

Licensee/Facility:

SOUTHERN NUCLEAR OPERATING CO., INC.
Hatch
Baxley, Georgia
Dockets: 050-00321 050-00366
[1] GE-4, [2] GE-4

Notification:

MR Number: 2-2005-0005
Date: 03/14/2005
Call / Fax from Licensee

Subject: FAILURE OF SAFETY/RELIEF VALVE TEE-QUENCHER SUPPORT BOLTS

Discussion:

While shutdown for a refueling outage, the licensee conducted a routine visual inspection of the Unit 2 torus and found five broken bolts associated with the safety/relief valve Tee-Quencher supports. One bolt on five different Tee-Quencher support plates had failed. The Tee-Quenchers are attached to the end of the safety/relief valve discharge piping below the torus water level and consist of "T" shaped piping with steam spargers attached at each end. The Tee-Quenchers are used to eliminate unbalanced forces on the piping and distribute the hydrodynamic loads on the torus during safety/relief valve operation. Failure of the bolts could impact the integrity of the safety/relief valve discharge piping. There are eleven Tee-Quenchers, each secured by 4 bolts. The licensee has replaced all 44 bolts in the Unit 2 torus.

The bolts are high-strength alloy steel (ASTM A540 Grade B21) and torqued to about 70% of yield strength. These bolts were installed in both the Unit 1 and Unit 2 torus during modifications in the early 1980's. A failure analysis performed by a testing facility has determined that the bolt failures were most likely caused by stress corrosion cracking and possibly hydrogen embrittlement. The potential for hydrogen embrittlement was attributed to conditions in the torus which include a zinc primer coating. Based on engineering calculations, the licensee has determined that three intact bolts on a Tee-Quencher support plate are sufficient to withstand the loading from safety/relief valve operation. The licensee is also evaluating postulated conditions of only two intact bolts per Tee-quencher and has preliminarily determined that this would also be sufficient to withstand the forces of safety/relief valve operations.

The NRC resident inspectors continue to closely monitor the licensee's actions and, with assistance from other Region II inspectors, are reviewing the licensee's assessments of the condition, including potential implications for the Unit 1 torus.

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