

3.3 INSTRUMENTATION

3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

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

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|-----------------|
| A. One or more required channels inoperable. | A.1 Place channel in trip. | 12 hours |
| | <p><u>OR</u></p> <p>A.2 -----NOTE----- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. -----</p> <p>Place associated trip system in trip.</p> | 12 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|--------------------|
| B. -----NOTE----- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ----- One or more Functions with one or more required channels inoperable in both trip systems. | B.1 Place channel in one trip system in trip. OR B.2 Place one trip system in trip. | 6 hours 6 hours |
| C. One or more Functions with RPS trip capability not maintained. | C.1 Restore RPS trip capability. | 1 hour |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel. | Immediately |
| E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | E.1 Reduce THERMAL POWER to < 30% RTP. | 4 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-----------------|
| F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | F.1 Be in MODE 2. | 6 hours |
| G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | G.1 Be in MODE 3. | 12 hours |
| H. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | H.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |
| I. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | I.1 Initiate alternate method to detect and suppress thermal hydraulic instability oscillations. | 12 hours |
| J. Required Action and associated Completion Time of Condition I not met. | J.1 Reduce THERMAL POWER to < 20% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS 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 associated Function maintains RPS trip capability.

| SURVEILLANCE | | FREQUENCY |
|--------------|---|-----------|
| SR 3.3.1.1.1 | (Not used.) | |
| SR 3.3.1.1.2 | Perform CHANNEL CHECK. | 24 hours |
| SR 3.3.1.1.3 | -----NOTE----- Not required to be performed until 12 hours after THERMAL POWER \geq 25% RTP. Adjust the average power range monitor (APRM) channels to conform to the calculated power while operating at \geq 25% RTP. | 7 days |
| SR 3.3.1.1.4 | -----NOTE----- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. Perform CHANNEL FUNCTIONAL TEST. | 7 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---------------|---|--|
| SR 3.3.1.1.5 | Perform a functional test of each automatic scram contactor. | 7 days |
| SR 3.3.1.1.6 | Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap. | Prior to withdrawing SRMs from the fully inserted position |
| SR 3.3.1.1.7 | -----NOTE----- Only required to be met during entry into MODE 2 from MODE 1. ----- Verify the IRM and APRM channels overlap. | 7 days |
| SR 3.3.1.1.8 | Calibrate the local power range monitors. | 1100 MWD/T average core exposure |
| SR 3.3.1.1.9 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.1.1.10 | Calibrate the trip units. | 92 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|------------------|
| <p>SR 3.3.1.1.11 -----NOTES-----</p> <ol style="list-style-type: none"> 1. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. 2. For Functions 2.b and 2.f, the CHANNEL FUNCTIONAL TEST includes the recirculation flow input processing, excluding the flow transmitters. <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | <p>184 days</p> |
| <p>SR 3.3.1.1.12 Perform CHANNEL FUNCTIONAL TEST.</p> | <p>24 months</p> |
| <p>SR 3.3.1.1.13 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. 3. For Functions 2.b and 2.f, the recirculation flow transmitters that feed the APRMs are included. <p>-----</p> <p>Perform CHANNEL CALIBRATION.</p> | <p>24 months</p> |
| <p>SR 3.3.1.1.14 (Not used.)</p> | |
| <p>SR 3.3.1.1.15 Perform LOGIC SYSTEM FUNCTIONAL TEST.</p> | <p>24 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|---|
| SR 3.3.1.1.16 Verify Turbine Stop Valve—Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is $\geq 30\%$ RTP. | 24 months |
| SR 3.3.1.1.17 -----NOTES----- 1. Neutron detectors are excluded. 2. For Functions 3 and 4, the sensor response time may be assumed to be the design sensor response time. 3. For Function 5, "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. 4. For Function 2.e, "n" equals 8 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. Testing of APRM and Oscillation Power Range Monitor (OPRM) outputs shall alternate. ----- Verify the RPS RESPONSE TIME is within limits. | 24 months on a STAGGERED TEST BASIS |
| SR 3.3.1.1.18 Adjust recirculation drive flow to conform to reactor core flow. | Once within 7 days after reaching equilibrium conditions following refueling outage |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|---|-----------|
| SR 3.3.1.1.19 Verify OPRM is not bypassed when APRM Simulated Thermal Power is $\geq 25\%$ and recirculation drive flow is $\leq 60\%$. | 24 months |

Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER TRIP SYSTEM | CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|-------------------------------------|--|--|--|---|--|
| 1. Intermediate Range Monitors | | | | | |
| a. Neutron Flux —High | 2 | 3 | G | SR 3.3.1.1.2 SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.1.1.6 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 120/125 divisions of full scale |
| | 5(a) | 3 | H | SR 3.3.1.1.2 SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 120/125 divisions of full scale |
| b. Inop | 2 | 3 | G | SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.1.1.15 | NA |
| | 5(a) | 3 | H | SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.2.2.15 | NA |
| 2. Average Power Range Monitors | | | | | |
| a. Neutron Flux —High (Setdown) | 2 | 3(c) | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.13 | ≤ 22.7% RTP |
| b. Simulated Thermal Power —High | 1 | 3(c) | F | SR 3.3.1.1.2 SR 3.3.1.1.3 SR 3.3.1.1.5 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.13 SR 3.3.1.1.18 | ≤ 0.66W + 62.0% RTP(b) and ≤ 117.1% RTP |
| (continued) | | | | | |

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) $\leq [0.66(W - \Delta W) + 62.0\% \text{ RTP}]$ when reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating." The value of ΔW is defined in plant procedures.

