Appendix A. Results and Calculations

Spreadsheet Printouts

General Calculations

Mercury Specific Calculations and Examples

Bypass Calculations

Data Tracking Logs

FOSSIL ENERGY RESEARCH CORP.

ISOKINETIC TEST DATA SUMMARY

Test Program Information				
Client	PNM	*Data input by*	MDM	
Plant/Unit	San Juan 2	*Method*	Ontario Hydro	
Sample Location	Module H Inlet	*Stack Area, ft^2*	172.4	
Fuel	Coal	*Sample Train ID*	1-FERCo	
F_D, dscf/MMBtu	9780	*Meter factor, Y_D*	1.001	
F_C, scf CO_2/MMBtu	1800	*Ref Temp, F*	68	
Pre-test Information				
Test Number	2-Inlet	3-Inlet	4-Inlet	Average
Test Date, 1999	21-Oct	22-Oct	22-Oct	
Pitot Factor, C_p	0.84	0.84	0.84	-
Barometric Pressure, in Hg	25.1	25.2	24.9	-
Sample Time, min	150	150	150	-
Nozzle Diameter, in	0.276	0.276	0.276	-
Sample Train Data				
Meter Volume, acf	87.876	78.180	75.753	-
Orifice k factor	0.556	0.549	0.568	0.558
Static Pressure, iwg	-0.13	-0.13	0	0
ΔP, iwg	0.2432	0.2069	0.1795	0.2099
ΔH, iwg	1.11	0.90	0.79	0.93
Meter Temp, F	77.8	56.5	85.0	73.1
Stack Temp, F	293.9	277.9	295.8	289.2
Water collected, g	151.6	130.7	134.8	139.0
O_2, %	5.61	5.32	4.63	5.19
CO_2, %	13.46	13.72	14.33	13.84
Start time/stop time	1454/1821	0815/1117	1403/1700	
Sample Train Results				
Std Sample Vol, dscf	72.679	67.552	61.276	67.169
Std Sample Vol, m^3	2.058	1.913	1.735	1.902
Std Moisture Vol, dscf	7.156	6.169	6.363	-
Moisture, %	8.96%	8.37%	9.41%	8.91%
Dry Molecular Weight	30.38	30.41	30.48	-
Wet Molecular Weight	29.27	29.37	29.30	29.31
Gas Velocity, ft/s	35.82	32.57	30.92	33.10
Duct Gas Flow, wacfm	370,469	336,809	319,764	342,347
Duct Gas Flow, dscfm	198,078	185,927	168,354	184,120
Isokinetic Ratio, %	101.50	100.51	100.69	-
Mercury catch, ug				
Particulate	0.07	0.14	0.08	0.072
Oxidized	11.00	5.50	8.00	
Elemental	10.23	7.10	5.70	
Total	21.23	12.74	13.70	15.89
Mercury catch, ug/m^3				
Particulate	0.034	0.073	0.046	0.038
Oxidized	5.345	2.875	4.611	4.28
Elemental	4.971	3.712	3.285	3.99
Total	10.316	6.660	7.896	8.29
Mercury catch, lb/10^{12} Btu				
Particulate	0.028	0.060	0.036	0.031
Oxidized	4.451	2.350	3.608	3.47
Elemental	4.140	3.034	2.571	3.25
Total	8.591	5.443	6.179	6.74
Mercury, lb/hr				
Particulate	0.00003	0.00005	0.00003	0.00003
Oxidized	0.0040	0.0020	0.0029	0.0030
Elemental	0.0037	0.0026	0.0021	0.0028
Total	0.0076	0.0046	0.0050	0.0057

Note: shaded values are not detects. Calculations are shown at detection levels.

FOSSIL ENERGY RESEARCH CORP.

ISOKINETIC TEST DATA SUMMARY

Test Program Information				
Client	PNM	*Data input by*	MDM	
Plant/Unit	San Juan 2	*Method*	Ontario Hydro	
Sample Location	Module H Outlet	*Stack Area, ft^2*	130.0	
Fuel	Coal	*Sample Train ID*	3-WCS	
F_D, dscf/MMBtu	9780	*Meter factor, Y_D*	0.98	
F_C, scf CO_2/MMBtu	1800	*Ref Temp, F*	68	
Pre-test Information				
Test Number	2-Outlet	3-Outlet	4-Outlet	Average
Test Date, 1999	21-Oct	22-Oct	22-Oct	
Pitot Factor, C_p	0.84	0.84	0.84	-
Barometric Pressure, in Hg	25.0	25.1	24.9	-
Sample Time, min	144	144	144	-
Nozzle Diameter, in	0.227	0.227	0.227	-
Sample Train Data				
Meter Volume, acf	103.896	90.790	89.705	-
Static Pressure, iwg	0.70	0.70	0.70	0.70
ΔP, iwg	0.6197	0.5037	0.4518	0.5251
ΔH, iwg	1.46	1.14	1.08	1.23
Meter Temp, F	90.2	70.3	82.2	80.9
Stack Temp, F	117.8	117.8	118.8	118.1
Water collected, g	292.7	251.4	257.6	267.2
O_2, %	5.80	5.70	5.16	5.55
CO_2, %	13.30	13.39	13.86	13.51
Start time/stop time	1305/1729	0805/1104	1214/1620	
Sample Train Results				
Std Sample Vol, dscf	81.987	74.560	71.467	76.005
Std Sample Vol, m^3	2.322	2.111	2.024	2.152
Std Moisture Vol, dscf	13.815	11.866	12.159	-
Measured Moisture, %	14.42%	13.73%	14.54%	14.23%
Saturation Moisture, %	13.1%	13.0%	13.4%	13.2%
Dry Molecular Weight	30.36	30.37	30.42	-
Wet Molecular Weight	28.74	28.76	28.76	28.75
Duct Gas Velocity, ft/s	50.56	45.47	43.28	46.44
Duct Gas Flow, wacfm	394,360	354,702	337,580	362,214
Duct Gas Flow, dscfm	262,205	237,051	222,400	240,552
Isokinetic Ratio, %	100.5	101.1	103.2	-
Mercury catch, ug				
Particulate	0.10	0.15	0.10	
Oxidized	0.89	0.67	0.55	
Elemental	14.00	8.60	8.30	
Total	14.98	9.42	8.95	11.12
Mercury catch, ug/m^3				
Particulate	0.041	0.071	0.048	0.05
Oxidized	0.381	0.317	0.272	0.32
Elemental	6.030	4.073	4.101	4.73
Total	6.452	4.462	4.422	5.11
Mercury catch, lb/10^{12} Btu				
Particulate	0.035	0.060	0.039	0.044
Oxidized	0.321	0.266	0.220	0.269
Elemental	5.085	3.412	3.318	3.939
Total	5.441	3.738	3.577	4.252
Mercury, lb/hr				
Particulate	0.00004	0.00006	0.00004	0.00005
Oxidized	0.0004	0.0003	0.0002	0.0003
Elemental	0.0059	0.0036	0.0034	0.0043
Total	0.0063	0.0040	0.0037	0.0047

EMISSION CALCULATIONS

1. Sample Volume and Isokinetics

   a. Sample gas volume, dscf

   $V_{m\ std} = 0.03342 V_m\ [P_{bar} + (H/13.6)](T_{ref}/T_m)(Y)$

   b. Water vapor volume, scf

   $V_{w\ std} = 0.0472\ V_{lc}\ (T_{ref}/528°R)$

   c. Moisture content, nondimensional

   $B_{wo} = V_{w\ std}/(V_{m\ std} + V_{w\ std})$

   d. Stack gas molecular weight, lb/lb mole

   $MW_{dry} = 0.44(\%\ CO_2) + 0.32(\%\ O_2) + 0.28\ (\%\ N_2)$

   $MW_{wet} = MW_{dry}\ (1 - B_{wo}) + 18\ (B_{wo})$

   e. Absolute stack pressure, iwg

   $Ps = P_{bar} + P_{sg}/13.6$

   f. Stack velocity, ft/sec

$$V_s = 2.90\ C_p \sqrt{\Delta PTs}\ \sqrt{\frac{29.92}{Ps} \times \frac{28.95}{MW_{wet}}}$$

   g. Actual stack gas flow rate, wacfm

   $Q = (V_s)(A_s)(60)$

   h. Standard stack gas flow, dscfm

   $Q_{sd} = Q(1 - B_{wo})\ (T_{ref}/Ts)(Ps/29.92)$

   i. Percent isokinetic

$$I = \frac{17.32 \times T_s\ (V_{m\ std})}{(1 - B_{wo})\ \theta \times V_s \times Ps \times Dn^2} \times \frac{528°R}{T_{ref}}$$

2. Particulate Emissions

   a. Grain loading, gr/dscf

   $C = 0.01543\ (M_n/V_{m\ std})$

   b. Grain loading at 12% CO_2, gr/dscf

   $C_{(12\%\ CO2)} = C\ (12/\%CO_2)$

c. Mass emissions, lb/hr

$M = C \times Qsd \times (60\ min/hr)/(7000\ gr/lb)$

3. Gaseous Emissions, lb/hr

$$M = ppm \times 10^{-6} \quad \frac{MW_i\ lb/lb\ mole}{SV} \quad X\ Qsd\ X\ 60\ min/hr$$

where SV = specific molar volume of an ideal gas:

385.3 ft^3/lb mole for $T_{ref} = 528°R$

379.5 ft^3/lb mole for $T_{ref} = 520°R$

4. Emissions Rates, lb/10^6 Btu

a. Fuel factor at 68°F, dscf/10^6 Btu at 0% O_2

$$F_{68} = \frac{10^6[3.64(\%H) + 1.53(\%C) + 0.14(\%N) + 0.57(\%S) - 0.46(\%O_2, fuel)]}{HHV,\ Btu/lb}$$

b. Fuel factor at 60°F

$F_{60} = F_{68}\ (520°R/528°R)$

c. Gaseous emission factor

$$lb/10^6\ Btu_i = ppm_i \times 10^{-6} \times \frac{MW_i\ lb}{lb\ mole} \times \frac{1}{SV} \times F \times \frac{20.9}{20.9 - \%O_2}$$

d. Particulate emission factor

$$lb/10^6\ Btu = C \times \frac{1\ lb}{7000\ gr} \times F \times \frac{20.9}{20.9 - \%O_2}$$

These calculations are routinely performed on FERCo's computer.

Nomenclature:

A_s = stack area, ft^2
B_{wo} = flue gas moisture content
$C_{12\%CO2}$ = particulate grain loading, gr/dscf corrected to 12% CO_2
C = particulate grain loading, gr/dscf
C_p = pitot calibration factor, dimensionless
Dn = nozzle diameter, in.
F = fuel F factor, dscf/10^6 Btu at 0% O_2
H = orifice pressure differential, iwg
I = % isokinetics
M_n = mass of collected particulate, mg
M_i = mass of emissions species i, lb/hr
MW = molecular weight of flue gas
MW_i = molecular weight of species i:
- NO_x: 64
- CO: 28
- SO_2: 64
- HC: 16

Σ = sample time, min.

ΔP = average velocity head, iwg = $\left(\overline{\sqrt{\Delta P}}\right)^2$

P_{bar} = barometric pressure, in. Hg
Ps = stack absolute pressure, in. Hg
Psg = stack static pressure, iwg
Q = wet stack gas flow rate at actual conditions, wacfm
qsd = dry stack gas flow rate at standard conditions, dscfm
SV = specific molar volume of an ideal gas at std conditions, ft^3/lb mole
Tm = meter temperature, °R
T_{ref} = reference temperature, °R
Ts = stack temperature, °R
V_s = stack velocity, ft/sec
V_{lc} = volume of liquid collected in impingers, ml
V_m = dry meter volume uncorrected, dcf
$V_{m\ std}$ = dry meter volume at standard conditions, dscf
$V_{w\ std}$ = volume of water vapor at standard conditions, scf
Y = meter calibration coefficient

FOSSIL ENERGY RESEARCH CORP.

23342 C SOUTH POINTE, LAGUNA HILLS, CA 92653 (714) 859-4466

Date _____ Operator _____

Sampling train _____ Checked by _____

Site _____ Used for runs _____

1. C_p (for S-type pitots) = _____
2. P_b (barometric pressure at location) = _____
3. D_n (nozzle diameter inches) = _____
4. B_w (moisture in gas stream, percent) = _____
5. P_m (barometric pressure at meter, in Hg) $= \frac{\text{AVG } \Delta H}{13.6} + P_b$ = _____
6. $\Delta H@$ (pressure differential of orifice in meterbox, H_2O) = _____
7. P_s (stack pressure, in Hg) $= P_b \pm \frac{\text{stack static pressure } (H_2O)}{13.6}$ = _____
8. T_s (average stack temperature, °R) = _____ °F + 460 = _____ °R
9. T_m (average meter temperature, °R = ambient + 20°F + 460 = _____ °R
10. M_d (molecular weight of stack gas, dry, lb/lb mole)
    $= (0.44 \times \% CO_2) + (0.32 \times \% O_2) + [0.28 + \% N_2]$
    $= (0.44 \times$ _____ $) + (0.32 \times$ _____ $) + (0.28 +$ _____ $)$ = _____
11. M_s (molecular weight of stack gas with water vapor, lb/lb mole)
    $= [M_d \times (1-B_w)] + [18 \times B_w]$
    $= [$ _____ $\times (1 -$ _____ $)] + [18 \times$ _____ $]$ = _____
12. $K = (846.72)\ (D_n^4)\ (\Delta H@)\ (C_p^2)\ (1-B_w)^2 \left[\frac{M_d}{M_s}\right] \left[\frac{P_s}{P_m}\right] \left[\frac{T_m}{T_s}\right]$

    $K = (846.72)$ (_____)^4 (_____) (_____)^2 (_____)^2 (_____) (_____) (_____)
    $K =$ _____

$\Delta H = K\Delta P$
Correlation Chart

ΔH	ΔP

K-Factor Calculation Form

Calculations to determine mercury as lb/10^{12} Btu in fuel												
Mercury	=	Mercury	x	1.E-06	x	(1-H_2O)	/	HHV	*	1.E+12		
lb/10^{12} Btu		ppm dry						lb/Btu				
Example, San Juan Test 4												
6.31	=	0.065	x	1.E-06	x	0.9483	/	9,819	*	1.E+12		
lb/10^{12} Btu		ppm dry						lb/Btu				
Calculations to determine mercury as lb/hr in fuel												
Mercury	=	Mercury	x	1.E-06	x	(1-H_2O)	x	coal flow				
lb/hr		ppm dry						lb/hr as-fired				
Example, San Juan Test 4												
0.021	=	0.065	x	1.E-06	x	0.9483	x	345000				
lb/hr		ppm dry						lb/hr as-fired				
Calculations to determine gas flow rates from fuel input												
Oxygen based												
Flow	=	fuel flow	x	HHV	x	Fd-factor	x	20.9/(20.9-O_2)	/	60	/	1,000,000
dscfm		lb/hr		Btu/lb		dscf/mmBtu				min/hr		
Example, San Juan Test 4 Outlet												
755,755	=	345000	x	9819	x	9780	x	1.369	/	60	/	1,000,000
dscfm		lb/hr		Btu/lb		dscf/mmBtu				min/hr		

Calculations to determine mercury as lb/10^{12} Btu in gas												
Mercury	=	Mercury	/	Sample vol	x	2.20.E-09	x	9780	*	20.9/(20.9-O_2)	*	1.E+06
lb/10^{12} Btu		ug/sample		dscf		lb/ug		f-factor		dilution		10^{12}/10^{6}
								dscf/10^{6} Btu		correciton		
Example, San Juan Test 4 Outlet Total Mercury												
3.58	=	8.95	/	71.47	x	2.20.E-09	x	9780	x	1.328	*	1.E+06
lb/10^{12} Btu		ug/sample		dscf		lb/ug		f-factor		dilution		10^{12}/10^{6}
								dscf/10^{6} Btu		correction		
Calculations to determine mercury as lb/hr in gas												
Mercury	=	Mercury	/	Sample vol	x	2.20.E-09	x	Gas flow	x	60		
lb/hr		ug/sample		dscf		lb/ug		dscfm		min/hr		
Example, San Juan Test 4 Outlet Total Mercury												
0.0037	=	8.95	/	71.47	x	2.20.E-09	x	222400	x	60		
lb/hr		ug/sample		dscf		lb/ug		dscfm		min/hr		

Worksheet for bypass calculations San Juan 2 Mercury ICR Tests				
	Run 1	Run 2	Run 3	Average
By Heat Balance				
Cp for dry flue gas, Btu/lb-R	0.248	0.248	0.248	0.248
Enhalpy of dry flue gas, Btu/lb, 32 F ref				
Outlet	21.28	21.28	21.53	21.36
Inlet	64.95	60.98	65.42	63.79
Stack	29.14	28.52	29.76	29.14
lb water vapor/lb gas				
outlet vapor	0.0820	0.0814	0.0839	0.0824
outlet liquid water	0.0083	0.0046	0.0071	0.0067
inlet	0.0551	0.0513	0.0578	0.0547
stack	0.0799	0.0823	0.0829	0.0817
Enthalpy of water, Btu/lb water, 32 F ref				
outlet vapor	1113	1113	1113	1113
outlet liquid water	86	86	87	86
inlet	1198	1185	1200	1194
stack	1195	1194	1194	1194
Enthalpy of water, Btu/lb gas, 32 F ref				
outlet vapor	91.3	90.5	93.4	91.7
outlet liquid water	0.7	0.4	0.6	0.6
inlet	66.0	60.8	69.3	65.4
stack	95.5	98.3	98.9	97.6
Enthalpy of gas, Btu/lb				
Outlet	28.78	28.65	29.36	28.93
Inlet	68.59	64.10	69.43	67.36
Stack	36.77	36.61	37.96	37.11
Bypass by enthalpy, %	20%	22%	21%	21%
By Temperature Balance (presented as a check)				
Outlet temperature	118	118	119	118
Inlet temperature	294	278	296	289
Stack temperature	150	147	152	150
Bypass based on temperature, %	18%	18%	19%	18%
By Moisture Balance (presented as a check)				
Outlet moisture	14.4%	13.7%	14.5%	14.2%
Inlet moisture	9.0%	8.4%	9.4%	8.9%
Stack moisture (plant CEMS)	12.7%	13.0%	13.1%	12.9%
Bypass based on moisture, %	32%	13%	28%	24%

Data Tracking Log

Test Unit: San Juan 2
Test Dates: 10/21-10/22/99

	By	Date
Mercury Gas Data		
Data taken	MDM	10/22
Data reduced	MDM	10/22
Entered in spreadsheet	MDM	10/22
Field custody taken	AB	10/22
Lab data received	MDM	12/20
Lab data entered	MDM	12/20
Results prepared/summarized	MDM	12/20
Results entered in report	MDM	1/4
Coal sample data		
Lab data received	1/11	MM
Lab data entered	1/11	MM
Results prepared/summarized	1/11	MM
Results entered in report	1/11	MM

Appendix B. Raw Field Data and Calibration Data Sheets

Sampling Data

Velocity Traverses

O_2 Meter Calibration

O_2 Meter Gas Certificates

Dry Gas Meter Calibration

Pitot Probe Calibration

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. 1-Inlet-Hg METHOD _____ PAGE ____ OF ____

SAMPLE LOCATION Inlet TEST CONDITION Field Blank AMBIENT TEMPERATURE _____

OPERATOR/ASSISTANT BA/JTB METER VOLUME START/END _____ / _____ DATE _____

PRE-TEST DATA:	*EQUIPMENT INFO:*
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	Δ H @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = _____ x ΔP	Nozzle diameter, in.
	Filter No. QT-5869
	Filter material quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	✓	-	600.9	=	
2	KCl	✓	-	585.1	=	
3	KCl	✓	-	584.8	=	
4	HNO_3/H_2O_2	✓	-	593.6	=	
5	$KMnO_4/H_2SO_4$	✓	-	602.2	=	
6	$KMnO_4/H_2SO_4$	✓	-	644.9	=	
7	$KMnO_4/H_2SO_4$	✓	-	609.9	=	
8	SG	✓	-	821.0	=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test				
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/1
Stop				/1
Avg/total				

check weight on balance 595.2/595.0

SAMPLE POINT	TIME (clock)	METER VOLUME ft^3	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT		O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
		412-2168													Impingers Loaded 15
															Impingers Recovered
															Filter Loaded
															Filter Recovered
															Probe Wash
															TEST AVERAGES/TOTALS
															Calculated by:
															Checked by:
															Δ P, iwg
															Δ H, iwg
															Sample vol, acf
															Stack temp, F
															Meter temp, F
															Static press, iwg
															Water collected, g
															O_2, %
															Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. 2-Inlet-Hg METHOD OH PAGE 1 OF 2
SAMPLE LOCATION Inlet TEST CONDITION AMBIENT TEMPERATURE
OPERATOR/ASSISTANT PH / JB METER VOLUME START/END 242.261 / 330.137 DATE 10/21/99

PRE-TEST DATA:	EQUIPMENT INFO:
Barometric Pressure, In.Hg	Meter No. Ferco 1
Assumed Stack Pressure, iwg	Meter Yd 1.001
Assumed Moisture, %	ΔH@ 2.000
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = 4.5 x ΔP	Nozzle diameter, in.
	Filter No. QT-55
	Filter material quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	777.6	-	624.9	=	152.7
2	KCl	624.4	-	612.6	=	11.8
3	KCl	686.2	-	684.9	=	1.3
4	HNO_3/H_2O_2	596.8	-	591.1	=	5.7
5	$KMnO_4/H_2SO_4$	641.0	-	638.4	=	2.6
6	$KMnO_4/H_2SO_4$	617.6	-	616.7	=	0.9
7	$KMnO_4/H_2SO_4$	674.8	-	674.4	=	0.4
8	SG	776.1	-	749.9	=	26.2
			-50ml Heating		Total	151.6

COMMENTS: * stopped to install power cord on heated line

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	0.0	17"	OK	PH
Post-test	0.0	10"	OK	PH

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER in	METER out	IMP OUT		O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
A 5	14:54	242.261	.32	1.44	295	251	259	74	74	66		6.0	7		Impingers Loaded 15
4	14 58	245.45	.25	1.13	296	250	262	75	75	60		5.8	6.5		Impingers Recovered
3	15 04	248.4	.28	1.26	296	248	266	76	75	59		6.0	7		Filter Loaded 15
2	09	251.52	.28	1.26	295	251	268	77	75	59		6.0	6.5		Filter Recovered
1	14	254.63	.22	.99	295	250	270	79	75	59		6.3	5.5		Probe Wash
	19	257.41	.25 PH	1.13 PH				78	77	6 PH					
B 5	15 24	257.41	.25	1.13	297	249	271	78	77	66		6.6	6		TEST AVERAGES/TOTALS
4	32	860.4	.23	1.04	297	249	268	79	77	63		5.4	6		Calculated by: MM
3	37	263.39	.21	1.4	298	250	267	80	78	62		5.3	7.5		Checked by: MM
2	42	266.65	.26	1.17	297	249	267	81	78	64		5.3	7		ΔP, iwg .2432
1	47	269.8	.22	.99	295	248	268	81	78	65		5.3	6		ΔH, iwg 1.11
-	52	272.734													Sample vol, acf 80.056 87.876
C 5	16 07	272.734	.25	1.13	297	247	270	78	78	65		5.5	6		Stack temp, F 293.9
4	16 12	275.61	.28	1.04	298	240	246	78	78	66		5.6	6		Meter temp, F 77.8
3	16 19	278.52	.25	1.13	296	248	264	78	77	62		5.2	5.5		Static press, iwg -.13
2	24	281.4	.26	1.17	294	253	268	79	77	60		5.4	6		Water collected, g 151.6
1	29	284.28	.2	.9	292	251	271	80	78	59		5.3	5.5		O_2, % 5.61
	34	287.121													Sample time, min 150

Ontario Hydro

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT _____ TEST NO. 2 INLET METHOD _____ PAGE 2 OF 2

SAMPLE LOCATION INLET TEST CONDITION _____ AMBIENT TEMPERATURE _____

OPERATOR/ASSISTANT PA GB METER VOLUME START/END _____ / _____ DATE 10/21/99

PRE-TEST DATA:	*EQUIPMENT INFO:*
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	Δ H @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = _____ x ΔP	Nozzle diameter, in.
	Filter No.
	Filter material

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1			-		=	
2			-		=	
3			-		=	
4			-		=	
5			-		=	
6			-		=	
7			-		=	
8			-		=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test				
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	Δ H	Meter Reading	Meter In/Out
Start				/___
Stop				/___
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	LINE/FILTER	METER in	METER out	IMP OUT		O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
D 5	1640	287.121	.27	1.22	297	250	282	74	78	59		5.3	6.5		Impingers Loaded
4	45	290.0	.14	.86	297	254	279	78	78	55		5.3	5.5	-.13	Impingers Recovered
3	50	292.64	.21	.95	295	248	276	79	78	55		5.1	6		Filter Loaded
2	55	295.37	.23	1.04	290	251	225	79	78	55		5.2	6		Filter Recovered
1	1700	298.2	.21	.95	287	253	274	80	78	55		5.5	6		Probe Wash
	05	300.41													
E 5	1715	300.91	-.3	1.35	296	250	284	76	77	65		5.7	6		TEST AVERAGES/TOTALS
4	20	303.80	.22	.99	295	256	277	77	77	55		5.5	6		Calculated by:
3	25	306.74	.24	1.08	294	254	277	79	77	55		5.3	6		Checked by:
2	30	309.6	.24	1.08	290	250	276	79	77	57		5.3	6		Δ P, iwg
1	35	312.47	.2	.9	286	249	274	79	77	58		5.1	5.5		Δ H, iwg
-	40	315.265													Sample vol, acf
F 5	1756	315.265	.3	1.35	295	255	288	77	77	66		5.9	7		Stack temp, F
4	1801	318.3	.28	1.26	293	252	282	78	77	56		5.9	6.5		Meter temp, F
3	06	321.35	.26	1.17	291	255	279	80	77	58		5.9	7		Static press, iwg
2	11	324.4	.23	1.04	288	250	277	81	78	59		6.1	6.5		Water collected, g
1	16	327.38	.22	.99	286	249	277	81	78	61		6.3	5.5		O_2, %
	21	330.137													Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. 3-Inlet-Hg METHOD OH PAGE 1 OF 2
SAMPLE LOCATION 'H' Scrubber Inlet TEST CONDITION AMBIENT TEMPERATURE ~40
OPERATOR/ASSISTANT BF/JB METER VOLUME START/END / DATE 10/22/99

PRE-TEST DATA:	
Barometric Pressure, In.Hg	
Assumed Stack Pressure, iwg	-0.13
Assumed Moisture, %	8.8
Assumed Molecular Weight	28.5
Assumed Stack Temperature	275
Assumed Meter Temperature	60
Average ΔP	.25
Stack diameter/area	
Sample time, min/point	5
ΔH = A·34× ΔP	

EQUIPMENT INFO:	
Meter No.	1-FERCO
Meter Yd	1.001
ΔH @	2.000
Pitot ID, Cp	16'
O_2/CO_2 Method	Portable
Teflon connecting line? (Y/N)	Y
Probe material	Teflon
Probe length	16'
Nozzle material	Glass
Nozzle diameter, in.	0.276
Filter No.	QT-52
Filter material	quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	736.1	-	590.9	=	145.2
2	KCl	609.4	-	595.8	=	13.6
3	KCl	696.1	-	694.7	=	1.4
4	HNO_3/H_2O_2	627.1	-	622.1	=	5
5	$KMnO_4/H_2SO_4$	601.2	-	600.6	=	0.6
6	$KMnO_4/H_2SO_4$	563.0	-	561.9	=	1.1
7	$KMnO_4/H_2SO_4$	219.9	-	219.9	=	0
8	SG	905.9	-	892.1	=	13.8
		line rinse			Total	130.7

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	<0.005	15	BF	BF
Post-test	0.01	8	BF	BF

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	Line ~~FILTER~~	METER In	METER out	IMP OUT		O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
	0	~~331.925~~	~~0.3~~	~~1.3~~											Impingers Loaded
F-5	0815	332.025	0.3	1.3	275	235	281	46	45	44		5.6	8		Impingers Recovered
4	0820	335.1	.25	1.09	273	240	272	47	46	43		5.5✓	8		Filter Loaded
3	0825	338.4	.25	1.09	271	24[illegible]	268	48	46	42		5.6	8		Filter Recovered
2	0830	341.35	.22	.94	268	249	269	49	46	42		5.5✓	7		Probe Wash
1	0835	344.1	.18	.78	266	252	266	49	46	43		5.5	5		
~~STOP~~	~~0840~~	~~346.422~~	~~.29~~	~~1.26~~	~~274~~	~~251~~	~~276~~	~~49~~	~~47~~	~~45~~					
E-5	0846	346.422	0.29	1.26	274	251	276	49	47	45		5.7	6		TEST AVERAGES/TOTALS
4	0851	349.2	.21	.91	273	246	274	50	47	43		5.8✓	5		Calculated by:
3	0856	351.7	.23	1.0	271	249	267	51	47	43		5.3	6		Checked by:
2	0901	354.2	.23	1.0	267	248	265	51	48	43		5.2	6		ΔP, iwg
1	0906	357.1	.16	.69	262	249	264	52	48	43		5.1	5		ΔH, iwg
STOP	0911	359.446						~~52~~	~~48~~						Sample vol, acf
D 5	0923	359.446	.23	1.0	275	275	280	50	48	47		5.6✓			Stack temp, F
4	0928	362.3	.16	.69	274	251	274	54	53	45		4.9	6		Meter temp, F
3	0933	364.5	.18	.78	276	247	272	55	51	44		5.2	5		Static press, iwg
2	0938	366.7	.20	.87	273	241	268	58	53	44		4.8	6		Water collected, g
1	0943	369.14	.18	.78	269	251	266	58	53	44		4.9	5		O_2, %
															Sample time, min

STOP 0948 372.91.0

FOSSIL ENERGY RESEARCH CORPORATION

Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. 3-INlet-Hg METHOD OH PAGE 2 OF 2

SAMPLE LOCATION H Scrubber INlet TEST CONDITION AMBIENT TEMPERATURE

OPERATOR/ASSISTANT B. Finken / J. Bovee METER VOLUME START/END / DATE 10/02/99

PRE-TEST DATA:	EQUIPMENT INFO:
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	ΔH @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = ____ x ΔP	Nozzle diameter, in.
	Filter No.
	Filter material

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1			-		=	
2			-		=	
3			-		=	
4			-		=	
5			-		=	
6			-		=	
7			-		=	
8			-		=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test				
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/____
Stop				/____
Avg/total				

→ See pg. 1

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	LINE ~~FILTER~~	METER in	METER out	IMP OUT		O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
C-5	0953	371.962	.20	.87	281	250	278	58	54	46		4.9 ✓	6		Impingers Loaded
4	0958	374.16	.19	.82	282	249	272	60	55	45		5.2	5		Impingers Recovered
3	1003	377.0	.21	.91	281	249	271	61	56	45		4.9	6		Filter Loaded
2	1008	379.15	.21	.91	279	253	268	62	57	45		5.2	6		Filter Recovered
1	1013	382.25	.16	.69	278	251	267	64	58	46		5.2 ✓	5		Probe Wash
STOP	1018	384.625													
B-5	1025	384.625	.20	.87	285	249	277	64	60	52		5.5	5		TEST AVERAGES/TOTALS
4	1030	387.2	.20	.87	285	249	276	65	60	50		5.5 ✓	5		Calculated by: BF
3	1035	389.165	.26	1.13	286	249	263	65	61	47		5.1	6		Checked by:
2	1040	392.0	.20	.87	287	247	263	66	62	48		5.3	6		ΔP, iwg 0.2069 ✓
1	1045	395.0	.16	.69	284	250	267	69	63	49		5.5 ✓	5		ΔH, iwg 0.90 ✓
STOP	1050	397.365													Sample vol, acf 78.180 ✓
A-5	1052	397.365	.21	.91	289	246	276	68	64	52		5.6	6		Stack temp, F 277.9 ✓
4	1057	400.8	.19	.82	289	250	272	69	64	52		5.8 ✓	6		Meter temp, F 56.48 ✓ ✓
3	1102	402.5	.21	.91	289	249	270	70	65	51		5.5 ✓	6		Static press, iwg -0.13 ✓
2	1107	405.1	.22	.95	288	247	269	72	67	52		5.0 ✓	6		Water collected, g
1	1112	407.7	.16	.69	285	247	270	72	67	51		5.1	5		O_2, % 5.32 ✓
END	1117	410.205													Sample time, min 150

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. ~~Inlet Field Blank~~ METHOD OH PAGE 1 OF 2
SAMPLE LOCATION Inlet - H. Scrubber TEST CONDITION 4-In Ot AMBIENT TEMPERATURE
OPERATOR/ASSISTANT Finken / Bovee METER VOLUME START/END / DATE 10/22/99

PRE-TEST DATA:

Barometric Pressure, In.Hg	25
Assumed Stack Pressure, iwg	-0.13
Assumed Moisture, %	8 8
Assumed Molecular Weight	28.5
Assumed Stack Temperature	279
Assumed Meter Temperature	80
Average ΔP	.125
Stack diameter/area	
Sample time, min/point	5
ΔH = 4.34 x ΔP	

EQUIPMENT INFO:

Meter No.	1 - FERCO
Meter Yd	1.001
ΔH @	2.000
Pitot ID, Cp	0.84
O_2/CO_2 Method	Portable
Teflon connecting line? (Y/N)	Y
Probe material	Teflon
Probe length	16'
Nozzle material	Glass
Nozzle diameter, in.	~~.50~~ 0.276
Filter No.	QT-69 (unbaked)
Filter material	quartz

Filter QT-50 used

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	778.4	-	637.1	=	141.3
2	KCl	613.2	-	599.0	=	14.2
3	KCl	666.7	-	666.7	=	0
4	$NaOCl/H_2O$	602.4	-	596.8	=	5.6
5	$KMnO_4/H_2SO_4$	650.5	-	649.1	=	1.4
6	$KMnO_4/H_2SO_4$	613.5	-	612.3	=	1.2
7	$KMnO_4/H_2SO_4$	661.8	-	660.4	=	
8	SG	795.3	-	775.6	=	19.7
		liner rinse 50			Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	0.015	10	BF	BF
Post-test	0.004	10	BF	BF

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F STACK	PROBE	LINE ~~FILTER~~	METER In	METER out	IMP OUT	O_2	VAC.	STATIC PRESS. iwg
A-5	1403	418.250	.23	1.0	297	253	294	81	80	66	5.2	7	
4	1408	420.76	.18	.78	298	248	287	82	81	63	5.1	7	
3	1413	423.45	.20	0.87	297	248	282	84	82	62	5.0	7	
2	1418	426.0	.20	.87	296	251	281	83	81	62	4.9	7	
1	1423	428.5	.18	.78	295	247	277	85	82	63	4.6	7	
STOP	1428	431.040											
B-5	1433	433.040	.20	.87	298	249	285	83	82	62	5.0	7	
4	1438	433.75	.18	.78	299	251	279	85	83	61	5.0	7	
3	1443	436.27	.25	1.09	300	248	277	86	83	61	4.6	9	
2	1448	439.2	.20	.87	298	246	276	86	84	63	4.7	8	
1	1453	442.04	.16	.69	295	249	276	86	84	63	4.5	6	
STOP	1458	444.545											
C-5	1503	444.545	.20	.87	299	249	282	86	84	64	5.0	7	
4	1508	447.15	.14	.61	298	253	286	84	84	62	4.5	6	
3	1513	449.16	.18	.78	297	247	276	87	85	62	4.6	7	
2	1518	451.91	.18	.78	297	248	279	87	85	61	4.8	7	
1	1523	454.6	.17	.52	293	251	279	89	86	64	4.5	5	
STOP	1528	456.760											

CHAIN OF CUSTODY INFORMATION

- Impingers Loaded 13
- Impingers Recovered
- Filter Loaded 13
- Filter Recovered
- Probe Wash

TEST AVERAGES/TOTALS

- Calculated by: BF
- Checked by:
- ΔP, iwg .1795
- ΔH, iwg .79
- Sample vol, acf 75.753
- Stack temp, F 295.8
- Meter temp, F 85.0
- Static press, iwg -0.13
- Water collected, g
- O_2, % 4.63
- Sample time, min 150

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY SAN JUAN
SAMPLE LOCATION A SCRUBBER INLET
OPERATOR/ASSISTANT Rinker / Bovee
UNIT 2
TEST NO. 4-Inlet-Hg
TEST CONDITION
METER VOLUME START/END /
METHOD OH
AMBIENT TEMPERATURE ~70
PAGE 2 OF 2
DATE 10/22/97

