Florida
Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302

April 23, 1996
3F0496-27

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: Engineering Evaluation of Performance Test PT-630

Reference: NRC/FPC Meeting Notes dated February 15, 1996.

Dear Sir:

As agreed upon at a meeting between Florida Power Corporation (FPC) and NRC staff on February 8, 1996 and documented in the reference meeting notes, FPC has completed a performance test to confirm the design adequacy of Operating Procedure OP-103B, Curve 8, 'Max. MUT Operating Pressure vs. Level'. Enclosed is an FPC Interoffice Correspondence dated April 22, 1996, which documents the evaluation of the test data against the curve. It also includes an independent evaluation of the test data by MPR Associates. Both evaluations conclude that the pressure loss coefficients used in Calculation M94-0053 are conservative and the curve is sufficiently accurate and conservative to protect the HPI pumps against ingestion of hydrogen during emergency operation.

To assist the NRC in their review, two points of clarification of the information are offered below regarding the information at the top of page 1 of Table 2:

1. Table 2 refers to flow rates from Table 1. Reactor Building Spray (BS) pump flow is not found in Table 1 since no computer data was available for this flow rate. BS flow was set to 1500 GPM with the installed flow controller.

2. Table 2 refers to '14" flow'. This value represents total flow in the BWST suction line to the three pumps which draw suction from that tank. It is the summation of 'LPI flow', 'BS flow', and '6" flow' (not 'HPI flow'). The

A001
1/1

difference between '6" flow' and 'HPI flow' is the amount of flow through the HPI pumps which is being drawn from the makeup tank (MUT). '6" flow' was calculated by converting BWST level change into flow rate since the LPI and BS pumps were recirculating flow back to the BWST. This was the most accurate way to distinguish between HPI flow from the BWST and the MUT and quantify the HPI portion of total flow in the 14-inch diameter BWST suction line.

Please contact FPC if additional information is required.

Sincerely,

L. C. Kelley, Director
Nuclear Operations Site Support

LCK/BG:ff

Enclosure

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

Florida Power
CORPORATION

INTEROFFICE CORRESPONDENCE

Nuclear Engineering Design (OFFICE) | NA2J (MAC) | 240-3606 (TELEPHONE)

SUBJECT: **Crystal River Unit 3**
PT-630/M94-0053 Rev. 3 Comparison
File: M94-0053, IOC NED96-0234

Attention: This document supercedes document IOC NED96-0234

TO: **G. H. Halnon**

DATE: **April 22, 1996**
NED96-0259

Please find attached Verified and Approved Comparison of Pt-630 Data and M94-0053 Rev. 3 Head Loss Predictions. This comparison documents FPC's determination that the factors used in M94-0053 Rev. 3 for Head Loss calculations are conservative when compared to Measured Values obtained in performance of PT-630. In addition, the same type of comparison with similar results performed by MPR is also included as an attachment to the FPC comparison.

The FPC and MPR comparisons have minor differences in; 1) the flows used to calculate head losses and 2) the Plant evaluation of the test gage on MUV-287. These differences are discussed below and have insignificant impact on the validation determination, (0.3ft less than FPC's at the same flows).

