operating (After CPC Upgrade)  
3.3.1

Table 3.3.1-1 (page 2 of 3)  
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8. Steam Generator #1 Level – Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 43.7%
9. Steam Generator #2 Level – Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 43.7%
10. Steam Generator #1 Level – High	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 91.5%
11. Steam Generator #2 Level – High	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 91.5%
12. Reactor Coolant Flow, Steam Generator #1-Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Ramp: ≤ 0.115 psid/sec. Floor: ≥ 12.49 psid Step: ≤ 17.2 psid
13. Reactor Coolant Flow, Steam Generator #2-Low	1.2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Ramp: ≤ 0.115 psid/sec. Floor: ≥ 12.49 psid Step: ≤ 17.2 psid

(continued)

RPS Instrumentation – Operating (After CPC Upgrade)  
3.3.1

Table 3.3.1-1 (page 3 of 3)  
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
14. 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 3.3.1.7 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	≤ 21.0 kW/ft
15. 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 3.3.1.7 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	≥ 1.3 (through operating cycle 10)  ≥ 1.34 (operating cycle 11 and later)

(b) Trip may be bypassed when logarithmic power is < 1E-4% NRTP. Bypass shall be automatically removed when logarithmic power is ≥ 1E-4% NRTP.

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. (Before CPC Upgrade)

ACTIONS

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



ACTIONS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.6 Disable the Reactor Power Cutback System (RPCS)	4 hours
C. Receipt of a CPC channel B or C cabinet high temperature alarm.	C.1 Perform CHANNEL FUNCTIONAL TEST on affected CEAC(s).	12 hours
D. One or two CEACs with three or more auto restarts during a 12 hour period.	D.1 Perform CHANNEL FUNCTIONAL TEST on affected CEAC.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.3.1 Perform a CHANNEL CHECK.	12 hours
SR 3.3.3.2 Check the CEAC auto restart count.	12 hours
SR 3.3.3.3 Perform a CHANNEL FUNCTIONAL TEST.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.3.4	Perform a CHANNEL CALIBRATION.	18 months
SR 3.3.3.5	Perform a CHANNEL FUNCTIONAL TEST.	18 months
SR 3.3.3.6	Verify the isolation characteristics of each CEAC isolation amplifier.	18 months

3.3 INSTRUMENTATION

3.3.3 Control Element Assembly Calculators (CEACs)

LC0 3.3.3 Two CEACs shall be OPERABLE in each CPC channel

APPLICABILITY: MODES 1 and 2. (After CPC Upgrade)

ACTIONS

-----NOTE-----  
Separate condition entry is allowed for each CPC channel.  
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CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CEAC inoperable in one or more CPC channels.	A.1 Declare the affected CPC channel(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Perform SR 3.1.5.1	Once per 4 hours
	<u>AND</u>	
	A.2.2 Restore CEAC to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.  <u>OR</u> Both CEACs inoperable in one or more CPC channels.	B.1 Declare the affected CPC channel(s) inoperable.	Immediately
	<u>OR</u>	(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. (continued)</p>	<p>B.2.1 Verify the departure from nucleate boiling ratio requirement of LCO 3.2.4, "Departure from Nucleate Boiling Ratio (DNBR)," is met.</p> <p><u>AND</u></p>	<p>4 hours</p>
	<p>B.2.2 Verify all full length and part length control element assembly (CEA) groups are fully withdrawn and maintained fully withdrawn, except during Surveillance testing pursuant to SR 3.1.5.3 or for control, when CEA group #5 may be inserted to a maximum of 127.5 inches withdrawn.</p> <p><u>AND</u></p>	<p>4 hours</p>
	<p>B.2.3 Verify the "RSPT/CEAC Inoperable" addressable constant in each affected core protection calculator (CPC) is set to indicate that both CEACs are inoperable.</p> <p><u>AND</u></p>	<p>4 hours</p> <p>(continued)</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.2.4 Verify the Control Element Drive Mechanism Control System is placed in "STANDBY MODE" and maintained in "STANDBY MODE," except during CEA motion permitted by Required Action B.2.2.</p> <p><u>AND</u></p> <p>B.2.5 Perform SR 3.1.5.1.</p> <p><u>AND</u></p> <p>B.2.6 Disable the Reactor Power Cutback System (RPCS)</p>	<p>4 hours</p> <p>Once per 4 hours</p> <p>4 hours</p>
<p>C. Required Action and associated Completion Time of Condition B not met.</p>	<p>C.1 Be in MODE 3.</p>	<p>6 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.3.1 Perform a CHANNEL CHECK.	12 hours
SR 3.3.3.2 Deleted	
SR 3.3.3.3 Perform a CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.3.4 Perform a CHANNEL CALIBRATION.	18 months
SR 3.3.3.5 Perform a CHANNEL FUNCTIONAL TEST.	18 months

## 5.0 ADMINISTRATIVE CONTROLS

## 5.4 Procedures

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- 5.4.1 Written procedures shall be established, implemented, and maintained covering the following activities:
- a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978;
  - b. The emergency operating procedures required to implement the requirements of NUREG-0737 and to NUREG-0737, Supplement 1, as stated in Generic Letter 82-33; ..
  - c. Quality assurance for effluent and environmental monitoring;
  - d. Fire Protection Program implementation; and
  - e. All programs specified in Specification 5.5.
  - f. Modification of core protection calculator (CPC) addressable constants. These procedures shall include provisions to ensure that sufficient margin is maintained in CPC type I addressable constants to avoid excessive operator interaction with CPCs during reactor operation.

Modifications to the CPC software (including changes of algorithms and fuel cycle specific data) shall be performed in accordance with the most recent version of "CPC Protection Algorithm Software Change Procedure," CEN-39(A)-P, which has been determined to be applicable to the facility. Additions or deletions to CPC addressable constants or changes to addressable constant software limit values shall not be implemented without prior NRC approval.

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## 5.0 ADMINISTRATIVE CONTROLS

5.4 Procedures

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- 5.4.1 Written procedures shall be established, implemented, and maintained covering the following activities:
- a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978;
  - b. The emergency operating procedures required to implement the requirements of NUREG-0737 and to NUREG-0737, Supplement 1, as stated in Generic Letter 82-33;
  - c. Quality assurance for effluent and environmental monitoring;
  - d. Fire Protection Program implementation; and
  - e. All programs specified in Specification 5.5.
  - f. Modification of core protection calculator (CPC) addressable constants. These procedures shall include provisions to ensure that sufficient margin is maintained in CPC type I addressable constants to avoid excessive operator interaction with CPCs during reactor operation.

Modifications to the CPC software (including changes of algorithms and fuel cycle specific data) shall be performed in accordance with the most recent version of the "Software Program Manual for Common Q Systems", CE-CES-195, which has been determined to be applicable to the facility. Additions or deletions to CPC addressable constants or changes to addressable constant software limit values shall not be implemented without prior NRC approval.

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