ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
POTENTIAL TO OVERLOAD CCS PUMP DISCHARGE NOZZLE
NCR CEB 79-37
10CFR50.55(e)
REVISED FINAL REPORT

Description of Deficiency

In the component cooling system, a condition exists that could overload the five CCS pump discharge nozzles. The pumps are connected to the system piping by means of a tied bellows. The bellows allows lateral movement of the pipe caused by thermal growth, seismic event, etc., such that no additional pressure load is transmitted into the pump. However, the pressure loaded bellows tie rods preclude axial movement such as that resulting from thermal pipe growth. In this case, since no support was provided to carry this load, the load introduced by thermal pipe growth is transmitted through the bellows tie rods and is proportionately induced into the pump nozzle. Attention was brought to this condition during a TVA design review. All five pumps are similarly designed and would, therefore, be similarly affected.

The deficiency exists because of an oversight during the original design in not providing a support to carry this load. The bellows tie rods and the load they transfer were modeled incorrectly. This deficiency does not exist on the Sequoyah Nuclear Plant because this design aspect was correctly analyzed for this facility.

Safety Implications

Because of this condition, the manufacturer's allowable nozzle pressure is exceeded. Each unit has two 100-percent capacity pumps and one spare that is available to both units. Since all five pumps have this condition and are subject to its effects, we must conclude that the safety margin engineered into the system is degraded.

Corrective Action

The design was modified by replacing some rigid supports with a snubber. This design change allows the pipe to expand axially in both directions.

The problem was reanalyzed using the modified design. The latest analysis utilizes the earthquake response spectrum for that particular zone in which this equipment is located. The previous analysis utilized the response spectrum for the zone in that building that had the highest acceleration.

The isometrics and support load tables have been revised and reissued. The support load data has been reviewed to determine what support changes are needed. As a result of the new support load data, approximately 50 supports required modifications. TVA anticipates completing all design drawings by August 29, 1980. All supports will be properly installed as required by December 5, 1980.