TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

April 14, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

In the Matter of the	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

At the request of your staff, we met with Oak Ridge National Laboratory (ORNL) on February 11, 1983 to discuss concerns regarding operation with a single recirculation loop at Browns Ferry Nuclear Plant. During that meeting we answered questions and provided ORNL with considerable data on past Browns Ferry experience in single loop. Enclosed is additional information and clarification regarding our previous submittals on single loop.

We are still very much interested in obtaining NRC approval of single loop operation at the highest power level attainable. However, we understanding that single loop operation at power levels up to 50 percent may be the only possible option available to us at this time. We want to avoid the need for emergency approval and are willing to work closely with NRC and contractors to resolve any remaining questions and concerns on this issue as expeditiously as possible.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills

L. M. Mills, Manager
Nuclear Licensing

Subscribed and sworn to before
me this 14th day of April 1983.

Paulette H. White
Notary Public

My Commission Expires 9-5-84

A001

Enclosure
cc: See page 2

8304180426 830414
PDR ADOCK 05000259
P PDR

Mr. Harold R. Denton April 14, 1983

cc (Enclosure):

U.S. Nuclear Regulatory Commission
Region II
ATTN: James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 2900
Atlanta, Georgia 30303

Mr. R. J. Clark
Browns Ferry Project Manager
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20814

ENCLOSURE

ADDITIONAL INFORMATION AND CLARIFICATION REGARDING
SINGLE RECIRCULATION LOOP OPERATION
BROWNS FERRY NUCLEAR PLANT
(Reference: TVA letter from L. M. Mills to
H. R. Denton dated January 6, 1983)

1. NRC requested that figure 3 of the referenced letter be clarified. Test data was recorded at various conditions as listed in the attached tables A-1 and A-2. The maximum peak to peak variation APRM signal was then determined from each recording and that point was plotted against the active loop flow for that condition. The figure also includes an operating map showing the region in which the tests were performed. It should be noted that active loop flow and total core flow are not directly proportional due to inactive loop backflow characteristics.

2. During the February 11, 1983 meeting between TVA and ORNL, it was pointed out to us that our response to question 1 of the referenced letter was incorrect.

   Paragraph 2 of that response states that "the individual jet pump flow variations show no relationships to the power-void characteristics signal (i.e., flux) and their signals show no common oscillation driving them from the discharge end . . . jet pump noise observed . . . is not driven by power-void feedback." TVA agrees that this is not correct and, in fact, there will always be a component of jet pump variation though it may be small which is characteristic of power-void feedback and which is common to all jet pumps. We contend that because the individual jet pump flow signals bear no resemblance to the flux and total flow signals, the power-void effect on the jet pump signals is a minor component compared to the others which add together to comprise the total signal, and that the major components are not common to all jet pumps and not related to power-void feedback.

TABLE A-1

Test A Signals Recorded

No.	Title	Units	Scale Units/in.	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8
	Pump Speed - Percent			49	54	60	66	70	75	80	85
	Core Flow - Percent			42	44.9	48.7	48.7	49.7	49.7	50.7	52.6
	Power - Percent			51.6	53.4	55.2	57.3	59.4	59.4	61.1	62.8
	Condition			A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8
	Signal			Initial value at test condition							
2	B Recirc Pump ΔP	PSId	10	50	60	75	90	100	115	132	150
3	Jet Pump 1-10 Flow	Millions lbs/hr	4	42.0	46.0	52.0	56.0	60.0	64.0	68.0	72.0
4	B Recirc Pump Speed	Percent	10	49	54	60	66	70	75	80	85
5	Jet Pump 1 Flow	Millions lbs/hr	1	4.0	4.0	4.3	5.0	5.5	5.8	5.8	6.0
6	Jet Pump 6 Flow	Millions lbs/hr	1	4.0	4.2	4.6	5.2	5.5	6.0	6.0	6.2
7	B Recirc Drive Flow *	Thousands GPM.	7	26	29	34	35	37	40	42	45
8	Total Feedwater Flow	Millions lbs/hr	2	6.8	6.8	7	7.1	7.6	7.6	7.9	8.2
9	Rx Press (NR)	PSIG	5	954	954	945	945	952	953	953	953
10	Core Plate ΔP	PSId	1	1.8	2.4	2.4	2.7	3.0	3.3	3.9	5.1
11	Jet Pump 11-20 Flow	Millions lbs/hr	4	DNSCL	DNSCL	2.0	10.0	12.0	15.0	17.0	19.0
13	Jet Pump 11 Flow	Millions lbs/hr	1	0	.2	.4	.8	.95	1.1	1.2	1.5
14	Jet Pump 16 Flow	Millions lbs/hr	1	.1	.6	.9	1.2	1.3	1.5	1.7	1.8
15	NR Water Level	Inches	5	34.0	34.0	34.0	33.5	33.5	33.5	33.5	34.0
16	LPRM 48-33B	Percent	10	28	28	29	30	32	32	33	38
17	LPRM 48-33A	Percent	10	27	27	26	27	25	25	25	25
18	LPRM 48-33C	Percent	10	28 +	28 +	29 **	30	30 **	31	31	36
19	LPRM 48-33D	Percent	10	16	15	15	16	17	18	19	20
20	APRMD	Percent	10	52.0	53.0	55.0	57.5	58.0	59.0	62.0	70.0

* Signal polarity reversed for all conditions + signal missing for these conditions

** Signal polarity reversed for these conditions

Table A-1: Scale and initial conditions for first set of recordings

TABLE A-2

Test B Signals REcorded

No.	Title	Units	Scale Units/in			
Pump Speed - Percent				50	70	85
Core Flow - Percent						
Power - Percent						
Condition				B-1	B-2	B-3
Signals				Initial Value at test condition		
2	B Recirc Pump ΔP	PSIG	10	50	100	150
3	Jet Pump 1-10 Flow	Millions lbs/hr	4	44	60	72
10	Core Plate ΔP	PSI d	1	1.9	3.0	4.2
19	APRMD	Percent	10	56	63	67
20	Jet Pump Head	PSId	1	0	1.5	3.5
21	Jet Pump 7 ΔP	PSId	3	7.5	15.0	21.5*
22	Jet Pump 8 ΔP	PSId	3	8.0	16.0	24 *
23	Jet Pump 9 ΔP	PSId	3	9.0	16.5	23 *
24	Jet Pump 10 ΔP	PSId	3	8.5	13.0	18 *

* Scale changed to 6 psid per inch for condition B-3

Table A-2: Scale and initial conditions for second set of recordings