Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609

May 11, 1995

TVA-BFN-TS-359 10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2 AND 3 - TECHNICAL SPECIFICATION (TS) 359 - SCRAM PILOT AIR HEADER LOW PRESSURE TRIP

In accordance with the provisions of 10 CFR 50.4 and 50.90, TVA is submitting a request for an amendment (TS-359) to licenses DPR-33, DPR-52 and DPR-68 to change the TSs for Units 1, 2, and 3. The proposed change reflects the interim addition of the scram pilot air header low pressure trip function on Unit 3. This trip function is currently reflected in the Unit 2 TSs. In addition, a note in the table that specifies the reactor protection system instrumentation requirements is being clarified for all three units.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The BFN Plant Operations Review Committee and the BFN Nuclear Safety Review Board have reviewed this proposed change and determined that operation of BFN Units 1, 2 and 3 in accordance with the proposed change will not endanger the health and safety of the public. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Alabama State Department of Public Health.

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Enclosure 1 to this letter provides the description and evaluation of the proposed change. This includes TVA's determination that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review. Enclosure 2 contains copies of the appropriate Units 1, 2, and 3 TS pages marked-up to show the proposed change. Enclosure 3 forwards the revised Units 1, 2, and 3 TS pages that incorporate the proposed change.

TVA requests that the revised TS be made effective within 30 days of NRC approval. If you have any questions about this change, please contact me at (205) 729-2636.

Sincerely,

Pedro Salas
Manager of Site Licensing

Enclosures
cc: See page 3

Subscribed and sworn to before me
on this 11th day of May 1995.

Barbara A. Blanton
Notary Public

My Commission Expires My Commission Expires 10/06/98

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2 AND 3

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-359
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

I. DESCRIPTION OF THE PROPOSED CHANGE

In summary, the proposed change reflects the interim addition of the scram pilot air header low pressure trip function on Unit 3. This proposed change is consistent with the current Unit 2 TS. The scram pilot air header low pressure switch scram function performs the same function as the high water level switches in the Scram Discharge Instrument Volume. The scram pilot air header low pressure switch scram function has also recently contributed to decreased plant availability. Therefore, TVA intends to pursue the overall reactor protection system design issue and the long term need for the scram pilot air header low pressure switch scram function. In addition, a note in the table that specifies the reactor protection system (RPS) instrumentation requirements is being clarified for all three units. The specific changes are described below.

1. The current requirements for RPS instrumentation are listed in Table 3.1.A, RPS (SCRAM) Instrumentation Requirements. The scram pilot air header low pressure instrumentation will be added to this table on TS Page 3.1/4.1-3 for Unit 3 as shown below:

Min. No. of Operable Instr. Channels Per Trip System (1)(23)	Trip Function	Trip Level Setting	Modes in which Function Must Be Operable: Shut-down	Refuel (7)	Startup/ Hot Standby	Run	Action (1)
2	Low Scram Pilot Air Header Pressure	≥ 50 psig	X(2)	X(2)	X	X	1.A

2. Note 2 for Table 3.1.A on TS Page 3.1/4.1-5 for Unit 1 is revised as follows:

   Current note:

   > "Scram discharge volume high bypass may be used in shutdown or refuel to bypass scram discharge volume scram with control rod block for reactor protection system reset."

   Proposed note:

   > "The scram discharge volume high water level bypass may be used in SHUTDOWN or REFUEL to bypass the scram discharge volume high-high water level scram signal in order to reset the reactor protection system trip. A control rod withdraw block is present when this scram signal is bypassed."

3. Note 2 for Table 3.1.A on TS Page 3.1/4.1-5 for Unit 2 is revised as follows:

   Current note:

   > "Scram discharge volume high bypass may be used in SHUTDOWN or REFUEL to bypass scram discharge volume scram and scram pilot air header low pressure scram with control rod block for reactor protection system reset."

   Proposed note:

   > "The scram discharge volume high water level bypass may be used in SHUTDOWN or REFUEL to bypass both the scram discharge volume high-high water level and scram pilot air header low pressure scram signals in order to reset the reactor protection system trip. A control rod withdraw block is present when these scram signals are bypassed."

4. Note 2 for Table 3.1.A on TS Page 3.1/4.1-4 for Unit 3 is revised as follows:

Current note:

"Scram discharge volume high bypass may be used in shutdown or refuel to bypass scram discharge volume scram with control rod block for reactor protection system reset."

