



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

ENCLOSURE 4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 190 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 152 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By letter dated May 18, 1990, as superseded by October 30, 1990, the Tennessee Valley Authority (TVA, the licensee) proposed changes to the Technical Specifications (TS) for the Browns Ferry Nuclear Plant (BFN) Units 1, 2 and 3. The proposed TS amendments would revise: (1) Table 3.2.B and Limiting Conditions for Operations (LCO) 3.5.B.11, 3.5.E.1, 3.5.F.1, 3.5.G.1, 3.6.D.1, including applicable Bases, to correct the equipment operability requirements for certain systems when the reactor is in the COLD SHUTDOWN CONDITION in order to accommodate required routine testing evaluations (e.g., hydrostatic and integrated leak rate testing), (2) Table 3.2.B to decrease the maximum operating power level allowed, with an inoperable Recirculation Pump Trip (RPT) system(s), from 85 percent to 30 percent power, and (3) Table 3.2.B to correct two typographical errors.

2.0 EVALUATION

TVA is required by TS Section 4.7.A to conduct a primary containment integrated leakrate test (ILRT) at certain frequencies. The ILRT is performed with the plant in the cold shutdown condition by pressurizing the primary containment (drywell and torus) to design basis accident pressure (49.6 psig) and monitoring pressure and temperature for a prescribed period of time. Drywell high pressure instrumentation listed in Table 3.2.B, "Instrumentation, That Initiates Or Controls The Core And Containment Cooling Systems," are required to be operable by Note 1 of the table. Note 1 states, "Whenever any CSCS System is required by Section 3.5 to be operable, there shall be two operable trip systems except as noted..." Drywell high pressure instruments have a trip level setting between 1 and 2.5 psig. To perform this test the high drywell pressure instruments would have to be inhibited to prevent unnecessary Emergency Core Cooling System (ECCS) actuation. These instruments, along with the low reactor pressure instruments provide indication of a steam leak. With the reactor in the cold shutdown condition (Reactor Coolant System (RCS) temperature less than 212°F and the reactor mode switch in the shutdown or refuel position), no steam is present to be detected, therefore it is acceptable for the drywell pressure instruments to be inoperable. The licensee proposed adding a Note 18 to the list of notes

at the end of Table 3.2.B that states, "Not required to be OPERABLE in the COLD SHUTDOWN CONDITION." TVA's TS change to allow these particular instruments to be inoperable whenever the plant is in a cold shutdown condition is considered acceptable by the staff, and is also consistent with the General Electric Standard Technical Specifications (GE STS).

Once per operating cycle, the plant is required to perform an inservice hydrostatic pressure test on the reactor vessel and attached piping out to and including the first isolation valve to ensure the integrity of the RCS pressure boundary. The test is performed (1096 to 1150 psig in the dome) in excess of normal operating pressure (approximately 1020 psig). An inservice leakage test is required whenever the RCS pressure boundary is breached. This test is similar to the hydrostatic test, but is performed at normal operating pressure. These tests are performed in the cold shutdown condition at the end of the refueling outage with fuel loaded and the reactor pressure vessel head installed.

TS LCO 3.6.D.1, "Relief Valves," states that "when more than one relief valve is known to be failed, an orderly shutdown shall be initiated and the reactor depressurized to less than 105 psig within 24 hours." This is interpreted to mean that all the relief valves are required to be operable when the reactor pressure is above 105 psig. When the reactor vessel hydrostatic test is performed, the reactor vessel pressure is increased to 1150 psig. In this condition, the current TS LCO requires operability of all relief valves since the pressure is above 105 psig. TVA proposed to add a note to state that relief valves are not required to be operable during cold shutdown conditions due to low reactor coolant enthalpy and availability of Residual Heat Removal (RHR) and Core Spray (CS) systems. TVA's TS amendment to revise relief valve operability requirements for cold shutdown conditions is considered acceptable by the staff, and is also consistent with GE STS.

During a hydrostatic test of the RCS, 11 of 13 relief valves will be disabled. The remaining 2 relief valves will be reset at higher pressures to provide an alternate means of overpressure protection. Since hydrostatic tests or inservice leakage tests are performed at cold shutdown conditions, only 2 relief valves are required to be operable. Hence, the revised TS Bases proposed by TVA which states that overpressure protection is provided during hydrostatic tests by two of the relief valves is considered acceptable by the staff.

