ATTACHMENT B

Marked-Up Current Technical Specification Pages

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION

REACTIVITY CONTROL

Applicability:

Applies to the operational status of the control rod system.

Objective:

To assure the ability of the control rod system to control reactivity.

Specification:

A. Reactivity Limitations

1. Reactivity margin - core loading

The core loading shall be limited to that which can be made subcritical in the most reactive condition during the operating cycle with the strongest operable control rod in its full-out position and all other operable rods fully inserted.

TS ref 3.3.A, Applicability

4.3 SURVEILLANCE REQUIREMENT

REACTIVITY CONTROL

Applicability:

Applies to the surveillance requirements of the control rod system.

Objective:

To verify the ability of the control rod system to control reactivity.

Specification:

A. Reactivity Limitations

1. Reactivity margin - core loading

Sufficient control rods shall be withdrawn following a refueling outage when core alterations were performed to demonstrate with a margin of 0.25 percent delta k that the core can be made subcritical at any time in the subsequent fuel cycle with the strongest operable control rod fully withdrawn and all other operable rods fully inserted.

TS ref 4.3.A.1, 3.3.A.2

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

2. Reactivity margin - inoperable control rods

a. Control rod drives which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing.

TSup 3.3.C, Actions

b. The control rod directional control valves for inoperable control rods shall be disarmed electrically and the

TSup 3.3.C, Actions

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

2. Reactivity margin - inoperable control rods

Each partially or fully withdrawn operable control rod shall be exercised one notch at least once each week. This test shall be performed at least once per 24 hours in the event power operation is continuing with three or more inoperable control rods or in the event power operation is continuing with one fully or partially withdrawn rod which cannot be moved and for which control rod drive mechanism damage has not been ruled out. The surveillance need not be completed within 24 hours if the number of inoperable rods has been reduced to less than three and if it has been demonstrated that control rod drive mechanism collet housing failure is not the cause of an immovable control rod.

TSup 4.3.C

TSup 4.3.C.1.b

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

control rods shall be in such positions that Specification 3.3.A.1 is met.

TS ref 3.3.C, Actions

c. Control rod drives which are fully inserted and electrically disarmed shall not be considered inoperable.

d. Control rods with scram times greater than those permitted by Specification 3.3.C are inoperable, but if they can be moved with control rod drive pressure, they need not be disarmed electrically if Specification 3.3.A.1 is met for each position of these rods.

TS ref 4.3.A.2 & 3.3.C Actions

e. During reactor power operation, the number of inoperable control rods shall not exceed eight.

TS ref 3.3.C, Action 4

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

3. The scram discharge volume vent and drain valves shall be verified open at least once per 31 days. These valves may be closed intermittently for testing under administrative control and at least once per 92 days, each valve shall be cycled through at least one complete cycle of full travel. At least once each Refueling Outage, the scram discharge volume vent and drain valves will be demonstrated to:

a. Close within 30 seconds after receipt of a signal for control rods to scram, and

b. Open when the scram signal is reset.

TSup 4.3.K

B. Control Rods

B. Control Rods

1. All control rods shall be coupled to their drive mechanisms when the mode switch is in "Startup" or "Run". With a control rod not coupled to its associated drive mechanism, operation may continue provided:
a. Below 20% power, the rod shall be declared inoperable, full inserted, and

TSup 3.3.H Applicability

TSup 3.3.H Applicability & Actions

1. Coupling Integrity

a. The coupling integrity of each control rod shall be demonstrated by

TSup 4.3.H

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

the directional control valves electrically disarmed until recoupling can be attempted at all-rods-in or at power levels above 20 percent power.

BWP 3.3.H, ACTIONS

b. Above 20% power, recoupling is being attempted

BWP 3.3.H ACTIONS

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

withdrawing each control rod to the fully withdrawn position and verifying that the rod does not go to the overtravel position;

BWP 4.3.H

i. Prior to reactor criticality after completing alteration of the reactor core,

BWP 4.3.H.1

ii. Anytime the control rod is withdrawn to the "Full out" position in subsequent operation, and

BWP 4.3.H.2

iii. For specifically affected invidiaual control rods following maintenance on or modification to the control rod or rod drive system which could affect the rod drive coupling integrity.

BWP 4.3.H.3

b. Normal operating practice is to observe the

BWP 3.3.H, 4.3.H, ACTIONS

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

in accordance with an established procedure or the rod shall be declared inoperable, fully inserted and the directional control valves electrically disarmed.

TSUP 3,3,H, Actions

BWP 3.3.J

2. The control rod drive housing support system shall be in place during reactor power operation and when the reactor coolant system is pressurized above atmospheric pressure with fuel in the reactor vessel, unless all control rods are fully inserted and Specification 3.3.A.1 is met.

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

expected response of the nuclear instrumentation to verify that the control rod is following its drive each time that control rod is withdrawn. For control rod drives that have experienced uncoupling and no response is discernable on the nuclear instrumentation, the response should be verified when the reactor is operating at power levels above 20 percent.

TSUP 3,3,H, 4,3,H, ACTIONS

2. The control rod drive drive housing support system shall be inspected after reassembly and the results of the inspection recorded.

TSUP 4,3,J

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

3. a. Control rod withdrawal sequences shall be established so that maximum reactivity that could be added by dropout of any increment of any one control blade would be such that the rod drop accident design limit of 280 cal/gm is not exceeded.

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

3. a. To consider the rod worth minimizer operable, the following steps must be performed:

TSUP 4.3.L.1

i. The control rod withdrawal sequence for the rod worth minimizer computer shall be verified as correct.

TSUP 4.3.L.1

ii. The rod worth minimizer computer on-line diagnostic test shall be successfully completed.

TSUP 4.3.L.1

iii. Proper annunciation of the select error of at least one out-of-sequence control rod in each fully inserted group shall be verified.

TSUP 4.3.L.2.a, 4.3.L.3.a

iv. The rod block function of the rod worth minimizer shall be verified by attempting to withdraw an out-of-sequence control rod beyond the block point.

TSUP 4.3.L.2.b, 4.3.L.3.b

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

b. Whenever the reactor is in the startup or run mode below 20% rated thermal power, the Rod Worth Minimizer shall be operable. A second operator or qualified technical person may be used as a substitute for an inoperable Rod Worth Minimizer which fails after withdrawal of at least 12 control rods to the fully withdrawn position. The Rod Worth Minimizer may also be bypassed for low power physics testing to demonstrate the shutdown margin requirements of specifications 3.3.A.1 if a nuclear engineer is present and verifies the step-by-step rod movements of the test procedure.