Proposed note:

"The scram discharge volume high water level bypass may be used in SHUTDOWN or REFUEL to bypass both the scram discharge volume high-high water level and scram pilot air header low pressure scram signals in order to reset the reactor protection system trip. A control rod withdraw block is present when these scram signals are bypassed."

5. Note 7 for Table 3.1.A on TS Page 3.1/4.1-4 for Unit 3 is revised as follows:

Current note:

"When the reactor is subcritical and the reactor water temperature is less than 212°F, only the following trip functions need to be OPERABLE:

A. Mode switch in SHUTDOWN

B. Manual scram

C. High flux IRM

D. Scram discharge volume high level

E. APRM 15 percent scram"

Proposed note:

"When the reactor is subcritical and the reactor water temperature is less than 212°F, only the following trip functions need to be OPERABLE:

A. Mode switch in SHUTDOWN

B. Manual scram

C. High flux IRM

D. Scram discharge volume high level

E. APRM 15 percent scram

F. Scram pilot air header low pressure"

6. The current functional tests and the minimum functional test frequencies for safety related RPS instrument and control circuits are listed in Table 4.1.A. The low scram pilot air header pressure instrumentation will be added to this table on TS Page 3.1/4.1-8 for Unit 3 as shown below:

	Group (2)	Functional Test	Minimum Frequency(3)
Low Scram Pilot Air Header Pressure (PS 85-35 A1, A2, B1, & B2)	A	Trip Channel and Alarm	Once/6 Months

7. The current RPS instrument calibration minimum calibration frequencies for reactor protection instrument channels are listed in Table 4.1.B. The low scram pilot air header pressure instrumentation will be added to this table on TS Page 3.1/4.1-10 for Unit 3 as shown below:

Instrument Channel	Group (1)	Calibration	Minimum Frequency(2)
Low Scram Pilot Air Header Pressure (PS 85-35 A1, A2, B1, & B2)	A	Standard Pressure Source	Once/18 Months

8. Bases Section 3.1, TS Page 3.1/4.1-15 for Unit 3 is revised as follows:

Current Bases:

"The high reactor pressure, high drywell pressure, reactor low water level and scram discharge volume high level scrams are required for STARTUP and RUN modes of plant operation."

Revised Bases:

"The high reactor pressure, high drywell pressure, reactor low water level, low scram pilot air header pressure and scram discharge volume high level scrams are required for STARTUP and RUN modes of plant operation."

9. The following discussion will be added to Bases Section 3.1, TS Page 3.1/4.1-15 for Unit 3.

> "The low scram pilot air header pressure trip performs the same function as the high water level in the scram discharge instrument volume for fast fill events in which the high level instrument response time may be inadequate. A fast fill event is postulated for certain degraded control air events in which the scram outlet valves unseat enough to allow 5 gpm per drive leakage into the scram discharge volume but not enough to cause control rod insertion."

10. Corrects the capitalization of the terms "operable" and "inoperable" on the affected Units 1, 2 and 3 TS pages in order to conform with the current TS Definitions section.

II. REASON FOR THE PROPOSED CHANGE

The scram pilot air header low pressure trip function performs the same protective function as the existing scram discharge volume (SDV) high water level trip. Both trip functions ensure that a reactor scram is initiated while sufficient volume remains in the SDV to accept discharged water from the control rod drives (CRDs). For a postulated low air header pressure event, where the scram outlet valves leak but do not fully open, the rate at which water could be introduced into the SDV may cause the volume to fill with water before the high level switches can initiate a reactor scram. The low air header pressure trip function provides added protection against this scenario and is being added to the Unit 3 TSs.

In addition, the description of the SDV high water level bypass in the Units 1, 2, and 3 TSs requires clarification in order to reduce the potential for misinterpretation.

III. SAFETY ANALYSIS

During a routine shutdown of BFN Unit 3 on June 28, 1980, 76 of 185 control rods failed to fully insert in response to a manual scram from approximately 30 percent power. All rods were subsequently inserted within 15 minutes and no reactor damage or hazard to the public occurred. However, the event did cause an in-depth review of the Boiling Water Reactor (BWR) CRD system, which identified design deficiencies that required corrective measures. These measures were set forth in the generic Safety Evaluation

Report (SER), which was transmitted by NRC letter to All BWR Licensees, dated December 9, 1980, BWR Scram Discharge System. The overall scram system design, with the addition of the scram pilot air header low pressure trip function, satisfies the criteria contained in the generic SER.

The scram pilot air header low pressure trip (which was originally implemented generically as a short-term solution) performs the same protective function as the SDV high water level trip. Both trip functions ensure that a reactor scram is initiated while sufficient volume remains in the SDV to accept discharged water from the CRDs.

