DESCRIPTION OF PROPOSED CHANGE AND SAFETY ANALYSIS
PROPOSED CHANGE NO. 89 TO THE TECHNICAL SPECIFICATIONS
PROVISIONAL OPERATING LICENSE DPR-13

This is a request to revise Appendix A Technical Specifications 3.5, INSTRUMENTATION AND CONTROL and 4.1, OPERATIONAL SAFETY ITEMS.

Reason for Change

As a part of an NRC staff review of the LER's and Technical Specification requirements related to the Control Rod Position Indication Systems (RPI) at Westinghouse PWR's it was determined that a wide variation exists in the plant specific requirements in this area. In an effort to clarify the NRC requirements, a letter dated November 5, 1979 was provided to holders of an operating license which requested that the existing Technical Specifications be reviewed to ensure that the control rods are required to be maintained within margins of the Westinghouse safety analyses for control rod misalignment. Additionally an NRC staff decision was provided which deemed acceptable the use of direct LVDT voltage measurements in lieu of the position recorder indication to determine the operability of the Rod Position Indication System.

By letter dated January 4, 1980 we committed to implement the above described Technical Specification changes.

Existing Specification

The existing Technical Specifications 3.5 and 4.1 are as constituted in Appendix A to Provisional Operating License No. DPR-13.

Proposed Specification

Technical Specification 3.5.2, CONTROL GROUP INSERTION LIMITS, would be revised to read in part:

(1) "A. The position of all control rods shall be at or above the limits shown in Figure 3.5.2.1 except during low power physics tests."

(2) "D. Deleted."

The Basis for Technical Specification 3.5.2, CONTROL GROUP INSERTION LIMITS, would be revised by the deletion of the last paragraph which now reads, "Specification D provides that the control rod system will always be capable of shutting down the reactor."

Technical Specification 3.5 would be revised by the addition of Sections 3.5.3, CONTROL AND SHUTDOWN ROD MISALIGNMENT and 3.5.4, ROD POSITION INDICATION SYSTEM, to read as indicated in the Enclosure 1.

The balance of Technical Specification 3.5 would remain as constituted in Appendix A to Provisional Operating License No. DPR-13.

Technical Specification 4.1 would be revised by the addition of paragraphs E., F., and G., under Specification to read as follows:

"E. All control rods shall be determined to be above the rod insertion limits shown in Figure 3.5.2.1 by verifying that each analog detector indicates at least 21 steps above the rod insertion limits, to account for instrument inaccuracies, at least once per shift during operation.

F. The position of each rod shall be determined to be within the group demand limit and each rod position indicator shall be determined to be OPERABLE by verifying that the rod position indication system (Analog Detection System) and the step counter indication system (Digital Detection System) agree within 35 steps at least once per shift during operation except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the rod position indication system (Analog Detection System) and the step counter indication system (Digital Detection System) at least once per 4 hours.

G. Each 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."

The balance of Technical Specification 4.1 would remain as constituted in Appendix A to Provisional Operating License No. DPR-13.

Safety Analysis

The Technical Specification Changes discussed above are provided to ensure that (1) acceptable power distribution limits are maintained, (2) the minimum shutdown margin is maintained, and (3) limit the potential effects of rod misalignment on associated accident analyses. Operability of the control rod position indicators is required to determine control rod alignment and insertion limits.

The conditional statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met.

Control rod positions and operability of the rod position indicators are required to be verified on a nominal basis of once per shift 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 satisified.

As indicated in the Westinghouse report entitled, "Verification of Rod Misalignment Technical Specification, San Onofre Unit No. 1, Southern California Edison Company," dated March 1980 (Enclosure 2), it was determined that an individual rod can be misaligned up to 21 inches from the bank position without impacting safe operation as long as all control rods are maintained above the rod insertion limits. Since the San Onofre Unit 1 control rod step size is 3/8 inch, the 21 inches is equal to 56 steps.

The accuracy of the analog detection system is specified to be ± 17 steps in Section 5.4 of the San Onofre Unit 1 Final Safety Analysis. It has been determined that this accuracy applies to steady state operation and that during startup or shutdown maneuvers when thermal transients are enduced in the system, the accuracy of the instrument tends to drift. In order to determine the amount of drift which would be experienced by the analog detection system, a statistical evaluation of past rod position recorder data was performed. The results of this evaluation indicate that the analog detection system has an accuracy of ± 21 steps (with a 95% confidence limit) during periods when the system is undergoing thermal transients.

