

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
POTENTIAL TO OVERLOAD CCS PUMP DISCHARGE NOZZLES

NCR CEB 79-37  
10 CFR 50.55(e)  
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 due to 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 due to 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

This problem will be reanalyzed to determine the support changes necessary to adequately carry all nozzle loads and the necessary support corrections will be made. The isometrics and support load tables will be reissued on or before March 7, 1980, to reflect this design change.

All present and future analyses which contain bellows will be checked for correct modeling of bellows. The design will ensure that the pressure loads will be adequately carried by supports. Technical supervisors have been made aware of this problem in order to monitor the designs for other TVA plants.

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