UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

December 17, 2004

EA-04-223

Tennessee Valley Authority
ATTN: Mr. K. W. Singer
Chief Nuclear Officer and
Executive Vice President
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: NRC INSPECTION REPORT NO. 05000327/2004010; PRELIMINARY WHITE FINDING; SEQUOYAH NUCLEAR POWER PLANT

Dear Mr. Singer:

This letter and the enclosed supporting documentation discuss a finding that appears to have low-to-moderate safety significance. As described in Section 4OA2.2 of NRC Inspection Report 05000327, 328/2004004, issued on October 25, 2004, a finding was identified which concerned the failure to promptly identify and correct binding problems with the Siemens breaker mechanism operated cell (MOC) slide assembly for the 1A Residual Heat Removal (RHR) pump. On July 7, 2004, the 1A RHR pump failed to start during routine surveillance testing due to MOC slide assembly binding. Your staff, along with vendor personnel, examined the failed breaker, determined that the MOC slide assembly was binding on the mounting hardware, and attributed the failure to insufficient clearance between the assembly and the mounting hardware. They also indicated that this binding was exacerbated by bradding of the slide assembly metal at the upper end of the mounting slot. This allowed the slide assembly to become wedged between the circuit breaker side sheet and mounting hardware. The bradding was caused by the successive impacts of the slot against the mounting hardware as the breaker was cycled open. The failed breaker had been installed in the 1A RHR Pump cubicle on April 27, 2004, and was last successfully operated on June 23, 2004.

We are aware that Sequoyah encountered various compatibility and design problems associated with the modification to install Siemens breakers (modified by Wyle) in Sequoyah's 6.9-kV breaker cabinets. Several of these issues required modifications to the MOC linkage to address operational problems. A similar binding problem on a different breaker had been discovered on July 11, 2003, when maintenance technicians discovered a tight shoulder bolt during a receipt inspection. Following a series of failures during post-maintenance testing in the Spring of 2004, Siemens found a binding problem (due to bradding in the MOC slide assembly) on one of four breakers TVA sent to Siemens for analysis, prompting Siemens to recommend (in May 2004) that visual and/or functional inspections be conducted on the breakers. Although Siemens stated that the functional inspection would be more accurate, your staff chose to do visual inspections.

The binding/bradding problem that led to the failure of RHR Pump 1A on July 7, 2004, was not detected when your staff performed the visual inspection on the 1A RHR breaker on June 9, 2004. The NRC has determined that TVA's actions in response to the previous MOC linkage problems and Siemen's discovery of the binding problem in April of 2004 did not constitute adequate corrective action to preclude the failure of the 1A RHR breaker. This performance deficiency constitutes an apparent violation of 10 CFR 50, Appendix B, in that TVA failed to identify and correct a significant condition adverse to quality, which resulted in the failure of RHR Pump 1A to start during surveillance testing. Accordingly, this apparent violation is identified as AV 05000327/2004010-01, Failure to take adequate corrective actions regarding the 1A RHR pump breaker.

This finding was assessed based on the best available information, including influential assumptions, using the applicable Significance Determination Process (SDP) and was preliminarily determined to be a White finding (i.e., a finding with some increased importance to safety, which may require additional NRC inspection). The finding has a low-to-moderate safety significance primarily due to the significance of the RHR system in overall Emergency Core Cooling System operation. Specifically, the loss of one train of RHR would result in reduced sump recirculation capability following a small or medium break-size loss-of-coolant-accident, with no recirculation capability following the loss of 125-VDC Battery Board 2. The finding does not represent a current safety concern because your staff subsequently installed the original ABB design 6.9-kV breakers into all safety-related 6.9-kV breaker cubicles with an automatic or emergency closure function.

The finding is also an apparent violation of NRC requirements and is being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's Web site at www.nrc.gov; select **What We Do, Enforcement**, then **Enforcement Policy**.