TS up 3.3.L, Applicability

TS up 3.3.L, Actions

TS up 3.3.L, Applicability

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

b. If the rod worth minimizer is inoperable while the reactor is in the startup or run mode below 20% rated thermal power and a second independent operator or engineer is being used, he shall verify that all rod positions are correct prior to commencing withdrawal of each rod group.

TS up 3.3.L Actions

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.3 SURVEILLANCE REQUIREMENT (Cont'd.)
4. Control rod shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per second.	4. Prior to control rod withdrawal for startup or during refueling verify that at least two source range channels have been observed count rate of at least three counts per second.
5. During operating with limiting control rod patterns, as determined by the nuclear engineer, either:	5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s) and daily thereafter.
a. Both RBM channels shall be operable; or	
b. Control rod withdrawal shall be blocked; or	
c. The operating power level shall be limited so the MCPR will remain above the MCPR fuel cladding integrity safety limit assuming a single error that results in complete withdrawal of any single operable control rod.	

RELOCATED TO TSUP 3/4.10

RELOCATED TO TSUP 3/4.10

TSUP 3.3.3 ACTIONS

TSUP 4.3.M

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

C. Scram Insertion Times

1. The average scram insertion time, based on the de-energization of the scram pilot valve solenoids as time zero, of all operable control rods in the reactor power operation condition shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (sec)
5	0.375
20	0.900
50	2.00
90	3.50

TS up 3.3.E

The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two by two array shall be no greater than:

TSup 3.3.F

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (sec)
5	0.398
20	0.954
50	2.120
90	3.800

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

C. Scram Insertion Times

1. After each refueling outage, prior to operation greater than 40 (30) percent of rated thermal power, all control rods shall be subject to scram-time tests from the fully withdrawn position with reactor pressure above 800 psig. If the control rods are tested individually, their hydraulic control units shall be isolated from the control rod drive pumps.

TS up 4.3.D

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.3 SURVEILLANCE REQUIREMENT (Cont'd.)
2. The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.	2. At ~~16 week~~ 120 day intervals, at least ~~50%~~ 10% of the control rod drives shall be tested as in 4.3.C.1 ~~so~~ that every 32 weeks all of the control rods shall have been tested. Whenever 50% or more of the control rod drives have been tested, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained.
	3. Following completion of each set of scram testing as described above, the results will be compared against the average scram speed distribution used in the transient analysis to verify the applicability of the current MCPR Operating Limit. Refer to Specification 3.5.L.
D. Control Rod Accumulators	D. Control Rod Accumulators
At all reactor operating pressures, a rod accumulator may be inoperable provided that no other control rod in the ~~nine-rod~~ square array around this rod has a:	Once a shift check the status of the pressure and level alarms for each accumulator.
1. Inoperable accumulator,	
2. Directional control valve electrically disarmed while in a non-fully inserted position.	

TS up 3.3.D

TS up 4.3.D.1

RELOCATED TO TS up 3/4.11

7 days

TS up 4.3.G

TS up 3.3.G Applicability & Actions

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)	4.3 SURVEILLANCE REQUIREMENT (Cont'd.)
3. Scram insertion greater than maximum permissible insertion time. If a control rod with an inoperable accumulator is inserted "full-in" and its directional control valves are electrically disarmed, it shall not be considered to have an inoperable accumulator and the rod block associated with that inoperable accumulator may be bypassed.	
E. Reactivity Anomalies	E. Reactivity Anomalies
The reactivity equivalent of the difference between the actual critical rod configuration and the expected configuration during power operation shall not exceed 1% delta K. If this limit is exceeded, the reactor will be shutdown until the cause has been determined and corrective actions have been taken if such actions are appropriate. In accordance with Specification 6.6, the NRC shall be notified of this reportable occurrence within 24 hours.	During the startup test program and startups following refueling outages, the critical rod configurations will be compared to the expected configurations at selected operating conditions. These comparisons will be used as base data for reactivity monitoring during subsequent power operation throughout the fuel cycle. At specific power operating conditions, the critical rod configuration will be compared to the configuration expected based upon appropriately corrected past data. This comparison will be made at least every equivalent full power month.

TSup 3,3,G Bypl. & Actions

TSup 3,3,B

TSup 3,3,B

TSup 4,3,B,1

TSup 4.3.B.2

FOR INFORMATION ONLY

3.3 LIMITING CONDITION FOR OPERATION (Cont'd.)

F. If Specifications 3.3.A through D above are not met, an orderly shutdown shall be initiated and the reactor shall be in the Cold Shutdown condition within 24 hours.

G. Economic Generation Control System

Operation of the unit with the Economic Generation Control System with automatic flow control shall be permissible only in the range of 65-100% of rated core flow, with reactor power above 20%.

BWP 3.3.N

4.3 SURVEILLANCE REQUIREMENT (Cont'd.)

F. (N/A)

12 hours

G. Economic Generation Control System (EGCS)

Prior to entering EGCS and once per shift while operating in EGCS, the EGCS operating parameters will be reviewed for acceptability.

BWP 4.3.N

Each individual BWR Station has it own issue-specific shutdown requirements.

3921a

3.3/4.3 REACTIVITY CONTROL

LIMITING CONDITIONS FOR OPERATION

Applicability:

Applies to the operational status of the control rod system.

Objective:

To assure the ability of the control rod system to control reactivity.

SURVEILLANCE REQUIREMENTS

Applicability:

Applies to the surveillance requirements of the control rod system.

Objective:

To verify the ability of the control rod system to control reactivity.

SPECIFICATIONS

TSUP 4.3.A.1 & 3.3.A.2

A. Reactivity Limitations

1. Reactivity margin - core loading

   The core loading shall be limited to that which can be made subcritical in the most reactive condition during the operating cycle with the strongest operable control rod in its full-out position and all other operable rods fully inserted.

TSUP 3.3.A, Applicability

2. Reactivity margin - inoperable control rods

   a. Control rod drives which cannot be moved with control rod drive pressure shall be considered inoperable except as in c below. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing.

TSUP 3.3.C, Actions

   b. The control rod directional control valves for inoperable control rods shall be disarmed electrically and

TSUP 3.3.C, Actions

A. Reactivity Limitations

1. Reactivity margin - core loading

   Sufficient control rods shall be withdrawn following a refueling outage when core alterations were performed to demonstrate with a margin of 0.25% Δk that the core can be made subcritical at any time in the subsequent fuel cycle with the strongest operable control rod fully withdrawn and all other operable rods fully inserted.