(c) Each APRM channel provides inputs to both trip systems.

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER TRIP SYSTEM | CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|--|--|--|--|--|--------------------|
| 2. Average Power Range Monitors (continued) | | | | | |
| c. Neutron Flux —High | 1 | 3(c) | F | SR 3.3.1.1.2 SR 3.3.1.1.3 SR 3.3.1.1.5 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.13 | ≤ 118.7% RTP |
| d. Inop | 1,2 | 3(c) | G | SR 3.3.1.1.5 SR 3.3.1.1.11 | NA |
| e. 2-Out-Of-4 Voter | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.11 SR 3.3.1.1.15 SR 3.3.1.1.17 | NA |
| f. OPRM Upscale | ≥ 20% RTP | 3(c) | I | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.13 SR 3.3.1.1.18 SR 3.3.1.1.19 | NA ^(d) |
| 3. Reactor Vessel Steam Dome Pressure —High | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17 | ≤ 1077 psig |
| 4. Reactor Vessel Water Level —Low Level 1 | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17 | ≥ 153 inches |
| 5. Main Steam Isolation Valve —Closure | 1 | 8 | F | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17 | ≤ 10% closed |
| 6. Drywell Pressure —High | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 1.8 psig |

(continued)

(c) Each APRM channel provides inputs to both trip systems.

(d) See COLR for OPRM period based detection algorithm (PBDA) setpoint limits.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER TRIP SYSTEM | CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|--|--|--|--|--|--------------------|
| 7. Scram Discharge Volume Water Level —High | 1,2 | 2 | G | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 108 gallons |
| | 5(a) | 2 | H | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 108 gallons |
| 8. Turbine Stop Valve —Closure | ≥ 30% RTP | 4 | E | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.17 | ≤ 10% closed |
| 9. Turbine Control Valve Fast Closure, Control Oil Pressure —Low | ≥ 30% RTP | 2 | E | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.17 | ≥ 500 psig |
| 10. Reactor Mode Switch — Shutdown Position | 1,2 | 1 | G | SR 3.3.1.1.12 SR 3.3.1.1.15 | NA |
| | 5(a) | 1 | H | SR 3.3.1.1.12 SR 3.3.1.1.15 | NA |
| 11. Manual Scram | 1,2 | 1 | G | SR 3.3.1.1.9 SR 3.3.1.1.15 | NA |
| | 5(a) | 1 | H | SR 3.3.1.1.9 SR 3.3.1.1.15 | NA |

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

3.3 INSTRUMENTATION

3.3.1.2 Source Range Monitor (SRM) Instrumentation

LCO 3.3.1.2 The SRM instrumentation in Table 3.3.1.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.2-1.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|---|-----------------|
| A. One or more required SRMs inoperable in MODE 2 with intermediate range monitors (IRMs) on Range 2 or below. | A.1 Restore required SRMs to OPERABLE status. | 4 hours |
| B. Three required SRMs inoperable in MODE 2 with IRMs on Range 2 or below. | B.1 Suspend control rod withdrawal. | Immediately |
| C. Required Action and associated Completion Time of Condition A or B not met. | C.1 Be in MODE 3. | 12 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-----------------|
| D. One or more required SRMs inoperable in MODE 3 or 4. | D.1 Fully insert all insertable control rods. | 1 hour |
| | <u>AND</u> D.2 Place reactor mode switch in the shutdown position. | 1 hour |
| E. One or more required SRMs inoperable in MODE 5. | E.1 Suspend CORE ALTERATIONS except for control rod insertion. | Immediately |
| | <u>AND</u> E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified condition.

| SURVEILLANCE | | FREQUENCY |
|--------------|---|-----------|
| SR 3.3.1.2.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.1.2.2 | <p>-----NOTES-----</p> <ol style="list-style-type: none">1. Only required to be met during CORE ALTERATIONS.2. One SRM may be used to satisfy more than one of the following. <p>-----</p> <p>Verify an OPERABLE SRM detector is located in:</p> <ol style="list-style-type: none">a. The fueled region;b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; andc. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fuel region. | 12 hours |
| SR 3.3.1.2.3 | Perform CHANNEL CHECK. | 24 hours |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|---|
| <p>SR 3.3.1.2.4 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. 2. Not required to be met during a core spiral offload. <p>-----</p> <p>Verify count rate is ≥ 3.0 cps.</p> | <p>12 hours during CORE ALTERATIONS</p> <p><u>AND</u></p> <p>24 hours</p> |
| <p>SR 3.3.1.2.5 Perform CHANNEL FUNCTIONAL TEST.</p> | <p>7 days</p> |
| <p>SR 3.3.1.2.6 -----NOTE-----</p> <p>Not required to be performed until 12 hours after IRMs on Range 2 or below.</p> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | <p>31 days</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|------------------|
| <p>SR 3.3.1.2.7 -----NOTES-----</p> <p>1. Neutron detectors are excluded.</p> <p>2. Not required to be performed until 12 hours after IRMs on Range 2 or below.</p> <p>-----</p> <p>Perform CHANNEL CALIBRATION.</p> | <p>24 months</p> |

