HELPING BUILD ARKANSAS

ARKANSAS POWER & LIGHT COMPANY

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February 7, 1975

Mr. Donald K. Knuth, Director
Office of Inspection and Enforcement
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Arkansas Power & Light Company
Arkansas Nuclear One-Unit 2
Docket No. 50-368
Significant Deficiency Report
Spent Fuel Pool Walls

Dear Mr. Knuth:

On January 9, 1975 we reported a deficiency regarding spent fuel pool walls as required by 10 CFR 50.55(e). Attached is an interim report providing information available at this time. We expect to have sufficient information to submit a final report by April 1, 1975.

Yours truly,

J. D. Phillips
Senior Vice President

JDP/NAM/vm

Attachment

cc: Mr. Morris Howard, Director
Office of Inspection and Enforcement
Region IV
U. S. Nuclear Regulatory Commission
White Settlement, Texas 76108

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

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STATE OF ARKANSAS)
) SS
COUNTY OF PULASKI)

J. D. Phillips, being duly sworn, states that he is a Senior Vice President of Arkansas Power & Light Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this Supplementary Information; that he has read all of the statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

J. D. Phillips

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named this 7th day of February, 1975.

Linda B. Thomas
Notary Public

My Commission Expires:

March 1, 1978

knuth
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INTERIM REPORT

SPENT FUEL POOL WALLS

This report covers the design deficiency reported for the Arkansas Nuclear One - Unit 2 Spent Fuel Pool Walls.

1) Description of Deficiency

The horizontal reinforcing steel on the inside face of the spent fuel pool and the tilt pit is not properly detailed to develop the bars at points of high stress. This occurs at the junction of East West walls with North South walls. The horizontal reinforcing steel in these walls is bent to form a 90 degree bend on the inside face of the pool rather than extending through the wall where they should have been lapped with the horizontal steel on the outer-face.

2) Analysis of the Safety Implications

For purposes of this analysis we have conservatively assumed catastrophic failure of the tilt pit wall. Two cases were considered: 1) with the fuel transfer tube isolation valve closed, as would be the case during normal plant operations and 2) with the fuel transfer tube isolation valve open, as would be the case during preparation for start or ending refueling operations.

In case (1), water lost from the spent fuel pool would be contained in the tilt pit. In case (2), the water would be contained in the tilt pit and the refueling canal. Case (2) obviously results in the greater loss of water from the spent fuel pool. Our analysis, however, has shown that, even in case (2), the fuel in the storage rack would not be uncovered.

Normally the water in the spent fuel pool is maintained at a level 26 ft. above the top of the active fuel in the spent fuel racks. As explained in FSAR Section 9.1.2 the water level in the pool minimizes doses at the operating floor during refueling operation.

For case (1) pool water level would drop less than 7 feet. Radiation levels at the pool surface would not increase significantly. Indications available to the control room operator to alert him of this condition are discussed in FSAR Section 9.1.2.5. Methods of adding water to the pool are discussed in FSAR Section 9.1.3.2. Makeup to the pool could be initiated and cooling re-established.

For case (2) we conservatively assumed that, just prior to the postulated failure, the refueling canal was completely dry. This situation could occur if, after completing operations, the refueling canal was completely drained with the fuel transfer tube isolation valve open. For this case we found that the spent fuel pool water level could drop as much as 23 feet. Radiation levels above the pool would be high preventing local access to the refueling floor. Make-up to the pool could be accomplished remotely via the LPSI pumps and the refueling canal or via the fuel pool purification system. It is also likely that boiling would occur in the pool before the pool level was raised sufficiently to re-establish normal cooling.

From our analyses of the effects of a postulated failure of the wall between the spent fuel pool and the fuel tilt pit, we have concluded the following:

(1) Plant personnel in the vicinity of the spent fuel pool at the time of this failure could receive doses in excess of the limits prescribed in 10CFR20. The expected level will be made a part of the final report.

(2) No hazard to the health and safety of the genera. public would exist and site boundary doses would not exceed the limits prescribed in 10CFR100.

(3) No damage would occur to spent fuel elements stored in the pool at the time of this accident.

3) Corrective Action Taken

When the deficiency became known, a check of the calculations was made to see how the wall had been designed. A finite element analysis was used to determine the stress under the final loading which took into account the thermal effects as well as the hydrostatic loading. The wall separating the tilt pit and spent fuel pool was analyzed by calculations which assumed the wall to be fixed on both sides and the bottom with a long slot (27') near one side accounting for the spent fuel pool bulk head gate. The upper portion, due to the effect of the gate, was analyzed as a plate fixed on two sides.

To determine the extent of the problem the wall was re-analyzed using different boundary conditions. Based on the manner in which the horizontal steel is anchored the edge conditions were changed from fixed to pinned and the

wall re-analyzed using a finite element program. High local shears resulted around the bottom of the slot for the bulk head gate and at the junction with the West wall of the spent fuel pool.

To bring the shear stress within an acceptable level a permanent strut will be installed in the tilt pit. The strut will be made from stainless steel and will not interfere with the normal operation of the fuel handling and tilting equipment.

Additional analyses are being made to determine the amount of prestress force to be used in installing the struts. In addition, analyses are being run to determine the effect on the other corners of the pool which have similar defects. Our preliminary figures indicate that these corners can act as pinned joints, however, the shear stresses are being verified by computer analysis.