Burners (next week)

9/3/4/5 Base

9/3/4/7 Baseline

9/3/4/9

all 8 — put together graphs
Fill in holes - additional tests
Determine sweet spot
set up

Mon/Tues

Outer Air Balance w/ pred. adjustments

Check IBAMS

target
O_2 3.0
CO <100
NOx <.3

Troubleshoot

Wed/Thur/Fri Check profiles all 8 temp/O_2/CO
BIDS 950MW
all 8 combos of 7 °/s - CO

Chase high CO pockets if > 200ppm
(how - open spin)

Determine
Final Settings

ABT- predicted outer air register settings

4/20/04

NOTE: U2 Spring Outage, 3/2004 ABT burners replaced and BPI overfire air added plus installed windbox baffles

Outer Reg Spin / Inner (notches)
OR/3¾"/4

UNIT 2

Front			Outer Air Register	**initial settings**
	Pulv	1	11.0	8.2
		2	11.0	7.9
	E	3	11.0	7.7
		4	11.0	7.7
		5	11.0	7.9
		6	11.0	8.2
	Pulv	1	11.0	8.4
		2	11.0	8.1
	A	3	11.0	7.9
		4	11.0	7.9
		5	11.0	8.1
		6	11.0	8.4
	Pulv	1	11.0	8.6
		2	11.0	8.3
	F	3	11.0	8.1
		4	11.0	8.1
		5	11.0	8.3
		6	11.0	8.6
	Pulv	1	11.0	9.4
		2	11.0	9.0
	B	3	11.0	8.8
		4	11.0	8.8
		5	11.0	9.0
		6	11.0	9.4
			ave	8.4

Rear			Outer Air Register	**initial settings**	
	Pulv	1	11.0	9.7	
		2	11.0	9.3	
	D	3	11.0	9.1	
		4	11.0	9.1	
		5	11.0	9.3	
		6	11.0	9.7	
	Pulv	1	11.0	9.9	
		2	11.0	9.5	
	H	3	11.0	9.3	
		4	11.0	9.3	
		5	11.0	9.5	
		6	11.0	9.9	
	Pulv	1	11.0	10.1	
		2	11.0	9.7	
	C	3	11.0	9.5	
		4	11.0	9.5	
		5	11.0	9.7	
		6	11.0	10.1	
	Pulv	1	11.0	11.0	
		2	11.0	10.6	
	G	3	11.0	10.3	
		4	11.0	10.3	
		5	11.0	10.6	
		6	11.0	11.0	
			ave	9.8	**9.1**

BIAS:

Front to Rear BIAS	Rear	1.00	Front	0.85				
Top to Bottom BIAS	1st- B/ G	1.00	2nd- F/ C	0.92	3rd- A/ H	0.90	4th- E/ D	0.88
Side to Side BIAS (**w/ baffles**)	Out- 1/ 6	1.00	Mid- 2/ 5	0.96	Inner- 3/ 4	0.94		

IP7_035356

Test NOTES!

APRIL 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
3/28 U2 Startup	3/29 U2 500 MWg Turndowns	3/30	3/31	1	2	3 U2 off-line
4 U2 S/U Transformer - 2 Lowside Bushings Replaced Vibr Balancing - E coupling + A coupling	5 PGT test analyzers here / PGT rep	6	7	8 U2 Startup	9 x	10 x
11 x Easter Weekend	12 x U2 Dirty Air Flow TESTING (all 8 pulv) PA Flow (CAMS) Calibration Testing (all 8 pulv)	13	14	15	16	17
18	19 Test Grid Setup	20	21 Rob-left early Pulv C O/S Sadur/brokenthroat	22 Callout Workdomgwdestest	23 Worked Pulv B O/S PA flow damper	24
25	26 Outer Air Hood - Balance	27	28 Profiles - all 8 O/S Bias - 950 MWg	29	30	1

MAY 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	**3**	**4**	**5**	**6**	**7**	**8**
9	**10**	**11**	**12**	**13**	**14**	**15**
16	**17**	**18**	**19**	**20**	**21**	**22**
23	**24**	**25**	**26**	**27**	**28** x	**29** x Memorial Day Weekend
30 x Memorial Day Weekend	**31** x **Memorial Day**	**1** x	**2**	**3**	**4**	**5**

JUNE 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	**31**	**1**	**2**	**3**	**4**	**5**
6	**7** Annual Coal	**8** Pile Inventory	**9** Survey	**10** (5 days)	**11**	**12**
13	**14**	**15**	**16**	**17**	**18**	**19**
20	**21**	**22**	**23**	**24**	**25**	**26**
27	**28**	**29**	**30**	**1**	**2**	**3**

JULY 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4 **July 4 Holiday**	**5**	**6**	**7**	**8**	**9**	**10**
11	**12**	**13**	**14**	**15**	**16**	**17**
18	**19**	**20**	**21**	**22**	**23**	**24** **July 24- Holiday**
25	**26**	**27**	**28**	**29**	**30**	**31**

APRIL 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
3/28 **~~U1~~ U2 STARTUP**)	**3/29** ~~U1~~ U2 500 MW Turndowns Night shift	**3/30** U2 950 MW Turbine Enthalpy Drop w/ Alstom ~~U1~~ U2 500 MW Turndowns Night shift	**3/31** ID FAN TESTING (all week long)	**1**	**2**	**3** **~~U1~~ U2 Off-Line** -Overspeeds - Remove fine mesh screens -Turb Balance
4	**5** XXXXX U2 BOILER	**6** OFF-LINE TEST GRID	**7** TRANSFMR SETUP &	**8** BUSHINGS CHECKOUT	**9**	**10**
11 **Easter Weekend**	**12** U2 DIRTY PA FLOW	**13** AIR FLOW CALIBRATIO	**14** TESTING NS ON CAMS	**15** (8 PULVS) SYSTEM	**16**	**17** Boiler Safety Valve- Hydro Sets (3 days)
18	**19** U2 BURNER	**20** DIAGNOSTIC	**21** TESTING &	**22** TUNING	**23** (W/O OFA)	**24**
25	**26** U2 BURNER	**27** TUNING	**28** (2ND WEEK)	**29**	**30**	**1**

MAY 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	**3** U2 BURNER	**4** ACCEPTANCE	**5** TESTING	**6**	**7**	**8**
9	**10** U2 SCNDRY	**11** AIR HEATER	**12** TESTING	**13**	**14**	**15**
16	**17** U2 BURNER	**18** & OFA	**19** SETUP &	**20** TUNING	**21**	**22**
23	**24** U2 STATE	**25** ENVNMNTL	**26** TESTING	**27**	**28**	**29**

JUNE 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30 Memorial Day Weekend	**31** **Memorial Day**	**1**	**2**	**3**	**4**	**5**
6	**7** Annual Coal	**8** Pile Inventory	**9** Survey	**10** (5 days)	**11**	**12**
13	**14**	**15**	**16**	**17**	**18**	**19**
20	**21**	**22**	**23**	**24**	**25**	**26**

BOILER, BURNER, OVERFIRE AIR & SAH- SETUP< TUNING & TESTING Rev1 03/24/04

Testing is required following the Unit 2 Major Outage where the following modifications were made:

installation of new ABT low NOX Burners
new ABB flame scanners,
installation of new BPI Overfire Air system,
Boiler Superheat Platen extension,
Secondary Air Heater element changeout,
pulverizer primary air flow replacement (CAMS)
Overfire Air Flow measurement (CAMS)
individual Burner Air Flow Monitoring System (IBAM)
PI information computer and historian upgrade to version PI3
Information Computer upgrade (ABB) (initial phase of DCS controls upgrade)

NOTES: - Following the U2 Outage, Unit 2 has 950 MW gross capability (approved new unit rating).
- U2 Overfire Air System can't be operated or fully tested until the UDAQ Operating Permit is received.
- Need availability of all 8 pulverizers for 8 weeks to complete all burner, OFA and UDAQ environmental required testing.

DETAILED SCHEDULE- U2 UNIT STARTUP, Sat 3/27/04

Initial Burner Adjustments and Flame Scanner Tuning (1st lighter and coal fires) (NO BIDS- on startup)
1st Oil Fires- NEW SCANNER tuning and adjustments. Need to cycle thru all 8 rows of lighters for tuning
notify- Jerry Finlinson, ABB rep, I&C Techs

1st Coal Fires (start- 1st row B or G)- requires BURNER ADJUSTMENTS for flame shape & stability
Need to cycle thru all 8 pulverizers for initial burner adjustments and scanner tuning
notify- Aaron Nissen, Garry Christensen, ABT rep- Terkle Larson & Jerry Finlinson, ABB rep, I&C Techs

Burner Turndowns (BIDS- 500 MW)- Burner Adjustments and Flame Scanner Tuning (BIDS- test on 2 night shifts, 3/29& 30/04) Needed to verify flame position and scanner sighting due to new burners and scanners, plus modifications using internal baffles to windbox, changes in secondary air damper positions and windbox duct pressure required for the overfire air system setup

Testing needs to be with 4 pulverizers in-service staggered front and rear wall (to enable visual sighting of all flames). Each pulverizer needs to be ramped from minimum to maximum feeder speed (with NO Overfire Air).
Testing by Aaron Nissen, Garry Christensen, ABT Rep, Jerry Finlinson, ABB Rep, and I&C

Setup Economizer Backpass Test Gas Analyzers and Test Grid (NO BIDS)
Setup test grids at the boiler economizer outlet (east and west), primary air heater outlet (east and west), secondary air heater outlet (east and west) with gas sample points and thermocouples, plus stack mid-point elevation sample point station. Setup includes: gas sample lines, vacuum pumps, chillers, bubblers, knockout bottles, desiccant filters, dust filters, metering stations, calibration stations (with zero and full span calibration bottles), 14 test gas analyzers (O2, CO2,& CO), data acquisition system and archiving software (at economizer, PAH outlet, SAH outlet and stack mid-point.

Coal Line Burner Balancing- Dirty Air Flow Tests (all 8 pulverizers) (NO BIDS- during normal operation) Each pulverizer tested individually (but need availability of all 8 pulverizers), tests conducted at 80% feeder speed

Tests conducted by Garry Christensen and Rob Jeffery

Pulverizer Primary Air Flow (CAMS) Calibration Testing (NO BIDS- during normal operation)
Required due to replacement of the pulverizer primary air flow elements. Testing consists of feichheimer probe flow traverses to characterize new pitot tubes.

Prim Air Flow (CAMS) -Testing has to be done with each pulverizer on-line and able to ramp from 50% feeder speed to 75% and 90% (backoff pulv if it starts loading up).

Testing coordinated by Jerry Finlinson, testing conducted by Air Monitoring Systems

Burner Air Flow Measurement System (IBAM) Checkout (NO BIDS- during normal operation)
Checkout air flow measurement system, air line plumbing, flow transmitters, and calculation package.

Checkout coordinated by Jerry Finlinson

Boiler Backpass Grid- Fine tune Burner Adjustments (targets CO < 100 ppm) (Initial baseline and checkout- NO BIDS, final tuning will require BIDS- wait to submit)
Start out with all 8 pulverizers in- service and trouble shoot & fine tune burners based on the Economizer Outlet Test Grid and then systematically rotate each pulverizer out of service and continue balancing

Testing by Aaron Nissen, Garry Christensen , Dave Spence & Rob Jeffery, with test equipment from Power Generations Technologies (PGT)

Burner & Secondary Air Heater (& Prim Air Heater) Acceptance Testing (BIDS- wait to submit), also see test plan. Full Load Tests at various pulv configurations and O2 levels. Test results based on the Flue Gas Test Grids

Testing by Aaron Nissen, Garry Christensen, Dave Spence & Rob Jeffery, with test equipment from PGT)

Overfire Air Flow System Checkout and Turnover NO BIDS
System walkdown, final (hot) damper stroking, and controls checkout.
NOTE: Need Operating Permit to place Overfire Air System In-Service and fine tune burners.

Checkout by Phil Hailes

Overfire Air Flow (CAMS) Calibration Testing (NO BIDS- during normal operation)
NOTE: Need Operating Permit to place Overfire Air System In-Service and fine tune burners.
Required due to new system installation. Testing consists of feichheimer probe flow traverses to characterize new pitot tubes.

Overfire Air Dampers and CAMS- Testing of dampers (inlet dampers, 1/3 and 2/3 dampers) will be done with north and then south side dampers. Flow traverse calibration points will be at 1/3 dampers open, 2/3 dampers open and both 1/3 & 2/3 dampers open (inlet dampers full open).

Testing coordinated by Jerry Finlinson, testing conducted by Air Monitoring Systems

Boiler Backpass Grid- Fine tune OFA and Burner Adjustments (targets CO < 180 ppm) (Initial baseline and checkout- NO BIDS, final tuning will require BIDS- wait to submit)
NOTE: Need Operating Permit to place Overfire Air System In-Service and fine tune burners.
Start out with all 8 pulverizers in- service and fine tune burners based on the Economizer Outlet Test Grid and then systematically rotate each pulverizer out of service and continue balancing

Testing by Aaron Nissen, Garry Christensen, Dave Spence & Rob Jeffery, with test equipment from PGT

UDAQ Envir Required Demonstration Testing (BIDS- wait to submit), also see test plan
Complete State (UDAQ) required Burner and Overfire Air Tests to demonstrate NOX reduction but no allowable increase in CO emissions (base of 180 ppm). Operating parameters- vary OFA flow (o/s, 1/3, 2/3 & both dampers full open) and vary O2 levels (same as testing last year on Unit 1). Also will satisfy Overfire Air acceptance testing.
NOTE: Need Operating Permit to place Overfire Air System In-Service and fine tune burners.

Testing by Aaron Nissen, Garry Christensen, Dave Spence & Rob Jeffery, with test equipment from PGT

APRIL 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
3/28 **U1 STARTUP**)	**3/29** U1 500 MW Turndowns Night shift	**3/30** U2 950 MW Turbine Enthalpy Drop w/ Alstom U1 500 MW Turndowns Night shift	**3/31** ID FAN TESTING (all week long)	**1**	**2**	**3** **U1 Off-Line** -Overspeeds - Remove fine mesh screens -Turb Balance
4	**5** XXXXX U2 BOILER	**6** OFF-LINE TEST GRID	**7** TRANSFMR SETUP &	**8** BUSHINGS CHECKOUT	**9**	**10**
11 **Easter Weekend**	**12** U2 DIRTY PA FLOW	**13** AIR FLOW CALIBRATIO	**14** TESTING NS ON CAMS	**15** (8 PULVS) SYSTEM	**16**	**17** Boiler Safety Valve- Hydro Sets (3 days)
18	**19** U2 BURNER	**20** DIAGNOSTIC	**21** TESTING &	**22** TUNING	**23** (W/O OFA)	**24**
25	**26** U2 BURNER	**27** TUNING	**28** (2ND WEEK)	**29**	**30**	**1**

MAY 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	3 U2 BURNER	4 ACCEPTANCE	5 TESTING	6	7	8
9	10 U2 SCNDRY	11 AIR HEATER	12 TESTING	13	14	15
16	17 U2 BURNER	18 & OFA	19 SETUP &	20 TUNING	21	22
23	24 U2 STATE	25 ENVNMNTL	26 TESTING	27	28	29

JUNE 2004

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30 Memorial Day Weekend	31 **Memorial Day**	1	2	3	4	5
6	7 Annual Coal	8 Pile Inventory	9 Survey	10 (5 days)	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26

Mon 4/26/04 Burner Balancing

(continuation) All 8 pulv I/s placed E pulv
Boyd-C / Lynn Thomas / Dennis Howe

9/3 3/4 / 5 Baseline cross check w/ Fri 4-23
7 showing / 8 pm

(Aeron calculation on BIDS / PdM / other)

9/3 3/4 / 7
5 / 6th

Pulled away - Brd package
PdM tracting

Rob CO/CO_2 - CO East (11th) excessive drift / recalibration
(every hour)
Rob to call + get replacement (PGT / ESC Kieth Gronewold

9/3 3/4 / 9
3 / 4

9/3 3/4 / 4 → 1½" open
done @ 1415
8 showing / 9 Data Collection 1430-1530

Move Outer registers balance

tNOK - Keep airflow steady
w/ coal quality changes
so doesn't impact CO / NOx

PROBLEM BIDS for rest of week
ECC Emergency / Heat Wave
Don't touch anything (need to rotate pulv o/s)

Printed out for: UNIT2OP - 26-Apr-04 14:37:25

0 Messages O2 Data O2 Unit Comparisons 26-Apr-04 14:37:25

Data		Unit 1	Unit 2
Meas'd Load	MW	950.25	899.75
East Probe 1	% O2	2.25	2.12
Probe 2	% O2	4.23	2.87
Probe 3	% O2	3.86	3.80
Probe 4	% O2	3.25	4.04
Average	% O2	3.38	3.00
West Probe 5	% O2	2.09	3.80
Probe 6	% O2	2.80	2.94
Probe 7	% O2	2.56	2.91
Probe 8	% O2	1.94	3.56
Average	% O2	2.40	3.22
Econ O2 Out Average	% O2	2.87	3.11
Econ O2 Out Setpoint	% O2	3.09	3.17
O2 Trim Setpoint		31.1	54.6
Total Air %		78.5	77.3
Coal Flow	TPH	374.6	353.4
# of Pulv In-service		7.	8.
Main Steam Pressure		2394.6	2220.0
Stack NOx	PPM	205.	204.
Scrubber NOx	PPM	233.	218.
Stack Converted NOx	LB/MBTU	0.339	0.354
Target NOx	LB/MBTU	0.364	0.396
Scrubber Inlet SO2	PPM	409.4	368.1
PSH/RH Bias Dmpr Pos		105./ 30.	94./ 75.
MS/RH Temps		1002.2/1005.9	1005.0/1013.4

	U1	U2
OFA		
%	12.4	4.7
Inlets		
SW	99.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	1.
NE	7.	0.
2/3		
SW	76.	0.
SE	76.	0.
NW	76.	1.
NE	75.	0.
Flow		
SW	239.	65.
SE	249.	63.
NW	212.	107.
NE	200.	82.
	914.	317.