The scram inlet and outlet valves are held closed by the air pressure in the scram air header. The scram outlet valves begin to unseat as the air pressure drops below 43 psig (which is higher than the pressure that scram inlet valves begin to unseat). The scram pilot air header low pressure switches detect losses in air pressure and initiate an anticipatory scram to ensure the scram is complete prior to the possible onset of hydraulic locking in the SDV. The proposed trip level setting of 50 psig is conservative and assures a trip signal and successful reactor scram is accomplished prior to hydraulic locking occurring in the SDV as a result of significant flow past the scram outlet valves.

In addition, the description of the SDV high water level bypass in the Units 1, 2, and 3 TSs is being revised to more concisely depict the function of the SDV high water level bypass.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA has concluded that operation of BFN Units 1, 2, and 3 in accordance with the proposed change to the TSs does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

A. **The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.**

The scram pilot air header low pressure switches perform the same function as the high water level switches in the scram charge instrument volume. They automatically initiate control rod insertion (SCRAM) in the event that degraded conditions are detected in the BWR CRD System. Since the scram pilot air header pressure trip function ensures that the CRD System is available to mitigate the consequence of an accident or transient, and the addition of the scram pilot air header low pressure trip scram function does not affect the precursors for any accident or transient analyzed in Chapter 14 of the BFN Updated Final Safety Analysis Report (UFSAR), there is no increase in the probability of any accident previously evaluated.

The design criteria for the scram system is contained in the generic SER, which was transmitted by NRC letter to All BWR Licensees, dated December 9, 1980, BWR Scram Discharge System. The scram pilot air header pressure trip function ensures that the CRD System is available to mitigate the consequence of an accident or transient, and the overall scram system design, with the addition of the scram pilot air header low pressure trip function, satisfies the criteria contained in the generic SER. Since the scram function would be successfully performed, the addition of the scram pilot air header low pressure trip scram function does not involve a significant increase in the consequences of any accident previously evaluated.

The clarification of the description of the SDV high water level bypass in the RPS does not, by itself, reflect a modification to plant equipment, maintenance activities, or operating instructions. The revised description does not effect the precursors for any accident or transient analyzed in Chapter 14 of the BFN UFSAR or equipment used in the mitigation of these accidents or transients. Therefore, there is no increase in the probability of any accident previously evaluated nor an increase in the consequences of any accident previously evaluated.

B. **The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The scram pilot air header low pressure trip performs the same protective function as the SDV high water level trip. Both trip functions ensure that a reactor scram is initiated while sufficient volume remains in the SDV to accept discharged water from the CRDs.

The scram inlet and outlet valves are held closed by the air pressure in the scram air header. The scram outlet valves begin to unseat as the air pressure drops below 43 psig (which is higher than the pressure that scram inlet valves begin to unseat). The scram pilot air header low pressure switches detect losses in air pressure and initiate an anticipatory scram to ensure the scram is complete prior to the possible onset of hydraulic locking in the SDV. The proposed trip level setting of 50 psig is conservative and assures a trip signal and successful reactor scram is accomplished prior to hydraulic locking occurring in the SDV as a result of significant flow past the scram outlet valves.

The overall scram system design, with the addition of the scram pilot air header low pressure trip function is in conformance with the generic SER. No new system failure modes are created as a result of adding the scram pilot air header low pressure trip scram function. Therefore, the addition of the scram pilot air header low pressure trip scram function does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The clarification of the description of the SDV high water level bypass in the RPS does not, by itself, reflect a modification to plant equipment, maintenance activities, or operating instructions. No new external threats, system interactions, release pathways, or equipment failure modes are created. Therefore, the clarification of this description does not create the possibility of a new or different kind of accident from any accident previously evaluated.

C. **The proposed amendment does not involve a significant reduction in a margin of safety.**

The overall scram system design, with the addition of the scram pilot air header low pressure trip function is in conformance with the generic SER. Since the scram system would successfully operate to mitigate the consequences of accidents and transients previously

analyzed, the proposed amendment does not involve a significant reduction in the margin of safety.

The clarification of the description of the SDV high water level bypass in the RPS does not, by itself, reflect a modification to plant equipment, maintenance activities, or operating instructions. There is no change to the licensing or design basis of the RPS. Therefore, the revised description does not involve a significant reduction in the margin of safety.

V. ENVIRONMENTAL IMPACT CONSIDERATION

The proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Accordingly, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.