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS |
|-------------------------|--|----------------------|------------------------------|
| 1. Source Range Monitor | 2 ^(a) | 3 | SR 3.3.1.2.1 |
| | | | SR 3.3.1.2.4 |
| | | | SR 3.3.1.2.6 |
| | | | SR 3.3.1.2.7 |
| | 3,4 | 2 | SR 3.3.1.2.3 |
| | | | SR 3.3.1.2.4 |
| | | | SR 3.3.1.2.6 |
| | | | SR 3.3.1.2.7 |
| | 5 | 2 ^(b) | SR 3.3.1.2.1 |
| | | | SR 3.3.1.2.2 |
| | | | SR 3.3.1.2.4 |
| | | | SR 3.3.1.2.5 |
| | | | SR 3.3.1.2.7 |

(a) With IRMs on Range 2 or below.

(b) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

3.3 INSTRUMENTATION

3.3.2.1 Control Rod Block Instrumentation

LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2.1-1.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|--------------------------------|
| A. One rod block monitor (RBM) channel inoperable. | A.1 Restore RBM channel to OPERABLE status. | 24 hours |
| B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Two RBM channels inoperable. | B.1 Place one RBM channel in trip. | 1 hour |
| C. Rod worth minimizer (RWM) inoperable during reactor startup. | C.1 Suspend control rod movement except by scram. <u>OR</u> | Immediately (continued) |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|---|-----------------------------|
| C. (continued) | C.2.1.1 Verify ≥ 12 rods withdrawn. | Immediately |
| | <u>OR</u> | |
| | C.2.1.2 Verify by administrative methods that startup with RWM inoperable, for reasons other than bypassed control rod(s), has not been performed in the last calendar year. | Immediately |
| | <u>AND</u> | |
| | C.2.2 Verify movement of bypassed control rod(s) is in compliance with banked position withdrawal sequence (BPWS) by a second licensed operator or other qualified member of the technical staff. | During control rod movement |
| D. RWM inoperable during reactor shutdown. | D.1 Verify movement of bypassed control rod(s) is in accordance with BPWS by a second licensed operator or other qualified member of the technical staff. | During control rod movement |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-----------------|
| E. One or more Reactor Mode Switch—Shutdown Position channels inoperable. | E.1 Suspend control rod withdrawal. | Immediately |
| | <u>AND</u> E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.
2. When an RBM 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 associated Function maintains control rod block capability.

| SURVEILLANCE | FREQUENCY |
|---|-----------|
| SR 3.3.2.1.1 Perform CHANNEL FUNCTIONAL TEST. | 184 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|---|------------------|
| <p>SR 3.3.2.1.2 -----NOTE----- Not required to be performed until 1 hour after any control rod is withdrawn at $\leq 10\%$ RTP in MODE 2. ----- Perform CHANNEL FUNCTIONAL TEST.</p> | <p>92 days</p> |
| <p>SR 3.3.2.1.3 -----NOTE----- Not required to be performed until 1 hour after THERMAL POWER is $\leq 10\%$ RTP in MODE 1. ----- Perform CHANNEL FUNCTIONAL TEST.</p> | <p>92 days</p> |
| <p>SR 3.3.2.1.4 Verify the RBM:</p> <ul style="list-style-type: none"> a. Low Power Range—Upscale Function OR Intermediate Power Range—Upscale Function OR High Power Range—Upscale Function is enabled (not bypassed) when APRM Simulated Thermal Power is $\geq 29\%$. b. Intermediate Power Range—Upscale Function OR High Power Range—Upscale Function is enabled (not bypassed) when APRM Simulated Thermal Power is \geq Intermediate Power Range Setpoint specified in the COLR. c. High Power Range—Upscale Function is enabled (not bypassed) when APRM Simulated Thermal Power is \geq High Power Range Setpoint specified in the COLR. | <p>24 months</p> |

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SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|--------------|--|--|
| SR 3.3.2.1.5 | Verify the RWM is not bypassed when THERMAL POWER is \leq 10% RTP. | 24 months |
| SR 3.3.2.1.6 | <p>-----NOTE----- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. -----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | 24 months |
| SR 3.3.2.1.7 | <p>-----NOTE----- Neutron detectors are excluded. -----</p> <p>Perform CHANNEL CALIBRATION.</p> | 24 months |
| SR 3.3.2.1.8 | Verify control rod sequences input to the RWM are in conformance with BPWS. | Prior to declaring RWM OPERABLE following loading of sequence into RWM |

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|---|--|----------------------|--|--------------------|
| 1. Rod Block Monitor | | | | |
| a. Low Power Range —Upscale | (a) | 2 | SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7 | (h) |
| b. Intermediate Power Range —Upscale | (b) | 2 | SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7 | (h) |
| c. High Power Range —Upscale | (c),(d) | 2 | SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7 | (h) |
| d. Inop | (d),(e) | 2 | SR 3.3.2.1.1 | NA |
| 2. Rod Worth Minimizer | 1 ^(f) , 2 ^(f) | 1 | SR 3.3.2.1.2 SR 3.3.2.1.3 SR 3.3.2.1.5 SR 3.3.2.1.8 | NA |
| 3. Reactor Mode Switch —Shutdown Position | (g) | 2 | SR 3.3.2.1.6 | NA |