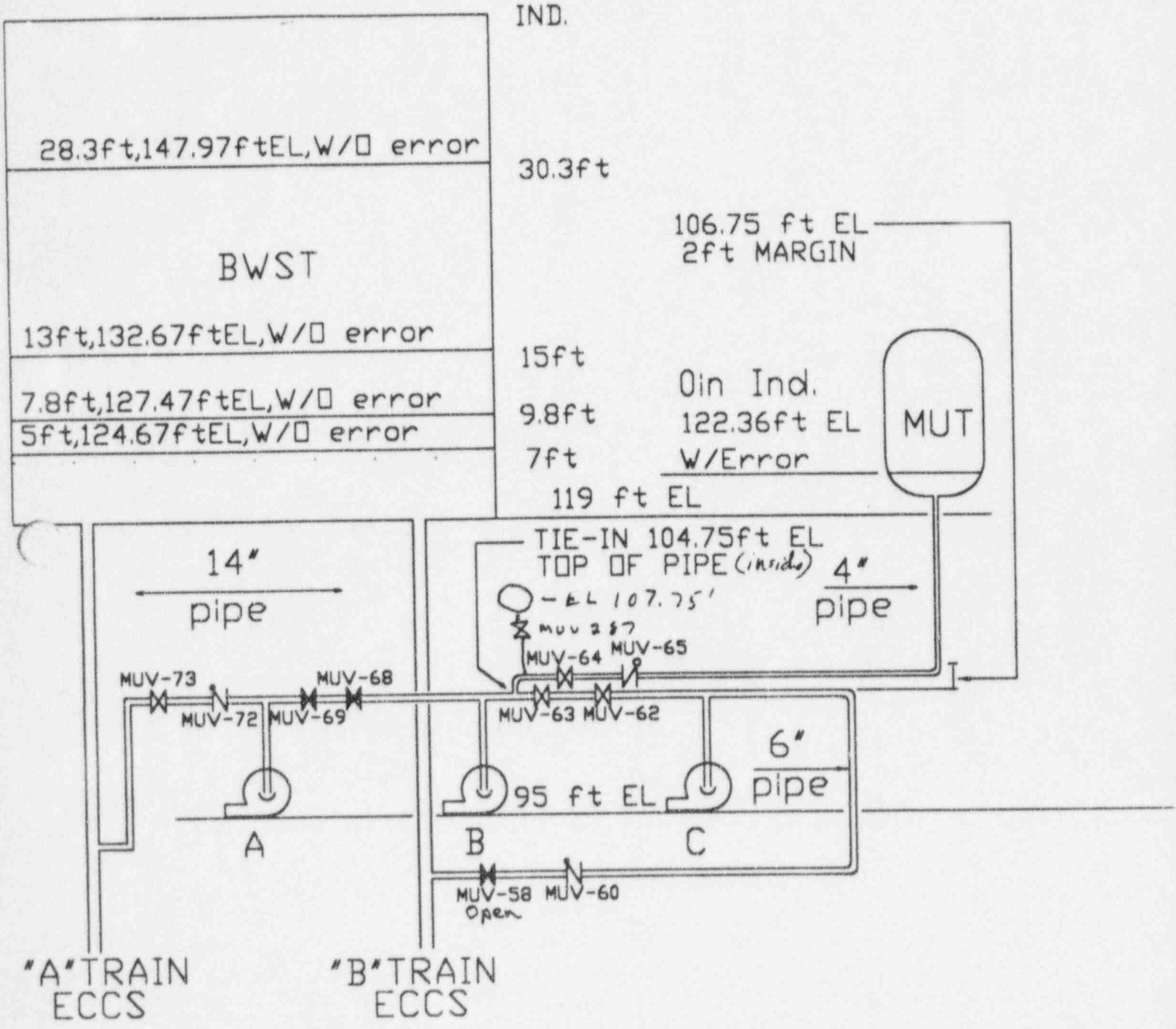
1) MPR used summation of REDAS HPI flows while FPC used the level change in BWST to determine flows because some of the HPI flow was from the MUT during the PT. In addition, MPR used the same K factors for all flow rates while FPC adjusted the 6" piping K factor because of the velocity changes through the splitting tee.

2) MPR used a test gauge differential from the tie-ins of 3.25ft and a tie-in elevation of 104.50ft EL while FPC used 3ft and 104.75 respectively.

In addition to the above comparison, there is attached a data sheet taken during PT-630 and sketch showing relative piping elevations and test gages for PT-630. If there are any questions or comments please let me know.

P.R. Tanguay, Director
Nuclear Engineering & Projects

cc: R.E. Clauson
D.A. Shook
J. R. Maseda
Records Management


IND.
28.3ft,147.97ftEL,W/0 error
30.3ft
106.75 ft EL
2ft MARGIN
BWST
13ft,132.67ftEL,W/0 error
15ft
0in Ind.
122.36ft EL
W/Error
MUT
7.8ft,127.47ftEL,W/0 error
9.8ft
5ft,124.67ftEL,W/0 error
7ft
119 ft EL
TIE-IN 104.75ft EL
TOP OF PIPE (inside)
14"
pipe
4"
pipe
-EL 107.75'
MUV 257
MUV-64
MUV-65
MUV-73
MUV-68
MUV-72
MUV-69
MUV-63
MUV-62
6"
pipe
95 ft EL
A
B
C
MUV-58
Open
MUV-60
"A" TRAIN
ECCS
"B" TRAIN
ECCS

DATA TABLE Time: 0005 0009 0012 0017 0026

	Initial	DHP Recirc	DHP/BSP Recirc	MUP DHP/BSP Recirc	HPI 200 GPM	HPI 300 GPM	HPI 400 GPM	HPI 500 GPM	HPI 540 GPM
ACTUAL HPI FLOW					200	300	400	500	537
DHP-1B Suct DH-4-PI2	26	25	24	24	24	24	23.5	23.5	23.5
DHP-1B Disch DH-5-PI2		180	170	167.5	167.5	165	165	165	165
BSP-1B Suct BS-9-PI2	42	41	25 ~~21 3~~ 3 10 76	25	25	25	25	25	25
BSP-1B DISCH BS-2-PI2			215	215	215	215	215	215	215
MUP-1B SUCT MU-9-PI2	30	30	30	28.5	20	16.5	15.5	14.5	14
MUP-1B DISCH MU-22-PI2				2975	2800	2550	2200	1625	1350
MUV-287 TEST GAUGE	28	28	28	27	15.2	14.8	14.1	13.3	12.9
BWST VAPOR TEST GAUGE	.2" H_2O	.2" H_2O	.2" H_2O	.2" H_2O	.2" H_2O	.2" H_2O	.2" H_2O	.2" H_2O	.2" H_2O

COMPARISON OF M94-0053 Rev. 3 TO PT-630 DATA

File: M94-0053 Rev. 3

ATTACHMENTS:

TABLE #1	REDAS DATA FROM PT-630 COLUMNS A THROUGH K LOCAL DATA TAKEN DURING PT-630 COLUMNS N,T, U, & V ALL OTHER COLUMNS ARE CALCULATIONS OF ABOVE DATA
TABLE #2	THIS TABLE TAKES PT-630 FLOW RATES AND USING M94-0053 Rev. 3 METHODOLOGY AND K FACTORS CALCULATES A RESULTING HEAD LOSS FOR THE FLOW FROM THE BWST. IN ADDITION, THE RESULTS OF THE MPR REVIEW IS PRESENTED AND A COMPARISON OF MPR K FACTORS USING SPECIFIC PT-630 FLOWS.
CHART #1	PLOT OF MUT AND BWST LEVELS WITH TIME DURING PT-630. BWST Level is given in inches less 270" in order to plot on the same chart.
CHART #2	PLOT OF HPI FLOW FROM BWST AND MUT WITH TIME DURING PT-630.
CHART #3	PLOT OF REDAS PRESSURE AND LEVEL FOR THE MUT DURING PT-630 AND THE COMPUTER ALARM CURVE OF OP-103B.
MPR TELECOPY	MPR's evaluation of PT-630 data to their independent calculation of BWST to Tie-In head loss.

CONCLUSION:

Table #2 page 2 shows that the calculated head losses using M94-0053 Rev. 3 methodology to be 2.8 to 4.9 ft higher than that measured during PT-630. In addition, Table #1 Column O shows the additional head loss of the check valve in the 4" line from the MUT to be 0.51ft to 0.77ft which was not included in the M94-0053 Calculation and provides additional margin/conservatism. The flow rates calculated from level changes in Table #1 were used in the Table #2 account for a portion of the HPI flow coming from the MUT during the lower flow rates of the PT.

The data plots are responses expected under the PT conditions and show how the MUT initially supplies the MUP flow until level reduction and resulting pressure decrease cause the BWST to become the major source of water for the MUP.

Based on the Conservatism of the Calculated Head Losses (MPR and FPC) compared with Actual measured values of PT-630 the results of M94-0053 Rev. 3 is an acceptable basis for determination of the Allowable MUT Overpressures.

