DATA

AH data for 01 JAN 2002 thru 01 JUN 2002

UNIT 1	AVG
PAH Air Inlet [deg F]	83.9
PAH Air Outlet [deg F]	526.7
PAH Gas Inlet [deg F]	751.5
PAH Gas Outlet [deg F]	301.1
PAH Air D/P [INWC]*	2.7
PAH Gas D/P [INWC]	3.0
SAH Air Inlet [deg F]	61.8
SAH Air Outlet [deg F]	677.0
SAH Gas Inlet [deg F]	736.0
SAH Gas Outlet [deg F]	294.1
SAH Air D/P [INWC]*	3.1
SAH Gas D/P [INWC]	6.4

		Before Turbine Upgrade	After Turbine Upgrade
UNIT 2	AVG	PRE	POST
PAH Air Inlet [deg F]	83.1	75.2	91.1
PAH Air Outlet [deg F]	544.5	547.2	541.8
PAH Gas Inlet [deg F]	753.5	757.4	749.6
PAH Gas Outlet [deg F]	307.7	308.6	306.7
PAH Air D/P [INWC]*	2.9	3.0	2.8
PAH Gas D/P [INWC]	2.6	2.8	2.4
SAH Air Inlet [deg F]	60.1	54.0	66.2
SAH Air Outlet [deg F]	666.1	671.2	661.1
SAH Gas Inlet [deg F]	747.7	753.0	742.3
SAH Gas Outlet [deg F]	283.6	280.6	286.7
SAH Air D/P [INWC]*	3.4	3.4	3.4
SAH Gas D/P [INWC]	7.8	7.5	8.0

* No pressure drop data available for PAH and SAH. These values were calculated taking the downstream duct pressure reading and subtracting a 1 time (typical) reading on PA or FD fan discharge pressure value as shown below.

UNIT 1	DSCHRG [INWC]
FD FAN 1A	6.8
FD FAN 1B	6.5
PA FAN 2A	46.0
PA FAN 2B	46.0

1SGBPT0219 8.2 218

IRWD
• Door
• Clearance

Randy will by check chimney

UNIT 2	DSCHRG [INWC]
FD FAN 1A	7.6
FD FAN 1B	7.9
PA FAN 2A	47.0
PA FAN 2B	47.0

Taken from Control Room display 10 JUN 2002 @ 13:15

Flipped Basket 98

What is included in general theater Rehabilitation

IP7_034146

FYI

UNIT 1	
PAH Air Inlet [deg F]	83.9
PAH Air Outlet [deg F]	526.7
PAH Gas Inlet [deg F]	751.5
PAH Gas Outlet [deg F]	301.1
PAH Air D/P [INWC]	2.7
PAH Gas D/P [INWC]	3.0
SAH Air Inlet [deg F]	61.8
SAH Air Outlet [deg F]	677.0
SAH Gas Inlet [deg F]	736.0
SAH Gas Outlet [deg F]	294.1
SAH Air D/P [INWC]	3.1
SAH Gas D/P [INWC]	6.4

UNIT 2	AVG	PRE (outage)	POST (outage)
PAH Air Inlet [deg F]	83.1	75.2	91.1
PAH Air Outlet [deg F]	544.5	547.2	541.8
PAH Gas Inlet [deg F]	753.5	757.4	749.6
PAH Gas Outlet [deg F]	307.7	308.6	306.7
PAH Air D/P [INWC]	2.9	3.0	2.8
PAH Gas D/P [INWC]	2.6	2.8	2.4
SAH Air Inlet [deg F]	60.1	54.0	66.2
SAH Air Outlet [deg F]	666.1	671.2	661.1
SAH Gas Inlet [deg F]	747.7	753.0	742.3
SAH Gas Outlet [deg F]	283.6	280.6	286.7
SAH Air D/P [INWC]	3.4	3.4	3.4
SAH Gas D/P [INWC]	7.8	7.5	8.0

