



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

ENCLOSURE 4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 176 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 147 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 May 18, 1990, the Tennessee Valley Authority requested an amendment to licenses DPR-33, DPR-52 and DPR-68 to change Browns Ferry Nuclear Plant, Units 1, 2 and 3 Technical Specifications (TS). These changes were requested pursuant to the provisions of 10 CFR 50.4 and 50.90. This amendment was proposed in order to clarify the TS requirements for limiting conditions for operation (LCO) of the Residual Heat Removal Service Water (RHRSW) and Emergency Equipment Cooling Water (EECW) systems.

The RHRSW system provides cooling water from the ultimate heat sink (Wheeler Reservoir) to remove reactor core heat via the RHR heat exchangers. The RHRSW also serves as the standby coolant supply (SBCS) and can supply makeup to the reactor coolant system when all emergency core cooling systems have failed. The RHRSW system consists of eight motor-driven service water pumps (four pairs) that take a suction through strainers in the intake structure and supply four headers that serve the RHR heat exchangers for all three Browns Ferry units.

The EECW system provides cooling water from the ultimate heat sink to various component heat loads in the plant, including the diesel generator heat exchanger, RHR and Core Spray System (CSS) pump room coolers, RHR pump seal coolers, and various other heat loads. The EECW system also serves as a backup for the raw cooling water (RCW) system which is the normal water source for some operating systems including the reactor building closed cooling water (RBCCW) system. The EECW system consists of four, automatically starting, motor-driven service water pumps that take a suction through strainers in the intake structure and supply two headers (north header and south header) which serve all three Browns Ferry units. Cooling water is returned to the ultimate heat sink via a yard drainage system.

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Description of the Changes to BFN Technical Specifications for Units 1, 2 and 3

1. Revise LCO 3.5.C.1

Existing LCO 3.5.C.1 reads:

1. PRIOR TO STARTUP from a COLD CONDITION, 9 RHRSW pumps must be OPERABLE, with 7 pumps . . ., assigned to RHRSW service and two automatically starting pumps assigned to EECW service.

Change to LCO 3.5.C.1 reads:

1. PRIOR TO STARTUP from a COLD SHUTDOWN CONDITION, the RHRSW pumps, . . ., shall be OPERABLE and assigned to service as indicated in Table 3.5-1.
2. Table 3.5-1, "Minimum RHRSW and EECW Pump Assignment" has been reformatted as follows: A title has been included on the table, separate columns for the minimum number of RHRSW and EECW pumps required to be operable based on the number of fueled units, and notes made unnecessary as a consequence of the reformatting, have been deleted.
3. The Bases Section 3.5.C for RHRSW and EECW are revised as follows:
 - a. The Bases for EECW are replaced by - "The EECW has two completely independent headers (north and south) in a loop arrangement inside and outside the Reactor Building. Each header is supplied by two automatic RHRSW pumps. A crosstie at the RHRSW pump discharge provides the capability for each header to be supplied by four automatically starting RHRSW pumps. Those components requiring EECW, except the control air compressors which are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The air compressors only use EECW as an emergency backup supply."
 - b. A correction is being made to the "RHRSW" bases for Units 1 and 2 only to change "RHRSW" heat exchanger to "RHR" heat exchanger.
 - c. The following is added to the bases: "With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of specification 3.5.B.1 (RHR System). If only three RHRSW pumps are OPERABLE, a 30 days LCO exists because of the requirement of Specification 3.5.B.5 (RHR System)."

2.0 EVALUATION

TVA has clarified and simplified Table 3.5-1, "Minimum RHRSW and EECW Pump Assignment." The minimum pump assignment is a function of the number of units fueled. When the number of operable pumps is less than the assigned minimum, the specified LCO becomes effective which requires that the number of operable service water pumps must be brought back up to the minimum, within a certain time frame, if plant operation is to continue. The TS prescribe two different time limits which become effective whenever the number of assigned and/or operable pumps fall below the minimum number needed for indefinite operation. Plant operation with the number of assigned, operable pumps below the minimum for indefinite operation is allowed for either 30 days or seven days, depending on the actual number of pumps available and operational status of the Browns Ferry units. TVA's amendment does not affect existing LCO or surveillance requirements, it is intended to make the TS more user friendly for the operators and to eliminate a potential conflict with the RHR LCO requirements.

TVA has reformatted TS Table 3.5-1 and reduced the number of notes from four to just one. The previous Table 3.5-1 format and associated footnotes were sufficiently complex to impede comprehension and contribute to potential misapplication by reactor operators. The remaining note listed below revised Table 3.5-1 pertains to the EECW system. This note states that at least one operable pump must be assigned to each EECW header; and only the automatically starting pumps may be assigned to EECW header service. Since there are two headers for EECW serving all three units, one north header and one south header, the minimum allowable operable pumps for reduced time limits is two EECW pumps. The EECW system normally is in standby, with pumps A3, B3, C3, and D3 aligned to supply the EECW headers when required. Two pumps are aligned to each header. The maximum EECW flow rate required by the three unit plant is 9800 gpm, including non-safety systems requiring 4400 gpm for the RBCCW System air compressors cooler, control room air conditioning chillers and hydrogen/oxygen analyzer. Three of the four EECW pumps are necessary to supply this maximum flow rate; two EECW pumps can supply the essential plant loads. The staff concludes that the minimum EECW pump assignments of TS Table 3.5.1 are acceptable.

The RHRSW system normally is in standby, with two pumps aligned to each of four RHRSW headers which serve the RHR heat exchangers for three units. No cross-connections exist between the four RHRSW headers, but there are cross-connections between the pumps that are aligned to the RHRSW system and the service water pumps aligned to the EECW system. The cooling water requirements of each RHR heat exchanger can be supplied by one RHRSW pump. TS Table 3.5-1 specifies, in a clear concise format, the operability requirements of the RHRSW pumps, depending upon unit status. The staff finds that the minimum RHRSW pump assignments of Table 3.5-1 are acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

The amendments involve a change to a requirement with respect to 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 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 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, and (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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Dated: November 5, 1990