PRE-TEST DATA:	EQUIPMENT INFO:
Barometric Pressure, in.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	Δ H @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = ____ * ΔP	Nozzle diameter, in.
	Filter No.
	Filter material

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1			-		=	
2			-		=	
3			-		=	
4			-		=	
5			-		=	
6			-		=	
7			-		=	
8			-		=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test				
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

See Pg 1

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	LINE/FILTER	METER In	METER out	IMP OUT	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
D-5	1530	456.60	.16	.69	297	248	280	89	86	65	4.5	6		Impingers Loaded
4	1535	459.6	.13	.56	295	250	281	89	87	62	4.4	5		Impingers Recovered
3	1540	461.4	.15	.65	295	251	282	90	87	62	4.3	5		Filter Loaded
2	1545	463.7	.15	.65	292	248	292	90	88	62	4.3	5		Filter Recovered
1	1550	465.9	.14	.61	289	247	282	90	88	62	4.5	6		Probe Wash
STOP	1555	468.183												
E-5	1605	468.183	.18	.78	298	251	290	87	85	64	4.6	6		TEST AVERAGES/TOTALS
4	1610	470.85	.16	.69	295	253	286	84	83	58	4.5	6		Calculated by:
3	1615	473.3	.16	.69	295	254	287	84	83	58	4.4	6		Checked by:
2	1620	475.7	.16	.69	292	249	287	86	84	59	4.3	6		Δ P, iwg
1	1625	478.2	.16	.69	289	250	279	86	84	60	4.5	6		Δ H, iwg
STOP	1630	480.456												Sample vol, acf
F-5	1635	480.456	.25	1.09	299	250	282	86	84	64	5.0	6		Stack temp, F
4	1640	483.2	.24	1.04	297	251	271	86	83	58	4.6	8		Meter temp, F
3	1645	485.75	.23	1.0	297	254	270	88	84	59	4.5	8		Static press, iwg
2	1650	488.22	.19	.82	294	250	272	86	83	59	4.5	7		Water collected, g
1	1655	491.0	.17	.74	292	252	272	86	83	59	4.4	6		O_2, %
END	1700	494.103												Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION

Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO Outlet-FB METHOD OH PAGE 1 OF 1

SAMPLE LOCATION Scrubber Outlet TEST CONDITION _____ AMBIENT TEMPERATURE _____

OPERATOR/ASSISTANT _____ METER VOLUME START/END _____ / _____ DATE _____

PRE-TEST DATA:	EQUIPMENT INFO:
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	Δ H @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = _____ x ΔP	Nozzle diameter, in.
	Filter No. QT-70
	Filter material quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	657.3	-	608.5	=	
2	KCl	✓	-	585.5	=	
3	KCl	✓	-	586.9	=	
4	HNO_3/H_2O_2	✓	-	633.2	=	
5	$KMnO_4/H_2SO_4$	✓	-	712.9	=	
6	$KMnO_4/H_2SO_4$	✓	-	629.7	=	
7	$KMnO_4/H_2SO_4$	✓	-	708.9	=	
8	SG	✓	-	869.7	=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	0.0	12"		99
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/1
Stop				/1
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft^3	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT		O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
															Impingers Loaded
															Impingers Recovered
															Filter Loaded
															Filter Recovered
															Probe Wash
															TEST AVERAGES/TOTALS
															Calculated by:
															Checked by:
															Δ P, iwg
															Δ H, iwg
															Sample vol, acf
															Stack temp, F
															Meter temp, F
															Static press, iwg
															Water collected, g
															O_2, %
															Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. 2-Ont-Hg METHOD OH PAGE 1 OF 2
SAMPLE LOCATION Outlet TEST CONDITION AMBIENT TEMPERATURE
OPERATOR/ASSISTANT LP/BF METER VOLUME START/END / DATE 10-21-99

PRE-TEST DATA:	
Barometric Pressure, In.Hg	25.0
Assumed Stack Pressure, iwg	
Assumed Moisture, %	
Assumed Molecular Weight	
Assumed Stack Temperature	
Assumed Meter Temperature	
Average ΔP	
Stack diameter/area	
Sample time, min/point	
ΔH = _____ x ΔP	

EQUIPMENT INFO:	
Meter No.	3-WCS
Meter Yd	.98
Δ H @	
Pitot ID, Cp	.84
O_2/CO_2 Method	portable
Teflon connecting line? (Y/N)	Y
Probe material	glass
Probe length	12'
Nozzle material	steel
Nozzle diameter, in.	0.227
Filter No.	QT-54
Filter material	quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	883.9	-	612.5	=	271.4
2	KCl	647.4	-	612.7	=	34.7
3	KCl	686.3	-	680.0	=	6.3
4	HNO_3/H_2O_2	624.4	-	621.4	=	3.0
5	$KMnO_4/H_2SO_4$	703.4	-	702.2	=	1.2
6	$KMnO_4/H_2SO_4$	600.4	-	597.8	=	2.6
7	$KMnO_4/H_2SO_4$	727.4	-	726.8	=	0.6
8	SG	848.5	-	825.6	=	22.9
			-50.0 rinse		Total	292.7

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	0	10		LP
Post-test	0	10		LP

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT	Line	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
1	1305	388.032	.75	1.65	119	256	260	88	73	44	286	5.8	5		Impingers Loaded 13
2	1311	392.490	.46	1.01	119	254	264	90	74	45	285	5.8	4		Impingers Recovered 13
3	1317	396.270	.58	1.28	118	257	260	90	75	43	285	5.8	4		Filter Loaded 13
4	1323	400.140	.66	1.45	118	255	259	90	75	44	285	5.8	5		Filter Recovered 13
5	1329	404.4	.67	1.47	118	256	259	92	70	46	285	5.8	5		Probe Wash LP
6	1335	408.720	.33	.73	118	254	260	89	76	48	280	5.8	4		
STOP	1341	411.915	—	—	—	—	—	—	—	—	—	—	—		TEST AVERAGES/TOTALS
1	1535	411.915	.77	1.69	117	258	259	95	81	48	290	5.8	5		Calculated by:
2	1541	416.240	.79	1.74	119	260	260	98	82	47	289	5.8	5		Checked by:
3	1547	420.920	.87	1.91	119	259	258	99	83	51	289	5.8	6		Δ P, iwg avg 2
4	1553	425.860	.92	2.02	119	258	247	101	84	57	288	5.8	6		Δ H, iwg avg 1
5	1559	431.0	.92	2.02	119	256	250	101	84	56	288	5.8	6		Sample vol, acf
6	1605	436.120	.61	1.34	119	256	252	100	84	56	288	5.8	5		Stack temp, F
STOP	1611	440.483													Meter temp, F
															Static press, iwg
															Water collected, g
															O_2, %
															Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan 2 UNIT _____ TEST NO. 2-Out-Hg METHOD OH PAGE 2 OF 2
SAMPLE LOCATION _____ TEST CONDITION _____ AMBIENT TEMPERATURE _____
OPERATOR/ASSISTANT _____ METER VOLUME START/END _____ / _____ DATE 10-21-99

PRE-TEST DATA:	EQUIPMENT INFO:
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	ΔH @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = _____ x ΔP	Nozzle diameter, in.
	Filter No.
	Filter material

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1			-		=	
2			-		=	
3			-		=	
4			-		=	
5			-		=	
6			-		=	
7			-		=	
8			-		=	
				Total		

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	0	11		
Post-test	0	11		

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER in	METER out	IMP OUT	Time	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
1	1615	440.483	.20	.47	118	259	241	95	84	52	289	5.8	5		Impingers Loaded
2	1621	443.230	.65	1.53	116	259	261	101	84	51	289	5.8	5		Impingers Recovered
3	1627	447.5	.72	1.70	117	259	258	102	85	49	288	5.8	6		Filter Loaded
4	1633	452.270	.64	1.51	118	255	249	102	86	52	288	5.8	5		Filter Recovered
5	1639	456.9	.52	1.23	118	255	252	102	86	54	288	5.8	5		Probe Wash
6	1645	461.140	.44	1.04	119	257	251	101	86	55	289	5.8	4		
STOP	1651	464.928	—	—	—	—	—	—	—	—	—	—	—		
1	1653	464.925	.45	1.06	118	258	262	100	87	55	289	5.8	4		TEST AVERAGES/TOTALS
2	1659	468.680	.20	.47	118	258	250	99	87	56	289	5.8	4		Calculated by: BF
3	1705	471.530	.90	2.12	116	258	255	103	87	57	289	5.8	6		Checked by: ✓MM
4	1711	476.740	.90	2.12	118	257	253	103	87	58	289	5.8	6		ΔP, iwg 0.62 .697 ✓
5	1717	482.1	.90	2.12	113	258	252	104	88	61	289	5.8	6		ΔH, iwg 1.46 ✓
6	1723	487.470	.61	1.44	117	261	251	103	88	59	288	5.8	5		Sample vol, acf 103.896 ✓
STOP	1729	491.928													Stack temp, F 117.9 117.8
															Meter temp, F 90.2 ✓
															Static press, iwg .7 ✓
															Water collected, g 292.7 ✓
															O_2, % 5.8 ✓
															Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT 2 TEST NO. 3-Out-Hg METHOD OH PAGE 1 OF 2
SAMPLE LOCATION TEST CONDITION AMBIENT TEMPERATURE
OPERATOR/ASSISTANT METER VOLUME START/END 493.555 / 584.670 DATE 10/22/99

PRE-TEST DATA:	
Barometric Pressure, In.Hg	25.1
Assumed Stack Pressure, iwg	
Assumed Moisture, %	
Assumed Molecular Weight	
Assumed Stack Temperature	
Assumed Meter Temperature	
Average ΔP	
Stack diameter/area	
Sample time, min/point	6 MIN
ΔH = 2.2 x ΔP	
6 MIN	

EQUIPMENT INFO:	
Meter No.	3 WCS
Meter Yd	.980
Δ H @	1.711
Pitot ID, Cp	
O_2/CO_2 Method	
Teflon connecting line? (Y/N)	
Probe material	
Probe length	
Nozzle material	
Nozzle diameter, in.	
Filter No.	QT-56
Filter material	quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	830.2	-	596.9	=	233.3
2	KCl	646.0	-	608.4	=	37.6
3	KCl	583.6	-	575.2	=	8.4
4	$NaOCl/H_2O_2$	636.4	-	633.2	=	3.2
5	$KMnO_4/H_2SO_4$	711.1	-	710.8	=	0.3
6	$KMnO_4/H_2SO_4$	643.1	-	641.7	=	1.4
7	$KMnO_4/H_2SO_4$	678.8	-	679.4	=	-0.6
8	SG	869.7	-	851.9	=	17.8
		line rinse	-50		Total	251.4

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	100²	8	OK	PH
Post-test	0.0	10		PH

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft^3	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT	Aux LINE	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
A 6	0805	493.555	.5	1.1	118	262	195	72	57	55	285	6.1	4.5		Impingers Loaded 15
5	11	497.5	.39	.86	119	261	210	75	57	51	284		3.5		Impingers Recovered
4	17	500.85	.47	1.03	117	260	204	76	59	47	284	6.0	4		Filter Loaded 15
3	23	504.55	.87	1.25	120	263	202	78	62	45	284		4.5		Filter Recovered
2	29	508.5	.6	1.32	117	262	196	80	61	44	284	6.0	5		Probe Wash
1	35	512.6	.3	1.66	119	298	195	78	63	43	284				
-	41	515.546													
	√ pre-Leak	filter √ OK	Water - needs replaced	needs replaced											TEST AVERAGES/TOTALS
			Replaced	Filter Holder	Leak checked again			OK							Calculated by: MM
															Checked by: √ MM
B 6	0909	515.891	.64	1.4	116	293	328	67	61	44	284	5.6	4		ΔP, iwg .5037 √
5	15	519.90	.67	1.47	118	265	341	72	65	42	284		6		ΔH, iwg 1.14 √
4	21	524.05	.75	1.65	119	265	280	74	64	42	283	5.5	6		Sample vol, acf 90.79 √
3	27	528.50	.75	1.65	118	261	261	76	60	43	283		6		Stack temp, F 117.8
2	33	533.3	.78	1.72	119	264	257	77	61	44	283	5.6	6.5		Meter temp, F 70.3 √
1	39	537.68	.45	.99	119	262	260	77	61	46	287				Static press, iwg .7
	45	541.511													Water collected, g 251.4 √
															O_2, % 5.70 √
															Sample time, min 144

FOSSIL ENERGY RESEARCH CORPORATION

Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT _____ TEST NO. 3 - Out METHOD _____ PAGE 2 OF 2

SAMPLE LOCATION _____ TEST CONDITION _____ AMBIENT TEMPERATURE _____

OPERATOR/ASSISTANT PA / KP METER VOLUME START/END _____ / _____ DATE 10/22/99

PRE-TEST DATA:	*EQUIPMENT INFO:*
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	Δ H @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = _____ x ΔP	Nozzle diameter, in.
	Filter No.
	Filter material

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1			-		=	
2			-		=	
3			-		=	
4			-		=	
5			-		=	
6			-		=	
7			-		=	
8			-		=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test				
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT	Unit	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
C 6	0949	541.511	.13	.66	118	263	255	70	61	46	284	5.4	6		Impingers Loaded
5	55	544.5	.55	1.21	117	264	295	77	62	46	285		5		Impingers Recovered
4	1001	548.26	.51	1.12	118	263	259	76	63	46	285	5.3	5		Filter Loaded
3	07	552.1	.57	1.25	118	261	263	79	64	46	285		5		Filter Recovered
2	13	556.04	.42	.92	118	261	268	85	65	47	286	5.65	4.5		Probe Wash
1	19	559.6	.35	.77	118	264	262	80	65	48	286		4		
	25	562.647													
															TEST AVERAGES/TOTALS
D 6	10:20	562.647	.15	.32	118	264	251	76	66	51	287	5.8	2		Calculated by:
5	34	564.87	.17	1.59	118	257	270	79	67	51	288		3		Checked by:
4	40	567.68	.75	1.65	118	259	261	83	67	50	288	5.7	6		ΔP, iwg
3	46	572.1	.8	1.76	118	258	255	85	68	50	288		7		ΔH, iwg
2	52	576.10	.7	1.54	115	261	257	85	70	54	287	5.7	6.5		Sample vol, acf
1	58	581.166	.3	.66	117	257	256	84	70	56	286		3.5		Stack temp, F
-	11:04	584.670													Meter temp, F
															Static press, iwg
															Water collected, g
															O_2, %
															Sample time, min

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan Unit 2 UNIT 2 TEST NO. 4-Oct-1Hg METHOD OH PAGE 1 OF 2
SAMPLE LOCATION Outlet TEST CONDITION AMBIENT TEMPERATURE
OPERATOR/ASSISTANT PA/LP METER VOLUME START/END 585.589 / 675.294 DATE 10/22/99

PRE-TEST DATA:	
Barometric Pressure, In.Hg	24.9
Assumed Stack Pressure, iwg	
Assumed Moisture, %	
Assumed Molecular Weight	
Assumed Stack Temperature	
Assumed Meter Temperature	
Average ΔP	
Stack diameter/area	
Sample time, min/point	6
ΔH = 2.3 x ΔP	

EQUIPMENT INFO:	
Meter No.	3-WCS
Meter Yd	0.980
Δ H @	1.711
Pitot ID, Cp	
O_2/CO_2 Method	
Teflon connecting line? (Y/N)	
Probe material	
Probe length	
Nozzle material	
Nozzle diameter, in.	
Filter No.	QT ~~59~~
Filter material	quartz

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1	KCl	863.1	-	613.5	=	249.6
2	KCl	641.6	-	618.0	=	23
3	KCl	680.6	-	676.9	=	3.7
4	~~$KMnO_4$/H_2SO_4~~	625.7	-	623.1	=	2.1
5	~~$KMnO_4$/H_2SO_4~~	702.3	-	701.0	=	1.3
6	~~$KMnO_4$/H_2SO_4~~	592.0	-	586.8	=	5.2
7	~~$KMnO_4$/H_2SO_4~~	724.5	-	724.5	=	0
8	SG	853.7	-	831.6	=	22.1
		line rinse	-50		Total	257.6

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test	0.0	10	OK	PA
Post-test	0.0	12	OK	PA

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/
Stop				/
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft³	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT	Cond.	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
A 6	1214	585.589	.56	1.29	120	256	288	83	70	49	286	5.5	9		Impingers Loaded JS
5	20	590.08	.53	1.76	114	256	304	83	70	48	286		4.5		Impingers Recovered JS
4	26	594.41	.50	1.15	118	256	250	85	71	46	286	5.5	5.5		Filter Loaded JS
3	12:32	597.091	STOPPED SAMPLING, WAITING FOR INLET TO START												Filter Recovered JS
~~2~~	38	RESTART @ 14:04 QT POINTS													Probe Wash LP
3 ~~A~~	~~14:04~~	597.091	.48	1.06	119	261	256	73	73	49	287	5.4	6		
2 ~~A~~	~~10~~	600.9	.5	1.15	119	257	283	78	73	44	287		6		
1	16	604.85	.23	.53	114	255	259	80	74	45	286	5.5	3.5		TEST AVERAGES/TOTALS
	14:22	607.542													Calculated by: MM
															Checked by: √MM
B 6	1425	607.542	.5	1.15	118	257	254	81	74	~~48~~	286	5.1	6		Δ P, iwg .4518 √
5	31	611.38	.41	1.4	118	256	279	86	74	45	286		7		Δ H, iwg 1.08 √
4	37	615.58	.63	1.45	119	259	257	86	76	46	286	5.3	7		Sample vol, acf 89.705 √
3	43	619.9	.69	1.59	121	259	267	88	76	47	285		7.5		Stack temp, F 118.8
2	49	624.24	.66	1.52	118	257	259	89	77	48	285	5.0	7.5		Meter temp, F 118.8 82.2 √
1	55	628.9	.42	.97	116	255	263	89	78	49	286		5.5		Static press, iwg .7 √
	1501	632.341													Water collected, g 257.6 √
															O_2, % 5.16 √
															Sample time, min 144

FOSSIL ENERGY RESEARCH CORPORATION
Ontario Hydro Mercury Speciation Sampling Data Sheet

FACILITY San Juan UNIT ____ TEST NO. 4 OUT METHOD ____ PAGE 2 OF 2

SAMPLE LOCATION ____ TEST CONDITION ____ AMBIENT TEMPERATURE ____

OPERATOR/ASSISTANT ____ METER VOLUME START/END ____ / ____ DATE 10/22/99

PRE-TEST DATA:	EQUIPMENT INFO:
Barometric Pressure, In.Hg	Meter No.
Assumed Stack Pressure, iwg	Meter Yd
Assumed Moisture, %	Δ H @
Assumed Molecular Weight	Pitot ID, Cp
Assumed Stack Temperature	O_2/CO_2 Method
Assumed Meter Temperature	Teflon connecting line? (Y/N)
Average ΔP	Probe material
Stack diameter/area	Probe length
Sample time, min/point	Nozzle material
ΔH = _____ x ΔP	Nozzle diameter, In.
	Filter No.
	Filter material

IMPINGER WEIGHTS:

Imp #	Contents	Wt (end)		Wt (start)		Wt gain
1			-		=	
2			-		=	
3			-		=	
4			-		=	
5			-		=	
6			-		=	
7			-		=	
8			-		=	
					Total	

COMMENTS:

LEAK CHECKS:

	CFM	Vacuum	Pitot	Initial
Pre-test				
Post-test				

PRE-TEST METER CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter In/Out
Start				/___
Stop				/___
Avg/total				

SAMPLE POINT	TIME (clock)	METER VOLUME ft^3	ΔP iwg	ΔH iwg	TEMPERATURES, F: STACK	PROBE	FILTER	METER: In	METER: out	IMP OUT	CYC	O_2	VAC.	STATIC PRESS. iwg	CHAIN OF CUSTODY INFORMATION
C 6	1505	632.341	.35	.80	118	257	255	85	79	55	286	5.2	5		Impingers Loaded
5	11	635.74	.51	1.17	114	256	268	91	80	50	287		6.5		Impingers Recovered
4	17	639.07	.53	1.22	118	259	255	98	80	51	286	5.1	6.5		Filter Loaded
3	23	643.72	.47	1.08	121	257	264	91	81	52	286		6.5		Filter Recovered
2	29	647.63	.37	.85	119	262	263	92	81	53	286	5.0	5.5		Probe Wash
1	35	651.14	.33	.76	120	257	259	91	81	54	286		5		
-	41	654.233													
															TEST AVERAGES/TOTALS
D 6	1544	654.233	.12	.28	117	258	266	86	81	59	286	4.8	2		Calculated by:
5	50	656.3	.13	.3	119	260	274	88	81	58	286		2		Checked by:
4	56	658.41	.65	1.5	119	260	277	88	82	53	287	4.4	7.5		Δ P, iwg
3	1602	662.7	.72	1.66	119	260	266	91	82	53	286		8.0		Δ H, iwg
2	08	667.35	.63	1.45	119	261	272	92	82	56	287	4.8	8		Sample vol, acf
1	14	671.78	.35	.81	119	258	269	93	83	59	287		6		Stack temp, F
	20	675.894													Meter temp, F
															Static press, iwg
															Water collected, g
															O_2, %
															Sample time, min

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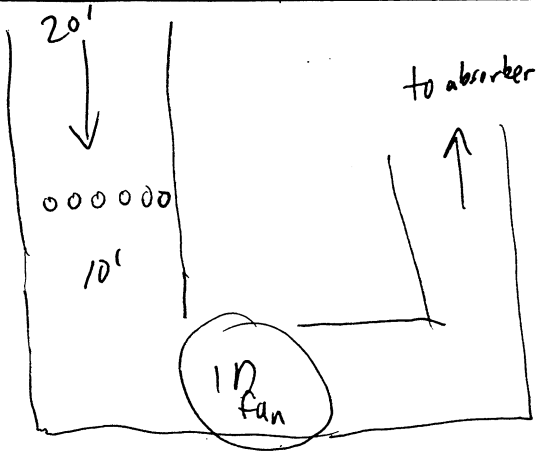
SAMPLING POINT LOCATION DATA
EPA Method 1

Plant San Juan 2 Inlet Data by MDM

Date 5/10/99 Test Location Inlet



M-17 sampling
use Module H

10' deep x 12'6" wide

4" caps

DIAGRAM OF SAMPLING LOCATION

Upstream Dist./Dia. 20'/1.8

Downstream Dist./Dia 10'/0.9

Coupling Length 18"

No. of Sampling Pts. ~~6pts x 5pts~~

Stack Dimension 10'x12'6" eq Diam = 11'1

Stack Are, ft² 125

210 ft²?

Sample Point	% of Diameter	In. from Near Wall	In. from Nozzle*
1	10	~~12~~	30
2	30	~~36~~ 36	54
3	50	~~60~~ 60	78
4	70	~~84~~ 84	102
5	90	~~108~~ 108	126
	N/G - see following page		

*Inches from wall plus coupling length

FOSSIL ENERGY RESEARCH CORP.

SAMPLING POINT LOCATION DATA
EPA Method 1

Plant San Juan 2 Data by McDannel

Date 10/21/99 Test Location Module H Inlet

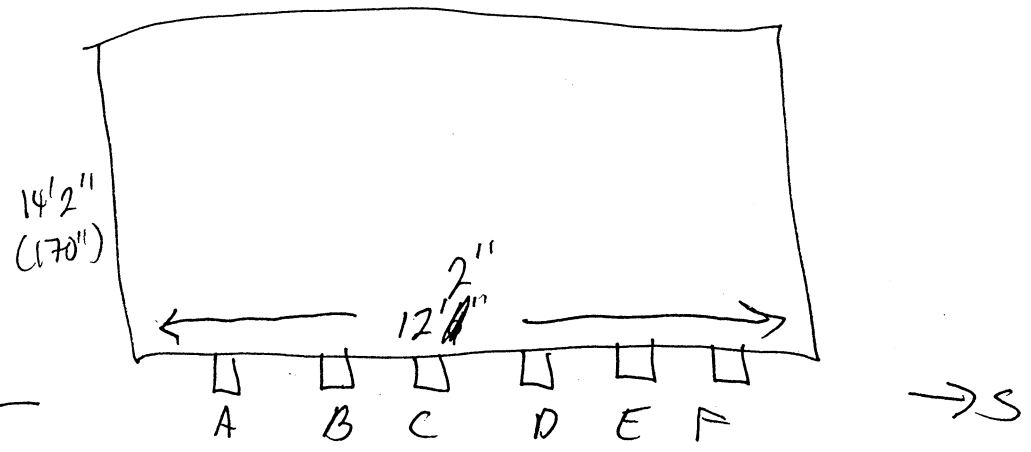


DIAGRAM OF SAMPLING LOCATION

see test plan
Upstream Dist./Dia._____

Downstream Dist./Dia_____

Coupling Length_____

No. of Sampling Pts._____

Stack Dimension_____

Stack Are, ft²_____

Sample Point	% of Diameter	In. from Near Wall	In. from Nozzle*
1	10%	17	33
2	30%	51	67
3	50%	85	101
4	70%	119	135
5	90%	153	169

*Inches from wall plus coupling length

Fossil Energy Research Corp.
Preliminary Velocity Traverse and Cyclonic Flow Check Data Sheet

Test No. Pre test flow
Client/Unit San Juan 2
Location Inlet

Date 10/20/99
Data by PAT
Start time ~~16:33~~
Stop time 17:03

Barometric pressure ~24.9
Static pressure, iwg -.22

Port	Point	ΔP	Temp	Yaw Angle
A5	5	.21	290	0
	4	.22	292	0
	3	.24	293	0
	2	.20	292	0
	1	.14	291	0
B	5	.25	282	0
	4	.26	291	0
	3	.24	293	0
	2	.22	292	0
	1	.17	291	0
C	5	.19	281	0
	4	.20	290	0
	3	.20	290	0
	2	.21	287	0
	1	.16	288	0

Port	Point	ΔP	Temp	Yaw Angle
D	5	.15	282	0
	4	.18	288	0
	3	.19	287	0
	2	.2	286	0
	1	.16	282	0
E	5	.19	283	0
	4	.2	288	0
	3	.2	287	0
	2	.18	284	0
	1	.14	283	0
F	5	.22	286	0
	4	.23	287	0
	3	.21	287	0
	2	.18	285	0
	1	.16	284	0

Leak check: Pre-test 0
Post-test 0

Manometer zero: Pre-test 0
Post-test 0

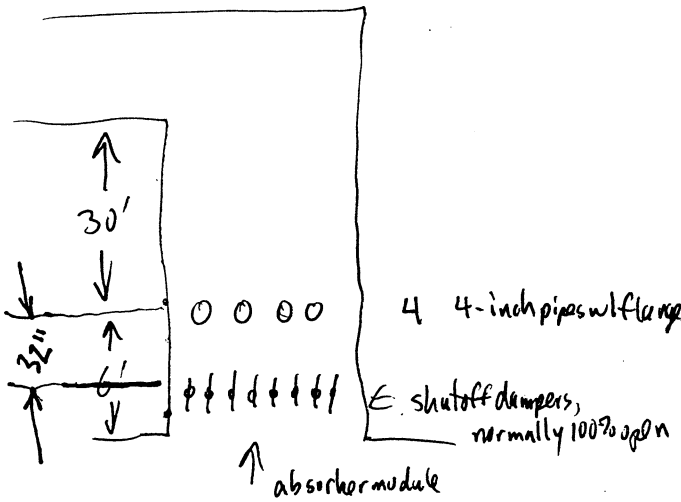
Notes/Comments

FOSSIL ENERGY RESEARCH CORP.

SAMPLING POINT LOCATION DATA
EPA Method 1

Plant San Juan 2 Outlet Data by ~~MDM~~ BF/LP

Date ~~5/10/99~~ 10/25/99 Test Location Outlet



M-5 sampling
Module H

10' deep × ~~12'6"~~ wide
13'0"

DIAGRAM OF SAMPLING LOCATION

Upstream Dist./Dia. ~~3'~~ 2.4' / ~~0.5~~ 0.24

Downstream Dist./Dia 30'/2.8

Coupling Length 18"

No. of Sampling Pts. 4 × 6

Stack Dimension 10' × 12'6" eadi = 11.1

Stack Are, ft² ~~125~~ 125

$$D_e = \frac{2LW}{L+W} = \frac{2(10)(12.5)}{10+12.5}$$

$D_e = 11.11$

*Inches from wall plus coupling length

Sample Point	% of Diameter	In. from Near Wall	In. from Nozzle*
1	~~10~~ 4/12	~~12~~ 10	~~30~~ 28
2	~~30~~ 3/12	~~36~~ 30	~~54~~ 48
3	~~50~~ 5/12	~~60~~ 50	~~78~~ 68
4	~~70~~ 7/12	~~84~~ 70	~~102~~ 88
5	~~90~~ 9/12	~~108~~ 90	~~126~~ 108
6	11/12	110	128

Fossil Energy Research Corp.
Preliminary Velocity Traverse and Cyclonic Flow Check Data Sheet

Test No. Pre VT
Client/Unit
Location # Scrubber outlet

Date 10/20/99
Data by BF/UP
Start time 1520
Stop time 1600

Barometric pressure
Static pressure, iwg

Port	Point	ΔP	Temp	Yaw Angle
A-6	6	.18	119	10
5	5	.45	119	12
4	4	.75	119	8
3	3	.70	119	10
2	2	.75	119	10
1	1	.58	119	0
B 6	6	.22	118	10
	5	.45	119	10
	4	.65	119	10
	3	.55	119	10
	2	.35	119	10
	1	.35	119	10
C	6	0.50	118	10
	5	.68	118	10
	4	.68	118	10
	3	.70	118	10
	2	.70	118	10
	1	.45	119	10

Port	Point	ΔP	Temp	Yaw Angle
D	6	.52	118	10
	5	.60	119	10
	4	.50	119	10
	3	.52	119	10
	2	.55	119	10
	1	.35	119	10

Leak check: Pre-test BF
Post-test BF

Manometer zero: Pre-test BF
Post-test BF

2.22 2.22
.6K
2.1

Notes/Comments 0.5168 , 119

Fossil Energy Research Corp.
Portable O_2 Analyzer Calibration Error Data Sheet

Unit San Juan 2
Pre test number 1
Post test number 2

Date 10/21/99
Data by (pre test) MDM
(post test) MDM

Mid range cal gas value 8.96
Mid range bottle number SA20637

Zero gas bottle number ALM12499

Analyzer scale 0-25%

Inlet Analyzer								
	Pre test calibration				*Post test calibration*			
	Reading	Diff % O_2	Diff % scale	Pass?	Reading	Diff % O_2	Diff % scale	Pass?
Test1 Zero	.1	.1	.4	Y				
Test1 Cal gas	9.3	.34	1.4	Y				
Test2 Zero	0.2	0.2	0.8	Y	0.1	.1	.4	Y
Test2 Cal gas	8.6	-.36	-1.5	Y	9.0	.04	.2	Y

Stack/Outlet Analyzer								
	Pre test calibration				*Post test calibration*			
	Reading	Diff % O_2	Diff % scale	Pass?	Reading	Diff % O_2	Diff % scale	Pass?
Zero	.1	.1	.4	Y	0.2	0.2	0.8	Y
Cal gas	9.4	.44	1.8	Y	9.3	0.34	1.4	Y

note - original inlet meter failed at end of Run 1 (catastrophic failure, could not be calibrated)
- replaced w/ spare analyzer for Test 2

Fossil Energy Research Corp.
Portable O_2 Analyzer Calibration Error Data Sheet

Unit San Juan 2
Pre test number 3
Post test number 4

Date 10/22/99
Data by (pre test) MM
(post test) MM

Mid range cal gas value 8.96
Mid range bottle number see 10/21

Zero gas bottle number see 10/21

Analyzer scale 0 - 25%

Inlet Analyzer								
	Pre test calibration				*Post test calibration*			
	Reading	Diff	Diff	Pass?	Reading	Diff	Diff	Pass?
		% O_2	% scale			% O_2	% scale	
Zero	0.1	0.1	.4	Y	0.1	.1	.4	Y
Cal gas	9.3	.34	1.4	Y	9.1	.14	.6	Y

Stack/Outlet Analyzer								
	Pre test calibration				*Post test calibration*			
	Reading	Diff	Diff	Pass?	Reading	Diff	Diff	Pass?
		% O_2	% scale			% O_2	% scale	
Zero	0.2	0.2	0.8	Y	0.2	.2	.8	Y
Cal gas	9.0	.04	0.2	Y	9.1	.14	.6	Y

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585 2151
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER DELTA AIR

P.O NUMBER

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
OXYGEN GMIS	vs 2658a	SA 9818	10.02%
CARBON DIOXIDE NTRM	82745x	SA 18781	17.89%

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. COMPONENT OXYGEN GMIS ANALYZER MAKE-MODEL-S/N Siemens Oxymat 5E S/N A12-839
   ANALYTICAL PRINCIPLE Paramagnetic
   FIRST ANALYSIS DATE 04/14/99
   LAST CALIBRATION DATE 04/05/99
   SECOND ANALYSIS DATE

Z 0.00	R 10.02	C 8.96	CONC. 8.96	Z	R	C	CONC.
R 10.02	Z 0.00	C 8.96	CONC. 8.96	R	Z	C	CONC.
Z 0.00	C 8.96	R 10.02	CONC. 8.96	Z	C	R	CONC.

   U/M % MEAN TEST ASSAY 8.96 % U/M % MEAN TEST ASSAY

2. COMPONENT CARBON DIOXIDE NTRM ANALYZER MAKE-MODEL-S/N Siemens Ultramat 5E S/N A12-730
   ANALYTICAL PRINCIPLE NDIR
   FIRST ANALYSIS DATE 04/14/99
   LAST CALIBRATION DATE 04/05/99
   SECOND ANALYSIS DATE

Z 0.00	R 17.90	C 17.96	CONC. 17.95	Z	R	C	CONC.
R 17.92	Z 0.00	C 18.02	CONC. 17.99	R	Z	C	CONC.
Z 0.00	C 18.00	R 17.94	CONC. 17.95	Z	C	R	CONC.

   U/M % MEAN TEST ASSAY 17.96 % U/M % MEAN TEST ASSAY

Values not valid below 150 psig

THIS CYLINDER NO. SA 20637
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 04/14/99
EXPIRATION DATE 04/14/02 TERM 36 MONTHS

CERTIFIED CONCENTRATION

OXYGEN	8.96 %
CARBON DIOXIDE	17.96 %
NITROGEN	BALANCE

SA 20637

ANALYZED BY JOSEPH CHARLES

CERTIFIED BY PHU TIEN NGUYEN

DELTA AIR QUALITY SERVICES, INC.

