



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

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 196 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 212 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 169 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

DOCKET NOS. 50-259, 50-260 AND 50-296

1.0 INTRODUCTION

By letter dated July 20, 1992 as supplemented March 18, 1993, the Tennessee Valley Authority (the licensee) submitted a request for changes to the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3 Technical Specifications (TS) and associated Bases. The staff's proposed finding of no significant hazards considerations is unaffected by the March 18, 1993 supplement. The requested changes would remove the Rod Sequence Control System (RSCS) and decrease the power level setpoint above which the Rod Worth Minimizer (RWM) is no longer required.

2.0 DISCUSSION

The RSCS restricts control rod movement to minimize the individual worth of control rods to lessen the consequences of a Rod Drop Accident (RDA). Control rod movement is restricted through the use of rod select, insert, and withdrawal blocks. The RSCS is a hard-wired (as opposed to a computer controlled), redundant backup system to the RWM. It is independent of the RWM in terms of inputs and outputs, but the two systems are compatible. The RSCS is designed to monitor and block, when necessary, operator actions to select, withdraw, or insert control rods, and thus assist in preventing significant control rod pattern errors which could lead to a control rod with a high potential reactivity worth. A significant pattern error is one of several abnormal conditions that must occur for an RDA to exceed the fuel energy density limit criteria. The RSCS was designed only for possible mitigation of the RDA and is active only during low power (currently less than 20 percent rated power) when an RDA might be significant. It provides rod blocks on detection of a significant pattern error. It does not, by itself, prevent an RDA. A similar pattern control function is provided by the RWM, a computer-controlled system. 4

By letter dated August 15, 1986, the BWR Owner's Group (BWROG), in cooperation with the General Electric Company (GE), proposed Amendment 17 to GE Licensing Topical Report NEDE-24011-P-A which would eliminate the requirement for the RSCS and retain the RWM but lower the setpoint for turnoff (during startup) or

9305060268 930430
PDR ADOCK 05000259
P PDR



100



100

turnon (during shutdown) from 20 to 10 percent. The NRC staff review of this report, documented by a letter by A. Thadani (USNRC) dated December 27, 1987 to J. Charnley (General Electric), concluded that the proposed changes were acceptable, and approved Amendment 17, but imposed several additional requirements which would be necessary to implement the changes. The additional requirements were:

1. The TS should require provisions for minimizing operations without the RWM system operable.
2. The occasional necessary use of a second operator as a replacement for the RWM should be strengthened by a utility review of relevant procedures, related forms and quality control to assure that the second operator provides an effective and truly independent monitoring process. A discussion of this review should accompany the request for RSCS removal.
3. Rod patterns used should be at least equivalent to Banked Position Withdrawal Sequence (BPWS) patterns.

3.0 EVALUATION

The licensee has proposed changes to several TS and associated Bases. These changes are:

1. Sections 3.3.A.2.d, 4.3.A.2.b, 3.3/4.3.B.3.a, and Tables 3/4.2.C were edited since they contained requirements pertaining only to the RSCS.
2. Sections 4.3.A.2.a and 4.3.B.1.a were edited to remove references to the RSCS (4.3.B.1.a also had an administrative change).
3. Sections 4.3.B.3.b.1.a, 4.3.B.3.b.2.a, 3.3.B.3.c and 3.3.B.3.b.1, 2, and 3 were edited as a result of the lowering of the RWM setpoint (3.3.B.3.c also had an administrative change).
4. Section 4.3.C.1 was edited since it contained references to RSCS requirements and the RWM setpoint, and to make an administrative change.
5. Section 4.3.B.3.b.3 was edited to make an administrative change.
6. The Table of Contents was changed to reflect a change in page numbers.
7. The BASES, Sections 3.3/4.3.A.2, 3.3/4.3.B.1 and 3, and 3.3/4.3.C were edited to appropriately reflect the changes made in TS.
8. Reference to the RSCS was deleted from Definition 1.M Note 4.
9. Reference to the RSCS was deleted from Bases 2.1.2.



Changes 1 through 7 were submitted by the July 20, 1992 letter. Changes 8 and 9 were part of the March 18, 1993 supplement.

These changes implement three items:

- A. Elimination of the RSCS requirements.
- B. Reduction of the RWM setpoint to 10 percent of full power.
- C. Increased administrative control of RWM operability (intended to result in decreased use of the second operator as a substitute for the RWM). The licensee has also discussed the procedures for second operator actions, when required, to ensure independent monitoring of the control rod patterns. BPWS control rod patterns are already required by the TS. However, this requirement has been reemphasized in several of the TS changes.

NRC staff review of the generic basis for removal of the RSCS and reducing the RWM setpoint is provided in the December 27, 1987 letter referenced above. The staff has reviewed the licensee's proposed TS changes relevant to items A and B above, and concludes that these proposed changes fall within the scope of the generic staff evaluation. The staff finds that the proposed TS changes are appropriate, clearly stated, and satisfy relevant technical criteria.

The licensee has also proposed provisions which minimize operations without the RWM operable (item C, above). The proposed revision to the TS requires the RWM to be operable at the beginning of each startup, with only one exception per year. This follows the pattern of previously approved RWM TS and previous reviews for RSCS removal (e.g., Hatch, see safety evaluation dated May 20, 1992). These changes have been previously found to provide the desired improvement in reliability for the system. Also, as required, the TS and procedures for the use of a second operator (when the RWM is inoperable) have been reviewed by the licensee. Staff review of the licensee's submittal confirms that appropriate administrative measures are provided to ensure a suitable independent check on the rod patterns used. Finally, as required, the TS revision prescribes the use of rod patterns equivalent to the BPWS patterns approved by previous staff reviews to maintain low control rod reactivity. The proposed changes to the TS and bases appropriately implement these changes.

In conclusion, the NRC staff has reviewed the reports submitted by the licensee for proposing TS changes relating to the removal of the RSCS and decrease of the power level setpoint above which the RWM is no longer required. Based on this review, we have concluded that appropriate documentation was submitted and the proposed TS changes satisfy staff positions and requirements in these areas. Therefore, the proposed TS changes are acceptable.



4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Alabama State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change the Surveillance Requirements and Bases. 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 the amendments involve no significant hazards consideration, and there has been no public comment on such finding (57 FR 48827). Accordingly, the 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 the 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: C. Beardslee and J. Williams

Date: April 30, 1993