R. E. Clauson
Design Engineer
R.E. Clauson

K. R. Ledzian 4/10/96
Verification Engineer
K.R. Ledzian

T. V. Austin
Engineering Supervisor
T.V. Austin

PT.[illegible] SULTS

Tr[illegible] #1

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
Test Time, 3/31/96, Hr 0	REDAS MUT Temperature	REDAS MUT Pressure	REDAS MUT Level	REDAS BWST Temperature	REDAS BWST Level	REDAS DHP Flow (Recirculation)	REDAS MUV-25 Flow	REDAS MUV-23 Flow	REDAS MUV-26 Flow	REDAS MUV-24 Flow	Calculated Total HPI Flow from REDAS Data	Calculated Head Loss from MUT Press	Calculated Head Loss from MUV-287 Press	Delta HL values related to the 4" CK Valve	BWST Level in inches and -270"	Calc HPI Flow from MUT based on level change	Calc HPI Flow from BWST based on level change	Calculated Total HPI flow from Level changes	Measured Press @ MUV-287 Test Gage	Measured BWST Vapor Space Press Test Gage	Main Control Board Indicated HPI Flow	Calc Total HPI flow from Level change(3 min avg)	Calc HPI Flow from BWST Level change(3 min avg)	Calc HPI Flow from MUT Level change(3 min avg)	Calc 1/4" Flow, HPI FromBWST 3min avg + DH & E	COMPUTER ALARM (ALLOWABLE OP 103B)
min	Deg	psig	in	Deg F	ft	gpm	gpm	gpm	gpm	gpm	gpm	ft	ft	ft	in	gpm	gpm	gpm	psig	in	gpm	gpm	gpm	gpm	gpm	psig
0	84	17.33	84.50	88	27.04	3075.8	0	0	0	0	0	-23.80			54.45	0.00	0.00	0.00								20.47
1	84	17.30	84.42	89	27.04	3078.85	0	0	0	0	0	-23.52			54.44	2.66	4.70	7.36				26.76	-3.45	30.21	4575.40	20.41
2	85	15.92	81.57	86	27.04	3079.28	0	0	0	92.51	92.51	-20.08			54.46	87.96	-15.04	72.92				84.08	3.13	80.95	4582.41	18.66
3	84	13.16	76.63	88	27.04	3072.44	0	32.32	0	95.42	127.73	-13.27			54.44	152.23	19.74	171.97				138.47	-9.71	148.18	4562.73	16.01
4	84	10.20	70.00	89	27.04	3073.64	0	33.14	0	94.00	127.14	-5.88			54.48	204.36	-33.84	170.52				193.79	8.15	185.65	4581.79	13.05
5	84	7.96	63.51	89	27.04	3078.81	0	32.68	0	93.91	126.58	-0.13	3.24		54.43	200.35	38.54	238.89	15.20	-0.20	200	211.65	33.53	178.13	4612.34	10.68
6	84	6.84	59.30	89	27.03	3077.16	0	32.91	0	93.83	126.74	2.80			54.31	129.67	95.88	225.55				246.33	118.13	128.21	4695.29	9.31
7	84	6.53	57.53	88	27.00	3078.47	0	113.61	0	100.74	214.35	3.64			54.03	54.60	219.96	274.56				236.06	159.49	76.57	4737.96	8.79
8	84	6.24	56.06	88	26.99	3079.14	0	107.68	0	98.65	204.33	4.41			53.82	45.45	162.62	208.07				241.22	200.85	40.37	4779.99	8.37
9	84	6.14	55.38	89	26.96	3077.22	0	107.89	0	96.24	204.14	4.69	4.07	-0.63	53.54	21.07	219.96	241.03	14.80	-0.20	300	297.84	267.90	29.94	4845.12	8.18
10	84	5.94	54.62	88	26.92	3078.77	86.95	111.86	0	106.19	305.00	5.18			53.00	23.32	421.12	444.44				364.65	338.09	26.57	4916.86	7.98
11	84	5.68	53.47	88	26.88	3091.43	119.56	119.37	0	111.77	350.71	5.83			52.53	35.31	373.18	408.49				385.95	360.33	25.62	4951.76	7.67
12	84	5.57	52.88	88	26.85	3104.96	118.79	119.50	0	111.51	349.80	6.11	5.57	-0.53	52.16	18.24	286.70	304.94	14.10	-0.20	400	413.33	392.29	21.04	4997.25	7.52
13	84	5.52	52.57	89	26.79	3098.21	118.40	119.44	0	111.24	349.08	6.19			51.50	9.57	517.00	526.57				381.45	366.60	14.85	4964.81	7.44
14	84	5.38	52.03	89	26.76	3096.58	106.60	112.33	57.94	103.52	380.44	6.53			51.12	16.75	296.10	312.85				468.18	448.07	20.11	5044.65	7.30
15	84	5.14	50.93	88	26.70	3096.82	110.23	116.59	93.99	104.07	424.87	7.12			50.44	34.01	531.10	565.11				414.01	388.85	25.16	[illegible]67	7.02
16	84	4.99	50.12	88	26.67	3091.84	119.11	118.92	98.17	112.38	448.58	7.51			50.01	24.73	339.34	364.07				475.65	451.20	24.45	5043.04	6.83
17	84	4.90	49.65	88	26.62	3095.48	117.47	118.60	97.69	107.75	441.52	7.71	7.20	-0.51	49.39	14.61	483.16	497.77	13.30	-0.20	500	478.24	462.48	15.76	5057.96	6.71
18	84	4.85	49.39	88	26.56	3098.37	119.47	117.96	97.72	107.26	442.41	7.77			48.67	7.93	564.94	572.87				465.58	456.21	9.37	[illegible]4.58	6.65
19	84	4.83	49.21	89	26.52	3100.53	115.00	114.65	107.87	111.69	449.21	7.81			48.26	5.57	320.54	326.11				518.17	510.42	7.75	[illegible]0.95	6.61
20	83	4.76	48.90	88	26.45	3096.82	119.18	123.57	112.11	114.68	469.55	7.91			47.44	9.75	645.78	655.53				492.29	483.16	9.13	5079.98	6.53
21	84	4.68	48.51	88	26.40	3091.75	129.58	121.63	112.09	120.27	483.57	8.09			46.82	12.06	483.16	495.22				570.48	559.61	10.87	5151.36	6.44
22	84	4.61	48.16	88	26.34	3086.71	122.65	130.34	120.38	115.52	488.89	8.22			46.12	10.80	549.90	560.70				506.58	495.69	10.88	5082.40	6.36
23	84	4.55	47.84	88	26.30	3086.99	114.24	128.25	128.17	125.96	496.62	8.33			45.54	9.79	454.02	463.81				545.23	535.80	9.43	5122.79	6.29
24	84	4.51	47.59	89	26.23	3086.3	114.43	127.47	126.58	125.50	493.98	8.38			44.77	7.70	603.48	611.18				504.94	497.57	7.37	5083.87	6.23
25	84	4.49	47.44	88	26.18	3086.02	114.80	127.47	126.73	124.71	493.71	8.40			44.22	4.63	435.22	439.85				550.86	545.51	5.34	5131.53	6.19
26	84	4.47	47.32	88	26.12	3085.57	114.52	127.65	126.25	124.28	492.70	8.40	7.63	-0.77	43.45	3.70	597.84	601.54	12.90	-0.20	537	529.90	526.09	3.82	5111.66	6.17
27	84	4.45	47.22	88	26.06	3083.92	115.73	126.99	126.30	123.77	492.79	8.39			42.76	3.12	545.20	548.32								6.14

Calculated Total HPI Flow from REDAS Data = Summation of all the REDAS MUV Flows

Calculated Head Loss from MUT Press = BWST + 119.17 - 0.2 / 12 - MUT Level/12 - 122.58 - (MUT Press*2.3175)

Calculated Head Loss from MUV-287 Press = BWST Level + 119.17 - 104.75 - 0.2/12 - 3 - MUV-287 Press*2.3175

Delta HL values related to the 4" CK Valve = (HL from MUV-287) - (HL from MUT Press)

The Calculated Head Loss from MUV-287 Press reading is the actual System Head loss from the BWST to the Tie-In Point which is to be compared to M94-0053 Rev. 3 for confirmation of Calculation Conservatism. The diference between the Calculated Head losses using MUT Press and MUV-287 Press is the effect of the 4" check valve, the - 51 to - 77 ft differences are shown in the Delta column.

