## 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 ± 12 steps (indicated position) of their group step counter demand position.

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~~ misaligned from the group step counter demand position by more than ± 12 steps (indicated position), 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~~ misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within one hour either:

1. The rod is restored ~~to OPERABLE status~~ within the above alignment requirements, or

2. The remainder of the rods in the group with the ~~inoperable~~ MISALIGNED rod are aligned to within ± 12 steps of the ~~inoperable~~ MISALIGNED rod ~~within one hour~~ while maintaining the rod sequence and insertion limit of specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 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:

R15



*See Special Test Exceptions 3.10.2 and 3.10.3.

ACTION: (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 power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours. FP

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.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours 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 shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

INSERT #5

## SHUTDOWN ROD INSERTION LIMIT

### LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the COLR. R159

APPLICABILITY: MODES 1* and 2*#

ACTION:

a. With a maximum of one shutdown rod inserted beyond the insertion limit specified in the COLR, except for surveillance testing pursuant to Specification 4.1.3.1.2# within one hour either: R159
C OR WHEN COMPLYING WITH ACTION b OF THIS SPECIFICATION

1~~a~~. Restore the rod to within the insertion limit specified in the COLR, or R159

2~~b~~. Declare the rod to be inoperable and apply ~~Specification~~ ACTION 3.1.3.1.c.3.

b (ADD INSERT #1)

### SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit specified in the COLR: R159

a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C or D during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

*See Special Test Exceptions 3.10.2 and 3.10.3.

#With $K_{eff}$ greater than or equal to 1.0.

R159

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the COLR. R159

APPLICABILITY: MODES 1* and 2*#.

ACTION:

a. With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, either: OR WHEN COMPLYING WITH ACTION b OF THIS SPECIFICATION R159

1. Restore the control banks to within the limits within two hours, or

2. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the group position using the insertion limits specified in the COLR, or R159

3. Be in HOT STANDBY within 6 hours.

b. (INSERT #2)

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours 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 $K_{eff}$ greater than or equal to 1.0.

(INSERT #3)



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The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those accident analyses affected by a misalignment rod are reevaluated to confirm that the results remain valid during future operation.

INSERT #4

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the accident analyses. Measurement with $T_{avg}$ greater than or equal to 541°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied.

3/4.1.3.4 ROD DROP TIME and 3/4.1.3.5 SHUTDOWN ROD INSERTION LIMIT

Fully withdrawn for shutdown and control rod banks is defined as a condition where the rod banks are positioned in a range of 222 to 231 steps fully withdrawn. This range is defined to permit axial repositioning of rod banks to mitigate rod wear on internal guide surfaces. R112

## 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 ± 12 steps (indicated position) of their group step counter demand position.

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~~ misaligned from the group step counter demand position by more than ± 12 steps (indicated position), 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~~ misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within one hour either:

1. The rod is restored ~~to OPERABLE status~~ within the above alignment requirements, or

2. The remainder of the rods in the group with the ~~inoperable~~ misaligned rod are aligned to within ± 12 steps of the ~~inoperable~~ misaligned rod while maintaining the rod sequence and insertion limit of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or R14

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:

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.

*See Special Test Exceptions 3.10.2 and 3.10.3.

ACTION: (Continued)

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ 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.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours 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 shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

INSERT #5

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the COLR: R146

APPLICABILITY: Modes 1* and 2*#.

ACTION:

a. With a maximum of one shutdown rod inserted beyond the insertion limit specified in the COLR, except for surveillance testing pursuant to Specification 4.1.3.1.2, within one hour either: R146
OR WHEN COMPLYING WITH ACTION b OF THIS SPECIFICATION

1. Restore the rod to within the insertion limit specified in the COLR, or R146

2. Declare the rod to be inoperable and apply ~~Specification~~ ACTION 3.1.3.1.c.3.

b. (ADD INSERT #1)

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit specified in the COLR: R146

a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C or D during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

*See Special Test Exceptions 3.10.2 and 3.10.3.
#With $K_{eff}$ greater than or equal to 1.0

R146

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the COLR. R1

APPLICABILITY: Modes 1* and 2**.

