

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
POTENTIAL INFERIOR STRUCTURAL STEEL CONTAINMENT VESSEL MOVEMENT ENVELOPE
NCR 1319R
10 CFR 50.55(e)
FINAL REPORT

Description of Condition

During the construction phase, fibrous glass expansion joint material was installed in the gap between the interior concrete refueling transfer canal structure and the containment vessel shell between azimuths 255° and 270° up to elevation 755 feet. TVA construction personnel used the expansion joint material as a forming agent instead of conventional forms due to the degree of difficulty in removing the forms. The design drawings called for the material to terminate at elevation 719.75 which would provide a 4-inch inward movement envelope for the dynamic displacement of the containment shell under a design basis accident (DBA). The presence of this material retards the free inward movement of the steel containment in the affected area under a DBA.

Safety Implications

The reevaluation of this condition using the additional constraint imposed by the expansion joint material has determined that the effect of this additional material is negligible. Therefore, this condition does not adversely affect the safe operation of the plant.

Corrective Action

To determine the effect of this expansion material on the containment vessel under a DBA, 12 postulated breaks were evaluated, and the break in hot leg 1 was determined to be most effected by the expansion material. A linear asymmetric transient response analysis using an iterative finite element approach was used to evaluate a break in hot leg 1. Then a transient pressure analysis was performed for the same break excluding the expansion joint material.

Upon comparison of the containment vessel response with and without expansion material, TVA has concluded that the difference between the results was negligible. Therefore, the expansion material can be neglected for the purpose of the containment analysis under DBA and the as-built condition is acceptable as is.