

**SALEM GENERATING STATION UNIT NO. 1
FACILITY OPERATING LICENSE DPR-70
DOCKET NO. 50-272
CHANGE TO TECHNICAL SPECIFICATIONS
MOVABLE CONTROL ASSEMBLIES AND POSITION INDICATION SYSTEMS**

TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating License No. DPR-70 are affected by this change request:

| <u>Technical Specification</u> | <u>Page</u> |
|--------------------------------|-------------------------|
| 3/4.1.3.1 | 3/4 1-18 thru 3/4 1-18a |
| 3/4.1.3.2.1 | 3/4 1-19 thru 3/4 1-19a |

In addition, BASES sections B3/4.1.4 and B3/4.2.4 are being revised by this proposed change.

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Insert A (Page 3/4 1-18)

± 18 steps (indicated position) when reactor power is ≤ 85% RATED THERMAL POWER, or ± 12 steps (indicated position) when reactor power is > 85% RATED THERMAL POWER,

Insert B (Page 3/4 1-18)

± 18 steps (indicated position) at ≤85% RATED THERMAL POWER or
± 12 steps (indicated position) at >85% RATED THERMAL POWER

Insert C (Page 3/4 1-18)

± 18 steps (indicated position) at ≤85% RATED THERMAL POWER or ±
12 steps (indicated position) at >85% RATED THERMAL POWER,

Insert D (Page 3/4 1-19)

± 18 steps at ≤85% reactor power or if reactor power is > 85%
RATED THERMAL POWER ± 12 steps

Insert E (Page 3/4 1-19a)

18 steps when reactor power is ≤ 85% RATED THERMAL POWER or if
reactor power is > 85% RATED THERMAL POWER, 12 steps

REACTIVITY CONTROL SYSTEMS
3/4.1.3 MOVABLE CONTROL ASSEMBLIES
GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

Replace with Insert A.

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 within one hour after rod motion.

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or mis-aligned from the group step counter demand position by more than + 12 steps (indicated position), be in HOT STANDBY within 6 hours. Replace with INSERT B.
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or mis-aligned from its group step counter demand position by more than + 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 bank with the inoperable rod are aligned to within + 12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Figures 3.1-1 and 3.1-2; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.5 during subsequent operation, or
 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:Replace with INSERT B.

Replace with INSERT C.

*See Special Test Exceptions 3.10.2 and 3.10.3.

- 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 $F_0(Z)$ and F_{2H} are verified to be within their limits within 72 hours.
- d) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER. THERMAL POWER shall be maintained less than or equal to 75% of RATED THERMAL POWER until compliance with ACTIONS 3.1.3.1.c.3.a and 3.1.3.1.c.3.c above are demonstrated.

SURVEILLANCE REQUIREMENTS

Revise

The limits established in the limiting condition for operation

4.1.3.1.1 The position of each full length rod shall be determined to be within + 12 steps (indicated position of the group demand position) at least once per 12 hours (allowing for one hour thermal soak after rod motion) except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

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

- a. Analog rod position indicators, within one hour after rod motion (allowance for thermal soak);

All Shutdown Banks: ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-228 steps. *Replace with Insert D*

Control Bank A: ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-228 steps. *Replace with Insert D*

Control Bank B: ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 160-228 steps. *Replace with Insert D*

Control Banks C and D: ± 12 steps of the group demand counters for withdrawal range of 0-228 steps. *Replace with Insert D*

- b. Group demand counters; ± 2 steps of the pulsed output of the Slave Cyclor Circuit over the withdrawal range of 0-228 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one analog rod position indicator per bank inoperable either:
1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and within one hour after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.
- b. With two or more analog rod position indicators per bank inoperable, within one hour restore the inoperable rod position indicator(s) to OPERABLE status or be in HOT STANDBY within the next 6 hours. A maximum of one rod position indicator per bank may remain inoperable following the hour, with Action (a) above being applicable from the original entry time into the LCO.
- c. With a maximum of one group demand position indicator per bank inoperable either:

1. Verify that all analog rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of 12 steps of each other at least once per 8 hours, or
Replace with Insert E.
2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2.1.1 Each analog rod position indicator ^{*Replace with insert E*} shall be determined to be OPERABLE by verifying that the demand position indication system and the rod position indication system agree within 12 steps (allowing for one hour thermal soak after rod motion) at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indication system at least once per 4 hours.

