

FEBRUARY 08 1980

Docket No. 50-348

Mr. F. L. Clayton, Jr.  
Senior Vice President  
Alabama Power Company  
P. O. Box 2641  
Birmingham, Alabama 35291

POOR ORIGINAL

Dear Mr. Clayton:

We have completed an evaluation of your plant with respect to cracking in feedwater system piping. A copy of our Safety Analysis is enclosed. We have concluded that non-destructive inspections performed and scheduled and the analyses performed for flawed piping are sufficient to ensure piping integrity until the recommendation of your Owner's Group and the NPC's Pipe Crack Study Group have been evaluated. Should we determine that further actions are required after that evaluation you will be notified at that time.

Sincerely,

Original signed by

A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors

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*L. Kintner - OPA*

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OFFICE	DOR:ORB#1	DOR:ORB#1			
SURNAME	EReves.ph	ASchwencer			
DATE	02/07/80	02/07/80			

SAFETY ANALYSIS OF  
ACTIONS TAKEN IN RESPONSE  
TO BULLETIN 79-13 "CRACKING IN  
FEEDWATER SYSTEM PIPING"

On May 20, 1979, Indiana and Michigan Power Company notified the NRC of cracking in two feedwater lines at their D. C. Cook Unit 2 facility. The cracking was discovered following a shutdown on May 19 to investigate leakage inside containment. Leaking circumferential cracks were identified in the 16-inch feedwater elbows adjacent to two steam generator nozzle to elbow welds. Subsequent radiographic examinations revealed cracks in all eight steam generator feedwater lines at this location on both Units 1 and 2.

On May 25, 1979, a letter was sent to all PWR licensees by the Office of Nuclear Reactor Regulation which informed licensees of the D. C. Cook failures inspection and operating histories. To further explore the generic nature of the cracking problem, the Office of Inspection and Enforcement requested licensees of PWR plants in current outages to immediately conduct volumetric examination of certain feedwater piping welds. As a result of these actions several other licensees reported cracking in the steam generator nozzle to feedwater piping weld vicinity. On June 25, 1979, IE Bulletin 79-13 was issued. The Bulletin required inspection of the steam generator nozzle-to-pipe welds and adjacent areas within 90 days and reinspection of these welds, the feedwater piping welds to the first support, the feedwater piping to containment penetration and the auxiliary feedwater to main feedwater piping connection at the next refueling outage.

In conformance with the Bulletin, the licensee of the plant(s) identified by the docket number(s) listed in the cover letter has completed the initial radiographic and visual examinations and has not found evidence of cracking in their feedwater piping.

From the results of instrumentation installed at several plants which have experienced feedwater piping cracks and other modeling and analysis by a utility sponsored Owners Group, it has been shown that significant cyclic stresses occur in the feedwater piping in the vicinity of the steam generator nozzle from mixing and stratification of cold auxiliary feedwater with hot water from the steam generator during low flow conditions. Metallurgical analysis of cracked feedwater piping has identified the mode of failure as fatigue assisted by corrosion.

The Owners Group is expected to complete its investigations and make recommendations for changes in design and operating procedures in February 1980. In addition, the NRC has instituted a Pipe Crack Study Group to review this and other pipe cracking problems in PWR's. It is anticipated that the Pipe Crack Study Group will complete its work by June 1980 and provide recommendations to be implemented by licensees as new criteria for operating plants, if required.

Although cracking has not been identified through the inspections performed to date for the Farley Unit No. 1, the Staff feels that the cyclic stress induced by the thermal transient present when cold auxiliary feedwater at low rates injected into the main feedwater may result in such cracking in the future. The Staff and the Owners Group both have performed independent analyses and have determined that flawed piping could withstand challenges from operating and faulted loads including seismic and limited water hammer loads without loss of piping integrity. Pipe breaks have occurred in the past in feedwater piping as the result of water hammer loads. However, measures such as "J" tubes have been instituted and operational changes have occurred to minimize the possibility of water hammer. In the unlikely event of a feedwater pipe break from a severe water hammer, the consequences have been analyzed as a design base accident and acceptable measures have been established to deal with the event.

We conclude that the nondestructive inspections performed and scheduled and the analyses performed for flawed piping ensure piping integrity for your plant until the recommendations of the Owners Group and the Pipe Crack Study Group have been evaluated. Should the Staff determine that further actions are required after evaluation of the Owners Group and Pipe Crack Study recommendations, you will be notified at that time.