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

TVA-BFN-TS-437

November 3, 2003

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop: OWFN P1-35
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of) Docket No. 50-259
Tennessee Valley Authority)

BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1 - TECHNICAL SPECIFICATIONS (TS) CHANGE 437 - SCRAM DISCHARGE VOLUME WATER LEVEL SETPOINT

Pursuant to 10 CFR 50.90, Tennessee Valley Authority (TVA) is submitting a request for a TS change (TS-437) to license DPR-33 for BFN Unit 1. The proposed amendment lowers the Allowable Value for Technical Specification Table 3.3.1.1-1, Reactor Protection System Instrumentation, Function 7.b, Scram Discharge Volume Water Level - High Float Switches. As part of the proposed change, TVA will also remove the Low Scram Pilot Air Header Pressure switches from service.

In response to IE Bulletin 80-17, "Failure of 76 of 185 Control Rods to Fully Insert During a Scram at a BWR," July 3, 1980, and its supplements, BFN implemented short-term and several long-term modifications to improve the performance of the Scram Discharge Volume System and the Scram Discharge Instrument Volume (SDIV). One of the short-term modifications installed the subject air header pressure switches, which scram the reactor on sensing low pressure in the control air system that serves the Control Rod Drive System. This modification was intended to be removed following the completion of the long-term modifications associated with the subject bulletin. However, as explained in the attached justification for the TS change, the Low Scram Pilot Air Header Pressure trip function has been maintained in service pending the remedy of a slow response time condition for the SDIV float switches.

Prior to restart of BFN Unit 1, the connecting piping between the SDIVs and the float switches will be replaced with larger pipe, and the elevation of the float switches will be lowered. These modifications will remedy the slow response time of the float switches, which eliminates the need to retain the Low Scram Pilot Air Header Pressure trip function. As discussed in Section 3.4 of Enclosure 1, these modifications and the lowering of the scram discharge volume water level setpoint have previously been approved on Units 2 and 3 (Reference 1). However, the proposed changes to the Unit 1 Technical Specifications are different from the Units 2 and 3 precedent in that the Unit 1 submittal does not include the removal of the low scram pilot air header pressure switches as was included in the Units 2 and 3 Technical Specification change. The low scram pilot air header pressure switches were never added to the Unit 1 Technical Specifications.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and attachments to the Alabama State Department of Public Health.

The proposed TS change is necessary to support the restart of Unit 1. Therefore, TVA requests that the amendment be approved by November 1, 2004.

Enclosure 1 provides TVA's evaluation of the proposed TS change. Enclosures 2 and 3 provide mark-ups and retyped pages of the proposed change to the TS, respectively.

There are no regulatory commitments associated with this submittal. If you have any questions about this amendment, please contact me at (256) 729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 3, 2003.

Sincerely,

T. E. Abney
Manager of Licensing
and Industry Affairs

Enclosures:

1. TVA Evaluation of the Proposed Changes
2. Proposed Technical Specifications Changes (mark-ups)
3. Proposed Technical Specification Changes (retyped)

References:

1. NRC letter, K.N. Jabbour to J.A. Scalice, dated April 8, 2002, "Browns Ferry Nuclear Plant, Units 2 and 3 - Issuance of Amendments to Remove the Low-Scram Pilot Air Header Pressure Switches (TAC Nos. MB2722 AND MB2723)."

cc: (Enclosures)
State Health Officer
Alabama State Department of Public Health
RSA Tower - Administration
Suite 1552
P.O. Box 303017
Montgomery, Alabama 36130-3017

ENCLOSURE 1

BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1

TECHNICAL SPECIFICATIONS (TS) CHANGE 437 - SCRAM DISCHARGE VOLUME WATER LEVEL SETPOINT TVA EVALUATION OF PROPOSED CHANGE

INDEX

1.0 DESCRIPTION

This letter is a request to amend Operating License DPR-33 for BFN Unit 1.

The proposed change would revise the Operating License to lower the Allowable Value for TS Table 3.3.1.1-1, Reactor Protection System Instrumentation, Function 7.b, Scram Discharge Volume Water Level - High Float Switches, from less than or equal to 50 gallons to less than or equal to 46 gallons. As part of the proposed change, TVA will also remove the Low Scram Pilot Air Header Pressure switches from service.

As discussed in Section 3.4, these modifications and the lowering of the scram discharge volume water level setpoint have previously been approved on Units 2 and 3.