EPA Method 5
522 Series Meter Box Calibration
Post-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: C:\APEX\[3-wcs-shrt-11-8-99.xls]522ORPO3
Revised: 7/25/95 Version: 2.2

CONVERSION FACTORS

1 mm Hg =	0.13330	kPa
1 cm =	0.39370	inch
1 mm =	0.03937	inch
1 cu ft =	28.32	liters

PROJECT: Epri Hg
Model #: apex
Serial #: 3-wcs

Date: ----------> November 8-9
Barometric Pressure: ----------> 29.92 (in. Hg)
Theoretical Critical Vacuum:---> 14.11 (in. Hg)

!!!!!!!!
IMPORTAN For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTAN The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

---------- DRY GAS METER READINGS ----------

-CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)
1.15	10.00	932.000	938.161	6.161	80.0	69.0	80.0	70.0	55	0.459	18.0	69.0	69.0	69.0
1.15	10.00	938.300	944.470	6.170	80.0	70.0	83.0	71.0	55	0.459	18.0	69.0	69.0	69.0
1.15	10.00	944.600	950.789	6.189	84.0	71.0	87.0	72.0	55	0.459	18.0	69.0	70.0	69.5

-- Average Temperatures --

DGM Outlet (deg R)	DGM Overall (deg R)	Ambient Temp (deg R)
529.5	534.8	529.0
530.5	536.0	529.0
531.5	538.5	529.5

********** RESULTS **********

--- DRY GAS METER ---

VOLUME ORRECTE Vm(std) (cu ft)	VOLUME RRECTED Vm(std) (liters)
6.098	172.7
6.093	172.5
6.083	172.3

--------- ORIFICE ---------

VOLUME CORRECTE Vcr(std) (cu ft)	VOLUME ORRECTE Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
5.971	169.1	5.985
5.971	169.1	5.985
5.968	169.0	5.988

Average Y -------> 0.980

-- DRY GAS METER --

CALIBRATION FACTOR Y Value (number)	Variation (number)
0.979	-0.001
0.980	0.000
0.981	0.001

--------- ORIFICE ---------

CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
1.809	45.95	0.003
1.806	45.87	-0.001
1.804	45.82	-0.002
1.806	45.88	<------- Average dH@

CFM @ dH=1 0.558

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

EPA Method 5
Meter Box Calibration
Pre/Post-Test Orifice Method

System I.D.: 3-WCS
Meter Serial #: 4DEX

Date: 3/23/99 (in Hg)
Barometric Pressure: 24.80 (in Hg)

DRY GAS METER READINGS											CRITICAL ORIFICE READINGS				
							Initial Temps.		Final Temps.					Ambient Temperature	
dH (in H2O)	Start Time hh:mm:ss	Stop Time hh:mm:ss	Elapsed Time mm.mm	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)
0.25	16			936.8	941.833	5.033	74	72	73	72	40	.239	21	60	60
0.54	25			925.1	936.44	11.34	72	70	74	72	48	.347	21	60	60
0.96	9			942.3	947.752	5.452	73	72	75	72	55	.459	17	60	60
1.6	10			948.2	955.986	7.786	76	72	78	72	63	.569	18	61	61
2.9	10			957.1	967.815	10.715	78	73	85	74	73	.820	15	61	61

RESULTS

DRY GAS METER					ORIFICE			DRY GAS METER			ORIFICE		
								CALIBRATION FACTOR			CALIBRATION FACTOR		
VOLUME CORRECTED Vm(std) (cu ft)					VOLUME CORRECTED Vcr(std) (cu ft)		VOLUME NOMINAL Vcr (cu ft)	Y Value (number)	Variation (number)		dH@ Value (in H2O)		Variation (in H2O)
4.136					4.159		4.143	1.000	0		1.712		-.037
9.340					9.435		11.214	1.010	.004		1.758		.009
4.488					4.493		5.340	1.001	-.005		1.783		.033
6.403					6.400		7.621	0.999	-.006		1.808		.059
8.796					8.909		10.610	1.013	.007		1.686		-.063

Average Y ⟶ 1.006

1.749 ⟵ Average dH@

SIGNED: Stafford Pearce for Bob Davis

Date: ~~4/21~~ 3/23/99

DGM Orifice Calibration Log Sheet

EPA Method 5
Meter Box Calibration
Pre/Post-Test Orifice Method

System I.D.: 3-WCS
Meter Serial #:

Date: 7-16-99
Barometric Pressure: 29.90 (in. Hg)

DRY GAS METER READINGS											CRITICAL ORIFICE READINGS				
dH (in H2O)	Start Time hh:mm:ss	Stop Time hh:mm:ss	Elapsed Time mm.mm	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	'K' Orifice Coefficient	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)
2.00	STOP WATCH		8 00	103.662	109.940	6.278	78.0	73.0	81	74	63	0.589	19.	73	74
2.00	↓	↓	8 00	109.940	116.071	6.231	78.0	74.0	82	74	63	0.589	19	73	73
2.00	↓	↓	8 00	116.071	122.315	6.244	79.0	75.0	83	75	63	0.589	19	72	72.5

RESULTS

DRY GAS METER VOLUME CORRECTED Vm(std) (cu ft)	ORIFICE VOLUME CORRECTED Vcr(std) (cu ft)	ORIFICE VOLUME NOMINAL Vcr (cu ft)	DRY GAS METER CALIBRATION FACTOR Y Value (number)	DRY GAS METER CALIBRATION FACTOR Variation (number)	ORIFICE CALIBRATION FACTOR dH@ Value (in H2O)	ORIFICE CALIBRATION FACTOR Variation (in H2O)
6.163	6.097	6.173	0.999	-0.002	1.916	0.005
6.150	6.103	6.167	0.992	0.001	1.910	0.000
6.152	6.105	6.164	0.993	0.001	1.905	-0.005

Average Y ⟶ 0.991

1.910.52 ⟵ Average dH@

SIGNED:

Date: 7-16-99

DGM Orifice Calibration Log Sheet

EPA Method 5
Meter Box Calibration
Pre/Post-Test Orifice Method

System I.D.: 3-WCS
Meter Serial#: Apex

Date: 8/4/99
Barometric Pressure: 29.74 (in. Hg)

DRY GAS METER READINGS											CRITICAL ORIFICE READINGS				
dH (in H2O)	Start Time hh:mm:ss	Stop Time hh:mm:ss	Elapsed Time mm.mm	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)
1.2	0	10	10	48.773	54.810	6.037	80	77	82	78	65	.459	21	81	81
1.2		20	10	54.810	61.040	6.230	82	78	84	79				81	82
1.2		30	10	61.040	67.183	6.143	84	79	86	81				82	82

RESULTS

DRY GAS METER VOLUME CORRECTED Vm(std) (cu ft)	ORIFICE VOLUME CORRECTED Vcr(std) (cu ft)	ORIFICE VOLUME NOMINAL Vcr (cu ft)	DRY GAS METER CALIBRATION FACTOR Y Value (number)	DRY GAS METER CALIBRATION FACTOR Variation (number)	ORIFICE CALIBRATION FACTOR dH@ Value (in H2O)	ORIFICE CALIBRATION FACTOR Variation (in H2O)
5.891	5.869	6.052	0.996	.014	1.913	0.002
6.062	5.866	6.055	0.968	-.015	1.912	.001
5.958	5.863	6.058	0.984	.001	1.908	-.003
					1.911	
	Average Y →		0.983		0.543	← Average dH@

SIGNED:

Date: 8/4/99

DGM Orifice Calibration Log Sheet

EPA Method 5
Meter Box Calibration
Pre/Post-Test Orifice Method

System I.D.: 3-WCS
Meter Serial #: APEX

Date: 10-11-99
Barometric Pressure: 29.92 (in. Hg)

DRY GAS METER READINGS											CRITICAL ORIFICE READINGS				
							Initial Temps.		Final Temps.					Ambient Temperature	
dH (in H2O)	Start Time hh:mm:ss	Stop Time hh:mm:ss	Elapsed Time mm.mm	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)
0.32	0947	1003	16:00	971.53	976.739	5.209	77	73	76	74	40	0.239	21	60	60
0.62	1006	1017	11:00	977.0	982.133	5.133	72	72	73	72	48	0.347	21	60	60
1.20	1019	1028	9:00	982.290	987.87	5.580	72	72	73	72	55	0.459	17	60	60
1.90	1030	1037	7:00	988.3	993.846	5.546	73	72	76	73	63	0.589	18	61	61
3.00	1039	1044	5:00	994.8	1000.265	5.465	76	73	73	73	73	0.820	15	61	61

RESULTS

DRY GAS METER					ORIFICE			DRY GAS METER			ORIFICE		
VOLUME CORRECTED Vm(std) (cu ft)					VOLUME CORRECTED Vcr(std) (cu ft)		VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y Value (number)	Variation (number)		CALIBRATION FACTOR dH@ Value (in H2O)		Variation (in H2O)
5.143					5.017		4.943	0.976	-0.005		1.812		0.101
5.098					5.008		4.934	0.982	0.002		1.670		-0.041
5.550					5.420		5.340	0.977	-0.004		1.847		0.136
5.512					5.405		5.335	0.980	0.000		1.778		0.067
5.444					5.374		5.305	0.987	0.007		1.447		-0.264

Average Y ⟶ 0.980

1.711 ⟵ Average dH@

SIGNED: Teresa Redegan

Date: 10-11-99

DGM Orifice Calibration Log Sheet

TEMPERATURE SYSTEM CALIBRATION

T_1 Reference Thermometer I.D.: F95-195
T_1 Reference Thermometer I.D.: F95-195
T_1 Reference Thermometer I.D.: F95-195

T/C I.D. #2	Readout I.D.	T/C - Readout °F				Reference Thermometer °F				Difference	
		Reading 1	Reading 2	Reading 3	Average	Reading 1	Reading 2	Reading 3	Average	°F	%, (°R)
T_1	3-WCS	32	32	32	32	32	32	32	32	0	0.0%
T_2	3-WCS	213	213	212	213	212	212	212	212	1	0.1%
T_3	3-WCS	385	387	386	386	390	390	390	390	-4	-0.5%
T_1	6-WCS	33	32	33	33	32	32	32	32	1	0.1%
T_2	6-WCS	214	214	213	214	212	212	212	212	2	0.2%
T_3	6-WCS	387	387	387	387	390	390	390	390	-3	-0.4%
T_1	CC-1	33	33	33	33	32	32	32	32	1	0.2%
T_2	CC-1	216	215	215	215	212	212	212	212	3	0.5%
T_3	CC-1	387	388	387	387	390	390	390	390	-3	-0.3%
T_1	2-WCS	33	33	33	33	32	32	32	32	1	0.2%
T_2	2-WCS	214	214	214	214	212	212	212	212	2	0.3%
T_3	2-WCS	385	384	386	385	390	390	390	390	-5	-0.6%
T_1	5-WCS	33	33	33	33	32	32	32	32	1	0.2%
T_2	5-WCS	213	213	213	213	212	212	212	212	1	0.1%
T_3	5-WCS	382	383	383	383	390	390	390	390	-7	-0.9%
T_1	8-WCS	35	34	34	34	32	32	32	32	2	0.5%
T_2	8-WCS	217	216	216	216	212	212	212	212	4	0.6%
T_3	8-WCS	388	388	387	388	390	390	390	390	-2	-0.3%
T_1	PTC-6	33	32	32	32	32	32	32	32	0	0.1%
T_2	PTC-6	212	212	212	212	212	212	212	212	0	0.0%
T_3	PTC-6	380	381	381	381	390	390	390	390	-9	-1.1%
T_1	PTC-2	35	35	35	35	32	32	32	32	3	0.6%
T_2	PTC-2	213	213	213	213	212	212	212	212	1	0.1%
T_3	PTC-2	384	384	384	384	390	390	390	390	-6	-0.7%
T_1	PTC-1	33	33	33	33	32	32	32	32	1	0.2%
T_2	PTC-1	214	213	214	214	212	212	212	212	2	0.2%
T_3	PTC-1	386	387	387	387	390	390	390	390	-3	-0.4%
T_1	7-WCS	33	33	33	33	32	32	32	32	1	0.2%
T_2	7-WCS	212	212	212	212	212	212	212	212	0	0.0%
T_3	7-WCS	388	388	389	388	390	390	390	390	-2	-0.2%

Notes: Performed on 4-27-99 by D. Wonderly, M. McCune, and L. Pedregon

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: C:\meter cal\Apex\[FERCO BOX 7 -99.xls]scenorth
Revised: 7/25/95 Version: 2.2

Model #: FERCO BOX
Serial #: 1-FERCO

Date: ----------> 07/19/99
Barometric Pressure: ----------> 29.95 (in. Hg)
Theoretical Critical Vacuum:---> 14.13 (in. Hg)

!!!!!!!!!
IMPORTAN For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTAN The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------

-CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)
0.32	17.00	660.110	665.510	5.400	89.0	86.0	89.0	86.0	40	0.239	19.0	88.0	89.0	88.5
0.71	11.00	665.510	670.552	5.042	88.0	87.0	90.0	87.0	48	0.347	19.0	90.0	90.0	90.0
1.30	11.00	653.403	660.110	6.707	86.0	87.0	89.0	86.0	55	0.459	17.0	85.0	87.0	86.0
2.15	8.00	670.552	676.750	6.198	90.0	87.0	94.0	88.0	63	0.589	15.0	91.0	90.0	90.5
4.20	6.00	647.000	653.403	6.403	86.0	85.0	85.0	87.0	73	0.820	17.0	84.0	84.0	84.0

---------- RESULTS ----------

--- DRY GAS METER ---

VOLUME CORRECTE Vm(std) (cu ft)	VOLUME RRECTED Vm(std) (liters)
5.215	147.7
4.869	137.9
6.499	184.0
5.988	169.6
6.262	177.4

--------- ORIFICE ---------

VOLUME CORRECTE Vcr(std) (cu ft)	VOLUME ORRECTE Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
5.196	147.1	5.394
4.875	138.0	5.075
6.472	183.3	6.688
6.015	170.3	6.267
6.318	178.9	6.505

Average Y ------->

-- DRY GAS METER --

CALIBRATION FACTOR Y

Value (number)	Variation (number)
0.996	-0.005
1.001	0.000
0.996	-0.005
1.005	0.003
1.009	0.008
1.001	

--------- ORIFICE ---------

CALIBRATION FACTOR dH@

Value (in H2O)	Value (mm H2O)	Variation (in H2O)
1.865	47.38	-0.135
1.965	49.91	-0.035
2.043	51.90	0.043
2.065	52.46	0.065
2.063	52.39	0.062
2.000	50.81	<------- Average dH@
d	0.530	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: _____ Date: 7-19-99

Post test Meter Cal
For Ferco Meter

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: C:\My Documents\[posthgferco.xls]scenorth
Revised: 7/25/95 Version: 2.2

Model #:
Serial #:

Date: ——————> 10-29-99
Barometric Pressure: ——> 29.90 (in. Hg)
Theoretical Critical Vacuum:—> 14.10 (in. Hg)

!!!!!!!
IMPORTAN For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTAN The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!

		DRY GAS METER READINGS							-CRITICAL ORIFICE READINGS-					
					Initial Temps.		Final Temps.				Actual -- Ambient Temperature --			
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
1.28	11.00	747.000	753.463	6.463	78.0	71.0	80.0	72.0	53	0.459	17.0	78.0	78.0	78.0
1.28	11.00	754.000	760.491	6.491	79.0	73.0	81.0	75.0	48	0.459	17.0	78.0	78.0	78.0
1.28	11.00	761.000	767.505	6.505	81.0	75.0	81.0	76.0	48	0.459	17.0	78.0	78.0	78.0

RESULTS

— DRY GAS METER —		——— ORIFICE ———			— DRY GAS METER —		——— ORIFICE ———		
VOLUME CORRECTE Vm(std) (cu ft)	VOLUME RRECTEO Vm(std) (liters)	VOLUME CORRECTE Vcr(std) (cu ft)	VOLUME ORRECTE Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y Value (number)	Variation (number)	CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
6.389	180.9	6.509	184.3	6.639	1.019	0.001	2.042	51.86	0.008
6.385	181.1	6.509	184.3	6.639	1.018	0.000	2.032	51.62	-0.001
6.394	181.1	6.509	184.3	6.639	1.018	0.000	2.026	51.47	-0.007
		Average Y ——>			1.018		2.033	51.65	<—— Average dH@
							CFR @ dH=	0.526	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: _____ Date: 10-29-99

FOSSIL ENERGY RESEARCH CORP

PITOT TUBE DIMENSIONAL CALIBRATION

Pitot tube ID	Coronado, San Juan, Navajo ~~Stack~~ Inlet	Tube diameter (D_t)	.375
Date	10/25/95	P_A	.5
Data by	PM/JTB	P_B	.5

(a) Face opening plane angle = 90 deg (Y/N)?	A	Y
	B	Y
(b) Face opening planes parallell to longitudinal axis (Y/N)?	A	Y
	B	Y
(c) Both legs equal length and centerline coincident?	A	Y
	B	Y
(d) $P_A = P_B$ (Y/N)?		Y
(e) $1.05\ D_t \leq P \leq 1.50\ D_t$ (Y/N)?		Y

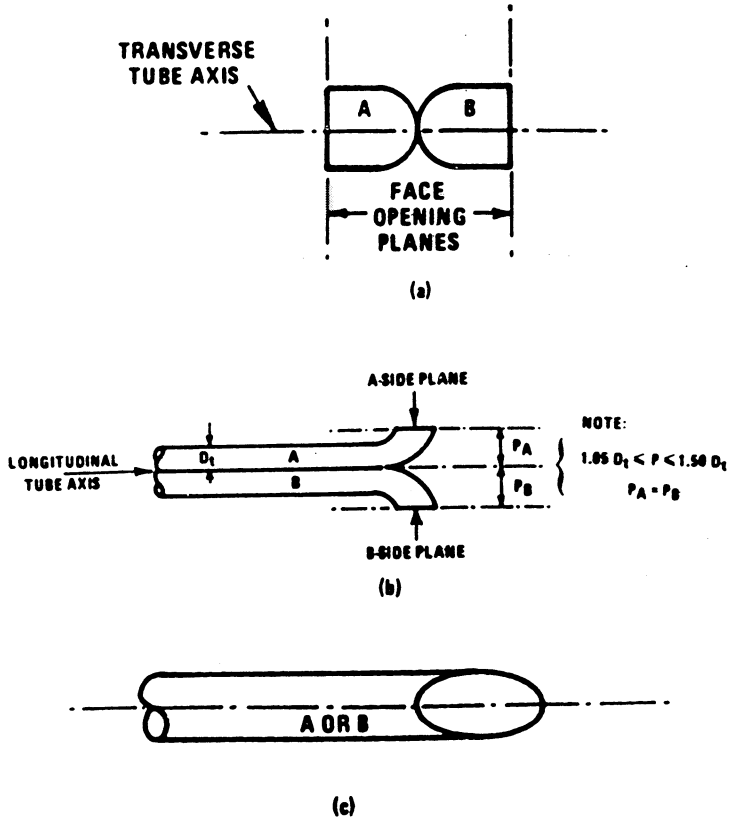


Figure 2-2. Properly constructed Type S pitot tube, shown in: (a) end view; face opening planes perpendicular to transverse axis; (b) top view; face opening planes parallel to longitudinal axis; (c) side view; both legs of equal length and centerlines coincident, when viewed from both sides. Baseline coefficient values of 0.84 may be assigned to pitot tubes constructed this way.

Coronado, San Juan Outlet

FOSSIL ENERGY RESEARCH CORP
PITOT TUBE DIMENSIONAL CALIBRATION

Pitot tube ID	#32 (outlet)	Tube diameter (D_t)	0.375
Date	10/18/99	P_A	
Data by	Finker	P_B	

(a) Face opening plane angle = 90 deg (Y/N)?	A	Y
	B	Y
(b) Face opening planes parallell to longitudinal axis (Y/N)?	A	Y
	B	Y
(c) Both legs equal length and centerline coincident?	A	Y
	B	Y
(d) $P_A = P_B$ (Y/N)?		Y
(e) $1.05\ D_t \leq P \leq 1.50\ D_t$ (Y/N)?		Y

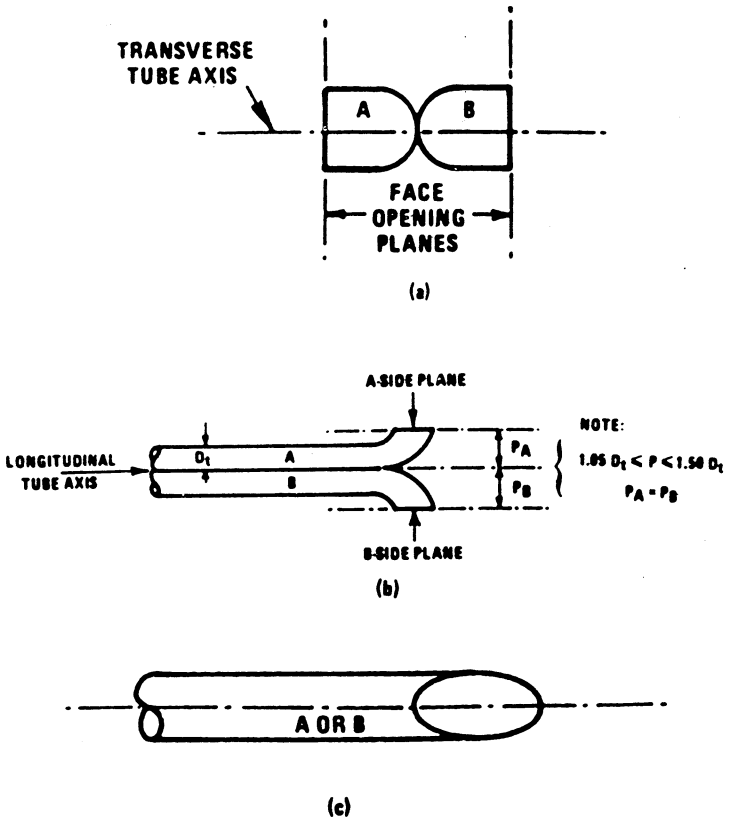


Figure 2-2. Properly constructed Type S pitot tube, shown in: (a) end view; face opening planes perpendicular to transverse axis; (b) top view; face opening planes parallel to longitudinal axis; (c) side view; both legs of equal length and centerlines coincident, when viewed from both sides. Baseline coefficient values of 0.84 may be assigned to pitot tubes constructed this way.

Appendix C. Chain-of-Custody Records

Chain-of-Custody Records

CHAIN OF CUSTODY

CLIENT: Coronado Unit 1, San Juan, Navaho TEST DATE(S): 10/19/99

LOCATION: — SAMPLER(S): TB

SAMPLE LOCATION: — PROJECT MANAGER: Mark McDaniel

TEST METHOD(S): Ontario Hydro Mercury DATE DUE: 45 days

OUTSIDE LAB REQUIRED?: Yes - Philip Analytical COMPLIANCE TEST? Yes - EPA

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/19/99	1200	Reagent Blank	3 quartz knobs	3	TB	
			0.1 N HNO_3	1		50 ml
			1 N KCl	1		50 ml
			5% HNO_3/10% H_2O_2	1		50 ml
			H_2SO_4/$KMnO_4$ Soln	1		50 ml
			10% $(NH_4)_2S$/10% NaCl	1		100 ml

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
[signature]	10/19/99 1200		

ANALYSIS REQUIRED:

Delta

CHAIN OF CUSTODY

CLIENT: San Juan — TEST DATE(S): 10/22/99

LOCATION: Unit 2 — SAMPLER(S): BF / PA

SAMPLE LOCATION: Inlet & Outlet of Scrubber — PROJECT MANAGER: Mark McDaniel

TEST METHOD(S): Ontario Hydro Mercury — DATE DUE: 45 day

OUTSIDE LAB REQUIRED?: Yes - Philip Analytical — COMPLIANCE TEST? Yes - EPA

Samples

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/22/99	1400	Inlet-FieldBlank	Thimble QT-69	1	BF	
			Front half	1	↓	
			KCl imp	1		
			HNO_3/H_2O_2 imp	1		
			$KMnO_4$ imp	1		
10/22/99	1730	Outlet FieldBlank	Thimble QT-70	1	PA	
			Probe Wash & Fltr	1	↓	
			KCl imp	1		
			HNO_3/H_2O_2 imp	1		
			$KMnO_4$ imp	1		

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
[signature]	10/22/99 1800		

ANALYSIS REQUIRED:

Mercury by Old speciation method

Delta

CHAIN OF CUSTODY

CLIENT: San Juan — TEST DATE(S): 10/21/99

LOCATION: Unit 2 — SAMPLER(S): BF / PA

SAMPLE LOCATION: Scrubber Inlet and Outlet — PROJECT MANAGER: Mark McDaniel

TEST METHOD(S): Ontario Hydro Mercury — DATE DUE: 45 days

OUTSIDE LAB REQUIRED?: Yes - Philip Analytical — COMPLIANCE TEST? Yes - EPA

Sample

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/21/99	1830	2-Outlet-Hg	Thimble QT-54	1	BF	
			Probe Wash & Fltr	1		
			KCl imp	2		
			HNO_3/H_2O_2 imp	1		
			$KMnO_4$ imp	1		
10/21/99	1830	2-Inlet-Hg	Thimble QT-55	1	PA	
			Front Half	1		
			KCl imp	2		
			HNO_3/H_2O_2 imp	1		
			$KMnO_4$ imp	1		

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
[signature]	10/22/99 1000		

ANALYSIS REQUIRED: Mercury by OH Method

Delta

CHAIN OF CUSTODY

CLIENT: San Juan — TEST DATE(S): 10/22/99

LOCATION: Unit 2 — SAMPLER(S): BF/PA

SAMPLE LOCATION: Inlet and Outlet — PROJECT MANAGER: Mark McDannel

TEST METHOD(S): Ontario Hydro Mercury — DATE DUE: 45 days

OUTSIDE LAB REQUIRED?: Yes - Philip Analytical — COMPLIANCE TEST? Yes - EPA

Sample

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/22/99	1400	3-Outlet-Hg	Thimble QT-56	1	PA	1/4 of test then filter changed.
			Thimble QT-58	1		Analyze filters separately
			Probe Wash & F/F	1		
			KCl imp	2		
			HNO_3/H_2O_2 imp	1		
			$KMnO_4$ imp	1	↓	
		3-Inlet-Hg	Thimble QT-57	1	BF	
			Front F/F	1		
			KCl imp	2		
			HNO_3/H_2O_2 imp	1		
			$KMnO_4$ imp	1	↓	

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
[signature]	10/22/99 1400		

ANALYSIS REQUIRED: Mercury by OH method

Delta

CHAIN OF CUSTODY

CLIENT: San Juan — TEST DATE(S): 10/22/99

LOCATION: Unit 2 — SAMPLER(S): BF/PA

SAMPLE LOCATION: Scrubber Inlet & Outlet — PROJECT MANAGER: Mark McDaniel

TEST METHOD(S): Ontario Hydro Mercury — DATE DUE: 45 days

OUTSIDE LAB REQUIRED?: Yes - Philip Analytical — COMPLIANCE TEST? Yes - EPA

Sample

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/22/99	1800	4-Inlet-Hg	Thimble QT-50	1	BF	
			Front Half	1		
			KCl imp	2		
			HNO3/H2O2 imp	1		
			KMnO4 imp	1		
10/22/99	1800	4-Outlet-Hg	Thimble QT-59	1	PA	
			Front Half & Probe Wash	1		
			KCl imp	2		
			HNO3/H2O2 imp	1		
			KMnO4 imp	1		

RELEASED BY	DATE/TIME	RECEIVED BY	DATE/TIME
	10/27/99 1800		

ANALYSIS REQUIRED: Mercury speciation by Ontario Hydro Method

Delta

List of FERCo Samples Shipped to Philip, October 27, 1999							
Ontario Hydro Samples							
Plant	Description	Test Date	Due Date	Comments			
Craig 1, Craig 3	Reagent Blanks	27-Sep	11-Nov				
Craig 1	Inlet Field Blank	27-Sep	11-Nov				
Craig 1	Stack Field Blank	27-Sep	11-Nov				
Craig 1	1-Inlet	28-Sep	12-Nov				
Craig 1	1-Stack	28-Sep	12-Nov				
Craig 1	2-Inlet	28-Sep	12-Nov				
Craig 1	2-Stack	28-Sep	12-Nov				
Craig 1	3-Inlet	29-Sep	13-Nov				
Craig 1	3-Stack	29-Sep	13-Nov				
Craig 3	Inlet Field Blank	2-Oct	16-Nov				
Craig 3	Stack Field Blank	2-Oct	16-Nov				
Craig 3	1-Inlet	4-Oct	18-Nov				
Craig 3	1-Stack	4-Oct	18-Nov				
Craig 3	2-Inlet	4-Oct	18-Nov				
Craig 3	2-Stack	4-Oct	18-Nov				
Craig 3	3-Inlet	4-Oct	18-Nov				
Craig 3	3-Stack	4-Oct	18-Nov				
Coronado 1, San Juan 2, Navajo 3	Reagent Blanks	19-Oct	3-Dec				
Coronado 1	Inlet Field Blank	19-Oct	3-Dec				
Coronado 1	Outlet Field Blank	19-Oct	3-Dec				
Coronado 1	1-Inlet	18-Oct	2-Dec				
Coronado 1	1-Outlet	18-Oct	2-Dec				
Coronado 1	2-Inlet	19-Oct	3-Dec				
Coronado 1	2-Outlet	19-Oct	3-Dec				
Coronado 1	3-Inlet	19-Oct	3-Dec				
Coronado 1	3-Outlet	19-Oct	3-Dec				
San Juan 2	Inlet Field Blank	22-Oct	6-Dec				
San Juan 2	Outlet Field Blank	22-Oct	6-Dec				
San Juan 2	2-Inlet	21-Oct	5-Dec				
San Juan 2	2-Outlet	21-Oct	5-Dec				
San Juan 2	3-Inlet	22-Oct	6-Dec	Has two filters. Analyze filters separately.			
San Juan 2	3-Outlet	22-Oct	6-Dec	↓			
San Juan 2	4-Inlet	22-Oct	6-Dec				
San Juan 2	4-Outlet	22-Oct	6-Dec				
Navajo 3	Inlet Field Blank	26-Oct	10-Dec				
Navajo 3	Outlet Field Blank	26-Oct	10-Dec				
Navajo 3	1-Inlet	25-Oct	9-Dec				
Navajo 3	1-Outlet	25-Oct	9-Dec				
Navajo 3	2-Inlet	26-Oct	10-Dec				
Navajo 3	2-Outlet	26-Oct	10-Dec				
Navajo 3	3-Inlet	26-Oct	10-Dec				
Navajo 3	3-Outlet	26-Oct	10-Dec				
Total number of samples		42					

List of FERCo Samples Shipped to Philip, October 27, 1999			
Coal Samples, analyze for Hg, Cl			
Plant	Description	Test Date	Target Date
Craig 1	Run 1	28-Sep	12-Nov
Craig 1	Run 2	28-Sep	12-Nov
Craig 1	Run 3	29-Sep	13-Nov
Craig 3	Run 1	4-Oct	18-Nov
Craig 3	Run 2	4-Oct	18-Nov
Craig 3	Run 3	4-Oct	18-Nov
Coronado 1	Run 1	18-Oct	2-Dec
Coronado 1	Run 2	19-Oct	3-Dec
Coronado 1	Run 3	19-Oct	3-Dec
San Juan 2	Run 2	21-Oct	5-Dec
San Juan 2	Run 3	22-Oct	6-Dec
San Juan 2	Run 4	22-Oct	6-Dec
Navajo 3	Run 1	25-Oct	9-Dec
Navajo 3	Run 2	26-Oct	10-Dec
Navajo 3	Run 3	26-Oct	10-Dec
Total number of samples		15	

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Mark McDaniel
Client: Fossil Energy Research Corp.
Re Client Project: Craig
FAX #: 949-859-7916
Phone #: 949-859-4466

Samples for: OH' Hg Tramy
were received in good condition unless indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
065693	Reagent Blank	99/09/27	99/10/29
065701	Unit 1 Stack-FB	99/09/27	99/10/29
065702	Unit 1 Stack-R1	99/09/28	99/10/29
065703	Unit 1 Stack-R2	99/09/28	99/10/29
065704	Unit 1 Stack-R3	99/09/29	99/10/29
065705	Unit 1 Inlet-FB	99/09/27	99/10/29
065706	Unit 1 Inlet-R1	99/09/28	99/10/29
065707	Unit 1 Inlet-R2	99/09/28	99/10/29
065708	Unit 1 Inlet-R3	99/09/29	99/10/29
065709	Unit 3 Stack-FB	99/10/02	99/10/29
065710	Unit 3 Stack-R1	99/10/04	99/10/29
065711	Unit 3 Stack-R2	99/10/04	99/10/29
065712	Unit 3 Stack-R3	99/10/05	99/10/29
065713	Unit 3 Inlet-FB	99/10/02	99/10/29
065714	Unit 3 Inlet-R1	99/10/04	99/10/29
065715	Unit 3 Inlet-R2	99/10/04	99/10/29
065716	Unit 3 Inlet-R3	99/10/05	99/10/29
065764	Reagent Blank QT40	99/10/19	99/10/29
065766	Unit 1 Stack-FB	99/10/19	99/10/29
065767	Unit 1 Stack-R1	99/10/18	99/10/29
065768	Unit 1 Stack-R2	99/10/19	99/10/29
065769	Unit 1 Stack-R3	99/10/19	99/10/29
065770	Unit 1 Inlet-FB	99/10/19	99/10/29
065771	Unit 1 Inlet-R1	99/10/18	99/10/29
065772	Unit 1 Inlet-R2	99/10/19	99/10/29
065773	Unit 1 Inlet-R3	99/10/19	99/10/29
065782	Unit 2 Stack-FB	99/10/22	99/10/29
065783	Unit 2 Stack-R2	99/10/21	99/10/29
065784	Unit 2 Stack-R3	99/10/22	99/10/29
065786	Unit 2 Stack-R4	99/10/22	99/10/29
065787	Unit 2 Inlet-FB	99/10/22	99/10/29
065788	Unit 2 Inlet-R2	99/10/21	99/10/29
065789	Unit 2 Inlet-R3	99/10/22	99/10/29
065790	Unit 2 Inlet-R4	99/10/22	99/10/29
065831	Unit 3 Stack-FB	99/10/25	99/10/29
065832	Unit 3 Stack-R11	99/10/25	99/10/29

Comments: _____

Date 99/11/08

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Mark McDaniel
Client: Fossil Energy Research Corp.
Re Client Project: Navajo
FAX #: 949-859-7916
Phone #: 949-859-4466

Samples for: 'DH' by Trains
were received in good condition unless indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
065833	Unit 3 Stack-R2	99/10/26	99/10/29
065834	Unit 3 Stack-R3	99/10/26	99/10/29
065835	Unit 3 Inlet-FB	99/10/26	99/10/29
065836	Unit 3 Inlet-R1	99/10/25	99/10/29
065837	Unit 3 Inlet-R2	99/10/26	99/10/29
065838	Unit 3 Inlet-R3	99/10/26	99/10/29

Comments: _____

Date 99/11/08

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Mark McDaniel
Client: Fossil Energy Research Corp.
Re Client Project: Craig
FAX #: 949-859-7916
Phone #: 949-859-4466

Samples for: Hg via 7471 and Cl (coal) via Bomb/IC.
were received in good condition unless indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
065718	Unit 1 Coal-R1	99/10/05	99/10/29
065719	Unit 1 Coal-R2	99/10/05	99/10/29
065720	Unit 1 Coal-R3	99/10/05	99/10/29
065721	Unit 3 Coal-R1	99/10/04	99/10/29
065722	Unit 3 Coal-R2	99/10/04	99/10/29
065723	Unit 3 Coal-R3	99/10/04	99/10/29
065724	Unit 1 Ash-R1	99/09/28	99/10/29
065725	Unit 1 Ash-R2	99/09/28	99/10/29
065726	Unit 1 Ash-R3	99/09/28	99/10/29
065727	Unit 3 Ash-R1	99/10/04	99/10/29
065728	Unit 3 Ash-R2	99/10/04	99/10/29
065729	Unit 3 Ash-R3	99/10/04	99/10/29
065775	Unit 1 Coal-R1	99/10/18	99/10/29
065776	Unit 1 Coal-R2	99/10/19	99/10/29
065777	Unit 1 Coal-R3	99/10/19	99/10/29
065778	Unit 1 Ash-R1	99/10/18	99/10/29
065779	Unit 1 Ash-R2	99/10/18	99/10/29
065780	Unit 1 Ash-R3	99/10/19	99/10/29
065792	Unit 2 Coal-R2	99/10/22	99/10/29
065793	Unit 2 Coal-R3	99/10/22	99/10/29
065794	Unit 2 Coal-R4	99/10/22	99/10/29
065828	Unit 2 Ash-R2	99/10/21	99/10/29
065829	Unit 2 Ash-R3/4	99/10/22	99/10/29
065840	Unit 3 Coal-R1	99/10/25	99/10/29
065841	Unit 3 Coal-R2	99/10/26	99/10/29
065842	Unit 3 Coal-R3	99/10/26	99/10/29
065843	Unit 3 Ash-R1	99/10/25	99/10/29
065844	Unit 3 Ash-R2	99/10/26	99/10/29
065845	Unit 3 Ash-R3	99/10/26	99/10/29

Comments: _____

Date 99/11/08

Coronado, San Juan, Navajo

Mercury ICR Program

Consumables Record Form and Tracking Log

Reagent	Supplier	Lot Number	Date rec'd	Date opened	Opened by	Meets inspection criteria	Date blank taken	Tests used
Bench Titration	Agarso	NA	7/1/99	7/1/99	JB	Yes	10/19/99	
DI H_2O	Arrowhead/Alpha	NA	7/1/99	10/14/99	JB	Yes cond = 0.8 µmhos	w/ reagents	
30% H_2O_2	Fisher	992088	7/1/99	10/18/99	JB	Yes	w/ $KMnO_4$/H_2O_2 reagent 10/19/99	
conc HCl	Fisher	418110	7/1/99	10/14/99	JB	Yes	Per cleaning no blank	
Nitric Acid	Fisher	118100	7/1/99	10/14/99	JB	Yes	10/19/99	
NaOH	Fisher	986410	7/20/99	7/20/99	JB	Yes	w/ hydroxylamine 10/19/99	
Sulfuric acid	Fisher	318061	7/1/99	10/14/99	JB	Yes	w/ $KMnO_4$/H_2SO_4 10/19/99	
Potassium Chloride	Fisher	986514	7/1/99	10/14/99	JB	Yes	10/19/99	
Hydroxylamine Sulfate	Fisher	991665	7/1/99	7/1/99	JB	Yes	10/19/99	
Potassium Permanganate	Fisher	985715	7/1/99	10/14/99	JB	Yes	w/ $KMnO_4$/H_2SO_4 10/19/99	

