

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

1750 Chestnut Street Tower II

June 5, 1981

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



Dear Mr. O'Reilly:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET  
NO. 50-327 - FACILITY OPERATING LICENSE DPR-77 - SPECIAL REPORT 81-2

The enclosed special report provides information concerning two emergency  
core cooling system injections to the reactor coolant system. This report  
is submitted in accordance with Sequoyah unit 1 Technical Specifications 6.9.2  
and 3.5.3.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

H. J. Green  
Director of Nuclear Power

Enclosure (3)

cc (Enclosure):

Director (3)  
Office of Management Information and Program Control  
U.S. Nuclear Regulatory Commission  
Wash., DC 20555

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Special Report 81-2  
Sequoyah Nuclear Plant  
Unit 1

ECCS Injections to the Reactor Coolant System

This report provides information concerning two emergency core cooling system injections to the reactor coolant system. The first inadvertent injection occurred on April 23, 1981, and the second occurred on May 1, 1981.

A. April 23, 1981 Safety Injection

Plant Status

Mode 3  
RCS Pressure 2234 psig  
RCS Temperature 539.8°F  
BIT Temperature 170°F

Event Description and Probable Consequences

On April 23, 1981, during performance of a main turbine overspeed test, an inadvertent safety injection occurred. The signal which brought in the safety injection was from a combination of high steamline flow coincident with low-low Tave. This safety injection caused the centrifugal charging pumps to pump water through the boron injection tank (170°F) into the Reactor Coolant System (539.8°F) for about 2-3 minutes.

Cause Description and Corrective Actions

The automatic initiation occurred when the average RCS temperature fell below the trip setpoint of 540°F coincident with a signal of high steamline flow. The safety injection was terminated about 2-3 minutes after the SI signal was actuated, and the reactor coolant system was restored to preinitiation conditions.

B. May 1, 1981 Safety Injection

Plant Status

Mode 2  
RCS Pressure 2220 psig  
RCS Temperature 500°F  
BIT Temperature 170°F

Event Description and Probable Consequences

On May 1, 1981, during recovery from a generator trip test, an inadvertent safety injection occurred. The safety injection was brought in by the reception of two high steamline differential pressure signals. This safety injection caused the centrifugal charging pumps to pump water through the boron injection tank (170°F) into the reactor coolant system (500°F) and eventually brought in water from the refueling water storage tank.

B. May 1, 1981 Safety Injection, Continued

Cause Description and Corrective Actions

The automatic initiation occurred when two reactor coolant pumps were returned to service after the generator trip test was complete. Apparently, the two RCP's were started almost simultaneously causing hot water to be pumped into two of the four steam generators. This made the pressure inside the two steam generators rise rapidly and, as a result, two high steamline differential pressure signals were received which caused automatic initiation of the safety injection. The injection was terminated shortly after the SI signal was actuated, and the reactor coolant system was restored to preinitiation conditions.

C. Fatigue Usage Factor

Sequoyah Technical Specification LCO 3.5.2 requires that the current value of the fatigue usage factor of safety injection nozzles be included in the Special Report if the value exceeds 0.7. Usage factors are not available for these nozzles because the primary piping was designed to the USAS B.31.1 Power Piping Code, which does not require fatigue analysis. However, IE Circular 78-05 states that Westinghouse Electric Corporation informed the Public Service Electric and Gas Company that 50 safety injections using 40°F water would be acceptable for the Salem I Plant which has a safety injection nozzle design similar to Sequoyah. It is our opinion, based on IE Circular 78-05, conversations with Westinghouse, and our own evaluation, that the fatigue usage factor for the affected nozzles will not exceed 0.7 if the ECCS occurrences are less than 35 cycles ( $0.7 \times 50$ ). These two safety injections are only the third and fourth such events for Sequoyah Unit 1.