



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO TECHNICAL SPECIFICATION CHANGE ADDRESSING OPERATION WITH A ROD

URGENT FAILURE ALARM

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATIONS UNITS 1 AND 2

DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated March 19, 1993, Virginia Electric and Power Company requested changes to the Technical Specifications (TS) for the Surry Power Station, Units 1 and 2. These changes address operation with a control rod urgent failure condition including limited operation with one control or shutdown bank inserted slightly below its insertion limit. A letter dated December 9, 1993, provided clarification of operation in the urgent failure condition. The December 9, 1993, submittal did not expand the scope of the original application and did not change the proposed no significant hazards determination.

Changes involving definition of actions and time limits for certain Limiting Conditions of Operation where none are currently defined are also added. In addition, administrative changes to provide consistency and readability are proposed. Finally, the control rod assembly partial movement surveillance test frequency is changed from biweekly to monthly.

The TS require periodic testing of each control and shutdown control rod assembly bank in the core during power operation to ensure that the control rod assemblies are trippable. This testing requires partial movement of each control rod assembly not fully inserted into the core. This is typically done at or near full power, one bank at a time. Current procedures call for sequential insertion and withdrawal of 18 steps for the bank being tested. Special test exceptions allow the rods to be inserted beyond their insertion limits for this test. The length of the test is not prescribed.

On several occasions, the Surry Power Station has experienced control rod urgent failure alarms during the control rod assembly surveillance testing. This alarm is indicative of an internal failure in the rod control equipment that has affected the ability of the system to move control rod assemblies. These failures have a number of causes and may take some time to diagnose. These failures in no way impact the trippability of the control rod assemblies.

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With an urgent failure alarm, the present TS provide 2 hours for troubleshooting and repair and, if unsuccessful, the unit must be brought to hot shutdown in 6 hours. The proposed changes would allow up to 72 hours for troubleshooting and repair if the rod assembly exceeds the insertion limit.

2.0 TECHNICAL SPECIFICATION CHANGES

TS 3.12.A.6 supplements TS 3.12.A.5 by providing a limit on both time and insertion if a bank is immovable due to failures external to the control rod assembly drive mechanism. A maximum of one control or shutdown bank (with the exception of Control Bank D) may be inserted below its insertion limit for up to 72 hours during diagnosis and repair of the Rod Control System provided that:

- 1) the control or 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, and
- 4) the shutdown margin requirement of TS 3.12.A.3.c is determined to be met at least once per 12 hours.

TS 3.12.C.3 has been changed to treat control banks which cannot be moved by the Rod Control System as operable provided:

- 1) the affected banks are trippable, and
- 2) each control rod assembly in the affected bank is aligned to within ± 24 steps of its respective group step counter demand position during the "Thermal Soak" period and to within ± 12 steps otherwise.

TS Table 4.1-2A has been revised to change the frequency for the control rod assembly exercise test frequency from biweekly to monthly.

3.0 EVALUATION

The present TS 3.12.A.5 allows exemption from the insertion limits for physics testing and periodic exercise of individual control rod assemblies. The exemption for control rod assembly testing is necessary because insertion limits require shutdown banks and control banks A, B and C to be fully withdrawn for full power operation. TS 3.12.A.5 provides 2 hours for troubleshooting and repair, and if unsuccessful, the unit must be brought to hot shutdown in 6 hours. The 2-hour time limit does not allow sufficient time for diagnosis and repair and the licensee has had to request enforcement discretion in order to complete diagnosis and repair on several occasions.

The proposed TS 3.12.A.6 supplements TS 3.12.A.5 by defining a limit of both time and insertion if a bank is immovable due to failures external to the control rod assembly drive mechanism. A maximum of one control or shutdown bank(with the exception of Control Bank D) may exceed its insertion limits by no more than 18 steps for up to 72 hours for diagnosis and repair of the rod control system provided the bank is trippable and satisfaction of shutdown margin requirements is verified once per 12 hours. Concurrent control rod misalignment (misalignment of individual control rod assemblies from their group step counter demand position by more than ± 12 steps) is not allowed. Because of the misalignment constraints and the 18 step limit, the impact on core reactivity and power distribution is very small. In addition the shutdown margin is specifically reconfirmed every 12 hours and explicit analytical checks on the radial power distribution are performed as part of the reload safety evaluation process. Furthermore, if the affected bank is not restored to above the insertion limit within the allowed 72 hours, the unit must be placed in hot shutdown within the next 6 hours. This change will allow sufficient time for diagnosis and repairs while maintaining the safety function of the control rods, since the affected rods are still trippable. In addition, alignment must be maintained and shutdown margin will be checked.

Adding TS 3.12.A.6 is acceptable because:

- 1) all control and shutdown rod assemblies are trippable,
- 2) immovable rod assemblies exceed no more than 18 steps,
- 3) immovable rod assemblies are aligned,
- 4) shutdown margin is specifically reconfirmed every 12 hours,
- 5) explicit analytical checks of radial power distribution are performed as part of reload safety evaluation,
- 6) if rod assemblies are not restored to within insertion limits within 72 hours, the unit must be placed in hot shutdown within the next 6 hours.

The next proposed TS change deals with the definition of an operable control rod assembly. If more than one control rod assembly in a given bank is immovable due to a failure external to the control rod assembly drive mechanism but remains trippable, the current specification (TS 3.12.C.3) allows 2 hours to restore the affected control rod assemblies to operable status. The proposed change to TS 3.12.C defines control banks which cannot be moved as OPERABLE as long as they are trippable and each control rod assembly is aligned with the group step counter. While there is no time limit for correcting such a problem, the licensee has committed in a letter dated December 9, 1993 to take prompt corrective action to return the Control Rod Drive System to service and regain the normal plant control function provided by the control rods. This change in the definition of an OPERABLE control rod assembly is acceptable because rods which are trippable, above the insertion limits and within the analyzed alignment requirements are fully capable of performing their intended safety function, even if they cannot be moved by the Rod Control System.

Various changes pertaining to action times were proposed because the existing Surry Technical Specifications do not contain action statements for certain conditions, or contain action statements with no time limits. This creates the potential for unnecessary entry into TS 3.0.1 when the requirements of a limiting condition for operation are not met. These proposed changes are consistent with the Standard Technical Specifications and are, therefore, acceptable.

Several editorial changes were proposed to correct inconsistencies in capitalization of defined terms and operating mode names. Also, previously deleted figures are being removed and the remaining figures are being renumbered. The staff finds the proposed editorial changes acceptable.

Finally, the control rod assembly surveillance frequency is being changed from biweekly to monthly. A review of recent test experience (in excess of 4,000 individual control rod assemblies tested) revealed no instance of mechanically stuck control rod assemblies. This test experience supports the proposed relaxation. The staff finds this change acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comment.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and also changes surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding (58 FR 28064). Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such

activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

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