Appendix D. Analytical Lab Reports

Gas Samples

Coal Samples

Certificate of Analysis

CLIENT INFORMATION

Attention:	Mark McDaniel
Client Name:	Fossil Energy Research Corp.
Project:	San Juan
Project Desc:	San Juan Unit 2
Address:	23342 C South Pointe Laguna Hills, CA CA 92653
Fax Number:	949-859-7916
Phone Number:	949-859-4466

LABORATORY INFORMATION

Contact:	Ron McLeod
Project:	AN991388
Date Received:	99/10/29
Date Reported:	99/12/20
Submission No.:	9K0070
Sample No.:	065781-065790

NOTES: *''-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can by determined for all analytes by multiplying the appropriate MDL X 3.33
Solids data is based on dry weight except for biota analyses.
Organic analyses are not corrected for extraction recovery standards except for isotope dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS: **Revised Report: Jan 28th 2000**

Certified by: _____

			Method	Blank	Blank	Blank	Blank	Unit 2	Unit 2	Unit 2
Client ID:			Blank	Spike #1	Spike #1	Spike #2	Spike #2	Stack-FB	Stack-R2	Stack-R2
Lab No.:			065781 99	065781 99	065781 99	065781 99	065781 99	065782 99	065783 99	065783 99
Date Sampled:			-	-	-	-	-	99/10/22	99/10/21	99/10/21
Component	**MDL**	**Units**			% Recoveries		% Recoveries			Duplicate
Mercury - filter - bulk	0.010	ug	<	0.11	110	0.099	99	<0.060	0.095	-
Mercury - KCl	0.030	"	<	0.30	98	0.30	99	<0.10	0.88	0.89
Mercury - KMnO4	0.030	"	<	0.31	100	0.31	100	<0.050	14	14
Mercury - H202	0.010	"	<	0.25	100	0.22	90	<0.25	<0.25	<0.25

PASC - Certificate of Analysis

			Unit 2	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2
Client ID:			Stack-R2	Stack-R2	Stack-R2	Stack-R2	Stack-R3	tack-R3 QT5	Stack-R4	Inlet-FB	Inlet-R2	Inlet-R3
Lab No.:			065783 99	065783 99	065783 99	065783 99	065784 99	065785 99	065786 99	065787 99	065788 99	065789 99
Date Sampled:			99/10/21	99/10/21	99/10/21	99/10/21	99/10/22	99/10/22	99/10/22	99/10/22	99/10/21	99/10/22
Component	**MDL**	**Units**	M. Spike	MS % Rec.	MS Dup	MSD % Rec.						
Mercury - filter - bulk	0.010	ug	-	-	-	-	0.15	<0.080	0.098	<0.060	<0.070	0.14
Mercury - KCl	0.030	"	1.9	100	1.9	99	0.67	-	0.55	0.30	11	5.5
Mercury - KMnO4	0.030	"	26	95	26	95	8.6	-	8.3	0.049	9.7	7.1
Mercury - H202	0.010	"	2.5	99	2.5	97	<0.25	-	<0.25	<0.25	0.53	<0.25

			Unit 2
	Client ID:		Inlet-R4
	Lab No.:		065790 99
	Date Sampled:		99/10/22
Component	**MDL**	**Units**	
Mercury - filter - bulk	0.010	ug	<0.080
Mercury - KCl	0.030	"	8.0
Mercury - KMnO4	0.030	"	5.7
Mercury - H202	0.010	"	<0.25

Batch Code:	**12175NFB**	**12191GFB**
Mercury - filter - bulk	065781 99	065788 99
	065782 99	
	065783 99	
	065784 99	
	065785 99	
	065786 99	
	065787 99	
	065789 99	
	065790 99	
Run Date:	99/12/17	99/12/19
Date of Sample Prep:	99/12/17	99/12/19

Batch Code:	**12012NKC**
Mercury - KCl	065781 99
	065782 99
	065783 99
	065784 99
	065786 99
	065787 99
	065788 99
	065789 99
	065790 99
Run Date:	99/12/01
Date of Sample Prep:	99/12/01

Batch Code:	**12022NM4**
Mercury - KMnO4	065781 99
	065782 99
	065783 99
	065784 99
	065786 99
	065787 99
	065788 99
	065789 99
	065790 99
Run Date:	99/12/03
Date of Sample Prep:	99/12/02

Batch Code:	**12102BPO**
Mercury - H202	065781 99
	065782 99
	065783 99
	065784 99
	065786 99
	065787 99
	065788 99
	065789 99
	065790 99
Run Date:	99/12/10

Date of Sample Prep: 99/12/10

Certificate of Analysis

CLIENT INFORMATION

Attention:	Mark McDaniel
Client Name:	Fossil Energy Research Corp.
Project:	San Juan
Project Desc:	San Juan Unit 2
Address:	23342 C South Pointe Laguna Hills, CA CA 92653
Fax Number:	949-859-7916
Phone Number:	949-859-4466

LABORATORY INFORMATION

Contact:	Ron McLeod
Project:	AN991388
Date Received:	99/10/29
Date Reported:	99/12/16
Submission No.:	9K0070
Sample No.:	065791-065829

NOTES: *''-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can by determined for all analytes by multiplying the appropriate MDL X 3.33
Solids data is based on dry weight except for biota analyses.
Organic analyses are not corrected for extraction recovery standards except for isotope dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

Certified by: _____

PASC - Certificate of Analysis

			Method Blank	Blank Spike	Blank Spike	Unit 2 Coal-R2	Unit 2 Coal-R3	Unit 2 Coal-R4	Unit 2 Coal-R4	Unit 2 Coal-R4	Unit 2 Coal-R4	Unit 2 Ash-R2	Unit 2 Ash-R3/4
Client ID:													
Lab No.:			065791 99	065791 99	065791 99	065792 99	065793 99	065794 99	065794 99	065794 99	065794 99	065828 99	065829 99
Date Sampled:			-	-	-	99/10/22	99/10/22	99/10/22	99/10/22	99/10/22	99/10/22	99/10/21	99/10/22
Component	**MDL**	**Units**			% Recoveries				Duplicate	M. Spike	MS % Rec.		
Total Chlorine (as Cl)	0.0005	(%)	-	-	-	0.020	0.010	0.020	-	-	-	-	-
Mercury	0.04	mg/kg	<	1.0	100	<	0.060	0.070	0.040	1.1	110	<	<

FRONTIER GEOSCIENCES INC.
ENVIRONMENTAL RESEARCH & SPECIALTY ANALYTICAL LABORATORY
(206) 622-6960 • FAX: (206) 622-6870
E-MAIL: INFO@FRONTIER.WA.COM
414 PONTIUS NORTH • SEATTLE, WA 98109

January 11, 2000

Mark McDannel
Fossil Energy Research Corp.
23342C South Pointe
Laguna Hills, CA 92653

SUBJECT: RESULTS FOR RUSH COAL SAMPLES

Dear Mr. McDannel,

Attached please find results for your rush samples. There are no analytical issues associated with these results and all of the associated quality control results look good.

Please call or e-mail (jamesk@frontier.wa.com) me if you have any questions or concerns.

Sincerely,

James Keithly

Frontier Geosciences Inc
Quality Assurance Data Tables

QA Table 1: Data Set Matrix Duplicate Analysis

Lab Sample ID	Lab Data Set	Rep 1 ng Hg/gram	Rep 2 ng Hg/gram	Average Result ng Hg/gram	Matrix Duplicate RPD
another client	990107	18.98 ng/g	17.35 ng/g	18.16	8.9%

QA Table 2: Data Set Matrix Spike Recovery (100ng Hg/sample Matrix Spike)

Lab Sample ID	Lab Data Set	Amt Spiked Per Gram ng Hg/gram	Spike Result ng Hg/gram	Amount Recovered ng Hg/gram	Matrix Spike Rec. %
another client	990107	193.87	229.57	211.41	109.0%
another client	990107	198.14	208.16	190.00	95.9%

Average Matrix Spike Recovery = 102.5%

QA Table 3: Standard Reference Material Recovery

IMPORTANT NOTE: SRM 1630a
Note the certified value for this SRM is being revised as a result of a recent round-robin study. Frontier was informed that the new certified value will be 85 ng/g. Therefore, we are altering the true value for this report.

Results: SRM 1630a Trace Mercury in Coal					
Lab Sample ID	Lab Data Set	Reference Value ng Hg/gram	Measured Value ng Hg/gram	Excepted Recovery Range (%)	Actual Recovery %
NIST 1630a	991217	85	97.2	75-125	114.3%

CONFIDENTIAL DATA

Table 1: Results of Mercury Analysis - Fossil Energy Research Corp.
Frontier Geosciences Inc

			Reagent and System Blank Corrected			
Sample ID	Lab Data Set	Total Hg ng Hg/gram	Matrix Duplicate ng Hg/gram	Matrix Duplicate RPD	Matrix Dup Average ng Hg/gram	As Received ppm Hg (ug Hg/gram)
San Juan 2, Run 2, 10/21/99	THg51-990107	41.62 ng/g				0.042
San Juan 2, Run 3, 10/22/99	THg51-990107	48.48 ng/g				0.048
San Juan 2, Run 4, 10/22/99	THg51-990107	62.36 ng/g				0.062
Estimated MDL - 990107		**0.002 ug Hg/g**				

$$\text{Dry Hg} = \text{Hg}_{\text{as received}} / \left(1 - \frac{\%\text{moisture}}{100}\right)$$

Run	$\text{Hg}_{\text{as received}}$	Coal Moisture	Hg Dry
2	.042	5.71	.045
3	.048	5.35	.051
4	.062	5.17	.065

COMMERCIAL TESTING & ENGINEERING CO.

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DENVER, CO 80239
TEL: (303) 373-4772
FAX: (303) 373-4791

November 16, 1999

FOSSIL ENERGY RESEARCH
23342 C South Pointe
Laguna Hills CA 92653

Sample identification by
FOSSIL ENERGY RESEARCH CORP.

SAMPLE ID: SAN JUAN 2
TEST 2
REQUISITION NO: 99-6693-1463

Kind of sample COAL

Sample taken by FOSSIL ENERGY RESEARCH CORP.

Date sampled ------

Date received November 11, 1999

Analysis report no. 72-417098

SHORT PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.71	xxxxx
%Ash	28.26	29.97
Btu/lb	9406	9976
% Sulfur	0.63	0.67

MAF BTU/lb	14245		
lb SO_2/mm Btu	1.34	lb Sulfur/mm Btu	0.67
% Air Dry Loss	3.96	As Received Net Sample Wt.	492.00 g

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Denver Laboratory

MEMBER ACIL

COMMERCIAL TESTING & ENGINEERING CO.

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FAX: (303) 373-4791

November 16, 1999

FOSSIL ENERGY RESEARCH
23342 C South Pointe
Laguna Hills CA 92653

Sample identification by
FOSSIL ENERGY RESEARCH CORP.

SAMPLE ID: SAN JUAN 2
TEST 3
REQUISITION NO: 99-6693-1463

Kind of sample COAL

Sample taken by FOSSIL ENERGY RESEARCH CORP.

Date sampled October 22, 1999

Date received November 11, 1999

Analysis report no. 72-417099

SHORT PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.35	xxxxx
%Ash	22.51	23.78
Btu/lb	10361	10947
% Sulfur	0.69	0.73

MAF BTU/lb	14362		
lb SO_2/mm Btu	1.33	lb Sulfur/mm Btu	0.67
% Air Dry Loss	3.63	As Received Net Sample Wt.	511.10 g

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Denver Laboratory

MEMBER ACIL

COMMERCIAL TESTING & ENGINEERING CO.

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FAX: (303) 373-4791

November 16, 1999

FOSSIL ENERGY RESEARCH
23342 C South Pointe
Laguna Hills CA 92653

Sample identification by
FOSSIL ENERGY RESEARCH CORP.

SAMPLE ID: SAN JUAN 2
TEST 4
REQUISITION NO: 99-6693-1463

Kind of sample COAL

Sample taken by FOSSIL ENERGY RESEARCH CORP.

Date sampled October 22, 1999

Date received November 11, 1999

Analysis report no. 72-417100

SHORT PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.17	xxxxx
%Ash	26.13	27.55
Btu/lb	9819	10354
% Sulfur	0.78	0.82

MAF BTU/lb	14291		
lb SO_2/mm Btu	1.59	lb Sulfur/mm Btu	0.79
% Air Dry Loss	3.47	As Received Net Sample Wt.	480.20 g

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Denver Laboratory

MEMBER ACIL

Appendix E. Audit Data Sheets

(no audits performed)

Appendix F. List of Participants

List of Participants		
San Juan Unit 2 Mercury ICR Testing		
Name	*Position on Test Team*	*Affiliation*
Mark McDannel	Team Leader, Data Reduction, Coal Sampling	Fossil Energy Research Corp.
Arlene Bell	Project Chemist, Sample Recovery and Custody	Delta Air Quality Services
Paul Anderson	Outlet Sampling Leader	Fossil Energy Research Corp.
Lawrence Pedregon	Outlet Assistant	Delta Air Quality Services
Robert Finken	Inlet Sampling Leader	Delta Air Quality Services
Jerry Bovee	Inlet Assistant	Fossil Energy Research Corp.
Ron McLeod	Laboratory Analyses	Philip Analytical Services
Michael Farley	Program Manager and Site Coordinator	Public Service New Mexico

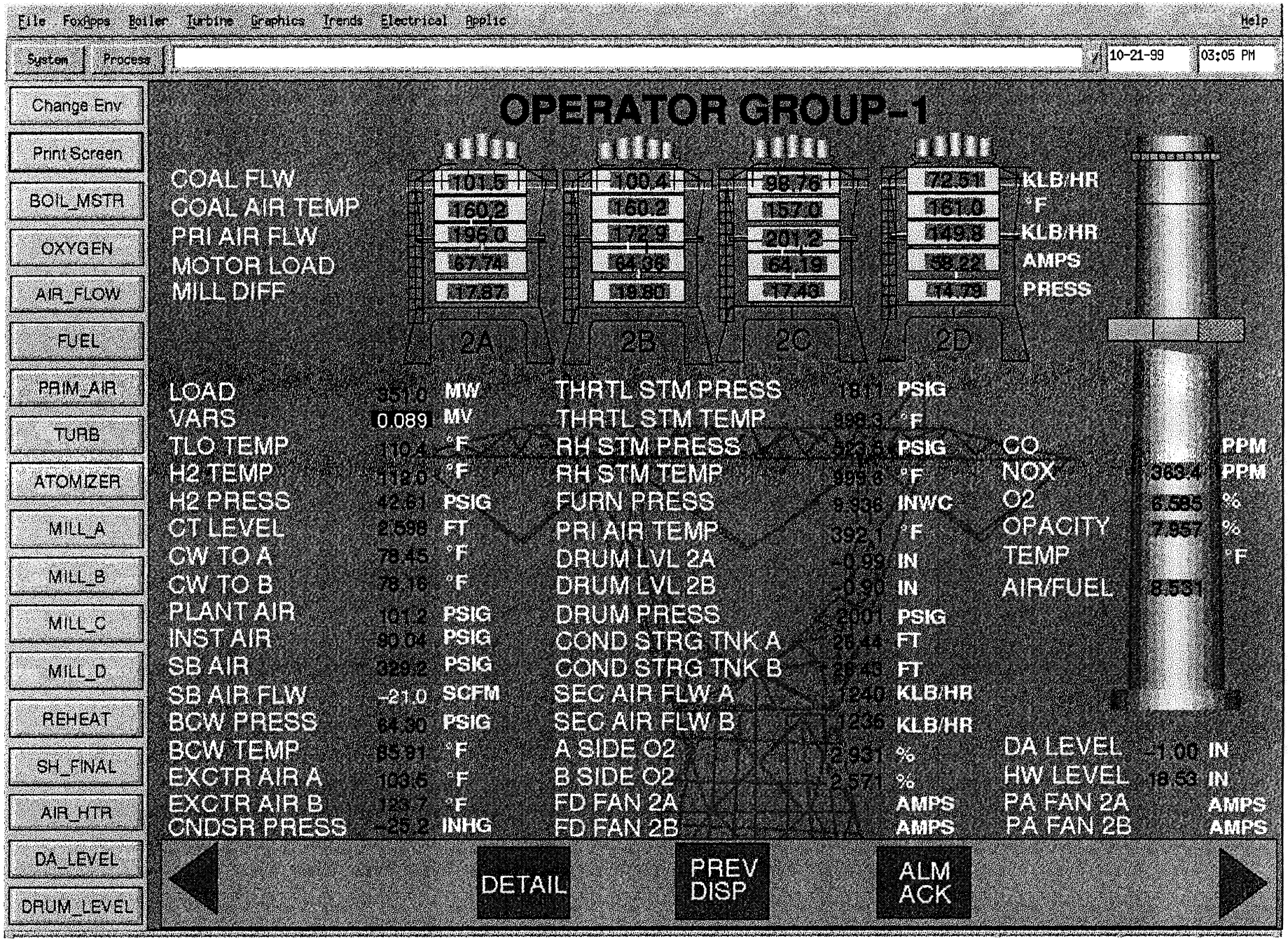
Appendix G. Additional Information

CEMS Data

ESP Data

Boiler Data

Scrubber Data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OXYGEN
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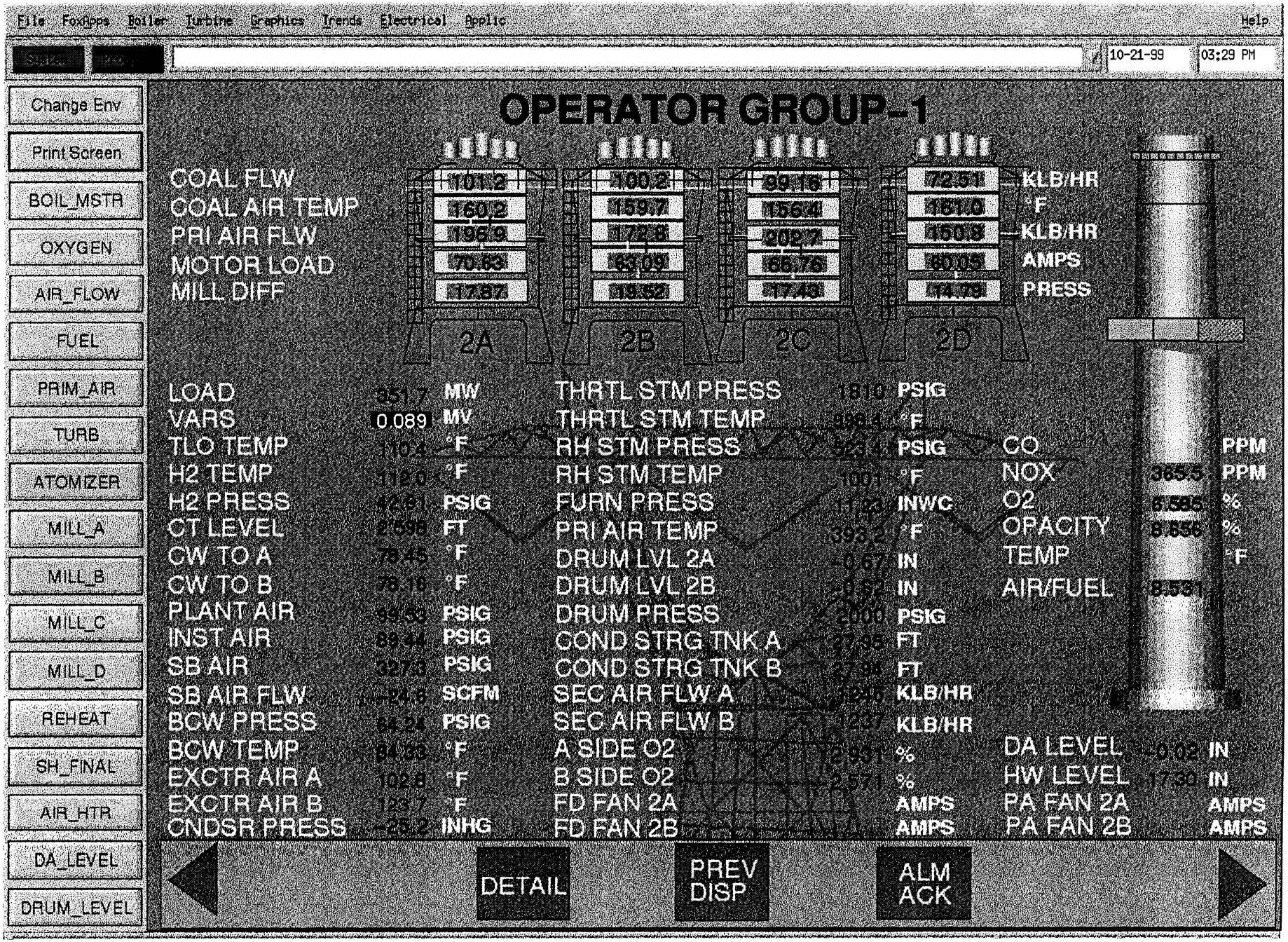
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 101.5 100.4 96.75 72.51 KLB/HR
COAL AIR TEMP 160.2 160.2 157.0 161.0 °F
PRI AIR FLW 196.0 172.9 201.2 149.8 KLB/HR
MOTOR LOAD 67.74 64.98 64.19 38.22 AMPS
MILL DIFF 17.87 18.80 17.43 14.78 PRESS
2A 2B 2C 2D
LOAD 351.0 MW
VARS 0.089 MV
TLO TEMP 110.4 °F
H2 TEMP 112.0 °F
H2 PRESS 42.61 PSIG
CT LEVEL 2.598 FT
CW TO A 78.45 °F
CW TO B 78.16 °F
PLANT AIR 101.2 PSIG
INST AIR 90.04 PSIG
SB AIR 029.2 PSIG
SB AIR FLW -21.0 SCFM
BCW PRESS 64.30 PSIG
BCW TEMP 85.91 °F
EXCTR AIR A 103.6 °F
EXCTR AIR B 123.7 °F
CNDSR PRESS -25.2 INHG
THRTL STM PRESS 1811 PSIG
THRTL STM TEMP 998.3 °F
RH STM PRESS 923.6 PSIG
RH STM TEMP 995.6 °F
FURN PRESS 0.936 INWC
PRI AIR TEMP 392.1 °F
DRUM LVL 2A -0.99 IN
DRUM LVL 2B -0.90 IN
DRUM PRESS 2001 PSIG
COND STRG TNK A 26.44 FT
COND STRG TNK B 26.43 FT
SEC AIR FLW A 1240 KLB/HR
SEC AIR FLW B 1236 KLB/HR
A SIDE O2 2.931 %
B SIDE O2 2.571 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 363.4 PPM
O2 6.585 %
OPACITY 7.957 %
TEMP °F
AIR/FUEL 8.531
DA LEVEL -1.00 IN
HW LEVEL 18.53 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
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COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
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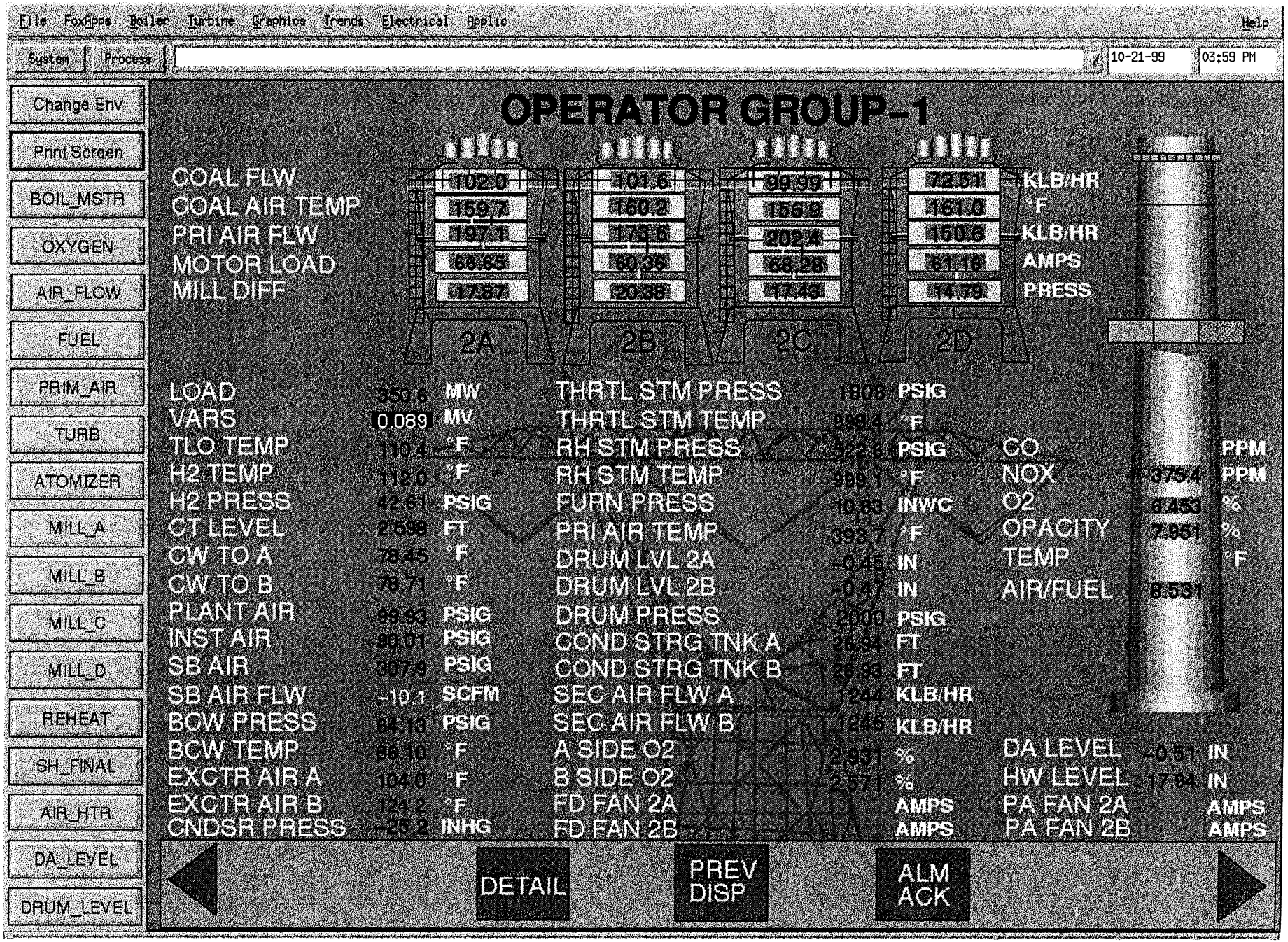
196.9
70.83
17.87
100.2
159.7
172.6
63.09
19.52
99.16
156.4
202.7
66.76
17.43
72.51
161.0
150.8
60.09
14.79
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 351.7 MW
VARS 0.089 MV
TLO TEMP 110.4 °F
H2 TEMP 112.0 °F
H2 PRESS 42.81 PSIG
CT LEVEL 2'598 FT
CW TO A 78.45 °F
CW TO B 78.16 °F
PLANT AIR 99.53 PSIG
INST AIR 89.44 PSIG
SB AIR 327.3 PSIG
SB AIR FLW 124.8 SCFM
BCW PRESS 64.24 PSIG
BCW TEMP 84.83 °F
EXCTR AIR A 102.8 °F
EXCTR AIR B 123.7 °F
CNDSR PRESS -25.2 INHG
THRTL STM PRESS 1810 PSIG
THRTL STM TEMP 998.4 °F
RH STM PRESS 923.4 PSIG
RH STM TEMP 1001 °F
FURN PRESS -1.23 INWC
PRI AIR TEMP 393.2 °F
DRUM LVL 2A -0.67 IN
DRUM LVL 2B -0.82 IN
DRUM PRESS 2000 PSIG
COND STRG TNK A 27.95 FT
COND STRG TNK B 27.94 FT
SEC AIR FLW A 1246 KLB/HR
SEC AIR FLW B 1237 KLB/HR
A SIDE O2 12.931 %
B SIDE O2 12.571 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 365.5 PPM
O2 6.585 %
OPACITY 8.656 %
TEMP °F
AIR/FUEL 8.531
DA LEVEL -0.02 IN
HW LEVEL 17.30 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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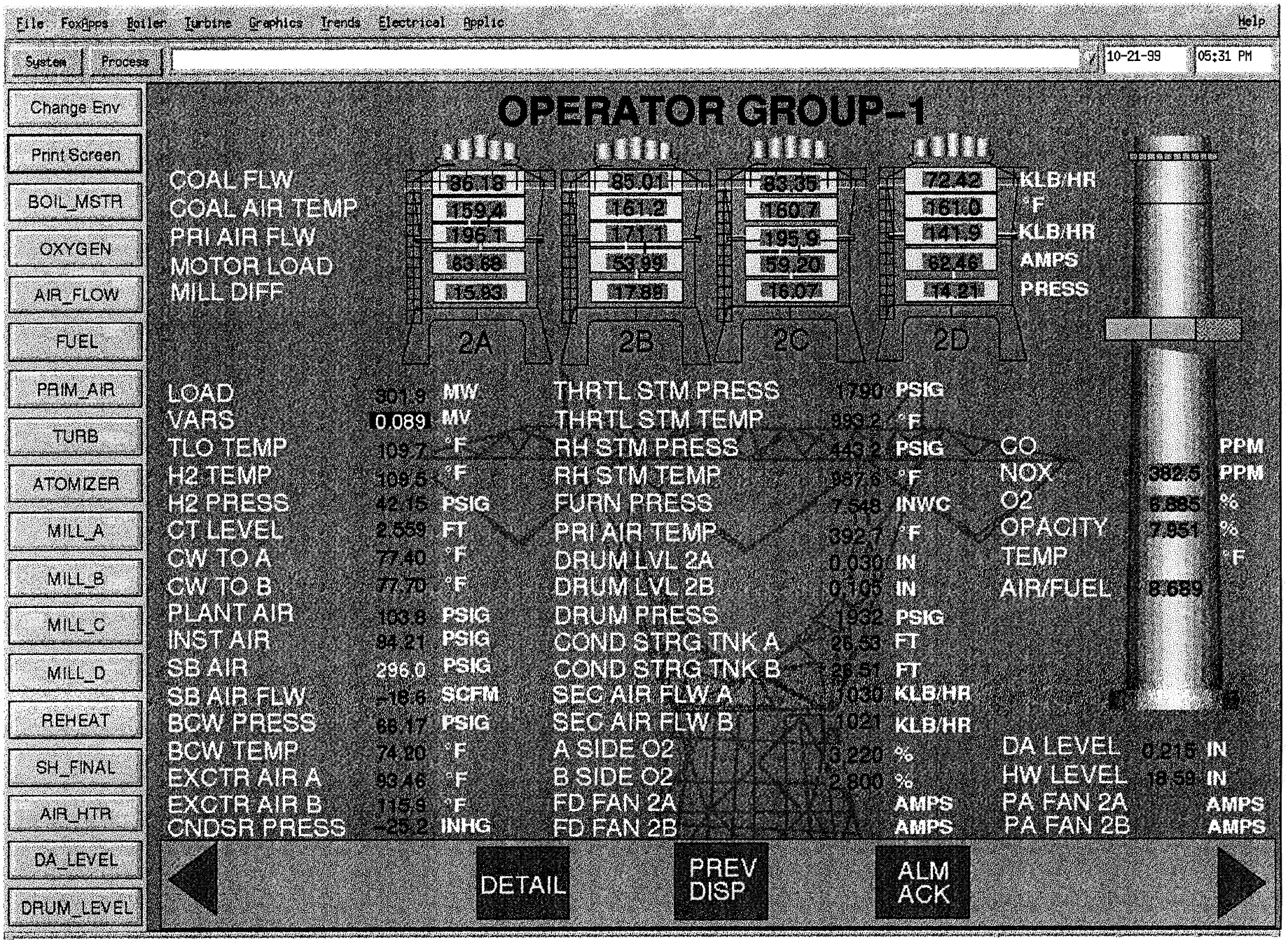
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 102.0 101.6 99.99 72.51 KLB/HR
COAL AIR TEMP 159.7 160.2 156.9 161.0 °F
PRI AIR FLW 197.1 173.6 202.4 150.5 KLB/HR
MOTOR LOAD 66.65 60.36 68.26 61.16 AMPS
MILL DIFF 17.87 20.38 17.43 14.79 PRESS
2A 2B 2C 2D
LOAD 350.6 MW
VARS 0.089 MV
TLO TEMP 110.4 °F
H2 TEMP 112.0 °F
H2 PRESS 42.61 PSIG
CT LEVEL 2.598 FT
CW TO A 78.45 °F
CW TO B 78.71 °F
PLANT AIR 99.93 PSIG
INST AIR 90.01 PSIG
SB AIR 307.9 PSIG
SB AIR FLW -10.1 SCFM
BCW PRESS 64.13 PSIG
BCW TEMP 86.10 °F
EXCTR AIR A 104.0 °F
EXCTR AIR B 124.2 °F
CNDSR PRESS -25.2 INHG
THRTL STM PRESS 1808 PSIG
THRTL STM TEMP 998.4 °F
RH STM PRESS 522.8 PSIG
RH STM TEMP 999.1 °F
FURN PRESS 10.83 INWC
PRI AIR TEMP 393.7 °F
DRUM LVL 2A -0.45 IN
DRUM LVL 2B -0.47 IN
DRUM PRESS 2000 PSIG
COND STRG TNK A 26.94 FT
COND STRG TNK B 26.93 FT
SEC AIR FLW A 1244 KLB/HR
SEC AIR FLW B 1246 KLB/HR
A SIDE O2 2.931 %
B SIDE O2 2.571 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 375.4 PPM
O2 6.453 %
OPACITY 7.851 %
TEMP °F
AIR/FUEL 8.531
DA LEVEL -0.51 IN
HW LEVEL 17.84 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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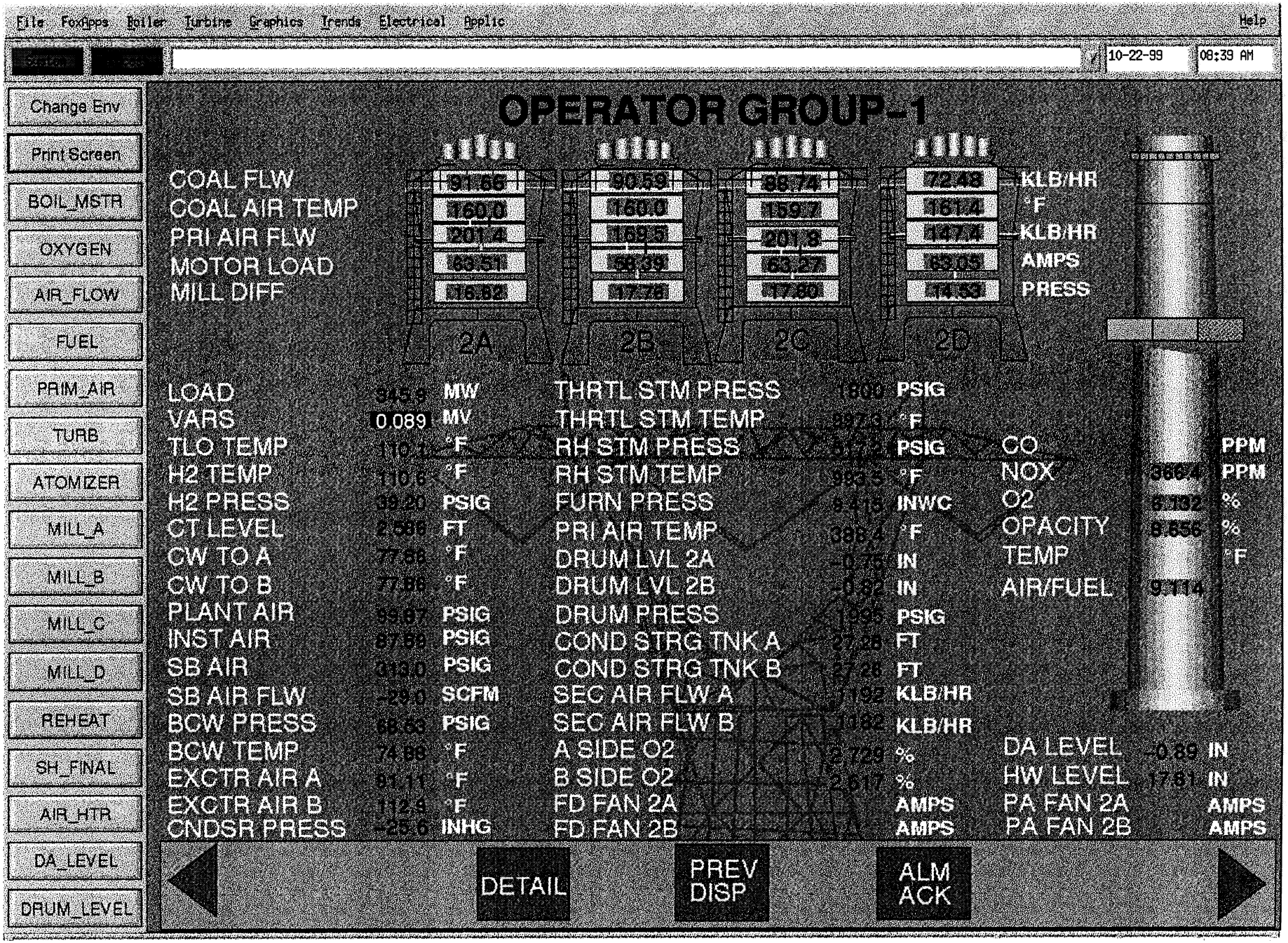
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 86.18 85.01 83.35 72.42 KLB/HR
COAL AIR TEMP 159.4 161.2 160.7 151.0 °F
PRI AIR FLW 195.1 171.1 195.9 141.9 KLB/HR
MOTOR LOAD 63.68 53.99 59.20 62.46 AMPS
MILL DIFF 15.83 17.89 16.07 14.21 PRESS
2A
2B
2C
2D
LOAD 301.9 MW
VARS 0.089 MV
TLO TEMP 109.7 °F
H2 TEMP 109.5 °F
H2 PRESS 42.15 PSIG
CT LEVEL 2.559 FT
CW TO A 77.40 °F
CW TO B 77.70 °F
PLANT AIR 103.8 PSIG
INST AIR 94.21 PSIG
SB AIR 296.0 PSIG
SB AIR FLW -18.6 SCFM
BCW PRESS 86.17 PSIG
BCW TEMP 74.20 °F
EXCTR AIR A 93.46 °F
EXCTR AIR B 115.9 °F
CNDSR PRESS -25.2 INHG
THRTL STM PRESS 1790 PSIG
THRTL STM TEMP 993.2 °F
RH STM PRESS 443.2 PSIG
RH STM TEMP 957.6 °F
FURN PRESS 7.548 INWC
PRI AIR TEMP 392.7 °F
DRUM LVL 2A 0.030 IN
DRUM LVL 2B 0.105 IN
DRUM PRESS 1932 PSIG
COND STRG TNK A 26.53 FT
COND STRG TNK B 26.51 FT
SEC AIR FLW A 1030 KLB/HR
SEC AIR FLW B 1021 KLB/HR
A SIDE O2 3.220 %
B SIDE O2 2.800 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 382.5 PPM
O2 6.885 %
OPACITY 7.951 %
TEMP °F
AIR/FUEL 8.689
DA LEVEL 0.215 IN
HW LEVEL 18.59 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK

