

ENCLOSURE

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2 DAMAGED TUBES IN CONTAINMENT SPRAY HEAT EXCHANGERS

NCR 16P

10 CFR 50.55(e)

FIRST INTERIM REPORT

Description of Condition

While draining containment spray heat exchanger 1B, it was discovered that a significant amount of leakage was occurring across the heat exchanger. When the heat exchangers were disassembled, tube fragments were found in the lower 1. The tubes of both unit 1 heat exchangers were then examined using eddy current probe. This examination revealed that several tubes in containment spray heat exchangers 1A and 1B were damaged. The apparent cause of the damage was flow induced vibration, which is a result of improper design of the tube bundle supports by the vendor. The manufacturer of the heat exchangers is Industrial Process Engineers Inc., a company which has now gone out of business.

Safety Implications

Had this condition gone uncorrected, an intolerable number of tubes could have failed. This would inhibit the containment spray system from performing its intended safety function. During a LOCA, this condition could have led to excessive leakage across the heat exchanger and thus the possibility of releasing radioactive water through the Essential Raw Cooling Water (ERCW) System.

Corrective System

Approximately 5.6 percent of the tubes in the 1B heat exchanger and 0.9 percent of the tubes in the 1A heat exchanger will need to be plugged. This includes all of the tubes with defects having 50 percent or more wall loss. To prevent further tube wear, the tubes will be staked. The plugging and staking of the unit 1 heat exchangers will be completed before initial criticality. It has been determined that the reduced heat transfer area because of the plugged tubes will not adversely affect the functioning of the system. The unit 2 heat exchangers, which have not been operated, will be staked in order to prevent vibration induced tube wear. The unit 2 heat exchangers will be staked before fuel loading of unit 2.

A further review has determined that the Component Cooling System (CCS) heat exchangers were also manufactured by Industrial Process Engineers Inc. Tube wear was also found in the CCS heat exchangers. There are 1950 tubes in each of the three CCS heat exchangers. Of these, all tubes having defects with wall losses of greater than 30 percent will be plugged. The actual number of tubes that will be plugged is 36, 7, and 3 in the A, B, and C heat exchangers, respectively.

A full flow vibration test is scheduled to be performed on the CCS heat exchangers to determine if excessive vibration is occurring. This test, the plugging, and any additional corrective action will be completed before initial criticality.

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