ACTION:

a. With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, OR WHEN COMPLYING WITH ACTION b OF THIS SPECIFICATION, either: R

1. Restore the control banks to within the limits within two hours, or

2. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the group position using the insertion limits specified in the COLR, or R

3. Be in at least HOT STANDBY within 6 hours.

b. INSERT #2

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours 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 $K_{eff}$ greater than or equal to 1.0.

INSERT #3

MOVEABLE CONTROL ASSEMBLIES (Continued)

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

INSERT #4

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with $T_{avg}$ greater than or equal to 541°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied.

3/4.1.3.4 ROD DROP TIME and 3/4.1.3.5 SHUTDOWN ROD INSERTION LIMIT

Fully withdrawn for shutdown and control rod banks is defined as a condition where the rod banks are positioned in a range of 222 to 231 steps fully withdrawn. This range is defined to permit axial repositioning of rod banks to mitigate rod wear on internal guide surfaces. R98

Insert #1

b. With a maximum of one shutdown bank inserted beyond the insertion limit specified in the COLR during surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system, POWER OPERATION may continue provided that:

1. The shutdown bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,

2. The affected bank is trippable,

3. Each shutdown and control rod is aligned to within ±12 steps of its respective group step counter demand position,

4. The insertion limits of Specification 3.1.3.6 are met for each control bank,

5. No reactor coolant system boron concentration dilution activities or power level increases are allowed,

6. The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours or upon insertion of the controlling bank more than 5 steps from the initial position, and

7. The shutdown bank is restored to within the insertion limit specified in the COLR within 72 hours.

Otherwise, be in HOT STANDBY within the next 6 hours.

**Insert #2**

b. With a maximum of one control bank inserted beyond the insertion limit specified in the COLR during surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system, POWER OPERATION ## may continue provided that:

1. The control bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,

2. The affected bank is trippable,

3. Each shutdown and control rod is aligned to within ±12 steps of its respective group step counter demand position,

4. The insertion limits of Specification 3.1.3.5 are met for each shutdown bank,

5. No reactor coolant system boron concentration dilution activities or power level increases are allowed,

6. The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours or upon insertion of the controlling bank more than 5 steps from the initial position, and

7. The control bank is restored to within the insertion limit specified in the COLR within 72 hours.

Otherwise, be in HOT STANDBY within the next 6 hours.

**Insert # 3**

## Provision for continued POWER OPERATION does not apply to the controlling bank(s) (normally Control Bank D) inserted beyond the insertion limit.

Insert #4

In the event that a malfunction of the Rod Control System renders control rods immovable, provision is made for continued operation provided:

- o The affected control rods remain trippable, and
- o The individual control rod alignment limits are met.

In the event that a malfunction of the Rod Control System renders control rod banks immovable during surveillance testing, provision is made for 72 hours of continued operation provided:

- o The affected control rod banks remains trippable,
- o The individual control rod alignment limits are met,
- o A maximum of one control or shutdown bank is inserted no more than 18 steps below the insertion limit,
- o No reactor coolant system boron concentration dilution activities or power level increases are allowed, and
- o The SHUTDOWN MARGIN requirements are verified every 12 hours or upon insertion of controlling bank during the period the insertion limit is not met.

The requirements to preclude Reactor Coolant System boron concentration dilution, while a control or shutdown bank is below insert limits, will minimize the impact on shutdown margin.

The controlling bank(s), which is normally Control Bank D, is excluded from the 72-hour provision since insertion of this bank(s) below the insertion limit is not required for control rod assembly surveillance testing. A controlling bank is defined as any control bank that is less than fully withdrawn as defined in the COLR with the exception of fully withdrawn banks that have been inserted in accordance with Surveillance Requirement 4.1.3.1.2. This provision excludes the use of the 72-hour allowance for control banks that can be exercised 10 steps in either direction without exceeding the insertion limits.