The proposed amendment is necessary to support the restart of Unit 1. Therefore, TVA requests that the amendment be approved by November 1, 2004.

2.0 PROPOSED CHANGE

The proposed amendment lowers the Allowable Value for TS Table 3.3.1.1-1, Reactor Protection System Instrumentation, Function 7.b, Scram Discharge Volume Water Level - High Float Switches from less than or equal to 50 gallons to less than or equal to 46 gallons.

The current requirement in Table 3.1.1.1-1 is shown below:

Table 3.3.1.1-1
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5[(a)]	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
b. Float Switch	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5[(a)]	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

The proposed requirement in Table 3.1.1.1-1 is shown below:

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5[(a)]	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
b. Float Switch	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ **46** gallons
	5[(a)]	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ **46** gallons

There are no changes to the TS Bases as a result of this change. Enclosure 2 includes marked-up Unit 1 TS pages, which show the specific changes. Retyped TS pages are provided in Enclosure 3.

3.0 BACKGROUND

Provided in this section is a discussion of previous regulatory issues and correspondence, a description of the associated modifications, and the reason for this proposed change. Also included at the end of this section is a comparison of the proposed change, background information, reason for change, and technical analysis submitted in support of this proposed amendment with the information provided by TVA and approved by NRC for the Units 2 and 3 license amendments.

3.1 Previous Regulatory Issues and Correspondence

On June 28, 1980, 76 of the 185 control rods failed to fully insert during a routine shutdown at BFN Unit 3. After two additional attempts to manually scram, 47 rods remained partially withdrawn. Following a longer drain of the scram discharge volume (SDV), the remaining rods fully inserted. The elapsed time from the initial scram to the time that all rods were inserted was approximately 15 minutes.

IE Bulletin 80-17 (Reference 1), its five supplements (References 2 through 6), and IE Information Notice 80-30 (Reference 7) describe system deficiencies associated with the SDV System at Boiling Water Reactors (BWRs). NRC requested that BWR owners respond to Bulletin 80-17 in a letter dated October 1, 1980 (Reference 8) and subsequently issued a generic Safety Evaluation Report on the BWR Scram Discharge System (Reference 9), which included technical bases and design criteria for improving the hydraulic coupling and overall performance of SDVs.

One of the deficiencies identified in the generic SER was a failure mode of the control air system, which could cause an inability to scram the control rods. Specifically, the scram outlet valves could open at a slightly higher set point than the scram inlet valves. The control air system typically operates at about 75 psi. If the pressure decreases to approximately 40 psi, the scram outlet valves could open. The scram inlet valves normally open at about 30 psi. If a slow loss of air pressure occurs such that the scram outlet valves remain slightly open while no movement of the control rods take place, the SDV could fill with water before the scram inlet valves open. Similarly, a slow fill event caused by excess Control Rod Drive (CRD) leakage (approximately 10 gpm) could also fill the SDV. These events would allow the SDV to fill with water and prevent a reactor scram, if required.

Supplement 3 of Bulletin 80-17 requested Licensees modify operating procedures to provide for an immediate manual scram when low pressure occurs in the CRD air system or when other indications occur. However, only a short time could be available for the operator to successfully initiate a reactor scram. Since a human factors evaluation determined that this manual scram could not be assured, the NRC staff issued orders to provide prompt added protection for credible degraded air conditions in the BWR control air supply system. These orders required an automatic system initiate control rod insertion if the air pressure decreased below a prescribed value. On January 9, 1981, BFN was ordered to install an automatic system to accomplish this scram (Reference 10). In response, TVA installed scram pilot air header pressure switches that would scram the reactor upon sensing low pressure in the control air system that serves the CRD System. This modification was intended to be removed following the completion of the long-term upgrades associated with the subject bulletin to improve the hydraulic coupling of the SDV System.

A complete description of the BFN short-term and long-term Bulletin 80-17 commitments is provided in References 11 through 15. The long-term modifications included the installation of separate SDIVs for each of the two control rod banks and the addition of diverse instruments in the SDIVs for the SDIV high water level trip function. Redundant pairs of resistance-temperature detectors (RTDs) and float switches were installed in each of the SDIVs. Field performance of the RTDs was satisfactory, however, a review of system data following reactor scrams showed that the actuation of the float switches typically lagged the RTDs by approximately 20 seconds. Pending remedy of the float switch slow response time, TVA has maintained the scram pilot air pressure switches in service.