BWST Level in inches and -270" = BWST Level x 12 - 270 (this was done to plot the two on the same chart)

Calculated Flow from MUT based on level change = (MUT Level time T - MUT Level time T - 1) x 30.84

Calculated Flow from BWST based on level change = (BWST Level time T - BWST Level time T - 1) x 9400

Calculated Total HPI flow from Level change = Summation of MUT and BWST Flows from Level change

Calculated flows from Level change(3 min avg) = Summation of flows from one min before to one min after divided by 3

Shaded area represents invalid Head Loss determination becase major flow is from the MUT

PT-630 RESULTS
TABLE #2

PT-630 Flow Rates taken from Table #1					
	LPI flow	3077	3105	3096	3086
	BSP flow	1500	1500	1500	1500
	HPI flow	298	413	478	530
	6" flow	268	392	462	526
	14" flow	4845	4997	5058	5112
BWST Water temperature of 88F used in head loss calc.					
	density 62.14				
	viscosity 0.78				
	psi to ft conversion 2.3175				
(f) FACTORS FOR 14 in PIPING FROM BWST TO HPI TEE					
Re 14" @4845 gpm		=50.6*4845*62.14/13.25/0.78			1.47E+06
	f =	0.0135			
Re 14" @4997 gpm		=50.6*4997*62.14/13.25/0.78			1.52E+06
	f =	0.0134			
Re 14" @5058 gpm		=50.6*5058*62.14/13.25/0.78			1.54E+06
	f =	0.0134			
Re 14 @5112 gpm		=50.6*5112*62.14/13.25/0.78			1.56E+06
	f =	0.0134			
(f) FACTORS FOR 6 in PIPING FROM BWST TO HPI TEE					
Re 6" @268gpm		=50.6*268*62.14/6.065/0.78			1.78E+05
	f =	0.018			
Re 6" @392 gpm		=50.6*392*62.14/6.065/0.78			2.61E+05
	f =	0.0172			
Re 6" @462 gpm		=50.6*462*62.14/6.065/0.78			3.07E+05
	f =	0.0169			
Re 6" @526 gpm		=50.6*526*62.14/6.065/0.78			3.50E+05
	f =	0.0167			
(K) FACTORS FOR FLOW SPLITTING TEE					
	(Values from Miller Paper, Attachment 12 to M94-0053 Rev. 3)				
	14" Flow rate (gpm)	4845	4997	5058	5112
	6" Flow rate (gpm)	268	392	462	526
A1/A3 = 28.89/137.88 =		0.20953	0.20953	0.20953	0.20953
	Q1/ Q4	0.06	0.08	0.09	0.10
	K 32	1.040	1.100	1.110	1.14