SA Damper		Unit 1		Unit 2
Pulv	A	73.	A	57.
Pulv	B	73.	B	57.
Pulv	C	77.	C	61.
Pulv	D	82.	D	61.
Pulv	E	81.	E	61.
Pulv	F	77.	F	61.
Pulv	G	10.	G	57.
Pulv	H	74.	H	56.

Coal Bias		U1	U2
A	Pulv	0.0	0.0
B	Pulv	0.0	0.0
C	Pulv	0.0	0.0
D	Pulv	0.0	0.0
E	Pulv	0.0	0.0
F	Pulv	0.0	0.0
G	Pulv	0.0	0.0
H	Pulv	0.0	0.0

PA Bias		Unit 1	Unit 2
A	Pulv	7.4	0.0
B	Pulv	0.0	0.0
C	Pulv	6.5	0.0
D	Pulv	0.0	0.0
E	Pulv	3.8	0.0
F	Pulv	3.0	0.0
G	Pulv	0.1	0.0
H	Pulv	6.0	0.0

EndTim= 26-Apr-04 14:37:25 /EvalTim= 26-Apr-04 14:37:25 /PanRate= 0

IP7_035370

U2 BURNER (new ABT) & OVERFIRE AIR (new BPI)- TUNING & DIAGNOSTICS TESTING
Test Data from the Week of 04-0418

Test Setup:
900 MW gross (NO BIDS)
No OFA I/S- tuning just burners
No coal or ash samples
Test Data from U2 PI/ 11th floor/ stack
Burner Settings: Outer Hood= Total Air (in) / Spin Vane (in)/ Inner Air Hood (notches)

Test Conditions:	Test #	Day	Date	Start Time	End Time
Baseline (Burner damper from Turndowns)	1	Wednesday	4/21/2004	1200	1230
8/ 3/ 3	2		4/21/2004	1400	1430
10/ 3/ 3	3a		4/21/2004	1515	1545
10/ 3/ 3	3b	Thursday	4/22/2004	915	945
12/ 3/ 3	4		4/22/2004	1030	1100
9/ 3/ 3	5		4/22/2004	1130	1200
9/ 3/ 5	6a		4/22/2004	1300	1330
9/ 3/ 7	7		4/22/2004	1415	1445
9/ 3/ 9	8		4/22/2004	1530	1600
9/ 3/ 5	6b	Friday	4/23/2004	1030	1100
9/ 2/ 5	9		4/23/2004	1145	1215
9/ 4.5/ 5	10		4/23/2004	1330	1400
9/ 3.75/ 5	11a		4/23/2004	1430	1500
9/ 3.75/ 5	11b	Monday	4/26/2004		
9/ 3.75/ 7	12				
9/ 3.75/ 9	13				
Balanced/ 3.75/ 7	14				

IP7_035371

Workplace:Print Workplace

inner 9th hole

IPSCU2 // Operator Workplace

4/26/2004 | Main Menu | Master | Boiler | Fuel | Air-Gas | Water | Temps | Auxiliary | Turbine | Alarms | 1:05:17

FUEL:U2SGAG17 IBAM Flow Meters

IBAM FLOW METERS - U2SGAG17

Rear

Pulverizer 1D

D1	D2	D3	D4	D5	D6
0.456	0.528	0.433	0.497	0.502	0.493

Pulverizer 1H

H1	H2	H3	H4	H5	H6
0.378	0.401	0.507	0.428	0.402	0.452

Pulverizer 1C

C1	C2	C3	C4	C5	C6
0.482	0.552	0.453	0.406	0.496	0.501

Pulverizer 1G

G1	G2	G3	G4	G5	G6
0.466	0.507	0.395	0.488	0.397	0.401

Front

Pulverizer 1E

E1	E2	E3	E4	E5	E6
0.398	0.455	0.489	0.508	0.583	0.420

Pulverizer 1A

A1	A2	A3	A4	A5	A6
0.418	0.592	0.464	0.475	0.240	0.383

Pulverizer 1F

F1	F2	F3	F4	F5	F6
0.440	0.437	0.493	0.431	0.606	0.514

Pulverizer 1B

B1	B2	B3	B4	B5	B6
0.477	0.230	0.579	0.380	0.540	0.531

Drum	FW Flow	MS Press	MS Temp	RH Temp	Fuel %	Air %	Draft	MW
XXX	XXX	2228	1004	1011	79.2	77.7	-0.4	900

U2operator | (Enter search name) | Replace

4/26/2004 1:05:23 PM

IP7_035372

Workplace:Print Workplace

inner 7th

IPSCU2 // Operator Workplace

4/26/2004 | Main Menu | Master | Boiler | Fuel | Air-Gas | Water | Temps | Auxiliary | Turbine | Alarms | 11:06:16

FUEL:U2SGAG17 IBAM Flow Meters

IBAM FLOW METERS - U2SGAG17

Rear

Pulverizer 1D

D1	D2	D3	D4	D5	D6
0.472	0.546	0.445	0.511	0.514	0.510

Pulverizer 1H

H1	H2	H3	H4	H5	H6
0.389	0.415	0.524	0.437	0.414	0.468

Pulverizer 1C

C1	C2	C3	C4	C5	C6
0.501	0.572	0.459	0.418	0.511	0.512

Pulverizer 1G

G1	G2	G3	G4	G5	G6
0.482	0.519	0.396	0.495	0.400	0.407

Front

Pulverizer 1E

E1	E2	E3	E4	E5	E6
0.412	0.472	0.509	0.531	0.598	0.440

Pulverizer 1A

A1	A2	A3	A4	A5	A6
0.427	0.614	0.480	0.496	0.249	0.397

Pulverizer 1F

F1	F2	F3	F4	F5	F6
0.449	0.452	0.510	0.440	0.622	0.535

Pulverizer 1B

B1	B2	B3	B4	B5	B6
0.482	0.238	0.603	0.395	0.555	0.549

Drum	FW Flow	MS Press	MS Temp	RH Temp	Fuel %	Air %	Draft	MW
XXX	XXX	2229	1004	1009	79.7	78.4	-0.5	903

U2operator | (Enter search name) | Replace

4/26/2004 11:06:19 AM

IP7_035373

Workplace:Print Workplace

Inner 5th

IPSCU2 // Operator Workplace

4/26/2004 | Main Menu | Master | Boiler | Fuel | Air-Gas | Water | Temps | Auxiliary | Turbine | Alarms | 10:04:41

FUEL:U2SGAG17 IBAM Flow Meters

IBAM FLOW METERS - U2SGAG17

Rear

Pulverizer 1D

D1	D2	D3	D4	D5	D6
0.490	0.564	0.458	0.528	0.533	0.528

Pulverizer 1H

H1	H2	H3	H4	H5	H6
0.400	0.428	0.542	0.444	0.423	0.482

Pulverizer 1C

C1	C2	C3	C4	C5	C6
0.511	0.593	0.480	0.427	0.522	0.526

Pulverizer 1G

G1	G2	G3	G4	G5	G6
0.496	0.535	0.412	0.505	0.408	0.421

Front

Pulverizer 1E

E1	E2	E3	E4	E5	E6
0.417	0.482	0.517	0.544	0.613	0.450

Pulverizer 1A

A1	A2	A3	A4	A5	A6
0.435	0.630	0.493	0.500	0.251	0.412

Pulverizer 1F

F1	F2	F3	F4	F5	F6
0.462	0.459	0.529	0.457	0.632	0.544

Pulverizer 1B

B1	B2	B3	B4	B5	B6
0.492	0.245	0.619	0.404	0.572	0.561

Drum	FW Flow	MS Press	MS Temp	RH Temp	Fuel %	Air %	Draft	MW
XXX	XXX	2230	1006	1007	79.9	78.6	-0.5	904

U2operator | (Enter search name) | Replace

4/26/2004 10:04:46 AM

IP7_035374

9/33/4/4

IP5CU2 // Operator Workplace

4/26/2004 | Main Menu | Master | Boiler | Fuel | Air-Gas | Water | Temps | Auxiliary | Turbine | Alarms | 2:30:00

FUEL:U2SGAG17 IBAM Flow Meters

IBAM FLOW METERS - U2SGAG17

Rear

Pulverizer 1D

D1	D2	D3	D4	D5	D6
0.492	0.563	0.453	0.516	0.528	0.521

Pulverizer 1H

H1	H2	H3	H4	H5	H6
0.398	0.426	0.532	0.440	0.420	0.471

Pulverizer 1C

C1	C2	C3	C4	C5	C6
0.507	0.588	0.475	0.428	0.515	0.525

Pulverizer 1G

G1	G2	G3	G4	G5	G6
0.501	0.536	0.406	0.510	0.408	0.420

Front

Pulverizer 1E

E1	E2	E3	E4	E5	E6
0.413	0.475	0.516	0.536	0.609	0.443

Pulverizer 1A

A1	A2	A3	A4	A5	A6
0.438	0.630	0.488	0.497	0.253	0.404

Pulverizer 1F

F1	F2	F3	F4	F5	F6
0.460	0.456	0.525	0.445	0.633	0.553

Pulverizer 1B

B1	B2	B3	B4	B5	B6
0.483	0.241	0.613	0.404	0.568	0.561

Drum	FW Flow	MS Press	MS Temp	RH Temp	Fuel %	Air %	Draft	MW
XXX	XXX	2228	1004	1014	78.8	77.3	-0.4	901

U2operator | (Enter search name) | Replace

IP7_035375

Thur 4/29 Burner Tuning / Setup

Pulv U2 E o/s SA damper 19%

(worked on CO/CO_2 analyzers - previous night
↑ Drift

Coal Quality yesterday big problems
today not as bad

	A	B	C	D	E	F	G	H
Air				2.1	~~X~~	6.5		
Coal					X	-4		
						(3.0)		
						(-4)		

Pulv loading up ↑ / requiring Bias
some Wyoming blend / not as bad
SO_2 inlet ok / ↑CO ↑LOI ↑NOx ↑Pulv ΔP ↑Pulv Bias
Bottom Ash guy
once pulv loadup / surge or hard / controls - O_2 up + down
H why 74% PA damper / 94% flow (vs 75)

NO OFA
O_2 54.9 trim / 79.9 % / O_2 ave 3.6%
(yesterday low 2.5
NO_x 0.328
Bias Dampers parked RH 50 SH 100

Write WO - I&C to calibrate O_2 U2

Trends / Dasta

O_2 all 8
calc + compare own averages

Dust Press
1 BAMS (still several low) A5 B2 / #5 high B3 + B5

all need temp profiles / heat flux / drum

Questions
why O_2 east/west unbalance?

Recommendations
changeout O_2 pt locations / better sweet spot

Results - profiles / plots
w/ each config 8 + 1 all O_2 / CO
what do we have?
what adjustments do we need?

o/s cooling damper position

(Get) BIDS in Thursday

Notes: PA fan low → high speed
75°F pull out of damper position

IP7_035377

IPSC

EQUIPMENT BID AND RECORD

USE 24HR TIME FORMAT

Requested by Aaron Nissen Div. IPSC Sec. IGS Submitted by _____ Operator _____ Time _____ Date

☐ Out of Service
☐ Clearance TO Aaron Nissen/ Garry Christensen Div. IPSC Sec. IGS
☒ O.K. Responsible Party

EQUIPMENT REQUESTED: Unit 2 Boiler Overfire Air Tests,, at 950 MW gross- 4 days, MStm Temp 1005 F/ HRH 1005 F/ throttled conditions.

NATURE OF WORK: Burner (new- ABTs) tuning and setup required for future State of Utah Required Testing for the Overfire Air System

BID Time
FROM: Tuesday 06:30- 18:00 MDST (Time) 04/27/04 (Date) **TO:** Friday 06:30- 18:00 MDST (Time) 04/30/04 (Date)

WORK Time
FROM: Tuesday 07:00- 17:30 MDST (Time) 04/27/04 (Date) **TO:** Friday 07:00- 17:30 MDST (Time) 04/30/04 (Date)

MST=Mountain Standard MDST=Mountain Daylight PST=Pacific Standard PDST=Pacific Daylight

PREPARATION REQUIRED: Throttle Press& valve position as needed for load / Main Steam Temp 1005F/ Hot Reheat 1005 F, 7 pulverizer operation (pulv-will specify which o/s). Boiler (in local), control reheat temps with bias dampers parked (no reheat sprays), no sootblowing during each test period, minimize convection pass sootblowing prior to each test (previous shift) so able to achieve Mstm & HRH temps at 950 MW, main steam temperature control by sprays is ok (but best to minimize, no prim sprays if possible)), no boiler drum blowdown during the test. Remove pulverizer- coal and prim air biases. Isolate Unit 1 CRH to aux steam supply.

BID APPROVED:

OPS Supv. _____ Time _____ Date _____ Removed by _____ Time _____ Date _____

Supt. _____ Time _____ Date _____ Issued to _____ Time _____ Date _____

Dispatcher _____ Time _____ Date _____ Returned by _____ Time _____ Date _____

EQUIPMENT NORMAL: Time _____ Date _____ By _____ Operator _____ Supv.

Remarks: _____

IP7_035378

IGS Unit 2 Boiler, Burner, Overfire Air System and SH Platen Extension POST- OUTAGE Testing

TEST #	DATE & TIME	LOAD MWg	TEST CONDITIONS	OFA%	OFA Dampers	O2%	NOx	CO
Requirements:								
State of Utah Required Testing (to demostrate no increase in CO due to installation of Overfire Air System)								
OFA Diagnostics Testing (to determine best spot to operate and develop control curves)								
WEEK 2								
Day 1	04/26/2004 Mon 6:30- 18:00	**900**	all 8 Pulv I/S	0%	inlet dampers closed inner air flow adjustments outer air flow balance	3.0	< 0.37	< 100 ppm
Rotate all pulv O/S to establish economizer backpass profiles								
Day 2	04/27/2004 Tues 6:30- 18:00	**950**	initially- all 8 Pulv I/S see- Operation Test Setup	0%	inlet dampers closed	3.0	< 0.37	< 100 ppm
Day 3	04/28/2004 ~~Tues~~ Wed 6:30- 18:00	**950**	Sequence each pulv O/S to establish economizer backpass profiles					
Day 4	04/29/2004 ~~Tues~~ Thur 6:30- 18:00	**950**	cont- Sequence each pulv O/S to establish economizer backpass profiles					
Day 5	04/30/2004 ~~Tues~~ Fri 6:30- 18:00	**950**	cont- Sequence each pulv O/S to establish economizer backpass profiles					

NOTE: O2% based on Boiler Outlet Grid values

Boiler Test Plan for Over Fire Air System and SH Platen Extension

4/26/04 r1

IGS Unit 2 POST-Outage Testing

Testing Objectives- There are a series of Boiler Tests which are being requested following the modifications which have been made to the Unit 2 boiler. The Unit 2 Major Outage (4 week) modifications consisted of installing new burners (ABT), new overfire air system (BPI) and extending the superheater platen section. The objective of the POST-outage testing is as follows:

Burner Setup and Tuning- to determine optimum operating positions of the outer air hoods (controls total air flow), outer air spin vane and inner air hood. We are trying to determine the operational "sweet spot" to achieve optimum NOX (target < 0.37 #/mbtu w/o OFA) and CO (target < 100 ppm w/o OFA). Additionally, we are balancing combustion air flow to each individual burner using the outer hoods and IBAMS (individual air flow instrumentation). After initial burner setting are established will go thru all combinations of 8 pulverizers out of service to reduce high concentrations of CO (bad actor burners).

Overfire Air Setup and Tuning- to determine operational "sweet spot" with the overfire air system in service (optimum NOX (target < 0.33 #/mbtu w/o OFA) and CO (target < 180 ppm w/o OFA). We are balancing (by throttling) overfire air flow at each of the four corners (monitoring CAMS flow measurement) and then testing 1/3, 2/3 and both 1/3 & 2/3 dampers to determine best operating conditions. After initial OFA setting are established will go thru all combinations of 8 pulverizers out of service to reduce high concentrations of CO.

State of Utah- Required Testing- document operating conditions after the Overfire Air System has been installed. POST-outage testing is being conducted on the request from the Utah Division of Air Quality based on concerns with an increase in CO emission levels, operating with the overfire air system. The Boiler Testing will be at a Load of 950 MWgross, Westridge coal blend, O2% and Overfire Air% varies (see Boiler Test Conditions and Operational Test Setup).

Test Personal: The testing is being conducted by IPSC Engineering who is leasing test quality gas analyzers from Power Generation Technologies (PGT).

> **Test Coordinators-** Aaron Nissen and Garry Christensen
> Gas Analyzers and Test Grid- Garry Christensen, Dave Spence & Rob Jeffery
> Coal & Fly Ash sample collection- Dave Spence and Bill Tanner
> Fly ash sample collection- Dave Spence, ISG Rod Hansen, Rick Fowles/ Kurt Aldredge
> possibly Babcock Power (BPI)- Steven Cox and Advanced Burner Tech (ABT)- Tarkle Larsen

Test Method- Testing will utilize the PI data acquisition system to document test conditions. In addition, a test grid is setup at the boiler outlet (11th floor) using 14 test probes at four different depths for a total of 56 points. The gas sampling system is setup with both east and west side averaging systems consisting of bubblers, vacuum pumps, chillers and desiccant filters. The cooled, dry, filtered gas samples are then analyzed for O2, CO2, and CO. Thermocouples are also at each location to get averaged boiler gas outlet temperatures. There is another test station at the stack mid-level for CO and O2 test measurements. It also includes test probe, sampling system, chillers and analyzers and data acquisition system.