- (a) THERMAL POWER is \geq 29% RTP and MCPR less than the limit specified in the COLR except not required to be OPERABLE if the Intermediate Power Range —Upscale Function or High Power Range —Upscale Function is OPERABLE.
- (b) THERMAL POWER is \geq Intermediate Power Range Setpoint specified in the COLR and MCPR less than the limit specified in the COLR except not required to be OPERABLE if the High Power Range —Upscale Function is OPERABLE.
- (c) THERMAL POWER \geq High Power Range Setpoint specified in the COLR and $<$ 90% RTP and MCPR less than the limit specified in the COLR.
- (d) THERMAL POWER \geq 90% RTP and MCPR less than the limit specified in the COLR.
- (e) THERMAL POWER \geq 29% and $<$ 90% RTP and MCPR less than the limit specified in the COLR.
- (f) With THERMAL POWER \leq 10% RTP.
- (g) Reactor mode switch in the shutdown position.
- (h) Allowable Value specified in the COLR.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 Recirculation Loops Operating

LCO 3.4.1 Two recirculation loops with matched recirculation pump speeds shall be in operation,

OR

One recirculation loop may be in operation provided the following limits are applied when the associated LCO is applicable:

- a. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," single loop operation limits specified in the COLR;
- b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," single loop operation limits specified in the COLR; and
- c. LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Function 2.b (Average Power Range Monitors Simulated Thermal Power—High), Allowable Value of Table 3.3.1.1-1 is reset for single loop operation.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|-------------------------------------|--|-----------------|
| A. Requirements of the LCO not met. | A.1 Satisfy the requirements of the LCO. | 6 hours |

(continued)

3.10 SPECIAL OPERATIONS

3.10.8 SHUTDOWN MARGIN (SDM) Test—Refueling

LCO 3.10.8 The reactor mode switch position specified in Table 1.1-1 for MODE 5 may be changed to include the startup/hot standby position, and operation considered not to be in MODE 2, to allow SDM testing, provided the following requirements are met:

- a. LCO 3.3.1.1, "Reactor Protection System Instrumentation," MODE 2 requirements for Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1;
- b. 1. LCO 3.3.2.1, "Control Rod Block Instrumentation," MODE 2 requirements for Function 2 of Table 3.3.2.1-1, with the banked position withdrawal sequence requirements of SR 3.3.2.1.8 changed to require the control rod sequence to conform to the SDM test sequence,

OR

- 2. Conformance to the approved control rod sequence for the SDM test is verified by a second licensed operator or other qualified member of the technical staff;
- c. Each withdrawn control rod shall be coupled to the associated CRD;
- d. All control rod withdrawals during out of sequence control rod moves shall be made in notch out mode;
- e. No other CORE ALTERATIONS are in progress; and
- f. CRD charging water header pressure \geq 940 psig.

APPLICABILITY: MODE 5 with the reactor mode switch in startup/hot standby position.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-------------------------------|
| <p>A. -----NOTE----- Separate Condition entry is allowed for each control rod. -----</p> <p>One or more control rods not coupled to its associated CRD.</p> | <p>-----NOTE----- Inoperable control rod may be bypassed in the rod worth minimizer (RWM) or RWM may be bypassed as allowed by LCO 3.3.2.1, "Control Rod Block Instrumentation," if required, to allow insertion of inoperable control rod and continued operation. -----</p> <p>A.1 Fully insert inoperable control rod.</p> <p><u>AND</u></p> <p>A.2 Disarm the associated CRD.</p> | <p>3 hours</p> <p>4 hours</p> |
| <p>B. One or more of the above requirements not met for reasons other than Condition A.</p> | <p>B.1 Place the reactor mode switch in the shutdown or refuel position.</p> | <p>Immediately</p> |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|--|
| <p>SR 3.10.8.1 Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1.</p> | <p>According to the applicable SRs</p> |

(continued)

5.6 Reporting Requirements (continued)

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
 - 1. The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) for Specification 3.2.1;
 - 2. The MINIMUM CRITICAL POWER RATIO (MCPR) for Specification 3.2.2;
 - 3. The period based detection algorithm (PBDA) setpoint for Function 2.f, Oscillation Power Range Monitor (OPRM) Upscale, for Specification 3.3.1.1; and
 - 4. The Allowable Values and power range setpoints for Rod Block Monitor Upscale Functions for Specification 3.3.2.1.
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:
 - 1. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version).
- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

(continued)

5.6 Reporting Requirements (continued)

5.6.6 Post Accident Monitoring (PAM) Instrumentation Report

When a report is required by Condition B or F of LCO 3.3.3.1, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