Unit 1

	Sec AH 1A		Sec AH 1B		Pri AH 2A		Pri AH 2B	
	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#
Air Ent. #/Hr	FT-97	1SGBFT0097	FT-98	1SGBFT0098	FT-49	1SGBFT0049	FT-74	1SGBFT0074
Air Lvg. #/Hr	FT-94	1SGBFT0094	FT-95	1SGBFT0095	FT-75-78	1SGBFT0075-78	FT-79,90-92	1SGBFT0079,90-92
Gas Ent. #/Hr								
Gas Lvg. #/Hr								
Air Ent. Deg F	TE-938	1SGBTE0938	TE-940	1SGBTE0940	TE-911	1SGBTE0911	TE-912	1SGBTE0912
Air Lvg. Deg F	TE-919	1SGBTE0919	TE-920	1SGBTE0920	TE-917	1SGBTE0917	TE-918	1SGBTE0918
Gas Ent. Deg F	TE-1650	1SGBTE1650	TE-1650	1SGBTE1650	TE-707	1SGBTE0707	TE-707	1SGBTE0707
Gas Lvg. Deg F	TE-927	1SGBTE0927	TE-929	1SGBTE0929	TE-913	1SGBTE0913	TE-915	1SGBTE0915
ACET Deg F		1SGBKV0008		1SGBKV0009		1SGBKV0006		1SGBKV0007
Fan Dschrg P Air "WG	PT-218	1SGBPT0218	PT-219	1SGBPT0219	PT-210	1SGBPT0210	PT-211	1SGBPT0211
Air Duct Outlet P "WG	PT-256	1SGBPT0256	PT-257	1SGBPT0257	PT-213	1SGBPT0213	PT-212	1SGBPT0212
Delta P Gas "WG	PT-216	1SGBPT0216	PT-217	1SGBPT0217	PT-214	1SGBPT0214	PT-215	1SGBPT0215
Hot End Diff. "WG								
Cold End Diff. "WG								

1INAKV0001

Unit 2

	Sec AH 1A		Sec AH 1B		Pri AH 2A		Pri AH 2B	
	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#
Air Ent. #/Hr	FT-97	2SGBFT0097	FT-98	2SGBFT0098	FT-49	2SGBFT0049	FT-74	2SGBFT0074
Air Lvg. #/Hr	FT-94	2SGBFT0094	FT-95	2SGBFT0095	FT-75-78	2SGBFT0075-78	FT-79,90-92	2SGBFT0079,90-92
Gas Ent. #/Hr								
Gas Lvg. #/Hr								
Air Ent. Deg F	TE-938	2SGBTE0938	TE-940	2SGBTE0940	TE-911	2SGBTE0911	TE-912	2SGBTE0912
Air Lvg. Deg F	TE-919	2SGBTE0919	TE-920	2SGBTE0920	TE-917	2SGBTE0917	TE-918	2SGBTE0918
Gas Ent. Deg F	TE-1650	2SGBTE1650	TE-1650	2SGBTE1650	TE-707	2SGBTE0707	TE-707	2SGBTE0707
Gas Lvg. Deg F	TE-927	2SGBTE0927	TE-929	2SGBTE0929	TE-913	2SGBTE0913	TE-915	2SGBTE0915
ACET Deg F		2SGBKV0008		2SGBKV0009		2SGBKV0006		2SGBKV0007
Fan Dschrg P Air "WG	PT-220	2SGBPT0220	PT-221	2SGBPT0221	PT-210	2SGBPT0210	PT-211	2SGBPT0211
Air Duct Outlet P "WG	PT-256	2SGBPT0256	PT-257	2SGBPT0257	PT-213	2SGBPT0213	PT-212	2SGBPT0212
Delta P Gas "WG	PT-216	2SGBPT0216	PT-217	2SGBPT0217	PT-214	2SGBPT0214	PT-215	2SGBPT0215
Hot End Diff. "WG								
Cold End Diff. "WG								

Unit 1

	Sec AH 1A		Sec AH 1B		Pri AH 2A		Pri AH 2B	
	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#
Air Ent. #/Hr	FT-97	1SGBFT0097	FT-98	1SGBFT0098	FT-49	1SGBFT0049	FT-74	1SGBFT0074
Air Lvg. #/Hr	FT-94	1SGBFT0094	FT-95	1SGBFT0095	FT-75-78	1SGBFT0075-78	FT-79,90-92	1SGBFT0079,90-92
Gas Ent. #/Hr								
Gas Lvg. #/Hr								
Air Ent. Deg F	TE-938	1SGBTE0938	TE-940	1SGBTE0940	TE-911	1SGBTE0911	TE-912	1SGBTE0912
Air Lvg. Deg F	TE-919	1SGBTE0919	TE-920	1SGBTE0920	TE-917	1SGBTE0917	TE-918	1SGBTE0918
Gas Ent. Deg F	TE-1650	1SGBTE1650	TE-1650	1SGBTE1650	TE-707	1SGBTE0707	TE-707	1SGBTE0707
Gas Lvg. Deg F	TE-927	1SGBTE0927	TE-929	1SGBTE0929	TE-913	1SGBTE0913	TE-915	1SGBTE~~0915~~ 916
ACET Deg F		1SGBKV0008		1SGBKV0009		1SGBKV0006		1SGBKV0007
Fan Dschrg P Air "WG	PT-220	1SGBPT0220	PT-221	1SGBPT0221	PT-210	1SGBPT0210	PT-211	1SGBPT0211
Air Duct Outlet P "WG	PT-256	1SGBPT0256	PT-257	1SGBPT0257	PT-213	1SGBPT0213	PT-212	1SGBPT0212
Delta P Gas "WG	PT-216	1SGBPT0216	PT-217	1SGBPT0217	PT-214	1SGBPT0214	PT-215	1SGBPT0215
Hot End Diff. "WG								
Cold End Diff. "WG								