San Juan 2 Boiler Data, Run 3, Oct 22 1999								
	Coal Flow, klb/hr						O2	
	A	B	C	D	Total	Load	A	B
Average	*88*	*87*	*85*	*72*	*333*	*339*	*2.90*	*2.16*
839	92	91	89	72	343	346	2.73	2.62
928	91	89	87	72	340	342	3.20	2.10
1000	84	82	81	72	319	322	3.02	2.02
1032	87	86	84	72	329	343	3.01	2.02
1100	88	87	86	72	333	343	2.54	2.02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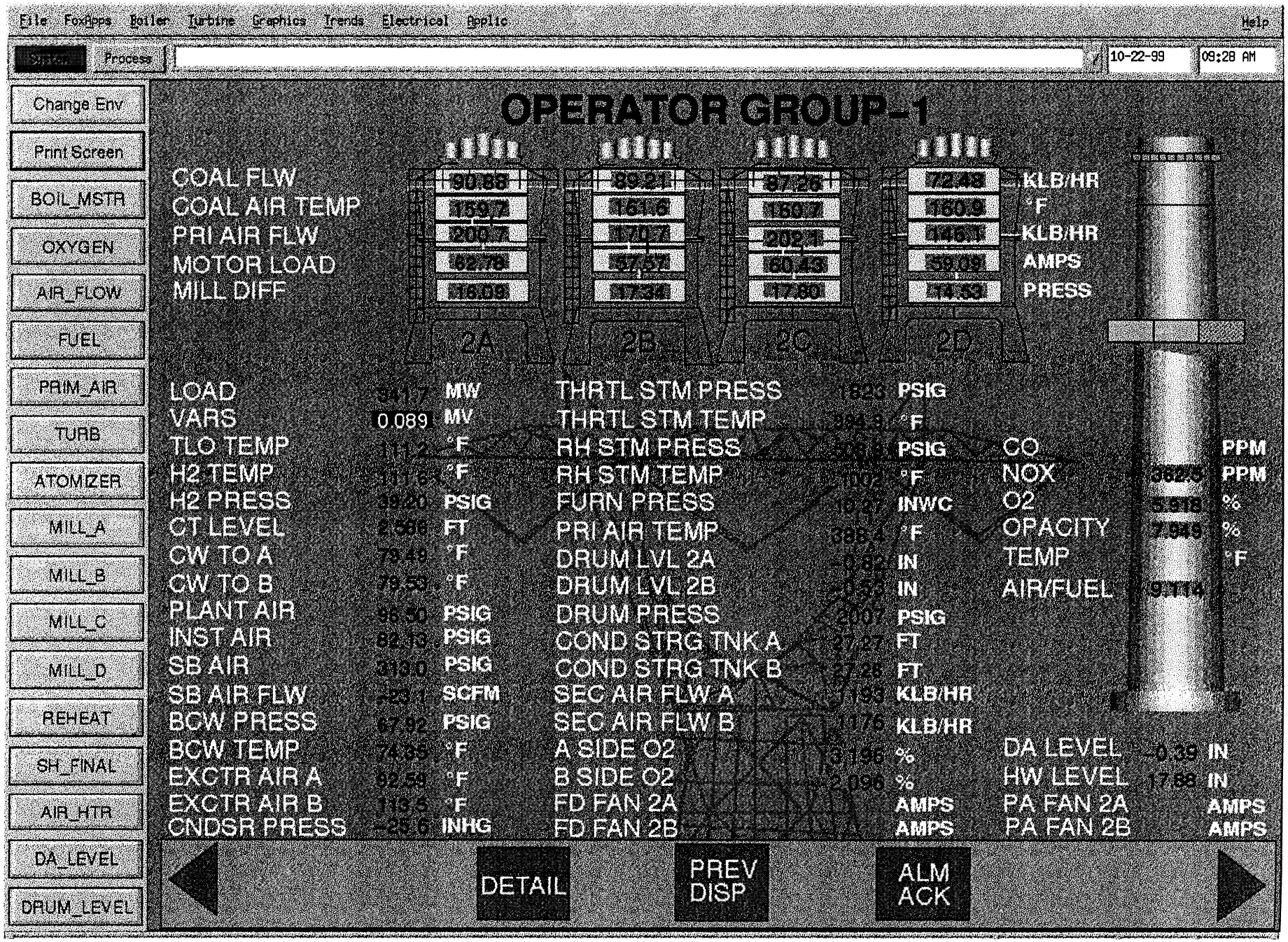
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
91.65
160.0
201.4
63.51
16.82
90.59
160.0
169.5
58.39
17.78
88.74
159.7
201.3
63.27
17.80
72.48
161.4
147.4
63.05
14.53
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 345.9 MW
VARS 0.089 MV
TLO TEMP 110.1 °F
H2 TEMP 110.6 °F
H2 PRESS 39.20 PSIG
CT LEVEL 2.586 FT
CW TO A 77.68 °F
CW TO B 77.88 °F
PLANT AIR 99.67 PSIG
INST AIR 87.89 PSIG
SB AIR 313.0 PSIG
SB AIR FLW -29.0 SCFM
BCW PRESS 68.63 PSIG
BCW TEMP 74.88 °F
EXCTR AIR A 81.11 °F
EXCTR AIR B 112.8 °F
CNDSR PRESS -25.6 INHG
THRTL STM PRESS 1800 PSIG
THRTL STM TEMP 997.3 °F
RH STM PRESS 817.2 PSIG
RH STM TEMP 983.5 °F
FURN PRESS -8.415 INWC
PRI AIR TEMP 388.4 °F
DRUM LVL 2A -0.75 IN
DRUM LVL 2B -0.82 IN
DRUM PRESS 1995 PSIG
COND STRG TNK A 27.28 FT
COND STRG TNK B 27.26 FT
SEC AIR FLW A 711.2 KLB/HR
SEC AIR FLW B 1182 KLB/HR
A SIDE O2 2.729 %
B SIDE O2 2.617 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 366.4 PPM
O2 3.132 %
OPACITY 8.656 %
TEMP °F
AIR/FUEL 9.114
DA LEVEL -0.89 IN
HW LEVEL 17.81 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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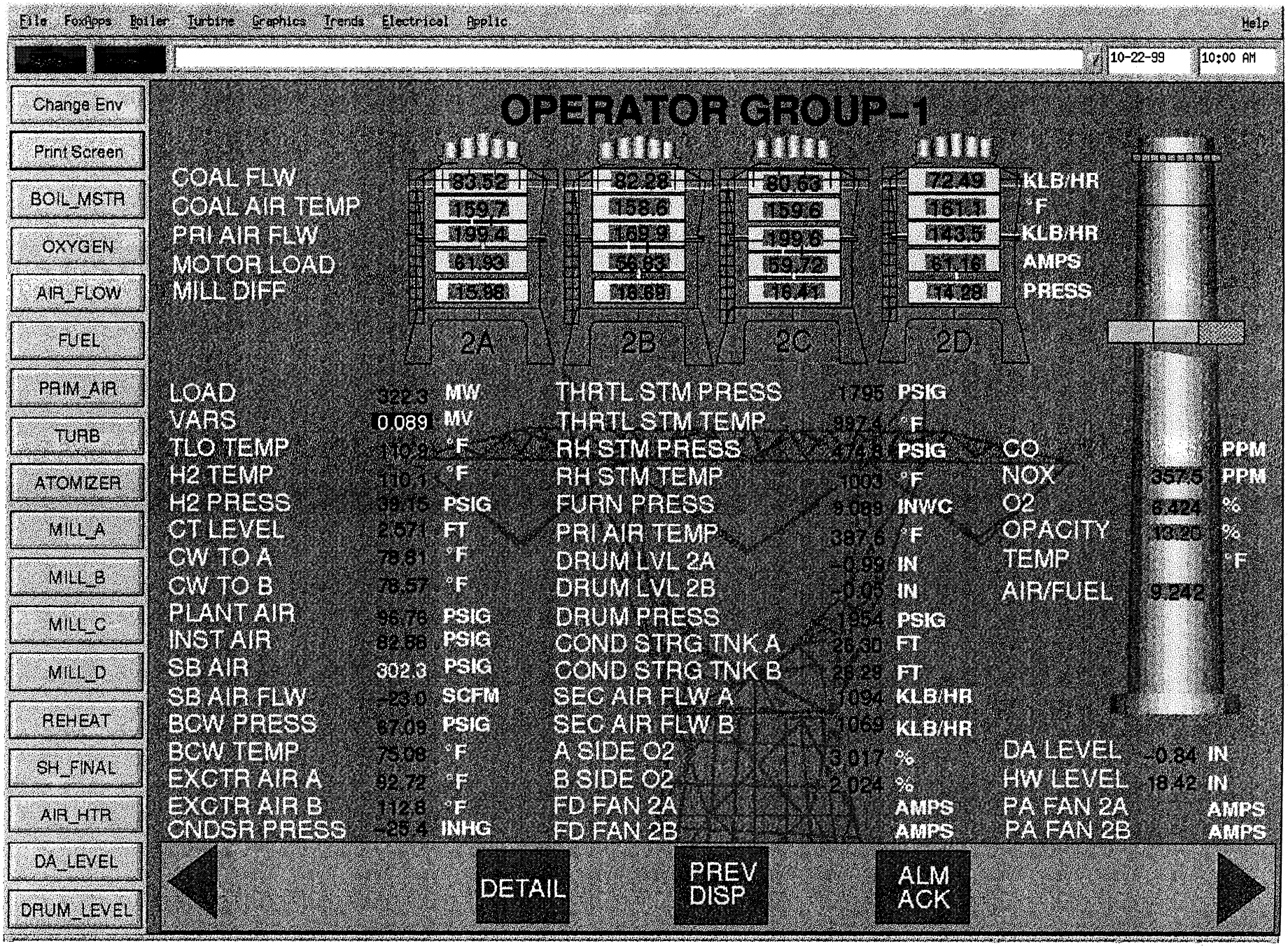
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 90.88 89.21 87.26 72.43 KLB/HR
COAL AIR TEMP 159.7 161.6 160.7 160.9 °F
PRI AIR FLW 200.7 170.7 202.1 146.1 KLB/HR
MOTOR LOAD 62.78 57.57 60.43 59.09 AMPS
MILL DIFF 16.09 17.34 17.80 14.53 PRESS
2A 2B 2C 2D
LOAD 341.7 MW
VARS 0.089 MV
TLO TEMP 111.2 °F
H2 TEMP 111.6 °F
H2 PRESS 39.20 PSIG
CT LEVEL 2.586 FT
CW TO A 79.49 °F
CW TO B 79.53 °F
PLANT AIR 96.30 PSIG
INST AIR 82.13 PSIG
SB AIR 313.0 PSIG
SB AIR FLW -23.1 SCFM
BCW PRESS 67.92 PSIG
BCW TEMP 74.85 °F
EXCTR AIR A 92.59 °F
EXCTR AIR B 113.5 °F
CNDSR PRESS -25.6 INHG
THRTL STM PRESS 1823 PSIG
THRTL STM TEMP 994.9 °F
RH STM PRESS 526.8 PSIG
RH STM TEMP 1002 °F
FURN PRESS 19.27 INWC
PRI AIR TEMP 398.4 °F
DRUM LVL 2A -0.82 IN
DRUM LVL 2B -0.53 IN
DRUM PRESS 2007 PSIG
COND STRG TNK A 27.27 FT
COND STRG TNK B 27.26 FT
SEC AIR FLW A 1193 KLB/HR
SEC AIR FLW B 1176 KLB/HR
A SIDE O2 13.196 %
B SIDE O2 12.096 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 362.5 PPM
O2 5.818 %
OPACITY 7.549 %
TEMP °F
AIR/FUEL 9.1114
DA LEVEL -0.39 IN
HW LEVEL 17.88 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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BOIL_MSTR
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
COAL FLW 83.52 82.28 80.63 72.49 KLB/HR
COAL AIR TEMP 159.7 158.6 159.6 161.1 °F
PRI AIR FLW 199.4 169.9 199.6 143.5 KLB/HR
MOTOR LOAD 61.93 56.93 59.72 61.16 AMPS
MILL DIFF 15.98 16.69 16.41 14.28 PRESS
2A
2B
2C
2D
LOAD 322.3 MW
VARS 0.089 MV
TLO TEMP 110.9 °F
H2 TEMP 110.1 °F
H2 PRESS 39.15 PSIG
CT LEVEL 2.571 FT
CW TO A 79.81 °F
CW TO B 76.57 °F
PLANT AIR 96.76 PSIG
INST AIR 82.66 PSIG
SB AIR 302.3 PSIG
SB AIR FLW -23.0 SCFM
BCW PRESS 67.09 PSIG
BCW TEMP 75.08 °F
EXCTR AIR A 92.72 °F
EXCTR AIR B 112.8 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1795 PSIG
THRTL STM TEMP 897.4 °F
RH STM PRESS 474.8 PSIG
RH STM TEMP 1003 °F
FURN PRESS 0.068 INWC
PRI AIR TEMP 387.6 °F
DRUM LVL 2A -0.99 IN
DRUM LVL 2B -0.05 IN
DRUM PRESS 1954 PSIG
COND STRG TNK A 26.30 FT
COND STRG TNK B 26.29 FT
SEC AIR FLW A 1094 KLB/HR
SEC AIR FLW B 1069 KLB/HR
A SIDE O2 3.017 %
B SIDE O2 2.024 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 357.5 PPM
O2 6.424 %
OPACITY 13.20 %
TEMP °F
AIR/FUEL 9.242
DA LEVEL -0.84 IN
HW LEVEL 18.42 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK


File FoxApps Boiler Turbine Graphics Trends Electrical Applic Help
10-22-99
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OPERATOR GROUP-1
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Print Screen
BOIL_MSTR
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
37.05
160.7
199.6
61.40
16.55
85.72
160.7
167.3
57.82
17.61
83.92
160.7
201.1
60.34
16.94
72.49
161.1
145.1
63.02
14.28
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 343.3 MW
VARS 0.089 MV
TLO TEMP 110.4 °F
H2 TEMP 111.2 °F
H2 PRESS 39.15 PSIG
CT LEVEL 2.571 FT
CW TO A 79.27 °F
CW TO B 76.55 °F
PLANT AIR 95.63 PSIG
INST AIR 88.09 PSIG
SB AIR 2969 PSIG
SB AIR FLW 2308 SCFM
BCW PRESS 67.84 PSIG
BCW TEMP 76.14 °F
EXCTR AIR A 92.72 °F
EXCTR AIR B 113.8 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1828 PSIG
THRTL STM TEMP 997.0 °F
RH STM PRESS 510.2 PSIG
RH STM TEMP 1000 °F
FURN PRESS -0.56 INWC
PRI AIR TEMP 387.7 °F
DRUM LVL 2A -1.16 IN
DRUM LVL 2B -0.50 IN
DRUM PRESS 2009 PSIG
COND STRG TNK A 25.29 FT
COND STRG TNK B 25.28 FT
SEC AIR FLW A 1147 KLB/HR
SEC AIR FLW B 1023 KLB/HR
A SIDE O2 3.005 %
B SIDE O2 2.024 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 362.4 PPM
O2 5.915 %
OPACITY 11.85 %
TEMP °F
AIR/FUEL 9.242
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HW LEVEL 18.37 IN
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PA FAN 2B AMPS
DETAIL
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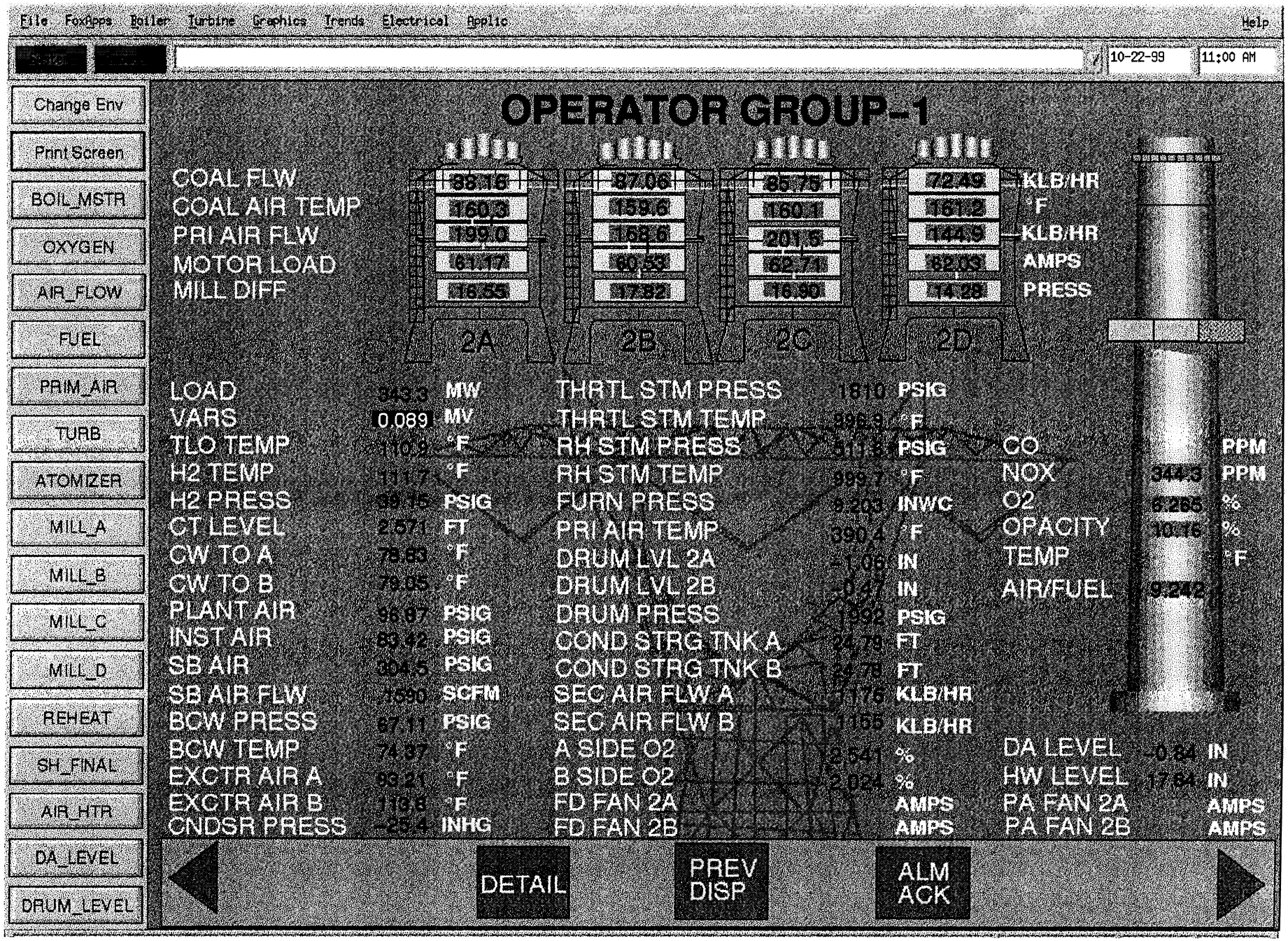
ALM ACK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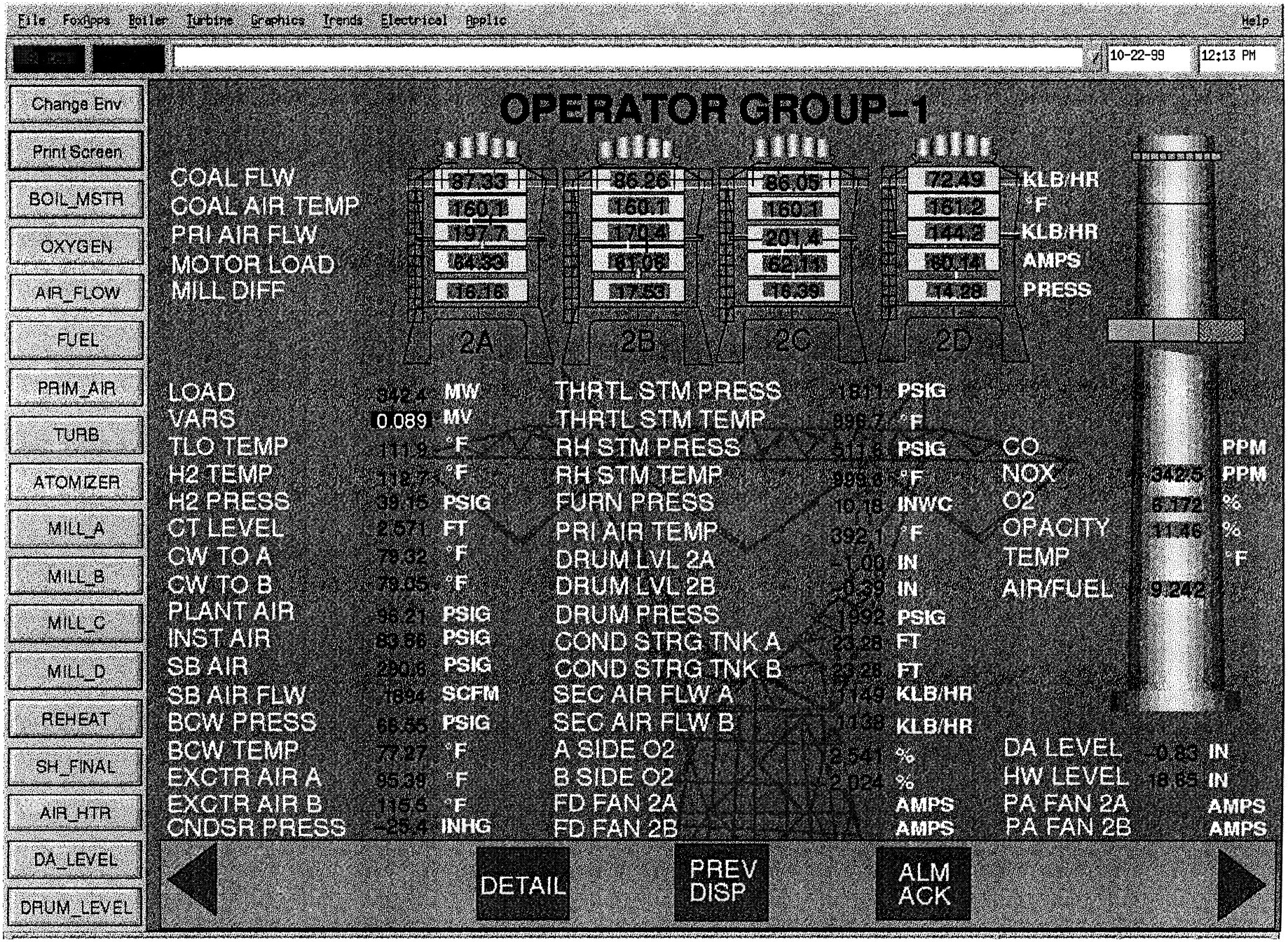
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 38.16 87.06 85.75 72.49 KLB/HR
COAL AIR TEMP 160.3 159.6 160.1 161.2 °F
PRI AIR FLW 199.0 158.6 201.5 144.9 KLB/HR
MOTOR LOAD 61.17 60.53 62.71 62.03 AMPS
MILL DIFF 16.53 17.82 16.90 14.28 PRESS
2A 2B 2C 2D
LOAD 343.3 MW
VARS 0.089 MV
TLO TEMP 110.9 °F
H2 TEMP 111.7 °F
H2 PRESS 39.15 PSIG
CT LEVEL 2.571 FT
CW TO A 78.83 °F
CW TO B 79.05 °F
PLANT AIR 96.87 PSIG
INST AIR 83.42 PSIG
SB AIR 304.5 PSIG
SB AIR FLW 1590 SCFM
BCW PRESS 67.11 PSIG
BCW TEMP 74.37 °F
EXCTR AIR A 93.21 °F
EXCTR AIR B 113.6 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1810 PSIG
THRTL STM TEMP 996.9 °F
RH STM PRESS 811.3 PSIG
RH STM TEMP 999.7 °F
FURN PRESS 9.203 INWC
PRI AIR TEMP 390.4 °F
DRUM LVL 2A -1.06 IN
DRUM LVL 2B -0.47 IN
DRUM PRESS 1992 PSIG
COND STRG TNK A 24.79 FT
COND STRG TNK B 24.78 FT
SEC AIR FLW A 1176 KLB/HR
SEC AIR FLW B 1155 KLB/HR
A SIDE O2 2.541 %
B SIDE O2 2.024 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 344.3 PPM
O2 5.265 %
OPACITY 10.16 %
TEMP °F
AIR/FUEL 9.242
DA LEVEL -0.84 IN
HW LEVEL 17.84 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK

San Juan 2 Boiler Data, Run 4, Oct 22 1999								
	Coal Flow, klb/hr						O2	
	A	B	C	D	Total	Load	A	B
Average	*92*	*91*	*90*	*72*	*345*	*344*	*2.19*	*2.07*
1213	87	86	86	72	332	342	2.54	2.02
1247	90	89	87	72	339	342	2.54	2.03
1325	90	89	88	72	339	343	2.54	2.03
1403	89	88	87	72	336	333	2.04	2.03
1428	94	93	91	72	350	344	2.11	2.23
1457	95	95	92	72	354	352	1.93	2.04
1529	94	94	93	72	354	350	1.96	2.04
1558	96	95	93	72	357	347	1.86	2.14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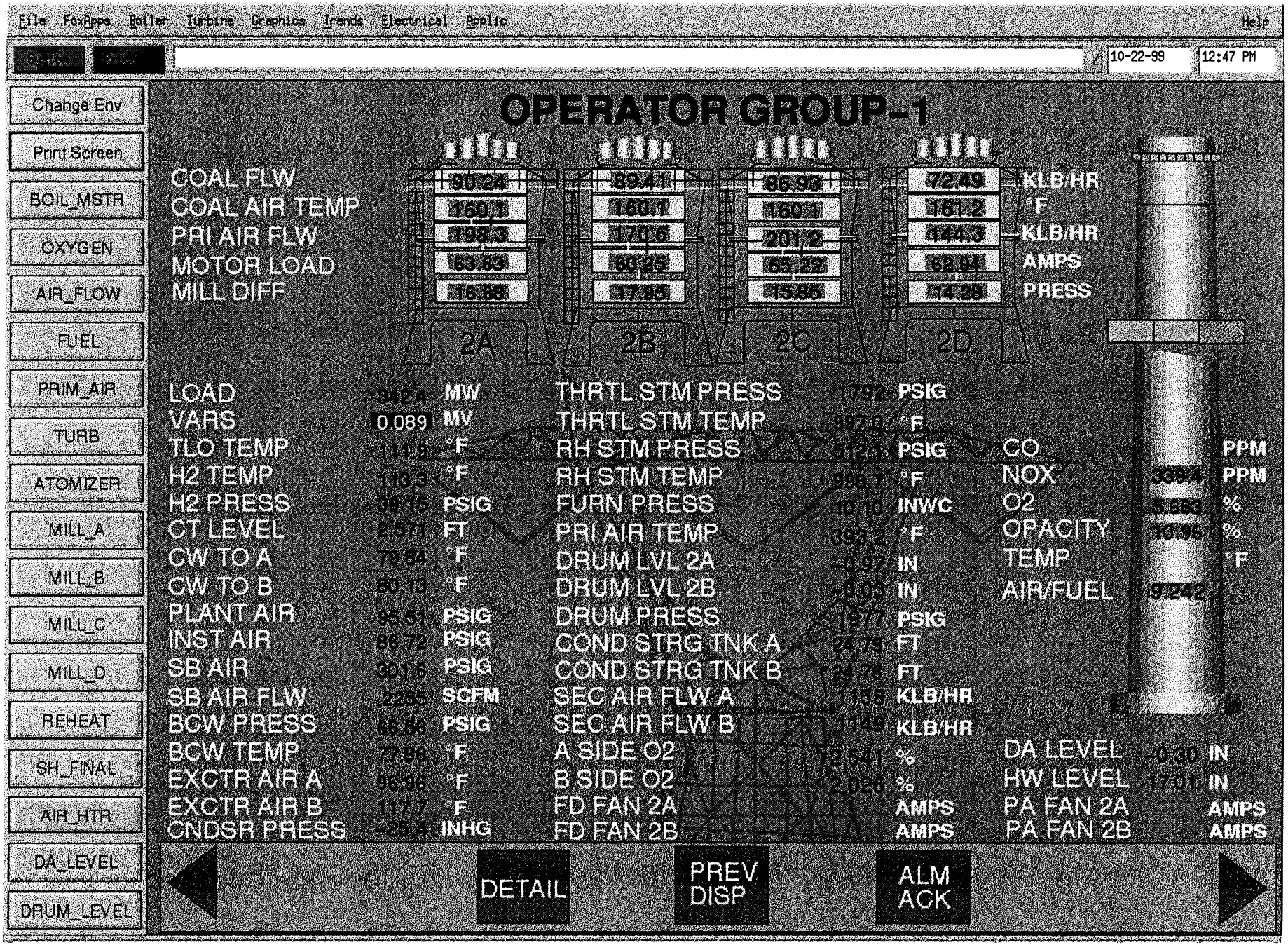
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
37.33
86.26
86.05
72.49
KLB/HR
160.1
160.1
160.1
161.2
°F
197.7
170.4
201.4
144.2
KLB/HR
64.33
61.06
62.11
60.14
AMPS
16.16
17.53
16.39
14.28
PRESS
2A
2B
2C
2D
LOAD 342.4 MW
VARS 0.089 MV
TLO TEMP 111.9 °F
H2 TEMP 112.7 °F
H2 PRESS 39.15 PSIG
CT LEVEL 2.571 FT
CW TO A 79.32 °F
CW TO B 79.05 °F
PLANT AIR 96.21 PSIG
INST AIR 89.88 PSIG
SB AIR 290.6 PSIG
SB AIR FLW 1894 SCFM
BCW PRESS 66.55 PSIG
BCW TEMP 77.27 °F
EXCTR AIR A 95.39 °F
EXCTR AIR B 115.5 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1811 PSIG
THRTL STM TEMP 996.7 °F
RH STM PRESS 511.5 PSIG
RH STM TEMP 995.6 °F
FURN PRESS 10.18 INWC
PRI AIR TEMP 392.1 °F
DRUM LVL 2A -1.00 IN
DRUM LVL 2B -0.39 IN
DRUM PRESS 1992 PSIG
COND STRG TNK A 23.28 FT
COND STRG TNK B 23.28 FT
SEC AIR FLW A 1149 KLB/HR
SEC AIR FLW B 1138 KLB/HR
A SIDE O2 12.541 %
B SIDE O2 12.024 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 342.5 PPM
O2 5.172 %
OPACITY 11.46 %
TEMP °F
AIR/FUEL 9.242
DA LEVEL -0.83 IN
HW LEVEL 18.85 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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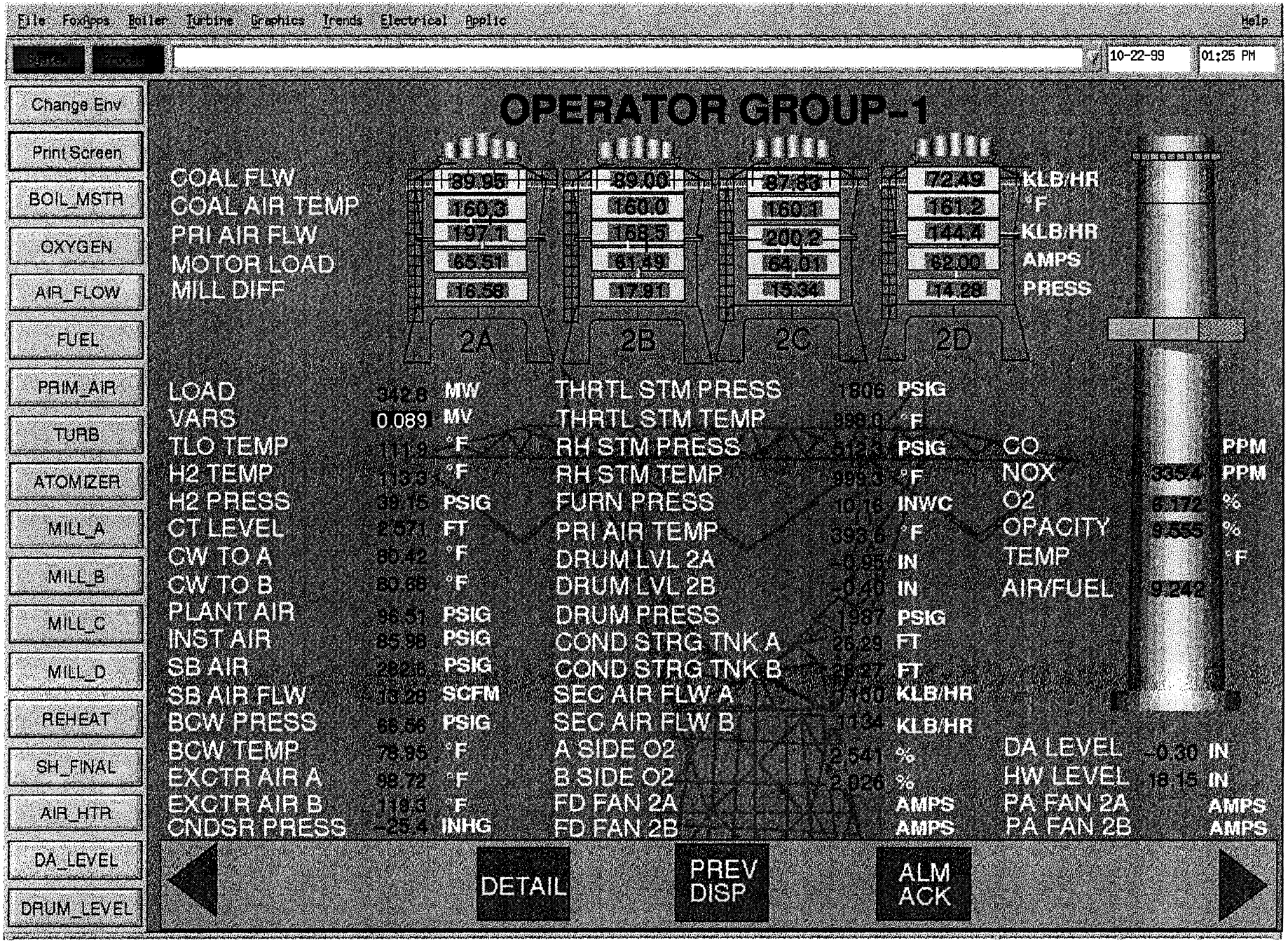
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
90.24
160.1
198.3
63.83
16.88
89.41
160.1
170.6
60.25
17.95
86.93
160.1
201.2
65.22
15.85
72.49
161.2
144.3
62.94
14.28
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 342.4 MW
VARS 0.089 MV
TLO TEMP 111.9 °F
H2 TEMP 113.3 °F
H2 PRESS 39.15 PSIG
CT LEVEL 2.571 FT
CW TO A 79.84 °F
CW TO B 80.13 °F
PLANT AIR 95.51 PSIG
INST AIR 86.72 PSIG
SB AIR 30.16 PSIG
SB AIR FLW .2255 SCFM
BCW PRESS 66.56 PSIG
BCW TEMP 77.86 °F
EXCTR AIR A 96.96 °F
EXCTR AIR B 117.7 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1792 PSIG
THRTL STM TEMP 997.0 °F
RH STM PRESS 512.1 PSIG
RH STM TEMP 998.7 °F
FURN PRESS -10.10 INWC
PRI AIR TEMP 393.2 °F
DRUM LVL 2A -0.97 IN
DRUM LVL 2B -0.03 IN
DRUM PRESS 1977 PSIG
COND STRG TNK A 24.79 FT
COND STRG TNK B 24.76 FT
SEC AIR FLW A 1156 KLB/HR
SEC AIR FLW B 1149 KLB/HR
A SIDE O2 2.541 %
B SIDE O2 2.026 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 339.4 PPM
O2 5.863 %
OPACITY 10.95 %
TEMP °F
AIR/FUEL 9.242
DA LEVEL -0.30 IN
HW LEVEL 17.01 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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10-22-99
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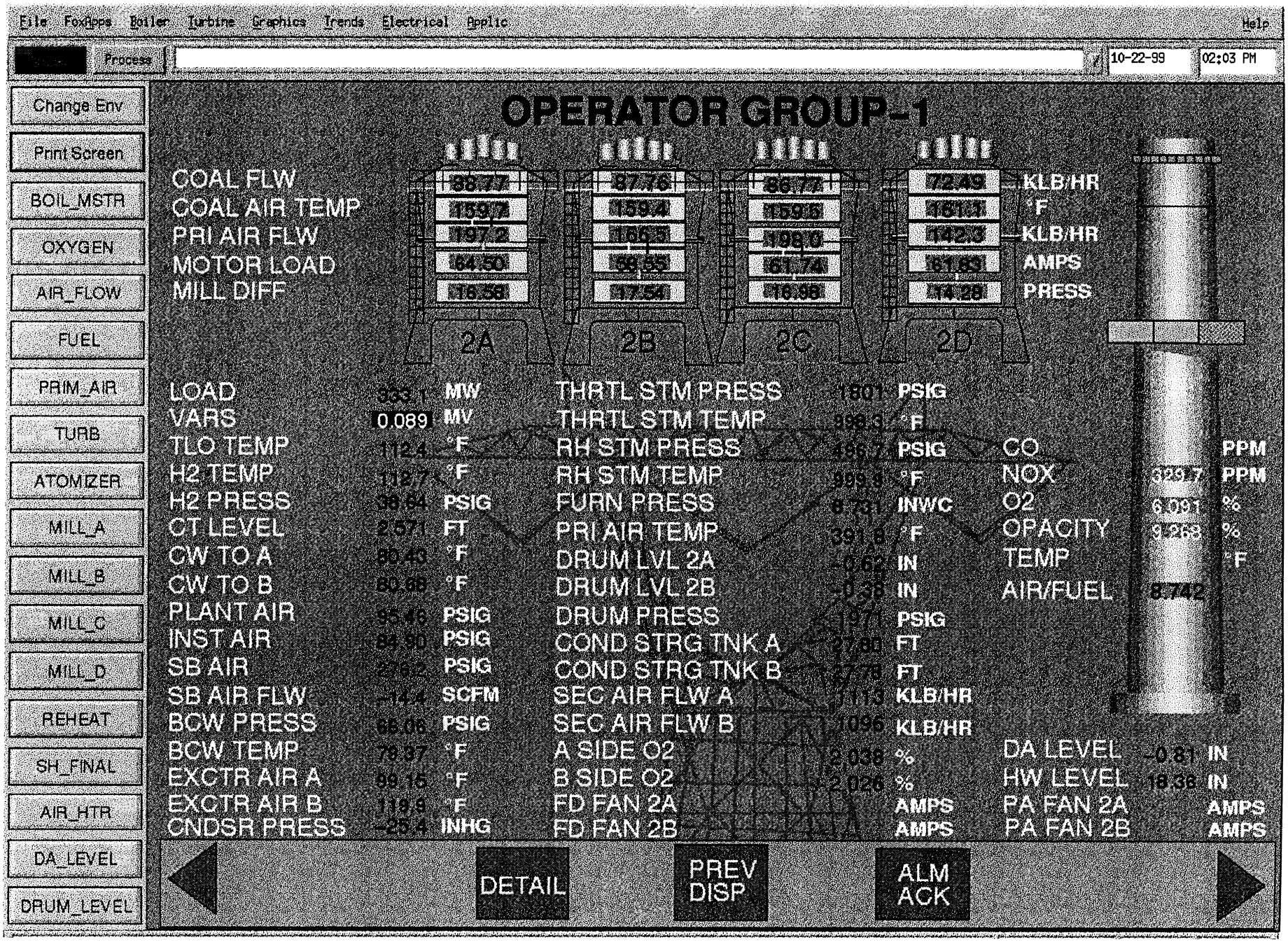
BOIL_MSTR
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
39.95
89.00
97.80
72.49
KLB/HR
160.3
160.0
160.1
161.2
°F
197.1
168.5
200.2
144.4
KLB/HR
65.51
61.49
64.01
62.00
AMPS
16.58
17.91
15.34
14.28
PRESS
2A
2B
2C
2D
LOAD 342.8 MW
VARS 0.089 MV
TLO TEMP 111.9 °F
H2 TEMP 113.3 °F
H2 PRESS 39.15 PSIG
CT LEVEL 2.571 FT
CW TO A 80.42 °F
CW TO B 80.68 °F
PLANT AIR 96.51 PSIG
INST AIR 85.98 PSIG
SB AIR 282.6 PSIG
SB AIR FLW 13.28 SCFM
BCW PRESS 66.56 PSIG
BCW TEMP 78.95 °F
EXCTR AIR A 98.72 °F
EXCTR AIR B 119.3 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1806 PSIG
THRTL STM TEMP 988.0 °F
RH STM PRESS 512.3 PSIG
RH STM TEMP 995.3 °F
FURN PRESS -10.16 INWC
PRI AIR TEMP 393.6 °F
DRUM LVL 2A -0.05 IN
DRUM LVL 2B -0.40 IN
DRUM PRESS 1987 PSIG
COND STRG TNK A 26.29 FT
COND STRG TNK B 26.27 FT
SEC AIR FLW A 1150 KLB/HR
SEC AIR FLW B 1134 KLB/HR
A SIDE O2 2.541 %
B SIDE O2 2.026 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 335.4 PPM
O2 5.172 %
OPACITY 9.555 %
TEMP °F
AIR/FUEL 9.242
DA LEVEL -0.30 IN
HW LEVEL 18.15 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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Process
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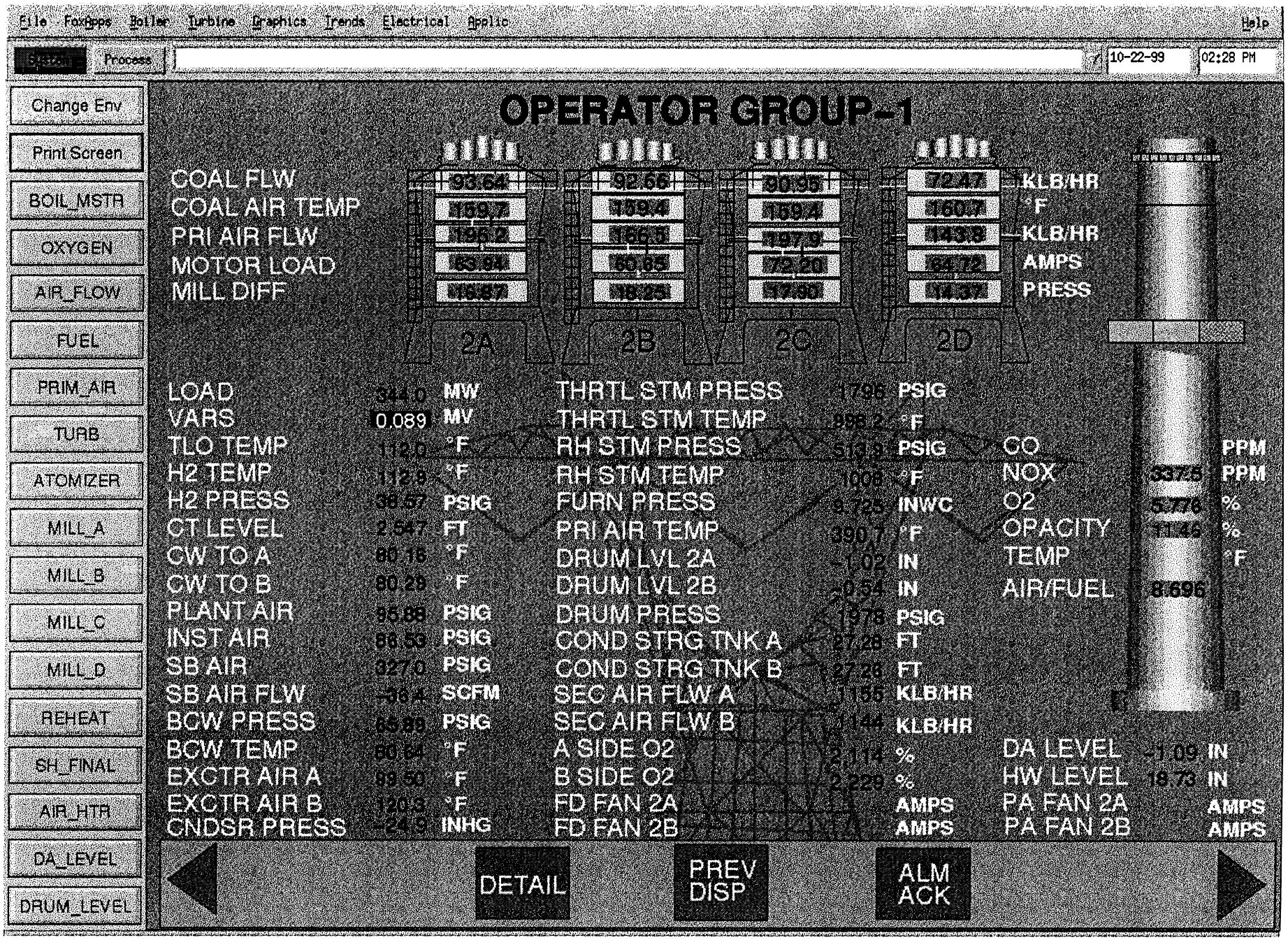
Print Screen
BOIL_MSTR
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
38.77
159.7
197.2
64.50
16.58
37.76
159.4
166.5
59.55
17.54
36.77
159.5
198.0
61.74
16.98
72.49
151.1
142.3
61.63
14.28
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 333.1 MW
VARS 0.089 MV
TLO TEMP 112.4 °F
H2 TEMP 112.7 °F
H2 PRESS 38.64 PSIG
CT LEVEL 2.571 FT
CW TO A 80.43 °F
CW TO B 80.66 °F
PLANT AIR 95.46 PSIG
INST AIR 84.90 PSIG
SB AIR 276.2 PSIG
SB AIR FLW -14.4 SCFM
BCW PRESS 66.06 PSIG
BCW TEMP 78.87 °F
EXCTR AIR A 99.15 °F
EXCTR AIR B 119.9 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1801 PSIG
THRTL STM TEMP 998.3 °F
RH STM PRESS 466.7 PSIG
RH STM TEMP 999.3 °F
FURN PRESS 0.731 INWC
PRI AIR TEMP 391.6 °F
DRUM LVL 2A -0.62 IN
DRUM LVL 2B -0.38 IN
DRUM PRESS 1071 PSIG
COND STRG TNK A 27.80 FT
COND STRG TNK B 27.78 FT
SEC AIR FLW A 1113 KLB/HR
SEC AIR FLW B 1096 KLB/HR
A SIDE O2 2.038 %
B SIDE O2 2.026 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 323.7 PPM
O2 6.091 %
OPACITY 9.268 %
TEMP °F
AIR/FUEL 8.742
DA LEVEL -0.81 IN
HW LEVEL -18.36 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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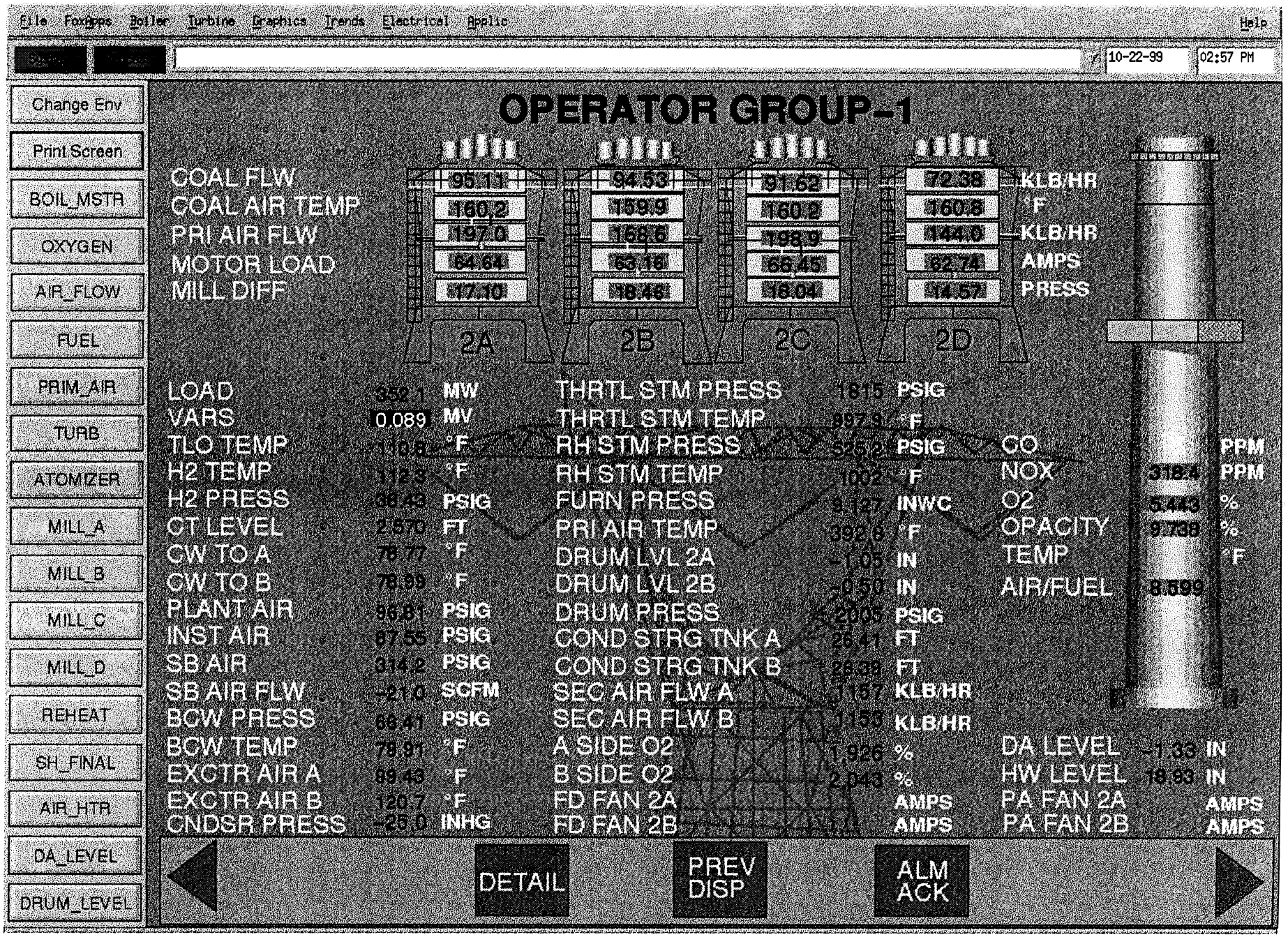
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
93.64
159.7
156.2
63.84
16.87
92.66
159.4
166.5
60.65
18.25
90.35
159.4
197.9
72.20
17.80
72.47
160.7
143.9
64.72
14.37
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 344.0 MW
VARS 0.089 MV
TLO TEMP 112.0 °F
H2 TEMP 112.9 °F
H2 PRESS 38.57 PSIG
CT LEVEL 2.547 FT
CW TO A 80.16 °F
CW TO B 80.29 °F
PLANT AIR 95.88 PSIG
INST AIR 86.53 PSIG
SB AIR 027.0 PSIG
SB AIR FLW -36.4 SCFM
BCW PRESS 65.89 PSIG
BCW TEMP 80.64 °F
EXCTR AIR A 89.50 °F
EXCTR AIR B 120.3 °F
CNDSR PRESS -24.9 INHG
THRTL STM PRESS 1796 PSIG
THRTL STM TEMP 986.2 °F
RH STM PRESS 513.9 PSIG
RH STM TEMP 1006 °F
FURN PRESS 9.725 INWC
PRI AIR TEMP 390.7 °F
DRUM LVL 2A -1.02 IN
DRUM LVL 2B -0.54 IN
DRUM PRESS 1978 PSIG
COND STRG TNK A 27.28 FT
COND STRG TNK B 27.26 FT
SEC AIR FLW A 1155 KLB/HR
SEC AIR FLW B 1144 KLB/HR
A SIDE O2 2.114 %
B SIDE O2 2.220 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 337.5 PPM
O2 5.776 %
OPACITY 11.46 %
TEMP °F
AIR/FUEL 8.696
DA LEVEL -1.09 IN
HW LEVEL 18.73 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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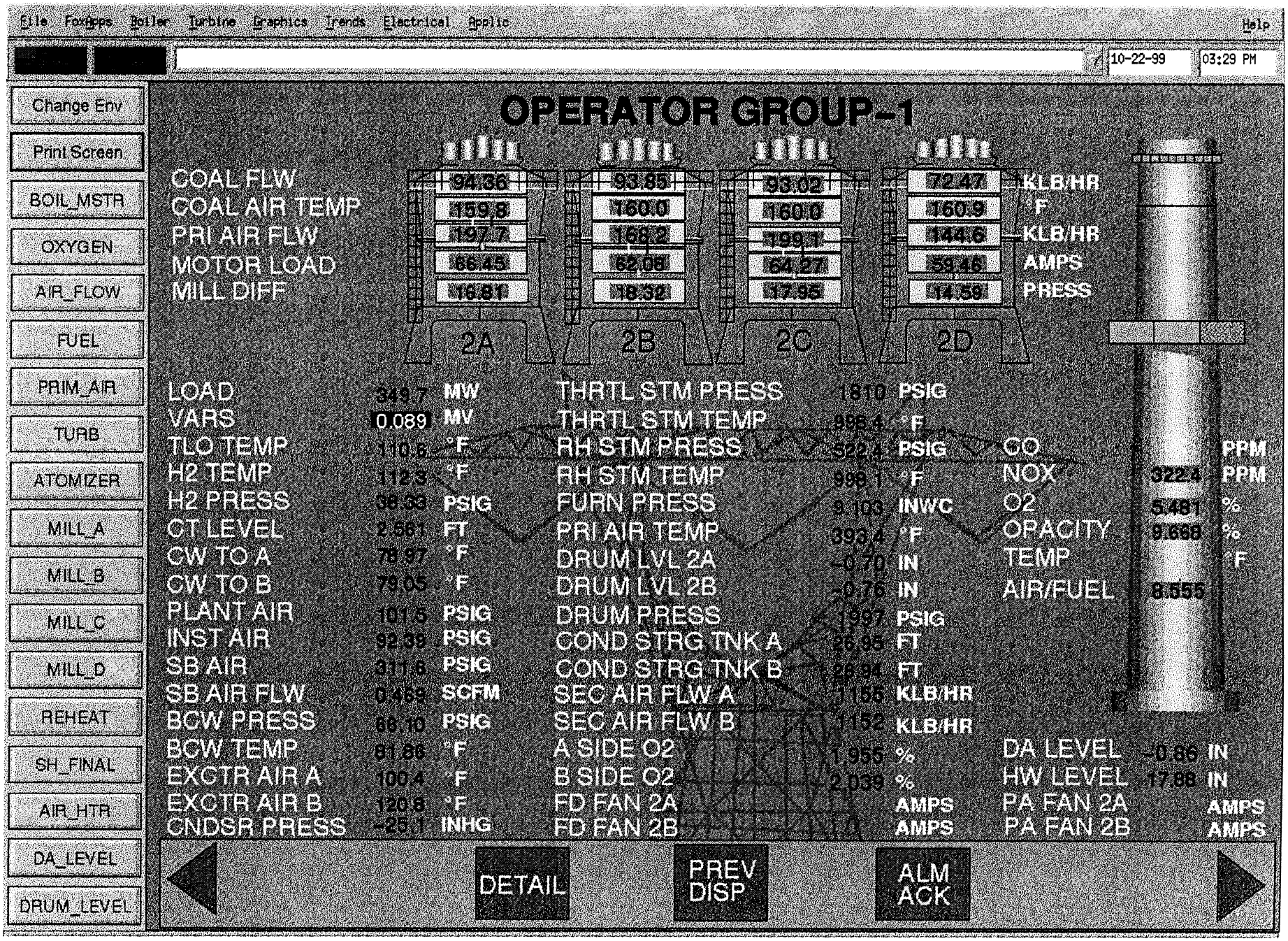
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
95.11
160.2
197.0
64.64
17.10
94.53
159.9
168.5
63.16
18.46
91.62
160.2
198.9
66.45
18.04
72.38
160.8
144.0
62.74
14.57
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 352.1 MW
VARS 0.089 MV
TLO TEMP 110.8 °F
H2 TEMP 112.3 °F
H2 PRESS 38.43 PSIG
CT LEVEL 2.570 FT
CW TO A 76.77 °F
CW TO B 76.99 °F
PLANT AIR 96.81 PSIG
INST AIR 87.55 PSIG
SB AIR 314.2 PSIG
SB AIR FLW -21.0 SCFM
BCW PRESS 68.41 PSIG
BCW TEMP 78.91 °F
EXCTR AIR A 89.43 °F
EXCTR AIR B 120.7 °F
CNDSR PRESS -25.0 INHG
THRTL STM PRESS 1815 PSIG
THRTL STM TEMP 997.9 °F
RH STM PRESS 525.2 PSIG
RH STM TEMP 1002 °F
FURN PRESS -9.127 INWC
PRI AIR TEMP 392.8 °F
DRUM LVL 2A -1.05 IN
DRUM LVL 2B -0.50 IN
DRUM PRESS 2005 PSIG
COND STRG TNK A 26.41 FT
COND STRG TNK B 28.38 FT
SEC AIR FLW A 1157 KLB/HR
SEC AIR FLW B 1153 KLB/HR
A SIDE O2 1.926 %
B SIDE O2 2.043 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 318.4 PPM
O2 5.443 %
OPACITY 9.738 %
TEMP °F
AIR/FUEL 8.599
DA LEVEL -1.33 IN
HW LEVEL 19.83 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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10-22-99
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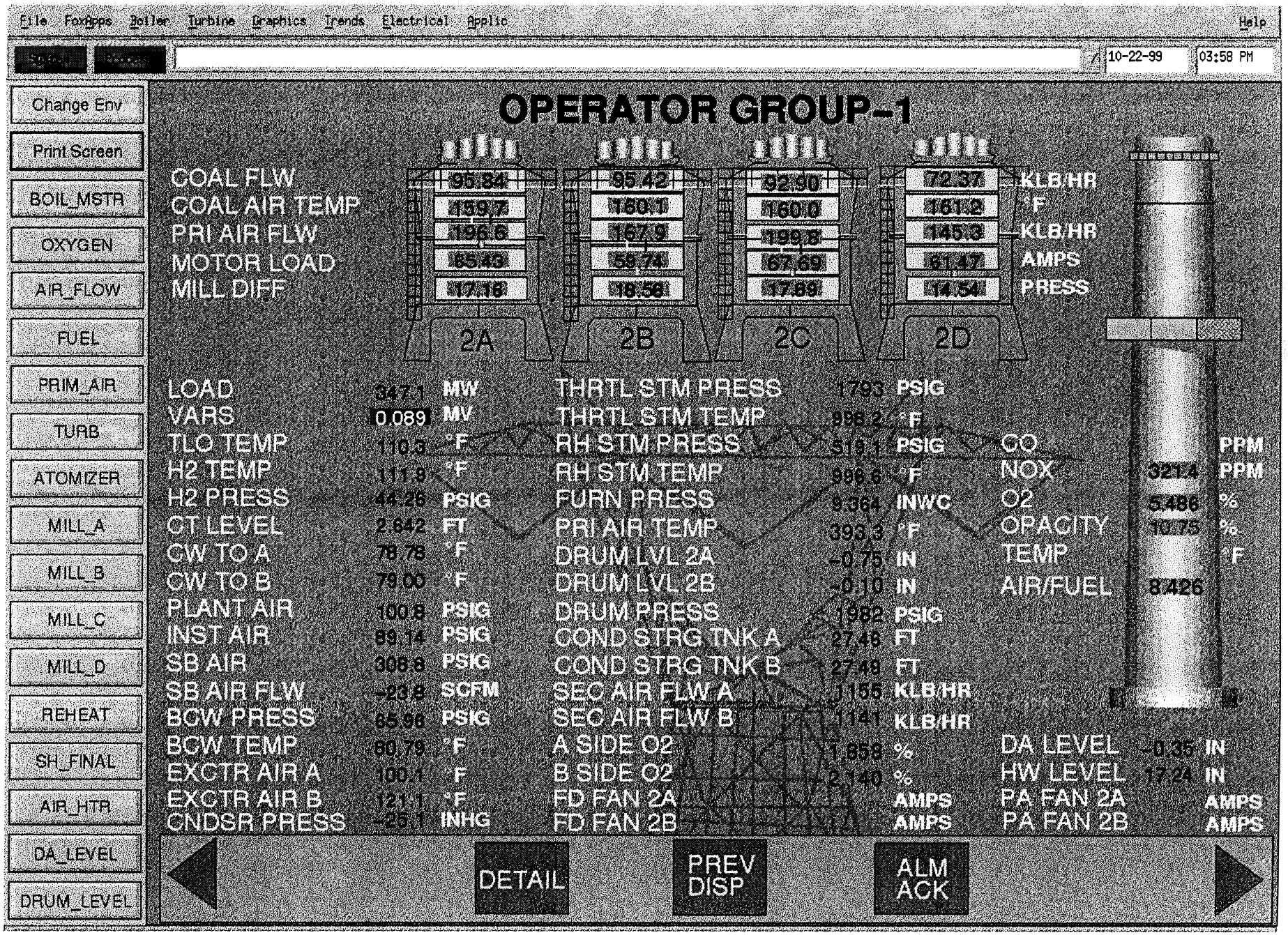
BOIL_MSTR
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 94.36 93.85 93.02 72.47 KLB/HR
COAL AIR TEMP 159.8 160.0 160.0 160.9 °F
PRI AIR FLW 197.7 158.2 199.1 144.6 KLB/HR
MOTOR LOAD 66.45 62.06 64.27 59.46 AMPS
MILL DIFF 16.81 18.32 17.95 14.58 PRESS
2A 2B 2C 2D
LOAD 349.7 MW
VARS 0.089 MV
TLO TEMP 110.6 °F
H2 TEMP 112.3 °F
H2 PRESS 38.33 PSIG
CT LEVEL 2.561 FT
CW TO A 78.97 °F
CW TO B 79.05 °F
PLANT AIR 101.5 PSIG
INST AIR 92.39 PSIG
SB AIR 311.6 PSIG
SB AIR FLW 0.469 SCFM
BCW PRESS 66.10 PSIG
BCW TEMP 81.86 °F
EXCTR AIR A 100.4 °F
EXCTR AIR B 120.8 °F
CNDSR PRESS -25.1 INHG
THRTL STM PRESS 1810 PSIG
THRTL STM TEMP 996.4 °F
RH STM PRESS 522.4 PSIG
RH STM TEMP 998.1 °F
FURN PRESS 9.103 INWC
PRI AIR TEMP 393.4 °F
DRUM LVL 2A -0.70 IN
DRUM LVL 2B -0.76 IN
DRUM PRESS 1997 PSIG
COND STRG TNK A 26.95 FT
COND STRG TNK B 26.94 FT
SEC AIR FLW A 1155 KLB/HR
SEC AIR FLW B 1152 KLB/HR
A SIDE O2 1.955 %
B SIDE O2 2.039 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 322.4 PPM
O2 5.481 %
OPACITY 9.668 %
TEMP °F
AIR/FUEL 8.555
DA LEVEL -0.86 IN
HW LEVEL 17.88 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK


File FoxApps Boiler Turbine Graphics Trends Electrical Applic Help
10-22-99
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BOIL_MSTR
OXYGEN
AIR_FLOW
FUEL
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW 95.84 95.42 92.90 72.37 KLB/HR
COAL AIR TEMP 159.7 160.1 160.0 161.2 °F
PRI AIR FLW 196.6 167.9 199.8 145.3 KLB/HR
MOTOR LOAD 65.43 59.74 67.69 61.47 AMPS
MILL DIFF 17.16 18.58 17.69 14.54 PRESS
2A 2B 2C 2D
LOAD 347.1 MW
VARS 0.089 MV
TLO TEMP 110.3 °F
H2 TEMP 111.9 °F
H2 PRESS 44.26 PSIG
CT LEVEL 2.642 FT
CW TO A 78.78 °F
CW TO B 79.00 °F
PLANT AIR 100.8 PSIG
INST AIR 89.14 PSIG
SB AIR 306.8 PSIG
SB AIR FLW -23.8 SCFM
BCW PRESS 65.96 PSIG
BCW TEMP 80.79 °F
EXCTR AIR A 100.1 °F
EXCTR AIR B 121.1 °F
CNDSR PRESS -25.1 INHG
THRTL STM PRESS 1793 PSIG
THRTL STM TEMP 956.2 °F
RH STM PRESS 519.1 PSIG
RH STM TEMP 996.6 °F
FURN PRESS 9.364 INWC
PRI AIR TEMP 393.3 °F
DRUM LVL 2A -0.75 IN
DRUM LVL 2B -0.10 IN
DRUM PRESS 1982 PSIG
COND STRG TNK A 27.46 FT
COND STRG TNK B 27.49 FT
SEC AIR FLW A 1155 KLB/HR
SEC AIR FLW B 1141 KLB/HR
A SIDE O2 1.858 %
B SIDE O2 2.140 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 321.4 PPM
O2 5.486 %
OPACITY 10.75 %
TEMP °F
AIR/FUEL 8.426
DA LEVEL -0.35 IN
HW LEVEL 17.24 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK

10/21/99

Please Take Readings every 1/2 hour during the testing.

	E CELL				F CELL				G CELL			
Time	pH	Blower Amps	Feed Soilds	Sump Level	pH	Blower Amps	Feed Soilds	Sump Level	pH	Blower Amp	Feed Soilds	Sump Level
0730	5.57	297	21.6	66.3	5.10	307	17.8	70.2	5.00	296	19.0	72.4
0800	5.54	298	21.9	65.4	5.10	302	18.5	68.2	5.00	296	18.2	73.9
0830	5.56	303	21.3	66.6	5.10	303	17.6	70.3	5.00	300	19.5	72.8
0900	5.56	301	21.3	67.6	5.09	302	18.1	68.2	5.00	300	19.1	73.6
0930	5.54	301	20.7	69.3	5.10	306	18.0	69.3	5.00	302	19.2	71.7
1000	5.56	302	20.9	68.4	5.09	306	18.0	67.1	5.00	301	17.4	72.1
1030	5.54	304	20.7	68.8	5.11	307	17.4	69.6	5.00	304	18.6	70.3
1100	5.52	305	20.7	69.1	5.10	306	17.5	67.1	5.00	305	19.7	68.9
1130	5.52	304	20.8	68.4	5.10	305	17.3	69.2	5.00	303	20.5	68.1
1200	5.52	304	20.7	69.1	5.12	305	17.7	66.8	5.00	302	21.6	68.0
1230	5.52	303	21.0	67.9	5.10	305	16.8	69.8	5.00	302	20.4	67.3
1300	5.52	304	20.8	69.1	5.10	305	17.2	67.1	5.00	302	20.5	67.7
1330	5.52	303	21.6	66.0	5.10	305	17.1	60.6	5.00	302	19.5	69.3
1400	5.52	303	20.8	69.8	5.10	305	17.3	67.3	5.00	301	19.1	67.8
1430	5.52	303	21.1	67.6	5.10	305	17.0	67.7	5.00	301	17.9	69.0

10-21-99

Please Take Readings every 1/2 hour during the testing.

	E CELL				F CELL				G CELL			
Time	pH	Blower Amps	Feed Soilds	Sump Level	pH	Blower Amps	Feed Soilds	Sump Level	pH	Blower Amp	Feed Soilds	Sump Level
1500	5.52	303	20.8	69.4	5.10	304	17.5	66.8	5.00	302	19.3	67.6
1530	5.55	303	20.9	68.6	5.11	304	16.8	68.8	5.00	300	19.7	66.9
1600	5.54	302	20.7	69.4	5.11	304	17.5	66.8	5.00	300	19	67.6.
1630	5.57	303	21.3	67.7	5.10	304	16.5	69.2	5.01	300	18.6	67.8
1700	5.55	302	21.1	69.1	5.11	304	17.0	66.9	5.00	299	17.5	67.8
1730	5.55	302	21.2	67.5	5.11	304	16.6	68.5	5.00	300	16.5	69.0
1800	5.55	303	21.0	68.5	5.11	305	16.9	69.6	5.00	301	20.3	67.4
1830	5.55	303	21.1	68.0	5.11	304	16.7	69.2	5.00	300	18.6	68.8

10/22/99

Please Take Readings every 1/2 hour during the testing.