Since an individual rod can be misaligned by up to ± 56 steps without impacting safe operation (as indicated in Enclosure 2), and the accuracy under transient conditions for the analog detection system was determined to be ± 21 steps, safe operation is assured by requiring that the analog detection system be maintained with ± 35 steps of the bank position indicated by the digital step counter. In addition, in order to assure that all rods are above the insertion limit, the indicated position will be maintained 21 steps above the limit in order to account for instrument inaccuracies.

Based upon the analysis provided in this report, it is concluded that (1) the proposed change does not involve an unreviewed safety question as defined in 10CFR50.59, nor does it present significant hazards considerations not described or implicit in the Final Safety Analysis, and (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change.

ENCLOSURE 1

3.5.3 CONTROL AND SHUTDOWN ROD MISALIGNMENT

Applicability: Applies to the number of steps an individual control or shutdown rod may be misaligned from its group position during power operation.

Objective: To ensure that the effects of rod misalignment from the group position do not exceed the core design margins.

Specifications:

A. During power operation, all rods shall be OPERABLE and maintained within ± 35 steps (indicated by the Analog Detection System) of their step counter indicated bank position (indicated by the Digital Detection System).

B. With specification A, above, not met, the following specifications are applicable.

1. With one or more 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 BASIS of Specification 3.5.2 is satisfied within 1 hour and be in HOT SHUTDOWN within 6 hours.

2. With more than one rod inoperable or misaligned from the step counter indicated position by more than ± 35 steps (indicated by the Analog Detection System), be in HOT SHUTDOWN within 6 hours.

3. With one rod inoperable due to causes other than addressed by Specification B.1, above, or misaligned from its step counter indicated height by more than ± 35 steps (indicated by the Analog Detection System), POWER OPERATION may continue provided that within one hour either:

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

   b. The rod is declared inoperable and the SHUTDOWN MARGIN BASIS of Specification 3.5.2 is satisfied. POWER OPERATION may then continue provided that:

1) A reevaluation of each accident analysis of Table 3.5.3-1 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.

2) The SHUTDOWN MARGIN BASIS of Specification 3.5.2 is determined at least once per 12 hours.

3) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and F^N_H are verified to be within their limits within 72 hours.

TABLE 3.5.3-1

ACCIDENT ANALYSES REQUIRING REEVALUATION
IN THE EVENT OF AN INOPERABLE ROD

Rod Cluster Control Assembly Insertion Characterisitics

Rod Cluster Control Assembly Misalignment

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

Single Rod Cluster Control Assembly Withdrawal At Full Power

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

Major Secondary System Pipe Rupture

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

4) Either 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, or

5) The remainder of the rods in the group with the inoperable rod are aligned to within ± 35 steps of the inoperable rod within one hour while maintaining the rod insertion limits of Figure 3.5.2.1.

Basis: 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 affects of rod misalignment on associated accident analyses.

The misalignment allowance of Specification B, assures core performance within allowed design margins including allowance for the inaccuracy of the position signals.

3.5.4 ROD POSITION INDICATING SYSTEM

Applicability: Applies to the operating status of the Rod Position Indicating System.

Objective: To ensure the ability to accurately detect the position of control and shutdown rods.

Specification:

A. During power operation the Analog Detection System and the Digital Detection System shall be OPERABLE and capable of determining the control rod positions within ± 21 steps.

B. The Analog Detection System remains OPERABLE if the specified rod position indications can be obtained from direct LVDT voltage measurements.

C. With specifications A and B, above, not met, the following specifications are applicable.

1. With a maximum of one rod position indicator (Analog Detection System) per bank inoperable either:

a. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors within 8 hours, and at least once per 8 hours thereafter and immediately after any motion of the non-indicating rod which exceeds 56 steps in one direction since the last determination of the rod's position, or

b. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

2. With a maximum of one step counter indicator (Digital Detection System) per bank inoperable either:

a. Verify that all rod position indicators (Analog Detection System) 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 35 steps of each other at least once per 8 hours, or

b. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

3. With more than one rod position indicator (Analog Detection System) per bank inoperable or more than one step counter indicator (Digital Detection System) per bank inoperable be in Hot SHUTDOWN within 6 hours.

Basis: Control rod position and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per shift 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.

The indicator inoperability allowance of Specification C requires indirect measurement of rod position or a restriction in THERMAL POWERS; either of these restrictions provide assurance of fuel rod integrity during continued operation.