Unit 2

	Sec AH 1A		Sec AH 1B		Pri AH 2A		Pri AH 2B	
	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#	Instrument #	PI#
Air Ent. #/Hr	FT-97	2SGBFT0097	FT-98	2SGBFT0098	FT-49	2SGBFT0049	FT-74	2SGBFT0074
Air Lvg. #/Hr	FT-94	2SGBFT0094	FT-95	2SGBFT0095	FT-75-78	2SGBFT0075-78	FT-79,90-92	2SGBFT0079,90-92
Gas Ent. #/Hr								
Gas Lvg. #/Hr								
Air Ent. Deg F	TE-938	2SGBTE0938	TE-940	2SGBTE0940	TE-911	2SGBTE0911	TE-912	2SGBTE0912
Air Lvg. Deg F	TE-919	2SGBTE0919	TE-920	2SGBTE0920	TE-917	2SGBTE0917	TE-918	2SGBTE0918
Gas Ent. Deg F	TE-1650	2SGBTE1650	TE-1650	2SGBTE1650	TE-707	2SGBTE0707	TE-707	2SGBTE0707
Gas Lvg. Deg F	TE-927	2SGBTE0927	TE-929	2SGBTE0929	TE-913	2SGBTE0913	TE-915	2SGBTE0915
ACET Deg F		2SGBKV0008		2SGBKV0009		2SGBKV0006		2SGBKV0007
Fan Dschrg P Air "WG	PT-220	2SGBPT0220	PT-221	2SGBPT0221	PT-210	2SGBPT0210	PT-211	2SGBPT0211
Air Duct Outlet P "WG	PT-256	2SGBPT0256	PT-257	2SGBPT0257	PT-213	2SGBPT0213	PT-212	2SGBPT0212
Delta P Gas "WG	PT-216	2SGBPT0216	PT-217	2SGBPT0217	PT-214	2SGBPT0214	PT-215	2SGBPT0215
Hot End Diff. "WG								
Cold End Diff. "WG								

Sec	1A	1B
FD ΔP	PT-218	PT-219
FAN Room P	1INAKV0001	
	1TEAK280104	
	1INAPPT0227	

PR1	2A	2B
PA Duct PRS	1COAXI072A	
	1COAXI074M	
	R	

$$\cancel{\frac{V_1^2}{2g}} + \frac{P_1}{\rho g} = \frac{V_2^2}{2g} + \frac{P_2}{\rho g}$$

IP7_034150

	Unit 1				Unit 2			
	Sec AH 1A	Sec AH 1B	Pri AH 2A	Pri AH 2B	Sec AH 1A	Sec AH 1B	Pri AH 2A	Pri AH 2B
Air Ent. #/Hr	1SGBFT0097	1SGBFT0098	1SGBFT0049	1SGBFT0074				
Air Lvg. #/Hr	1SGBFT0094	1SGBFT0095						
Gas Ent. #/Hr								
Gas Lvg. #/Hr								
Air Ent. Deg F	1SGBTE0938		1SGBTE0911	1SGBTE0912				
Air Lvg. Deg F	1SGBTE0919		1SGBTE0917					
Gas Ent. Deg F	1SGATE1650		1SGATE0707					
Gas Lvg. Deg F	1SGBTE0927		1SGBTE0913					
~~Gas Lvg. Deg F (unc)~~								
~~Gas Lvg. Deg F (cor)~~								
ACET Deg F	1SGBKV0008		1SGBKV0006					
FAN ~~Delta~~ P Air "WG	1SGBPT0220	1SGBPT0221	1SGBPT0210	1SGBPT0211				
Delta P Gas "WG	1SGBPT0216	1SGBPT0217	1SGBPT0214	1SGBPT0215				
Hot End Diff. "WG								
Cold End Diff. "WG								

1A

1SGBKV0002

1SGBPT0216

SEC AIR DUCT OUTLET

EAST SIDE AIR HEATERS

1A 1S 1COAXI074R (KCFM) (INLET OR OUTLET AIR OR GAS)