3.2 Description of Proposed Modifications

A detailed description of the CRD system and the function of the SDV can be found in the following Updated Final Safety Analysis Report (UFSAR) sections:

- Section 3.4.5.3 - Control Rod Drive Hydraulic System;
- Section 7.2.3.5 - Reactor Protection System - Operation; and
- Section 7.7.4.3.2 - Rod Block Interlocks - Rod Block Functions.

A system analysis determined that the slow response time of the float switches was due to an undersized piping connection between the SDIVs and the float switch assemblies, which limits the fill rate of the float switch assemblies and unduly delays switch actuation. Therefore, TVA will increase the piping size between the SDIV and float switch assemblies from the existing 3/4-inch diameter, Schedule 160 piping, to 2-inch diameter, Schedule 80 piping. This piping change increases the cross-sectional flow area between the SDIVs and the switch assemblies by a factor of 10, which will increase the fill rate for the float switches. To further offset the float switch response time, the float switch assemblies will be physically lowered by approximately 10 inches, which translates to a decrease of the Allowable Value of 50 gallons to 46 gallons. These modifications, which will be completed prior to the restart of BFN Unit 1, will remedy the slow response time of the float switches and eliminate the need to retain the low scram pilot air header pressure trip function.

3.3 Reason for the Proposed Change

Removal of the low scram pilot air header pressure trip function is beneficial in eliminating risks associated with spurious reactor scrams caused by pressure switch malfunctions or by inadvertent actuation of the switches during maintenance or testing activities. BFN Unit 2 has experienced one unnecessary scram from power on low scram air header pressure. This was due to a maintenance error while working on a pressure regulator in the scram air header system as reported in Licensee Event Report (LER) 50-260/94004 (Reference 16). Unit 2 has also experienced a scram from the pressure switches while conducting maintenance activities during shutdown operations as reported in LER 50-260/95004 (Reference 17). Hence, plant operating history would characterize the scram pilot air pressure trip system as being prone to unplanned actuations on a infrequent basis. It follows that the removal of this trip function would eliminate the system as a potential initiator of reactor transients.

Additionally, the TS change would reduce manpower resources associated with maintenance and testing of the scram pilot air header switches, and eliminate radiation exposure to employees involved in the testing and calibration of the pressure switches. This is an added benefit.

3.4 Comparison with previous Technical Specification changes for Unit 2 and 3

TVA has compared the proposed change, background information, reason for change, and technical analysis submitted in support of this proposed amendment with the information provided by TVA and approved by NRC in TS 366 (References 18 and 19) for the removal of the low scram pilot air header pressure switches and lowering of the allowable value for the Scram Discharge Volume Water Level - High Float Switches on Units 2 and 3. The comparison for each of these areas is provided below:

- The proposed change to the Unit 1 TS does not include the removal of the low scram pilot air header pressure switches as was included in the Units 2 and 3 TS change.

  The low scram pilot air header pressure switches were added to the Unit 2 TS in License Amendment (Reference 20) and Amendment 197 for Unit 3 (Reference 21). These pressure switches were included in the TS as Function 13, Low Scram Pilot Air Header Pressure, in the RPS Instrumentation Table (Table 3.3.1.1-1). These switches were never added to the Unit 1 TS. Therefore, no change is required to remove them from the Unit 1 TS.

- The background information provided in support of the Unit 1 TS change incorporates the same elements previously submitted in support of the Units 2 and 3 TS change. The discussion was consolidated and additional information was added for clarification.

- The underlying reason for the Unit 1 TS change is the same as that which was previously submitted for the Units 2 and 3 TS change. Specifically, removal of the Low Scram Pilot Air Header Pressure trip function is beneficial in eliminating risks associated with spurious reactor scrams caused by pressure switch malfunctions or by inadvertent actuation of the switches during maintenance or testing activities. In addition, TVA needs to maximize consistency between the Unit 1 and Units 2 and 3 TS, operations and maintenance practices prior to restarting Unit 1.

- The technical analysis submitted for this Unit 1 TS change incorporates the same elements previously submitted in support of the previous TS changes for Units 2 and 3.

