

ENCLOSURE

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2
STEAM GENERATOR WATER LEVEL REFERENCE COLUMN ERROR
NCR MEB 79-32
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The steam generator (SG) secondary side water level instrumentation utilizes a reference water column external to the SG but inside the SG enclosure. The column has a condensate reservoir at the top with the top portion of the reservoir connected to the SG steam space. A differential pressure transmitter is connected between the bottom of the column and the SG water space. The column thus provides a reference water column of constant height, to which the water depth in the SG is compared through the transmitter. In the event of a high energy line break in the containment, the reference column could become heated and the reduced water density could cause the SG water level to be indicated erroneously high. In the event of a main feedwater line break, this would delay actuation of the SG low-low level signal which initiates a reactor trip. A timely reactor trip is assumed in the plant safety analysis of a main feedwater line break.

The deficiency results from a Westinghouse design oversight. Westinghouse reported the deficiency to TVA and other Westinghouse plant owners, and has also reported it to NRC under 10 CFR 21.

Safety Implications

Although there are several redundant reactor trip signal sources, the steam generator low-low water level signal is the primary one assumed by Westinghouse in the plant safety analysis for a main feedwater line break. A delay in the initiation of that signal would therefore introduce a condition not analyzed in the safety analysis.

Corrective Action

Westinghouse has completed the analysis of the main feedwater line break, considering the effect on the steam generator water level reference column. They have determined that a low-low water level setpoint of 21 percent of full scale will ensure reactor trip within the time assumed in the safety analysis. This setpoint will be implemented in the plant design hardware, and a corresponding technical specification change is being written. These corrective actions will be completed before fuel loading of unit 1.

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