



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

November 5, 1979

Docket No. 50-29

Mr. Robert H. Groce  
Licensing Engineer  
Yankee Atomic Electric Company  
20 Turnpike Road  
Westboro, Massachusetts 01581

Dear Mr. Groce:

The staff has recently completed a review of the LER's and Technical Specification requirements related to the Control Rod Position Indication Systems (RPI) at Westinghouse PWRs. We have determined that a wide variation exists in the number of LERS received and the technical specification requirements and have, therefore, decided to clarify our requirements.

At the time of development of the Standard Technical Specifications, a systematic attempt was made to clarify potentially ambiguous specifications. One such specification was the control rod misalignment specification for Westinghouse-designed reactors. Westinghouse has performed safety analyses for control rod misalignment up to 15 inches or 24 steps (one step equals 5/8 inch). Since analysis of misalignments in excess of this amount have not been submitted, we have imposed an LCO restricting continued operation with a misalignment in excess of 15 inches. Because the analog control rod position indication system has an uncertainty of 7.5 inches (12 steps), when an indicated deviation of 12 steps exists, the actual misalignment may be 15 inches. This is because one of the coils, spaced at 3.75 inches, may be failed without the operator knowing about it. The Standard Technical Specifications were written to eliminate any confusion about this, and allow a deviation of up to 12 indicated steps. Surveillance requirements, on the indication accuracy of 12 steps were also prepared to ensure that the 15 inch LCO is met.

There is no difference intended in requirements issued for any Westinghouse reactor. Westinghouse has informed the NRC that all of their customers have been informed of this and that all the licensees should be following the same procedures regardless of the language of their Technical Specification. That is, plants with Technical Specifications written in terms of 15 inch misalignment should be considering the 12 step instrument inaccuracy when monitoring rod position.

A related problem is that the installed analog control rod position indicating system equipment may not, in some areas, be adequate to maintain the control rod misalignment specification requirement because of drift problems in the calibration curves. This is evidenced by numerous LER's concerning rod position indication accuracy. In these cases, the uncertainty may be more than 12 steps.

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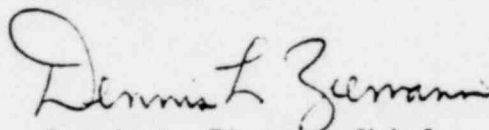
The present Westinghouse Standard Technical Specifications (W-STs) require all full length control rods to be positioned within  $\pm 12$  steps (indicated position) of their group step counter demand position. Since numerous problems have developed in signal conditioning circuits for display indication of control rod position, the staff has determined that the "indicated position" requirement may be fulfilled by voltage measurements obtained from the position indication mechanism (and therefore no LER need be submitted) provided a sufficient data base has been established to ensure a correlation between voltage and position. A copy of the current, applicable W-STs Specifications (3/4.1.3.1 and 3/4.1.3.2) are attached for your information and consideration.

It is requested that you review your present technical specifications to ensure that the control rods are required to be maintained within  $\pm 12$  steps indicated and that the rod position indication system is verified to be accurate to within 12 steps. If your review indicates that this is not the case, you should so inform the Commission within 30 days of your receipt of this letter together with your plans to correct the deficiencies.

Any needed corrective actions may take several forms; such as (1) revising your technical specifications to limit control rod misalignment to no more than  $\pm 12$  steps indicated position, (2) seeking relief by performing analyses justifying (with penalties if needed) greater misalignments, or (3) proposing alternate or supplemental monitoring specifications to demonstrate compliance with the  $\pm 12$  step indicated alignment requirement.

If you have any questions on this matter, please contact us.

Sincerely,



Dennis L. Ziemann, Chief  
Operating Reactors Branch #2  
Division of Operating Reactors

Enclosure:  
W-STs Specifications  
3/4.1.3.1 and  
3/4.1.3.2

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Mr. Robert H. Groce

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cc w/enclosure:

Mr. Lawrence E. Minnick, President  
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Westboro, Massachusetts 01581

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## REACTIVITY CONTROL SYSTEMS

### 3/4.1.3 MOVABLE CONTROL ASSEMBLIES

#### GROUP HEIGHT

#### LIMITING CONDITION FOR OPERATION

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3.1.3.1 All full length (shutdown and control) rods, and all part length rods which are inserted in the core, shall be OPERABLE and positioned within  $\pm 12$  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 or part length rod inoperable or misaligned from the group step counter demand position by more than  $\pm 12$  steps (indicated position), be in HOT STANDBY within 6 hours.
- c. With one full or part 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  $\pm 12$  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 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.
    - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

\*See Special Test Exceptions 3.10.2 and 3.10.3.

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## REACTIVITY CONTROL SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

- c) A power distribution map is obtained from the movable incore detectors and  $F_0(Z)$  and  $F_{\Delta H}^N$  are verified to be within their limits within 72 hours.
- d) 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
- e) The remainder of the rods in the group with the inoperable rod are aligned to within  $\pm 12$  steps of the inoperable rod within one hour 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 (3.1.3.6) during subsequent operation.

POOR ORIGINAL

### SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full and part 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 and each part length rod which is 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.

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TABLE 3.1-1

ACCIDENT ANALYSES REQUIRING REEVALUATION  
IN THE EVENT OF AN INOPERABLE FULL OR PART  
LENGTH ROD

Rod Cluster Control Assembly Insertion Characteristics

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)

## REACTIVITY CONTROL SYSTEMS

### POSITION INDICATION SYSTEMS-OPERATING

#### LIMITING CONDITION FOR OPERATION

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3.1.3.2 The shutdown, control and part length control rod position indication system and the demand position indication system shall be OPERABLE and capable of determining the control rod positions within  $\pm 12$  steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one 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 immediately 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 a maximum of one demand position indicator per bank inoperable either:
  1. Verify that all 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
  2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

#### SURVEILLANCE REQUIREMENTS

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4.1.3.2 Each rod position indicator shall be determined to be OPERABLE by verifying that the demand position indication system and the rod position indication system agree within 12 steps 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.