4.0 TECHNICAL ANALYSIS

Updated Final Safety Analysis Report Section 3.4 describes the design and operation of the SDV System. The scram discharge system receives the water displaced by the motion of the control rod drives during a reactor scram. The system contains two separate SDVs serving the East and West rod banks, each of which drains to its own adjacent instrumented drain tank (namely, the SDIVs). The primary design objective of the SDV System is to ensure that sufficient free volume is maintained available to receive water displaced by the control rods during a full scram, which in turn maintains scram capability. Should the SDV fill to a point where there is insufficient free volume to accept the displaced water, control rod insertion would be impeded.

SDIV water level is measured by two diverse methods. Level in each SDIV is measured by two thermal probes (RTD devices) and two Magnetrol float switches for a total of eight level switches. The outputs of these devices are arranged so that there is a signal from a float switch and a thermal probe provided to each RPS logic channel. The trip logic is one-out-of-two taken twice for a scram, so actuation of either the float switches or the RTD switches will initiate a high water level scram, and a trip in either SDIV will initiate a reactor scram. For BFN Unit 1, the high water level trip TS Allowable Value is currently 50 gallons measured in the SDIVs, as shown for Function 7 in TS Table 3.3.1.1-1, RPS Instrumentation.

During plant operation, the SDIV/SDV vents and drains are open, so the SDVs and SDIVs will be empty and the entire SDV is available for accepting a reactor scram. To provide protection against malfunctions that could result in inleakage or accumulation of water in the SDV System, such as a blocked SDIV drain line, water level is continuously monitored in the SDIVs and a reactor scram is initiated on SDIV high water level while the remaining free SDV volume is still sufficient to accommodate the water from a reactor scram. SDV inleakage can also be caused by low pressure in the control air system that serves the CRD System. Low control air pressure in the scram pilot air header could result in the partial opening of the pneumatic scram outlet valves, which would allow leakage past the scram outlet valves into the SDV. Section 4.2.4 of the December 9, 1980, SER (Reference 9) for Bulletin 80-17 provides the technical basis and design criteria for acceptable system design for SDV inleakage events.

The SDIV high water level trip protects against water inleakage into the SDVs if there is good hydraulic coupling between the SDV and SDIVs. At the time of the original issue of Bulletin 80-17, the SDVs for the East and West rod banks drained into a single SDIV, and the drain lines between the SDVs for the two rod banks and the single SDIV were 2-inch pipes. This configuration did not provide adequate hydraulic coupling. Therefore, pending improvement of SDV/SDIV hydraulic coupling, NRC (Reference 10) required BFN to install an automatic scram on low air pressure in the CRD System. The BFN long-term Bulletin 80-17 modifications included providing a separate SDIV for each rod bank with a 6-inch line connecting the SDVs and SDIVs. With these SDV/SDIV hydraulic coupling improvement modifications implemented, the water accumulation and inleakage events, including low air pressure events described in the December 9, 1980, NRC SER for SDV Systems (Reference 9), are successfully mitigated by the SDIV high water level scram alone. Hence, the low air pressure scram would no longer be needed except for the SDIV float switch problem as explained below.

The SER design criteria also required single failure criteria be applied in evaluating the SDV design. If an RTD switch failure is postulated, the timing of the high level SDIV scram for inleakage events would be governed by the response of the float switches since actuation of the float switches would be required to fully complete the RPS trip logic. With the observed long delay time of the float switches, this would result in a scram being generated at an SDIV level in excess of the 50 gallon TS Allowable Value for the SDIV high water level trip function. This system response does not meet the design criteria objectives of Section 4.2.4 of the SER (Reference 9) regarding inleakage events when considering worst case single failures in that the SDIV high level trip would be unduly delayed. With this situation, TVA did not consider the SDIV high water level trip design objectives met for inleakage events, and pending remedy of the slow response time of the Magnetrol float switches, TVA has maintained the low air pressure switches in service. With the low air pressure trip enabled, a reactor trip is automatically generated prior to CRD System air pressure reaching a point low enough to allow the scram discharge valves to partially open and allow inleakage into the SDV.

