

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

August 27, 1981

SQRD-50-328-81-13

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303



Dear Mr. O'Reilly:

SEQUOYAH NUCLEAR PLANT UNIT 2 - FAILURE OF THE GENERATOR SYSTEM TO SUPPLY
ADEQUATE VOLTAGE TO THE SAFETY-RELATED BOARDS - SQRD-50-328/81-13 -
REVISED FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
M. Thomas on January 5, 1981, in accordance with 10 CFR 50.55(e) as
NC (s SQN EEB 8054 and WBN EEB 8009. Interim reports were submitted for
Sequoyah unit 2 and Watts Bar units 1 and 2 on February 4 and April 3,
1981. A final report was submitted on June 12, 1981. The Watts Bar
deficiency (WBRD-50-390/81-13 and WBRD-50-391/81-12) is now being handled
under a separate report. Enclosed is our revised final report.

We have reassessed the potential for actual occurrence of the event
described in the deficiency and determined that the corrective action
originally described is not necessary. We have revised the final report
accordingly.

If you have any questions, please get in touch with D. L. Lambert at
FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills
L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

cc: Mr. Victor Stello, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE
SEQUOYAH NUCLEAR PLANT UNIT 2
FAILURE OF THE GENERATOR SYSTEM TO SUPPLY
ADEQUATE VOLTAGE TO THE SAFETY-RELATED BOARDS
SQRD-50-328/81-13
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

When a reactor is tripped automatically for reasons other than an electrical fault or generator bearing failure, the main generator is not tripped for 30 seconds. During this time, the turbine stop valves are closed, and the generator is driven as a synchronous motor. The transfer of the safety boards to the preferred offsite supply is also delayed for 30 seconds. If the generator voltage regulator system failed to operate within its specified range during this delay period, inadequate voltage could be supplied to the 6900-volt shutdown boards following the unit trip. If this occurred, both trains of essential safety-related equipment supplied by the 6900-volt shutdown boards would be unable to meet the required response times stated in the safety analysis report.

Safety Implications

If the 6900-volt shutdown board was unable to meet the required response times, then it would be impossible to ensure that core cooling, containment integrity, and other vital safety features are maintained.

Corrective Action

At the present time, TVA has not identified an event which would produce the failure condition as identified in the NCR which is:

A failure of the generator exciter that produces a sufficiently under- or over-excited condition that causes the generator voltage to fall below its required minimum to ensure adequate voltage on the safety buses.

This is because of the following reasons:

1. A failure of the generator exciter that produces a sufficiently over-excited condition will cause a generator trip within two seconds through operation of a volts/hertz protective relay.
2. A failure of the generator exciter that produces a sufficiently under-excited condition will cause a generator trip within 20 cycles through operation of a generator backup relay.

In addition to this, the generator exciter is constructed with redundant systems which give it a very low probability of failure. Compounding this low probability with the probability of an undefined failure occurring during the 30-second interval following turbine trip results in a probability of occurrence of the event that is, in our judgement, insignificant.

Since the failure is nonmechanistic (undefined) and since the probability of the undefined failure occurring during the 30-second interval following turbine trip is insignificant, continued operation of unit 1 and startup of unit 2 with the present design is justified.