	E CELL				F CELL				G CELL			
Time	pH	Blower Amps	Feed Soilds	Sump Level	pH	Blower Amps	Feed Soilds	Sump Level	pH	Blower Amp	Feed Soilds	Sump Level
8:00	5.56	296	21.2	69.8	5.10	313	17.3	69.1	5.00	297	17.9	67.9
9:15	5.56	296	21.2	69.4	5.10	313	17.5	67.4	5.00	296	14.3	69.3
10:30	5.54	299	20.8	70.5	5.10	312	17.5	66.7	5.01	294	16.5	69.5
11:00	5.56	293	20.9	68.4	5.10	310	16.9	68.6	5.01	292	18.0	70.0
12:00	5.56	293	21.0	68.3	5.10	311	16.8	68.1	5.01	292	18.9	69.2
13:00	5.57	292	20.9	67.9	5.11	310	16.9	67.1	5.01	290	19.5	68.2
14:00	5.57	292	20.7	68.1	5.11	309	16.6	67.4	5.01	288	18.9	69.0
1430	[illegible]											
1500	5.57	291	20.9	67.7	5.11	309	16.6	68.3	5.00	289	16.3	68.3
1530	5.63	292	20.5	68.6	5.11	310	16.8	67.2	5.02	289	16.9	67.6
1600	5.59	291	20.6	68.5	5.11	300	16.4	69.1	5.01	289	17.5	67.8
1630	5.59	291	20.3	70.3	5.11	300	16.6	67.2	5.01	288	15.6	67.6
1700	5.62	294	20.3	69.1	5.11	300	16.5	67.3	5.01	297	15.7	68.5
1730												
1800												

San Juan Generating Station
Unit #2
Hourly Averages

Date	Hour	Stack Temperature	SO2 ppm	Moisture %	Opacity %	Unit Load	Gas Flow
19991020	0	126.74	41.48	8.319	5.149	199.601	688916.1
19991020	100	135.78	74.73	9.018	10.101	222.38	714633.1
19991020	200	152.73	145.79	9.032	7.029	306.352	932409.2
19991020	300	157.36	159.8	8.882	13.762	344.225	975023.7
19991020	400	158.43	153.53	9.151	5.254	350.89	991440.6
19991020	500	155.23	146.35	9.256	5.177	349.97	958044.3
19991020	600	155.99	283.24	8.579	5.237	354.268	960808.2
19991020	700	147.71	128.87	13.962	5.227	336.623	914404.6
19991020	800	145.15	113.67	13.564	6.223	325.969	884946.2
19991020	900	153.11	141.29	14.414	7.152	336.012	905759.3
19991020	1000	155.41	146.29	13.895	6.592	349.324	917985.9
19991020	1100	150.78	124.5	13.835	6.435	337.07	887613.5
19991020	1200	152.99	132.67	13.857	7.649	336.105	878467
19991020	1300	156.02	140.02	13.519	8.159	339.119	887174.9
19991020	1400	157.95	142.63	13.987	8.586	341.632	882017.3
19991020	1500	156.74	138.67	13.808	8.489	341.857	887691.4
19991020	1600	154.02	135.31	13.658	8.241	342.153	886205
19991020	1700	152.9	132.84	13.636	7.727	341.562	878509.1
19991020	1800	146.86	113.14	13.742	9.359	328.125	855890.8
19991020	1900	151.72	132.23	13.344	7.613	341.514	886712.1
19991020	2000	151.17	127.15	13.818	10.062	338.317	884530.6
19991020	2100	143.82	102.78	13.808	9.866	321.133	826617.7
19991020	2200	144.72	108.76	13.636	11.69	326.271	847450.4
19991020	2300	145.49	113.14	13.39	10.596	331.155	867242.3
19991021	0	156.27	154.82	13.473	11.904	338.886	874835.6
19991021	100	155.24	155.68	13.439	11.581	351.963	884089.9
19991021	200	154.11	153.37	13.331	11.689	350.893	874284.3
19991021	300	151.97	142.98	13.148	9.202	345.371	859869.8
19991021	400	152.63	142.71	13.021	8.071	346.349	860410.6
19991021	500	153.31	156.06	12.91	8.02	350.102	855364.1
19991021	600	149.73	288.7	7.763	7.464	341.49	850392.4
19991021	700	149.18	157.76	12.572	7.099	339.077	863237.6
19991021	800	151.36	176.35	12.265	7.629	349.592	878806.8
19991021	900	150.51	180.4	12.387	7.992	354.452	882791.9
19991021	1000	148.96	172.42	12.631	7.676	355.92	889105.6
19991021	1100	148	167.73	12.73	7.935	355.944	892192.6
19991021	1200	148.44	170.34	12.617	8.078	356.226	892206.7
19991021	1300	148.53	169.96	12.514	7.644	355.792	889018.5
19991021	1400	148.48	167.99	12.592	7.789	355.097	882767.4
19991021	1500	148.75	176.44	12.552	8.109	354.788	882858
19991021	1600	150.61	190.94	12.595	8.18	355.493	889619.9

Run 2

Run 2

San Juan Generating Station
Unit #2
Hourly Averages

Date	Hour	Stack Temperature	SO2 ppm	Moisture %	Opacity %	Unit Load	Gas Flow
19991021	1700	151.52	196.76	12.72	8.496	354.941	901084.7
19991021	1800	148.41	189.42	12.812	10.015	330.402	854038.5
19991021	1900	143.03	190.91	12.75	10.359	344.68	893963.9
19991021	2000	139.68	195.73	12.676	8.676	351.143	954751.5
19991021	2100	133.82	183.27	12.726	9.357	334.332	836218.6
19991021	2200	129.76	169.5	12.886	10.844	335.102	846114.4
19991021	2300	125.13	145.73	12.205	12.226	328.194	807790
19991022	0	127.48	127.98	12.434	11.681	341.802	868421.5
19991022	100	127.46	82.67	12.15	10.905	341.982	870819.5
19991022	200	134.11	108.94	12.326	11.395	342.406	878393.7
19991022	300	147.03	173.06	12.006	10.576	345.745	911361.6
19991022	400	142.09	150.96	12.03	17.925	330.69	863263.2
19991022	500	144.14	157.04	11.597	18.043	314.264	823913.2
19991022	600	152.54	299.3	7.5	14.971	350.609	892001
19991022	700	141.61	137.56	13.249	8.27	337.182	855120.2
19991022	800	137.74	119.29	12.878	10.122	326.483	816709.3
19991022	900	145.63	151.87	12.794	9.796	352.459	864975.1
19991022	1000	144.62	137.01	13.092	9.734	338.237	829478.9
19991022	1100	149.32	155.6	13.206	11.969	347.682	825706.5
19991022	1200	150.08	160.78	12.856	10.818	348.04	822391.6
19991022	1300	150.11	158.45	13.01	10.899	347.936	823459.4
19991022	1400	148.36	151.25	13.169	9.913	342.305	824557.7
19991022	1500	153.78	173.67	13.015	11.063	349.095	834706.1
19991022	1600	155.81	179.3	13.287	9.573	354.486	844977.1

Run 2 ↓
Run 3 ↑ ↓
Run 4 ↑ ↓

1:06 PM	11.86	1:12 PM	12.22	1:18 PM	13.32	1:24 PM	18.87	1:30 PM *	24.87
1:36 PM *	21.85	1:42 PM	18.02	1:48 PM *	23.52	1:54 PM *	20.89	1:59 PM	18.74
2:06 PM *	21.46	2:12 PM	19.99	2:18 PM	18.10	2:24 PM *	20.60	2:30 PM *	20.10
2:36 PM	18.22	2:42 PM *	20.38	2:48 PM *	20.22	2:54 PM	16.23	3:00 PM	19.72
3:06 PM *	25.81	3:12 PM *	24.14	3:18 PM *	22.49	3:24 PM *	24.02	3:30 PM *	25.00
3:36 PM *	26.19	3:42 PM *	25.12	3:48 PM *	27.62	3:54 PM *	26.47	4:00 PM *	26.66
4:06 PM *	27.19	4:12 PM *	25.39	4:18 PM *	22.93	4:24 PM *	28.31	4:30 PM *	23.95
4:36 PM *	21.70	4:42 PM *	27.55	4:48 PM *	26.12	4:54 PM *	25.51	4:59 PM *	28.43
5:06 PM *	25.55	5:12 PM *	23.98	5:18 PM *	25.16	5:24 PM *	25.10	5:30 PM *	28.49
5:36 PM *	27.92	5:42 PM *	23.35	5:48 PM *	23.02	5:54 PM *	25.99	6:00 PM *	29.38
6:06 PM *	23.48	6:12 PM *	23.33	6:18 PM *	23.46	6:24 PM *	21.68	6:30 PM	19.31
6:36 PM *	20.27	6:42 PM	19.31	6:48 PM	16.60	6:54 PM	15.72	7:00 PM	16.40
7:06 PM	15.97	7:12 PM	14.52	7:18 PM	17.34	7:24 PM	16.41	7:30 PM	16.22
7:36 PM *	22.51	7:42 PM *	21.85	7:48 PM	17.65	7:54 PM	19.69	7:59 PM	18.18
8:06 PM	18.28	8:12 PM	19.30	8:18 PM *	22.24	8:24 PM	17.61	8:30 PM	18.01
8:36 PM	18.38	8:42 PM	18.42	8:48 PM	18.43	8:54 PM *	21.04	8:59 PM *	20.71
9:06 PM *	21.26	9:12 PM *	22.52	9:18 PM	17.10	9:24 PM	17.14	9:30 PM	18.16
9:36 PM *	21.92	9:42 PM	15.69	9:48 PM	17.73	9:54 PM	17.79	9:59 PM	17.52
10:06 PM	17.07	10:12 PM *	22.39	10:18 PM *	23.46	10:24 PM *	20.36	10:30 PM *	26.26
10:36 PM *	22.79	10:42 PM	17.37	10:48 PM *	20.88	10:54 PM *	20.63	10:59 PM *	21.01
11:06 PM *	27.95	11:12 PM *	26.10	11:18 PM *	30.12	11:24 PM *	32.90	11:30 PM *	21.82
11:36 PM *	23.06	11:42 PM *	24.14	11:48 PM	18.41	11:54 PM *	21.07	11:59 PM *	22.21

CONTINUOUS EMISSIONS MONITORING 11:59 PM FRI., 22 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 1

24 HOUR CALIBRATION SUMMARY

FROM 5:29 AM FRI., 22 OCT., 1999 TILL 11:59 PM FRI., 22 OCT., 1999

TIME	O2 DEVIATION		SO2 DEVIATION		NOX DEVIATION		OPACITY DEVIATION	
	ZERO	SPAN	ZERO	SPAN	ZERO	SPAN	ZERO	SPAN
5:29 AM	-.22	-.02	-2.65	2.25	22	1.07	0.00	-.10

CONTINUOUS EMISSIONS MONITORING 12:05 AM SAT., 23 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 2

24 HOUR SUMMARY OF GASEOUS EMISSIONS

FROM 1:00 AM FRI., 22 OCT., 1999 TILL 12:00 AM SAT., 23 OCT., 1999

TIME HRS	O2 %	SO2 PPM	NOX PPM	OPACITY %	SO2 LB/MBTU	NOX LB/MBTU	GROSS GEN MW	HEAT RATE MBTU/HR	NUMBER OF SAMPLES TAKEN
1:00 AM	6.41	101.26	373.48	10.92	.193	.510	341.8	3366.74	573
2:00 AM	6.44	122.82	374.79	11.15	.234	.512	342.33	3362.51	583
3:00 AM	6.43	213.90	376.87	10.77	.407	.515	345.43	3396.66	577
4:00 AM	6.49	193.09	376.12	15.01	.367	.514	332.11	3224.03	580
5:00 AM	6.61	191.34	380.77	17.84	.364	.520	313.73	3045.68	575
6:00 AM	6.31	228.73	381.86	15.28	.435	.522	349.69	3400.27	574
7:00 AM	6.32	174.13	381.73	8.48	.331	.522	338.72	3241.53	580
8:00 AM	6.33	144.91	378.31	9.78	.276	.517	325.24	3117.88	573
9:00 AM	5.99	180.67	362.89	10.45	.344	.496	351.73	3361.27	573
10:00 AM	6.16	172.72	359.55	9.62	.329	.491	339.75	3214.52	574

11:00 AM	6.01	185.89	352.18	12.12	.354	.481	346.91	3303.24	579
12:00 PM	5.94	192.58	352.22	10.86	.366	.481	347.93	3287.95	578
1:00 PM	5.80	188.48	343.97	10.90	.359	.470	347.90	3271.28	576
2:00 PM	5.76	180.13	337.79	10.10	.343	.462	343.05	3291.77	578
3:00 PM	5.60	197.50	328.08	10.73	.376	.448	348.06	3418.47	579
4:00 PM	5.50	211.64	324.16	9.60	.403	.443	354.59	382.91	579
5:00 PM	5.48	185.87	324.33	11.34	.354	.443	348.34	3390.33	579
6:00 PM	5.69	195.15	339.09	14.42	.371	.463	338.68	3279.12	585
7:00 PM	5.80	221.81	360.10	11.42	.422	.492	352.14	3384.27	581
8:00 PM	5.85	181.79	352.17	12.62	.346	.481	340.86	3226.75	582
9:00 PM	5.90	201.52	357.58	15.92	.383	.489	337.77	3165.50	578
10:00 PM	5.81	166.35	359.46	20.23	.317	.491	343.35	3193.75	580
11:00 PM	5.70	145.45	351.43	16.81	.277	.480	345.82	3191.10	577
12:00 AM	5.82	144.16	350.98	15.00	.274	.480	328.32	2997.29	578

NOTE: VALUES FOR SO2 AND NOX ARE CORRECTED TO 3% O2

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 2

SO2 AND NOX; DAILY MASS CALCULATIONS

FROM 1:00 AM FRI., 22 OCT., 1999 TILL 12:00 AM SAT., 23 OCT., 1999

TIME HRS	SO2 LB/HR	SO2 TONS/HR	NOX LB/HR	NOX TONS/HR
1:00 AM	648.64	.32	1718.04	.86
2:00 AM	785.76	.39	1721.89	.86
3:00 AM	1382.36	.69	1749.04	.87
4:00 AM	1184.45	.59	1656.84	.83
5:00 AM	1108.79	.55	1584.54	.79
6:00 AM	1479.77	.74	1774.08	.89
7:00 AM	1073.95	.54	1690.68	.85
8:00 AM	859.64	.43	1611.62	.81
9:00 AM	1155.44	.58	1666.61	.83
10:00 AM	1056.37	.53	1579.18	.79
11:00 AM	1168.30	.58	1589.50	.79
12:00 PM	1204.74	.60	1582.32	.79
1:00 PM	1173.12	.59	1537.43	.77
2:00 PM	1128.17	.56	1519.26	.76
3:00 PM	1284.57	.64	1532.38	.77
4:00 PM	1402.49	.70	1542.61	.77
5:00 PM	1198.98	.60	1502.40	.75
6:00 PM	1217.54	.61	1519.25	.76
7:00 PM	1428.25	.71	1665.11	.83
8:00 PM	1116.08	.56	1552.65	.78
9:00 PM	1213.72	.61	1546.58	.77
10:00 PM	1010.84	.51	1568.58	.78
11:00 PM	883.11	.44	1532.27	.77
12:00 AM	822.12	.41	1437.37	.72
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DAILY TOTALS	26987.22	13.49	38380.23	19.19

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 2

24 HOUR OPACITY SUMMARY

FROM 12:06 AM FRI., 22 OCT., 1999 TILL 12:00 AM SAT., 23 OCT., 1999

TIME	OPACITY	TIME	OPACITY	TIME	OPACITY	TIME	OPACITY	TIME	OPACITY
12:06 AM	11.02	12:12 AM	10.92	12:18 AM	11.08	12:24 AM	11.25	12:30 AM	10.64
12:36 AM	12.18	12:42 AM	10.59	12:48 AM	10.81	12:54 AM	10.17	1:00 AM	10.41
1:06 AM	11.07	1:12 AM	10.33	1:18 AM	10.27	1:24 AM	10.51	1:30 AM	10.23
1:36 AM	10.08	1:42 AM	10.60	1:48 AM	13.20	1:54 AM	12.94	2:00 AM	12.26
2:06 AM	11.14	2:12 AM	11.43	2:18 AM	10.12	2:24 AM	11.22	2:30 AM	10.18
2:36 AM	11.47	2:42 AM	10.80	2:48 AM	10.32	2:54 AM	10.10	3:00 AM	11.09
3:06 AM	11.08	3:12 AM	10.94	3:18 AM	10.99	3:24 AM	11.24	3:30 AM	9.79
3:36 AM	17.41	3:42 AM	12.88	3:48 AM *	22.42	3:54 AM *	23.23	4:00 AM	19.95
4:06 AM	19.29	4:12 AM	12.28	4:18 AM	12.80	4:24 AM	15.36	4:30 AM	15.32
4:36 AM	15.75	4:42 AM	18.02	4:48 AM *	30.14	4:54 AM *	22.56	5:00 AM	17.06
5:06 AM *	22.09	5:12 AM *	20.26	5:18 AM	17.17	5:24 AM	13.01	5:30 AM	13.03
5:36 AM	16.64	5:42 AM *	21.77	5:48 AM	14.73	5:54 AM	9.98	6:00 AM	9.28
6:06 AM	9.31	6:12 AM	8.33	6:18 AM	8.56	6:24 AM	9.11	6:30 AM	7.71
6:36 AM	7.97	6:42 AM	8.42	6:48 AM	8.39	6:54 AM	8.62	7:00 AM	8.47
7:06 AM	8.20	7:12 AM	8.56	7:18 AM	9.05	7:24 AM	9.61	7:30 AM	8.90
7:36 AM	9.44	7:42 AM	11.85	7:48 AM	9.53	7:54 AM	10.91	8:00 AM	11.67
8:06 AM	13.58	8:12 AM	11.39	8:18 AM	9.74	8:24 AM	10.34	8:30 AM	10.24
8:36 AM	12.03	8:42 AM	9.21	8:48 AM	9.24	8:54 AM	9.54	9:00 AM	9.37
9:06 AM	10.96	9:12 AM	9.49	9:18 AM	9.63	9:24 AM	10.47	9:30 AM	9.76
9:36 AM	8.64	9:42 AM	9.41	9:48 AM	9.20	9:54 AM	8.62	10:00 AM	10.08
10:06 AM	12.60	10:12 AM	12.77	10:18 AM	15.09	10:24 AM	12.76	10:30 AM	12.05
10:36 AM	10.69	10:42 AM	11.48	10:48 AM	11.13	10:54 AM	10.29	11:00 AM	12.37
11:06 AM	11.06	11:12 AM	10.70	11:18 AM	10.99	11:24 AM	10.83	11:30 AM	10.40
11:36 AM	11.16	11:42 AM	11.86	11:48 AM	10.77	11:54 AM	10.05	12:00 PM	10.77
12:06 PM	10.51	12:12 PM	10.50	12:18 PM	11.88	12:24 PM	12.41	12:30 PM	10.95
12:36 PM	10.27	12:42 PM	11.04	12:48 PM	10.20	12:54 PM	10.96	1:00 PM	10.28
1:06 PM	10.56	1:12 PM	11.12	1:18 PM	9.86	1:24 PM	10.39	1:30 PM	9.54
1:36 PM	8.78	142 PM	9.01	1:48 PM	9.88	1:54 PM	9.34	2:00 PM	12.50
2:06 PM	10.10	2:12 PM	10.45	2:18 PM	10.37	2:24 PM	9.93	2:30 PM	11.06
2:36 PM	11.49	2:42 PM	11.09	2:48 PM	11.84	2:54 PM	10.12	3:00 PM	10.80
3:06 PM	10.29	3:12 PM	9.41	3:18 PM	9.69	3:24 PM	9.72	3:30 PM	9.32
3:36 PM	9.00	3:42 PM	9.04	3:48 PM	9.71	3:54 PM	9.25	4:00 PM	10.53
4:06 PM	11.46	4:12 PM	10.11	4:18 PM	10.38	4:24 PM	9.18	4:30 PM	9.69
4:36 PM	9.52	4:42 PM	12.46	4:48 PM	14.28	4:54 PM	10.81	5:00 PM	15.47
5:06 PM	13.79	5:12 PM	12.80	5:18 PM	11.66	5:24 PM	13.43	5:30 PM	14.39
5:36 PM	14.59	5:42 PM	13.14	5:48 PM *	20.09	5:54 PM	15.56	6:00 PM	14.78
6:06 PM	12.88	6:12 PM	13.00	6:18 PM	12.37	6:24 PM	11.86	6:30 PM	11.59
6:36 PM	10.57	6:42 PM	10.65	6:48 PM	10.52	6:54 PM	10.43	7:00 PM	10.39
7:06 PM	11.24	7:12 PM	9.92	7:18 PM	10.24	7:24 PM	11.51	7:30 PM	11.93
7:36 PM	13.19	7:42 PM	12.59	7:48 PM	15.25	7:54 PM	14.79	8:00 PM	15.53
8:06 PM	12.83	8:12 PM	13.91	8:18 PM	17.41	8:24 PM	17.81	8:30 PM	13.71
8:36 PM	14.32	8:42 PM	15.65	8:48 PM	15.94	8:54 PM	19.60	9:00 PM	17.67
9:06 PM *	27.30	9:12 PM *	26.91	9:18 PM *	24.79	9:24 PM *	20.05	9:30 PM	13.59
9:36 PM	12.69	9:42 PM	13.38	9:48 PM	15.88	9:54 PM *	22.14	10:00 PM *	26.26
10:06 PM	16.83	10:12 PM *	24.32	10:18 PM *	22.41	10:24 PM	13.36	10:30 PM	15.34
10:36 PM	19.35	10:42 PM	16.37	10:48 PM	12.95	10:54 PM	13.51	11:00 PM	13.29
11:06 PM	12.00	11:12 PM	12.07	11:18 PM	11.87	11:24 PM	14.20	11:30 PM	18.51
11:36 PM	15.31	11:42 PM	16.13	11:48 PM	15.36	11:54 PM	18.58	12:00 AM	16.02

CONTINUOUS EMISSIONS MONITORING 12:00 AM SAT, 23 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 2

24 HOUR CALIBRATION SUMMARY

FROM 5:29 AM FRI., 22 OCT., 1999 TILL 12:00 AM SAT., 23 OCT., 1999

TIME	O2 DEVIATION		SO2 DEVIATION		NOX DEVIATION		OPACITY DEVIATION	
	ZERO	SPAN	ZERO	SPAN	ZERO	SPAN	ZERO	SPAN
5:29 AM	.02	.16	-.33	-.16	-.01	.18	0.00	-.10

CONTINUOUS EMISSIONS MONITORING 12:05 AM SAT., 23 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 3

24 HOUR SUMMARY OF GASEOUS EMISSIONS

FROM 1:00 AM FRI., 22 OCT., 1999 TILL 12:00 AM SAT., 23 OCT., 1999

TIME HRS	O2 %	SO2 PPM	NOX PPM	OPACITY %	SO2 LB/MBTU	NOX LB/MBTU	GROSS GEN MW	HEAT RATE MBTU/HR	NUMBER OF SAMPLES TAKEN
1:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	579
2:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	584
3:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	584
4:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	582
5:00 AM	19.32	570.93	57.12	82.29	1.086	.078	21.38	.11	580
6:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	576
7:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	586
8:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	585
9:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	579
10:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	580
11:00 AM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	584
12:00 PM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	583
1:00 PM	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00	585
2:00 PM	17.07	403.10	208.49	99.36	.767	.285	50.88	581.41	578
3:00 PM	16.14	456.24	227.79	100.0	.868	.311	74.96	724.16	592
4:00 PM	13.47	640.59	310.64	79.60	1.219	.424	159.46	1592.84	593
5:00 PM	10.83	660.94	329.04	41.17	1.258	.450	270.33	2612.74	594
6:00 PM	10.12	470.24	314.38	27.00	.895	.430	294.87	2812.33	593
7:00 PM	9.04	347.17	272.70	10.03	.661	.373	324.18	3140.79	591
8:00 PM	8.70	214.65	245.99	6.87	.408	.336	326.91	3181.65	588
9:00 PM	8.58	207.89	239.67	6.22	.396	.327	328.54	3143.28	593
10:00 PM	8.51	205.19	237.50	6.32	.390	.325	329.15	3127.32	593
11:00 PM	8.60	189.14	235.35	5.92	.360	.322	326.34	3036.50	592
12:00 AM	8.67	176.33	232.83	6.16	.335	.318	325.66	2986.27	593

NOTE: VALUES FOR SO2 AND NOX ARE CORRECTED TO 3% O2

CONTINUOUS EMISSIONS MONITORING 12:05 AM SAT., 23 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 3

SO2 AND NOX; DAILY MASS CALCULATIONS

FROM 1:00 AM FRI., 22 OCT., 1999 TILL 12:00 AM SAT., 23 OCT., 1999

TIME HRS	SO2 LB/HR	SO2 TONS/HR	NOX LB/HR	NOX TONS/HR
1:00 AM	0.00	0.00	0.00	0.00
2:00 AM	0.00	0.00	0.00	0.00
3:00 AM	0.00	0.00	0.00	0.00
4:00 AM	0.00	0.00	0.00	0.00
5:00 AM	.12	.00	.01	.00
6:00 AM	0.00	0.00	0.00	0.00
7:00 AM	0.00	0.00	0.00	0.00
8:00 AM	0.00	0.00	0.00	0.00
9:00 AM	0.00	0.00	0.00	0.00
10:00 AM	0.00	0.00	0.00	0.00
11:00 AM	0.00	0.00	0.00	0.00
12:00 PM	0.00	0.00	0.00	0.00
1:0 PM	0.00	0.00	0.00	0.00
2:00 PM	445.92	.22	165.62	.08
3:00 PM	628.62	.31	225.39	.11
4:00 PM	1941.39	.97	676.06	.34
5:00 PM	3285.61	1.64	1174.63	.59
6:00 PM	2516.20	1.26	1208.03	.60
7:00 PM	2074.63	1.04	1170.25	.59
8:00 PM	1299.40	.65	106936	.53
9:00 PM	1243.30	.62	1029.32	.51
10:00 PM	1220.92	.61	1014.83	.51
11:00 PM	1092.74	.55	976.43	.49
12:00 AM	1001.88	.50	950.00	.48
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DAILY TOTALS	16750.71	8.38	9659.94	4.83

CONTINUOUS EMISSIONS MONITORING 12:05 AM SAT., 23 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 3

24 HOUR OPACITY SUMMARY

FROM 1:06 PM FRI., 22 OCT., 1999 TILL 11:59 PM FRI., 22 OCT., 1999

TIME	OPACITY	TIME	OPACITY	TIME	OPACITY	TIME	OPACITY	TIME	OPACITY
1:06 PM	0.00	1:12 PM	0.00	1:18 PM *	94.12	1:24 PM *	100.0	1:30 PM *	100.0
1:36 PM *	100.0	1:42 PM *	100.0	1:48 PM *	100.0	1:54 PM *	100.0	1:59 PM *	100.0
2:06 PM *	100.0	2:12 PM *	100.0	2:18 PM *	100.0	2:24 PM *	100.0	2:30 PM *	100.0
2:36 PM *	100.0	2:42 PM *	100.0	2:48 PM *	100.0	2:54 PM *	100.0	2:59 PM *	100.0
3:06 PM *	93.23	3:12 PM *	86.96	3:18 PM *	88.19	3:24 PM *	85.13	3:30 PM *	84.08
3:36 PM *	80.43	3:42 PM *	77.09	3:48 PM *	72.94	3:54 PM *	68.32	3:59 PM *	59.53
4:06 PM *	52.76	4:12 PM *	47.33	4:18 PM *	48.10	4:24 PM *	46.36	4:30 PM *	44.91
4:36 PM *	41.18	4:42 PM *	38.27	4:48 PM *	34.10	4:54 PM *	30.79	4:59 PM *	27.57
5:06 PM *	32.79	5:12 PM *	32.27	5:18 PM *	37.34	5:24 PM *	40.56	5:30 PM *	32.32
5:36 PM *	25.91	5:42 PM *	21.35	5:48 PM	17.94	5:54 PM	15.18	5:59 PM	14.56
6:06 PM	13.26	6:12 PM	13.20	6:18 PM	9.44	6:24 PM	8.65	6:30 PM	10.49
6:36 PM	10.25	6:42 PM	9.61	6:48 PM	9.67	6:54 PM	8.27	7:00 PM	7.67
7:06 PM	7.52	7:12 PM	7.50	7:18 PM	6.98	7:24 PM	6.86	7:30 PM	6.84

Unit 2 Precipitator Readings

2A-1
Lower Precipitator (South) Thursday, October 21, 1999

Module	Grnd?	Grnd?	AC V	AC A	DC MA	DC KV	Hoppers Over Fields	High
2A-1A	3	4	160	20	80	28	2A & 2B	2A
2A-1B	3	4	250	45	400	34	2A & 2B	2A
2A-1C	3	4	230	70	400	30	2A & 2B	2A
2A-1D	3	4	200	45	280	27	2A & 2B	2A
2A-1E	3	4	150	30	100	25	3E & 3F	
2A-1F	3	4	150	40	200	25	3E & 3F	
2A-1G	3	4	130	25	100	21	3E & 3F	
2A-1H	3	4	150	60	300	24	3E & 3F	

2B-1
Upper Precipitator (South)

Module	Grnd?	Grnd?	AC V	AC A	DC MA	DC KV	Hoppers Over Fields	High
2B-1A	3	4	260	45	240	37	2J & 2K	
2B-1B	3	4	220	40	200	30	2J & 2K	
2B-1C	3	4	190	40	240	26	2J & 2K	
2B-1D	3	4	170	40	180	25	2J & 2K	
2B-1E	3	4	150	60	160	24	2N & 2P	
2B-1F	3	4	150	45	300	22	2N & 2P	
2B-1G	3	4	130	100	400	21	2N & 2P	
2B-1H	3	4	170	135	800	20	2N & 2P	

2A-2
Lower Precipitator (North)

Module	Grnd?	Grnd?	AC V	AC A	DC MA	DC KV	Hoppers Over Fields	High
2A-2A	1	2	130	35	100	27	2C & 2D	
2A-2B	1	2	250	50	300	28	2C & 2D	
2A-2C	1	2	220	75	400	32	2C & 2D	
2A-2D	1	2	180	35	200	25	2C & 2D	
2A-2E	1	2	160	50	240	26	2G & 2H	
2A-2F	1	2	140	30	160	24	2G & 2H	
2A-2G	1	2	150	50	200	23	2G & 2H	
2A-2H	1	2	150	80	480	21	2G & 2H	

2B-2
Upper Precipitator (North)

Module	Grnd?	Grnd?	AC V	AC A	DC MA	DC KV	Hoppers Over Fields	High
2B-2A	1	2	230	40	180	36	2L & 2M	
2B-2B	1	2	200	30	140	30	2L & 2M	
2B-2C	1	2	170	25	140	26	2L & 2M	
2B-2D	1	2	180	25	180	25	2L & 2M	
2B-2E	1	2	150	40	200	23	2Q & 2R	
2B-2F	1	2	150	60	300	20	2Q & 2R	
2B-2G	1	2	150	75	400	22	2Q & 2R	
2B-2H	1	2	170	125	700	22	2Q & 2R	

Opacity 8.5 Megawatts-353 Readings Taken by: M Pacheco

Shaded area is a ground in that section

San Juan 2 ESP Data, Run 2, Oct 21 1999								
Precip	*Module*	*DC MA*	*DC KV*	*KVA*				
			Total KVA	*221.94*				
2A-1	1A	80	28	2.24				
2A-1	1B	400	34	13.60				
2A-1	1C	400	30	12.00				
2A-1	1D	280	27	7.56				
2A-1	1E	100	25	2.50				
2A-1	1F	200	25	5.00				
2A-1	1G	100	21	2.10				
2A-1	1H	300	24	7.20				
2B-1	1A	240	37	8.88				
2B-1	1B	200	30	6.00				
2B-1	1C	240	26	6.24				
2B-1	1D	180	25	4.50				
2B-1	1E	160	24	3.84				
2B-1	1F	300	22	6.60				
2B-1	1G	400	21	8.40				
2B-1	1H	800	20	16.00				
2A-2	1A	100	27	2.70				
2A-2	1B	300	28	8.40				
2A-2	1C	400	32	12.80				
2A-2	1D	200	35	7.00				
2A-2	1E	240	26	6.24				
2A-2	1F	160	24	3.84				
2A-2	1G	200	23	4.60				
2A-2	1H	480	21	10.08				
2B-2	1A	180	36	6.48				
2B-2	1B	140	30	4.20				
2B-2	1C	140	26	3.64				
2B-2	1D	180	25	4.50				
2B-2	1E	200	23	4.60				
2B-2	1F	300	20	6.00				
2B-2	1G	400	22	8.80				
2B-2	1H	700	22	15.40				

Subject: FW: Public Service Company of New Mexico
Date: Mon, 25 Oct 1999 06:34:24 -0600
From: "MFARLEY@pnm.com" <MFARLEY@pnm.com>
To: "'mmcdannel@ferco.com'" <mmcdannel@ferco.com>

Mark - attached are precipitator readings for Thursday. We don't have readings for Friday but the precipitator was operating similar to Thursday.

mike farley

> ----------
> *From:* *Freestone, Dave*
> *Sent:* *Monday, October 25, 1999 6:21 AM*
> *To:* *Farley, Mike*
> *Subject:* *FW: Public Service Company of New Mexico*
>
>
>
> ----------
> *From:* *Pacheco, Mike*
> *Sent:* *Thursday, October 21, 1999 9:19 AM*
> *To:* *Palmer, Dan; Freestone, Dave; Seymour, Bob; Karlin, Bill; Warner, Rodney; Whitaker, Ken; Ellis, Pat; Smith, Alan; Lorenz, Doug; Hoover, Carlson; Ewan, Tom; Smith, Roy; Quintana, Perfecto; Mitchell, Dave*
> *Subject:* *Public Service Company of New Mexico*
>
> *<<Unit2 Precip oct17.doc>>*
>
>

Unit2 Precip oct17.doc	**Name:** Unit2 Precip oct17.doc **Type:** Winword File (application/msword) **Encoding:** base64

CONTINUOUS EMISSIONS MONITORING 12:05 AM FRI., 22 OCT., 1999

PUBLIC SERVICE COMPANY OF NEW MEXICO

SAN JUAN -- UNIT 2

24 HOUR SUMMARY OF GASEOUS EMISSIONS

FROM 1:00 AM THU., 21 OCT., 1999 TILL 12:00 AM FRI., 22 OCT., 1999

TIME HRS	O2 %	SO2 PPM	NOX PPM	OPACITY %	SO2 LB/MBTU	NOX LB/MBTU	GROSS GEN MW	HEAT RATE MBTU/HR	NUMBER OF SAMPLES TAKEN
1:00 AM	6.01	187.24	353.85	12.39	.356	.483	351.55	3484.53	579
2:00 AM	5.95	184.20	352.72	10.85	.350	.482	350.72	3460.46	572
3:00 AM	5.98	173.98	354.15	10.06	.331	.484	345.66	3378.74	584
4:00 AM	6.00	170.31	359.22	7.74	.324	.491	345.69	3370.89	575
5:00 AM	6.04	187.22	360.72	8.31	.356	.493	350.38	3464.72	577
6:00 AM	6.04	216.43	357.61	7.98	.412	.489	340.71	3505.43	582
7:00 AM	6.58	199.78	396.09	6.98	.380	.541	340.10	3488.58	568
8:00 AM	6.56	218.22	392.25	7.70	.415	.536	348.53	3663.40	578
9:00 AM	6.45	223.51	377.30	7.99	.425	.516	354.54	3773.44	580
10:00 AM	6.42	213.09	372.54	7.67	.405	.509	356.01	3803.54	577
11:00 AM	6.39	206.61	373.30	7.95	.393	.510	355.97	3805.27	584
12:00 PM	6.31	209.14	369.27	8.07	.398	.505	356.15	3800.41	587
1:00 PM	6.28	207.88	371.10	7.87	.396	.507	355.88	3739.2	581
2:00 PM	6.21	205.85	369.88	7.79	.392	.505	355.17	3691.74	584
3:00 PM	6.17	211.40	366.50	7.86	.402	.501	354.97	3678.14	592
4:00 PM	6.24	231.33	367.86	8.14	.440	.503	355.47	3691.05	570
5:00 PM	6.36	242.92	376.02	8.56	.462	.514	354.93	3689.13	581
6:00 PM	6.63	237.20	383.69	9.73	.451	.524	331.14	3422.23	574
7:00 PM	6.36	235.92	367.93	10.24	.449	.503	343.32	3575.83	588
8:00 PM	6.12	235.69	351.86	8.92	.448	.481	352.05	3569.81	582
9:00 PM	6.22	224.62	357.7	9.29	.427	.488	334.60	3329.66	575
10:00 PM	6.25	212.51	360.49	10.78	.404	.493	335.11	3328.75	579
11:00 PM	6.41	180.00	365.10	12.35	.342	.499	327.45	3251.36	583
12:00 AM	6.36	167.46	367.08	11.89	.319	.502	342.23	3382.22	575

