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January 15, 1981

2-011-19

Mr. Thomas H. Novak
Assistant Director for
Operating Reactors
Division of Licensing
U. S. Nuclear Regulatory Comm.
Washington, D.C. 20555

SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Plan to Resolve Item I subtopic 4
of NRC August 5, 1980 letter - USI A-12
(File: 2-1510)

Gentlemen:

As discussed with your Mr. John Fair in the December 17, 1980 meeting on USI A-12, attached is a detailed plan describing the proposed analysis method chosen to demonstrate adequate fracture toughness characteristics for the snubber attachment lug to the reactor coolant pump. This plan is being submitted to outline our proposed method of addressing your concerns in item I subtopic 4 of your August 5, 1980 letter.

Very truly yours,

David C. Trimble

David C. Trimble
Manager, Licensing

DCT:DEJ:lp

Attachment

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A Plan For the Fracture
Evaluation of ANO Unit 2
Reactor Coolant Pump - Motor
Snubber Lugs

A fracture mechanics evaluation of the reactor coolant pump (RCP) motor snubber lugs will be performed in order to determine the margin against brittle fracture for the most severe combination of loading and fracture resistance.

1. Fracture Mechanics Analysis Method

   The fracture mechanics analysis will be performed using the finite element computer program, MARC. Cracks of various sizes will be hypothesized to occur in two locations. The first is the location of the highest tensile stress near the pin hole, and the second is the location of the highest shear (tear-out) stress between the hole and the lug edge.

2. Analysis Input

   The maximum specified loads, which are for the design basis earthquake (DBE) will be applied to the finite element model. Material properties for use in the analysis and evaluation will be obtained by a literature and file search by CE. A lower bound toughness, K_{IC}, taken from NUREG-0577 will be used if a higher toughness cannot be justified by data made available by the literature search.

3. Evaluation

   The stress intensity factor, K_I, will be computed for the various hypothetical cracks and the DBE loadings and compared to the K_{IC} of the material at the lowest service temperature. The size of crack which would cause K_I to be greater than K_{IC} is considered the critical crack size.

   A comparison of the critical crack size and the size of cracks which are reasonably assured to be detectable by preservice inspection will demonstrate the safety margin against brittle fracture.