

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37411

400 Chestnut Street Tower II

June 15, 1981

SQRD-50-328/81-39

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 - SI ACTUATED SIMULTANEOUS MOTOR STARTING -
SQRD-50-328/81-39 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. W. Crlenjak on May 5, 1981 in accordance with 10 CFR 50.55(e) as NCR SQN EEB 8116. An interim report was submitted on June 4, 1981. Enclosed is our final report.

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, 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
SI ACTUATED SIMULTANEOUS MOTOR STARTING
SQRD-50-328/81-39
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

During a review of preoperational test results, it was discovered that for a safety injection actuation with offsite power available a simultaneous start signal is sent to the residual heat removal pump, safety injection pump, containment srray pump, centrifugal charging pump, component cooling system pump, and several valve operators. During the time the first four pumps are accelerating, the voltage at the terminals of the unit 2, 350 horsepower component cooling system pumps could be as low as 354 volts or 77 percent of rated voltage. These motors are only rated to start at 80 percent of rated voltage.

Safety Implications

The acceleration times for the four medium-voltage motors during their simultaneous starting (98 percent rated voltage) are approximately two to five seconds. Had this resulted in overcurrent at the unit 2 component cooling system pumps during this period of time, some of these pumps could have tripped because of overcurrent and would have been unavailable for providing their safety function. However, as stated below, the acceleration time of two to five seconds should not affect the component cooling system pump motors. Additionally, during normal operation, a minimum of three of the plant's five component cooling system pumps are already running. Should an SI occur, only one pump maximum per unit plus the swing pump would be required to start at the same time. Therefore, this nonconformance will not affect the safety of the plant.

Corrective Action

The component cooling system pump motor's acceleration time at 80 percent voltage has been supplied by the vendor. Also, the overcurrent trip setting of the motor's feeder breaker has been reviewed. It has been determined that the overcurrent relay can be set so that the motor will remain connected to the bus during the depressed voltage caused by simultaneous motor starting and then accelerate when adequate starting voltage is restored.

TVA has also completed its analysis of other 460-volt motors that may be activated by a SI signal or by process control. There are no other motors powered directly from the Class IE 480-volt switchgear that would be started simultaneously with the medium-voltage motors named above. There are several valve operators and other motors powered from Class IE 480-volt

motor control centers that are started at this time. However, it was shown by testing during construction that valve operators would not trip on locked-rotor current in less than 16 seconds, and that the other motors would not trip on six times full-load current in less than 12 seconds (Construction Inspection Test No. 17, Revision 3). Therefore, these motors and valve operators will remain connected to the bus during the 2- to 5-second depressed voltage caused by simultaneous motor starting then accelerate when adequate starting voltage is restored.

The depressed voltage caused by simultaneous motor starting will have a duration of less than 10 seconds. As the medium-voltage motors reach normal running speed and consequently draw less current, the voltage at the 460-volt motor terminals will become adequate for starting. Therefore, the 460-volt motors will start within the same time allowed for a transfer to onsite power and will meet the safety response time. Therefore, TVA concludes that no corrective action is required for this NCR.