TSUP 4.3.C

2. Reactivity margin - inoperable control rods

   Each partially or fully withdrawn operable control rod shall be exercised one notch at least once each week. This test shall be performed at least once per 24 hours in the event power operation is continuing ~~with three or more inoperable control rods~~ or in the event power operation is continuing with one fully or partially withdrawn rod which cannot be moved and for which control rod drive mechanism damage has not been ruled out. The surveillance need not be completed within 24 hours if the number of inoperable rods has been reduced to less than three and if it has been demonstrated that control rod drive mechanism collet hous-

TSUP 4.3.C.1b

TSUB 3.3.C, ACTIONS

the control rods shall be in such positions that Specification 3.3.A.1 is met except as in d below.

c. Control rod drives which are fully inserted and electrically disarmed shall not be considered inoperable.

ing failure is not the cause of an immovable control rod.

FOR INFORMATION ONLY

TSUP 4.3.A.2 & 3.3.C, ACTIONS

d. Control rods with scram times greater than those permitted by Specification 3.3.C are inoperable, but if they can be moved with control rod drive pressure they need not be disarmed electrically if Specification 3.3.A.1 is met for each position of these rods.

TSUP 3.3.C, ACTION 4

e. During reactor power operation, the number of inoperable control rods shall not exceed eight.

3. Rod Position Indication System

TSUP 3.3.I,

a. The position of a control rod shall be determined from the rod position indication system (RPIS).

TSUP 3.3.I, ACTIONS

b. If the position of a control rod cannot be determined from the RPIS, such control rod shall be moved to a known position or fully inserted, scrammed, and considered inoperable.

TSUP 4.3.I

24 hrs

3. Rod Position Indication System

a. Once per ~~shift~~ during power operation and during control rod withdrawal the control rod display shall be observed for control rod position indication.

b. All control rods that have been fully inserted and scrammed shall be given an insert signal once per shift.

B. Control Rods

TSUP 4.3.H

1. Each control rod shall be coupled to its drive or completely inserted and the control rod directional or control valves disarmed electrically.

TSUP 3.3.H LCO, ACTIONS

B. Control Rods

1. The coupling integrity shall be verified for each withdrawn control rod as follows:

a. When the rod is withdrawn the first time subsequent to each refueling outage or after maintenance, observe discernible response of the nuclear instrumentation; however, for initial rods when response is not discernible, subsequent exercising of these rods after the reactor is critical shall be performed to verify instrumentation response.

TSUP 4.3.H

b. When the rod is fully withdrawn the first time subsequent to each refueling outage or after maintenance, observe that the drive does not go to the overtravel position.

2. This requirement does not apply in the refuel condition when the reactor is vented. Two control rod drives may be removed as long as Specification 3.3.A.1 is met.

TSUP 3.3.H, Applicability

2. The control rod drive housing support system shall be inspected after reassembly ~~and the results of the inspection recorded.~~

TSUP 4.3.J

FOR INFORMATION ONLY

QUAD-CITIES
DPR-30

TSUP 3.3.J ACTIONS, APPLICABILITY

3. The control rod drive housing support system shall be in place during reactor power operation and when the reactor coolant system is pressurized above atmospheric pressure with fuel in the reactor vessel unless all control rods are fully inserted and Specification 3.3.A.1 is met.

a. Control rod withdrawal sequences shall be established so that maximum reactivity that could be added by dropout of any increment of any one control blade would be such that the rod drop accident design limit of 280 cal/gm. is not exceeded.

TSUP 3.3.L, APPLICABILITY

b. Whenever the reactor is in the Startup/Hot Standby or Run mode below 20% rated thermal power, the rod worth minimizer shall be operable. A second operator or qualified technical person may be used as a substitute for an inoperable rod worth minimizer which fails after withdrawal of at least 12 control rods to the fully withdrawn position. The rod worth minimizer may also be bypassed for low power physics testing to demonstrate the shutdown margin requirements of Specification 3.3.A if a nuclear engineer is present and verifies the step-by-step rod movements of the test procedure.

TSUP 3.3.L, ACTIONS

TSUP 3.3.L, APPLICABILITY

4. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per seconds and these SRM's are fully inserted.

RELOCATED TO BUP 3/4.10

5. During operation with limiting control rod patterns, as determined by the nuclear engineer, either:

TSUP 3.3.M ACTIONS

a. both RBM channels shall be operable.

b. control rod withdrawal shall be blocked; or

TSUP 4.3.L

3. The correctness of the control rod withdrawal sequence input to the RWM computer shall be verified after loading the sequence.

Prior to the start of control rod withdrawal towards criticality, the capability of the rod worth minimizer to properly fulfill its function shall be verified by the following checks:

4.3.L.1

a. The RWM computer on line diagnostic test shall be successfully performed.

4.3.L.2.2, 4.3.L.3.a

b. Proper annunciation of the selection error of one out-of-sequence control rod shall be verified.

TSUP 4.3.L.2.b & 4.3.L.3.b

c. The rod block function of the RWM shall be verified by withdrawing the first rod as an out-of-sequence control rod no more than to the block point.

RELOCATED TO TSUP 3/4.10

4. Prior to control rod withdrawal for startup or during refueling, verify that a least two source range channels have an observed count rate of at least three counts per second.

TSUP 4.3.M

5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s) and daily thereafter.

TSUP 4.3.K

6. The scram discharge volume vent and drain valves shall be verified open at least once per 31 days. Theses valves may be closed intermittently for testing under administrative control and at least once per 92 days, each valve shall be cycled through at least one complete cycle of full travel. At least once each Refueling Outage, the scram discharge volume vent and drain valves will be demonstrated to:

a. Close within 30 seconds after receipt of a signal for control rods to scram, and

b. Open when the scram signal is reset.

