



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

ENCLOSURE 2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 181 TO FACILITY OPERATING LICENSE NO. DPR-52

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-260

1.0 INTRODUCTION

By letter from the Tennessee Valley Authority (the licensee) to the NRC dated June 8, 1990, changes were proposed to the Browns Ferry Nuclear Unit 2 (BFN2) Technical Specifications (TS) to permit operation with an extended load line limit (ELLL) on the power/flow map. The licensee's submittal included proposed Limiting Safety System Settings (LSSS), Limiting Conditions for Operation (LCOs), Figure and Table changes to the BFN2 TS relating to neutron flux scram trip settings and the limiting power/flow line.

Enclosed with the June 8, 1990 letter was a report discussing the technical analyses of the consequences of operation in the ELLL to justify the proposed changes. The proposed changes are addressed individually in the following Safety Evaluation (SE) Section 2.0.

2.0 EVALUATION

The licensee's submittal proposes an extension of the current allowed operating region on the reactor power/flow map via an extended load line limit analysis (ELLLA). The basis for the extension is described in supporting documentation provided by the licensee. Except for changes to the flow-biased neutron flux scram and rod block setpoints for ELLL and some Basis discussion changes, these changes require no other revisions to Cycle 6 TS.

Abnormal Operation Transients

Certain transients of Chapter 15 of the BFN2 Final Safety Analysis Report (FSAR) were considered for the ELLL. The limiting transients reevaluated were generator load rejection without turbine bypass (GLRWOB), and feedwater flow controller failure to maximum demand (FWCF). The potentially limiting GLRWOB and FWCF events were evaluated at the power/flow conditions corresponding to the ELLL bounding point (100% power, 87% core flow). The results of the evaluation show that the operating limit minimum critical power ratios (OLMCPR) for the limiting transients are equal to or bounded by the current TS limits. The NRC finds that no changes to the allowable limits are required.

General Electric (GE) has also examined other events and affected system components related to the requested extensions. These include overpressure protection, Loss of Coolant Accident (LOCA) events, pressure differentials and vibration response on reactor internals and fuel assemblies. The results show that design limits will not be exceeded. The containment LOCA response was analyzed and the results show no significant impact of the ELLL. The LOCA analysis performed for the current licensing basis remains applicable. The NRC review of these various GE examinations has concluded that suitable analyses were performed and the results show that operation with the extended load line region is either bounded by the licensee's reload safety analysis or the results are less than the design safety limits. The licensing safety analysis was approved in License Amendment 125 dated August 9, 1986 and updated by Amendment 172 dated September 13, 1989.

Modification of Flow-Biased Average Power Range Monitor (APRM) Scram and Rod Block Trip Equations

The ELLL proposal changes the APRM flux scram lines on the power/flow map and permits operation up to the new APRM flux scram line ($0.58W + 62\%$) and up to the intersection with the 100 percent power line occurring at a flow of 87 percent. This is a standard change for ELLL. The flow-biased rod block trip equation is changed to $0.58W + 50\%$ with a maximum value of 108%. These changes are acceptable since they are consistent with the applicable design safety limits.

Technical Specification Changes for ELLL

The proposed changes to the BFN2 TS are identified in the licensee's submittal. The bases for the changes and the NRC conclusions are detailed in the previous SE Sections.

Changes to the Limiting Safety Systems Settings (LSSS) and Limiting Conditions for Operation (LCO) were proposed as follows:

(1) TS 2.1.A.1.a Neutron Flux Trip Settings

A change is made to identify the proposed APRM flux scram trip setting as less than or equal to $0.58W + 62\%$.

(2) TS 2.1.A.1.c Neutron Flux Trip Settings

A change is made to identify the proposed APRM Rod Block trip setting as less than or equal to $0.58W + 50\%$.

(3) TS Figures 2.1-1 and 2.1-2

Figures are replaced with revised Figures to show the revised flow-biased scram and rod block lines based on equations developed from the trip settings in items (1) and (2) above.

(4) TS Table 3.2.c Instrumentation that Initiates Rod Blocks

A change is made to identify the proposed APRM Upscale (Flow Bias) trip level setting.

(5) TS 3.5.L.1 Core and Containment Cooling Systems

A revision is proposed to reflect the change in setpoint equations identified in (1) and (2) above.

For changes (1) through (5) above, the Basis discussion paragraphs were revised for consistency. The changes identified in the licensee's submittal are acceptable as proposed.

We have reviewed the information for operation of the BFN2 with an extended operating region. Based on this review, we conclude that appropriate documentation was submitted to justify that operation under the proposed TS changes will be within existing design limits. Thus, the proposed TS changes are acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets 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 the amendment.

4.0 CONCLUSION

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.

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