

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods, shall be OPERABLE and positioned within ± 18 steps (indicated position) when reactor power is $\leq 85\%$ RATED THERMAL POWER, or ± 12 steps (indicated position) when reactor power is $> 85\%$ RATED THERMAL POWER, of their group step counter demand position within one hour after rod motion.

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or mis-aligned from the group step counter demand position by more than ± 18 steps (indicated position) at $\leq 85\%$ RATED THERMAL POWER or ± 12 steps (indicated position) at $> 85\%$ RATED THERMAL POWER, be in HOT STANDBY within 6 hours.
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or mis-aligned from its group step counter demand position by more than ± 18 steps (indicated position) at $\leq 85\%$ RATED THERMAL POWER or ± 12 steps (indicated position) at $> 85\%$ RATED THERMAL POWER, POWER OPERATION may continue provided that within one hour either:
 1. Deleted
 2. The remainder of the rods in the bank with the inoperable rod are aligned to within ± 18 steps (indicated position) at $\leq 85\%$ RATED THERMAL POWER or ± 12 steps (indicated position) at $> 85\%$ RATED THERMAL POWER, of the inoperable rod while maintaining the rod sequence and insertion limits in the COLR per Specification 3.1.3.5. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.5 during subsequent operation, or
 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:

* See Special Test Exceptions 3.10.2 and 3.10.3.

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

- a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions.
- b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.
- c) A core power distribution measurement is obtained and $F_Q(Z)$ and $F_{\Delta H}^N$ are verified to be within their limits within 72 hours.
- d) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER. THERMAL POWER shall be maintained less than or equal to 75% of RATED THERMAL POWER until compliance with ACTIONS 3.1.3.1.c.3.a and 3.1.3.1.c.3.c above are demonstrated.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length rod* shall be determined to be within the limits established in the limiting condition for operation in accordance with the Surveillance Frequency Control Program (allowing for one hour thermal soak after rod motion) except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction in accordance with the Surveillance Frequency Control Program.

* Not required to be performed for rods associated with inoperable rod position indicator or demand position indicator.

TABLE 3.1-1

ACCIDENT ANALYSES REQUIRING REEVALUATION
IN THE EVENT OF AN INOPERABLE FULL LENGTH ROD

Rod Cluster Control Assembly Insertion Characteristics

Rod Cluster Control Assembly Mis-alignment

Loss Of Reactor Coolant From Ruptured Pipes Or From Cracks In Large Pipes
Which Actuates The Emergency Core Cooling System

Single Rod Cluster Control Assembly Withdrawal At Full Power

Major Reactor Coolant System Pipe Ruptures (Loss Of Coolant Accident)

Major Secondary System Pipe Rupture

Rupture of a Control Rod Drive Mechanism Housing (Rod Cluster Control
Assembly Ejection)

REACTIVITY CONTROL SYSTEMS

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2.1 The shutdown and control rod position indication (RPI) systems shall be OPERABLE and capable of determining the actual and demanded rod positions as follows:

- a. Analog rod position indicators;

All Shutdown Banks: ± 18 steps at $\leq 85\%$ reactor power or if reactor power is $> 85\%$ RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-230 steps.

Control Bank A: ± 18 steps at $\leq 85\%$ reactor power or if reactor power is $> 85\%$ RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-230 steps.

Control Bank B: ± 18 steps at $\leq 85\%$ reactor power or if reactor power is $> 85\%$ RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 160-230 steps.

Control Banks C and D: ± 18 steps at $\leq 85\%$ reactor power or if reactor power is $> 85\%$ RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal range of 0-230 steps.

-----Note-----

Individual RPIs are not required to be OPERABLE for 1 hour following movement of the associated rods.

- b. Group demand counters; ± 2 steps of the pulsed output of the Slave Cyclor Circuit over the withdrawal range of 0-230 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one analog rod position indicator per group inoperable either:
1. Determine the position of the non-indicating rod(s) indirectly using the power distribution monitoring system (if power is above 25% RTP) or using the movable incore detectors (if power is less than 25% RTP or the power distribution monitoring system is inoperable) at least once per 8 hours, or
 2. Verify the position of the non-indicating rod(s) indirectly using the power distribution monitoring system (if power is above 25% RTP) or using the movable incore detectors (if power is less than 25% or the power distribution monitoring system is inoperable) within 8 hours and once per 31 EFPD thereafter, and 8 hours after discovery of each unintended rod movement, and 8 hours after each movement of the non-indicating rod(s) greater than 12 steps, and prior to THERMAL POWER exceeding 50% RTP, and 8 hours after reaching RTP, or