BWP 3.3.M, ACTIONS

c. the operating power level shall be limited so that the MCPR will remain above the MCPR fuel cladding integrity safety limit assuming a single error that results in complete withdrawal of any single operable control rod

C. Scram Insertion Times

1. The average scram insertion time, based on the deenergization of the scram pilot valve solenoids at time zero, of all operable control rods in the reactor power operation condition shall be no greater than:

% Inserted From Fully Withdrawn	Average Scram Insertion Times (sec)
5	0.375
20	0.900
50	2.00
90	3.50

BWP 3.3.E

The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two by two array shall be no greater than:

BWP 3.3.F

% Inserted From Fully Withdrawn	Average Scram Times (sec)
5	0.398
20	0.954
50	2.12
90	3.80

2. The maximum scram insertion time for 90% insertion of any operable control rods shall not exceed 7 seconds.

BWP 3.3.D

3. If Specification 3.3.C.1 cannot be met, the reactor shall not be made supercritical; if operating, the reactor shall be shut down immediately upon determination that average scram time is deficient.

4. If Specification 3.3.C.2 cannot be met, the deficient control rod shall be con-

BWP 3.3.D, 3.3.C

C. Scram Insertion Times

40%

1. After refueling outage and prior to operation above 30% power, with reactor pressure above 800 psig, all control rods shall be subject to scram-time measurements from the fully withdrawn position. The scram times for single rod scram testing shall be measured without reliance on the control rod drive pumps.

BWP 4.3.D

BWP 4.3.P

2. All control rod drives shall have experienced scram test measurements each year. Also, 50% of the control rod drives in each quadrant of the reactor core shall be measured for the scram times specified in Specification 3.3.C during the interval not more frequently than 16 weeks ~~nor less frequently than 32 weeks~~. These tests shall be performed with a reactor pressure above 800 psig and may be measured during a reactor ~~scram.~~ Whenever all of the control rod drive scram times have been measured, an evaluation shall be made to

10%

120 days

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sidered inoperable, fully inserted into the core, and electrically disarmed.

5. If the overall average of the 20% insertion scram time data generated to date in the current cycle exceeds the limit specified in the CORE OPERATING LIMITS REPORT, the MCPR operating limit must be modified as required by Specification 3.5.K.

provide reasonable assurance that proper control rod drive performance is being maintained. The results of measurements performed on the control rod drives shall be submitted in the annual operating report to the NRC.

5. The cycle cumulative mean scram time for 20% insertion will be determined immediately following the testing required in Specifications 4.3.C.1 and 4.3.C.2 and the MCPR operating limit adjusted, if necessary, as required by Specification 3.5.K.

D. Control Rod Accumulators

At all reactor operating pressures, a rod accumulator may be inoperable provided that no other control rod in the nine-rod square array around that rod has:

1. An inoperable accumulator,

2. A directional control valve electrically disarmed while in a nonfully inserted position, or

3. A scram insertion greater than maximum permissible insertion time.

If a control rod with an inoperable accumulator is inserted full-in and its directional control valves are electrically disarmed, it shall not be considered to have an inoperable accumulator, and the rod block associated with that inoperable accumulator may be bypassed.

D. Control Rod Accumulators

Once a shift, check the status of the pressure and level alarms for each accumulator.

E. Reactivity Anomalies

The reactivity equivalent of the difference between the actual critical rod configuration and the expected configuration during power operation shall not exceed 1% Δ k. If this limit is exceeded, the reactor shall be shutdown until the cause has been determined and corrective actions have been taken. In accordance with Specification 6.6, the NRC shall be notified of this reportable occurrence within 24 hours.

E. Reactivity Anomalies

During the startup test program and startups following refueling outages, the critical rod configurations will be compared to the expected configurations at selected operating conditions. These comparisons will be used as base data for reactivity monitoring during subsequent power operation throughout the fuel cycle. At specific power operating conditions, the critical rod configuration will be compared to the configuration expected based upon appropriately corrected past data. This comparison will be made at least every equivalent full power month.

F. Economic Generation Control System

Operation of the unit with the economic generation control system with automatic flow control shall be permissible only in the range of 65% to 100% of rated core flow, with reactor power above 20%.

F. Economic Generation Control System

Prior to entering EGC and once per shift while operating in EGC, the EGC operating parameters will be reviewed for acceptability.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

G. If Specifications 3.3.A through D above are not met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

Each individual TSUP Section has its own issue specific shutdown requirement.

ATTACHMENT C

Marked-Up BWR/4 STS Pages

TSUP MARK-UP INSTRUCTIONS 3/4.3

FOR INFORMATION ONLY

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 SHUTDOWN MARGIN (SDM)

LIMITING CONDITION FOR OPERATION

3.1.1 The SHUTDOWN MARGIN (SDM) shall be equal to or greater than:

a. (0.38)% delta k/k with the highest worth control rod analytically determined, or

b. (0.28)% delta k/k with the highest worth control rod determined by test.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4 and 5.

ACTION:

With the SHUTDOWN MARGIN less than specified:

a. In OPERATIONAL ~~CONDITION~~ MODE 1 or 2, ~~reestablish~~ restore the required SHUTDOWN MARGIN within 6 hours or be in at least HOT SHUTDOWN within the next 12 hours.

b. In OPERATIONAL ~~CONDITION~~ MODE 3 or 4, immediately verify all insertable control rods to be fully inserted and suspend all activities that could reduce the SHUTDOWN MARGIN. In OPERATIONAL ~~CONDITION~~ MODE 4, establish SECONDARY CONTAINMENT INTEGRITY within 8 hours.

c. In OPERATIONAL ~~CONDITION~~ MODE 5, suspend CORE ALTERATIONS* and other activities that could reduce the SHUTDOWN MARGIN and fully insert all insertable control rods within 1 hour. Establish SECONDARY CONTAINMENT INTEGRITY within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.1 The SHUTDOWN MARGIN shall be determined to be equal to or greater than that specified at any time during the ~~fuel~~ operating cycle:

a. By measurement, prior to or during the first startup after each refueling outage

b. By measurement, within 500 MWD/T prior to the core average exposure at which the predicted SHUTDOWN MARGIN, including uncertainties and calculation biases, is equal to the specified limit.

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c. Within ~~one~~ 24 hours after detection of a withdrawn control rod that is immovable, as a result of excessive friction or mechanical interference, or is ~~untrippable~~ unscrammable, ~~except that~~ the ~~above~~ required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or ~~untrippable~~ unscrammable control rod.

known to be unscrammable

*Except movement of IRMs, SRMs or special movable detectors.

By calculation, prior to each fuel movement during the fuel loading sequence.

FOR INFORMATION ONLY

3/4.1.2 REACTIVITY ANOMALIES

LIMITING CONDITION FOR OPERATION

3.1.2 The reactivity equivalence of the difference between the actual ROD DENSITY and the predicted ROD DENSITY shall not exceed 1% ~~delta~~ Δ k/k.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1 and 2.