Checks are performed for each reload core to ensure that bank insertions of up to 18 steps will not result in power distributions, which violate the DNB criterion for ANS Condition II transients (moderate frequency transients analyzed in Section 15.2 of the UFSAR). Administrative requirements on the initial controlling bank position will ensure that this insertion and an additional controlling bank insertion of five steps or less will not violate the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 during the repair period. If the controlling bank is inserted more than five steps deeper than its initial position, a calculation will be performed to ensure that the SHUTDOWN MARGIN

**Insert #4** (continued)

requirement of Specification 3.1.1.1 is met. Since no dilution or power level increases are allowed, shutdown margin will be maintained as long as the controlling bank is far enough above its insertion limit to compensate for the inserted worth of the bank that is beyond its insertion limit.

The 72-hour period for a control rod assembly bank to be inserted below its insertion limit restricts the likelihood of a more severe (i.e., ANS Condition III or IV) accident or transient condition occurring concurrently with the insertion limit violation.

**Insert #5**

Each full-length rod not fully inserted in the core shall be determined to be trippable by verifying rod freedom of movement by movement of $\geq 10$ steps in either direction at least once per 92 days.

ENCLOSURE 2

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

(TVA-SQN-TS-95-03)

DESCRIPTION AND JUSTIFICATION FOR

OPERATION WITH A CONTROL ROD URGENT FAILURE CONDITION

Description of Change

TVA proposes to modify the Sequoyah Nuclear Plant (SQN) Units 1 and 2 Technical Specifications (TSs) 3/4.1.3, "Movable Control Assemblies," and Bases 3/4.1.3. These proposed changes address operation with a rod urgent failure condition (the control rods are out-of-service because of failures external to the individual rod drive mechanisms, i.e., programming circuitry, but the rods remain trippable), including limited operation with one control or shutdown bank inserted up to 18 steps below its insertion limit. In addition, the surveillance interval for rod movement verifications has been extended. The following paragraphs provide a brief description of the proposed changes.

TS 3.1.3.1 specifies shutdown and control rod operability and alignment limits within individual groups. Trippable, aligned rods are fully capable of performing their intended safety function. The existing specification can be interpreted that the rods are inoperable if they are immovable as a result of a rod urgent failure. The proposed TS change modifies the wording of the action statements to clearly address rods as untrippable or misaligned. The TS actions will no longer refer to rods being inoperable "due to other causes." Additionally, an administrative change is being made to clearly indicate the one hour applicability to Action Statements c.1, c.2, or c.3 for Unit 1.

TS Surveillance Requirement 4.1.3.1.2 provides the requirement for determining rod operability. The proposed change clarifies the requirements relative to rod trippability and extends the surveillance interval to 92 days that is consistent with plant operating experience and Generic Letter 93-05 guidance.

TS 3.1.3.5 defines the shutdown bank insertion limit. The proposed TS change adds an action statement to provide for up to 72 hours of continued power operation for diagnosis and repair of the rod control system with a maximum of one shutdown bank inserted below its insertion limit. This provision is applicable during shutdown bank surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system provided that:

1. The shutdown bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,

2. The affected bank is trippable,

3. Each shutdown and control rod is aligned to within $\pm 12$ steps of the respective group step counter demand position,

4. The insertion limits of Specification 3.1.3.6 are met for each control bank,

5. No reactor coolant system boron concentration dilution activities or power level increases are allowed, and

6. The "SHUTDOWN MARGIN" requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours or upon insertion of the controlling bank more than 5 steps from the initial position.

The affected shutdown bank must be restored to service within the allowed 72-hour period or hot standby must be established within the following 6 hours.

