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F. L. Clayton, Jr.
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July 8, 1982

Docket No. 50-364

Director, Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. S. A. Varga

Joseph M. Farley Nuclear Plant - Unit 2
License Conditions 2.C.(9)(b) and 2.C.(12)(c)
Boron Mixing and Natural Circulation Cooldown

Gentlemen:

Pursuant to License Condition 2.C.(9)(b), as amended by Amendment No. 9 to License No. NPF-8, and License Condition 2.C.(12)(c) regarding verification of adequate boron mixing during natural circulation cooldown and procedures for natural circulation cooling respectively, Alabama Power Company is submitting the necessary information to document that the test results at other plants are applicable to the Farley Nuclear Plant, Unit 2; thereby, obviating the requirement to run a natural circulation cooldown test with boron mixing on this unit. This letter provides the final documentation of full compliance with License Conditions 2.C.(9)(b) and 2.C.(12)(c).

The natural circulation cooldown test results at North Anna and Farley (transmitted to the NRC in letters from B. R. Sylvia to H. R. Denton dated July 22, 1980, and from F. L. Clayton to B. J. Youngblood dated May 18, 1981 respectively); the natural circulation cooldown and boron mixing test results at Salem and Sequoyah (transmitted to the NRC in letters from Public Service Electric and Gas Company and TVA respectively); and the natural circulation boron mixing test results at North Anna (transmitted to the NRC in a letter from R. H. Leasburg to H. R. Denton dated April 5, 1982) have conclusively demonstrated that:

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- (1) Based on test results, the North Anna and Farley primary systems (both 3 loop designs) exhibit effectively identical natural circulation behavior in terms of time to stabilize following reactor coolant pump trip, core flow distribution, core power distribution and flow rates as indicated by the loop delta temperatures.
- (2) Based on test results at both 3 and 4 loop plants, all plants exhibit very similar behavior on natural circulation, indicating similar RCS characteristics.
- (3) Based on North Anna, Salem and Sequoyah test results, boron mixing under natural circulation conditions is satisfactory with the test results applicable to Farley as previously stated (detailed correlation of 3 and 4 loop plant data is described in the F. L. Clayton to A. Schwencer letter dated October 5, 1980).
- (4) The boron mixing test results previously referenced were conservative in that the power levels (and flow) were nominally lower than those expected following an emergency condition. The tests at Salem and North Anna were performed at the end of cycle with a decay heat level of approximately 1% of rated power; the Sequoyah test was performed with nuclear heat of approximately 2% of rated power. Both of these tests verify the fact that natural circulation cooldown and boron mixing can be established at very low power levels (and flow).
- (5) Based on the previously referenced test results at all plants, the RCS is capable of a cooldown rate of approximately 50° F/hr. on natural circulation. This is a significantly higher rate than needed based on the Westinghouse emergency procedures (i.e., 25° F/hr.).
- (6) Based on the previously referenced test results, boration of the pressurizer during natural circulation is adequate at all plants using auxiliary pressurizer sprays.
- (7) Based on boron mixing and cooldown test results previously referenced, no core temperature distribution anomalies were induced by the addition of boric acid into the RCS or the cooldown process while on natural circulation.

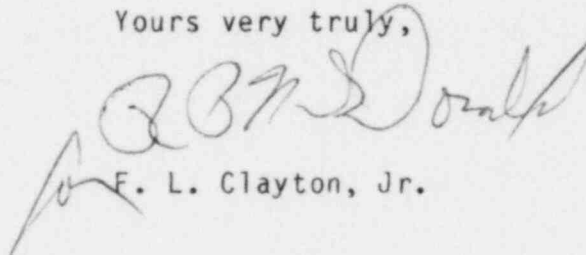
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Alabama Power Company has an approved Emergency Operating Procedure, "EOP-7, Loss of All AC Power," that includes natural circulation cooldown with boron mixing. This procedure is in use at Farley Nuclear Plant and operations personnel receive training on this mode of plant operation as part of the operator licensing process and the attendant requalification program. This procedure is discussed in a letter from F. L. Clayton to S. A. Varga dated September 16, 1981, and as used by the NRC in the Safety Evaluation related to Amendment No. 9 to License No. NPF-8 (transmitted to Alabama Power Company in a letter from E. A. Reeves to F. L. Clayton dated October 20, 1981).

Since the test results at North Anna (3 loop design), and at Salem and Sequoyah (both 4 loop designs) successfully and conclusively demonstrate the capability to mix boric acid and cooldown under natural circulation conditions; since the test results are directly applicable to Farley Unit 2 as stated above; and since the existing Emergency Operating Procedure, "EOP-7, Loss of All AC Power," includes a section on natural circulation cooldown with boron mixing; full compliance with License Conditions 2.C.(9)(b) and 2.C.(12)(c) has been demonstrated. This letter completes Alabama Power Company's commitment regarding these items.

Yours very truly,



F. L. Clayton, Jr.

FLCJr/GGY:jc-D13

cc: Mr. R. A. Thomas
Mr. G. F. Trowbridge
Mr. J. P. O'Reilly
Mr. E. A. Reeves
Mr. W. H. Bradford