A system analysis determined that the slow response time of the float switches was due to an undersized piping connection between the SDIVs and the float switch assemblies, which limits the fill rate of the float switch assemblies and unduly delays switch actuation. To remedy this response time, a plant design change has been prepared which will increase the piping size between the SDIV and float switch assemblies from the existing 3/4-inch diameter, Schedule 160 piping, to 2-inch diameter, Schedule 80

piping. This piping change increases the cross-sectional flow area between the SDIVs and the switch assemblies by a factor of 10, which will increase the fill rate of the float switches proportionally. To further offset the float switch response time, the float switch assemblies will be physically lowered by approximately 10 inches, which translates to a decrease of the TS Allowable Value of 50 gallons to 46 gallons. With these design changes, the float switch delay time will be remedied, and the SDIV high water level trip will alone accommodate the low air pressure inleakage events described in the SER (Reference 9) for SDV Systems. Therefore, after the subject modifications are completed, the low scram pilot air header pressure trip function is no longer needed and lowering the Allowable Value for the Scram Discharge Volume Water Level - High Float Switches is justified.

5.0 REGULATORY SAFETY ANALYSIS

The Tennessee Valley Authority (TVA) is submitting a request to amend Operating License DPR-33 for the Browns Ferry Nuclear Plant (BFN) Unit 1. The proposed change would lower the Allowable Value for Technical Specification (TS) Table 3.3.1.1-1, Reactor Protection System Instrumentation, Function 7.b, Scram Discharge Volume Water Level - High Float Switches, from less than or equal to 50 gallons to less than or equal to 46 gallons.

5.1 No Significant Hazards Consideration

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment", as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

Modifications to the Scram Discharge Instrument Volume (SDIV) System are being implemented to ensure that the SDIV high water level instrumentation will respond adequately to provide redundant, diverse trip functions for a Scram Discharge Volume (SDV) inleakage event. The proposed change does not involve any change to the design or functional requirements of plant systems and the surveillance test methods will be unchanged. The proposed change will not give rise to any increase in operating power level, fuel operating limits, or effluents. The proposed change does

not affect any accident precursors. In addition, the proposed change will not significantly increase any radiation levels. Since the scram function will be successfully performed, lowering the Allowable Value for the Scram Discharge Volume Water Level - High Float Switches and removal of the scram pilot air header pressure trip system does not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The design criteria for the Scram Discharge System is contained in the Safety Evaluation Report on the Boiling Water Reactor (BWR) Scram Discharge System, which was transmitted by NRC letter dated December 9, 1980, to All BWR Licensees. Modifications to the SDV System have been evaluated to demonstrate that the high water level instrumentation in the SDIV will respond adequately to provide the required trip function. No new system failure modes are created as a result of removing the low scram pilot air header trip, since the redundant and diverse SDIV high water level instruments will initiate a successful reactor scram. Therefore, lowering the Allowable Value for the Scram Discharge Volume Water Level - High Float Switches and removal of the scram pilot air header pressure trip system does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The water level in the SDIV is monitored by both resistance-temperature type detectors and float switches. Redundancy and diversity in the instrumentation that initiates the scram signal is maintained even with the lowering of the Allowable Value for the Scram Discharge Volume Water Level - High Float Switches and removal of the low scram pilot air header pressure trip function. Modifications to the SDIV System have been evaluated to demonstrate that the high water level instrumentation will respond adequately to provide the required trip function for an inleakage event. Therefore, the proposed amendment does not involve a significant reduction in the margin of safety.

Based on the above, TVA concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The NRC's December 9, 1980, generic Safety Evaluation Report (Reference 9) for Bulletin 80-17 provides the technical basis and design criteria to mitigate SDV inleakage events. Bulletin 80-17 was closed for BFN and other BWRs in NUREG/CR-5191, "Close-out of IE Bulletin 80-17: Failure of 76 of 185 Control Rods to Fully Insert During a Scram at a BWR," December 1988 (Reference 22). Closure documentation for Browns Ferry is also provided in NRC Inspection Reports 81-12 (Reference 23), 87-13 (Reference 24), and 87-46 (Reference 25). The modifications proposed in this TS amendment are in compliance with the technical basis and design criteria for acceptable system design and do not alter the basis for closure of Bulletin 80-17 at Browns Ferry Unit 1.

In conclusion, based on the considerations discussed above, (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 amendment will not be inimical to the common defense and security or the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 50.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. IE Bulletin No. 80-17, "Failure of 76 of 185 Control Rods to Fully Insert During A Scram at a BWR," July 3, 1980.