NOTE, we will utilize the O2 measurement at the boiler outlet. We are seeing a bias between station O2 and the O2 at the boiler outlet grid. The O2% at the boiler outlet, however, agrees with higher Air Flow shown in CCS, correlates with the higher ID Fan rpm and amps, plus correlates with higher NOx and low CO levels.
As part of the testing, we will try to reconcile why we have high station O2 levels.

In addition to east and west side averaged gas conditions, individual test points will also be taken during a separate test to develop backpass test grid profiles. These profiles will include O2, CO, NOx and temperatures which will be used to troubleshoot and diagnosis burner setup and secondary air plus overfire air flow balancing.

OFA System 1/3 and 2/3 dampers plus OFA secondary air inlet dampers will need position checked during the course of the testing.

IP7_035380

Fly ash samples will also be taken and correlated with the test results. We will need 2 Operators to help support fly ash sample collection. ISG will be collecting the fly ash samples at each of the different test points. All fly ash hopper rows need to be available (no maintenance work) and hoppers will need to be pulled down prior to the test (night shift) and between each test point.

Coal samples will also be taken throughout the test period at the coal feeder inlet (test taps installed special for testing). Note: there maybe a certain amount of coal spillage created while collecting these coal samples. Bottom ash samples will also be collected.

Boiler Performance Testing- Each test point needs 2 hours, allowing ½ to 1 hour between test points to lower O2, pull fly ash and sootblow for temperatures. Prior to each test period (daily), the gas analyzers need to be started, warmed up and calibrated. This process takes 1 to 1 ½ hours to complete. During this time, all tubing, bubblers, chillers, desiccant filters, and dust filters will be checked out.

Operational Test Setup- Boiler, Burner, & OFA Tests

NOTES:

1) PI system – needs to be up and running, no downtime or backups

2) CEM system – PI interface needs to be working

3) Do not washdown boiler in the backpass areas, due to test equipment, analyzers and computers.

4) Not for this phase ~~Coal Samples will also be taken at each test point at the coal feeder inlet (new test coal sample collection ports). Note: there may be a certain amount of coal spillage created while collecting these coal samples.~~

5) Not for this phase ~~Fly Ash Samples- need to be taken during each test period (need support of 2 Operators for fly ash sample collection). Fly Ash Hoppers need to be pulled down prior to the test (night shift) and between each test point. ISG will be collecting the fly ash samples at each test points. All fly ash hopper rows need to be available (no maintenance work)~~

IP7_035381

Operational Test Setup- Boiler, Burner, & OFA Tests

Load (MWgross) 950
Controls– boiler to local (or manual), Boiler Test Objective is for stable boiler/ throttle pressure and let MWs float.
(throttling control valves okay- this is not a turbine test at valves wide open)
Overfire Air System to manual

Throttle Press & Control Valve Position as needed for load
Main Steam Temp (F) 1005
Main Steam spray (kpph) <200
Hot Reheat Temp (F) 1005
Reheat Sprays (kpph) 0
Bias Dampers (%) may have to take PRH side to manual & set between 30- 45%, to control RH temps

Sootblowing as required to achieve Main Stm, HRH and FEGT temps
No sootblowing (during each test period of 2 hrs), sootblowing is allowed between each test
NOTE: for 950 MWg operation, need to allow SH & RH areas to get dirtier, but blow waterwalls to achieve FEGT (furnace exit gas temp) and EGOT (economizer gas outlet temp)

FEGT target (F) 2200, controlled by waterwall sootblowing
EGOT target (F) 760

O2 levels (measured at boiler outlet with test equipment)
Not for this phase ~~VARIES from 3.5%, 3.0%, & 2.5% at 2 hour increments~~
~~Note: there is a discrepancy between station instrumentation and local test analyzers (local reads are higher by 0.5% to 1.0% O2)~~

Over Fire Air System local control
1/3 & 2/3 port dampers, VARIES from 0% OFA (baseline), both closed or inlet dampers closed
Not for this phase ~~6% (2/3 damper closed, 1/3 damper @open, balanced flow all 4 corners)~~
~~9%(2/3 damper open, 1/3 damper closed)~~
~~12% (2/3 damper open, 1/3 damper open)~~

OFA inlet dampers south (SW & SE) dampers throttled ~45% to get balanced N to S flows

NOx level target (#/mbtu) < 0.37
CO (ppm) < 100
Primary Air Duct Press ("wc) 43

Pulverizer Configuration- 7 I/S, (Sec air damper- 20%)
Note- Remove all pulverizer biasing (unless absolutely necessary due to unmanageable coal dribble)

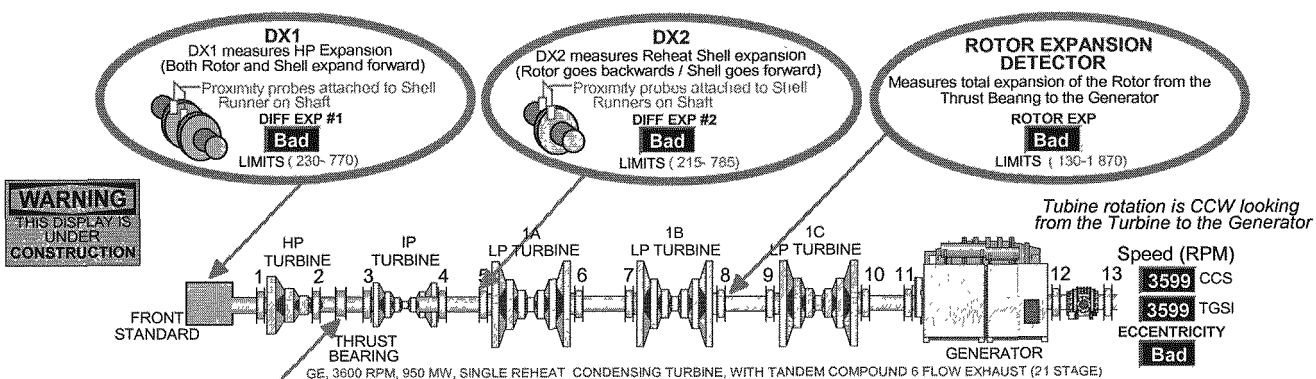
Need all normally running equipment in-service (7 Pulv, all FD, PA & ID fans, etc.). This ensures good uniform air and gas flow distribution.

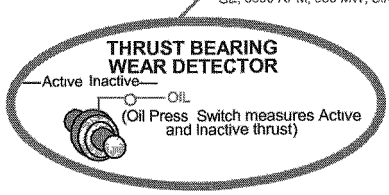
No Boiler Blowdown during the testing period
Isolate Unit 1 CRH to aux steam supply and route all building heat (if in service) drains to Unit 2.

Coal Supply- Westridge coal blend
No Rocks, please

IP7_035382

DX1





TURBINE DIFFERENTIAL EXPANSION

Shell and Exhaust Hoods are keyed to the foundation at the center of the "A" hood.
"A" Hood is the stationary point along the turbine shells.
Most expansion is in the HP and IP sections of the turbine.
Standards are mounted on the foundations for the HP and IP turbine shells.
The rotor in relation to the shell is fixed in position at the thrust bearing
The Thrust Bearing is phsically mounted on the IP rotor before T3 bearing and indicates #2 standard expansion
The rotor when heated expands in two directions:
A: Expands relative to the shell forward in the HP section.
B: Expands back from the Thrust Bearing to the Generator
Normal expansion of the Rotor places the Generator Field at its elecrical center.

ROTOR LONG ACTIONS

Do Not Trip! Turbine is in a Critical Condition
Decrease Main Steam Temperature
Increase Main Steam Pressure
Lower Air Flow
Lower Furnace Gas Temp
Mill Configuration

TEMPERATURE	205	193	193	214	211	195	193	186	200	181	191	180	147
TURBINE	1	2	3	4	5	6	7	8	9	10	11	12	13
VIBRATION	0.17	1.30	1.37	1.42	0.37	1.32	0.50	0.93	1.83	4.06	1.48	2.68	1.54

40.9 Weather I/O
Temp F Plant Overview
Main Menu
Utilities
Unit 1 936 MW
Menu AQCS
TURBINE EXPANSION
Rotor Prewarm *Unit #2* Hot Restart
Unit 2 950 MW
Menu AQCS
Coal Yard
Common
4/29/04 10:12:35 AM
IPSC

Printed out for: UNIT2OP - 29-Apr-04 14:10:10

0 Messages O2 Data O2 Unit Comparisons 29-Apr-04 14:10:10

Data		Unit 1	Unit 2
Meas'd Load	MW	933.25	949.25
East Probe 1	% O2	2.85	2.33
Probe 2	% O2	4.13	3.00
Probe 3	% O2	3.95	4.35
Probe 4	% O2	3.61	4.72
Average	% O2	3.66	3.35
West Probe 5	% O2	1.64	3.85
Probe 6	% O2	2.68	4.66
Probe 7	% O2	2.55	3.38
Probe 8	% O2	1.82	2.64
Average	% O2	2.12	3.12
Econ O2 Out Average	% O2	2.89	3.26
Econ O2 Out Setpoint	% O2	3.11	3.10
O2 Trim Setpoint		38.6	54.9
Total Air %		78.5	80.2
Coal Flow	TPH	360.4	366.4
# of Pulv In-service		7.	8.
Main Steam Pressure		2401.8	2340.6
Stack NOx	PPM	210.	183.
Scrubber NOx	PPM	229.	200.
Stack Converted NOx	LB/MBTU	0.347	0.308
Target NOx	LB/MBTU	0.369	0.401
Scrubber Inlet SO2	PPM	420.9	410.8

PSH/RH Bias Dmpr Pos 105./ 30. 100./ 47.

MS/RH Temps 1003.7/1009.2 1007.4/1012.6

	U1	U2
OFA		
%	12.5	4.3
Inlets		
SW	100.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	1.
NE	7.	0.
2/3		
SW	64.	0.
SE	64.	0.
NW	64.	1.
NE	62.	1.
Flow		
SW	232.	64.
SE	240.	65.
NW	220.	111.
NE	201.	97.
	872.	338.

SA Damper		Unit 1		Unit 2
Pulv	A	68.	A	18.
Pulv	B	69.	B	75.
Pulv	C	72.	C	80.
Pulv	D	77.	D	79.
Pulv	E	77.	E	75.
Pulv	F	72.	F	74.
Pulv	G	30.	G	75.
Pulv	H	70.	H	75.

Coal Bias	U1	U2
A Pulv	0.0	0.0
B Pulv	0.0	0.0
C Pulv	0.0	0.0
D Pulv	0.0	0.0
E Pulv	0.0	-4.0
F Pulv	0.0	-4.0
G Pulv	0.0	0.0
H Pulv	0.0	0.0

PA Bias	Unit 1	Unit 2
A Pulv	6.2	0.0
B Pulv	0.0	0.0
C Pulv	4.7	0.0
D Pulv	0.0	2.1
E Pulv	3.8	3.1
F Pulv	3.9	6.5
G Pulv	0.1	0.0
H Pulv	4.8	0.0

EndTim= 29-Apr-04 14:10:10 /EvalTim= 29-Apr-04 14:10:10 /PanRate= 0

IP7_035384

Printed out for: UNIT2OP - 29-Apr-04 14:11:30

0 Messages O2 Data O2 Unit Comparisons 29-Apr-04 14:11:30

Data		Unit 1	Unit 2
Meas'd Load	MW	937.50	950.00
East Probe 1	% O2	3.38	1.39
Probe 2	% O2	4.47	2.38
Probe 3	% O2	4.13	4.09
Probe 4	% O2	3.78	4.61
Average	% O2	3.88	3.02
West Probe 5	% O2	1.32	4.12
Probe 6	% O2	2.63	3.82
Probe 7	% O2	2.64	2.11
Probe 8	% O2	1.95	2.59
Average	% O2	2.13	2.87
Econ O2 Out Average	% O2	3.02	2.91
Econ O2 Out Setpoint	% O2	3.11	3.10
O2 Trim Setpoint		38.6	54.9
Total Air %		78.1	80.5
Coal Flow	TPH	360.0	366.4
# of Pulv In-service		7.	8.
Main Steam Pressure		2400.0	2338.8
Stack NOx	PPM	215.	188.
Scrubber NOx	PPM	235.	204.
Stack Converted NOx	LB/MBTU	0.352	0.314
Target NOx	LB/MBTU	0.369	0.401
Scrubber Inlet SO2	PPM	434.4	407.8
PSH/RH Bias Dmpr Pos		105./ 30.	100./ 47.
MS/RH Temps		1003.7/1009.4	1006.5/1013.0

	U1	U2
OFA		
%	12.3	4.3
Inlets		
SW	100.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	1.
NE	7.	0.
2/3		
SW	64.	0.
SE	64.	0.
NW	64.	1.
NE	62.	1.
Flow		
SW	232.	64.
SE	241.	68.
NW	208.	111.
NE	201.	107.
	883.	332.

SA Damper		Unit 1		Unit 2
Pulv	A	69.	A	18.
Pulv	B	69.	B	75.
Pulv	C	73.	C	80.
Pulv	D	77.	D	79.
Pulv	E	77.	E	74.
Pulv	F	73.	F	74.
Pulv	G	30.	G	75.
Pulv	H	70.	H	75.

Coal Bias	U1	U2
A Pulv	0.0	0.0
B Pulv	0.0	0.0
C Pulv	0.0	0.0
D Pulv	0.0	0.0
E Pulv	0.0	-4.0
F Pulv	0.0	-4.0
G Pulv	0.0	0.0
H Pulv	0.0	0.0

PA Bias	Unit 1	Unit 2
A Pulv	6.2	0.0
B Pulv	0.0	0.0
C Pulv	4.7	0.0
D Pulv	0.0	2.1
E Pulv	3.8	3.1
F Pulv	3.9	6.5
G Pulv	0.1	0.0
H Pulv	4.8	0.0

EndTim= 29-Apr-04 14:11:30 /EvalTim= 29-Apr-04 14:11:30 /PanRate= 0

IP7_035385

Printed out for: UNIT2OP - 29-Apr-04 14:11:45

0 Messages Envir Stat Environmental Stats 29-Apr-04 14:11:45

	Unit 1	Unit 2
Load	935.25 MW	949.00 MW
Opacity		
Casing Outlet	A 2.0 B 2.9 C 2.2	A 4.4 B 4.6 C 4.5
CEM @ Scrub Inlet	1.8	2.5
SO2		
Scrub In ppm /lb/mbtu	435. / 0.916	407. / 0.903
	1A 1B 1C 1D 1E 1F	1A 1B 1C 1D 1E 1F
Module Outlet ppm	23. 19. 0. 1. 6. 31.	15. 14. 28. 24. 0. 11.
Rxn Tank PH	5.78 5.80 4.00 8.00 5.76 5.81	5.95 5.70 5.87 5.90 7.50 5.9
Stack ppm/ lb/mbtu	21. / .049	26. / .058
% SO2 Removal	94.9	93.6
	WEPCO Target .065	WEPCO Target .060
	Upper Limit .138	Upper Limit .138
NOx	O2 3.02 OFA % 12.3	O2 2.80 OFA % 4.3
Scrubber Inlet ppm	235.	204.
Stack ppm/ lb/mbtu	213. / .352	187. / .314
	Target .369	Target .401
	Limit .461	Limit .461
CO2		
Scrub In/Stack %	14.20 / 13.12	13.40 / 12.81
Other		
Coal Flow TPH	359.8	366.4
Total Air %	78.5	79.8
Vol Flow MSCFH	136.23	135.37
Boiler Duty mbtu/hr	8470.0	8343.6
Corr FW Flow KPPH	5988.0	6686.0
O2 E/W	3.98 / 2.13	2.86 / 2.73

EndTim= 29-Apr-04 14:11:45 /EvalTim= 29-Apr-04 14:11:45 /PanRate= 0

IP7_035386

Printed out for: UNIT2OP - 29-Apr-04 14: 12: 33

0 Messages 1SGAclean U1 BOILER SOOTBLOWING CLEANLINESS 29-Apr-04 14: 12: 33

Fouled: <.7 Dirty: 0.7-0.80 Clean: >.80

Cleanliness Factors:		0.0 .7 .8
WATERWALLS	0.66	
SUPERHEATER		
SH Primary Bank	0.75	
SSH Platen Bank	0.63	
SSH Intrmed Bank	0.67	
SSH Outlet Bank	0.72	
REHEATER		
RH Primary Bank	0.81	
RH Outlet Banks	0.73	
ECONOMIZER	0.75	

Key Parameters:	CCS	PMAX
Main Stm Temp (DegF)	1004.	
Main Stm Spry (KPPH)	401.	422.
RH Stm Temp (DegF)	1009.	
RH Stm Spry (KPPH)	0.	0.
Fuel Flow (TPH)	360.	
Coal Flow (TPH)	369.	334.
Air Flow (%)	78.4	
OFA % 12.3	EAST	WEST
Secondary Air Flow (%)	70.7	71.6
O2 (%)	3.8	2.1
Air Htr Gas In Tmp (DegF)	776.	774.

SB TARGET GAS TEMPS

DRAFT PROFILE

O2 Trim

38.6

NOx (#/MBTU)

0.352

Bias Dmpr Pos

RH	SH
30.%	105%

Target EGT (F)

Furnace	2200.
Conv Pass	1475.
Pri RH	760.
PSH-Econ	760.
Econ Outlet	759.