3.3 INSTRUMENTATION

3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

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

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|-----------------|
| A. One or more required channels inoperable. | A.1 Place channel in trip. | 12 hours |
| | <p><u>OR</u></p> <p>A.2 -----NOTE----- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. -----</p> <p>Place associated trip system in trip.</p> | 12 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|--|----------------------------|
| B. -----NOTE----- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ----- One or more Functions with one or more required channels inoperable in both trip systems. | B.1 Place channel in one trip system in trip. <u>OR</u> B.2 Place one trip system in trip. | 6 hours 6 hours |
| C. One or more Functions with RPS trip capability not maintained. | C.1 Restore RPS trip capability. | 1 hour |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel. | Immediately |
| E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | E.1 Reduce THERMAL POWER to < 30% RTP. | 4 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-----------------|
| F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | F.1 Be in MODE 2. | 6 hours |
| G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | G.1 Be in MODE 3. | 12 hours |
| H. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | H.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |
| I. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | I.1 Initiate alternate method to detect and suppress thermal hydraulic instability oscillations. | 12 hours |
| J. Required Action and associated Completion Time of Condition I not met. | J.1 Reduce THERMAL POWER to < 20% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS 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 associated Function maintains RPS trip capability.

| SURVEILLANCE | | FREQUENCY |
|--------------|---|-----------|
| SR 3.3.1.1.1 | (Not used.) | |
| SR 3.3.1.1.2 | Perform CHANNEL CHECK. | 24 hours |
| SR 3.3.1.1.3 | <p>-----NOTE----- Not required to be performed until 12 hours after THERMAL POWER \geq 25% RTP. -----</p> <p>Adjust the average power range monitor (APRM) channels to conform to the calculated power while operating at \geq 25% RTP.</p> | 7 days |
| SR 3.3.1.1.4 | <p>-----NOTE----- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | 7 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---------------|---|--|
| SR 3.3.1.1.5 | Perform a functional test of each automatic scram contactor. | 7 days |
| SR 3.3.1.1.6 | Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap. | Prior to withdrawing SRMs from the fully inserted position |
| SR 3.3.1.1.7 | -----NOTE----- Only required to be met during entry into MODE 2 from MODE 1. ----- Verify the IRM and APRM channels overlap. | 7 days |
| SR 3.3.1.1.8 | Calibrate the local power range monitors. | 1100 MWD/T average core exposure |
| SR 3.3.1.1.9 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.1.1.10 | Calibrate the trip units. | 92 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|-----------|
| SR 3.3.1.1.11 -----NOTES----- 1. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. 2. For Functions 2.b and 2.f, the CHANNEL FUNCTIONAL TEST includes the recirculation flow input processing, excluding the flow transmitters. ----- Perform CHANNEL FUNCTIONAL TEST. | 184 days |
| SR 3.3.1.1.12 Perform CHANNEL FUNCTIONAL TEST. | 24 months |
| SR 3.3.1.1.13 -----NOTES----- 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. 3. For Functions 2.b and 2.f, the recirculation flow transmitters that feed the APRMs are included. ----- Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.1.1.14 (Not used.) | |
| SR 3.3.1.1.15 Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|---|
| SR 3.3.1.1.16 Verify Turbine Stop Valve—Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is $\geq 30\%$ RTP. | 24 months |
| SR 3.3.1.1.17 -----NOTES----- 1. Neutron detectors are excluded. 2. For Functions 3 and 4, the sensor response time may be assumed to be the design sensor response time. 3. For Function 5, "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. 4. For Function 2.e, "n" equals 8 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. Testing of APRM and Oscillation Power Range Monitor (OPRM) outputs shall alternate. ----- Verify the RPS RESPONSE TIME is within limits. | 24 months on a STAGGERED TEST BASIS |
| SR 3.3.1.1.18 Adjust recirculation drive flow to conform to reactor core flow. | Once within 7 days after reaching equilibrium conditions following refueling outage |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|---|-----------|
| SR 3.3.1.1.19 Verify OPRM is not bypassed when APRM Simulated Thermal Power is $\geq 25\%$ and recirculation drive flow is $\leq 60\%$. | 24 months |

Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER TRIP SYSTEM | CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|----------------------------------|--|--|--|------------------------------|--|
| 1. Intermediate Range Monitors | | | | | |
| a. Neutron Flux —High | 2 | 3 | G | SR 3.3.1.1.2 | ≤ 120/125 divisions of full scale |
| | | | | SR 3.3.1.1.4 | |
| | | | | SR 3.3.1.1.5 | |
| | | | | SR 3.3.1.1.6 | |
| | | | | SR 3.3.1.1.7 | |
| | | | | SR 3.3.1.1.13 | |
| | | | | SR 3.3.1.1.15 | |
| | 5(a) | 3 | H | SR 3.3.1.1.2 | ≤ 120/125 divisions of full scale |
| | | | | SR 3.3.1.1.4 | |
| | | | | SR 3.3.1.1.5 | |
| | | | | SR 3.3.1.1.13 | |
| | | | | SR 3.3.1.1.15 | |
| | 2 | 3 | G | SR 3.3.1.1.4 | NA |
| | | | | SR 3.3.1.1.5 | |
| | 5(a) | 3 | H | SR 3.3.1.1.4 | NA |
| | | | | SR 3.3.1.1.5 | |
| | | | | SR 3.3.2.2.15 | |
| | | | | | |
| 2. Average Power Range Monitors | | | | | |
| a. Neutron Flux —High (Setdown) | 2 | 3(c) | G | SR 3.3.1.1.2 | ≤ 22.7% RTP |
| | | | | SR 3.3.1.1.5 | |
| | | | | SR 3.3.1.1.7 | |
| | | | | SR 3.3.1.1.8 | |
| | | | | SR 3.3.1.1.11 | |
| | | | | SR 3.3.1.1.13 | |
| b. Simulated Thermal Power —High | 1 | 3(c) | F | SR 3.3.1.1.2 | ≤ 0.66W + 62.0% RTP (b) and ≤ 117.1% RTP |
| | | | | SR 3.3.1.1.3 | |
| | | | | SR 3.3.1.1.5 | |
| | | | | SR 3.3.1.1.8 | |
| | | | | SR 3.3.1.1.11 | |
| | | | | SR 3.3.1.1.13 | |
| | | | | SR 3.3.1.1.18 | |

