REVISION 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF FROM INSERVICE TESTING REQUIREMENTS

ALABAMA POWER COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT NO. 2

DOCKET NO. 50-364

Introduction

Alabama Power Company (the licensee) by letter dated July 5, 1983 noted certain exceptions taken to the NRC staff safety evaluation and reliefs granted by letter dated April 8, 1983 for Farley 2. Our revised evaluation follows for items (1) and (2) of Attachment 2 to the July 5, 1983 letter.

Evaluation and Conclusion

1) The licensee has referred to Page 11 of the Safety Evaluation Report and stated that "to agree with the requested relief the following should be inserted in place of the brackets,. . . paragraph 2.1.1.2. In the event the quarterly requirements of Table P-1 and . . . ". This issue is identified in the SER as relief request 2.2. The licensee has requested specific relief from the test requirement of measuring Residual Heat Removal (RHR) pumps, Q2E11P001 A-A and 1B-B, Differential Pressure (dP) or flow rate (Q) while the pumps are operating in a fixed resistance system and has proposed to determine dP or Q while pumps are operating in their normal configuration for a given plant operating condition.

   As discussed in the SER, the staff has approved this relief request.

The suggested word changes noted above slightly modify the SER description of the licensee's proposed alternate testing schemes but have no affect on the original staff finding that the relief should be approved.

We have reviewed the licensee's suggested rewording against the description of the alternate testing as provided in the revision of the licensee's inservice testing program discussed in the SER, Revision 2 dated August 6, 1982. The licensee's proposed rewording for the SER is the same as provided in the IST program which we previously reviewed and we conclude that the rewording is acceptable.

2) This issue refers to relief requests 3.1.2 and 4.1.2 in the SER. Request 3.1.2 addresses RHR containment sump suction isolation valves V025A and B, and request 4.1.2 concerns Containment Spray containment sump suction isolation valves V003A and B.

For these four valves the licensee has requested relief from the Code requirement that normally inaccessible valves with remote position indicators be visually observed at the same (or greater) frequency as refueling outages but not less than one observation every two years, to confirm that remote valve indications accurately reflect valve operation.

In Revision 2 of the Farley 2 Inservice Testing (IST) Program, the licensee stated that remote position indicators for all four of these valves would be used to verify valve position, and that

visual observation of valve position was not practical. The IST program states that visual observation would require removal of the valve protective chambers which are a portion of the containment pressure boundary. The program also states that the valves are provided with redundant position indicators and that position is accurately reflected by the remote indications.

As stated in the staff Safety Evaluation Report, the licensee had proposed, as an alternate test to the Code required position verification, to take credit for the valve leak rate test which is performed during each refueling outage. The performance of this test was stated to be used to verify that the remote position indicators accurately reflect the closed position of the valves. Following each valve leak rate test the air pressure would be relieved by opening the valve, thus verifying that the disk moves away from the seat.

Based on the above information, the staff, as stated in the SER, denied the requested relief. The staff had concluded that leak testing is an acceptable method to verify valve closure. However, the staff did not concur that venting the leak test pressure after leak testing by opening the valves would ensure that the valves could open sufficiently to allow the safety analysis design flow rate.

In attachment 2 to a licensee letter dated July 5, 1983 from F. L. Clayton, Jr. to the attention of S. A. Varga, and in a letter dated September 13, 1983 from F. L. Clayton, Jr. to S. A. Varga, the licensee provided additional substantive clarifying information regarding the valve position indication determination for these four valves.

The licensee reported that the position indication of three of these four valves is obtained from redundant measurement of physical valve actuator movement. The fourth valve, at the present time, utilizes valve torque measurement to provide indication of valve position. For this fourth valve, the licensee has provided a commitment to install a modification so that position indication for this valve will also be obtained by redundant measurement of physical actuator movement.

In its September 13, 1983 letter, the licensee further clarified that redundant measurement of each valve open position is derived from three separate sensors in each valve actuator and is indicated in the plant Control Room on three separate indicator lights. However, indication of valve closed position is derived from a single sensor on the valve actuator and is indicated in the Control Room by one indicator light. Thus after this modification has been completed, position indication from each of the four valves for the open position will be obtained from three redundant indicators that are activatated by physical actuator movement.