EndTim= 29-Apr-04 14: 12: 33 /EvalTim= 29-Apr-04 14: 12: 33 /PanRate= 0

IP7_035387

Printed out for: UNIT2OP - 29-Apr-04 14:12:54

0 Messages U2 Pulv U2 Pulv Operating data 29-Apr-04 14:12:54

Unit 2 951.3 MW	Pulv A	Pulv B	Pulv C	Pulv D	Pulv E	Pulv F	Pulv G	Pulv H
Coal Flow366.2TPH	0.2	53.9	57.5	50.3	52.0	50.4	54.1	52.7
Feeder Speed	0.2	79.2	83.1	74.1	75.8	74.5	79.5	77.5
Amps (Duct Pr44.0)	0.0	64.3	66.5	66.2	61.2	62.1	63.0	59.6
Coal Pipe Vel	3.	4075.	4042.	4113.	4155.	4290.	4044.	4018.
PA Flow %	0.0	90.1	90.4	92.6	92.5	95.3	90.9	90.7
PA Damper Pos (Duct Pr	0.0	73.0	78.2	74.2	81.8	87.7	73.8	95.3
SA Damper Pos	17.7	74.0	78.4	77.8	73.1	73.1	74.2	73.8
PA Mass Flow	1.	3564.	3579.	3661.	3673.	3781.	3595.	3587.
Pulv DP (NOx 0.31)	1.5	16.5	17.1	11.6	15.7	18.9	12.8	13.8
Air to Fuel Ratio	0.19	1.99	1.90	2.19	2.14	2.23	2.00	2.03
Pulv Inlet Temp	85.8	327.1	310.3	282.0	311.9	334.3	332.3	353.5
Pulv Outlet Temp	108.6	152.8	149.1	150.1	154.6	150.9	149.7	150.4
Coal Bias	0.0	0.0	0.0	0.0	-4.0	-4.0	0.0	0.0
Air Bias	0.0	0.0	0.0	2.1	3.1	6.5	0.0	0.0
Hyd Skid Pr Fdbk	1158.	2281.	2069.	1999.	2436.	2321.	2361.	2189.
Hyd Skid Pr Setpt	1149.	2391.	2400.	1149.	2092.	2241.	2369.	2341.

EndTim= 29-Apr-04 14:12:54 /EvalTim= 29-Apr-04 14:12:54 /PanRate= 0

IP7_035388

Printed out for: UNIT2OP - 29-Apr-04 14:17:34

0 Messages 2SGAclean U2 BOILER SOOTBLOWING CLEANLINESS 29-Apr-04 14:17:34

Fouled: <.7 Dirty: 0.7-0.80 Clean: >.80

Cleanliness Factors:		0.0 .7 .8
WATERWALLS	0.86	
SUPERHEATER		
SH Primary Bank	0.84	
SSH Platen Bank	1.09	
SSH Intrmed Bank	0.90	
SSH Outlet Bank	0.76	
REHEATER		
RH Primary Bank	0.90	
RH Outlet Banks	0.94	
ECONOMIZER	0.74	

UNIT 2

to U1 948.6 MW

Key Parameters:	CCS	PMAX
Main Stm Temp (DegF)	1010.	
Main Stm Spry (KPPH)	123.	122.
RH Stm Temp (DegF)	1013.	
RH Stm Spry (KPPH)	0.	0.
Fuel Flow (TPH)	364.	
Coal Flow (TPH)	361.	365.
Air Flow (%)	79.6	
OFA % 4.3	EAST	WEST
Secondary Air Flow (%)	72.6	71.9
O2 (%)	2.8	3.3
Air Htr Gas In Tmp (DegF)	757.	703.

SB TARGET GAS TEMPS

DRAFT PROFILE

O2 Trim

54.9

NOx (#/MBTU)

0.314

Bias Dmpr Pos

RH	SH
47.%	100.%

Target EGT (F)

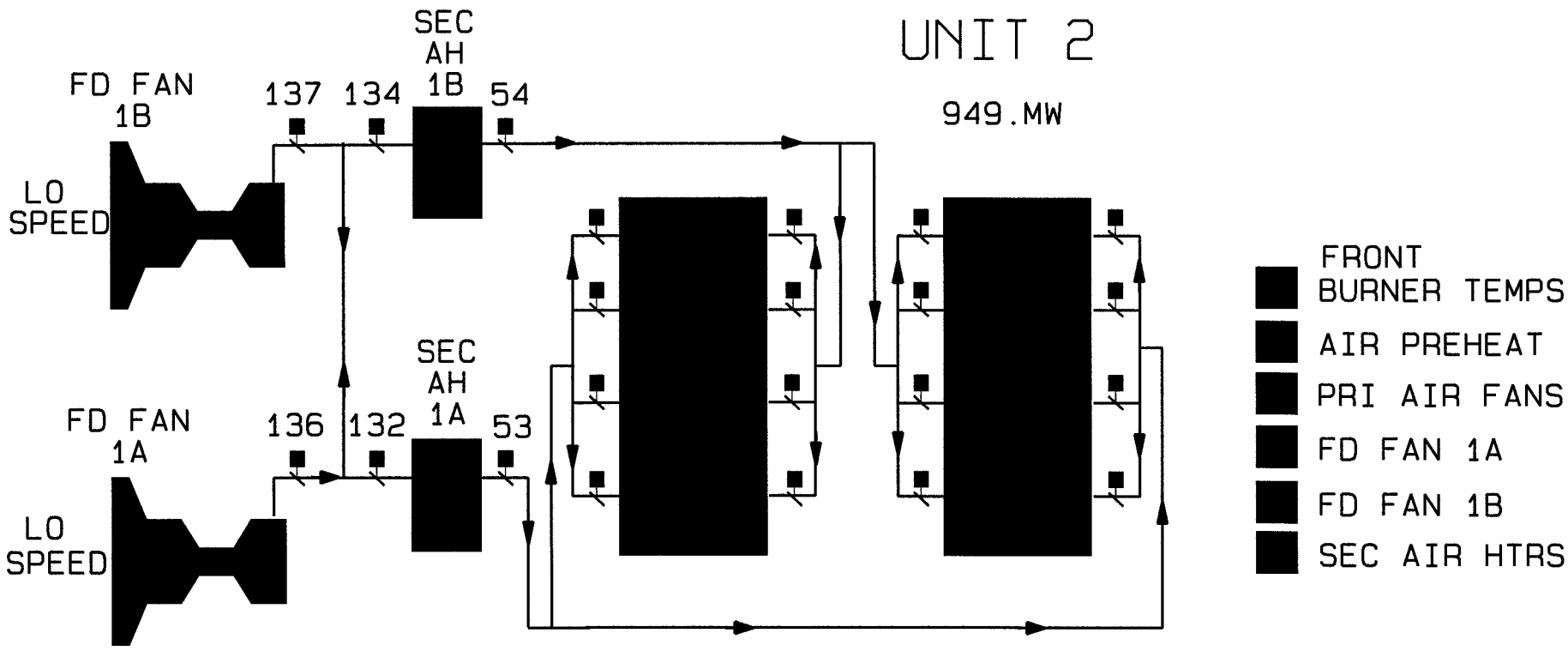
Furnace	2200.
Conv Pass	1475.
Pri RH	760.
PSH-Econ	760.
Econ Outlet	760.

EndTim= 29-Apr-04 14:17:34 /EvalTim= 29-Apr-04 14:17:34 /PanRate= 0

IP7_035389

Printed out for: UNIT2OP - 29-Apr-04 14:19:07

0 Messages 2SGBG01 COMBUSTION AIR 29-Apr-04 14:19:07



FAN ROOM TEMP
49.

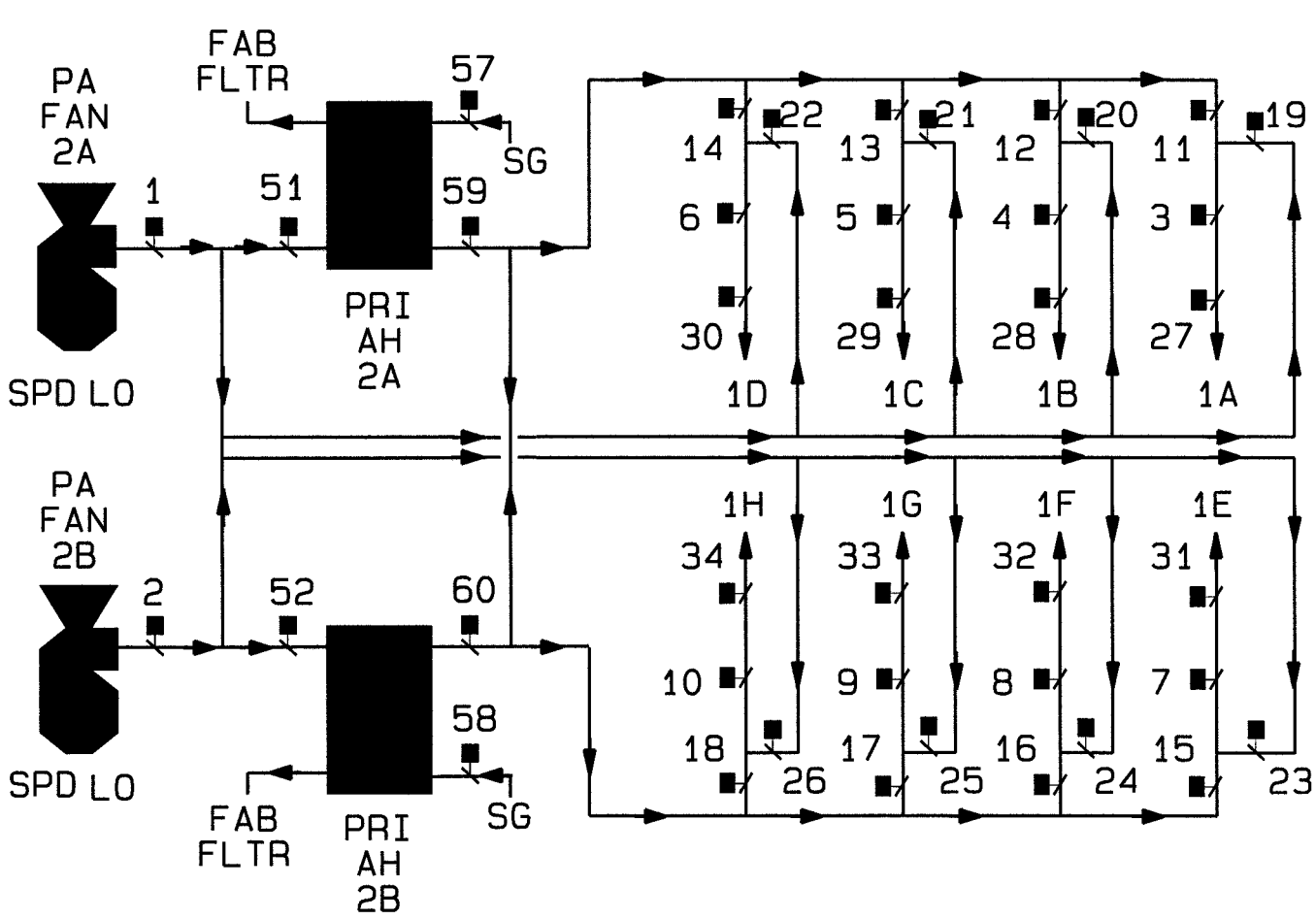
	FD FANS			SEC AIR HTRS			SEC AIR WINDBOX			
							DUCT PRESS		DAMPER POS	
							REAR NORTH	FRONT SOUTH	REAR NORTH	FRONT SOUTH
							INWC	INWC	%	%
	1A	1B		1A	1B	LVL 4	3.0	3.0	76.	72.
KLBH	Shutd	Shut	FLOW %	73.	72.	LVL 3	3.1	0.0	72.	18.
D/P	9.7	9.1	OT F	701.	711.	LVL 2	3.4	3.0	77.	71.
AMPS	209.	205.	IN F	56.	54.	LVL 1	2.3	2.6	72.	72.

EndTim= 29-Apr-04 14:19:07 /EvalTim= 29-Apr-04 14:19:07 /PanRate= 0

IP7_035390

Printed out for: UNIT2OP - 29-Apr-04 14: 19: 35

0 Messages 2SGBG05 PRIMARY AIR 29-Apr-04 14: 19: 35



950. MW

PRI AIR FANS

PRI AIR HTRS

PA DUCT PRESS	
INWC	44.1

PULVERIZERS			
	FLOW %	TARGET % +BIAS	INLET F
1A	0.0	69.0	84.
1B	90.0	90.4	326.
1C	89.8	91.9	313.
1D	90.3	90.4	284.
1E	92.2	91.5	312.
1F	95.2	95.1	329.
1G	90.5	90.6	331.
1H	89.8	89.7	347.

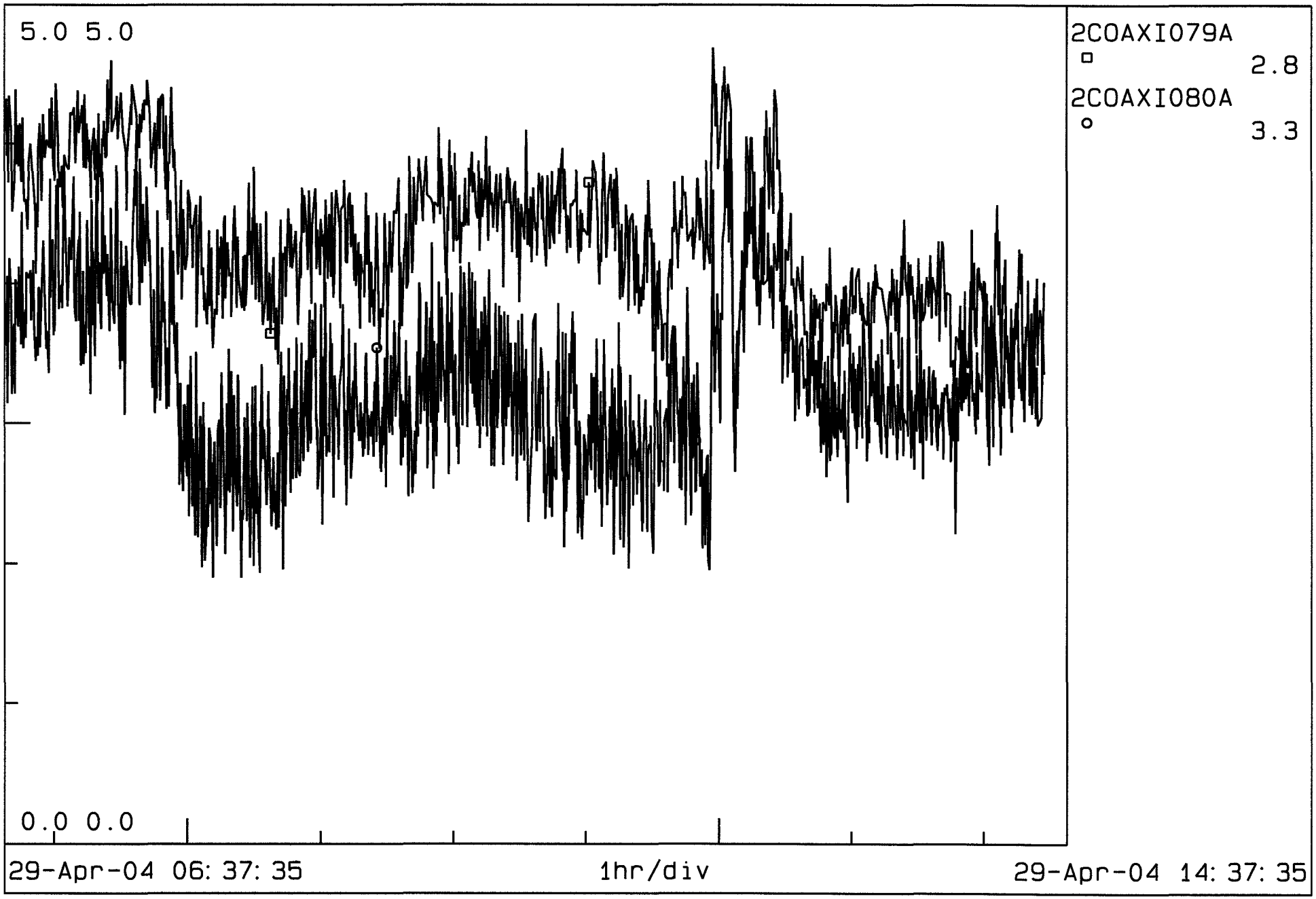
PRI AIR HTRS			PRI AIR FANS		
	2A	2B		2A	2B
FLU GAS OT	308.	312.	FLW %	30.7	35.7
AIR IN	74.	73.	AIR IN F	49.	49.
AIR OT	547.	529.	MTR AMPS	202.	204.

EndTim= 29-Apr-04 14: 19: 35 /EvalTim= 29-Apr-04 14: 19: 35 /PanRate= 0

IP7_035391

Printed out for: UNIT2OP - 29-Apr-04 14:27:39

0 Messages 02 Data 02 Unit Comparisons 29-Apr-04 14:27:39



EndTim= 29-Apr-04 14:27:39 /EvalTim= 29-Apr-04 14:27:39 /PanRate= 0

IP7_035392

Printed out for: UNIT2OP - 29-Apr-04 14:54:43

0 Messages U2 Pulv U2 Pulv Operating data 29-Apr-04 14:54:43

Unit 2 949.8 MW	Pulv A	Pulv B	Pulv C	Pulv D	Pulv E	Pulv F	Pulv G	Pulv H
Coal Flow366.2TPH	0.2	53.8	57.1	50.2	50.4	50.1	52.9	53.1
Feeder Speed	0.2	78.6	83.4	75.1	75.1	74.5	79.6	76.3
Amps (Duct Pr43.8)	0.0	60.5	69.2	65.3	61.8	59.4	62.0	65.3
Coal Pipe Vel	1.	4028.	4046.	4133.	4164.	4226.	4036.	4012.
PA Flow %	0.0	90.3	90.3	92.6	92.6	95.2	91.1	90.3
PA Damper Pos (Duct Pr	0.0	72.3	78.8	76.3	81.7	88.9	73.6	95.8
SA Damper Pos	17.7	74.0	78.8	78.4	73.8	73.5	74.5	74.3
PA Mass Flow	1.	3577.	3578.	3679.	3672.	3777.	3608.	3569.
Pulv DP (NOx 0.30)	1.5	16.6	16.9	11.8	15.8	19.3	12.5	14.7
Air to Fuel Ratio	0.19	2.01	1.90	2.18	2.16	2.23	2.01	2.08
Pulv Inlet Temp	83.6	325.0	308.1	281.2	308.1	328.8	332.1	354.4
Pulv Outlet Temp	105.9	152.2	149.1	150.6	154.7	149.7	149.7	150.6
Coal Bias	0.0	0.0	0.0	0.0	-4.0	-4.0	0.0	0.0
Air Bias	0.0	0.0	0.0	2.1	3.1	6.5	0.0	0.0
Hyd Skid Pr Fdbk	1159.	2275.	2070.	2003.	2419.	2320.	2357.	2183.
Hyd Skid Pr Setpt	1149.	2360.	2400.	1149.	2081.	2243.	2343.	2352.

