

Alabama Power Company  
600 North 18th Street  
Post Office Box 2641  
Birmingham, Alabama 35291  
Telephone 205 323-5341

F. L. CLAYTON, JR.  
Senior Vice President



November 20, 1979

Docket No. 50-348

Mr. D. G. Eisenhut, Acting Director  
Division of Operating Reactors  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

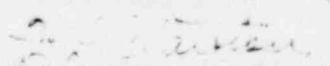
Dear Mr. Eisenhut:

As requested in your letter of October 13, 1979 concerning Auxiliary Feedwater Systems, Alabama Power Company submits the enclosed response.

Alabama Power Company's response to Enclosure 2 of your October 13, 1979 letter will be submitted by March 15, 1980.

If you have any further questions, please advise.

Yours very truly,

  
F. L. Clayton, Jr.

FLCJr/HRF:bhj

Enclosure

cc: Mr. G. F. Trowbridge  
Mr. R. A. Thomas

1399 127

P

A039  
5/11  
7911270 341

ENCLOSURE

Recommendation GS-4

Emergency procedures for transferring to alternate sources of AFW supply should be available to the plant operators. These procedures should include criteria to inform the operator when, and in what order, the transfer to alternate water sources should take place. The following cases should be covered by the procedures:

- The case in which the primary water supply is not initially available. The procedures for this case should include any operator actions required to protect the AFW system pumps against self-damage before water flow is initiated; and,
- The case in which the primary water supply is being depleted. The procedure for this case should provide for transfer to the alternate water sources prior to draining of the primary water supply.

Response:

Appropriate emergency procedures will be revised to include the above recommendations. This will be accomplished by February 1, 1980.

Recommendation GS-5

The as-built plant should be capable of providing the required AFW flow for at least two hours from one AFW pump train independent of any alternating current power source. If manual AFW system initiation or flow control is required following a complete loss of alternating current power, emergency procedures should be established for manually initiating and controlling the system under these conditions. Since the water for cooling of the lube oil for the turbine-driven pump bearings may be dependent on alternating current power, design or procedural changes shall be made to eliminate this dependency as soon as practicable. Until this is done, the emergency procedures should provide for an individual to be stationed at the turbine-driven pump in the event of the loss of all alternating current power to monitor pump bearing and/or lube oil temperatures. If necessary, this operator would operate the turbine-driven pump in an on-off mode until alternating current power is restored. Adequate lighting powered by direct current power sources and communications at local stations should also be provided if manual initiation and control of the AFW system is needed. (See Recommendation GL-3 for the longer-term resolution of this concern.)

Response:

A licensing basis for the AFW system was that the turbine driven pump would be capable of one hour of operation independent of all AC

power. To meet this criteria, the turbine driven auxiliary feedwater pump was designed with a lube oil system whose operation and cooling was independent of AC sources. The turbine requires only DC power used for turbine speed control. Steam admission valves require both DC power and an operable air supply for the valves to open and allow turbine operation. These valves are provided with air reservoirs of sufficient capacity, to open the valves and allow turbine operation. These licensing commitments are stated in FSAR Section 6.5.

Although the licensing basis was one hour of turbine operation, two hour turbine operation was used as the original design basis. A design review has verified that the required DC power Supply, and the air reservoirs on steam admission valves are sized to support two hour operation of the turbine driven AFW pump independent of all AC sources.

To assist in operation during total loss of all AC power, the turbine driven AFW pump room has been provided with emergency lighting.

Recommendation GS-6

The licensee should confirm flow path availability of an AFW system flow train that has been out of service to perform periodic testing or maintenance as follows:

- Procedures should be implemented to require an operator to determine that the AFW system valves are properly aligned and a second operator to independently verify that the valves are properly aligned.
- The licensee should propose Technical Specifications to assure that prior to plant startup following an extended cold shutdown, a flow test would be performed to verify the normal flow path from the primary AFW system water source to the steam generators. The flow test should be conducted with AFW system valves in their normal alignment.

Response:

Administrative Controls have been implemented which require that after maintenance, which could affect proper valve alignment, is performed on the auxiliary feedwater system or after a refueling outage, a system valve lineup verification be performed by operations personnel. Independent verification is then performed by a second individual who holds a reactor operators license.

A Technical Specification proposal will be submitted in the near future which will require that a flow test be performed to verify that each AFW pump will deliver flow to each steam generator following an extended cold shutdown.