In addition, in a telephone conversation on June 29, 1983 between licensee representatives, Mr. Ron George et al and the NRC staff, Mr. E. Reeves et al, the licensee advised that accessibility to visually inspect each of these four valves is only possible by removing the cover of the valve protective chamber. Each cover, considered a part of the containment boundary, is held in place by fifty to one hundred bolts.

Taking into account the additional information provided by the licensee in attachment 2 to the July 5, 1983 letter, the September 13, 1983 letter, and during the June 29, 1983 telephone discussion, we have reevaluated SER relief requests 3.1.2 and 4.1.2 and have concluded that the relief requested should be granted in part as discussed below.

With the modification, described above, to be made at the September 1983 refueling outage, all of these valves will have redundant position indication derived from physical actuator movement for indication of the open position. Verification that the valves are acutally in the closed position when the position indicator so indicates will be confirmed when the valve leak rate tests are performed during refueling outages.

When the valves are opened after the leak rate test, partial confirmation that they are fully opened when indicated by the position indicators will be provided by the relief of the test air pressure.

In order to comply with the Code requirement, visual inspection of each valve would have to be performed at each refueling outage, necessitating removal and reinstallation of each cover of each valve protective chamber. As previously noted, the protection chambers are part of the containment boundary. The staff has concluded that removal and reinstallation of the chamber covers each refueling outage, with the large number of bolts per cover, potentially imposes a relatively large risk of improper cover reinstallation with consequent violation of the containment boundary.

Additionally, we recognize that these valves are motor operated gate valves. After the leak rate test has been performed, the valves will be signaled to open. As the valves start to open the leak test air pressure will be relieved. After the valve actuator moves to the full open position, verification of this actuator movement will be provided by the redundant position indicators.

Verification that the valve disk has at least moved slightly away from the fully closed position is provided by relief of the test air pressure. When indication of full valve actuator movement is provided by the redundant position indicators, the valve disk should be in the full open position. For the disk to be less than full open at this time would require separation of the disk from the actuator and cessation of disk travel in an intermediate position or erroneous position indication from the three redundant position indicators.

Based on information tabulated in NUREG/CR-1363 Revision 1, "Data Summaries of Licensee Event Report of Valves at US Commercial Nuclear Power Plants January 1, 1976 - December 31, 1980", we have concluded that failures of safety related Motor Operated Gate Valves to open resulting from the valve disk actually separating from the actuator stem is very unlikely. The NUREG/CR reports very few failures of this type. Of the few reported for motor operated valves, almost all were in systems where the valves would be expected to be exposed to a dynamic or vibratory environment.

These four containment sump valves at Farley 2 will be exposed only to a dry, static environment. Therefore we have concluded that the probability of this valve failure mechanism, i.e. disk separation from actuator stem; is extremely low.

Additionally we consider simultaneous failure of all three redundant position indicators or a common mode failure within the valve actuator, resulting in erroneous indication of valve open position in all three indicators, to be very low in probability.

On balance, comparing the relatively low probability of disk separation from actuator stem or another failure resulting in erroneous indication from all redundant position indicators against what the staff has concluded is a relatively high probability of violation of containment boundary each time the valve protection chamber covers are removed and reassembled, we have concluded that partial relief from the Code verification requirement should be granted. As previously noted there is some possibility of valve, actuator, or indicator failure which could result in indicator readings not actually representative of the valve full open position. Therefore, we have concluded that visual inspection of the valve to confirm the operability of valve position indicators should be performed on a limited basis throughout the plant life.

We require that the visual verification inspection be performed whenever the valve enclosure covers are removed for any other reason (i.e., repair, inspection, maintenance, test activity, etc.) provided the inspection has not been performed within the previous two year period. Also as a minimum, provided the inspection was not

performed during the previous two years, we require that it be performed at least once per inspection interval, during the same extended plant outage when the core support structures are removed from the reactor vessel for the Code required once per interval inspections.

Based on the above considerations, we have concluded that the specified alternate testing will give reasonable assurance of valve position indicator operability intended by the Code and the partial relief thus granted will not endanger life or property or the common defense and security of the public.