1S 1SGBPT0214 (DIP) (AIR OR GAS)

PRI AIR DUCT OUTLET
1SGBPT0212
1SGBPT0213

AIR TEMP:

DENSITY:

IP7_034151

$$\frac{ft^3}{min} \quad \frac{lb}{ft^3}$$

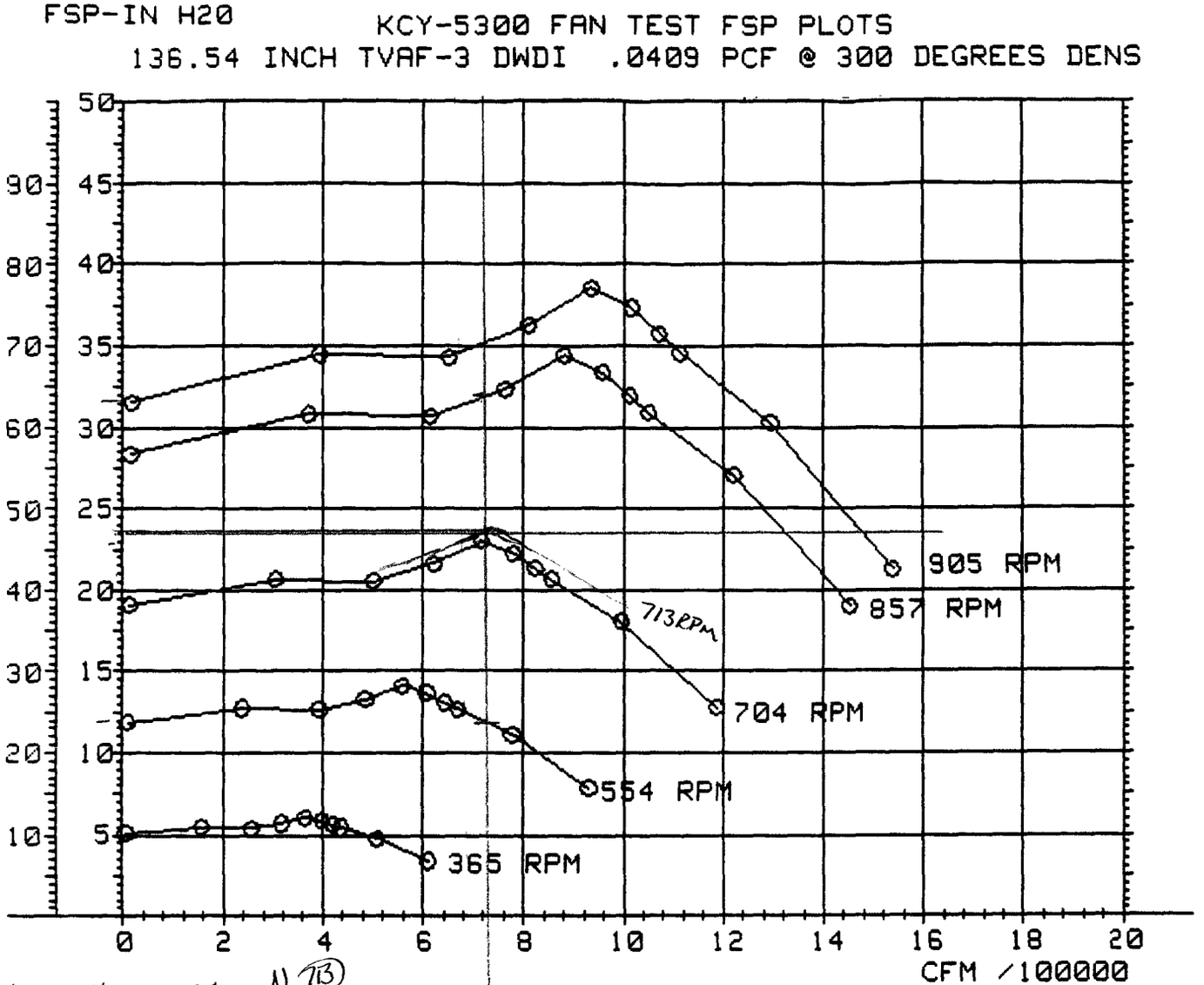
Current operating point for U1 ID FAN 1A