ACTION:

With the reactivity equivalence difference exceeding 1% ~~delta~~ Δ k/k:

a. Within 12 hours perform an analysis to determine and explain the cause of the reactivity difference; operation may continue if the difference is explained and corrected.

b. ~~Otherwise~~, be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.2 The reactivity equivalence of the difference between the actual ROD DENSITY and the predicted ROD DENSITY shall be verified to be less than or equal to 1% ~~delta~~ Δ k/k:

a. During the first startup following CORE ALTERATIONS, and

b. At least once per 31 effective full power days during POWER OPERATION.

FOR INFORMATION ONLY

3/4.1.3 CONTROL RODS

CONTROL ROD OPERABILITY

LIMITING CONDITION FOR OPERATION

3.1.3.1 All control rods shall be OPERABLE.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(s) 1 and 2.

ACTION:

a. With one control rod inoperable due to being immovable, as a result of excessive friction or mechanical interference, or known to be ~~untrippable~~ unscrammable:

1. Within one hour:

a) Verify that the inoperable control rod, if withdrawn, is separated from all other inoperable control rods by at least two control cells in all directions.

b) Disarm the associated directional control valves** either:

1) Electrically, or

2) Hydraulically by closing the drive water and exhaust water isolation valves.

c) Comply with Surveillance Requirement 4.1.1.c.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

2. Restore the inoperable control rod to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.

b. With one or more control rods ~~trippable~~ but inoperable for causes other than addressed in ACTION a, above:

1. If the inoperable control rod(s) is withdrawn, within one hour:

a) Verify that the inoperable withdrawn control rod(s) is separated from all other inoperable withdrawn control rods by at least two control cells in all directions, and

b) Demonstrate the insertion capability of the inoperable withdrawn control rod(s) by inserting the control rod(s) at least one notch by drive water pressure within the normal operating range*.

Otherwise, insert the inoperable withdrawn control rod(s) and disarm the associated directional control valves** either:

a) Electrically, or

b) Hydraulically by closing the drive water and exhaust water isolation valves.

---

*The inoperable control rod may then be withdrawn to a position no further withdrawn than its position when found to be inoperable.

**May be rearmed intermittently, under administrative control, to permit testing associated with restoring the control rod to OPERABLE status.

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

2. If the inoperable control rod(s) is fully inserted, within one hour disarm the associated directional control valves** either:

a) Electrically, or

b) Hydraulically by closing the drive water and exhaust water isolation valves.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

3. With the provisions of ACTION 2 above not met

3. The provisions of Specification 3.0.4 are not applicable.

c. With more than 8 control rods inoperable, be in at least HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The scram discharge volume drain and vent valves shall be demonstrated OPERABLE by:

a. At least once per 31 days verifying each valve to be open,* and

b. At least once per 92 days cycling each valve through at least one complete cycle of full travel.

4.1.3.1.2 When above the ~~preset power level~~ (low power setpoint) of the RWM and RSCS, all withdrawn control rods not required to have their directional control valves disarmed electrically or hydraulically shall be demonstrated OPERABLE by moving each control rod at least one notch:

a. At least once per 7 days, and

b. At least once per 24 hours when any control rod is immovable as a result of excessive friction or mechanical interference or known to be unscrammable.

4.1.3.1.3 All control rods shall be demonstrated OPERABLE by performance of Surveillance Requirements 4.1.3.2, 4.1.3.4, 4.1.3.5, 4.1.3.6 and 4.1.3.7.

4.3.D 4.3.F 4.3.G 4.3.H 4.3.I

*These valves may be closed intermittently for testing under administrative controls.

**May be rearmed intermittently, under administrative control, to permit testing associated with restoring the control rod to OPERABLE status.

FOR INFORMATION ONLY

INSERT FOR p 3/4 1-4

TSUP 3/4.3.K SDV LCOs

d. With one scram discharge volume vent valve and/or one scram discharge volume drain valve inoperable and open, restore the inoperable valve(s) to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours.

e. With any scram discharge volume vent valve(s) and/or any scram discharge volume drain valve(s) otherwise inoperable, restore the inoperable valve(s) to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours.

FOR INFORMATION ONLY

TSCR 3/4.3.K

SURVEILLANCE REQUIREMENTS (Continued)

4.1.3.1.4 The scram discharge volume shall be determined OPERABLE by demonstrating:

a. The scram discharge volume drain and vent valves OPERABLE, when control rods are scram tested from a normal control rod configuration of less than or equal to (50)% ROD DENSITY at least once per 18 months, by verifying that the drain and vent valves:

1. Close within (30) seconds after receipt of a signal for control rods to scram, and

2. Open when the scram signal is reset.

b. Proper (~~float~~) (level sensor) response by performance of a CHANNEL FUNCTIONAL TEST of the scram discharge volume scram and control rod block level instrumentation (ΔT level measuring system) (~~after each scram from a pressurized condition~~) (at least once per 31 days).

1. Proper float response by verification of proper switch actuation within 72 hours after each scram from a pressurized condition greater than or equal to [illegible] psig.)

* The provisions of Specification 4.0.4 are not applicable for entry into OPERATIONAL CONDITION 2 provided the surveillance is performed within 12 hours after reducing RCS T_avg to less than or equal to 200°F and ROD DENSITY.

FOR INFORMATION ONLY

CONTROL ROD MAXIMUM SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.2 The maximum scram insertion time of each control rod from the fully withdrawn position to notch position (5), based on de-energization of the scram pilot valve solenoids as time zero, shall not exceed (7.0) seconds.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1 and 2.

ACTION:

a. With the maximum scram insertion time of one or more control rods exceeding the above maximum scram insertion time (7) seconds:

1. Declare the control rod(s) with the slow insertion time inoperable, and

2. Perform the Surveillance Requirements of Specification 4.1.3.2.c at least once per 60 days of POWER OPERATION when operation is continued with three or more ~~control~~ rods with maximum scram insertion times in excess of (7.0) seconds.

Otherwise, be in at least HOT SHUTDOWN within 12 hours.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.2 The maximum scram insertion time of the control rods shall be demonstrated through measurement with reactor coolant pressure greater than or equal to 950 psig and, during single control rod scram time tests, the control rod drive pumps isolated from the accumulators:

a. For all control rods prior to THERMAL POWER exceeding 40% of RATED THERMAL POWER following CORE ALTERATIONS* or after a reactor shutdown that is greater than 120 days.

b. For specifically affected individual control rods following maintenance on or modification to the control rod or control rod drive system which could affect the scram insertion time of those specific control rods, and

c. For at least 10% of the control rods, on a rotating basis, at least once per 120 days of POWER OPERATION.