TSs currently require the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems to be operable when RCS pressure is greater than 150 psig. This requirement was originally made because it was believed that the only time RCS pressure would be 150 psig or greater was during startup and power operation. Hydrostatic and inservice leakage tests are conducted while in cold shutdown conditions with RCS pressures greater than 150 psig for which existing TS require the HPCI and RCIC systems to be operable. If called upon to operate, these systems would not be able to perform their intended functions because they are steam-driven systems and there is no steam supply available while the plant is in a cold shutdown condition. Therefore, adding the statement "...except for COLD SHUTDOWN CONDITION..." in LCO 3.5.E.1 and 3.5.F.1 to allow these systems to be inoperable during cold shutdown conditions is considered acceptable by the staff, and is also consistent with GE STS.

The RHR crosstie is currently required to be operable when RCS pressure is greater than atmospheric (LCO 3.5.B.11). This requirement was originally intended to assure RHR crosstie operability during startup and power operation to maintain the capability for long-term reactor core and primary containment cooling independent of the RHR system operability for a given unit. This is provided in case the torus is breached and causes flooding of the RHR pumps of the affected unit. However, with the reactor in the cold shutdown condition there is no high energy potential to breach the torus. Consequently, the RHR crosstie need not be operable during cold shutdown conditions. Therefore, adding the statement, "and the reactor is not in the COLD SHUTDOWN CONDITION..." to TS LCO 3.5.B.11 as regards RHR crosstie operability is considered acceptable by the staff.

The safety function of the Automatic Depressurization System (ADS) is to reduce RCS pressure, in the event of a Loss of Coolant Accident (LOCA), to a lower pressure point where the low pressure ECCS pumps can inject water and make up for the inventory loss from the LOCA. During cold shutdown operations the RCS temperature is less than 212°F. Below this temperature there is no steam pressure to relieve, and in the event of a pressure boundary breach while performing a hydrostatic test the decrease in vessel water level would correspond to a decrease in pressure. Pressure would eventually decrease to the point where low pressure pumps could inject and provide a make up supply of water. This accomplishes the same function of the ADS, and as such the ADS is not needed to be operable during cold shutdown operations. TVA's proposed change to TS 3.5.G.1.(2), by adding the phrase "...except in the COLD SHUTDOWN CONDITION," is considered acceptable by the staff, and is also consistent with the GE STS.

The staff has reviewed the licensee's proposed changes to the plant TS LCO requirements for cold shutdown operations (See item (1) of Introduction to this safety evaluation (SE)). Based on the above review, the staff concludes that the licensee's justification to support the proposed changes to the above-mentioned sections is acceptable. These changes revise specific TS operability requirements from being pressure dependent to mode dependent, which will now accommodate ILRT and inservice hydrostatic and leakage rate testing.

The RPT provides automatic trip of both recirculation pumps after a turbine trip or generator load rejection, if reactor power is above approximately 30 percent of rated full load. The purpose of this trip is to reduce the peak reactor pressure and peak heat flux resulting from transients in which it is postulated that there is a coincident failure of the turbine bypass system. The RPT signal is initiated by either turbine control valve fast closure or turbine stop valve closure. An automatic reactor scram is also initiated by these signals. The very rapid reduction in core flow following a recirculation pump trip, early in the transient, reduces the severity of these events because an immediate increase in core voids provides negative reactivity to supplement the negative reactivity insertion from a control rod scram. The proposed TS amendment corrects the maximum operating power level allowed with an inoperable RPT system(s) from 85 percent to 30 percent Core Thermal Power (CTP). Thirty percent CTP is used in the RPT analysis (NEDO-24119, "Basis for Installation of Recirculation Pump Trip System for Browns Ferry," April 1978, and BFN Updated Final Safety Analysis Report (UFSAR) Section 7.9.4.5), and is conser-

vatively determined to be the maximum power level at which fuel cladding integrity can be assumed during an end of cycle limiting overpressurization even without RPT protection.

The proposed TS change (See Item (2) of the Introduction to this SE) to Table 3.2.B reduces the maximum allowed operating reactor power level, with the RPT system inoperable, from 85 percent to 30 percent to make it consistent with assumptions in the current licensing basis analysis. This change is considered acceptable by the staff.

Furthermore, with regards to editorial changes (correction of typographical errors) made to TS Table 3.2.B (See Item (3) of the Introduction to this SE), the staff considers them acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

The amendments involve a change to a requirement with respect to 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 (published in the Federal Register on November 28, 1990) 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 amendment involves no significant hazards consideration which was published in the Federal Register (55 FR 26295) on June 27, 1990, and (55 FR 49461) on November 28, 1990 and consulted with the State of Alabama. No public comments were received and the State of Alabama did not have any comments.

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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Dated: February 7, 1991