5/20/02 15:30 @ unit load 875 MW

$\Delta P = 23.5$ INWC

$I = 289$ A

$N = 748$ RPM



$$\frac{857-704}{31.5-23} = \frac{857-N_1}{31.5-23.5} \quad (713)$$

With new Air Heat - decrease in ΔP of 5 inWC

$23.5 \rightarrow 18.5$

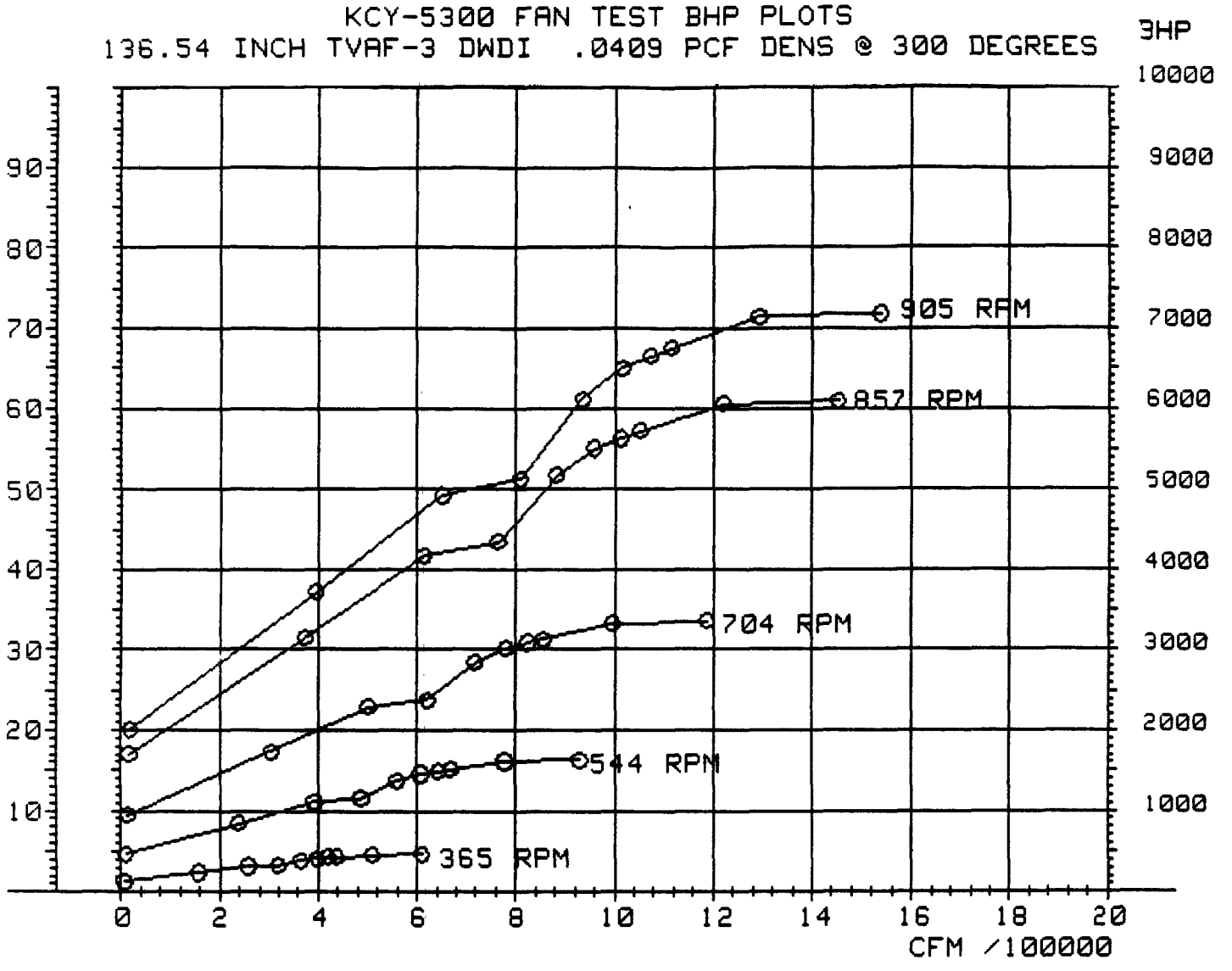
$$\frac{713-704}{23.5-23} = \frac{713-N_2}{23.5-18.5} \quad (623) \Rightarrow N_2 = 623$$

7.9

$$\frac{P_1}{P_2} = \left(\frac{713}{623}\right)^3 = 1.5$$

33% Savings

IP7_034153


KCY-5300 FAN TEST BHP PLOTS
136.54 INCH TVAF-3 DWDI .0409 PCF DENS @ 300 DEGREES
BHP
905 RPM
857 RPM
704 RPM
544 RPM
365 RPM
CFM /100000

