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the southern electric system

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Docket Nos. 50-348
50-364

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Gentlemen:

J. M. Farley Nuclear Plant - Units 1 and 2
Thermal Stresses in Piping Connected to Reactor
Coolant Systems - NRC Bulletin No. 88-08

Action 1 of NRC Bulletin No. 88-08 requests that Alabama Power Company review systems connected to the Reactor Coolant System (RCS) to determine whether unisolable sections of piping connected to the RCS can be subject to stresses from temperature stratification or temperature oscillations that could be induced by leaking valves and that were not evaluated in the design analysis of the piping. The bulletin allows 60 days for this review.

Action 2 requests that any unisolable sections of piping connected to the RCS that may have been subjected to excessive thermal stresses be examined nondestructively at the welds, heat-affected zones and high stress locations, including geometric discontinuities, to provide assurance that there are no existing flaws. The bulletin allows this Action to be completed before the end of the next refueling outage.

Action 3 requests that Alabama Power Company plan and implement a program to provide continuing assurance that unisolable sections of all piping connected to the RCS will not be subjected to the combined cyclic and static thermal and other stresses that could cause fatigue failure during the remaining life of the unit. This assurance may be provided by instrumenting this piping to detect adverse temperature distributions and establishing appropriate limits on temperature distributions. This program, if required, should be implemented before the end of the next refueling outage.

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The bulletin further requires Alabama Power Company to submit a letter confirming the completion of Action 1, within 30 days of the completion of Action 1, and to include in the confirmatory letter a schedule for completing Actions 2 and 3 if the Action 1 review indicates that a potential problem exists. Supplement 1 to the bulletin did not add any new requirements.

Unit 1

Action 1 - The review indicated the potential for the described thermal conditions to exist on the hot and cold leg safety injection lines. This Action is complete.

Action 2 - When Unit 1 was shut down for the eighth refueling outage (Spring 1988), susceptible welds were nondestructively examined on the hot and cold leg safety injection lines using the enhanced ultrasonic technique presented to the NRC staff in the meeting held January 15, 1988 and documented by a February 8, 1988 memorandum by the NRC Project Manager for Farley. No recordable indications were found; however, one weld on "C" loop hot leg could not be nondestructively examined due to interference with a pipe support. This support will be removed at the next refueling outage and the weld inspected. This examination was performed before the bulletin was issued. During the next refueling outage, sections of the hot and cold leg injection lines, between the RCS and the first check valve from the RCS, will be examined using the enhanced ultrasonic technique on welds, heat-affected zones and high stress locations, including geometric discontinuities.

Action 3 - Also during the eighth refueling outage, resistance temperature detectors (RTD's) were installed on all three cold leg injection lines and all three hot leg injection lines. The RTD's were installed on the top and bottom of each line, both upstream and downstream of the first check valve from the RCS. These RTD's have been monitored since plant startup from the refueling outage and no detrimental thermal conditions have been observed. If temperatures deviate from the established ranges, an engineering evaluation will be performed. The thermal effects which caused the initiation and propagation of the crack in Unit 2 are believed to have been caused by leakage from the Boron Injection Tank (BIT) bypass valve. The BIT bypass line in Unit 1 was cut and capped during the outage. The temperature monitoring system is considered temporary. A decision on a permanent installation will be made prior to the end of the next refueling outage.

Unit 2

Action 1 - The review indicated the potential for the described thermal conditions to exist on the hot and cold leg safety injection lines. This Action is complete.

Action 2 - In December of 1987, while investigating the cause of the crack in the "B" loop cold leg injection line, welds in unisolable sections of all three cold leg injection lines were examined using the enhanced ultrasonic testing technique. No additional cracks were found. This inspection was conducted during the crack repair outage in an attempt to determine the extent of the problem. Temperature stratification and temperature oscillations were discovered after the piping was replaced and instrumented, and the unit began a return to power. During the Unit 2 sixth refueling outage, sections of the hot and cold leg injection lines, between the RCS and the first check valve from the RCS, will be examined using the enhanced ultrasonic testing technique on welds, heat-affected zones and high stress locations, including geometric discontinuities.

Action 3 - As described to the NRC staff in a meeting held January 15, 1988, the "B" and "C" loop cold leg injection lines were instrumented with RTD's when other investigations failed to reveal a cause for the pipe crack. RTD's were placed on the "B" loop such that temperatures could be monitored at the sides of the pipe, in addition to the top and bottom of the pipe. These RTD's recorded the thermal effects which were determined to be the cause of the crack. (The temperature stratification and oscillations were terminated by aligning valves to create a path away from the RCS for the BIT bypass valve leakage.) The RTD's on the top and bottom of the "B" and "C" cold leg injection lines, upstream and downstream of the first check valve from the RCS, are currently being monitored. This monitoring system is also considered temporary. A decision on a permanent installation will be made prior to the end of the next refueling outage. During the sixth refueling outage, RTD's will be added to the "A" loop cold leg injection line and to all three hot leg injection lines such that each line will have RTD's top and bottom, upstream and downstream of the first check valve from the RCS. The Unit 2 BIT bypass line will be cut and capped at the next outage of sufficient duration.

In summary, all requested activities will be completed by the end of the next refueling outage of each unit (Unit 1, ninth, Fall 1989; Unit 2, sixth, Spring 1989).

If there are any questions, please advise.

Respectfully submitted,

ALABAMA POWER COMPANY

W. B. Hairston III

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WGH,III/RSF

cc: Mr. L. B. Long
Dr. J. N. Grace
Mr. E. A. Reeves
Mr. W. H. Bradford

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 28TH DAY OF July, 1988

Robert W. Stewart
Notary Public

My Commission Expires: 10/27/89