NOTE: VALUES FOR SO2 AND NOX ARE CORRECTED TO 3% O2

```
10000245141999
1012     2     SO2CONC2000024
1012     2     NOXCONC2010024
1012     2     CO2CONC2020024
1012     2     DILUENT2110024
1012     2     FLOWRTE2200024
1012     2     OPERATN3000024
1012     2     SO2MASS3100024
1012     2     NOXRATE3200024
2002     2SA2S199102100 98.3 156.3 156.301
2002     2SA2S199102101 98.3 157.9 157.901
2002     2SA2S199102102 98.3 147.8 147.801
2002     2SA2S199102103 98.3 139.3 139.301
2002     2SA2S199102104 98.3 157.3 157.301
2002     2SA2S199102105 98.3 173.2 173.201
2002     2SA2S199102106 98.3 161.0 161.001
2002     2SA2S199102107 98.3 172.2 172.201
2002     2SA2S199102108 98.3 178.5 178.501
2002     2SA2S199102109 98.3 175.9 175.901
2002     2SA2S199102110 98.3 167.4 167.401
2002     2SA2S199102111 98.3 170.1 170.101
2002     2SA2S199102112 98.3 170.9 170.901
2002     2SA2S199102113 98.3 171.2 171.201
2002     2SA2S199102114 98.3 173.5 173.501
2002     2SA2S199102115 98.3 190.2 190.201
2002     2SA2S199102116 98.3 196.2 196.201
2002     2SA2S199102117 98.3 196.8 196.801
2002     2SA2S199102118 98.3 182.1 182.101
2002     2SA2S199102119 98.3 196.9 196.901
2002     2SA2S199102120 98.3 191.2 191.201
2002     2SA2S199102121 98.3 175.3 175.301
2002     2SA2S199102122 98.3 143.5 143.501
2002     2SA2S199102123 98.3 145.1 145.101
2012     2NA2N199102100 293.901
2012     2NA2N199102101 293.401
2012     2NA2N199102102 301.301
2012     2NA2N199102103 297.901
2012     2NA2N199102104 300.701
2012     2NA2N199102105 297.201
2012     2NA2N199102106 314.901
2012     2NA2N199102107 315.601
2012     2NA2N199102108 303.801
2012     2NA2N199102109 301.101
2012     2NA2N199102110 304.001
2012     2NA2N199102111 300.401
2012     2NA2N199102112 302.201
2012     2NA2N199102113 302.801
2012     2NA2N199102114 301.701
2012     2NA2N199102115 300.001
2012     2NA2N199102116 305.601
2012     2NA2N199102117 307.201
2012     2NA2N199102118 293.401
2012     2NA2N199102119 289.301
2012     2NA2N199102120 291.101
2012     2NA2N199102121 294.501
2012     2NA2N199102122 294.601
2012     2NA2N199102123 297.801
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2022	2DA2C199102100	13.101				
2022	2DA2C199102101	13.101				
2022	2DA2C199102102	13.001				
2022	2DA2C199102103	13.101				
2022	2DA2C199102104	13.001				
2022	2DA2C199102105	13.101				
2022	2DA2C199102106	12.701				
2022	2DA2C199102107	12.601				
2022	2DA2C199102108	12.801				
2022	2DA2C199102109	12.801				
2022	2DA2C199102110	12.801				
2022	2DA2C199102111	12.901				
2022	2DA2C199102112	12.901				
2022	2DA2C199102113	12.901				
2022	2DA2C199102114	12.901				
2022	2DA2C199102115	12.901				
2022	2DA2C199102116	12.801				
2022	2DA2C199102117	12.501				
2022	2DA2C199102118	12.901				
2022	2DA2C199102119	13.001				
2022	2DA2C199102120	12.901				
2022	2DA2C199102121	12.901				
2022	2DA2C199102122	12.801				
2022	2DA2C199102123	12.801				
2112	2DA2N199102100	6.0				
2112	2DA2N199102101	6.0				
2112	2DA2N199102102	6.1				
2112	2DA2N199102103	6.0				
2112	2DA2N199102104	6.1				
2112	2DA2N199102105	6.0				
2112	2DA2N199102106	6.5				
2112	2DA2N199102107	6.6				
2112	2DA2N199102108	6.4				
2112	2DA2N199102109	6.4				
2112	2DA2N199102110	6.4				
2112	2DA2N199102111	6.3				
2112	2DA2N199102112	6.3				
2112	2DA2N199102113	6.2				
2112	2DA2N199102114	6.2				
2112	2DA2N199102115	6.2				
2112	2DA2N199102116	6.4				
2112	2DA2N199102117	6.7				
2112	2DA2N199102118	6.3				
2112	2DA2N199102119	6.1				
2112	2DA2N199102120	6.2				
2112	2DA2N199102121	6.2				
2112	2DA2N199102122	6.4				
2112	2DA2N199102123	6.4			wscfh	
Flow 2202	2FA2F199102100	99.0	53715555	57314498	13.81001	
2202	2FA2F199102101	99.0	52540830	56061067	13.71001	
2202	2FA2F199102102	99.0	52504695	56022511	13.41001	
2202	2FA2F199102103	99.0	50867550	54275677	13.41001	
2202	2FA2F199102104	99.0	51791970	55262033	13.51001	
2202	2FA2F199102105	99.0	50847360	54254134	10.91001	
2202	2FA2F199102106	99.0	52411755	55923344	12.81001	
2202	2FA2F199102107	99.0	52532550	56052232	12.71001	
2202	2FA2F199102108	99.0	52599255	56123406	12.51001	

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2202     2FA2F199102109 99.0  53670525  57266451 12.71001
2202     2FA2F199102110 99.0  53762850  57364962 13.11001
2202     2FA2F199102111 99.0  53654925  57249806 13.11001
2202     2FA2F199102112 99.0  53413785  56992510 13.11001
2202     2FA2F199102113 99.0  52986810  56536927 13.01001
2202     2FA2F199102114 99.0  53094780  56652131 13.11001
2202     2FA2F199102115 99.0  53056005  56610759 13.41001
2202     2FA2F199102116 99.0  53579235  57169045 13.31001
2202     2FA2F199102117 99.0  51473445  54922167 13.00901
2202     2FA2F199102118 99.0  51365625  54807123 12.81001
2202     2FA2F199102119 99.0  59423925  63405329 12.71001
2202     2FA2F199102120 99.0  49346940  52653186 12.91001
2202     2FA2F199102121 99.0  49955430  53302445 13.11001
2202     2FA2F199102122 99.0  47675580  50869845 13.20901
2202     2FA2F199102123 99.0  52772955  56308744 13.11001
2302     2DA2C199102105        21.000        2.020       2.035  0.0000Z
2302     2DA2C199102105        21.000       20.900      20.940  0.0000H
2302     2DA2N199102105        21.000        2.020       2.035  0.0000Z
2302     2DA2N199102105        21.000       20.900      20.940  0.0000H
2302     2FA2F199102105         1.330        0.000      -0.002  0.2000Z
2302     2FA2F199102105         1.330        0.900       0.915  1.1000H
2302     2NA2N199102105      1000.000        0.000      -0.198  0.0000Z
2302     2NA2N199102105      1000.000      905.000     911.700  0.7000H
2302     2SA2S199102105       380.000        0.000      -2.468  0.6000Z
2302     2SA2S199102105       380.000      349.000     347.936  0.3000H
2302     2SA2S199102105      1400.000     1320.000    1316.920  0.2000H
2312     2FA2F199102114P00
3002     991021001.00   350      10 3601.4
3002     991021011.00   351      10 3526.7
3002     991021021.00   345      10 3512.8
3002     991021031.00   341      10 3426.3
3002     991021041.00   350      10 3461.1
3002     991021051.00   340      10 3523.8
3002     991021061.00   343      10 3435.5
3002     991021071.00   344      10 3423.4
3002     991021081.00   354      10 3483.7
3002     991021091.00   355      10 3546.5
3002     991021101.00   355      10 3536.3
3002     991021111.00   355      10 3553.5
3002     991021121.00   356      10 3537.6
3002     991021131.00   354      10 3537.4
3002     991021141.00   354      10 3540.5
3002     991021151.00   354      10 3525.7
3002     991021161.00   354      10 3516.1
3002     991021171.00   332      09 3319.5
3002     991021181.00   339      10 3413.7
3002     991021191.00   353      10 4007.9
3002     991021201.00   338      10 3298.2
3002     991021211.00   335      10 3331.2
3002     991021221.00   324      09 3132.3
3002     991021231.00   341      10 3471.2
3012     991030     183.8    4112.9        0.434        0.489  100797.6
2091982.1    982860  20395294     0     0
3102     99102100 1201.4 1281.9201
3102     99102101 1188.5 1268.1201
3102     99102102 1115.6 1190.3201
3102     99102103 1018.6 1086.9201
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3102    99102104 1169.8 1248.2201
3102    99102105 1302.6 1389.8201
3102    99102106 1221.5 1303.3201
3102    99102107 1310.9 1398.8201
3102    99102108 1363.7 1455.1201
3102    99102109 1368.1 1459.8201
3102    99102110 1298.3 1385.3201
3102    99102111 1316.6 1404.8201
3102    99102112 1316.8 1405.0201
3102    99102113 1310.1 1397.9201
3102    99102114 1328.9 1417.9201
3102    99102115 1450.7 1547.9201
3102    99102116 1512.9 1614.3201
3102    99102117 1463.0 1561.0201
3102    99102118 1354.0 1444.7201
3102    99102119 1695.6 1809.2201
3102    99102120 1364.2 1455.6201
3102    99102121 1263.3 1347.9201
3102    99102122  985.8 1051.8201
3102    99102123 1104.6 1178.6201
3202    2N199102100 98.3    9780.0 0.481 0.5131020401
3202    2N199102101 98.3    9780.0 0.481 0.5131020401
3202    2N199102102 98.3    9780.0 0.497 0.5301020401
3202    2N199102103 98.3    9780.0 0.488 0.5211020401
3202    2N199102104 98.3    9780.0 0.496 0.5291020401
3202    2N199102105 98.3    9780.0 0.487 0.5201020401
3202    2N199102106 98.3    9780.0 0.534 0.5701020401
3202    2N199102107 98.3    9780.0 0.539 0.5751020401
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3202    2N199102109 98.3    9780.0 0.507 0.5411020401
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3202    2N199102118 98.3    9780.0 0.490 0.5231020401
3202    2N199102119 98.3    9780.0 0.477 0.5091020401
3202    2N199102120 98.3    9780.0 0.483 0.5151020401
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3302    99102100     368.9208
3302    99102101     361.3208
3302    99102102     359.5208
3302    99102103     351.0208
3302    99102104     354.2208
3302    99102105     361.0208
3302    99102106     353.0208
3302    99102107     351.4208
3302    99102108     358.3208
3302    99102109     364.8208
3302    99102110     363.7208
3302    99102111     365.8208
3302    99102112     364.2208
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3302      99102114      362.0208
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3302      99102117      340.4208
3302      99102118      351.4208
3302      99102119      410.2208
3302      99102120      337.2208
3302      99102121      340.6208
3302      99102122      322.2208
3302      99102123      357.0208
502SAN JUAN STATION    UNIT #2              2      P2DB C  O  OFA      ESP
CEMCEM(O2) O2F   COM                370
5102      2DA2C1UCO2 P O2  EXTAMETEK/THERMOX            FCA/MICRO       C106335
9501010000
5102      2DA2F1UFLOWP O2  EXTAMETEK/THERMOX            FCA/MICRO       C106335
9501010000
5102      2DA2N1UNOX P O2  EXTAMETEK/THERMOX            FCA/MICRO       C106335
9501010000
5102      2FA2F1UFLOWP FLOWDP EMRC                      GAS FLOW MONIT 0385
9501010000
5102      2MA2C1UCO2 P DAHSEXTPNM                       VERSION 2.4     PNM-1.0
9501010000
5102      2MA2F1UFLOWP DAHSDP PNM                       VERSION 2.4     PNM-1.0
9501010000
5102      2MA2N1UNOX P DAHSEXTPNM                       VERSION 2.4     PNM-1.0
9501010000
5102      2MA2O1UOP  P DAHSISCPNM                       VERSION 2.4     PNM-1.0
9501010000
5102      2MA2S1USO2 P DAHSEXTPNM                       VERSION 2.4     PNM-1.0
9501010000
5102      2NA2N1UNOX P NOX EXTTHERMO ELECTRON           10AR            10AR-9522-
108       9501010000
5102      2OA2O1UOP  P OP  ISCLEAR SIEGLER             RM41            1235
9501010000
5102      2SA2S1USO2 P SO2 EXTBOVAR/WESTERN RESEARCH    721ATM          93-721ATM-
7980      9501010000
5102      2WA2F1UFLOWP O2  IS AMETEK/THERMOX           WDG-INSITU      C106336
9501010000
5202      U201SO2 F-2  E_h = (1.66 * 10 ** - 7) * S#(2SA-2S1) * S#(2FA-2F1) *
((100 - F#(217)) / 100)
5202      U202SO2 F-3  E_q = (SUM FROM (h = 1) TO (n)) F#(201) / 2000
5202      U204NOx F-5  E = (1.194 * 10 ** - 7) * S#(2NA-2N1) * 9780 * (20.9 /
(20.9 - S#(2DA-2N1)))
5202      U207CO2 F-14aCO2 = 100 * (1800 / 9780) * ((20.9 - S#(2DA-2C1)) / 20.9)
5202      U208CO2 F-2  E_h = (5.7 * 10 ** - 7) * F#(207) * S#(2FA-2F1) * ((100 -
F#(217)) / 100)
5202      U209CO2      E_d = (SUM FROM (h = 1) TO (n)) F#(208) / 2000
5202      U214HI  F-18 HI = S#(2FA-2F1) * ((100 - F#(217)) / (100 * 9780)) *
((20.9 - S#(2DA-2C1)) / 20.9)
5202      U217H2O      H2O = (S#(2DA-2F1) - S#(2WA-2F1)) / S#(2DA-2F1) * 100
5302      SO2 HF      1043.000          1400.000     1500.000PPM  U950101
5302      SO2 LHD      300.000           380.000      500.000PPM  U950101
5302      NOx HTB      800.000 1.460    1000.000     1000.000PPM  U950101
5302      O2  HTB        0.000             21.000       25.000%    U950101
5302      FLOW TR 75259800.000              1.330        1.500INH2OU950101
```
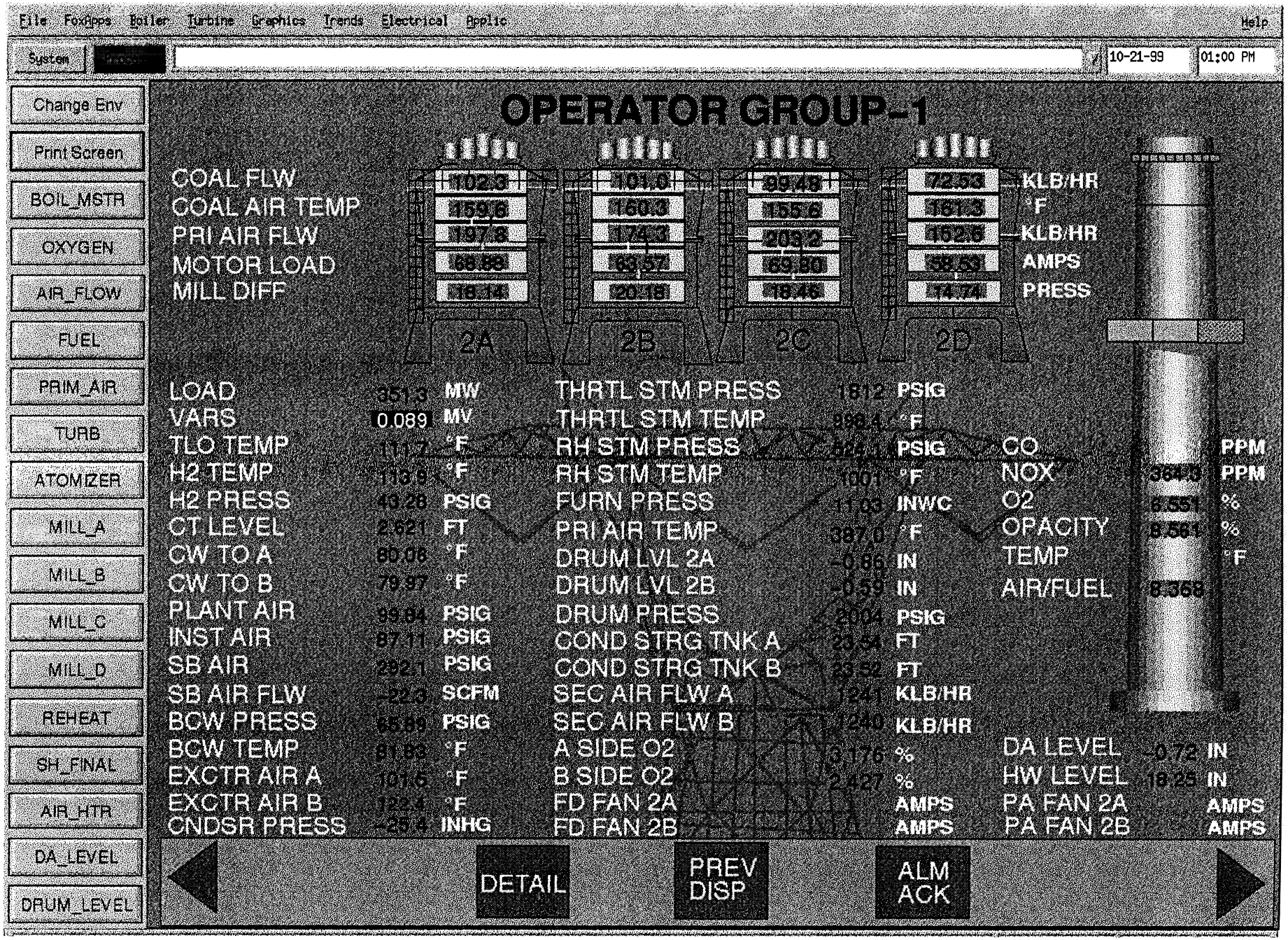

5502 FLOW2F199100514991005162 5Interference Check Failure
Successfully Completed Flow Interference Test

San Juan 2 Boiler Data, Run 2, Oct 21 1999								
	Coal Flow, klb/hr						O2	
	A	B	C	D	Total	Load	A	B
Average	*100*	*99*	*97*	*72*	*369*	*345*	*3.05*	*2.56*
1300	102	101	99	73	375	351	3.18	2.43
1327	102	101	99	73	374	350	3.18	2.43
1400	103	102	99	73	376	350	3.18	2.43
1429	103	102	99	72	377	350	2.87	2.64
1505	102	100	99	73	373	351	2.93	2.57
1529	101	100	99	73	373	352	2.93	2.57
1559	102	102	100	73	376	351	2.93	2.57
1731	86	85	83	72	327	302	3.22	2.80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OXYGEN
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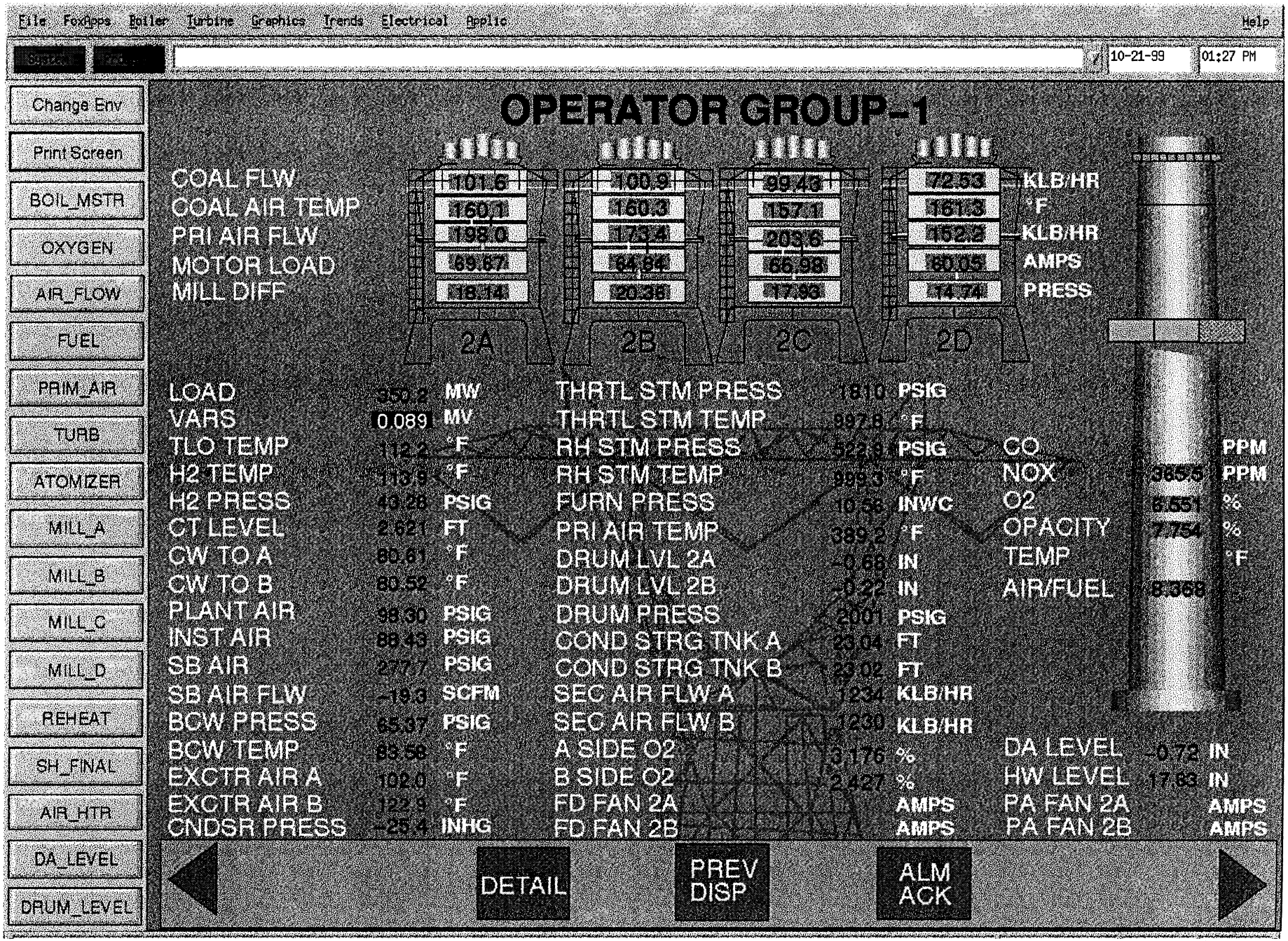
PRIM_AIR
TURB
ATOMIZER
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
102.3
159.8
197.8
69.88
18.14
101.0
160.3
174.3
69.57
20.18
99.43
155.6
203.2
69.80
18.46
72.53
161.3
152.6
38.53
14.74
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 351.3 MW
VARS 0.089 MV
TLO TEMP 111.7 °F
H2 TEMP 113.9 °F
H2 PRESS 43.28 PSIG
CT LEVEL 2.621 FT
CW TO A 80.06 °F
CW TO B 79.97 °F
PLANT AIR 99.84 PSIG
INST AIR 87.11 PSIG
SB AIR 292.1 PSIG
SB AIR FLW -22.3 SCFM
BCW PRESS 65.89 PSIG
BCW TEMP 81.83 °F
EXCTR AIR A 101.5 °F
EXCTR AIR B 122.4 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1812 PSIG
THRTL STM TEMP 998.4 °F
RH STM PRESS 824.1 PSIG
RH STM TEMP 1001 °F
FURN PRESS -1.03 INWC
PRI AIR TEMP 387.0 °F
DRUM LVL 2A -0.86 IN
DRUM LVL 2B -0.59 IN
DRUM PRESS 2004 PSIG
COND STRG TNK A 23.54 FT
COND STRG TNK B 23.52 FT
SEC AIR FLW A 1241 KLB/HR
SEC AIR FLW B 1240 KLB/HR
A SIDE O2 3.176 %
B SIDE O2 2.427 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX PPM
364.9
O2 8.551 %
OPACITY 8.561 %
TEMP °F
AIR/FUEL 8.368
DA LEVEL -0.72 IN
HW LEVEL 18.25 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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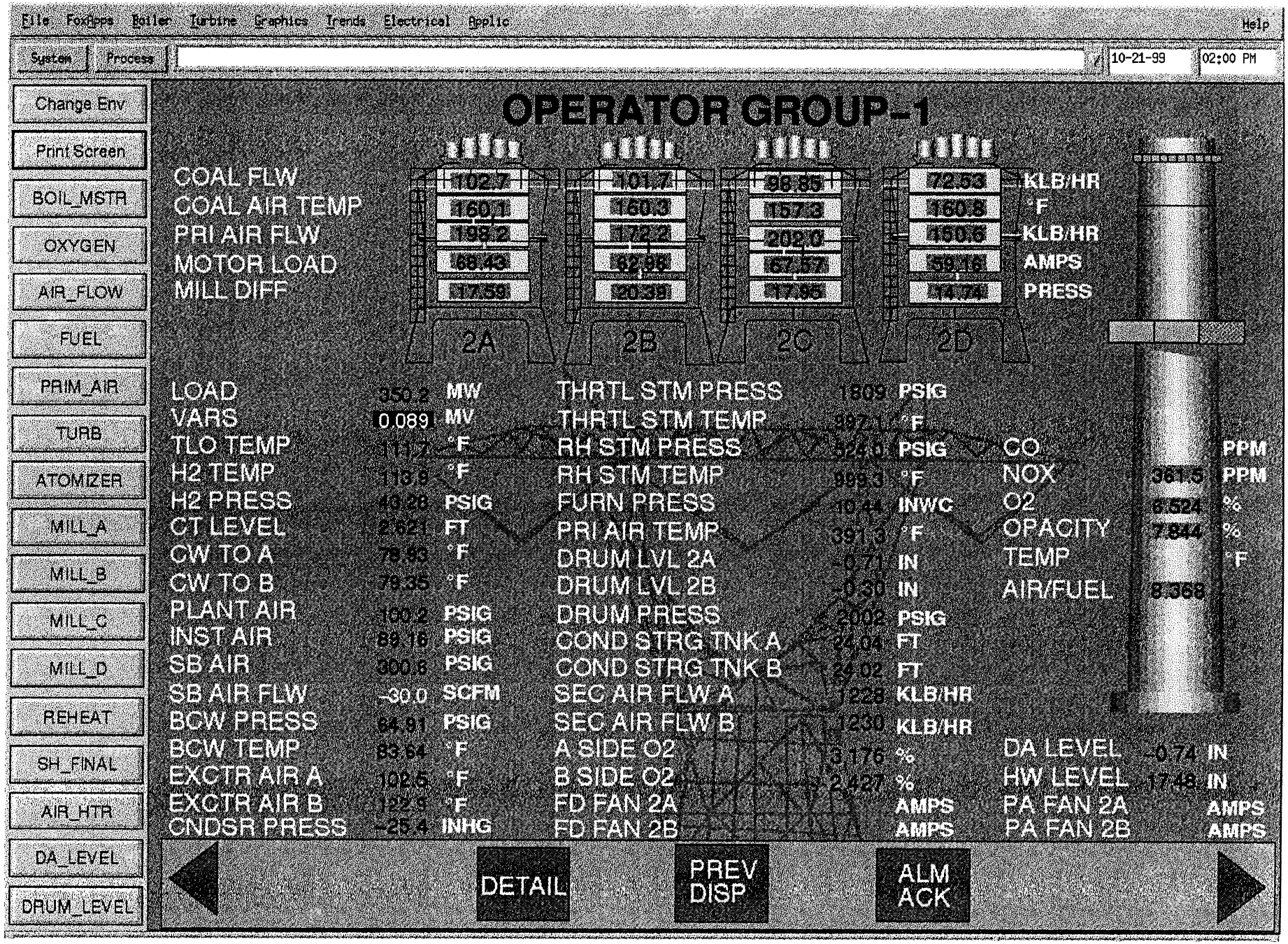
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
101.6
160.1
198.0
69.87
18.14
100.9
160.3
173.4
64.64
20.36
99.43
157.1
203.6
66.98
17.83
72.53
161.3
152.2
60.05
14.74
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 850.2 MW
VARS 0.089 MV
TLO TEMP 112.2 °F
H2 TEMP 113.9 °F
H2 PRESS 40.28 PSIG
CT LEVEL 2.621 FT
CW TO A 80.61 °F
CW TO B 80.52 °F
PLANT AIR 98.30 PSIG
INST AIR 88.43 PSIG
SB AIR 277.7 PSIG
SB AIR FLW -19.3 SCFM
BCW PRESS 85.37 PSIG
BCW TEMP 83.56 °F
EXCTR AIR A 102.0 °F
EXCTR AIR B 122.9 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1810 PSIG
THRTL STM TEMP 997.8 °F
RH STM PRESS 522.9 PSIG
RH STM TEMP 999.3 °F
FURN PRESS 10.56 INWC
PRI AIR TEMP 389.2 °F
DRUM LVL 2A -0.68 IN
DRUM LVL 2B -0.22 IN
DRUM PRESS 2001 PSIG
COND STRG TNK A 23.04 FT
COND STRG TNK B 23.02 FT
SEC AIR FLW A 1234 KLB/HR
SEC AIR FLW B 1230 KLB/HR
A SIDE O2 3.176 %
B SIDE O2 2.427 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 365.5 PPM
O2 6.551 %
OPACITY 7.754 %
TEMP °F
AIR/FUEL 8.368
DA LEVEL -0.72 IN
HW LEVEL 17.83 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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TURB
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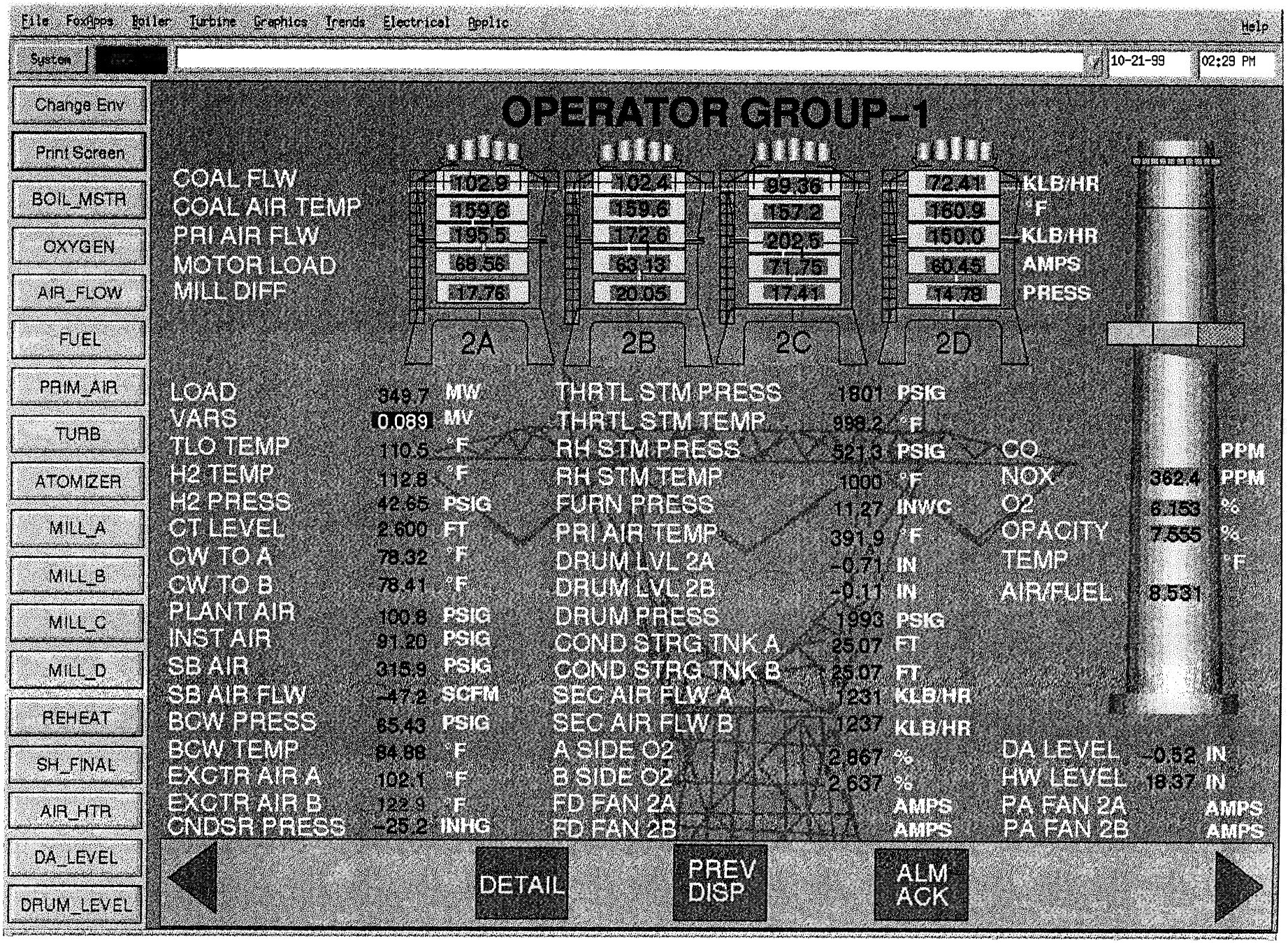
MILL_A
MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
102.7
160.1
198.2
68.43
17.59
101.7
160.3
172.2
62.96
20.39
99.85
157.3
202.0
67.57
17.95
72.53
160.8
150.6
59.16
14.74
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 350.2 MW
VARS 0.089 MV
TLO TEMP 111.7 °F
H2 TEMP 113.9 °F
H2 PRESS 40.28 PSIG
CT LEVEL 2.621 FT
CW TO A 78.93 °F
CW TO B 79.35 °F
PLANT AIR 100.2 PSIG
INST AIR 89.16 PSIG
SB AIR 300.6 PSIG
SB AIR FLW -30.0 SCFM
BCW PRESS 64.91 PSIG
BCW TEMP 83.64 °F
EXCTR AIR A 102.5 °F
EXCTR AIR B 122.9 °F
CNDSR PRESS -25.4 INHG
THRTL STM PRESS 1609 PSIG
THRTL STM TEMP 997.1 °F
RH STM PRESS 524.0 PSIG
RH STM TEMP 999.3 °F
FURN PRESS -10.44 INWC
PRI AIR TEMP 391.3 °F
DRUM LVL 2A -0.71 IN
DRUM LVL 2B -0.30 IN
DRUM PRESS 2002 PSIG
COND STRG TNK A 24.04 FT
COND STRG TNK B 24.02 FT
SEC AIR FLW A 1228 KLB/HR
SEC AIR FLW B 1230 KLB/HR
A SIDE O2 3.176 %
B SIDE O2 2.427 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 361.5 PPM
O2 6.524 %
OPACITY 7.844 %
TEMP °F
AIR/FUEL 8.368
DA LEVEL -0.74 IN
HW LEVEL 17.48 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK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MILL_B
MILL_C
MILL_D
REHEAT
SH_FINAL
AIR_HTR
DA_LEVEL
DRUM_LEVEL
OPERATOR GROUP-1
COAL FLW
COAL AIR TEMP
PRI AIR FLW
MOTOR LOAD
MILL DIFF
102.9
159.6
195.5
68.56
17.76
102.4
159.6
172.6
63.13
20.05
99.36
157.2
202.5
71.75
17.41
72.41
160.9
150.0
60.45
14.78
KLB/HR
°F
KLB/HR
AMPS
PRESS
2A
2B
2C
2D
LOAD 349.7 MW
VARS 0.089 MV
TLO TEMP 110.5 °F
H2 TEMP 112.8 °F
H2 PRESS 42.65 PSIG
CT LEVEL 2.600 FT
CW TO A 78.32 °F
CW TO B 78.41 °F
PLANT AIR 100.8 PSIG
INST AIR 91.20 PSIG
SB AIR 315.9 PSIG
SB AIR FLW -47.2 SCFM
BCW PRESS 65.43 PSIG
BCW TEMP 84.88 °F
EXCTR AIR A 102.1 °F
EXCTR AIR B 122.9 °F
CNDSR PRESS -25.2 INHG
THRTL STM PRESS 1801 PSIG
THRTL STM TEMP 998.2 °F
RH STM PRESS 521.3 PSIG
RH STM TEMP 1000 °F
FURN PRESS 11.27 INWC
PRI AIR TEMP 391.9 °F
DRUM LVL 2A -0.71 IN
DRUM LVL 2B -0.11 IN
DRUM PRESS 1993 PSIG
COND STRG TNK A 25.07 FT
COND STRG TNK B 25.07 FT
SEC AIR FLW A 1231 KLB/HR
SEC AIR FLW B 1237 KLB/HR
A SIDE O2 2.867 %
B SIDE O2 2.637 %
FD FAN 2A AMPS
FD FAN 2B AMPS
CO PPM
NOX 362.4 PPM
O2 6.153 %
OPACITY 7.555 %
TEMP °F
AIR/FUEL 8.531
DA LEVEL -0.52 IN
HW LEVEL 18.37 IN
PA FAN 2A AMPS
PA FAN 2B AMPS
DETAIL
PREV DISP
ALM ACK