IP7_034154

Printed out for: DAVID-K - 20-May-02 08:45:39

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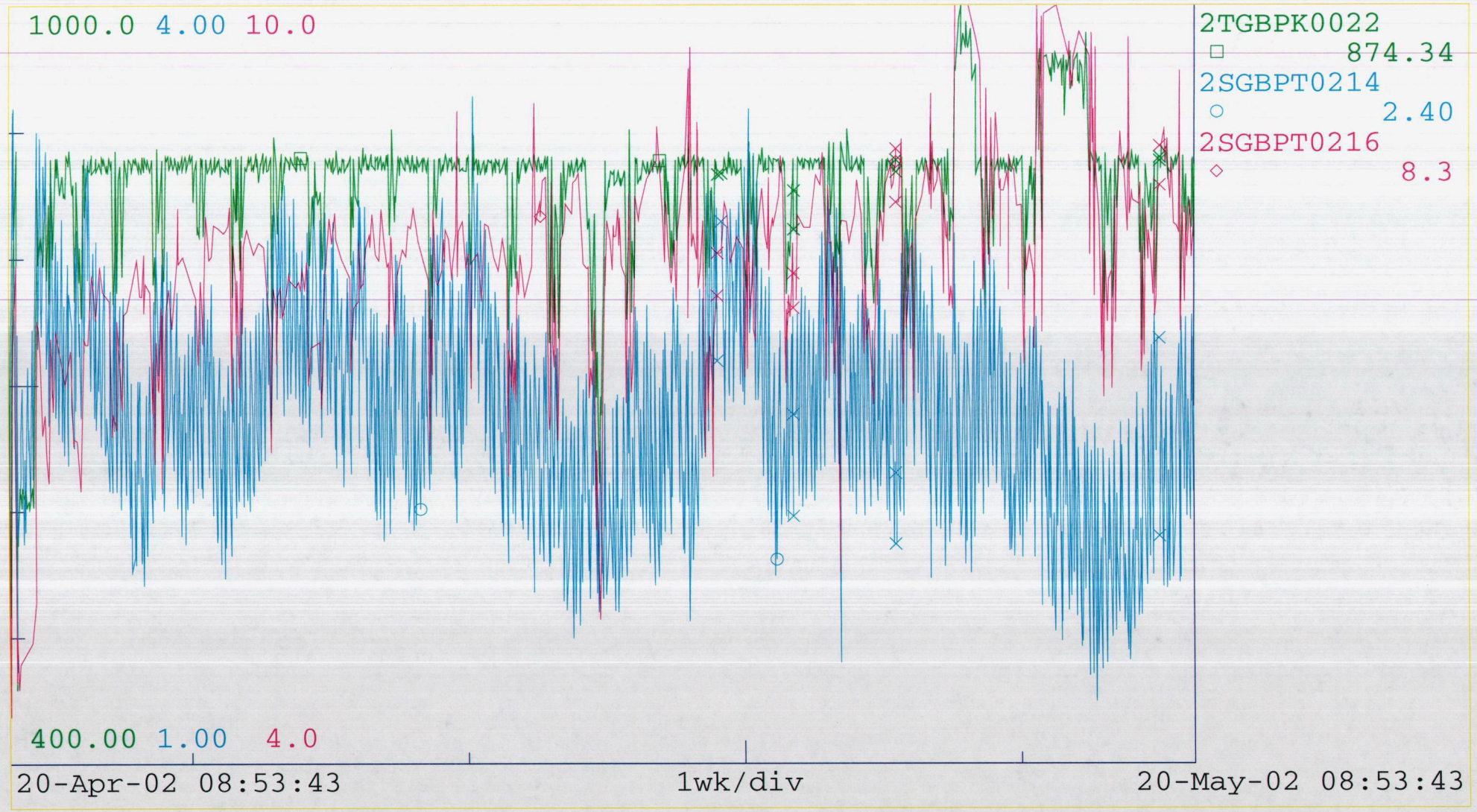