PT-630 RESULTS
TABLE #2

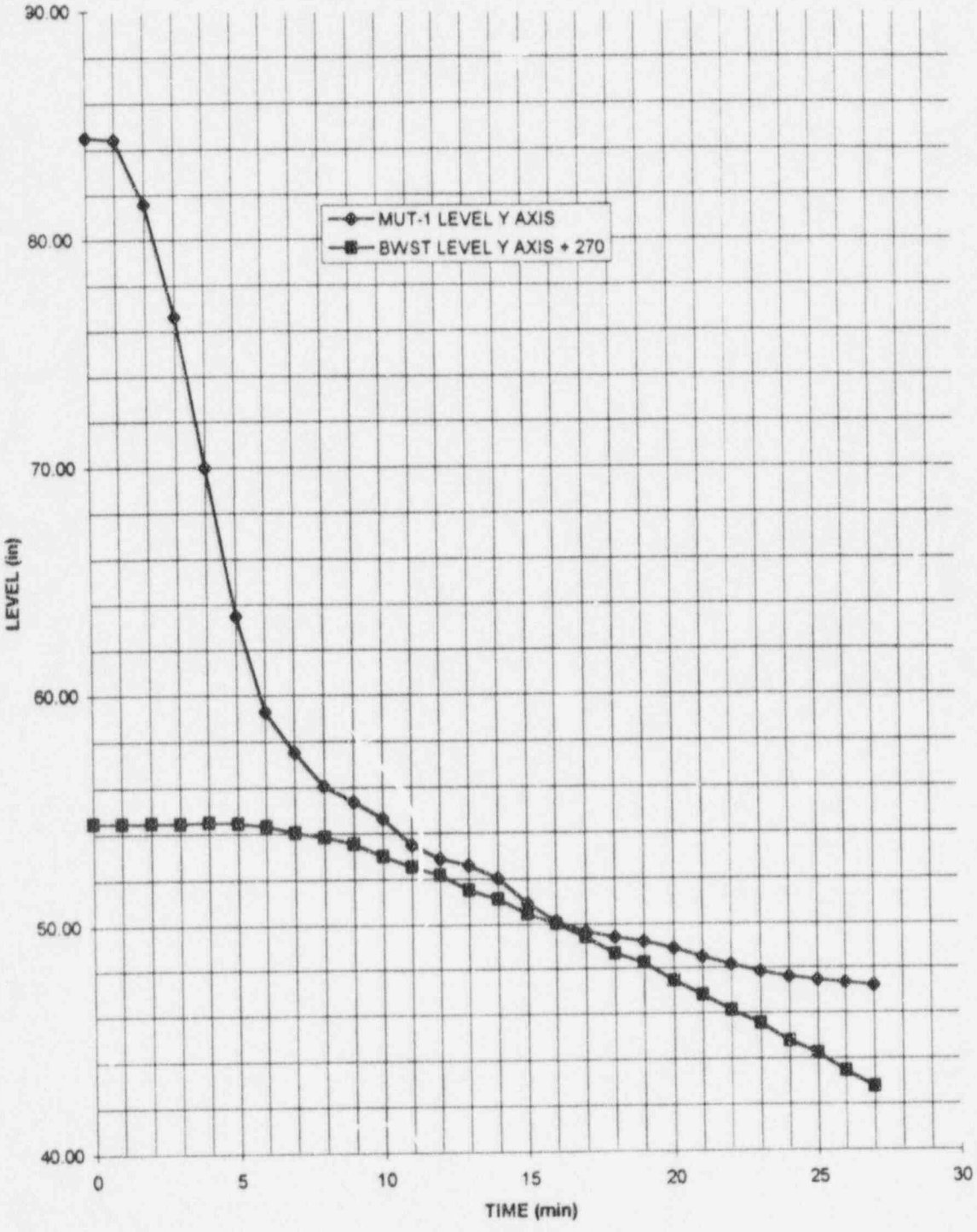
CALCULATION OF "B" TRAIN HEAD LOSSES FOR PT-630 FLOWS							
14" flow rate (gpm)			4845	4997	5058	5112	
Friction factor			0.0135	0.0134	0.0134	0.0134	
Component	QTY	K Eq					
Entrance Loss	1	0.5	0.500	0.500	0.500	0.500	
14" Pipe	30.55	f X L/D	0.374	0.371	0.371	0.371	
Elbow 90	1	14f	0.189	0.188	0.188	0.188	
Elbow 45	2	7f	0.189	0.188	0.188	0.188	
Tee Run	1	20f	0.270	0.268	0.268	0.268	
Reducer "T" w/Flow Split		Miller	1.040	1.100	1.110	1.140	
Reducer "T" Run		20f	0.000	0.000	0.000	0.000	
		Total K's	2.562	2.614	2.624	2.654	
Hd Loss = 0.00259 x k x flow^2 / Pipe ID^4			5.053	5.485	5.641	5.828	
6" Flow Rate (gpm)			268	392	462	526	
Friction factor			0.018	0.0172	0.0169	0.0167	
Reducer 6" Tee Branch	0	60f	0	0	0	0	
14" x 6" Reducer	0	.5 x (1-B^	0	0	0	0	
6" Pipe	166	f X L/D	5.912	5.649	5.551	5.485	
Elbow 90	12	14f	3.024	2.890	2.839	2.806	
1/2 Tee Run	1	20f	0.180	0.172	0.169	0.167	
Tee Run Flow Split		Miller	0.000	0.000	0.000	0.000	
Elbow 45	3	7f	0.378	0.361	0.355	0.351	
Gate Valve MUV-58	1	8f	0.144	0.138	0.135	0.134	
CK Valve MUV-60	1	50f	0.900	0.860	0.845	0.835	
Tee Branch	1	60f	1.080	1.032	1.014	1.002	
		Total K's	11.618	11.102	10.908	10.779	
Hd Loss = 0.00259 x k x flow^2 / Pipe ID^4			1.597	3.265	4.457	5.708	
6" Flow Rate (gpm)			268	392	462	526	
Friction factor			0.018	0.0172	0.0169	0.0167	
6" Pipe	12.6	f X L/D	0.449	0.429	0.421	0.416	
Gate Valve MUV-62	1	8f	0.144	0.138	0.135	0.134	
Gate Valve MUV-63	1	8f	0.144	0.138	0.135	0.134	
1/2 Tee Run	2x1/2	20f	0.360	0.344	0.338	0.334	
1/2 'Tee Run	1	20f	0.000	0.000	0.000	0.000	
Velocity Head Loss		1	1.000	1.000	1.000	1.000	
		Total K's	2.097	2.048	2.030	2.018	
Hd Loss = 0.00259 x k x flow^2 / Pipe ID^4			0.288	0.602	0.829	1.068	
Total Calculated Head Loss			6.938	9.352	10.927	12.605	
PT-630 Total Measured Head Loss TABLE 1			4.1	5.6	7.23	7.66	
		Delta	2.838	3.752	3.697	4.945	

