

ENCLOSURE

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2  
SPENT FUEL POOL GATES  
NCR SQN NEB 8012  
10CFR50.55(e)  
FINAL REPORT

Description of Deficiency

The NCR states that the spent fuel pool gates (one to the transfer canal and one to the cask loading area) are not designed to Seismic Category I requirements in accordance with Regulatory Guide 1.13. Similar NCR's were written on Watts Bar (WBNNEB8005) and Bellefonte (BLNNEB8005) Nuclear Plants.

Safety Implications

Structural failure of the gates during a seismic event could result in damage to stored spent fuel elements. This could result in radiation levels in the spent fuel pool area higher than those assumed in the plant safety analysis, and thus could result in doses to plant personnel and the public greater than has been analyzed. This safety-related function results in a Seismic Category I(L) classification of the gates. There was a question within TVA as to whether the gates also have a primary safety function of maintaining sufficient water level above the spent fuel. This function, if verified, would have made the gates Seismic Category I and would require QA program coverage of the gates' fabrication. It was found by analyses of pool water level drops due to leaking gates that this is not a required function of the gates; the water level will not drop sufficiently in any case to permit excessive radiation levels in the pool area.

Corrective Action

The spent fuel pool gates for all three plants were designed by TVA, considering seismic loadings. The fabrication was contracted out with the design ensuring the seismic integrity of the gates although the procurement documents did not otherwise specify the seismic requirements. Quality assurance program coverage was not specified because the original designs considered that the gates would normally be stored, and would be installed only when it would be necessary to dewater the transfer canal of the cask loading area for maintenance.

Because of increasing QC and QA documentation emphasis within TVA in the years since the gate fabrication was contracted out, the QA aspects of the gates' integrity is to be verified for all three plants. This will be done through the evaluation of inspection and repair records at the fabricators' facilities and at the sites if possible. Alternatively, certificates of compliance will be obtained from the fabricators to verify that the specified materials and construction standards were used in the gates' fabrication. Failing both of the above, the verification will be obtained through testing and inspection of the materials and welds in the gates. Any required corrective actions will be taken. This work does not affect the reportability to NRC of the three NCR's discussed above.

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The gate designs were analyzed later for the case of water on both sides of the installed gates, and it was for this case that the Sequoyah cask loading area gate was found to be inadequate. This was the only case of potential failure among the six gates at the three plants. The transfer canal and the cask loading area gates at Sequoyah and Watts Bar were designed with paired restraints attached to the pool wall at the top and at the bottom of the gates. At Watts Bar, restraints were later added at midheight to correct a leakage problem encountered on testing of the gates in the pool. These restraints, and similar ones added at Bellefonte, account for these gates being seismically qualified. The midheight restraints were omitted at Sequoyah, and this problem will be corrected by the addition of midheight restraints attached to the pool wall at the cask loading area gate, or by other restraints, such as a wire rope net, which will prevent damage to the spent fuel elements by failure of the gate during a seismic event. This work will be completed before initial criticality.