EndTim= 29-Apr-04 14:54:43 /EvalTim= 29-Apr-04 14:54:43 /PanRate= 0

IP7_035393

Printed out for: UNIT2OP - 29-Apr-04 14:54:59

0 Messages O2 Data O2 Unit Comparisons 29-Apr-04 14:54:59

Data		Unit 1	Unit 2
Meas'd Load	MW	937.00	950.25
East Probe 1	% O2	3.24	1.64
Probe 2	% O2	4.54	2.73
Probe 3	% O2	4.14	4.36
Probe 4	% O2	3.59	4.28
Average	% O2	3.66	2.76
West Probe 5	% O2	1.69	3.09
Probe 6	% O2	2.65	4.09
Probe 7	% O2	2.47	2.76
Probe 8	% O2	1.67	2.49
Average	% O2	2.10	2.81
Econ O2 Out Average	% O2	2.88	2.77
Econ O2 Out Setpoint	% O2	3.11	3.10
O2 Trim Setpoint		38.6	56.3
Total Air %		78.9	80.1
Coal Flow	TPH	362.6	366.2
# of Pulv In-service		7.	8.
Main Steam Pressure		2386.8	2345.4
Stack NOx	PPM	210.	184.
Scrubber NOx	PPM	228.	197.
Stack Converted NOx	LB/MBTU	0.348	0.304
Target NOx	LB/MBTU	0.370	0.402
Scrubber Inlet SO2	PPM	424.1	408.4
PSH/RH Bias Dmpr Pos		105./ 30.	100./ 47.
MS/RH Temps		1006.5/1010.0	1006.5/1010.0

	U1	U2
OFA		
%	12.4	4.5
Inlets		
SW	100.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	1.
NE	7.	0.
2/3		
SW	64.	0.
SE	64.	0.
NW	64.	1.
NE	63.	1.
Flow		
SW	235.	61.
SE	246.	64.
NW	213.	107.
NE	196.	107.
	890.	325.

SA Damper		Unit 1		Unit 2
Pulv	A	70.	A	18.
Pulv	B	70.	B	75.
Pulv	C	74.	C	79.
Pulv	D	78.	D	78.
Pulv	E	78.	E	74.
Pulv	F	74.	F	74.
Pulv	G	30.	G	75.
Pulv	H	71.	H	74.

Coal Bias	U1	U2
A Pulv	0.0	0.0
B Pulv	0.0	0.0
C Pulv	0.0	0.0
D Pulv	0.0	0.0
E Pulv	0.0	-4.0
F Pulv	0.0	-4.0
G Pulv	0.0	0.0
H Pulv	0.0	0.0

PA Bias	Unit 1	Unit 2
A Pulv	6.2	0.0
B Pulv	0.0	0.0
C Pulv	4.7	0.0
D Pulv	0.0	2.1
E Pulv	3.8	3.1
F Pulv	3.9	6.5
G Pulv	0.1	0.0
H Pulv	4.8	0.0

EndTim= 29-Apr-04 14:54:59 /EvalTim= 29-Apr-04 14:54:59 /PanRate= 0

IP7_035394

Printed out for: UNIT2OP - 29-Apr-04 15:02:31

0 Messages O2 Data O2 Unit Comparisons 29-Apr-04 15:02:31

Data		Unit 1	Unit 2
Meas'd Load	MW	937.00	949.25
East Probe 1	% O2	3.24	2.47
Probe 2	% O2	4.65	2.91
Probe 3	% O2	4.22	4.28
Probe 4	% O2	3.66	4.23
Average	% O2	3.66	3.31
West Probe 5	% O2	1.69	2.90
Probe 6	% O2	2.49	4.77
Probe 7	% O2	2.40	3.42
Probe 8	% O2	1.63	2.98
Average	% O2	2.10	2.97
Econ O2 Out Average	% O2	2.88	3.14
Econ O2 Out Setpoint	% O2	3.11	3.10
O2 Trim Setpoint		38.6	56.3
Total Air %		78.9	79.8
Coal Flow	TPH	362.6	363.9
# of Pulv In-service		7.	8.
Main Steam Pressure		2388.0	2356.8
Stack NOx	PPM	210.	184.
Scrubber NOx	PPM	228.	197.
Stack Converted NOx	LB/MBTU	0.348	0.309
Target NOx	LB/MBTU	0.370	0.401
Scrubber Inlet SO2	PPM	424.1	405.9
PSH/RH Bias Dmpr Pos		105./ 30.	100./ 47.
MS/RH Temps		1006.5/1010.0	1002.5/1011.6

	U1	U2
OFA		
%	12.4	4.5
Inlets		
SW	100.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	1.
NE	7.	0.
2/3		
SW	64.	0.
SE	64.	0.
NW	64.	1.
NE	63.	1.
Flow		
SW	235.	61.
SE	246.	66.
NW	213.	106.
NE	196.	97.
	890.	330.

SA Damper		Unit 1		Unit 2
Pulv	A	70.	A	18.
Pulv	B	70.	B	73.
Pulv	C	74.	C	78.
Pulv	D	78.	D	77.
Pulv	E	78.	E	73.
Pulv	F	74.	F	72.
Pulv	G	30.	G	74.
Pulv	H	71.	H	74.

Coal Bias	U1	U2
A Pulv	0.0	0.0
B Pulv	0.0	0.0
C Pulv	0.0	0.0
D Pulv	0.0	0.0
E Pulv	0.0	-4.0
F Pulv	0.0	-4.0
G Pulv	0.0	0.0
H Pulv	0.0	0.0

PA Bias	Unit 1	Unit 2
A Pulv	6.2	0.0
B Pulv	0.0	0.0
C Pulv	4.7	0.0
D Pulv	0.0	2.1
E Pulv	3.8	3.1
F Pulv	3.9	6.5
G Pulv	0.1	0.0
H Pulv	4.8	0.0

EndTim= 29-Apr-04 15:02:31 /EvalTim= 29-Apr-04 15:02:31 /PanRate= 0

IP7_035395

Printed out for: UNIT2OP - 29-Apr-04 15:04:11

0 Messages Envir Stat Environmental Stats 29-Apr-04 15:04:11

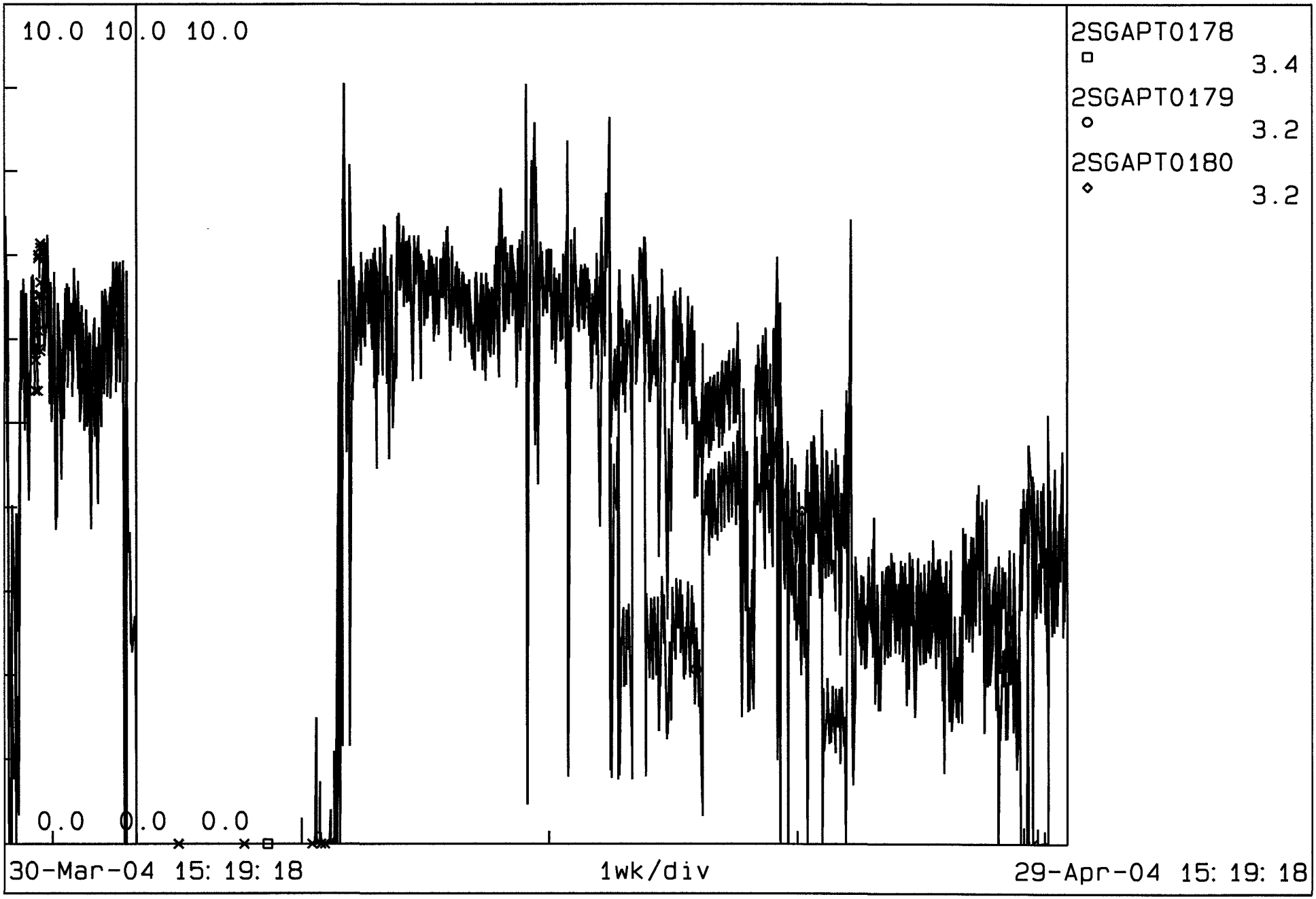
	Unit 1	Unit 2
Load	937.00 MW	948.50 MW
Opacity		
Casing Outlet	A 2.0 B 2.9 C 2.2	A 4.3 B 4.5 C 4.4
CEM @ Scrub Inlet	1.5	3.8
SO2		
Scrub In ppm /lb/mbtu	424. / 0.890	406. / 0.907
	1A 1B 1C 1D 1E 1F	1A 1B 1C 1D 1E 1F
Module Outlet ppm	22. 17. 0. 0. 5. 27.	19. 17. 33. 25. 1. 10.
Rxn Tank PH	5.80 5.80 4.00 8.00 5.76 5.81	5.98 5.74 5.88 5.92 7.50 5.9
Stack ppm/ lb/mbtu	20. / .046	25. / .057
% SO2 Removal	94.8	93.8
	WEPCO Target .061	WEPCO Target .060
	Upper Limit .138	Upper Limit .138
NOx	O2 2.88 OFA % 12.4	O2 2.99 OFA % 4.5
Scrubber Inlet ppm	228.	197.
Stack ppm/ lb/mbtu	210. / .348	184. / .309
	Target .370	Target .401
	Limit .461	Limit .461
CO2		
Scrub In/Stack %	14.22 / 13.04	13.32 / 12.70
Other		
Coal Flow TPH	362.0	363.3
Total Air %	79.1	80.4
Vol Flow MSCFH	134.16	137.04
Boiler Duty mbtu/hr	8485.4	8343.6
Corr FW Flow KPPH	6030.2	6635.7
O2 E/W	3.66 / 2.10	2.91 / 3.00

EndTim= 29-Apr-04 15:04:11 /EvalTim= 29-Apr-04 15:04:11 /PanRate= 0

IP7_035396

Printed out for: UNIT2OP - 29-Apr-04 15:09:36

0 Messages 2SGBG01 COMBUSTION AIR 29-Apr-04 15:09:36

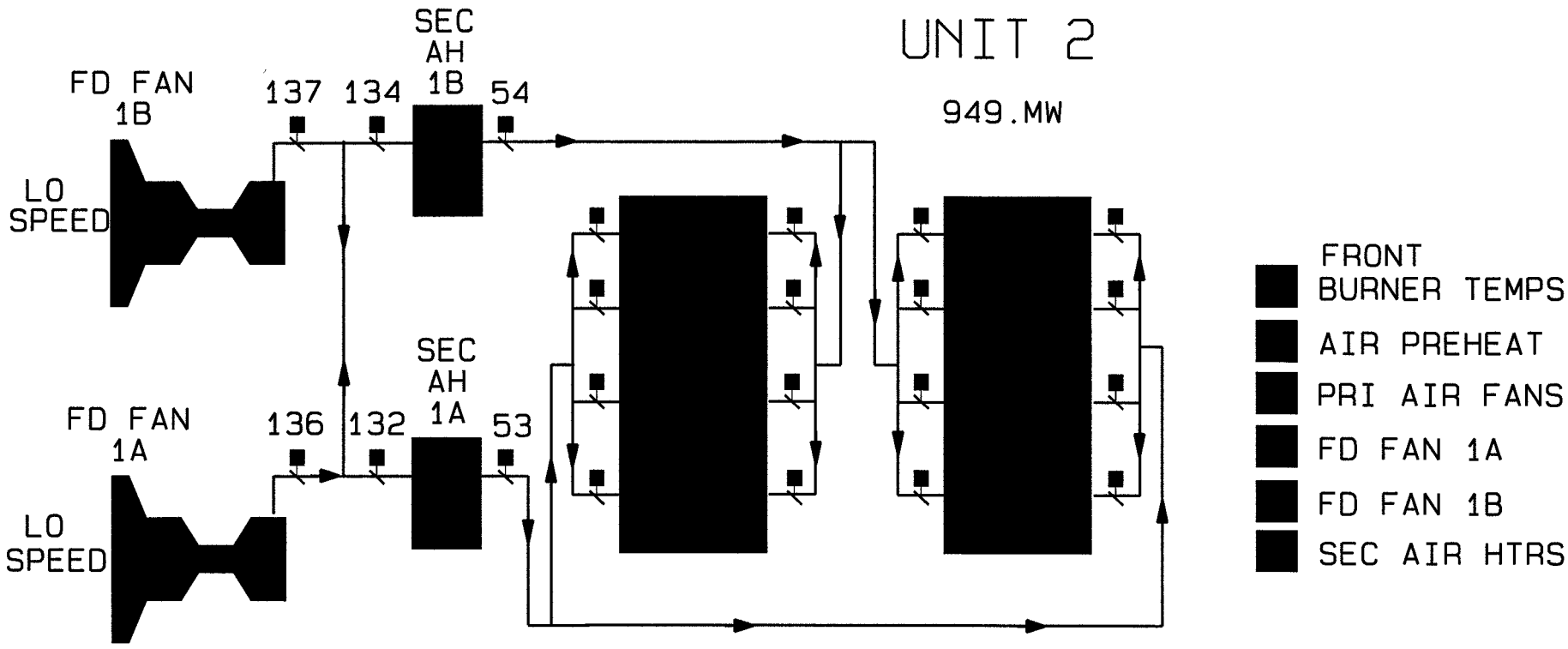


EndTim= 29-Apr-04 15:09:35 /EvalTim= 29-Apr-04 15:09:35 /PanRate= 0

IP7_035397

Printed out for: UNIT2OP - 29-Apr-04 15: 10: 22

0 Messages 2SGBG01 COMBUSTION AIR 29-Apr-04 15: 10: 22



FAN ROOM TEMP
50.

	FD FANS			SEC AIR HTRS			SEC AIR WINDBOX			
							DUCT PRESS		DAMPER POS	
							REAR NORTH	FRONT SOUTH	REAR NORTH	FRONT SOUTH
	1A	1B		1A	1B		INWC	INWC	%	%
						LVL 4	3.4	3.2	78.	73.
KLBH	Shutd	Shut	FLOW %	73.	72.	LVL 3	3.3	0.0	74.	18.
D/P	9.8	9.4	OT F	700.	712.	LVL 2	3.4	3.2	78.	73.
AMPS	211.	206.	IN F	57.	55.	LVL 1	2.3	2.9	74.	74.