PT-630 RESULTS
TABLE #2

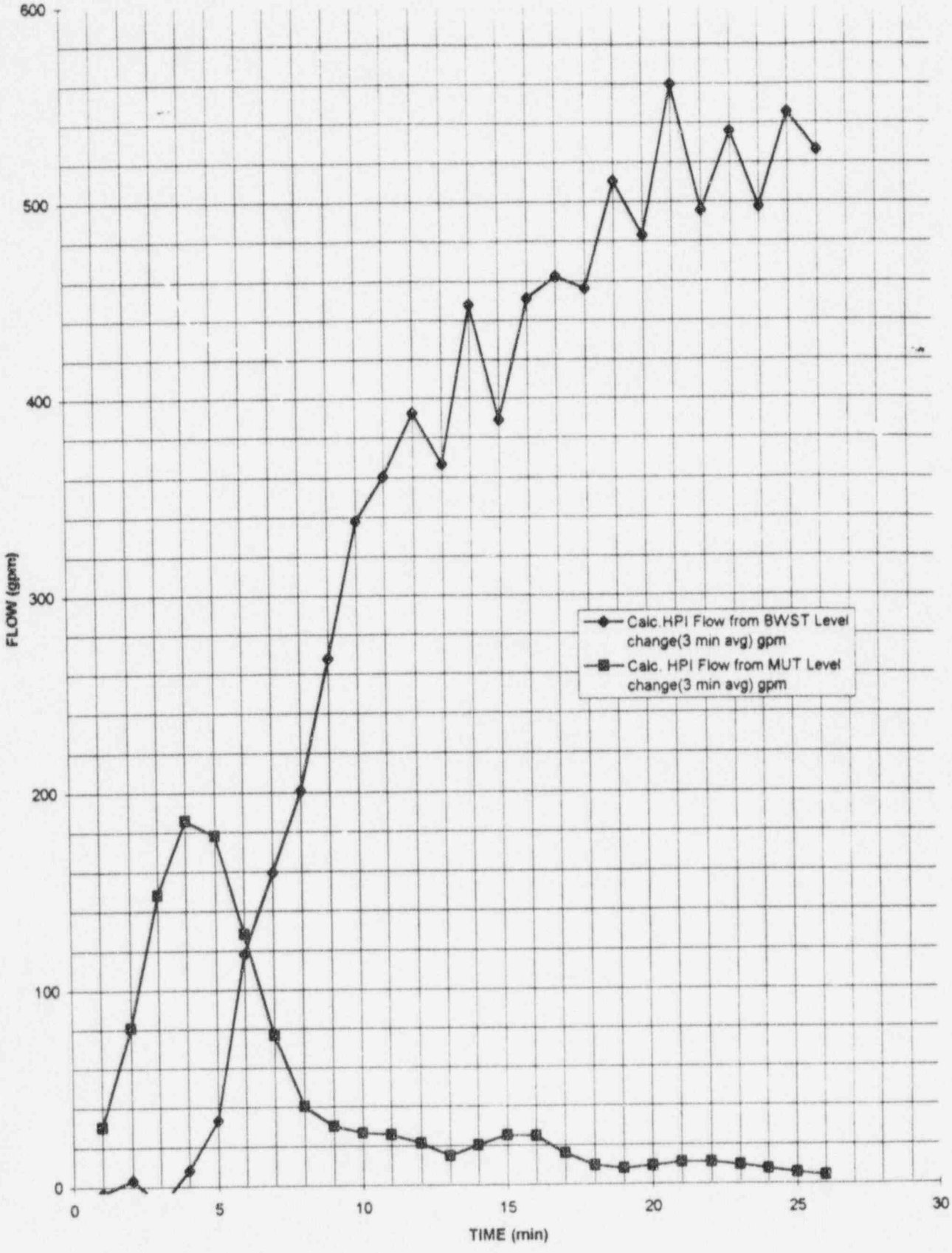
CALCULATION OF HEAD LOSSES USING MPR'S K FACTORS								
MPR Flow 14"	5075		BWST L	145.79	Measured (psig)	12.9		
14" Velocity	11.80779		TIE-IN	-104.5	Corrected (psig)	14.30		
MPR Flow 6"	493		DELT H	41.29				
6" Velocity	5.475259		HL	11.41188				
MPR Calc. Head Loss	11.41188		Press (ft)	29.88	DELTA (psig)	1.41		
			Press (psig)	12.89	DELTA (ft)	3.27		

COMPARISON OF MPR K FACTORS WITH FPC FLOWS					
14" F	4845	4997	5058	5112	
14" V	11.27266	11.62632	11.76824	11.89388	
6" F	268	392	462	526	
6" V	2.976409	4.353553	5.130973	5.841757	
HL	6.86588	9.128017	10.67482	12.28901	
FPC CALCULATED	6.938	9.352	10.927	12.605	