1399 129

Recommendation GS-7

The licensee should verify that the automatic start AFW system signals and associated circuitry are safety-grade. If this cannot be verified, the AFW system automatic initiation system should be modified in the short-term to meet the functional requirements listed below. For the longer term, the automatic initiation signals and circuits should be upgraded to meet safety-grade requirements as indicated in Recommendation GL-5.

The design should provide for the automatic initiation of the auxiliary feedwater system flow.

The automatic initiation signals and circuits should be designed so that a single failure will not result in the loss of auxiliary feedwater system function.

Testability of the initiation signals and circuits shall be a feature of the design.

The initiation signals and circuits should be powered from the emergency buses.

Manual capability to initiate the auxiliary feedwater system from the control room should be retained and should be implemented so that a single failure in the manual circuits will not result in the loss of system function.

The alternating current motor-driven pumps and valves in the auxiliary feedwater system should be included in the automatic actuation (simultaneous and/or sequential) of the loads to the emergency buses.

The automatic initiation signals and circuits shall be designed so that their failure will not result in the loss of manual capability to initiate the AFW system from the control room.

Response:

Recommendation GS-7 duplicates exactly Item 2.1.7A specified in Page A-30 of NUREG 0578. As stated in my October 24, 1979 letter, the requirements of NUREG-0578, and thus of Recommendation GS-7, are met by the Farley Nuclear Plant.

Additional Recommendation 1

The licenses should provide redundant level indications and low level alarms in the control room for the AFW system primary water supply to allow the operator to anticipate the need to make up water or transfer to an alternate water supply and prevent a low pump suction pressure condition from occurring. The low level alarm setpoint should allow at least 20 minutes for operator action, assuming that the largest capacity AFW pump is operating.

Response:

Recommended action will be accomplished before the end of the second refueling outage.

Additional Recommendation 2

The licensee should perform a 72-hour endurance test on all AFW system pumps, if such a test or continuous period of operation has not been accomplished to date. Following the 72-hour pump run, the pumps should be shut down and cooled down and then restarted and run for one hour. Test acceptance criteria should include demonstrating that the pumps remain within design limits with respect to bearing/bearing oil temperatures and vibration and that pump room ambient conditions (temperature, humidity) do not exceed environmental qualification limits for safety-related equipment in the room.

Response:

Recommended action will be performed by May 1, 1980.

Additional Recommendation 3

The licensee should implement the following requirements as specified by Item 2.1.7.B on page A-32 of NUREG-0578:

"Safety-grade indication of auxiliary feedwater flow to each steam generator shall be provided in the control room.

The auxiliary feedwater flow instrument channels shall be powered from the emergency buses consistent with satisfying the emergency power diversity requirements for the auxiliary feedwater system set forth in Auxiliary Systems Branch Technical Position 10-1 of the Standard Review Plan, Section 10.4.9."

Response:

Auxiliary feedwater injection lines to each steam generator are provided with flow indication. This flow indication is on the Main Control Board and is powered from the plant emergency power. These flow instrument loops are testable. Redundancy requirements are met by qualified steam generator level instrumentation (Safety Grade).

The auxiliary feedwater line flow indicators will be seismically and environmentally qualified by January 1, 1981. This will meet all safety grade requirements.



Additional Recommendation 4

Licensees with plants which require local manual realignment of valves to conduct periodic tests on one AFW system train and which have only one remaining AFW train available for operation, should propose Technical Specifications to provide that a dedicated individual who is in communication with the control room be stationed at the manual valves. Upon instruction from the control room, this operator would re-align the valves in the AFW system train from the test mode to its operational alignment.

Response:

This is not applicable for Farley Nuclear Plant.

Recommendation GL-3

At least one AFW system pump and its associated flow path and essential instrumentation should automatically initiate AFW system flow and be capable of being operated independently of any alternating current power source for at least two hours. Conversion of direct current power to alternating current is acceptable.

Response:

The turbine driven auxiliary feedwater pump is capable of initiation and operation independent of any AC power source for at least two hours. The requirements of Recommendation GL-3 are met by the design of the Farley Nuclear Plant.

Recommendation GL-5

The licensee should upgrade the AFW system automatic initiation signals and circuits to meet safety-grade requirements.

Response:

Recommendation GL-5 duplicates the long term requirements shown on Page A-31 of NUREG 0578. As stated in my October 24, 1979 letter, this requirement of NUREG 0578, and thus of Recommendation GL-5, is met by the design of the Farley Nuclear Plant.

1399 132