*Except movement of SRM, IRM, or special movable detectors or normal control rod movement.

(2) The provisions of Specification 4.0.D are not applicable provided this surveillance is conducted prior to exceeding 40% of RATED THERMAL POWER.

FOR INFORMATION ONLY

CONTROL ROD AVERAGE SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.3 The average scram insertion time of all OPERABLE control rods from the fully withdrawn position, based on de-energization of the scram pilot valve solenoids as time zero, shall not exceed any of the following:

% Inserted	Position Inserted From Fully Withdrawn	Average Scram Insertion Time (Seconds)
5	(45)	~~(0.43)~~ 0.375
20	(39)	(0.86) 0.900
50	(25)	(1.93) 2.6
90	(05)	(3.49) 3.50

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1 and 2.

ACTION:

With the average scram insertion time exceeding any of the above limits, be in at least HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.3 ~~All~~ The control rods average scram times shall be demonstrated OPERABLE by scram time testing from the fully withdrawn position as required by Surveillance Requirement ~~4.1.3.2~~ 4.3.D.

FOR INFORMATION ONLY

REACTIVITY CONTROL SYSTEMS

FOUR CONTROL ROD GROUP SCRAM INSERTION TIMES

LIMITING CONDITION FOR OPERATION

3.1.3.4 The average scram insertion times from the fully withdrawn position, for the three fastest control rods in each group of four control rods arranged in a two-by-two array, based on deenergization of the scram pilot valve solenoids as time zero, shall not exceed any of the following:

Position Inserted From Fully Withdrawn	Average Scram Insertion Time (Seconds)
5	(0.43)
20	(0.86)
50	(1.93)
90	(3.49)

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ 1 and 2.

ACTION:

a. With the average scram insertion times of control rods exceeding the above limits:

1. Declare the control rods with the slower than average scram insertion times inoperable until an analysis is performed to determine that required scram reactivity remains for the slow four control rod group, and

2. Perform the Surveillance Requirements of Specification 4.1.3.2.c at least once per 60 days when operation is continued with an average scram insertion time(s) in excess of the average scram insertion time limit.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.4 All control rods shall be demonstrated OPERABLE by scram time testing from the fully withdrawn position as required by Surveillance Requirement 4.1.3.2.

FOR INFORMATION ONLY

REACTIVITY CONTROL SYSTEMS

CONTROL ROD SCRAM ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.1.3.5 All control rod scram accumulators shall be OPERABLE.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2 and 5*.

ACTION:

a. In OPERATIONAL ~~CONDITIONS~~ MODE 1 or 2:

1. With one control rod scram accumulator inoperable, within 8 hours:

a) Restore the inoperable accumulator to OPERABLE status, or

b) Declare the control rod associated with the inoperable accumulator inoperable.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

2. With more than one control rod scram accumulator inoperable, declare the associated control rods inoperable and:

a) If the control rod associated with any inoperable scram accumulator is withdrawn, immediately verify that at least one control rod drive pump is operating by inserting at least one withdrawn control rod at least one notch, or place the reactor mode switch in the Shutdown position.

b) Fully insert the inoperable control rods and disarm the associated control valves* either:

1) Electrically, or

2) Hydraulically by closing the drive water and exhaust water isolation valves.

Otherwise, be in at least HOT SHUTDOWN within 12 hours.

b. In OPERATIONAL ~~CONDITION~~ MODE 5:

1. With one withdrawn control rod with its associated scram accumulator inoperable, fully insert the affected control rod and disarm the associated directional control valves* within one hour, either:

a) Electrically, or

b) Hydraulically by closing the drive water and exhaust water isolation valves.

2. With more than one withdrawn control rod with the associated scram accumulator inoperable or no control rod drive pump operating, immediately place the reactor mode switch in the Shutdown position.

c. ~~The provisions of Specification 3.0.4 are not applicable.~~ In OPERATIONAL MODE 5, this Specification is applicable for ~~At least~~ the accumulators associated with each withdrawn control rod ~~s~~ except that is not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

* May be valved intermittently, under administrative control, to permit testing associated with restoring the control rod to OPERABLE status.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS

4.3.9 4.1.3.5 Each control rod scram accumulator shall be determined OPERABLE:

a. At least once per 7 ~~days~~ by verifying that the indicated pressure is ~~(940) + (30), -(0)~~ psig unless the control rod is inserted and disarmed or scrammed. greater than or equal to ~~(940)~~ 800 psig

b. At least once per 18 months by:

1. Performance of a:

a) CHANNEL FUNCTIONAL TEST of the leak detectors, and

b) CHANNEL CALIBRATION of the pressure detectors, and verifying an alarm setpoint of (940) + (30), -(0) psig on decreasing pressure.

2. ~~(Verifying)~~ {Measuring and recording the time for up to 10 minutes} that {each individual} accumulator check valve maintains {the associated} accumulator pressure above the alarm set point ~~{for greater than or equal to 10 minutes)~~ with no control rod drive pump operating.

REACTIVITY CONTROL SYSTEMS

FOR INFORMATION ONLY

CONTROL ROD DRIVE COUPLING

LIMITING CONDITION FOR OPERATION

3.~~1.3.6~~ All control rods shall be coupled to their drive mechanisms.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2 and 5*.

ACTION:

a. In OPERATIONAL ~~CONDITION~~ MODE 1 and 2 with one control rod not coupled to its associated drive mechanism, within 2 hours:

1. If permitted by the RWM ~~and RSCS~~, insert the control rod drive mechanism to accomplish recoupling and verify recoupling by withdrawing the control rod, and:

a) Observing any indicated response of the nuclear instrumentation, and

b) Demonstrating that the control rod will not go to the overtravel position.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

2. If recoupling is not accomplished ~~on the first attempt or, if not permitted by the RWM or RSCS, then until permitted by the RWM and RSCS,~~ declare the control rod inoperable, insert the control rod and disarm the associated directional control valves** either:

a) Electrically, or

b) Hydraulically by closing the drive water and exhaust water isolation valves.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. In OPERATIONAL CONDITION 5* with a withdrawn control rod not coupled to its associated drive mechanism, within 2 hours ~~either~~:

1. Insert the control rod to accomplish recoupling and verify recoupling by withdrawing the control rod and demonstrating that the control rod will not go to the overtravel position, or

2. If recoupling is not accomplished, insert the control rod and disarm the associated directional control valves** either:

a) Electrically, or

b) Hydraulically by closing the drive water and exhaust water isolation valves.