(continued)

(continued)

- (a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.
- (b) $\leq [0.66(W - \Delta W) + 62.0\% \text{ RTP}]$ when reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating." The value of ΔW is defined in plant procedures.
- (c) Each APRM channel provides inputs to both trip systems.

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER TRIP SYSTEM | CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|---|--|--|--|--|--------------------|
| 2. Average Power Range Monitors (continued) | | | | | |
| c. Neutron Flux —High | 1 | 3 ^(c) | F | SR 3.3.1.1.2 SR 3.3.1.1.3 SR 3.3.1.1.5 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.13 | ≤ 118.7% RTP |
| d. Inop | 1,2 | 3 ^(c) | G | SR 3.3.1.1.5 SR 3.3.1.1.11 | NA |
| e. 2-Out-Of-4 Voter | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.11 SR 3.3.1.1.15 SR 3.3.1.1.17 | NA |
| f. OPRM Upscale | ≥ 20% RTP | 3 ^(c) | I | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.13 SR 3.3.1.1.18 SR 3.3.1.1.19 | NA ^(d) |
| 3. Reactor Vessel Steam Dome Pressure —High | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17 | ≤ 1077 psig |
| 4. Reactor Vessel Water Level —Low Level 1 | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17 | ≥ 153 inches |
| 5. Main Steam Isolation Valve —Closure | 1 | 8 | F | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17 | ≤ 10% closed |
| 6. Drywell Pressure —High | 1,2 | 2 | G | SR 3.3.1.1.2 SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 1.8 psig |

(continued)

(c) Each APRM channel provides inputs to both trip systems.

(d) See COLR for OPRM period based detection algorithm (PBDA) setpoint limits.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS PER TRIP SYSTEM | CONDITIONS REFERENCED FROM REQUIRED ACTION D.1 | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|--|--|--|--|--|--------------------|
| 7. Scram Discharge Volume Water Level —High | 1,2 | 2 | G | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 108 gallons |
| | 5(a) | 2 | H | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 | ≤ 108 gallons |
| 8. Turbine Stop Valve —Closure | ≥ 30% RTP | 4 | E | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.17 | ≤ 10% closed |
| 9. Turbine Control Valve Fast Closure, Control Oil Pressure —Low | ≥ 30% RTP | 2 | E | SR 3.3.1.1.5 SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.17 | ≥ 500 psig |
| 10. Reactor Mode Switch — Shutdown Position | 1,2 | 1 | G | SR 3.3.1.1.12 SR 3.3.1.1.15 | NA |
| | 5(a) | 1 | H | SR 3.3.1.1.12 SR 3.3.1.1.15 | NA |
| 11. Manual Scram | 1,2 | 1 | G | SR 3.3.1.1.9 SR 3.3.1.1.15 | NA |
| | 5(a) | 1 | H | SR 3.3.1.1.9 SR 3.3.1.1.15 | NA |

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

3.3 INSTRUMENTATION

3.3.1.2 Source Range Monitor (SRM) Instrumentation

LCO 3.3.1.2 The SRM instrumentation in Table 3.3.1.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.2-1.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|---|-----------------|
| A. One or more required SRMs inoperable in MODE 2 with intermediate range monitors (IRMs) on Range 2 or below. | A.1 Restore required SRMs to OPERABLE status. | 4 hours |
| B. Three required SRMs inoperable in MODE 2 with IRMs on Range 2 or below. | B.1 Suspend control rod withdrawal. | Immediately |
| C. Required Action and associated Completion Time of Condition A or B not met. | C.1 Be in MODE 3. | 12 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-----------------|
| D. One or more required SRMs inoperable in MODE 3 or 4. | D.1 Fully insert all insertable control rods. | 1 hour |
| | <u>AND</u> D.2 Place reactor mode switch in the shutdown position. | 1 hour |
| E. One or more required SRMs inoperable in MODE 5. | E.1 Suspend CORE ALTERATIONS except for control rod insertion. | Immediately |
| | <u>AND</u> E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified condition.