TS 3.1.3.6 defines the control bank insertion limit. The proposed TS change adds an action statement to provide for up to 72 hours of continued power operation for diagnosis and repair of the rod control system with a maximum of one control bank inserted below its insertion limit. This provision is applicable during control bank surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system provided that:

1. The control bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,

2. The affected bank is trippable,

3. Each shutdown and control rod is aligned to within $\pm 12$ steps of the respective group step counter demand position,

4. The insertion limits of Specification 3.1.3.5 are met for each shutdown bank,

5. No reactor coolant system boron concentration dilution activities or power level increases are allowed, and

6. The "SHUTDOWN MARGIN" requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours or upon insertion of the controlling bank more than 5 steps from the initial position.

The affected control bank must be restored to service within the allowed 72-hour period or hot standby must be established within the following 6 hours. The provisions for continued POWER OPERATION do not apply to the controlling bank(s), which is normally Control Bank D, because insertion of this bank(s) below the insertion limit is not required for rod surveillance testing.

TS 3/4.1.3 bases are being supplemented to discuss the technical basis for the allowances for operation with one or more banks out-of-service due to failures in a rod control system power or logic cabinet.

Reason for Change

SQN TSs require periodic testing of all control and shutdown rods in the core during power operation to ensure that the rods are trippable, i.e., able to drop into the core upon receipt of a reactor trip signal. This testing currently involves moving each rod not fully inserted into the core at least 10 steps in either direction at least once per month. This is typically done at or near full power, one bank at a time. The current procedures call for sequential insertion and withdrawal of over 10 steps for the bank being tested. Since all of the control and shutdown banks except Control Bank D are required to be essentially fully withdrawn from the core at full power, special test exceptions are included in the insertion limit TSs for the case of rod surveillance testing. The current specifications are not prescriptive concerning the allowed duration of the test mode.

Occasionally, a rod urgent alarm is experienced during rod surveillance testing. The rod urgent failure alarm is indicative of an internal failure in the rod control equipment that has affected the ability of the system to move rods. Automatic rod motion and overlapped rod motion are stopped on a rod urgent failure. The failure may be either in the power cabinet or in the system logic cabinet.

A power cabinet rod urgent failure can be caused by coil current regulator failure, a phase failure (excessive ripple in coil voltage), a logic error (simultaneous zero current order to the stationary and movable grippers), a loose circuit card, or a multiplex error (current sensed in the movable or lift coils for a rod or group of rods not selected by the multiplex function). The system responds to these conditions via failure detection logic, which overrides the existing current orders from the logic cabinet with a low current order to all grippers in that cabinet. This is done to prevent spurious rod drops due to the failure. Also an "inhibit" signal is sent to the logic cabinet pulser unit to stop all rod motion, in or out, in auto or manual. Movement of individual banks, which are not associated with an alarmed cabinet, may still be accomplished by selection of individual bank operation on the control board.

A rod urgent failure in the logic cabinet can be caused by pulser failure, slave cycle failure or loose circuit cards. An "inhibit" signal is sent to the pulser, which stops automatic and manual rod motion, but still allows individual banks to move.

A rod urgent failure condition during rod surveillance testing may result in an immovable (but still trippable) group or bank up to 18 steps below the insertion limits. In addition, there is a potential that an immovable (but still trippable) group or bank may occur during power maneuvers (e.g., during turbine valve freedom testing) where the insertion limits are fully met.

The proposed TS change will allow plant personnel to diagnose and repair the rod control system in an orderly manner while continuing to ensure that the control and shutdown banks are capable of performing their safety function as designed. Since the affected banks would remain trippable and subject to the rod insertion limits and the group height alignment limits, no degradation in the ability of the banks to perform their intended safety function (i.e., reactor trip) would be introduced.

The proposed change in testing frequency would reduce the burden on plant personnel, prevent unnecessary wear to plant equipment, and minimize the potential for a plant transient.

Justification for Changes

The proposed TS change modifies the wording to clearly define a rod assembly as operable if it is trippable. The rods will remain fully trippable during the diagnosis and repair period; therefore, they are capable of performing their intended safety function. Normal control rod motion is not necessary to mitigate Updated Final Safety Analysis Report (UFSAR) Chapter 15.2 analyzed transients; therefore, no specific limiting condition for operation is imposed for rod urgent failures. However, prompt action has been taken in the past, and will continue to be taken, to correct the condition and return the control rod drive system to service and regain the normal plant control function provided by the control rods.

