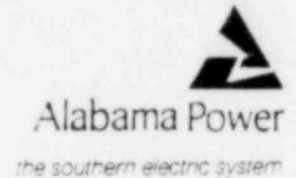


Alabama Power Company
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Telephone 205 250-1000

F. L. CLAYTON, JR.
Senior Vice President

December 8, 1980



Joseph M. Farley Nuclear Plant - Unit 2
Hydrogen Dilution Fan Blades
File: A-35.62.81
Log: 80-2021

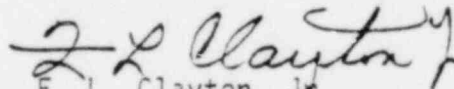
Mr. James P. O'Reilly
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
101 Marietta Street, N.W. - Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Alabama Power Company submits the attached deficiency (10CFR50.55(e)) evaluation report on the problem associated with the Hydrogen Dilution Fan Blades in the Joseph M. Farley Nuclear Plant-Unit 2. The attached is also intended to meet reporting requirements of 10CFR Part 21.

This item was reported as a possible significant deficiency to Mr. M. D. Hunt, U.S. NRC, on September 24, 1980 and was reported as a significant deficiency to Mr. D. S. Price, U.S. NRC, on November 20, 1980.

Very truly yours,


F. L. Clayton, Jr.

FLC:WCP:sh
Attachment

xc + Attachment: Mr. R. A. Thomas
Mr. G. F. Trowbridge
~~Mr. G. F. Trowbridge~~
Mr. W. H. Bradford
Mr. D. S. Price

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DEFICIENCY EVALUATION FOR

HYDROGEN DILUTION FANS

Initial Report to NRC:

On September 24, 1980 Mr. W. C. Petty, Jr., QA Manager-Design and Construction, reported to Mr. Milt Hunt of the NRC-Region II, that a potential significant deficiency existed concerning the reactor cavity hydrogen dilution fans at Joseph M. Farley Nuclear Plant - Unit 2.

On November 20, 1980 Mr. W. C. Petty, Jr. notified Mr. D. S. Price of the NRC-Region II that this problem was reportable as a significant deficiency.

Description of Occurrence:

Reactor cavity hydrogen dilution fan 2B (Q2E22C001B-B) was initially energized and tested on August 10, 1980. The fan was subsequently started and stopped several times without incident from August 10 through August 13, 1980. On August 14, 1980, the fan was started and it later tripped on overload. Investigation revealed a loose part in the fan when rotated by hand. Disassembly revealed a blade mounting bolt had fractured, allowing the blade to come loose. Subsequently, after disassembly of the fan for blade replacement another bolt failed while being torqued to its recommended torque value. After the second failure, Alabama Power Company die penetrant checked the hubs and blades of the fans. No indications were found.

The blades and bolt are cast as a single assembly for Joy Manufacturing Company by a subvendor. The metal is poured into a ceramic mold that is supported by sand. The sand acts as a heat sink for the heat from the molten metal. After a cooling period, the sand is removed from around the mold. The mold and metal are removed and the sand is reused. If the sand is not allowed a sufficient cooling time, when a new mold is poured, the slower cooling of the metal can produce a larger grain size in the material. Previously, blade failures have occurred in the shop testing of the fans. Modifications have been made to the foundry procedures to ensure the problem does not recur.

Technical Specification and FSAR Requirements:

The technical specification requirement calls for two independent reactor cavity hydrogen dilution systems to be operable. With one reactor cavity hydrogen dilution system inoperable, restore the inoperable system to operable status within thirty days or be in HOT STANDBY within six hours.

Each system shall be demonstrated operable at least once every 92 days on a staggered test basis by verifying system start from the control room and verifying system operation for at least 15 minutes.

The FSAR requirements for the reactor cavity hydrogen dilution system are in Section 6.2. Section 6.2.5.1.4 states the system is designed for maintenance-free operation for a period of 100 days following a loss of coolant accident.

Engineering Evaluation:

Farley Nuclear Plant-Unit 2 is required to have two trains of the reactor cavity hydrogen dilution system operable. Technical specifications allow thirty days for repair of a defective train.

A single failure in either the electrical system or a blade failure in the opposite train fan could contribute to a buildup of hydrogen within the reactor cavity. A spark from an electrical short or other source could potentially ignite the hydrogen or cause the hydrogen to explode.

Therefore, it can be concluded that if the blade failure was to have remained uncorrected, it could have affected adversely the safety of the operation of the nuclear plant at any time throughout the expected lifetime of the plant. The blade failure also represents a deviation from the performance specifications which will require extensive repair to meet the criteria and bases stated in the Safety Analysis Report and to establish the adequacy of the component to perform its intended safety function.

Corrective Action:

The two fan hubs and blades were returned to Joy Manufacturing Company where overspeed tests at approximately 4300 rpm were successfully run.

Joy Manufacturing has stated the normal operating speed for this fan is 1770 rpm and that normal overspeed testing is 25% over operating speed.

The fans were reinstalled in Unit 2 on November 17, 1980 with all testing documentation on-site.