EndTim= 29-Apr-04 15: 10: 22 /EvalTim= 29-Apr-04 15: 10: 22 /PanRate= 0

IP7_035398

Printed out for: UNIT2OP - 29-Apr-04 15:21:42

0 Messages O2 Data O2 Unit Comparisons 29-Apr-04 15:21:42

Data		Unit 1	Unit 2
Meas'd Load	MW	937.00	950.50
East Probe 1	% O2	3.24	1.96
Probe 2	% O2	4.55	2.93
Probe 3	% O2	4.18	4.59
Probe 4	% O2	3.40	4.70
Average	% O2	3.66	3.33
West Probe 5	% O2	1.69	4.41
Probe 6	% O2	2.43	3.88
Probe 7	% O2	2.55	2.41
Probe 8	% O2	1.88	2.74
Average	% O2	2.10	3.11
Econ O2 Out Average	% O2	2.88	3.18
Econ O2 Out Setpoint	% O2	3.11	3.10
O2 Trim Setpoint		38.6	58.8
Total Air %		78.9	82.6
Coal Flow	TPH	361.9	367.4
# of Pulv In-service		7.	8.
Main Steam Pressure		2386.8	2338.8
Stack NOx	PPM	210.	193.
Scrubber NOx	PPM	228.	207.
Stack Converted NOx	LB/MBTU	0.348	0.322
Target NOx	LB/MBTU	0.370	0.402
Scrubber Inlet SO2	PPM	424.1	401.1
PSH/RH Bias Dmpr Pos		105./ 30.	100./ 47.
MS/RH Temps		1006.5/1010.0	1013.4/1008.0

	U1	U2
OFA		
%	12.4	4.5
Inlets		
SW	100.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	1.
NE	7.	0.
2/3		
SW	64.	0.
SE	64.	0.
NW	64.	1.
NE	65.	1.
Flow		
SW	235.	67.
SE	246.	69.
NW	213.	109.
NE	196.	109.
	890.	354.

SA Damper		Unit 1		Unit 2
Pulv	A	70.	A	18.
Pulv	B	70.	B	75.
Pulv	C	74.	C	79.
Pulv	D	78.	D	79.
Pulv	E	78.	E	74.
Pulv	F	74.	F	74.
Pulv	G	30.	G	75.
Pulv	H	71.	H	75.

Coal Bias	U1	U2
A Pulv	0.0	0.0
B Pulv	0.0	0.0
C Pulv	0.0	0.0
D Pulv	0.0	0.0
E Pulv	0.0	-4.0
F Pulv	0.0	-4.0
G Pulv	0.0	0.0
H Pulv	0.0	0.0

PA Bias	Unit 1	Unit 2
A Pulv	6.2	0.0
B Pulv	0.0	0.0
C Pulv	4.7	0.0
D Pulv	0.0	2.1
E Pulv	3.8	3.1
F Pulv	3.9	6.5
G Pulv	0.1	0.0
H Pulv	4.8	0.0

EndTim= 29-Apr-04 15:21:42 /EvalTim= 29-Apr-04 15:21:42 /PanRate= 0

IP7_035399

Printed out for: UNIT2OP - 29-Apr-04 15:22:42

0 Messages U2 SA pg 2 U2 Burner SA Flow Measurement Cals's 29-Apr-04 15:22:42

Average Burner SA Flows

Burner Row		Front Wall		Rear Wall	Top to Bottom Balance	
4th	E	95.	D	98.	4th row ave	96.
3rd	A	43.	H	91.	3rd row ave	67.
2nd	F	98.	C	95.	2nd row ave	96.
1st	B	93.	G	82.	1st row ave	88.

Front to Rear Balance

Total Ave 87. Front Wall Ave 82. Rear Wall Ave 91.

Side to Side Balance

Front Burners

#6 82. #5 87. #4 81. #3 87. #2 75. #1 80.

Rear Burners

#6 91. #5 89. #4 90. #3 91. #2 95. #1 91.

Average

#6 87. #5 88. #4 86. #3 89. #2 85. #1 85.

Totalized Flow Pt Cre

Unit 2	
OFA	
%	4.5
Inlets	
SW	0.
SE	0.
NW	0.
NE	0.
1/3	
SW	0.
SE	0.
NW	1.
NE	0.
2/3	
SW	0.
SE	0.
NW	1.
NE	1.
Flow	
SW	67.
SE	69.
NW	109.
NE	94.
	339.

SA Flow E 75.6 %/W 74.8 % Total Air % 82.3 Meas'd Load 952.3 MW

EndTim= 29-Apr-04 15:22:42 /EvalTim= 29-Apr-04 15:22:42 /PanRate= 0

IP7_035400

IPSCU2 // Operator Workplace

4/29/2004 | Main Menu | Master | Boiler | Fuel | Air-Gas | Water | Temps | Auxiliary | Turbine | Alarms | 2:05:31

FUEL:U2SGAG17 IBAM Flow Meters

IBAM FLOW METERS - U2SGAG17

Rear

Pulverizer 1D

D1	D2	D3	D4	D5	D6
0.621	0.714	0.595	0.675	0.691	0.678

Pulverizer 1H

H1	H2	H3	H4	H5	H6
0.505	0.538	0.698	0.559	0.524	0.586

Pulverizer 1C

C1	C2	C3	C4	C5	C6
0.618	0.710	0.596	0.526	0.607	0.637

Pulverizer 1G

G1	G2	G3	G4	G5	G6
0.532	0.555	0.414	0.506	0.398	0.425

Front

Pulverizer 1E

E1	E2	E3	E4	E5	E6
0.503	0.595	0.648	0.646	0.755	0.520

Pulverizer 1A

A1	A2	A3	A4	A5	A6
0.130	0.165	0.134	0.128	0.073	0.108

Pulverizer 1F

F1	F2	F3	F4	F5	F6
0.596	0.567	0.697	0.619	0.818	0.694

Pulverizer 1B

B1	B2	B3	B4	B5	B6
0.633	0.306	0.788	0.517	0.711	0.713

Drum	XXX	FW Flow	XXX	MS Press	2350	MS Temp		RH Temp	1012	Fuel %	81.5	Air %	80.0	Draft	-0.8	MW	950

U2operator | U2TECZC0110 | Replace

IP7_035401

E/W Imbalance (side to side)
O_2 surging by 2% O_2

Air or Coal flow

Options

Pulv loading up
monitor Boiler Press / Controls
is it stat lined

Pulv ΔPs how high 20+?

Pulv Bias

increase PA Duct Press
PA Fans - high speed

Burner Registers

↑ duct press / better balance / pinch down

Keep Airflow up 950 MW 80%+

Printed out for: AARON-N - 25-Apr-04 17:16:19

100 Messages O2 Data O2 Unit Comparisons 25-Apr-04 17:16:19

Data		Unit 1	Unit 2
Meas'd Load	MW	948.25	900.25
East Probe 1	% O2	2.59	2.69
Probe 2	% O2	4.22	3.23
Probe 3	% O2	3.44	3.84
Probe 4	% O2	3.02	3.74
Average	% O2	3.39	3.28
West Probe 5	% O2	2.40	3.17
Probe 6	% O2	2.75	2.10
Probe 7	% O2	2.48	2.40
Probe 8	% O2	2.27	2.51
Average	% O2	2.46	2.61
Econ O2 Out Average	% O2	2.90	2.87
Econ O2 Out Setpoint	% O2	3.09	3.17
O2 Trim Setpoint		37.4	53.4
Total Air %		80.2	76.7
Coal Flow	TPH	371.7	351.6
# of Pulv In-service		7.	7.
Main Steam Pressure		2391.0	2231.4
Stack NOx	PPM	207.	170.
Scrubber NOx	PPM	226.	182.
Stack Converted NOx	LB/MBTU	0.339	0.291
Target NOx	LB/MBTU	0.354	0.383
Scrubber Inlet SO2	PPM	346.3	323.7
PSH/RH Bias Dmpr Pos		105./ 30.	94./ 34.
MS/RH Temps		1001.7/1005.3	1002.9/1004.3

	U1	U2
OFA		
%	12.8	4.7
Inlets		
SW	99.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	0.
NE	7.	0.
2/3		
SW	76.	0.
SE	76.	0.
NW	75.	1.
NE	75.	0.
Flow		
SW	249.	63.
SE	257.	66.
NW	224.	106.
NE	213.	98.
	943.	331.

SA Damper		Unit 1		Unit 2
Pulv	A	73.	A	66.
Pulv	B	74.	B	66.
Pulv	C	77.	C	71.
Pulv	D	81.	D	70.
Pulv	E	82.	E	19.
Pulv	F	77.	F	71.
Pulv	G	10.	G	67.
Pulv	H	74.	H	66.

Coal Bias		U1	U2
A	Pulv	0.0	0.0
B	Pulv	0.0	0.0
C	Pulv	0.0	0.0
D	Pulv	0.0	0.0
E	Pulv	0.0	0.0
F	Pulv	0.0	0.0
G	Pulv	0.0	0.0
H	Pulv	0.0	0.0

PA Bias		Unit 1	Unit 2
A	Pulv	7.4	0.0
B	Pulv	0.0	4.2
C	Pulv	6.5	0.0
D	Pulv	0.0	0.0
E	Pulv	3.8	4.2
F	Pulv	3.0	5.4
G	Pulv	0.1	0.0
H	Pulv	6.0	4.8

EndTim= 25-Apr-04 17:16:19 /EvalTim= 25-Apr-04 17:16:19 /PanRate= 0

IP7_035403

Printed out for: AARON-N - 25-Apr-04 17:16:27

100 Messages O2 Data O2 Unit Comparisons 25-Apr-04 17:16:27

Data		Unit 1	Unit 2
Meas'd Load	MW	948.25	900.25
East Probe 1	% O2	2.59	2.69
Probe 2	% O2	4.22	3.23
Probe 3	% O2	3.44	3.84
Probe 4	% O2	3.02	3.74
Average	% O2	3.39	3.28
West Probe 5	% O2	2.40	3.17
Probe 6	% O2	2.75	2.10
Probe 7	% O2	2.48	2.40
Probe 8	% O2	2.27	2.51
Average	% O2	2.46	2.61
Econ O2 Out Average	% O2	2.90	2.87
Econ O2 Out Setpoint	% O2	3.09	3.17
O2 Trim Setpoint		37.4	53.4
Total Air %		80.2	76.7
Coal Flow	TPH	371.7	351.6
# of Pulv In-service		7.	7.
Main Steam Pressure		2391.0	2231.4
Stack NOx	PPM	207.	170.
Scrubber NOx	PPM	226.	182.
Stack Converted NOx	LB/MBTU	0.339	0.291
Target NOx	LB/MBTU	0.354	0.383
Scrubber Inlet SO2	PPM	346.3	323.7
PSH/RH Bias Dmpr Pos		105./ 30.	94./ 34.
MS/RH Temps		1001.7/1005.3	1002.9/1004.3

	U1	U2
OFA		
%	12.8	4.7
Inlets		
SW	99.	0.
SE	99.	0.
NW	98.	0.
NE	99.	0.
1/3		
SW	2.	0.
SE	3.	0.
NW	0.	0.
NE	7.	0.
2/3		
SW	76.	0.
SE	76.	0.
NW	75.	1.
NE	75.	0.
Flow		
SW	249.	63.
SE	257.	66.
NW	224.	106.
NE	213.	98.
	943.	331.

SA Damper		Unit 1		Unit 2
Pulv	A	73.	A	66.
Pulv	B	74.	B	66.
Pulv	C	77.	C	71.
Pulv	D	81.	D	70.
Pulv	E	82.	E	19.
Pulv	F	77.	F	71.
Pulv	G	10.	G	67.
Pulv	H	74.	H	66.

Coal Bias	U1	U2
A Pulv	0.0	0.0
B Pulv	0.0	0.0
C Pulv	0.0	0.0
D Pulv	0.0	0.0
E Pulv	0.0	0.0
F Pulv	0.0	0.0
G Pulv	0.0	0.0
H Pulv	0.0	0.0

PA Bias	Unit 1	Unit 2
A Pulv	7.4	0.0
B Pulv	0.0	4.2
C Pulv	6.5	0.0
D Pulv	0.0	0.0
E Pulv	3.8	4.2
F Pulv	3.0	5.4
G Pulv	0.1	0.0
H Pulv	6.0	4.8

EndTim= 25-Apr-04 17:16:27 /EvalTim= 25-Apr-04 17:16:27 /PanRate= 0

IP7_035404

Printed out for: AARON-N - 25-Apr-04 17:16:41

100 Messages UNITCOMP UNIT COMPARISONS 25-Apr-04 17:16:41

Data		UNIT 1	UNIT 2
Meas'd Load	KW	948953.	901191.
Throttle Flow	KPPH	6275.50	6238.75
Throttle Press	PSIA	2404.23	2244.02
Throttle Temp	DEG F	1001.70	1002.15
Hot Reheat Temp	DEG F	1006.35	1001.03
Exhaust Press A	INHG	2.76	2.72
Exhaust Press B	INHG	2.24	2.17
Exhaust Press C	INHG	1.98	1.99
Power Factor		0.99	0.99
H2 Pressure	PSIG	63.50	65.50
CV Position	PCT	37.57	36.92
1st Stage Press	PSIA	2276.43	2124.02
4th Stg Shell Press	PSIA	1043.71	985.41
HP Exhaust Press	PSIA	604.63	575.33
IP Inlet Press	PSIA	565.50	536.67
IP Exhaust Press	PSIA	134.50	127.05
HP Turbine Eff	PCT	88.08	89.58
IP Turbine Eff	PCT	91.32	91.86
Meas'd GTHR	BTU/KW-HR	7245.	7859.
RH Press Drop	PCT	6.44	6.75
HP Turb Press Ratio		3.83	3.75
IP Turb Press Ratio		4.16	4.18
Blr HL Eff	PCT	89.03	89.27
Blr Input/Output Eff	PCT	83.38	90.14
Coal Flow	TONS/HR	372.	351.

Data	UNIT 1	UNIT 2
Aux Pwr MW	49.50	1.04
Final FW Flow	6093.50	6042.75
SH Sprays	185.88	197.75
Calc'd Sprays	210.92	210.45
Throttle Flow	OverR	6751.35
Dea Drain Flow	6526.88	6230.05
BBFP Disch FL	6780.00	OverR
BFP Disch Flow	6603.00	OverR
Cond Flow	5085.00	4719.00
Calc'd Cond FL	4739.33	4968.37
GTHR PMAX	7245.	7859
GTHR PI	7226.	7927
GTHR CORR	7288.	7910
NTHR PMAX	7653.	BadTot
NTHR PI	7605.	7921
GUHR PMAX	8138.	8804
GUHR PI	8150.	8929
GUHR CORR	8213.	8890
GUHR ACCOUNT	8986.	8970
NUHR CURVE	9429.	CalcF
NUHR PMAX	8587.	BadTot
NUHR PI	8610.	8947
NUHR CORR	8657.	CalcF
NUHR ACCOUNT	9476.	8964

EndTim= 25-Apr-04 17:16:41 /EvalTim= 25-Apr-04 17:16:41 /PanRate= 0

IP7_035405

Printed out for: AARON-N - 25-Apr-04 17:16:56

100 Messages Envir Stat Environmental Stats 25-Apr-04 17:16:56

	Unit 1	Unit 2
Load	946.75 MW	900.25 MW
Opacity		
Casing Outlet	A 2.2 B 2.7 C 2.1	A 4.2 B 4.5 C 4.1
CEM @ Scrub Inlet	1.6	3.6
SO2		
Scrub In ppm /lb/mbtu	349. / 0.738	326. / 0.739
	1A 1B 1C 1D 1E 1F	1A 1B 1C 1D 1E 1F
Module Outlet ppm	16. 10. 0. 0. 7. 25.	0. 12. 16. 14. 0. 7.
Rxn Tank PH	5.81 5.82 4.00 8.00 5.81 5.80	7.57 5.80 5.89 5.89 7.50 5.9
Stack ppm/ lb/mbtu	15. / .037	18. / .042
% SO2 Removal	94.9	94.2
	WEPCO Target .042	WEPCO Target .042
	Upper Limit .138	Upper Limit .138
NOx	O2 2.77 OFA % 12.8	O2 3.11 OFA % 4.7
Scrubber Inlet ppm	225.	182.
Stack ppm/ lb/mbtu	207. / .339	170. / .291
	Target .354	Target .383
	Limit .461	Limit .461
CO2		
Scrub In/Stack %	14.12 / 13.04	13.18 / 12.51
Other		
Coal Flow TPH	371.9	350.2
Total Air %	79.9	76.6
Vol Flow MSCFH	134.72	132.00
Boiler Duty mbtu/hr	8584.4	7946.5
Corr FW Flow KPPH	6340.1	6183.7
O2 E/W	3.13 / 2.36	3.10 / 3.07

EndTim= 25-Apr-04 17:16:56 /EvalTim= 25-Apr-04 17:16:56 /PanRate= 0

IP7_035406

Printed out for: AARON-N - 25-Apr-04 17:20:08

100 Messages Envir Stat Environmental Stats 25-Apr-04 17:20:08

	Unit 1	Unit 2
Load	948.25 MW	899.00 MW
Opacity		
Casing Outlet	A 2.2 B 2.7 C 2.5	A 4.1 B 4.5 C 4.1
CEM @ Scrub Inlet	2.1	2.7
SO2		
Scrub In ppm /lb/mbtu	350. / 0.743	326. / 0.743
	1A 1B 1C 1D 1E 1F	1A 1B 1C 1D 1E 1F
Module Outlet ppm	17. 10. 0. 0. 7. 18.	0. 13. 16. 15. 0. 7.
Rxn Tank PH	5.81 5.81 4.00 8.00 5.81 5.82	7.57 5.82 5.88 5.88 7.50 5.9
Stack ppm/ lb/mbtu	15. / .036	18. / .041
% SO2 Removal	94.9	94.2
	WEPCO Target .043	WEPCO Target .043
	Upper Limit .138	Upper Limit .138
NOx	O2 2.76 OFA % 12.8	O2 3.17 OFA % 4.7
Scrubber Inlet ppm	226.	180.
Stack ppm/ lb/mbtu	204. / .339	170. / .291
	Target .354	Target .384
	Limit .461	Limit .461
CO2		
Scrub In/Stack %	14.10 / 13.04	13.13 / 12.48
Other		
Coal Flow TPH	372.7	348.2
Total Air %	80.1	76.1
Vol Flow MSCFH	137.53	130.99
Boiler Duty mbtu/hr	8595.4	7958.7
Corr FW Flow KPPH	6320.0	6207.0
O2 E/W	3.22 / 2.35	3.58 / 2.74

