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

Alabama Power
the southern electric system

July 24, 1979

Docket Nos. 50-348 & 50-364
Information on PWR Feedwater Lines

Mr. Victor Stello, Jr., Director
Division of Operating Reactor
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stello:

Enclosed is Alabama Power Company's sixty (60) day response to the information request on PWR feedwater lines, dated May 25, 1979. This response is for Plant Farley - Units 1 and 2 with the exception of Preservice/Inservice Inspection and Operating History items 4 and 5, which is only for the operating unit, Farley Unit 1.

Yours very truly,

F. L. Clayton, Jr.

FLCJr/KAP/mmb
Enclosure
cc: Mr. R. A. Thomas
Mr. G. F. Trowbridge

B001
S E 1/1
ADD:
TA/EDO
AD/SYS & PROJ
ENGR BR
REAC SFTY BR
PLANT SYS BR
EEB

(4)

7908010380

FABRICATION HISTORY

ITEM 3 : Provide the NDE performed during and after fabrication of the weld joints requested in Item 2.

RESPONSE: Shop-fabricated welds were examined by radiography and magnetic particle methods. Field welds were examined by radiography liquid penetrant and hydrostatic testing methods.

ITEM 4 : Provide the codes edition to which the feedwater piping system was fabricated.

RESPONSE: The feedwater piping system was fabricated to the 1971 ASME Boiler and Pressure Vessel Code, Section III; Nuclear Power Plant Components, including all Addenda thru Summer 1971.

ITEM 5 : State the fracture toughness requirements, if any, for the feedwater piping system

RESPONSE: All piping and associated welding filler metal which is part of containment penetration shall be impact tested at $+10^{o}F$. Impact tests are not required for pipes 1/2" or less in nominal wall thickness or 6 inch nominal diameter and less. Acceptable valves shall be those listed in Table I-7.1 of the Nuclear Code.

PRESERVICE/INSERVICE INSPECTION & OPERATING HISTORY:

ITEM 1 : State whether the feedwater system welds received a preservice inspection in accordance with ASME B & PV Code, Section XI.

RESPONSE: Unit 1 - Feedwater piping classified as ASME Class 2 (between the steam generators and the containment isolation valves) received a preservice examination in accordance with the requirements of the ASME Code, Section XI, 1971 Edition through the Winter 1972 Addenda as considered practical as indicated in Section 5.2 8 of the FSAR. In addition, the preservice inspection incorporated as much of the 1974 Edition of ASME XI through the Summer 1976 Addenda as considered practical.

Unit 2 - A preservice inspection of ASME Class 2 feedwater piping was performed in accordance with the ASME Code, Section XI, 1974 Edition through the Summer 1975 Addenda to the extent considered practical as outlined in Section 5.2.8 of the FSAR.

ITEM 2 : Provide the extent of inservice inspection performed on the feedwater pipe to steam generator nozzle welds. Include the results of the examination, any corrective actions taken and causes of any failures.

RESPONSE: Unit 1 - A volumetric examination using radiography and ultrasonic methods was performed on the three (3) steam generator nozzles to feedwater pipe welds during the 1979 refueling outage. The examination revealed no flaws in the examination areas. As a result, no corrective action was taken.

Unit 2 - Not applicable

ITEM 3 : Provide the schedule and extent of inservice inspection for the feedwater system for the next inspection interval.

RESPONSE: Unit 1 - The following table provides the inservice inspection extent and schedule of ASME Class 2 feedwater for the first inspection interval (10 years):

COMPONENT	EXAMINATION REQUIREMENT	QUANTITY TO BE EXAMINED BY END OF 3-1/3 yr.	6-2/3 yr.	10 yr.
14" Circ. Welds-Feedwater	Volumetric	1	-	1
10" Circ. Welds-Aux. Feedwater	Volumetric	1	-	-
8" Circ. Welds-Aux. Feedwater	Volumetric	1	1	-
Integrally Welded Supports	Surface	1	1	1
Support Components	Visual	2	3	2

In addition, the feedwaterpiping is scheduled for a visual examination while under hydrostatic pressure by the expiration of the 10-year interval.

RESPONSE: (Item 3)
Unit 2 - The ten-year inspection plan for Unit No. 2 has not been developed at this time.

ITEM 4 : Provide any history of water hammer or vibration in the feedwater system, and design changes and/or actions taken to prevent these occurrences.

RESPONSE: Modifications to steam generators and feedwater system piping were made during the plant construction to minimize water hammer and its effects based on experience gained from operating PWR's. Changes included were routing feedwater piping to minimize the length of horizontal piping attached to the steam generator feedwater nozzle. and installation of 0-tubes on the feedring to minimize drain-down when the feedring is uncovered.

Tests were conducted during hot functionals to verify the effectiveness of these changes. Results confirmed that forces imposed on supports, and stresses induced in the piping system are within acceptable limits.

The question of water hammer associated with feedwater flow instabilities is addressed in FSAR section 10.4.7.3 and in Admendment 53 as a response to Question G-1. In addition, a copy of the test procedure with results was forwarded by letter W. W. Mintz to Mr. Frank Jape, USNRC, dated April 22, 1977.

To date no incidents of water hammer or vibration have occurred which could be attributable to design of the feedwater system or steam generator.

ITEM 5 : Provide a description of feedwater chemistry control and a summary of chemistry data.

RESPONSE: The feedwater system is a once-through system and its chemical treatment is based on the All Volatile Treatment (AVT) concept. The primary emphasis of this treatment concept as related to the feedwater system is to minimize corrosion by eliminating oxygen in the feedwater as far as possible. This is accomplished by adding hydrazine to the condensate. Part of the hydrazine decomposes to ammonia and thus provides the mechanism of all control in the feedwater.

Due to the importance of oxygen exclusion from the feedwater and the necessity of maintaining adequate levels of hydrazine to accomplish this, the concentrations of oxygen and hydrazine are the only two "control" specifications established for feedwater chemistry control. The specifications for normal power operation are:

Oxygen	< 5 ppb
Hydrazine	$[O_2] + 5$ ppb

From a review of our data during normal power operation for August 1977 through March 1979 the concentration of oxygen was measured as <5 ppb on 425 occasions; 10 ppb on 4 occasions; and 15 ppb on 5 occasions. The hydrazine concentration has generally been maintained at appropriate levels. Some problems have been experienced in simultaneously maintaining the required level of hydrazine and the appropriate feedwater pH value.

Listed below are valves of other parameters monitored in the feedwater system.

pH	8.8 - 9.? @ 25°C
Fe	$<$ 10 ppb
Cu	$<$ 5 ppb
Cation Conductivity	$\leq$ 1 umho/cm @ 25°C
Specific Conductivity	$\leq$ 4 umho/cm @ 25°C
Ammonia	$\leq$ 0.5 ppm
Silica	None specified