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Docket No. 50-364

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

Dear Mr. Clayton:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR FARLEY 2 OPERATING LICENSE APPLICATION

As a result of our continuing review of the operating license application for the Joseph M. Farley Nuclear Plant Unit 2, we have developed the enclosed request for additional information and position.

Please provide the information requested in the enclosure. Our review schedule is based on the assumption that the additional information will be available for our review of Items 1, 2 and 3 by August 8, 1980. Items 4 of the enclosed request should be provided in March, 1981. If you cannot meet these dates, please inform us within seven (7) days after receipt of this letter so that we may revise our scheduling.

Sincerely,

**Original signed by**

Robert L. Tedesco, Assistant Director
for Licensing
Division of Licensing

Enclosure:
Request for Additional
Information

cc w/enclosure:
See next page

*See previous concurrences

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION
JOSEPH M. FARLEY NUCLEAR PLANT UNIT 2
DOCKET NO. 50-364

Requests from the following branch in NRC are included in this enclosure. Requests and pages numbered sequentially with respect to requests transmitted following issuance of SER Supplement No. 3.

| BRANCH | PAGE NO. |
|---|---|
| Reactor Systems Branch | 210-1 thru 210-5 |

210.0 Reactor Systems Branch

210.1 The safety issue of containment emergency sump performance under post-LOCA conditions can be viewed as two parts: (1) containment sump hydraulic performance (i.e., providing adequate NPSH) to the recirculation pumps with up to 50 percent of the screen area blocked) and (2) the effects of debris. The first part, sump hydraulic performance, has previously been addressed in the Farley Plant, and has been acceptably resolved. The problem addressed herein is the potential for debris from insulation and other sources within containment to collect and compromise the ability of the ECCS to recriculate coolant from the containment sump through the RHR heat exchangers to the vessel. The following additional information is requested. For items that have been previously resolved, you may respond by referring to the previous documentation. Items 1, 2, and 3 must be resolved prior to full power operation item 4 must be resolved prior to startup following the first refueling.

1. In addition to insulation debris resulting from LOCA effects, debris can be generated within the containment from other sources, such as (1) degraded materials (paint chips), and (2) items which are taken into and left in the containment following maintenance and inspection activities.

   Describe how the housekeeping program for Farley will control and limit debris accumulation from these sources. The objectives is to assure that debris capable of defeating the post-LOCA core cooling

functions are identified and removed from the containment. The response should include references to specific procedures or other means to assure that "as licensed" cleanliness will be attained prior to initial operation and prior to each resumption of operation.

2. Address the degree of compliance of Farley with the following recommendations which is also set forth as item C.14 of Regulatory Guide 1.82:

   "Inservice inspection requirements for coolant pump components (trash racks, screens, and pump suction inlets) should include the following:

   a. Coolant sump components should be inspected during every refueling period downtime, and

   b. The inspection should be a visual examination of the components for evidence of structural distress or corrosion."

3. The resolution of the concerns noted below plus the provisions of adequate NPSH under non-debris conditions, and adequate housekeeping practices are expected to reduce the likelihood of problems during recirculation. However, in the event that LPI recirculation system problems such as pump cavitation or air entrainment do occur, the operator should have the capability to recognize and contend with the problems.

   Both cavitation and air entrainment could be expected to cause pump vibration and oscillations in system flow rate and pressure. Show that the operator will be provided with sufficient instrumentation and appropriate indications to allow and enable detection of these problems. List the instrumentation available giving both the location of the sensor and the readout.

The incidence of cavitation, air entrainment or vortex formation could be reduced by reducting the system flow rate. The operator should have the capability to perform indicated actions (e.g., throttling or terminating flow, resort to alternate cooling system, etc.). Show that the emergency operating instructions and the operator training consider the need to monitor the long-term performance of the recirculation system and consider the need for corrective actions to alleviate problems.

4. As stated in the Farley SER memorandum, a full scale model test of the Farley sump design has been conducted to show that adverse hydraulic phenomena which would impede long-term cooling of the core following a LOCA will not occur. This testing was performed with up to fifty percent of the sump screens blocked. The responses to the following concerns are required to support this assumption.

   a. Various types of insulation may be used in the containment. For each type provide the following information:

      (1) The manufacturer, brand name, volume and area covered.

      (2) A brief description of the material and an estimate of the tendency of this material either to form particles small enough to pass through the fine screen in the sump or to block the sump trash racks or sump screens.

      (3) Location of the material (metal mirrored, foam glass, foam rubber, foam concrete, fiberglass, etc.) with respect to whether a mechanism exists for the material to be transported to the sump.

   b. Provide an estimate of the amount of debris that the sump inlet screens may be subjected to during a loss-of-coolant accident. Describe the origin of the debris and design features of the containment sump and

equipment which would preclude the screens becoming blocked or the sump plugged by debris. Your discussion should include consideration of at least the following sources of possible debris: equipment insulation, sand plug materials, reactor cavity annulus sand tanks or sand bags for biological shielding, containment loose insulation, and debris which could be generated by failure of non-safety related equipment within the containment. Entry of sand plug materials into the containment sump and the possibility of sand covering the recirculation line inlets prior to the initiation of recirculation flow from the containment should be specifically addressed.

Please provide this information along with your conclusion regarding the percentage of the screens which would be expected to be blocked by particles of all sizes, including those greater than 250 mils.

c. With respect to the conclusion that debris with a specific gravity greater than unity will settle before reaching the sump cover, consider the potential for flow paths which may direct significant quantities of debris laden coolant into the lower containment in the vicinity of the sump and the availability or lack of sufficient horizontal surface areas or obstructions to promote settlings or holdup of debris prior to reaching the sump.

d. Does metal mirror insulation house other materials, fibrous or otherwise, which could become debris if the insulation were blown off as a result of a LOCA?

e. If the Farley containment contains loose insulation, include examples of how the insulation will be precluded from reaching the sump.

(4) Provide a schematic drawing of the post-LOCA water level in containment during the recirculation mode relative to the elevation of the ECCS sump floor. Include on this drawing the location of the containment water level sensor and the elevations corresponding to readings of zero and 100 percent of range on the control room indicator.

(5) Provide several large scale drawings of the containment structures, systems and components at elevations.

(6) Does Farley utilize similar materials in the containment during power operation for purposes such as reactor cavity annulus biological shielding (e.g., sand tanks or sand bags) or reactor cavity blow out sand plugs?