ΔT and Overtemperature ΔT trip settings shall be reduced by the equivalent of 2% power for every 1% quadrant to average power tilt.

C. Inoperable Control Rods

1. A control rod assembly shall be considered inoperable if the assembly cannot be moved by the drive mechanism or the assembly remains misaligned from its bank by more than 12 steps. Additionally a full-length control rod shall be considered inoperable if its rod drop time is greater than 1.8 seconds to dashpot entry.
2. No more than one inoperable control rod assembly shall be permitted when the reactor is critical.
3. If more than one control rod assembly in a given bank is out of service because of a single failure external to the individual rod drive mechanism, i.e. programming circuitry, the provisions of Specifications 3.12.C.1 and 3.12.C.2 shall not apply and the reactor may remain critical for a period not to exceed two hours provided immediate attention is directed toward making the necessary repairs. In the event the affected assemblies cannot be returned to service within this specified period the reactor will be brought to hot shutdown conditions.
4. The provisions of Specifications 3.12.C.1 and 3.12.C.2 shall not apply during physics tests in which the assemblies are intentionally misaligned.
5. The insertion limits in TS Figure 3.12-2 apply: a. If an inoperable full-length rod is located below the 200 step level and is capable of being tripped, or

2. The core quadrant power balance shall be determined by one of the following methods:

   a. Movable detectors (at least two per quadrant)

   b. Core exit thermocouples (at least four per quadrant)

E. Rod Position Indicator Channels

1. The rod position indication system shall be operable and capable of determining the control rod positions within ±12 steps.

2. If a rod position indicator channel is out of service, then:

   a. For operation above 50% of rated power, the position of the RCC shall be checked indirectly using core instrumentation (excore detectors and/or incore thermocouples and/or movable incore detectors) at least once per 8 hours and immediately after any motion of the non-indicating rod exceeding 24 steps, or

   b. Reduce Power to less than 50% of rated power within 8 hours. During operations below 50% of rated power, no special monitoring is required.

3. If more than one rod position (RPI) indicator channel per group or two RPI channels per bank are inoperable, then the requirements of Specification 3.0.1 will be followed.

F. Misaligned or Dropped Control Rod

1. If the Rod Position Indicator Channel is functional and the associated full length control rod is misaligned from its group step demand postion by more than ±12 steps (indicating postion) and cannot be realigned, the hot channel factors must be shown to be within design limits as specified by Specification 3.12.B.1 within 8 hours. If the limits of Specification 3.12.B.1 cannot be met, then power shall be reduced to less than 75% of rated power within one (1) hour, and the High Neutron Flux trip setpoint shall be reduced to less than or equal to 85% of rated power within the next four (4) hours.

2. To increase power above 75% of rated power with a full-length control rod more than ±12 steps (indicated position) out of alignment with its group step demand postion, an analysis shall first be made to determine the hot channel factors and the resulting allowable power level based on the limits of Specification 3.12.B.1.

Basis

The reactivity control concept assumed for operation is that reactivity changes accompanying changes in reactor power are compensated by control rod assembly motion. Reactivity changes associated with xenon, samarium, fuel depletion, and large changes in reactor coolant temperature (operating temperature to cold shutdown) are compensated for by changes in the soluble boron concentration. During power operation, the shutdown groups are fully withdrawn and control of power is by the control groups. A reactor trip occurring during power operation will place the reactor into the hot shutdown condition. The control rod assembly insertion limits provide for achieving hot shutdown by reactor trip at any time, assuming the highest worth control rod assembly remains fully withdrawn, with sufficient margins to meet the assumptions used in the accident analysis. In addition, they provide a limit

on the maximum inserted rod worth in the unlikely event of a hypothetical assembly ejection and provide for acceptable nuclear peaking factors. The limit may be determined on the basis of unit startup and operating data to provide a more realistic limit which will allow for more flexibility in unit operation and still assure compliance with the shutdown requirement. The maximum shutdown margin requirement occurs at end of core life and is based on the value used in the analysis of the hypothetical steam break accident. The rod insertion limits are based on end of core life conditions. The shutdown margin for the entire cycle length is established at 1.77% reactivity. All other accident analysis with the exception of the chemical and volume control system malfunction analysis are based on 1% reactivity shutdown margin. Relative positions of control rod banks are determined by a specified control rod bank overlap. This overlap is based on the consideration of axial power shape control.

The specified control rod insertion limits have been revised to limit the potential ejected rod worth in order to account for the effects of fuel densification.

The various control rod assemblies (shutdown banks, control banks A, B, C, and D) are each to be moved as a bank; that is, with all assemblies in the bank within one step (5/8 inch) of the bank position. Position indication is provided by two methods: a digital count of actuating pulses which shows the demand position of the banks, and a linear position indicator, Linear Variable Differential Transformer, which indicates the actual assembly position. The position indication accuracy of the Linear Differential Transformer is approximately $\pm$5% of span ($\pm$12 steps) under steady state conditions. The relative accuracy of the linear position indicator has been considered in establishing the maximum allowable deviation of a control rod assembly from its indicated group step demand position. In the event that the linear position indicator is not

4. Two physically independent circuits from the offsite transmission newtork to energize the 4,160 and 480 v emergency buses. One of these sources must be immediately available, i.e. primary source; and the other must be capable of being made available within 8 hours; i.e. dependable alternate source.

5. Two operable flow paths for providing fuel to each diesel generator.

6. Two station batteries, two chargers, and the d.c. distribution systems operable.

7. Emergency diesel generator battery, charger and the d.c. control circuitry operable for the unit diesel generator and for the shared back-up diesel generator.

B. During power operation or the return to power from hot shutdown conditions, the requirements of specification 3.16-A may be modified by one of the following:

1. One diesel generator may be unavailable or inoperable provided the operability of the other diesel generator is demonstrated daily. If this diesel generator is not returned to an operable status within 7 days, the reactor shall be brought to a cold shutdown condition. One diesel fuel oil flow path may be "inoperable" for 24 hours provided the other flow is proven operable. If after 24 hours, the inoperable flow path cannot be returned to service, the diesel shall be considered "inoperable". When the emergency diesel generator battery, charger or d.c. control circuitry is inoperable, the diesel shall be considered "inoperable".