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

3. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.
- b. With two or more analog rod position indicators per group inoperable:
 1. Immediately place the control rods in manual control, and
 2. Deleted
 3. Verify the position of the rods with inoperable position indicators indirectly using the power distribution monitoring system (if power is above 25% RTP) or using the movable incore detectors (if power is less than 25% RTP or the power distribution monitoring system is inoperable) at least once per 8 hours, and
 4. Within 24 hours* restore the inoperable rod position indicators to OPERABLE status such that a maximum of one rod position indicator per group is inoperable, or
 5. Be in HOT STANDBY within the next 6 hours.
- c. When one or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position:
 1. Determine the position of the non-indicating rod(s) indirectly using the power distribution monitoring system (if power is above 25% RTP) or using the movable incore detectors (if power is less than 25% RTP or the power distribution monitoring system is inoperable) within 8 hours, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.
- d. With a maximum of one group demand position indicator per bank inoperable either:
 1. Verify that all analog rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of 18 steps when reactor power is \leq 85% RATED THERMAL POWER or if reactor power is $>$ 85% RATED THERMAL POWER, 12 steps of each other at least once per 8 hours, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

* During the Unit 2 25th operating cycle, a one-time 30 hour allowed outage time is permitted to allow repair of the rod position indication Solatron transformer. This one-time change will cease to apply if Unit 2 enters Mode 3 prior to the S2R25 refueling outage.

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

4.1.3.2.1.1 Each analog rod position indicator* shall be determined to be OPERABLE by verifying that the demand position indication system and the rod position indication system agree within 18 steps when reactor power is \leq 85% RATED THERMAL POWER or if reactor power is $>$ 85% RATED THERMAL POWER, 12 steps (allowing for one hour thermal soak after rod motion) in accordance with the Surveillance Frequency Control Program except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indication system at least once per 4 hours.

4.1.3.2.1.2 Each of the above required rod position indicator(s) shall be determined to be OPERABLE by performance of a CHANNEL CALIBRATION in accordance with the Surveillance Frequency Control Program.

**Not required to be met for RPIs associated with rods that do not meet LCO 3.1.3.1*

REACTIVITY CONTROL SYSTEMS

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.3 The individual full length (shutdown and control) rod drop time from 230 steps withdrawn shall be less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

- a. T_{avg} greater than or equal to 541°F, and
- b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 & 2.

ACTION:

- a. With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.
- b. With the rod drop times within limits but determined with 3 reactor coolant pumps operating, operation may proceed provided THERMAL POWER is restricted to less than or equal to 76% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.1.3.3 The rod drop time of full length rods shall be demonstrated through measurement prior to reactor criticality:

- a. For all rods following each removal of the reactor vessel head,
- b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and
- c. In accordance with the Surveillance Frequency Control Program.

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.4 All shutdown rods shall be FULLY WITHDRAWN.

-----Note-----
Not applicable to shutdown banks inserted while performing SR 4.1.3.1.2

APPLICABILITY: MODES 1*, and 2*#@.

ACTION:

1. With one shutdown bank inserted ≤ 10 steps beyond FULLY WITHDRAWN; within 1 hour verify all control banks are within the insertion limits specified in the COLR and determine the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied; and within 24 hours restore the shutdown bank to FULLY WITHDRAWN or be in HOT STANDBY within the next 6 hours.
2. With a maximum of one shutdown rod not FULLY WITHDRAWN, for reasons other than Action 1, within one hour either:
 - a. FULLY WITHDRAW the rod, or,
 - b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.4 Each shutdown rod shall be determined to be FULLY WITHDRAWN by use of the group demand counters, and verified by the analog rod position indicators**:

- a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C, and D during an approach to reactor critically, and
- b. In accordance with the Surveillance Frequency Control Program thereafter.

* See Special Test Exceptions 3.10.2 and 3.10.3.

** Not required to be performed until 1 hour after rod motion.

@ Surveillance 4.1.3.4.a is applicable prior to withdrawing any control banks in preparation for startup (Mode 2).

With Keff greater than or equal to 1.0.

Note: This page effective prior to startup from fifth refueling outage scheduled to begin March 1990. Letter dated Jan. 11, 1990.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 The control banks shall be limited in physical insertion as specified in the CORE OPERATING LIMITS REPORT (COLR).

-----Note-----
Not applicable to control banks inserted while performing SR 4.1.3.1.2

APPLICABILITY: MODES 1*, and 2*#

ACTION:

1. With control bank A, B, or C inserted ≤ 10 steps beyond the insertion limits specified in the COLR; within 1 hour verify all shutdown banks are FULLY WITHDRAWN and determine the SHUTDOWN MARGIN requirement of 3.1.1.1 is satisfied; and within 24 hours restore the control bank to within the insertion limits specified in the COLR or be in HOT STANDBY within the next 6 hours.
2. With the control banks inserted beyond the above insertion limits, for reasons other than Action 1, either:
 - a. Restore the control banks to within the limits within two hours, or
 - b. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank position using the insertion limits specified in the CLOR, or
 - c. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

-----Note-----
Not required to be performed until 1 hour after associated rod motion.

4.1.3.5 The position of each control bank shall be determined to be within the insertion limits in accordance with the Surveillance Frequency Control Program by use of the group demand counters and verified by the analog rod position indicators except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify the individual rod positions at least once per 4 hours.

* See Special Test Exceptions 3.10.2 and 3.10.3

With Keff greater than or equal to 1.0

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