4.1.3.2.1.2 Each of the above required rod position indicator(s) shall be determined to be OPERABLE by performance of a CHANNEL calibration at least once per 18 months.

REACTIVITY CONTROL SYSTEMS

BASES

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of $1\pm$ delta k/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 2,600 gallons of 8,560 ppm borated water from the boric acid storage tanks or 7,100 gallons of 2300 ppm borated water from the refueling water storage tank.

The 37,000 gallon limit in the refueling water storage tank for Modes 5 and 6 is based upon 21,210 gallons that is undetectable due to lower tap location, 8,550 gallons for instrument error, 7,100 gallons required for shutdown margin, and an additional 140 gallons due to rounding up.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 8.5 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) limit the potential effects of rod mis-alignment on associated accident analyses. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. OPERABLE condition for the analog rod position indicators is defined as being capable of indicating rod position to within ± 12 steps of the bank demand position for a range of positions. For the Shutdown Banks, and Control Bank A this range is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 200 and 228 steps withdrawn inclusive. This permits the operator to verify that the control rods in these banks are either fully withdrawn or fully inserted, the normal operating modes for these banks. Knowledge of these banks positions in these ranges satisfies all accident analysis assumptions concerning their position. The range for control Bank B is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 160 and 228 steps withdrawn inclusive. For Control Banks C and D the range is defined as the group demand counter indicated position between 0 and 228 steps withdrawn. Comparison of the group demand counters to the bank insertion limits with verification of rod position with the analog rod position indicators (after thermal soak after rod motion) is sufficient verification that the control rods are above the insertion limits. The full out position will be specifically established for each cycle by the Reload Safety Analysis for that cycle. This position will be within the band established by "FULLY WITHDRAWN" and will be administratively controlled. This band is allowable to minimize RCCA wear, pursuant to Information Notice 87-19.

the allowed
Rod
misalignment
relative to

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX AND NUCLEAR ENTHALPY HOT CHANNEL AND RADIAL PEAKING FACTORS-

$F_Q(Z)$, $F_{\Delta H}^N$ and $F_{xy}(Z)$

The limits on heat flux and nuclear enthalpy hot channel factors ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these hot channel factors are measurable but will normally only be determined periodically as specified in Specifications 4.2.2 and 4.2.3. This periodic surveillance is sufficient to insure that the hot channel factor limits are maintained provided:

- a. Control rod in a single group move together with no individual rod insertion differing by more than ± 12 steps from the group demand position.
- b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.5.
- c. The control rod insertion limits of Specifications 3.1.3.4 and 3.1.3.5 are maintained.
- d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

by more than the allowed rod misalignment.

The relaxation in $F_{\Delta H}^N$ as a function of THERMAL POWER allows changes in the radial power shape $F_{\Delta H}^N$ for all permissible rod insertion limits. $F_{\Delta H}^N$ will be maintained within its limits provided conditions a thru d above, are maintained.

When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance for a full core map taken with the incore detector flux mapping system and 3% is the appropriate allowance for manufacturing tolerance.

When $F_{\Delta H}^N$ is measured, experimental error must be allowed for and 4% is the appropriate allowance for a full core map taken with the incore detection system. The specified limit for $F_{\Delta H}^N$ also contains an 8% allowance for uncertainties which mean that normal operation will result in $F_{\Delta H}^N \leq 1.55/1.08$. The 8% allowance is based on the following considerations: