

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

October 6, 1982

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Denton:

In the Matter of the )  
Tennessee Valley Authority )

Docket Nos. 50-259  
50-260  
50-296

By letters dated October 27 and December 15, 1980, TVA provided a response to D. G. Eisenhut's October 1, 1980 letter to All BWR Licensees regarding long-term modifications to the BWR scram system. We are presently implementing the long-term modifications on unit 2 during the reload 4 outage.

Enclosed is a description of the final modifications and changes in our short-term interim commitments for unit 2. We intend to make these changes before startup from the present unit 2 outage and subsequent units 1 and 3 outages in which the same modifications are performed. Please notify us immediately if you have any questions regarding the enclosed material.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*L. M. Mills*  
L. M. Mills, Manager  
Nuclear Licensing

Sworn to and subscribed before  
me this 6<sup>th</sup> day of October 1982.

Paulette H. White  
Notary Public

My Commission Expires 9-5-84

Enclosure

cc: See page 2

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Mr. Harold R. Denton

October 6, 1982

cc (Enclosure):

U.S. Nuclear Regulatory Commission  
Region II  
ATTN: James P. O'Reilly, Regional Administrator  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

Mr. R. J. Clark  
Browns Ferry Project Manager  
U.S. Nuclear Regulatory Commission  
7920 Norfolk Avenue  
Bethesda, Maryland 20814

ENCLOSURE  
BROWNS FERRY NUCLEAR PLANT  
CONTROL ROD DRIVE SYSTEM  
LONG-TERM MODIFICATIONS

Long-Term Modifications

The design of the modifications to the scram discharge volume (SDV) and the instrument volume (SDIV) was made with consideration given to the BWR Owners' Group design criteria. We have additionally reviewed the design against the criteria of the "Generic Safety Evaluation Report, BWR Scram Discharge System" transmitted in D. G. Eisenhower's letter to All BWR Licensees dated December 9, 1980. From our review, we believe that we meet the intent of the various criteria listed and, as stated in section 4.3 of the SER, require no further staff preimplementation approval.

The following is a brief summary of the modifications being performed emphasizing improving the hydraulic coupling between the SDV and SDIV and improving the detection of water in the SDIV.

1. Piping Modifications -

Each SDV will have an independent SDIV closely coupled to it with continuously downward sloping drain piping equal in diameter to the SDV piping. Each SDV will also have vent lines rising above the SDV and routed to clean radioactive waste (CRW). These vent lines will have vacuum breakers installed to ensure positive venting when required and will be crosstied between SDVs to prevent loss of venting in case of a single vent valve closure.

2. Valving Modifications

The vent and drain lines will have two isolation valves in series. The valves will be of a type whose internals or the orientation of the valve itself will not allow water to pool or form a loop seal in the valve. In addition, the presently installed relief valve on the drain piping is being removed to reduce the probability of a single failure causing an unisolatable break in the scram system.

3. Instrumentation Modifications

Each SDIV will have two main control room alarms (the present 3-5 gallon alarm and the 24-gallon CRD withdrawal inhibit) to alert the operator of the accumulation of water in the SDIV. Each SDIV will have full 1-out-of-2-taken-twice scram instrumentation so that the accumulation of 50 gallons of water in either SDIV will result in scram initiation. The present scram instrumentation will be replaced with the more reliable Magnetrol type float switches and diverse Rosemount sealed dP transmitters and electronic switches to protect against common cause failures. In addition, to ensure that large hydrodynamic forces during scram operation do not adversely affect the instrumentation, the instrument lines will tap into the side of the SDIV instead of the drain lines.

### Deletion of Interim Commitments

During the period of time immediately following the partial rod insertion at Browns Ferry unit 3 and the present, a number of interim requirements were imposed to resolve individually identified inadequacies in the CRD system. The design of the long-term modifications to the SDV included improvements to fully address the individual inadequacies in an integrated and consistent manner. With implementation of the long-term modifications, the following interim commitments are being deleted.

1. SDV Continuous Monitoring System (CMS)

IE Bulletin 80-17, supplement 1 dated July 18, 1980, initially required installation of an ultrasonic CMS on the SDV to monitor for accumulation of water. Confirmatory orders for Browns Ferry were issued on October 2, 1980 and additional requirements for CMS testing were proposed in IEB 80-17, supplement 4 dated December 18, 1980. With the improved hydraulic coupling between the SDV and SDIV and with diverse SDIV instrumentation, the CMS is no longer necessary and will be removed or maintained at our option.

2. Scram on CRD Low Air Header Pressure

IE Notice 80-30 dated August 19, 1980 was initially issued providing information concerning potential filling of the SDV due to degradation of air pressure in the CRD air header. IE Bulletin 80-17, supplement 3 imposed procedural requirements to address these concerns. Subsequently, orders were issued for Browns Ferry on January 9, 1981 requiring installation of instrumentation to induce an automatic scram on low air header pressure. Similar orders were issued to other plants that had poor hydraulic communication in the SDV system. With the significantly improved hydraulic coupling of the SDV and SDIV, this automatic scram and procedural changes are no longer necessary and will be removed.

3. Functional Testing of the SDIV Instrumentation Following a Scram

IE Bulletin 80-17, supplement 3 dated August 22, 1980 was issued requiring interim functional testing of the SDIV instrumentation following each scram. This testing was required until the "reliability of the water level indication in the scram discharge volume(s)" was substantially increased. The replacement of the Robertshaw type float switches with Magnetrol type float switches, the installation of the diverse Rosemount sealed dP switches, and the realignment of the instrument lines to the SDIV vertical tank substantially increase the reliability of the instrumentation. In addition, we are presently performing this surveillance on a monthly basis as required by our technical specifications, and we have estimated that this additional functional testing causes a radiation exposure of 3600 mR/yr for three operating units. This additional testing is unjustifiable and inconsistent with our ALARA goals; therefore, this requirement is being deleted.