~~c. The provisions of Specification 3.0.4 are not applicable.~~

*~~At least each~~ withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

**May be rearmed intermittently, under administrative control, to permit testing associated with restoring the control rod to OPERABLE status.

FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS

3.4

4.1.3.6 Each affected control rod shall be demonstrated to be coupled to its drive mechanism by observing any indicated response of the nuclear instrumentation while withdrawing the control rod to the fully withdrawn position and then verifying that the control rod drive does not go to the overtravel position:

1 a. Prior to reactor criticality after completing CORE ALTERATIONS that could have affected the control rod drive coupling integrity,

2 b. Anytime the control rod is withdrawn to the "Full out" position in subsequent operation, and

3 c. Following maintenance on or modification to the control rod or control rod drive system which could have affected the control rod drive coupling integrity.

FOR INFORMATION ONLY

REACTIVITY CONTROL SYSTEMS

CONTROL ROD POSITION INDICATION (Optional, non-solid state RSCS)

LIMITING CONDITION FOR OPERATION

3.1.3.7 The control rod position indication system shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 5*.

ACTION:

a. In OPERATIONAL CONDITION 1 or 2:

1. With one or more control rod position indicators inoperable, except for the "Full-in" or "Full-out" indicators, within one hour:

a) Determine the position of the control rod by (an alternate method), or

b) Move the control rod to a position with an OPERABLE position indicator, or

c) When THERMAL POWER is:

1) Within the (preset power level) (low power setpoint) of the RSCS, declare the control rod inoperable, or

2) Greater than the (preset power level) (low power setpoint) of the RSCS, declare the control rod inoperable, insert the control rod and disarm the associated directional control valves** either:

(a) Electrically, or

(b) Hydraulically by closing the drive water and exhaust water isolation valves.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

N/A to D/A

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* At least each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

** May be rearmed intermittently, under administrative control, to permit testing associated with restoring the control rod to OPERABLE status.

FOR INFORMATION ONLY

REACTIVITY CONTROL SYSTEMS

CONTROL ROD POSITION INDICATION (Optional, solid-state RSCS)

LIMITING CONDITION FOR OPERATION

3.1.3.7 The control rod position indication system shall be OPERABLE.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1, 2 and 5*.

ACTION:

a. In OPERATIONAL ~~CONDITION~~ MODE 1 or 2 with one or more control rod position indicators inoperable, within one hour:

1. Determine the position of the control rod by an alternate method, or

2. Move the control rod to a position with an OPERABLE position indicator, or

3. When THERMAL POWER is:

a) Within the (preset power level) (low power setpoint) of the RSCS:

1) Declare the control rod inoperable, and

2) Verify the position and bypassing of control rods with inoperable "Full-in" and/or "Full-out" position indicators by a second licensed operator or other technically qualified member of the unit technical staff.

b) Greater than the (preset power level) (low power setpoint) of the RSCS, declare the control rod inoperable, insert the control rod and disarm the associated directional control valves** either:

1) Electrically, or

2) Hydraulically by closing the drive water and exhaust water isolation valves.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. In OPERATIONAL CONDITION 5* with a withdrawn control rod position indicator inoperable, move the control rod to a position with an OPERABLE position indicator or fully insert the control rod.

c. The provisions of Specification 3.0.4 are not applicable.

~~At least each~~ withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

**May be rearmed intermittently, under administrative control, to permit testing associated with restoring the control rod to OPERABLE status.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

2. With one or more control rod "Full-in" and/or "Full-out" position indicators inoperable, either:

   a) When THERMAL POWER is within the (preset power level) (low power setpoint) of the RSCS:

      1) Within one hour:

         (a) Determine the position of the control rod(s) by (an alternate method), or

         (b) Move the control rod to a position with an OPERABLE position indicator, or

         (c) Declare the control rod inoperable.

      2) Verify the position and bypassing of control rods with operable "Full-in and/or Full-out" position indicators by a second licensed operator or other technically qualified member of the unit technical staff.

   b) When THERMAL POWER is greater than the (preset power level) (low power setpoint) of the RSCS, determine the position of the control rod(s) by (an alternate method).

   Otherwise, be in at least HOT SHUTDOWN within 12 hours.

b. In OPERATIONAL CONDITION 5* with a withdrawn control rod position indicator inoperable, move the control rod to a position with an OPERABLE position indicator or insert the control rod.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.3.7 The control rod position indication system shall be determined OPERABLE by verifying:

a. At least once per 24 hours that the position of each control rod is indicated,

b. That the indicated control rod position changes during the movement of the control rod drive when performing Surveillance Requirement 4.1.3.1.2, and

c. That the control rod position indicator corresponds to the control rod position indicated by the "Full out" position indicator when performing Surveillance Requirement 4.1.3.6.b.

*At least each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.

FOR INFORMATION ONLY

See above

SURVEILLANCE REQUIREMENTS

4.1.3.7 The control rod position indication system shall be determined OPERABLE by verifying:

a. At least once per 24 hours that the position of each control rod is indicated,

b. That the indicated control rod position changes during the movement of the control rod drive when performing Surveillance Requirement 4.1.3.1.2, and

c. That the control rod position indicator corresponds to the control rod position indicated by the "Full out" position indicator when performing Surveillance Requirement 4.1.3.6.b.

No RSCS AT D/G

FOR INFORMATION ONLY

CONTROL ROD DRIVE HOUSING SUPPORT

LIMITING CONDITION FOR OPERATION

3.J e

3.1.3.8 The control rod drive housing support shall be in place.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODES 1, 2 and 3.

ACTION:

With the control rod drive housing support not in place, be in at least HOT SHUTDOWN within 12 hours and in at least COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

3.J e

4.1.3.8 The control rod drive housing support shall be verified to be in place by a visual inspection prior to startup any time it has been disassembled or when maintenance has been performed in the control rod drive housing support area.