Before we make a final decision on this matter, we are providing you an opportunity to: (1) present to the NRC your perspectives on the facts and assumptions, used by the NRC to arrive at the finding and its significance, at a Regulatory Conference or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. The NRC will also issue a press release to announce the conference. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Steve Cahill at (404) 562-4520 within 10 business days of the date of your receipt of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination decision and you will be advised by separate correspondence of the results of our deliberations on this matter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document

Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Leonard Wert, Deputy Director
Division of Reactor Projects

Docket No.: 50-327
License No.: DPR-77

Enclosure: SDP Phase III Summary

cc w/encl: (See page 4)

cc w/encl:
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OFFICE	DRP/RII	DRP/RII	DRP/RII	EICS/RII	DRS/RII		
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NAME	SCahill	MFreeman	VMcCree	CEvans	RBernhard		
DATE	12/17/2004	12/17/2004	12/17/2004	12/17/2004	12/17/2004		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
PUBLIC DOCUMENT	YES NO						

OFFICIAL RECORD COPY DOCUMENT NAME: E:\Filenet\ML043550003.wpd

SDP Phase III Summary

SRA Analysis Number: SEQ0401
Analysis Type: SDP Phase III
Inspection Report # (if issued): 5000327/2004010
Plant Name: Sequoyah
Unit Number: 1
Enforcement Action # (if applicable): EA-04-223

I. Background - On July 7, 2004, RHR Pump 1A failed to start during routine surveillance testing because the breaker did not close and latch. The same failure occurred a second time during troubleshooting. The licensee, along with vendor personnel, examined the failed breaker, determined that the MOC slide assembly was binding on the mounting hardware, and attributed the failure to insufficient clearance between the assembly and the mounting hardware. They also indicated that this binding was exacerbated by bradding of the slide assembly metal at the upper end of the mounting slot that allowed the slide assembly to become wedged between the circuit breaker side sheet and mounting hardware. The bradding was caused by the impact of the slot against the mounting hardware as the breaker opened. The failed breaker was installed in the RHR Pump 1A cubicle in April, and was last successfully operated on June 23, 2004.

Performance Deficiency - The licensee failed to correct a known binding problem between the MOC slide assembly and the mounting hardware on Siemens breakers. This subsequently resulted in the failure of RHR Pump 1A to start on demand due to the same binding mechanism

Exposure Time - Assume the failure is a wear out issue, and is number of cycles dependent. June 9, 2004(date of inadequate inspection until July 8, 2004 (29 days) for event requiring two operations of the RHR breaker. June 23 until July 8 (15 days) for all other events requiring a single operation.

Date of Occurrence - July 7, 2004

II. Safety Impact: WHITE

III. Risk Analysis/Considerations

Assumptions

1. RHR pump 1A will fail to start.
2. Recovery should be considered for sequences involving FTR of the 1B RHR pump, or for failures during piggyback.

PRA Model used for basis of the risk analysis: SPAR Rev.3i

Enclosure

IV. Calculations

A GEM run is attached. The A train RHR pump was failed for one year. Since the opposite train RHR breaker was from a different manufacturer, and not subject to the same failure, the Common Cause probability was kept the same.

A one year exposure is 3.3E-5.

DELTA CDF FOR EXPOSURE TIME
For the limiting case of 29 days:
Adjusting for the 29 day interval:
3.3E-5/year * 29days/365days per year = 2.6E-6/29 days.

For the case of 15 days:
Adjusting for the 15 day interval:
3.3E-5/year * 15days/365days per year = 1.3E-6/15 days.

Both assumptions result in at least a white finding.

Reviewing the sequences revealed that the dominant sequences did not involve the cutsets that recovery would mitigate in a way that would significantly impact the results. (i.e., RHR-MDP1B fail to run or ventilation failure sequences that would impact LPR/HPR long term, but would allow short term success, and a chance to swap out the failed breaker)

Sequoyah performed their external risk analysis through screening methods, so an external PRA is not accessible. Examination of the short exposure time of the finding shows it will preclude external events from increasing the result to the next higher color..

V. Conclusions/Recommendations - Risk increase over the base case was > 1E-6. The finding is White.

VI. References

SPAR analysis
Phase I Screening Sheets