2. IE Bulletin No. 80-17, "Failure of 76 of 185 Control Rods to Fully Insert at a BWR, Supplement 1," July 18, 1980.

3. IE Bulletin No. 80-17, "Failure of 76 of 185 Control Rods to Fully Insert at a BWR, Supplement 2," July 22, 1980.

4. IE Bulletin No. 80-17, "Failure of 76 of 185 Control Rods to Fully Insert at a BWR, Supplement 3," August 22, 1980.

5. IE Bulletin No. 80-17, "Failure of 76 of 185 Control Rods to Fully Insert at a BWR, Supplement 4," December 18, 1980.

6. IE Bulletin No. 80-17, "Failure of 76 of 185 Control Rods to Fully Insert at a BWR, Supplement 5," February 13, 1981.

7. IE Information Notice No. 80-30, "Potential for Unacceptable Interaction between the Control Rod Drive Scram Function and Non-essential Control Air at Certain GE BWR Facilities," August 19, 1980.

8. NRC Letter to all BWR Licensees, dated October 1, 1980, BWR Scram System.

9. NRC Letter to all BWR Licensees, dated December 9, 1980, NRC Generic Safety Evaluation on Scram Discharge System.

10. NRC letter, T.A. Ippolito to H.G. Paris, dated January 9, 1981, "Orders for Modification of License Concerning BWR Scram Discharge Systems."

11. TVA Letter to NRC dated December 15, 1980, discussing planned SDV modifications.

12. TVA Letter to NRC dated Feb 3, 1981, providing schedule for SDV modifications.

13. TVA Letter to NRC dated May 5, 1981, providing modification details and schedule information.

14. TVA Letter to NRC dated October 6, 1982, providing details concerning long-term SDV modifications.

15. TVA Letter to NRC dated June 27, 1984, revision of SDV commitments.

16. LER 50-260/94004, BFN Unit 2 Scram from Full Power During Planned Maintenance Activity Due to Inappropriate Personnel Action, May 13, 1994.

17. LER 50-260/95004, BFN Unit 2 Reactor Scram Resulting From Personnel Error During Surveillance Testing Causing the Actuation of the ESF System, April 28, 1995.

18. TVA letter, T.E. Abney to NRC, dated August 17, 2001, "Browns Ferry Nuclear Plant (BFN) - Units 2 and 3 - Technical Specifications (TS) Change 366 - Removal of Low Scram Pilot Air Header Pressure Switches (TAC Nos. MB2722 and MB2723)."

19. NRC letter, K.N. Jabbour to J.A. Scalice, dated April 8, 2002, "Browns Ferry Nuclear Plant, Units 2 and 3 - Issuance of Amendments to Remove the Low-Scram Pilot Air Header Pressure Switches (TAC Nos. MB2722 and MB2723)."

20. NRC TS SER dated August 19, 1986, Amendment 125 to the BFN Unit 2 License.

21. NRC TS SER dated August 29, 1995, Air Header Switches for Unit 3 - Amendment 197 to the BFN Unit 3 License.

22. NUREG/CR-5191, "Close-out of IE Bulletin 80-17: Failure of 76 of 185 Control Rods to Fully Insert During a Scram at a BWR," December 1988.

23. NRC Inspection Report 81-12, May 26, 1981.

24. NRC Inspection Report 87-13, April 9, 1987.

25. NRC Inspection Report 87-46, February 20, 1988.

ENCLOSURE 2

BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1

TECHNICAL SPECIFICATIONS (TS) CHANGE 437 -
SCRAM DISCHARGE VOLUME WATER LEVEL SETPOINT

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Downscale	1	2	F	SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.14	≥ 3% RTP
e. Inop	1,2	2	G	SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.14	NA
3. Reactor Vessel Steam Dome Pressure - High	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1055 psig
4. Reactor Vessel Water Level - Low, Level 3	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 538 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5(a)	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
b. Float Switch	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ ~~50~~ gallons 46
	5(a)	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ ~~50~~ gallons 46

ENCLOSURE 3

BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1

TECHNICAL SPECIFICATIONS (TS) CHANGE 437 -
SCRAM DISCHARGE VOLUME WATER LEVEL SETPOINT

PROPOSED TECHNICAL SPECIFICATION CHANGE (RETYPED)

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Downscale	1	2	F	SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.14	≥ 3% RTP
e. Inop	1,2	2	G	SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.14	NA
3. Reactor Vessel Steam Dome Pressure - High	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1055 psig
4. Reactor Vessel Water Level - Low, Level 3	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 538 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5(a)	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
b. Float Switch	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.