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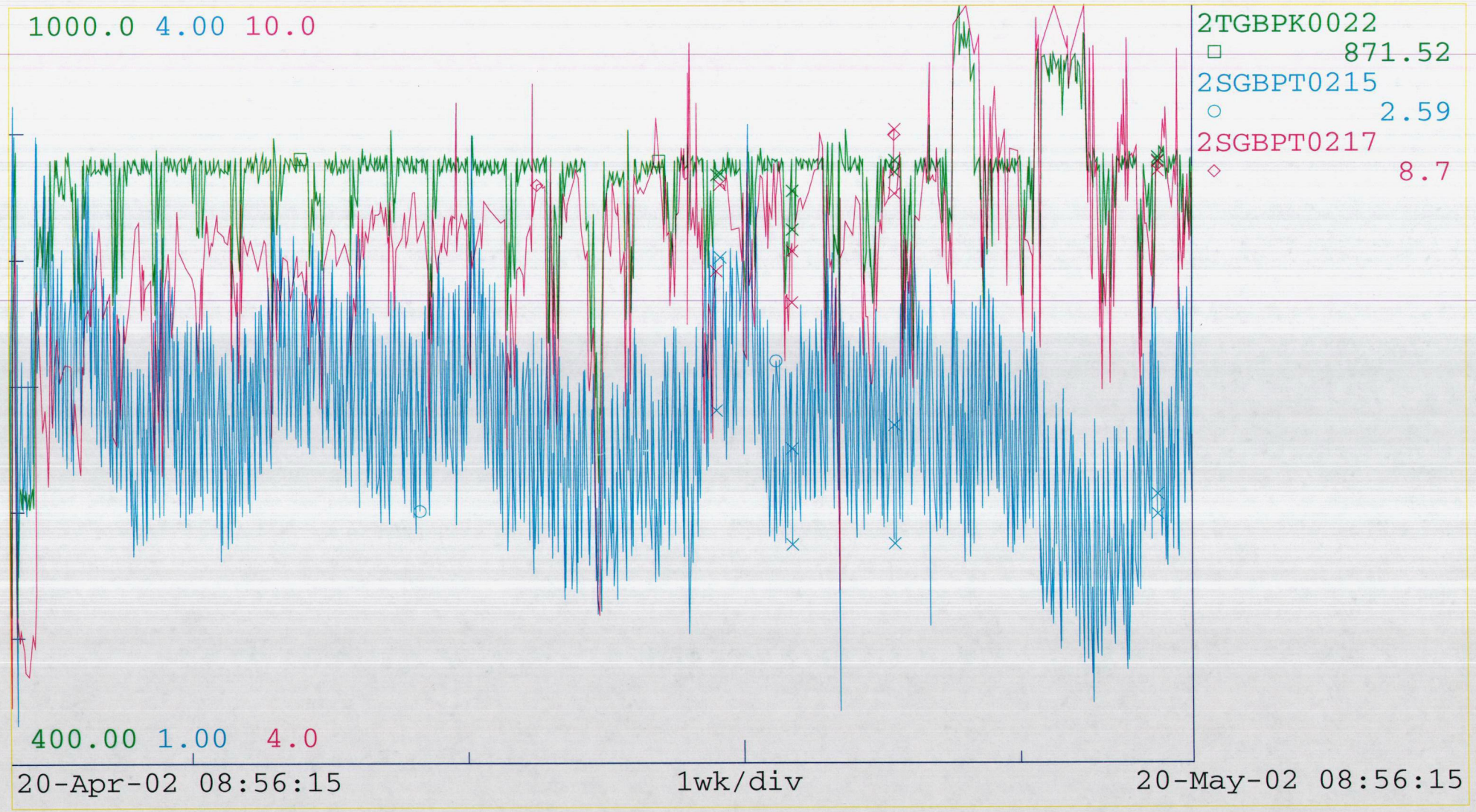
IP7_034155