| SURVEILLANCE | | FREQUENCY |
|--------------|---|-----------|
| SR 3.3.1.2.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.1.2.2 | <p>-----NOTES-----</p> <ol style="list-style-type: none">1. Only required to be met during CORE ALTERATIONS.2. One SRM may be used to satisfy more than one of the following. <p>-----</p> <p>Verify an OPERABLE SRM detector is located in:</p> <ol style="list-style-type: none">a. The fueled region;b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; andc. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region. | 12 hours |
| SR 3.3.1.2.3 | Perform CHANNEL CHECK. | 24 hours |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|---|
| <p>SR 3.3.1.2.4 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. 2. Not required to be met during a core spiral offload. <p>-----</p> <p>Verify count rate is ≥ 3.0 cps.</p> | <p>12 hours during CORE ALTERATIONS</p> <p><u>AND</u></p> <p>24 hours</p> |
| <p>SR 3.3.1.2.5 Perform CHANNEL FUNCTIONAL TEST.</p> | <p>7 days</p> |
| <p>SR 3.3.1.2.6 -----NOTE-----</p> <p>Not required to be performed until 12 hours after IRMs on Range 2 or below.</p> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | <p>31 days</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|------------------|
| <p>SR 3.3.1.2.7 -----NOTES-----</p> <p>1. Neutron detectors are excluded.</p> <p>2. Not required to be performed until 12 hours after IRMs on Range 2 or below.</p> <p>-----</p> <p>Perform CHANNEL CALIBRATION.</p> | <p>24 months</p> |

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS |
|-------------------------|--|----------------------|------------------------------|
| 1. Source Range Monitor | 2(a) | 3 | SR 3.3.1.2.1 |
| | | | SR 3.3.1.2.4 |
| | | | SR 3.3.1.2.6 |
| | | | SR 3.3.1.2.7 |
| | 3,4 | 2 | SR 3.3.1.2.3 |
| | | | SR 3.3.1.2.4 |
| | | | SR 3.3.1.2.6 |
| | | | SR 3.3.1.2.7 |
| | 5 | 2(b) | SR 3.3.1.2.1 |
| | | | SR 3.3.1.2.2 |
| | | | SR 3.3.1.2.4 |
| | | | SR 3.3.1.2.5 |
| | | | SR 3.3.1.2.7 |

(a) With IRMs on Range 2 or below.

(b) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

3.3 INSTRUMENTATION

3.3.2.1 Control Rod Block Instrumentation

LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2.1-1.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|--------------------------------|
| A. One rod block monitor (RBM) channel inoperable. | A.1 Restore RBM channel to OPERABLE status. | 24 hours |
| B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Two RBM channels inoperable. | B.1 Place one RBM channel in trip. | 1 hour |
| C. Rod worth minimizer (RWM) inoperable during reactor startup. | C.1 Suspend control rod movement except by scram. <u>OR</u> | Immediately (continued) |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|---|-----------------------------|
| C. (continued) | C.2.1.1 Verify ≥ 12 rods withdrawn. | Immediately |
| | <u>OR</u> | |
| | C.2.1.2 Verify by administrative methods that startup with RWM inoperable, for reasons other than bypassed control rod(s), has not been performed in the last calendar year. | Immediately |
| | <u>AND</u> | |
| | C.2.2 Verify movement of bypassed control rod(s) is in compliance with banked position withdrawal sequence (BPWS) by a second licensed operator or other qualified member of the technical staff. | During control rod movement |
| D. RWM inoperable during reactor shutdown. | D.1 Verify movement of bypassed control rod(s) is in accordance with BPWS by a second licensed operator or other qualified member of the technical staff. | During control rod movement |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-----------------|
| E. One or more Reactor Mode Switch—Shutdown Position channels inoperable. | E.1 Suspend control rod withdrawal. | Immediately |
| | <u>AND</u> E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.
2. When an RBM 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 associated Function maintains control rod block capability.

| SURVEILLANCE | FREQUENCY |
|---|-----------|
| SR 3.3.2.1.1 Perform CHANNEL FUNCTIONAL TEST. | 184 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|---|-----------|
| <p>SR 3.3.2.1.2 -----NOTE----- Not required to be performed until 1 hour after any control rod is withdrawn at $\leq 10\%$ RTP in MODE 2. -----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | 92 days |
| <p>SR 3.3.2.1.3 -----NOTE----- Not required to be performed until 1 hour after THERMAL POWER is $\leq 10\%$ RTP in MODE 1. -----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | 92 days |
| <p>SR 3.3.2.1.4 Verify the RBM:</p> <ul style="list-style-type: none"> a. Low Power Range—Upscale Function OR Intermediate Power Range—Upscale Function OR High Power Range—Upscale Function is enabled (not bypassed) when APRM Simulated Thermal Power is $\geq 29\%$. b. Intermediate Power Range—Upscale Function OR High Power Range—Upscale Function is enabled (not bypassed) when APRM Simulated Thermal Power is \geq Intermediate Power Range Setpoint specified in the COLR. c. High Power Range—Upscale Function is enabled (not bypassed) when APRM Simulated Thermal Power is \geq High Power Range Setpoint specified in the COLR. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|--------------|--|--|
| SR 3.3.2.1.5 | Verify the RWM is not bypassed when THERMAL POWER is \leq 10% RTP. | 24 months |
| SR 3.3.2.1.6 | <p>-----NOTE----- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. -----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p> | 24 months |
| SR 3.3.2.1.7 | <p>-----NOTE----- Neutron detectors are excluded. -----</p> <p>Perform CHANNEL CALIBRATION.</p> | 24 months |
| SR 3.3.2.1.8 | Verify control rod sequences input to the RWM are in conformance with BPWS. | Prior to declaring RWM OPERABLE following loading of sequence into RWM |

