

February 25, 2005

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

10 CFR 2.201

Gentlemen:

In the Matter of)
Tennessee Valley Authority)

Docket No. 50-327

**SEQUOYAH NUCLEAR PLANT (SQN) - FINAL SIGNIFICANCE
DETERMINATION FOR A WHITE FINDING AND NOTICE OF VIOLATION -
NRC INSPECTION REPORT NO. 05000327/2005007 - REPLY TO A NOTICE
OF VIOLATION (NOV); EA-04-223**

This letter and its enclosure provide TVA's reply to the subject NOV. The NOV contains a violation for failure to identify and correct conditions adverse to quality to preclude the failure of a breaker to operate. The violation is documented in NRC's letter to Mr. K. W. Singer, dated January 26, 2005.

Please direct questions concerning this issue to me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

Original signed by James D. Smith for

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures
cc: See page 2

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PLP:JDS:JB:KTS

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ENCLOSURE

**TENNESSEE VALLEY AUTHORITY (TVA)
SEQUOYAH NUCLEAR PLANT (SQN)
UNIT 1**

**Inspection Report No. 05000327/2005007
Reply To A Notice Of Violation (NOV)**

I. RESTATEMENT OF VIOLATION

"During an NRC inspection completed on September 25, 2004, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," (Enforcement Policy), the violation is listed below:

10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, requires in part that measures shall be established to assure that conditions adverse to quality, such as failures and malfunctions, are promptly identified and corrected.

Contrary to the above, from April 27, 2004, through July 7, 2004, the licensee failed to correct conditions adverse to quality. Specifically, a breaker linkage binding/bradding problem that led to the failure of the 1A Residual Heat Removal (RHR) pump to start on demand during surveillance testing on July 7, 2004, was not detected during the visual inspection of the 1A RHR breaker on June 9, 2004. The licensee's actions in response to the previous linkage problems and the vendor's discovery of the binding problem in April of 2004 did not assure that the condition was identified and corrected to preclude the failure of the 1A RHR breaker to operate during testing.

This violation is associated with a White Significance Determination Process finding for Unit 1."

II. TVA'S REPLY TO THE VIOLATION

1. Reason For The Violation

The reason for failure to identify and correct the bradding of breaker components that resulted in the failure of the 1A RHR breaker to operate was that TVA

did not validate vendor reports and tests, and therefore failed to adequately examine and act upon earlier failure data associated with the Siemens breakers.

On April 25, 2004, a Siemens breaker failed to close during testing. Following this failure, the vendor determined that the failure mechanism was excessive bradding of the mechanism operated cell (MOC) slide bracket on the breaker. The bradding was found to have increased overall thickness of the MOC slide by approximately 0.022 inches. The MOC switches are located in the switchgear cubicle and operated by the breaker through a system of twelve moving parts on the breaker and in the cubicle. As a result of bradding, the MOC slide became wedged between the breaker side sheet and the washers under the head of the MOC slide mounting bolt.

In May 2004, the vendor provided a draft report that stated minor bradding is normal and does not affect breaker operation, and that breakers should be inspected visually or functionally. Additionally, the report stated that functional testing of the MOC operator over its full range of travel is less subjective and more accurate. TVA performed a functional inspection of twelve breakers, which included the MOC operator. None of the twelve breakers exhibited any performance problems. Three of the twelve breakers were found to have minor bradding on the MOC slide. This inspection appeared to support the vendor's statement that minor bradding is expected and not an operational problem. As a result, TVA incorrectly concluded that visual inspection would be an appropriate inspection method for identification of potential performance problems related to bradding.

Subsequent TVA breaker inspections of installed breakers applied the visual inspection method. For the subject breaker, the bradding was not detectable by direct visual inspection. The upset metal was approximately 0.007 inch on each side of the bracket, increasing the overall thickness of MOC slide by approximately 0.013 inch. The clearance between the bolted components was found to be approximately 0.002 inch. As a result of the bradding, the MOC slide became wedged between the breaker side sheet and the washers under the head of the MOC slide mounting bolt. TVA failed to understand that fabrication clearance at the bolted connection concurrent with minor bradding

could result in breaker performance problems, thereby making visual inspection alone inadequate.

An additional cause was the decision to perform the design change using the documentation only Engineering Design Change (EDC) process. The EDC process was selected based on feedback from another TVA plant in their experience with breaker installation. However, there are several barriers in the Design Change Notice (DCN) process that are not included in the documentation only EDC process. The barriers in the DCN process would have likely prevented the failure to validate the vendor design. The Siemens breakers were expected to have the same form, fit, and function as the breakers they replaced. However, the Siemens design resulted in the breaker operation being approximately twice as fast as the breaker being replaced. The additional breaker operating speed increased the force on the MOC switch by a factor of four. The faster operation of the Siemens breaker was not identified in the EDC process and, therefore, the impact to the switchgear was not addressed.

2. Corrective Steps That Have Been Taken And The Results Achieved

Following failure of the 1A RHR breaker TVA:

- a) Replaced Siemens breakers with ABB breakers in safety-related 6.9-kV breaker cubicles with an automatic or accident close function. This action ensured that Siemens breaker issues would not result in additional performance problems before correction of the hardware condition. The ABB breakers are functioning with acceptable reliability.
- b) Revised the appropriate Engineering procedure to ensure that information is adequately verified. The revision provides guidance to have the engineer verify inputs to the basis for operability by using field measurements, testing, or other available means for development of a functional evaluation. This includes information related to vendor inputs.
- c) Revised the appropriate design change process procedure to provide additional control for use of documentation only EDCs when used instead of the standard modification process. This would allow

EDCs to be presented to the design review board to ensure that the EDC is the proper process for the change.

3. Corrective Steps That Will Be Taken To Avoid Further Violations

No additional steps necessary to prevent recurrence.

4. Date When Full Compliance Will Be Achieved

TVA is in full compliance.