EndTim= 25-Apr-04 17:20:08 /EvalTim= 25-Apr-04 17:20:08 /PanRate= 0

IP7_035407

Printed out for: AARON-N - 25-Apr-04 17:20:21

100 Messages U2 Pulv U2 Pulv Operating data 25-Apr-04 17:20:21

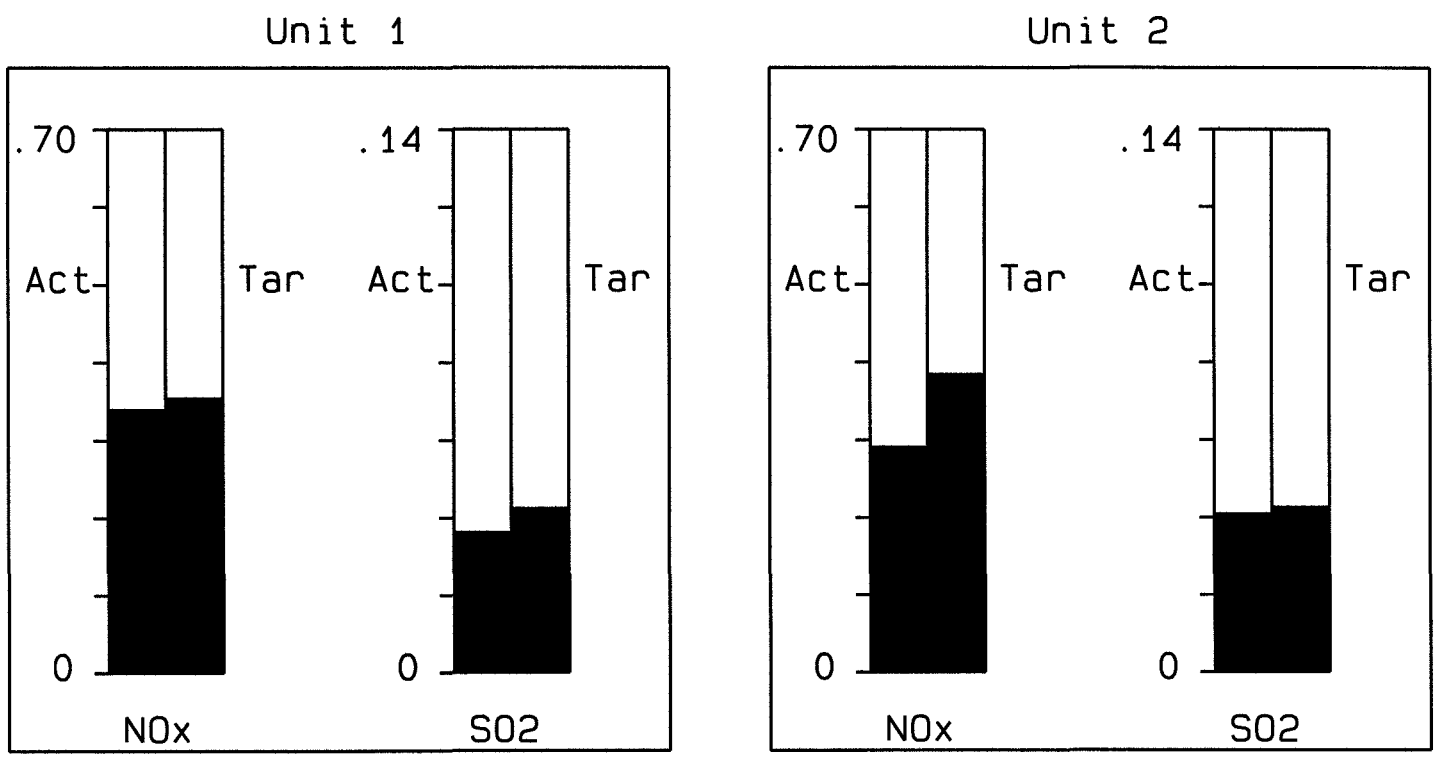
Unit 2 901.0 MW	Pulv A	Pulv B	Pulv C	Pulv D	Pulv E	Pulv F	Pulv G	Pulv H
Coal Flow348.4TPH	49.1	50.8	53.2	49.2	0.0	50.5	50.4	50.6
Feeder Speed	72.4	73.4	76.7	72.6	0.0	73.4	74.3	73.1
Amps (Duct Pr44.2)	59.2	58.8	65.0	70.2	0.0	61.0	58.8	60.4
Coal Pipe Vel	3971.	4109.	3897.	3569.	0.	4152.	3922.	4098.
PA Flow %	90.5	92.9	88.5	82.9	0.0	93.9	89.2	93.6
PA Damper Pos (Duct Pr	82.9	72.5	74.6	72.1	0.0	82.2	72.7	94.8
SA Damper Pos	68.9	68.9	73.3	72.9	19.0	72.9	68.7	68.5
PA Mass Flow	3577.	3645.	3483.	3272.	0.	3698.	3521.	3674.
Pulv DP (NOx 0.29)	15.3	16.0	15.2	10.7	0.0	17.6	0.0	12.3
Air to Fuel Ratio	2.18	2.19	1.99	1.97	0.00	2.22	2.09	2.21
Pulv Inlet Temp	331.0	351.7	337.3	309.5	91.3	374.0	373.1	384.6
Pulv Outlet Temp	149.7	153.6	149.4	148.0	91.9	150.1	150.1	150.8
Coal Bias	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Bias	0.0	4.2	0.0	0.0	4.2	5.4	0.0	4.8
Hyd Skid Pr Fdbk	2136.	2132.	2027.	1985.	2422.	2346.	2219.	2132.
Hyd Skid Pr Setpt	2224.	2265.	2362.	1149.	1779.	2237.	2259.	2243.

EndTim= 25-Apr-04 17:20:21 /EvalTim= 25-Apr-04 17:20:21 /PanRate= 0

Printed out for: AARON-N - 25-Apr-04 17:20:41

100 Messages OP ENVIR NOx/SO2 Targets 25-Apr-04 17:20:41

	Unit 1	Unit 2
Load, gross MW	948.00	898.50
Scrubber Inlet SO_2 PPM	350.0	326.1
Actual NOx lb/mbtu	0.34	0.29
Target NOx lb/mbtu	0.35	0.38
Actual SO2 lb/mbtu	0.036	0.041
Target SO2 lb/mbtu	0.042	0.043



EndTim= 25-Apr-04 17:20:41 /EvalTim= 25-Apr-04 17:20:41 /PanRate= 0

IP7_035409

Printed out for: AARON-N - 25-Apr-04 17:21:12

100 Messages U2 SA Flow Secondary Air flow 25-Apr-04 17:21:12

Unit 2

Pulv on/off	Pulv D/P	PA / SA DAMPER Position		WB Press	SA FLOW Average
E OFF	0.0	0.0	19.0%	0.0	CalcF
A ON	15.5	82.9	69.8%	2.3	85.
F ON	18.4	82.9	74.2%	2.7	94.
B ON	15.4	72.9	70.2%	2.3	92.
D ON	10.8	73.5	73.8%	2.7	94.
H ON	12.1	95.4	70.1%	2.6	89.
C ON	15.1	74.8	74.3%	2.9	93.
G ON	0.0	73.1	70.3%	2.0	85.

(Total Air 76.2 %) Coal Flow 348.9 TPH

Burner SA Flow Measurment

2E6 38.	2E5 46.	2E4 41.	2E3 42.	2E2 39.	2E1 38.
2A6 81.	2A5 65.	2A4 91.	2A3 90.	2A2 100.	2A1 84.
2F6 98.	2F5 105.	2F4 89.	2F3 95.	2F2 90.	2F1 89.
2B6 99.	2B5 101.	2B4 85.	2B3 105.	2B2 66.	2B1 93.

FRONT WALL (looking North)

2D6 96.	2D5 96.	2D4 96.	2D3 89.	2D2 98.	2D1 91.
2H6 91.	2H5 86.	2H4 88.	2H3 97.	2H2 87.	2H1 84.
2C6 94.	2C5 94.	2C4 85.	2C3 90.	2C2 100.	2C1 93.
2G6 82.	2G5 79.	2G4 89.	2G3 81.	2G2 90.	2G1 88.

REAR WALL (looking North)

PA Duct Pr 44.2 INWC O2 % 3.25 E/ 2.85 W

SA Duct Pr 2.4 E/ 2.5 W NOx 0.29 lb/mBtu SA WB Temp 697. E/ 704. W Load 901. MW

EndTim= 25-Apr-04 17:21:12 /EvalTim= 25-Apr-04 17:21:12 /PanRate= 0

IP7_035410

Printed out for: AARON-N - 25-Apr-04 17:21:22

100 Messages U2 SA pg 2 U2 Burner SA Flow Measurement Cals's 25-Apr-04 17:21:22

Average Burner SA Flows

Burner Row		Front Wall		Rear Wall
4th	E	CalcF	D	94.
3rd	A	85.	H	89.
2nd	F	94.	C	93.
1st	B	92.	G	85.

Top to Bottom Balance

4th row ave 94.

3rd row ave 87.

2nd row ave 94.

1st row ave 88.

Front to Rear Balance

Total Ave 90. Front Wall Ave 90. Rear Wall Ave 90.

Side to Side Balance

Front Burners

#6 93. #5 91. #4 88. #3 97. #2 85. #1 89.

Rear Burners

#6 91. #5 89. #4 89. #3 89. #2 94. #1 89.

Average

#6 91. #5 90. #4 89. #3 92. #2 90. #1 89.

Totalized Flow Pt Cre

Unit 2

OFA	
%	4.7
Inlets	
SW	0.
SE	0.
NW	0.
NE	0.
1/3	
SW	0.
SE	0.
NW	0.
NE	0.
2/3	
SW	0.
SE	0.
NW	1.
NE	0.
Flow	
SW	63.
SE	69.
NW	106.
NE	101.
	332.

SA Flow E 69.6 %/W 69.3 % Total Air % 76.5 Meas'd Load 899.5 MW

EndTim= 25-Apr-04 17:21:22 /EvalTim= 25-Apr-04 17:21:22 /PanRate= 0

IP7_035411

Printed out for: AARON-N - 25-Apr-04 17:21:44

100 Messages UNITCOMP UNIT COMPARISONS 25-Apr-04 17:21:44

Data		UNIT 1	UNIT 2
Meas'd Load	KW	947500.	898968.
Throttle Flow	KPPH	6153.00	6237.00
Throttle Press	PSIA	2403.63	2234.42
Throttle Temp	DEG F	1002.15	995.25
Hot Reheat Temp	DEG F	1007.18	998.17
Exhaust Press A	INHG	2.78	2.72
Exhaust Press B	INHG	2.24	2.17
Exhaust Press C	INHG	1.99	1.98
Power Factor		0.99	0.99
H2 Pressure	PSIG	63.30	65.50
CV Position	PCT	40.43	35.11
1st Stage Press	PSIA	2280.63	2127.02
4th Stg Shell Press	PSIA	1044.74	985.41
HP Exhaust Press	PSIA	604.38	575.68
IP Inlet Press	PSIA	565.50	537.26
IP Exhaust Press	PSIA	134.55	127.45
HP Turbine Eff	PCT	88.34	89.19
IP Turbine Eff	PCT	91.30	91.46
Meas'd GTHR	BTU/KW-HR	7294.	7864.
RH Press Drop	PCT	6.43	6.66
HP Turb Press Ratio		3.83	3.75
IP Turb Press Ratio		4.16	4.16
Blr HL Eff	PCT	89.00	89.25
Blr Input/Output Eff	PCT	83.16	90.91
Coal Flow	TONS/HR	372.	349.

Data	UNIT 1	UNIT 2
Aux Pwr MW	49.80	3.1(
Final FW Flow	5974.50	6056.7[illegible]
SH Sprays	183.38	186.8[illegible]
Calc'd Sprays	210.32	215.8[illegible]
Throttle Flow	6966.54	6738.1[illegible]
Dea Drain Flow	6504.72	6164.2[illegible]
BBFP Disch FL	6722.50	OverR
BFP Disch Flow	6607.05	OverR
Cond Flow	4974.00	4773.0(
Calc'd Cond FL	4719.81	4958.5[illegible]
GTHR PMAX	7294.	7864
GTHR PI	7181.	7891
GTHR CORR	7337.	7879
NTHR PMAX	7660.	BadTot
NTHR PI	7586.	7875
GUHR PMAX	8195.	8811
GUHR PI	8131.	8801
GUHR CORR	8233.	8831
GUHR ACCOUNT	8986.	8901
NUHR CURVE	9429.	CalcF
NUHR PMAX	8585.	BadTot
NUHR PI	8560.	8841
NUHR CORR	8549.	CalcF
NUHR ACCOUNT	9518.	8883

EndTim= 25-Apr-04 17:21:44 /EvalTim= 25-Apr-04 17:21:44 /PanRate= 0

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Printed out for: AARON-N - 25-Apr-04 17:21:58

100 Messages FLOW COMP Flow Comparisons for both units 25-Apr-04 17:21:58

Data		UNIT 1	UNIT 2
Meas'd Load	KW	949875.	899992.
Cond Flow	KPPH	4914.00	4687.50
Calc'd Cond Flow	KPPH	4710.50	4944.29
Dea Drain Flow	KPPH	6504.72	6164.22
BBFP Disch Flow	KPPH	6722.50	OverR
BFP Disch Flow	KPPH	6607.05	OverR
SH Sprays (CCS)	KPPH	183.00	181.75
Calc'd Sprays	KPPH	215.21	212.60
Final FW Flow (CCS)	KPPH	5948.25	6048.00
Final FW Flow (Fox1A)	KPPH	6685.60	6529.08
Calc'd Final FW Flow	KPPH	6339.69	5958.31
Throttle Flow (CCS)	KPPH	6128.50	6224.75
Throttle Flow (Fox1A)	KPPH	6966.54	6738.13
Turbine Steam Flow	KPPH	6741.00	6273.75
Cold RH Flow calc'd	LB/HR	5116415.	5318644.
Coal Flow (CCS)	TONS/HR	370.80	355.72
Coal TPH Indiv Sum A'	TONS/HR	371.60	355.55
Coal TPH Indiv Sum B'	TONS/HR	368.75	357.71
Fuel Flow (CCS)	TONS/HR	372.10	349.65
Coal Flow Back calc'd	TONS/HR	338.47	344.84
Coal Flow Expected	TONS/HR	368.80	CalcF

Data	UNIT 1	UNIT 2
Aux Pwr MW	49.80	3.1(
Blr HL Eff	89.03	89.2(
GTHR PMAX	7217.	7858
GTHR PI	7181.	7891
GTHR CORR	7257.	7873
NTHR PMAX	7625.	BadTot
NTHR PI	7586.	7875
GUHR PMAX	8106.	8801
GUHR PI	8131.	8801
GUHR CORR	8233.	8831
GUHR ACCOUNT	8986.	8901
NUHR CURVE	9429.	CalcF
NUHR PMAX	8568.	BadTot
NUHR PI	8560.	8841
NUHR CORR	8549.	CalcF
NUHR ACCOUNT	9518.	8883

EndTim= 25-Apr-04 17:21:58 /EvalTim= 25-Apr-04 17:21:58 /PanRate= 0

IP7_035413

Printed out for: AARON-N - 25-Apr-04 17:22:26

100 Messages U2Auxpwr Unit 2 Aux Power 25-Apr-04 17:22:26

Load 898.3 mw Aux PowerShutdo mw Ambient Temp 66.5 deg F

SWGR 2A1	1.0	mw	SWGR 2A2		1.0	mw	SWGR 2B2		1.0	mw
CCCW Pmp 1A	36.2	amps	ID Fan 1A	1A1	116.7	amps	ID Fan 1C	1C1	281.2	amps
Air CPRSR 1C	Shutdo	amps		1A2	243.1	amps		1C2	230.7	amps
Pulv 1A	61.8	amps	ID Fan 1B	1B1	255.7	amps	ID Fan 1D	1D1	230.2	amps
Pulv 1B	59.9	amps		1B2	269.5	amps		1D2	218.2	amps
Pulv 1C	62.3	amps	FD Fan 1A		205.4	amps	FD Fan 1B		202.2	amps
Pulv 1D	68.5	amps	PA Fan 2A		201.4	amps	PA Fan 2B		203.1	amps
			CNDS P 1A		113.6	amps	CNDS P 1B		0.0	amps
SUMMATION	CalcF	amps	CNDS P 1C		116.3	amps	CWP 1A		185.2	amps
			CWP 1B		180.3	amps	Air CPRSR 1D		Shutdo	amps
			Turb LO Flush P				CWP 1C		183.5	amps
			Flyash CPSR 1A	STOP			Flyash CPSR 1B	STOP		
SWGR 2B1	1.0	mw	Belt CNVR 18B	YES			Flyash CPSR 1C	START		
CCCW Pmp 1B	0.0	amps	BBFP 2B		39.6	amps	BBFP 2A		40.2	amps
			Stby BFP 1C		0.0	amps	BBFP 2C		0.0	amps
Pulv 1E	0.0	amps								
Pulv 1F	59.6	amps	SUMMATION		1750.5	amps	SUMMATION		CalcF	amps
Pulv 1G	59.7	amps								
Pulv 1H	61.1	amps								

Total Pulv Amps	425.7	amps
Total ID Fan Amps	1856.8	amps
Total FD Fan Amps	407.6	amps
Total PA Fan Amps	406.5	amps
Total CCCW P Amps	36.2	amps
Total Cnd P Amps	228.6	amps
Total CWP Amps	548.9	amps
Total BBFP Amps	79.9	amps