The radial peaking factor ($F_{\Delta H}$) will be checked for the allowed conditions for each reload core by modeling the testing of each control and shutdown bank using NRC approved methods. Based on the results of these calculations, verification will be made that the Departure from Nucleate Boiling Ratio (DNBR) criterion for American Nuclear Society (ANS) Condition II (UFSAR Chapter 15.2) transients initiated from the test condition will continue to be met. Through this reload design process, it will be verified that the test controls for test bank and controlling bank insertion are appropriate to ensure that this criterion is met for all rod surveillance tests throughout the cycle.

During the proposed 72-hour diagnosis and repair period, insertion below the insertion limit is restricted to one control or shutdown bank at a time. Concurrent rod misalignment (i.e., misalignment of individual rods from their group step counter demand position by more than ±12 steps) is not allowed. The insertion of the affected bank below the limit is constrained by peaking factor requirements. Because of these constraints, the impact on core reactivity and power distribution is very small. The shutdown margin is specifically reconfirmed every 12 hours during the diagnosis and repair period. Explicit analytical checks on the radial power distribution during the diagnosis and repair period are performed as part of the reload safety evaluation process.

Operation with a bank (except controlling bank[s]) below the fully withdrawn insertion limit by up to 18 steps will not cause core radial peaking factors, which result in violation of the applicable Departure from Nucleate Boiling limits for ANS Condition II transients.

Operation with a bank (except controlling bank(s)) below the fully withdrawn insertion limit by up to 18 steps will not result in shutdown margins lower than assumed in the accident analyses and required by Specification 3.1.1.1. The worth of the 18 step insertion will be assessed during the reload core design process and the controlling bank will be maintained far enough above the insertion limits to offset the worth of the 18 step insertion.

Since insertion limits apply and the control rods will remain fully trippable during the diagnosis and repair period, the results and conclusions of the UFSAR for anticipated (ANS Condition II) transients, such as uncontrolled rod withdrawal, remain unchanged.

Because the proposed operation with a single control or shutdown bank inserted up to 18 steps below the insertion limit is limited to 72-hours duration (equivalent to the allowed period of operation before verifing the hot channel factors are within limits for a misaligned rod in Standard TS) and is not allowed to produce radial power distributions that exceed the ANS Condition II design limits, additional evaluation of these accidents is not required. Since the probability of a more severe (Condition III or IV) event during the 72-hour diagnosis and repair period is negligible, additional evaluation of these events is not warranted. This is a similar approach to the existing TS treatment of a single misaligned rod (TS 3.1.3.1.c.3).

The existing inoperable rod specification allows for evaluation of certain UFSAR Chapter 15 accidents within 5 days of identification of the misaligned rod condition. This evaluation is required to support continued power operation (i.e., beyond 5 days) with an inoperable control rod.

A requirement for power reduction in response to a rod urgent failure alarm with a single bank up to 18 steps below the insertion limits is not warranted since: (1) the perturbation to the normal operation power distribution will be much less severe than that of a fully misaligned single control rod, (2) by design, steady state and Condition II transient criteria will be met for full power conditions, and (3) the rod urgent failure condition may render the capability to manually insert control banks unavailable, which could severely restrict the operator's ability to control axial power distribution swings to within the TS limits during a subsequent power reduction.

Occasional operation without manual rod insertion capability will not invalidate any of the accident analyses in UFSAR Chapter 15 since credit is not taken for this control mode in the analyses. Manual rod insertion is listed as a contingency action for Anticipated Transient Without a Scram (ATWS) in the emergency operating procedures and is considered in the generic assessment of ATWS risk. However, the major contributor to limiting ATWS risk is the ATWS Mitigation System Actuation Circuitry (AMSAC), which provides a turbine trip and auxiliary feedwater initiation, which is diverse from the reactor protection system. Therefore, temporary operation without manual rod insertion capability will have a negligible impact on ATWS risk.

