

1.1 Definitions

Shutdown margin (SDM)
(continued)

- a. All full length CEAs (shutdown and regulating) are fully inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CEAs verified fully inserted by two independent means, it is not necessary to account for a stuck CEA in the SDM calculation. With any CEAs not capable of being fully inserted, the reactivity worth of these CEAs must be accounted for in the determination of SDM, and
- b. There is no change in part length CEA position.

STAGGERED TEST BASIS

A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during n Surveillance Frequency intervals, where n is the total number of systems, subsystems, channels, or other designated components in the associated function.

THERMAL POWER

THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

$$\text{SDM} - T_{\text{avg}} > 200^{\circ}\text{F}$$

3.1.1

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM) - $T_{\text{avg}} > 200^{\circ}\text{F}$

LCO 3.1.1 SDM shall be within the limits specified in the COLR. |

APPLICABILITY: MODES 3 and 4.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--------------------------|---|-----------------|
| A. SDM not within limit. | A.1 Initiate boration to restore SDM to within limit. | 15 minutes |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|--|---|
| SR 3.1.1.1 Verify SDM is acceptable with increased allowance for the withdrawn worth of inoperable CEAs. | 1 hour after detection of inoperable CEA(s) and every 12 hours thereafter |
| SR 3.1.1.2 Verify SDM to be within the limits specified in the COLR. | 24 hours |

$$\text{SDM} - T_{\text{avg}} \leq 200^{\circ}\text{F}$$

3.1.2

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 SHUTDOWN MARGIN (SDM) - $T_{\text{avg}} \leq 200^{\circ}\text{F}$

LCO 3.1.2 SDM shall be within the limits specified in the COLR. |

APPLICABILITY: MODE 5.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--------------------------|---|-----------------|
| A. SDM not within limit. | A.1 Initiate boration to restore SDM to within limit. | 15 minutes |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|--|-----------|
| SR 3.1.2.1 Verify SDM to be within the limits specified in the COLR. | 24 hours |

3.1 REACTIVITY CONTROL SYSTEMS

3.1.3 Reactivity Balance

LCO 3.1.3 The core reactivity balance shall be within $\pm 1\% \Delta k/k$ of predicted values.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|-----------------|
| A. Core reactivity balance not within limit. | A.1 Re-evaluate core design and safety analysis and determine that the reactor core is acceptable for continued operation. | 7 days |
| | <u>AND</u> A.2 Establish appropriate operating restrictions and SRs. | 7 days |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 6 hours |

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Control Element Assembly (CEA) Alignment

LCO 3.1.5 All full length CEAs shall be OPERABLE and all full and part length CEAs shall be aligned to within 7 inches of all other CEAs in its group.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|---|--------------------|
| <p>A. One regulating CEA trippable and misaligned from its group by > 7 inches.</p> | <p>A.1 Initiate THERMAL POWER reduction in accordance with COLR requirements.</p> | <p>15 minutes</p> |
| | <p><u>AND</u></p> <p>A.2.1 Restore the misaligned CEA(s) to within 7 inches of its group.</p> | <p>2 hours</p> |
| | <p><u>OR</u></p> | <p>(continued)</p> |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|---|
| A. (continued) | A.2.2 Align the remainder of the CEAs in the group to within 7 inches of the misaligned CEA(s) while maintaining the insertion limit of LCO 3.1.7, "Regulating Control Element Assembly (CEA) Insertion Limits." | 2 hours |
| B. One shutdown CEA trippable and misaligned from its group by > 7 inches. | B.1 Initiate THERMAL POWER reduction in accordance with COLR requirements. <u>AND</u> B.2 Restore the misaligned CEA(s) to within 7 inches of its group. | 15 minutes 2 hours |

(continued)

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Shutdown Control Element Assembly (CEA) Insertion Limits

LCO 3.1.6 All shutdown CEAs shall be withdrawn to \geq 145 inches.

APPLICABILITY: MODE 1,
MODE 2 with any regulating CEA not fully inserted.

-----NOTE-----
This LCO is not applicable while performing SR 3.1.5.3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|--|-----------------|
| A. One or more shutdown CEA(s) not within limit. | A.1 Restore shutdown CEA(s) to within limit. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 6 hours |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|--|---|----------------------------------|
| A. (continued) | A.2 Reduce THERMAL POWER to less than or equal to the fraction of RTP allowed by the CEA group position and insertion limits specified in the COLR. | 2 hours |
| B. Regulating CEA groups inserted between the long term steady state insertion limit and the transient insertion limit for > 4 hours per 24 hour interval with COLSS in service. | B.1 Verify short term steady state insertion limits are not exceeded. <u>OR</u> B.2 Restrict increases in THERMAL POWER to $\leq 5\%$ RTP per hour. | 15 minutes 15 minutes |
| C. Regulating CEA groups inserted between the long term steady state insertion limit and the transient insertion limit for intervals > 5 effective full power days (EFPD) per 30 EFPD interval or > 14 EFPD per 365 EFPD interval with COLSS in service. | C.1 Restore regulating CEA groups to within limits. | 2 hours |

(continued)

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. 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 limits as 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 limits as 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.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---------------------------------------|-----------------|
| A. With COLSS in service and the COLSS calculated core power exceeding the COLSS calculated core power operating limit. | A.1 Restore the DNBR to within limit. | 1 hour |

(continued)

5.7 Reporting Requirements (continued)

5.7.1.4 (Deleted)

5.7.1.5 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. Specification 3.1.1, "SHUTDOWN MARGIN (SDM) - T_{avg} >200°F;"
2. Specification 3.1.2, "SHUTDOWN MARGIN (SDM) - T_{avg} ≤200°F;"
3. Specification 3.1.4, "Moderator Temperature Coefficient;"
4. Specification 3.1.5, "Control Element Assembly (CEA) Alignment;"
5. Specification 3.1.7, "Regulating CEA Insertion Limits;"
6. Specification 3.1.8, "Part Length Control Element Assembly Insertion Limits;"
7. Specification 3.2.1, "Linear Heat Rate;"
8. Specification 3.2.4, "Departure From Nucleate Boiling Ratio;"
9. Specification 3.2.5, "Axial Shape Index;"
10. Specification 3.9.1, "Boron Concentration."

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:

(continued)