Coal yard

Scrubber

SUMMATION 179.4 amps

EndTim= 25-Apr-04 17:22:26 /EvalTim= 25-Apr-04 17:22:26 /PanRate= 0

IP7_035414

Printed out for: AARON-N - 25-Apr-04 17:23:29

100 Messages PUMPS MTR PUMPS AND MOTOR DATA 25-Apr-04 17:23:29

CWP Unit 1	1A	1B	1C	Unit 2	1A	1B	1C
Motor Amps	183.0	182.5	180.0		185.2	181.4	183.6
Thrust BRG	129.0	148.4	147.2		139.8	139.3	151.0
Upper BRG	144.2	127.3	130.4		134.4	132.8	136.0
Lower BRG	119.2	128.0	101.0		93.0	113.1	118.0
Stator C	72.4	71.9	76.0		65.1	88.2	77.1

Cond Pmp	1A	1B	1C		1A	1B	1C
Motor Amps	119.3	119.6	0.0		113.5	0.0	116.2
Thrust BRG	135.1	157.9	86.1		129.7	83.6	158.5
Upper BRG	153.3	145.8	88.3		159.9	84.2	142.3
Lower BRG	150.5	149.1	87.1		159.4	81.3	160.8
Stator C	79.3	77.0	29.4		67.3	26.4	85.9

Air Compressor	1A	1B	1C	1D
Motor Amps	49.4	0.0	Shutd	Shutd
Inboard BRG	154.0	89.7	161.4	159.1
Outboard BRG	156.9	93.3	149.7	147.0
Stator C	80.5	33.2	103.2	105.6

Conveyor	2A	2B	3	4	5A	5B	6	8	18A	18B
Inboard BRG	76.6	86.5	70.2	72.1	81.1	76.5	67.4	115.9	136.7	129.7
Outboard BRG	79.6	89.0	68.1	66.9	81.4	77.9	70.0	99.3	133.4	142.2

PA Fan Mtr/Fan	2A	2B		2A	2B
Motor Amps	200.0	204.1		202.3	203.6
Inboard BRG	114.8	115.9		123.1	116.0
Outboard BRG	127.1	129.9		128.6	131.0
Fan Inbrd BRG	140.7	141.1		131.1	100.1
Fan Outbd BRG	130.8	147.4		142.6	112.8

EndTim= 25-Apr-04 17:23:29 /EvalTim= 25-Apr-04 17:23:29 /PanRate= 0

IP7_035415

Printed out for: AARON-N - 25-Apr-04 17:23:43

100 Messages Fans PA, FD, ID FAN DATA 25-Apr-04 17:23:43

UNIT 1

948.0 MW	FD 1A	FD 1B	PA 2A	PA 2B		ID 1A	ID 1B	ID 1C	ID 1D
Speed	Low	Low	Low	Low	Fox	793.1	793.4	804.7	798.1
					CCS	791.8	792.8	809.3	802.2
Amps	202.7	212.0	200.0	204.1	Lnk 1_1	315.0	333.8	352.5	341.3
					Lnk 1_2	311.3	341.3	345.0	341.3
Inlet Pr						-22.4	-22.4	-22.4	-22.4
Outlet Pr			43.5	43.5		4.66	4.36	4.18	4.53
Blade Pos	56.6	55.8	63.5	63.5					

UNIT 2

899.8 MW	FD 1A	FD 1B	PA 2A	PA 2B		ID 1A	ID 1B	ID 1C	ID 1D
Speed	Low	Low	Low	Low	Fox	690.8	687.3	677.6	686.0
					CCS	688.3	688.3	682.7	606.5
Amps	205.4	202.2	203.1	205.1	Lnk 1_1	116.7	257.7	279.2	231.3
					Lnk 1_2	259.8	268.7	232.7	208.3
Inlet Pr						-15.5	-15.5	-15.5	-15.5
Outlet Pr			43.8	43.8		4.09	3.90	4.09	4.08
Blade Pos	51.5	51.3	71.3	71.7					

EndTim= 25-Apr-04 17:23:43 /EvalTim= 25-Apr-04 17:23:43 /PanRate= 0

IP7_035416

Printed out for: AARON-N - 25-Apr-04 17:24:49

100 Messages PUMPS MTR PUMPS AND MOTOR DATA 25-Apr-04 17:24:49

CWP Unit 1	1A	1B	1C	Unit 2	1A	1B	1C
Motor Amps	182.5	181.5	180.0		185.4	180.7	183.6
Thrust BRG	129.0	148.4	147.2		139.8	139.3	151.0
Upper BRG	144.2	127.3	130.4		133.9	133.3	137.1
Lower BRG	119.2	128.0	101.0		93.0	113.1	118.0
Stator C	72.4	71.9	76.0		65.1	88.2	76.5

Cond Pmp	1A	1B	1C	1A	1B	1C
Motor Amps	120.6	119.6	0.0	113.3	0.0	116.2
Thrust BRG	135.1	157.9	86.1	129.5	83.6	158.5
Upper BRG	153.3	145.8	88.3	159.4	84.7	141.8
Lower BRG	150.5	149.1	87.4	159.4	81.3	160.8
Stator C	79.3	77.0	29.4	67.3	26.4	85.7

Air Compressor	1A	1B	1C	1D
Motor Amps	49.4	0.2	Shutd	Shutd
Inboard BRG	153.6	88.8	161.4	159.1
Outboard BRG	156.4	92.7	149.7	147.0
Stator C	80.5	33.2	103.2	105.6

Conveyor	2A	2B	3	4	5A	5B	6	8	18A	18B
Inboard BRG	76.6	86.4	70.2	72.1	81.1	76.5	67.4	115.9	136.7	129.7
Outboard BRG	79.6	89.0	68.1	66.9	81.4	77.9	70.0	99.3	133.4	142.2

PA Fan Mtr/Fan	2A	2B	2A	2B
Motor Amps	200.0	204.1	204.6	205.5
Inboard BRG	114.8	115.9	123.1	116.0
Outboard BRG	127.1	129.9	128.6	131.5
Fan Inbrd BRG	140.7	141.1	131.1	100.1
Fan Outbd BRG	130.8	147.4	142.6	112.8

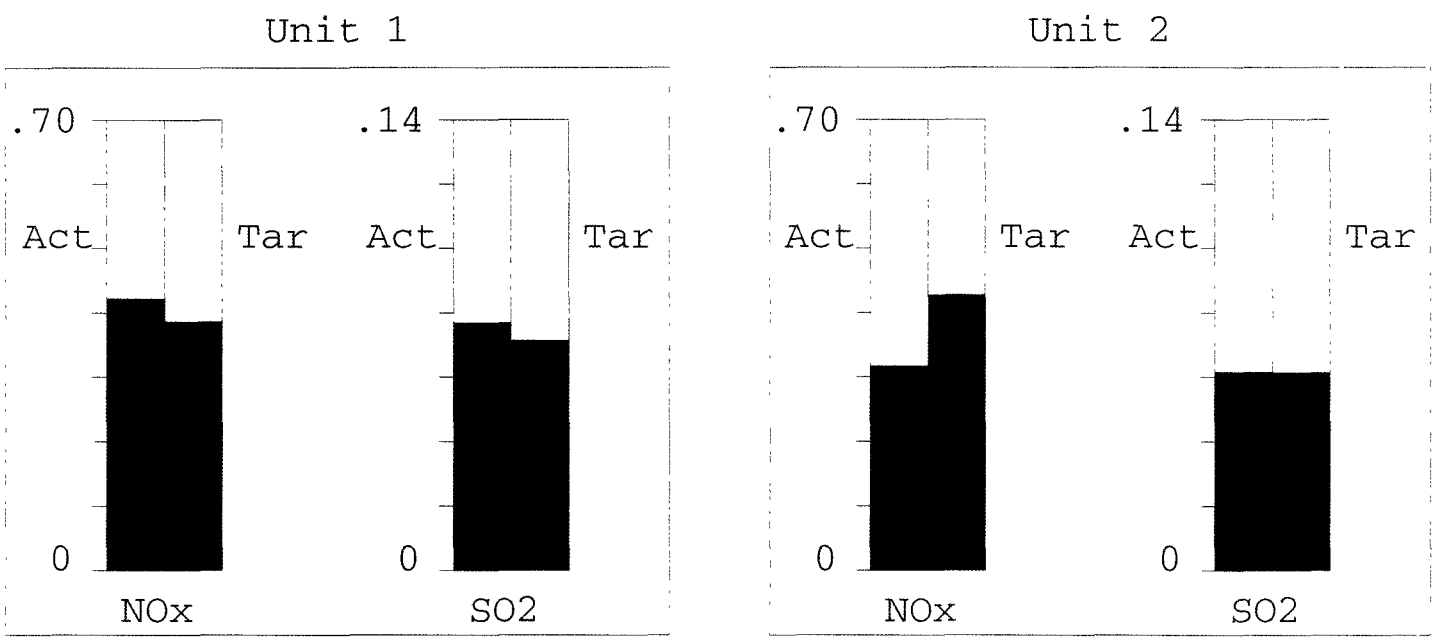
EndTim= 25-Apr-04 17:24:49 /EvalTim= 25-Apr-04 17:24:49 /PanRate= 0

IP7_035417

Printed out for: UOSUPER - 19-Apr-04 12:56:30

0 Messages OP ENVIR NOx/SO2 Targets 19-Apr-04 12:56:30

	Unit 1	Unit 2
Load, gross MW	949.00	899.00
Scrubber Inlet SO2 PPM	452.5	394.2
Actual NOx lb/mbtu	0.42	0.32
Target NOx lb/mbtu	0.39	0.43
Actual SO2 lb/mbtu	0.077	0.062
Target SO2 lb/mbtu	0.071	0.061

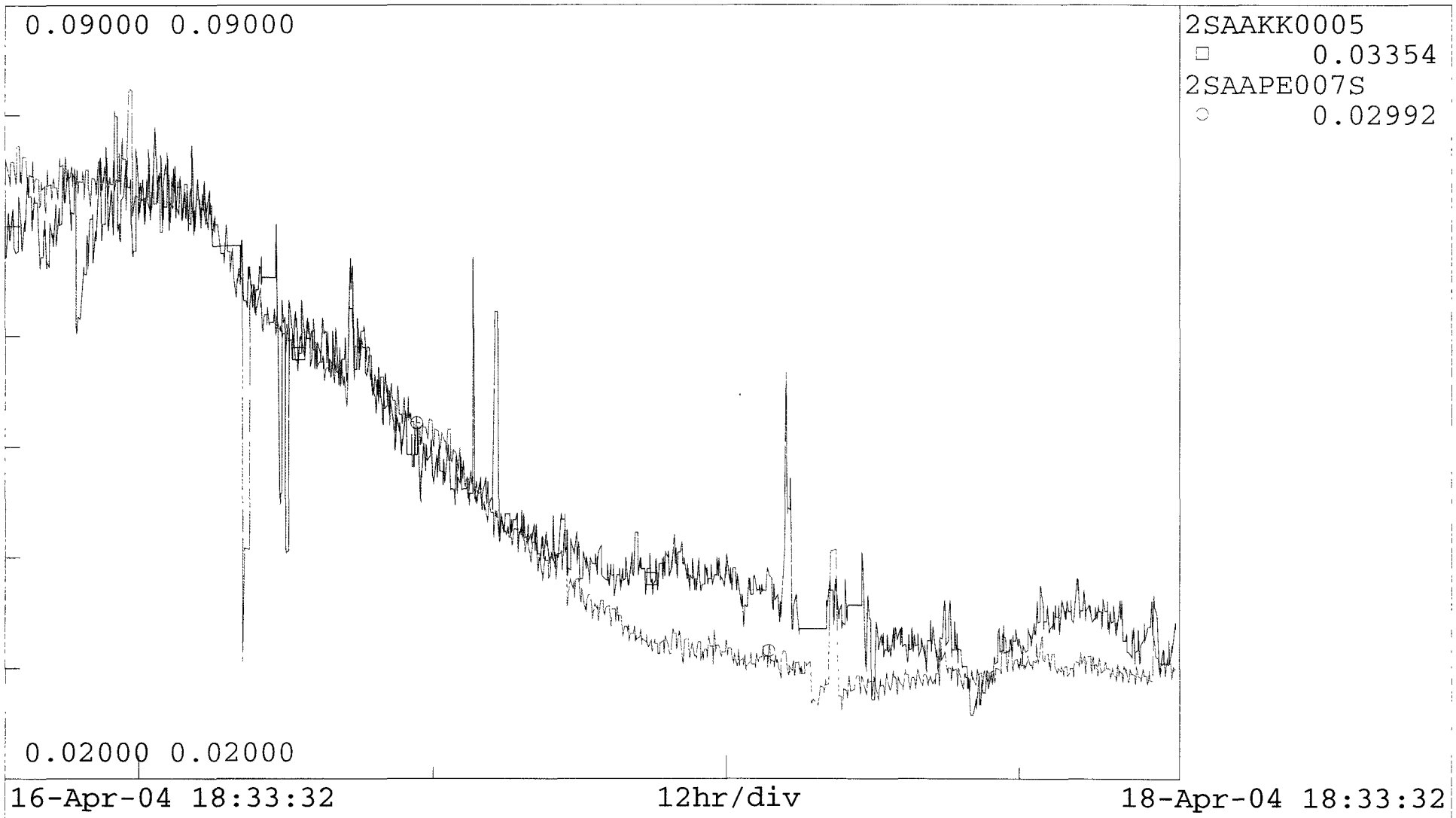


EndTim= 19-Apr-04 12:56:30 /EvalTim= 19-Apr-04 12:56:30 /PanRate= 0

IP7_035418

Printed out for: UOSUPER - 18-Apr-04 18:24:19

0 Messages OP ENVIR NOx/SO2 Targets 18-Apr-04 18:24:19



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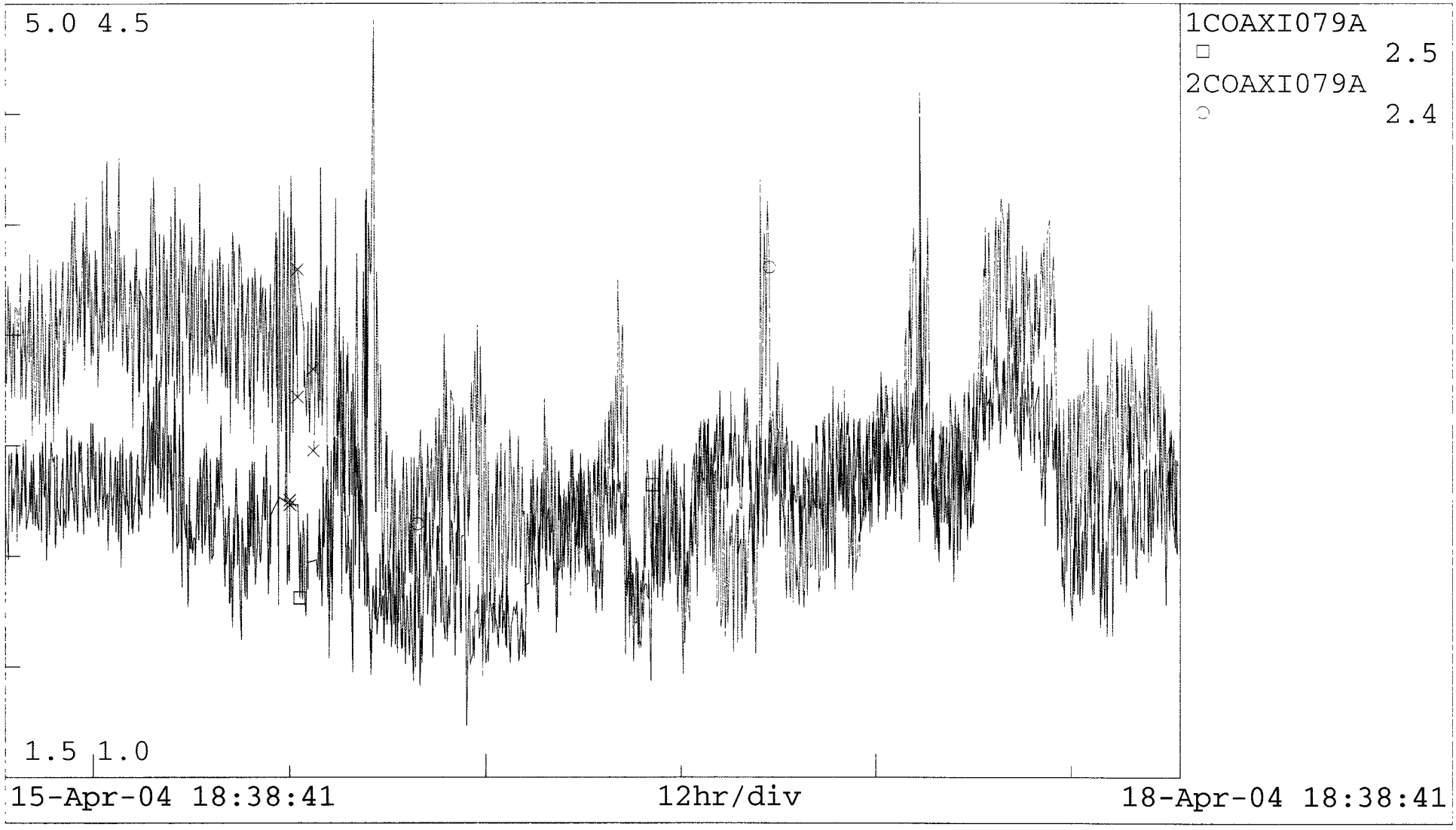
IP7_035419

Printed out for: UOSUPER - 18-Apr-04 18:29:59

0 Messages O2 Data O2 Unit Comparisons 18-Apr-04 18:29:59



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IP7_035420