Printed out for: DAVID-K - 20-May-02 08:48:37

0 Messages 2SGBG08 WEST SIDE AIR HEATERS 20-May-02 08:48:37



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IP7_034156

Printed out for: DAVID-K - 20-May-02 08:41:17

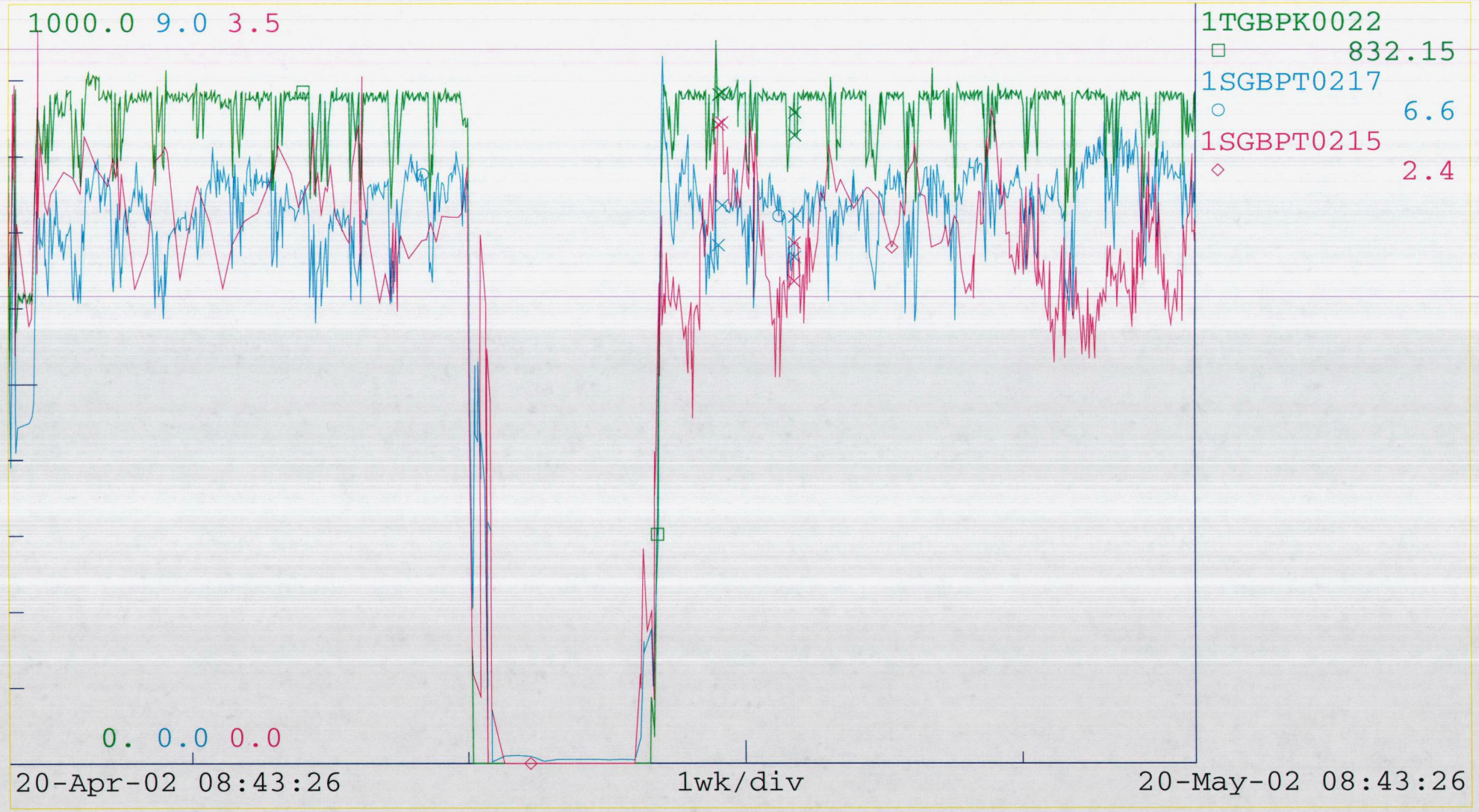
0 Messages 1SGBG07 EAST SIDE AIR HEATERS 20-May-02 08:41:17

EndTim= 20-May-02 08:41:17 /EvalTim= 20-May-02 08:41:17 /PanRate= 0

IP7_034157

Printed out for: DAVID-K - 20-May-02 08:35:13

0 Messages 1SGBG08 WEST SIDE AIR HEATERS 20-May-02 08:35:13



EndTim= 20-May-02 08:35:13 /EvalTim= 20-May-02 08:35:13 /PanRate= 0

IP7_034158

Project Title: WO # Date:

Project Cost ($)	3500000	Total cost of project including material and labor in current dollars
Salvage Value of Old Equipment ($)	0	Salvage value of existing equipment that will be removed.
Total Coal Savings (Ton/yr)	0	List the tons of coal that will be saved annually as a result of the project.
Total Fuel Oil Savings (Gal./yr)	0	List the gallons of fuel oil that will be saved annually as a result of the project.
Power Savings (MWhr)	0	List the annual auxillary power savings that will result from the project.
Other Savings ($)	1749564	List the annual savings that will result such as maintenance savings.
Annual Costs With the new Equipment ($)	10000	List the annual costs associated with the new equipment such as maintenance costs.
Future Salvage Value New Equipment($)	0	List the expected salvage value of the new equipment at the end of the project life.
Project Life (Years)	15	

Total Coal Cost ($/Ton)	25.13
Total Fuel Oil Cost ($/Gal)	0.74
Replacement Power Cost ($/MWhr)	25
Cost of Money (%)	6.04
O&M Escalation (%)	3

Present Value of Project	$13,351,010
Benefit/Cost Ratio	4.81
Payback Period	2.0
Rate of Return	**53%**

Notes and Assumptions:

Prepared by: Bret Kent

IP7_034159