



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

ENCLOSURE 4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 178 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 184 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 149 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 August 7, 1978, the NRC advised the Tennessee Valley Authority (TVA or the licensee) of deficiencies regarding the Reactor Protection System (RPS) Power Monitoring System (PMS) identified at Hatch Nuclear Plant, Unit 2, and the potential for similar deficiencies at other Boiling Water Reactors (BWRs). The NRC requested that TVA evaluate the design of the Browns Ferry Nuclear Power Plant (BFN) RPS and promptly commence surveillance of the RPS power supply as described in the letter. By letter dated December 13, 1978, the licensee responded that the proposed RPS modifications were not necessary and that additional Technical Specification (TS) changes were not planned. The licensee's letter also advised the NRC that the surveillance requirement imposed by the August 7, 1978, letter would be discontinued after January 1, 1979. The NRC's letter of September 24, 1980, advised TVA that based on the NRC's evaluation, BFN could experience the same adverse conditions found at Hatch, Unit 2, and modifications should be implemented at BFN with specified TS.

By letter dated July 1, 1981, TVA provided the general outline of the design approach for the requested modifications. Proposed TS limits were submitted as part of the Unit 1 reload. However, the reload submittals from TVA did not provide sufficient information to substantiate design conformance to General Design Criteria (GDC) 2, GDC 21 and IEEE 279-1971. Also, the proposed trip setpoints of the protective relays were not based on analysis and test verification. By letter dated October 12, 1983, the NRC transmitted these concerns to TVA, and the subsequent response dated August 9, 1984, resolved some issues. A request for additional information was sent to TVA on October 31, 1984, to which TVA responded by letter dated March 1, 1985. The NRC's Safety Evaluation (SE) on these modifications was issued on July 27, 1985. According to the SE, the NRC accepted the modifications and required that the licensee submit the revised TS after completion of the testing of design modifications, and also include the test verified relay setpoint and time delays in the TS. By letter dated December 22, 1988, TVA submitted this information to the NRC. The NRC reviewed the information and approved the TS amendment for BFN Unit 2. However, the plant experienced spurious trips due to transient conditions.

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Consequently in a June 4, 1990 letter, the licensee requested approval of the proposed amendment for the new setpoints for RPS circuit protection devices. The proposed amendment would (1) change the RPS circuit protection trip level setpoints for Unit 2, (2) add surveillance requirements 4.1.B.2 to the Units 1 and 3 TS with the new setpoints, (3) add surveillance requirement 4.1.B.1, which contains the new setpoints to Unit 3, and (4) add limiting conditions for operation 3.1.B.1 and 3.1.B.2 to the Unit 3 TSs.

The October 24, 1990 letter provided clarifying information that did not change the action described, or the initial determination of no significant hazards consideration as previously published, in the FEDERAL REGISTER. In addition, a grammatical change to TS 3.1.B, although not mentioned in the initial FEDERAL REGISTER notice, similarly did not alter the action or affect the initial determination.

2.0 EVALUATION

The previous values for the RPS circuit protection devices were as follows:

	Allowable TS Limit	Trip Setpoint
Overvoltage	126.5	124.5
Undervoltage (Motor Generator (MG) Set)	113.4	115.0
Undervoltage (Alternate Supply)	111.8	115.0
Underfrequency	57.0	58.0

The new values proposed in the June 4, 1990, submittal for the RPS circuit protection devices are as follows:

	Allowable TS Limit	Trip Setpoint
Overvoltage	132.0	129.09
Undervoltage	108.5	110.46
Underfrequency	56.0	57.0

The annunciator setpoint for overvoltage is set at 124.5 volts, and for undervoltage it is set at 115 volts. There is no annunciator for the underfrequency condition.

The NRC expressed a concern with the amendment request. The concern related to the new setpoints that may require some equipment to operate beyond their design ratings. The NRC made a request for additional information on September 27, 1990. TVA provided the additional information on October 24, 1990. The NRC reviewed the information and, during a November 15, 1990 conference call, asked TVA to provide more information related to all the spurious trips associated with the PMS and a list of all the RPS components together with their design ratings and calculated values of the parameters based on the new trip setpoints. During a meeting on November 27, 1990, TVA presented this information to the NRC staff. The current setpoint and alarm for undervoltage and overvoltage condition would not allow the operator enough time to take corrective action to prevent a spurious trip. According to TVA, the only components with

environmental qualification (EQ) requirements are ASCO solenoid valves, but since these valves do not operate beyond their design ratings, their qualification would not be affected. TVA has also received letters from two manufacturers stating that the equipment can operate without degradation at the calculated values, which are beyond their design ratings. The calculated values do not exceed the design ratings by more than ± 3 Volts and should not affect equipment performance.

For underfrequency all the components operate within their design ratings except for two components for which the allowable underfrequency exceeds the rated frequency by 1 cycle per second. However, since these components (MG sets) contain a large flywheel, the equipment should not see a significant frequency variation, except when there is a power source switchover for an MG set due to a bus fault. Based on the above evaluation, the NRC concludes that the new setpoints will not adversely impact the equipment and will improve plant reliability.

The new setpoints are reflected in revisions to surveillance requirement 4.1.B.2 for Units 1 and 2. For consistency with the other two units, the Unit 3 TS were revised to include surveillance requirements 4.1.B.1 and 4.1.B.2, and the associated LCOs 3.1.B.1 and 3.1.B.2, with the appropriate setpoints and adequate surveillance intervals to ensure plant safety and improve plant reliability. These changes are thus acceptable. In addition, an editorial change to correct the grammar of LCO 3.1.B for Units 1 and 2, although reflected in the proposed TS pages, but not discussed in the licensee submittal, is also acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

The amendments involve changes to requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The 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. 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 nor environmental assessment need be prepared in connection with the issuance of these amendments.

4.0 CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration, which was published in the FEDERAL REGISTER (55 FR 30314) on July 25, 1990, and consulted with the State of Alabama. No public comments were received and the State of Alabama did not have any comments. The State of Alabama was also informed of the staff's final no significant hazards consideration determination and the intent to issue a license amendment.

The staff 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 amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: H. Garg

Dated: January 3, 1991