Testing of the control rods is performed to detect rods that cannot be moved. This is accomplished by a specified amount of movement, in either direction, of each rod that is not fully inserted. As described above, electrical problems with the control rod drive system, in general, do not prevent insertion of a control rod into the core when the reactor trip breakers are opened. As identified in NRC Generic Letter 93-05, mechanical problems are much less common and were not always identified during control rod movement surveillance testing. For cases of mechanical problems, a reactor trip signal would not have resulted in the those rods inserting fully into the core. However, accident analyses assume that the single highest worth control rod is stuck and will not insert. Mechanical problems are typically discovered during control rod drop timing tests performed during start-up physics testing or when the rods are withdrawn from the core during plant start-up. Therefore, based on the successful operational record demonstrated by the control rod movement tests performed during power operation, extension of the control rod movement testing frequency from monthly to quarterly is acceptable. This extension of the surveillance interval is consistent with standard TS (NUREG 1431).

Environmental Impact Evaluation

The proposed change does not involve an unreviewed environmental question because operation of SQN Units 1 and 2 in accordance with this change would not:

1. Result in a significant increase in any adverse environmental impact previously evaluated in the Final Environmental Statement (FES) as modified by NRC's testimony to the Atomic Safety and Licensing Board, supplements to the FES, environmental impact appraisals, or decisions of the Atomic Safety and Licensing Board.

2. Result in a significant change in effluents or power levels.

3. Result in matters not previously reviewed in the licensing basis for SQN that may have a significant environmental impact.

ENCLOSURE 3

PROPOSED TECHNICAL SPECIFICATION CHANGE

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

(TVA-SQN-TS-95-03)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Significant Hazards Evaluation

TVA has evaluated the proposed technical specification (TS) change and has determined that it does not represent a significant hazards consideration based on criteria established in 10 CFR 50.92(c). Operation of Sequoyah Nuclear Plant (SQN) in accordance with the proposed amendment will not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   Allowing for continued operation during diagnosis and repair as a result of electronic or electrical malfunctions of the rod control system is acceptable, since the design safety function of the control rods (reactor trip) will remain unaffected during the diagnosis and repair period. During the extended troubleshooting and repair period, the requirements for control rod alignment, insertion limits (except for a small allowed deviation for one bank) and shutdown margin will be maintained. The small deviation from the control rod insertion limits allowed for one bank, for up to 72 hours, will not adversely impact the current TS requirements for normal operation core power distributions. The proposed changes do not affect the ability of the control rods to perform their intended safety function (rods remain trippable) when a safety system setting is reached. No new or unique accident precursors be introduced by the proposed changes. Therefore, the probability and consequences of accidents related to or dependent on control rod operation will remain unaffected.

   The proposed change will result in a small increase in the probability that, at any given time, a control or shutdown bank will be inserted slightly below (i.e., up to 18 steps) its insertion limit. However, by design, the control and shutdown banks will continue to meet the safety analysis criterion for steady state and American Nuclear Society (ANS) Condition II (moderate frequency) transients. The allowed insertion is not a malfunction of equipment important to safety in this case; therefore, the probability of such a malfunction is not increased. Limiting the allowed time for operation with the rod control system out-of-service, but with the rods trippable and with a control or shutdown bank below the insertion limit, eliminates the need for consideration of this condition coincident with any of the low frequency (ANS Condition III or IV) design basis accidents.

2. Create the possibility of a new or different kind of accident from any previously analyzed.

   There are no new failure mechanisms associated with plant operation for an extended period to perform diagnosis and repair on the rod control system. Limited periods of operation with immovable, but trippable control rods, does not involve any modification to the operational limits or physical design of the involved systems. There are no new accident precursors created because of the allowed diagnosis and repair period.

3. Involve a significant reduction in a margin of safety.

   The results of the current accident analyses are not impacted by this change. In addition, the margin of safety as defined in the basis of the TS has not been reduced because current core design limits continue to be met for the accidents of concern. Therefore, the margin of safety is not impacted.