FOR INFORMATION ONLY

REACTIVITY CONTROL SYSTEMS

3/4.1.4 CONTROL ROD PROGRAM CONTROLS

ROD WORTH MINIMIZER

LIMITING CONDITION FOR OPERATION

3.1.4.1 The rod worth minimizer (RWM) shall be OPERABLE.

APPLICABILITY: OPERATIONAL ~~CONDITIONS~~ MODE(S) 1 and 2*, when THERMAL POWER is less than or equal to (20)% of RATED THERMAL POWER, the minimum allowable (preset power level) (low power setpoint).

ACTION:

a. With the RWM inoperable, verify control rod movement and compliance with the prescribed control rod pattern by a second licensed operator or other technically qualified individual member of the unit technical staff who is present at the reactor control console. Otherwise, control rod movement may be only by actuating the manual scram or placing the reactor mode switch in the Shutdown position.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.1.4.1 The RWM shall be demonstrated OPERABLE:

a. In OPERATIONAL ~~CONDITION~~ MODE 2 within 8 hours prior to withdrawal of control rods for the purpose of making the reactor critical, ~~and in OPERATIONAL CONDITION 1 within 8 hours prior to RWM automatic initiation when reducing THERMAL POWER,~~ by verifying proper indication of the selection error of at least one out-of-sequence control rod.

b. ~~In OPERATIONAL CONDITION 2 within 8 hours prior to withdrawal of control rods for the purpose of making the reactor critical,~~ by verifying the rod block function by demonstrating inability to withdraw an out-of-sequence control rod.

c. In OPERATIONAL ~~CONDITION~~ MODE 1 within one hour after RWM automatic initiation when reducing THERMAL POWER, by verifying the rod block function by demonstrating inability to withdraw an out-of-sequence control rod.

d. By demonstrating that the control rod patterns and sequence input to the RWM computer are correctly loaded following any loading of the program into the computer.

---

* Entry into OPERATIONAL ~~CONDITION~~ MODE 2 and withdrawal of selected control rods is permitted for the purpose of determining the OPERABILITY of the RWM prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

N/A TO D/C - NO RSCS

REACTIVITY CONTROL SYSTEMS

ROD SEQUENCE CONTROL SYSTEM (Optional, Group Notch Type)

FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION

3.1.4.2 The rod sequence control system (RSCS) shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2*#, when THERMAL POWER is less than or equal to (20)% RATED THERMAL POWER, the minimum allowable (preset power level) (low power setpoint).

ACTION:

a. With the RSCS inoperable, control rod movement shall not be permitted, except by a scram.

b. With an inoperable control rod(s), OPERABLE control rod movement may continue by bypassing the inoperable control rod(s) in the RSCS provided that:

   1. The position and bypassing of inoperable control rods is verified by a second licensed operator or other technically qualified member of the unit technical staff, and

   2. There are not more than 3 inoperable control rods in any RSCS group.

SURVEILLANCE REQUIREMENTS

4.1.4.2 The RSCS shall be demonstrated OPERABLE by:

a. Selecting and attempting to move an inhibited control rod:

   1. After withdrawal of the first insequence control rod for each reactor startup, and

   2. Within one hour after rod inhibit mode automatic initiation when reducing THERMAL POWER.

b. Attempting to move a control rod more than one notch prior to other control rod movement after the group notch mode is automatically initiated during:

   1. Control rod withdrawal for each reactor startup, and

   2. Power reduction.

c. Performance of the comparator check of the group notch circuits within 8 hours prior to control rod:

   1. Withdrawal for each reactor startup, and

   2. Insertion to reduce THERMAL POWER to less than 20% of RATED THERMAL POWER.

*See Special Test Exception 3.10.2

#Entry into OPERATIONAL CONDITION 2 and withdrawal of selected control rods is permitted for the purpose of determining the OPERABILITY of the RSCS prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

(N/A to D/C - No RSCS)

REACTIVITY CONTROL SYSTEMS

FOR INFORMATION ONLY

ROD SEQUENCE CONTROL SYSTEM (Optional, Banked Position Type)

LIMITING CONDITION FOR OPERATION

3.1.4.2 The rod sequence control system (RSCS) shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2*#, when THERMAL POWER is less than or equal to (20)% RATED THERMAL POWER, the minimum allowable (preset power level) (low power setpoint).

ACTION:

a. With the RSCS inoperable, control rod movement shall not be permitted, except by a scram.

b. With an inoperable control rod(s), OPERABLE control rod movement may continue by bypassing the inoperable control rod(s) in the RSCS provided that:

1. The position and bypassing of inoperable control rods is verified by a second licensed operator or other technically qualified member of the unit technical staff, and

2. There are not more than 3 inoperable control rods in any RSCS group.

SURVEILLANCE REQUIREMENTS

4.1.4.2 The RSCS shall be demonstrated OPERABLE by:

a. Performance of a (self-test) (system diagnostic function):

1. Within 8 hours prior to each reactor startup, and

2. Prior to movement of a control rod after rod inhibit mode automatic initiation when reducing THERMAL POWER.

b. Attempting to select and move an inhibited control rod:

1. After withdrawal of the first insequence control rod for each reactor startup, and

2. Within one hour after rod inhibit mode automatic initiation when reducing THERMAL POWER.

*See Special Test Exception 3.10.2

#Entry into OPERATIONAL CONDITION 2 and withdrawal of selected control rods is permitted for the purpose of determining the OPERABILITY of the RSCS prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

FOR INFORMATION ONLY

ROD BLOCK MONITOR

LIMITING CONDITION FOR OPERATION

3.1.4.3 Both rod block monitor (RBM) channels shall be OPERABLE.

APPLICABILITY: OPERATIONAL ~~CONDITION~~ MODE 1, when THERMAL POWER is greater than or equal to (30)% of RATED THERMAL POWER.

ACTION:

a. With one RBM channel inoperable:

1. Verify that the reactor is not operating on a LIMITING CONTROL ROD PATTERN, and

2. Restore the inoperable RBM channel to OPERABLE status within 24 hours.

Otherwise, place the inoperable rod block monitor channel in the tripped condition within the next hour.

With the provisions of ACTION 1 above not met

b. With both RBM channels inoperable, place at least one inoperable rod block monitor channel in the tripped condition within one hour.

SURVEILLANCE REQUIREMENTS

4.1.4.3 Each of the above required RBM channels shall be demonstrated OPERABLE by performance of a:

a. CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION at the frequencies and for the OPERATIONAL CONDITIONS specified in Table 4.3.6-1.

b. CHANNEL FUNCTIONAL TEST prior to control rod withdrawal when the reactor is operating on a LIMITING CONTROL ROD PATTERN

but no more often than daily