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|---|--|----------------------|--|--------------------|
| 1. Rod Block Monitor | | | | |
| a. Low Power Range —Upscale | (a) | 2 | SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7 | (h) |
| b. Intermediate Power Range —Upscale | (b) | 2 | SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7 | (h) |
| c. High Power Range —Upscale | (c),(d) | 2 | SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7 | (h) |
| d. Inop | (d),(e) | 2 | SR 3.3.2.1.1 | NA |
| 2. Rod Worth Minimizer | 1 ^(f) , 2 ^(f) | 1 | SR 3.3.2.1.2 SR 3.3.2.1.3 SR 3.3.2.1.5 SR 3.3.2.1.8 | NA |
| 3. Reactor Mode Switch —Shutdown Position | (g) | 2 | SR 3.3.2.1.6 | NA |

- (a) THERMAL POWER is $\geq 29\%$ RTP and MCPR less than the limit specified in the COLR except not required to be OPERABLE if the Intermediate Power Range —Upscale Function or High Power Range —Upscale Function is OPERABLE.
- (b) THERMAL POWER is \geq Intermediate Power Range Setpoint specified in the COLR and MCPR less than the limit specified in the COLR except not required to be OPERABLE if the High Power Range —Upscale Function is OPERABLE.
- (c) THERMAL POWER \geq High Power Range Setpoint specified in the COLR and $< 90\%$ RTP and MCPR less than the limit specified in the COLR.
- (d) THERMAL POWER $\geq 90\%$ RTP and MCPR less than the limit specified in the COLR.
- (e) THERMAL POWER $\geq 29\%$ and $< 90\%$ RTP and MCPR less than the limit specified in the COLR.
- (f) With THERMAL POWER $\leq 10\%$ RTP.
- (g) Reactor mode switch in the shutdown position.
- (h) Allowable Value specified in the COLR.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 Recirculation Loops Operating

LCO 3.4.1 Two recirculation loops with matched recirculation pump speeds shall be in operation,

OR

One recirculation loop may be in operation provided the following limits are applied when the associated LCO is applicable:

- a. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," single loop operation limits specified in the COLR;
- b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," single loop operation limits specified in the COLR; and
- c. LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Function 2.b (Average Power Range Monitors Simulated Thermal Power—High), Allowable Value of Table 3.3.1.1-1 is reset for single loop operation.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|-------------------------------------|--|-----------------|
| A. Requirements of the LCO not met. | A.1 Satisfy the requirements of the LCO. | 6 hours |

(continued)

3.10 SPECIAL OPERATIONS

3.10.8 SHUTDOWN MARGIN (SDM) Test—Refueling

LCO 3.10.8 The reactor mode switch position specified in Table 1.1-1 for MODE 5 may be changed to include the startup/hot standby position, and operation considered not to be in MODE 2, to allow SDM testing, provided the following requirements are met:

- a. LCO 3.3.1.1, "Reactor Protection System Instrumentation," MODE 2 requirements for Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1;
- b. 1. LCO 3.3.2.1, "Control Rod Block Instrumentation," MODE 2 requirements for Function 2 of Table 3.3.2.1-1, with the banked position withdrawal sequence requirements of SR 3.3.2.1.8 changed to require the control rod sequence to conform to the SDM test sequence,

OR

- 2. Conformance to the approved control rod sequence for the SDM test is verified by a second licensed operator or other qualified member of the technical staff;
- c. Each withdrawn control rod shall be coupled to the associated CRD;
- d. All control rod withdrawals during out of sequence control rod moves shall be made in notch out mode;
- e. No other CORE ALTERATIONS are in progress; and
- f. CRD charging water header pressure \geq 940 psig.

APPLICABILITY: MODE 5 with the reactor mode switch in startup/hot standby position.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|-------------------------------|
| <p>A. -----NOTE----- Separate Condition entry is allowed for each control rod. -----</p> <p>One or more control rods not coupled to its associated CRD.</p> | <p>-----NOTE----- Inoperable control rod may be bypassed in the rod worth minimizer (RWM) or RWM may be bypassed as allowed by LCO 3.3.2.1, "Control Rod Block Instrumentation," if required, to allow insertion of inoperable control rod and continued operation. -----</p> <p>A.1 Fully insert inoperable control rod.</p> <p><u>AND</u></p> <p>A.2 Disarm the associated CRD.</p> | <p>3 hours</p> <p>4 hours</p> |
| <p>B. One or more of the above requirements not met for reasons other than Condition A.</p> | <p>B.1 Place the reactor mode switch in the shutdown or refuel position.</p> | <p>Immediately</p> |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|--|
| <p>SR 3.10.8.1 Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1.</p> | <p>According to the applicable SRs</p> |

(continued)

5.6 Reporting Requirements (continued)

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
 1. The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) for Specification 3.2.1;
 2. The MINIMUM CRITICAL POWER RATIO (MCPR) for Specification 3.2.2;
 3. The period based detection algorithm (PBDA) setpoint for Function 2.f, Oscillation Power Range Monitor (OPRM) Upscale, for Specification 3.3.1.1; and
 4. The Allowable Values and power range setpoints for Rod Block Monitor Upscale Functions for Specification 3.3.2.1.
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:
 1. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version).
- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

(continued)

5.6 Reporting Requirements (continued)

5.6.6 Post Accident Monitoring (PAM) Instrumentation Report

When a report is required by Condition B or F of LCO 3.3.3.1, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.