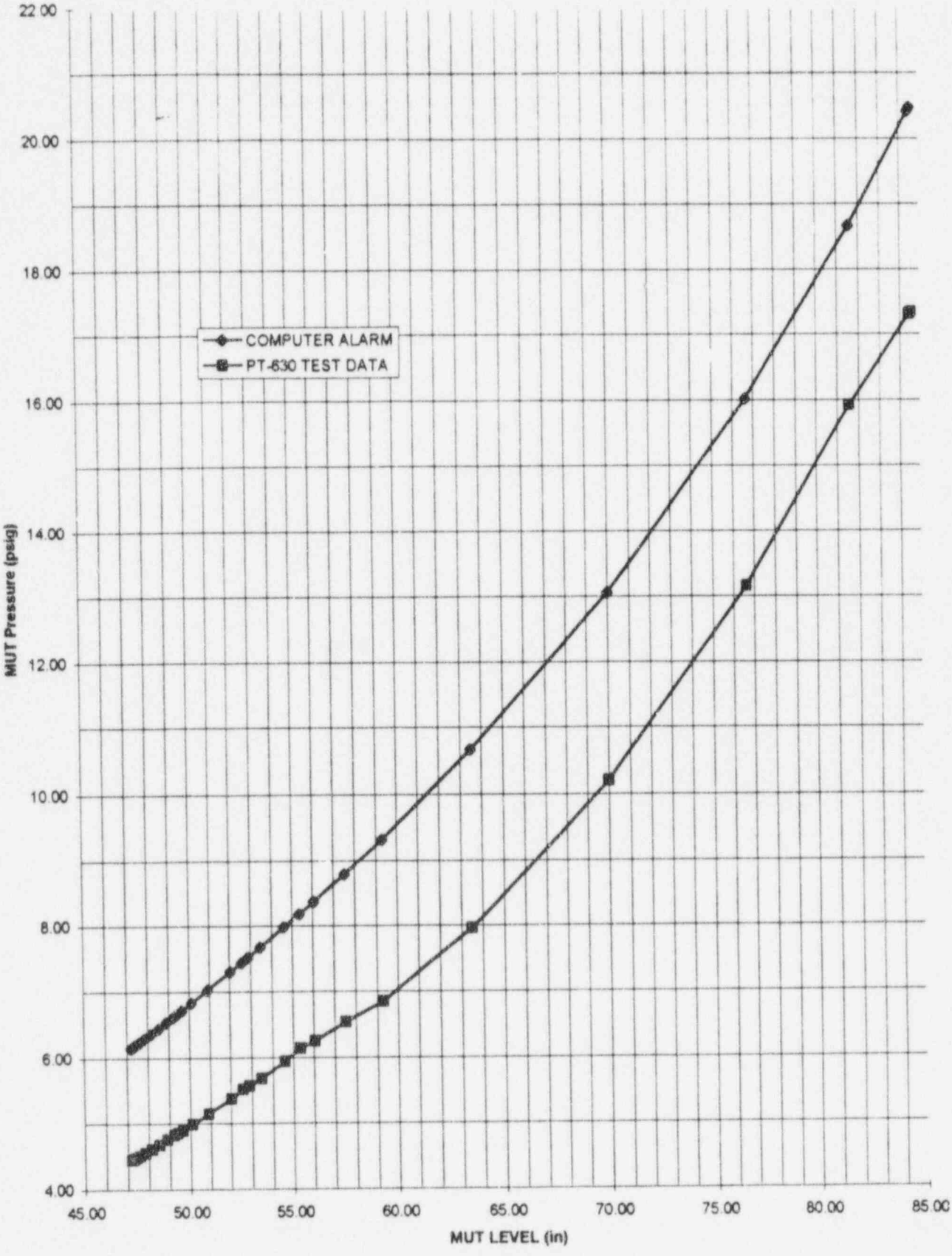
PT-630 RESULTS
CHART #!



PT-630 RESULTS
CHART #2



PT-630 RESULTS
CHART #3



MPR ASSOCIATES INC. ENGINEERS

32 YEARS OF EXCELLENCE 1964-1996

Date: April 22, 1996

To:	Paul Tanguay	**From:**	Dwight H. Harrison
Company:	Florida Power Company		
Fax Number:	352-563-4697	**Verification:**	352-563-4481
Subject:	CR3 Evaluation of Test Data Related to Max Allowable Makeup Tank		
Pages:	12 including this cover sheet		

Message:

320 KING STREET ALEXANDRIA, VA 22314-3230 703-519-0200 FAX: 703-519-0224

MPR
ASSOCIATES INC.
ENGINEERS

April 22, 1996

Mr. Paul Tanguay
Director, Nuclear Engineering and Projects
Florida Power Corporation
Crystal River Energy Complex
15760 West Power Line St.
Crystal River, Florida 34428-6708

Subject: Crystal River Unit 3 — Evaluation of Test Data Related to Maximum Allowable Makeup Tank Pressure

References:
(a) MPR Calculation 102075RCS01, Rev. 0, Comparison of Calculated and Measured Pressures at Junction of Makeup Tank Surge Line and Pump Suction Pipe

(b) MPR letter from R. C. Sanders to Mr. Paul Tanguay, Florida Power Company dated April 8, 1996

Dear Mr. Tanguay:

This letter forwards a revised version (Rev. 1) of the calculation, Reference (a), that was forwarded to you by Reference (b). The calculation has been revised to reflect a vacuum of 0.2 inch of water in the borated water storage tank (BWST), rather than a positive pressure of 0.2 inch of water. The information clarifying the test data was provided to MPR (Harrison) by FPC (Clauson) in a telephone conversation on April 22, 1996.

As would be expected, this change is very minor and does not affect the conclusions of our letter and the original calculations, References (a) and (b). That is, evaluation of the data confirms that the pressure loss coefficients used in the calculational technique are conservatively high.

If you have questions on the enclosed calculation or this letter, please do not hesitate to contact us.

Sincerely,

Dwight H. Harrison

Enclosure: MPR Calculation 102075RCS01, Rev. 1

cc: Mr. R. Clauson, Florida Power, w/encls

320 KING STREET ALEXANDRIA, VA 22314-3238 703-519-0200 FAX: 703-519-0224