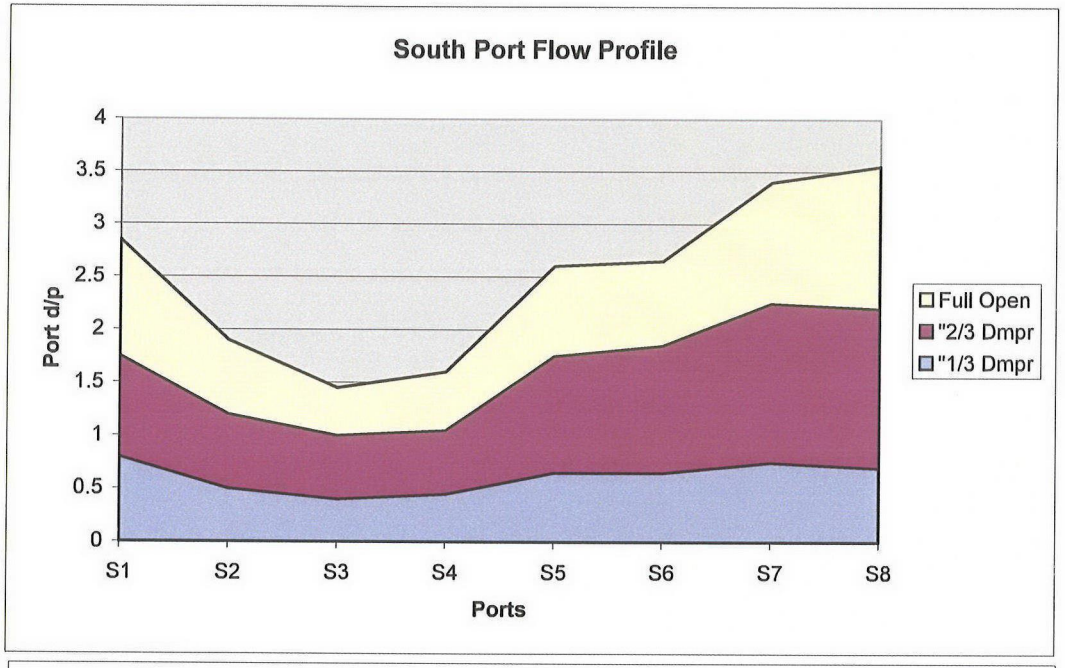
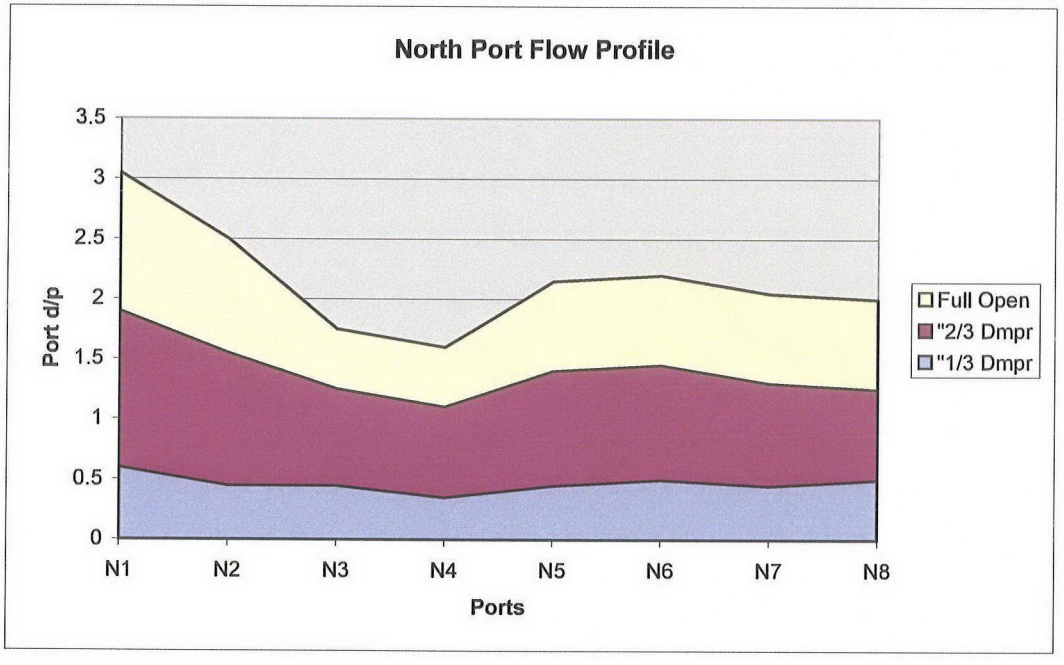
OFA Port	"1/3 Dmpr	"2/3 Dmpr	Full Open
S1	0.8	0.95	1.1
S2	0.5	0.7	0.7
S3	0.4	0.6	0.45
S4	0.45	0.6	0.55
S5	0.65	1.1	0.85
S6	0.65	1.2	0.8
S7	0.75	1.5	1.15
S8	0.7	1.5	1.35
OFA Port	"1/3 Dmpr	"2/3 Dmpr	Full Open
N1	0.6	1.3	1.15
N2	0.45	1.1	0.95
N3	0.45	0.8	0.5
N4	0.35	0.75	0.5
N5	0.45	0.95	0.75
N6	0.5	0.95	0.75
N7	0.45	0.85	0.75
N8	0.5	0.75	0.75





3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	77.000	120.000	77.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	691				
AVERAGE PRESSURE IN. W.C. (Pg)	1.31				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.10	25.10	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	64.167	64.167	
STACK VELOCITY FT/ SEC. (Vs) =	37.90	37.89	
ACTUAL STACK VOLUME (Q acfm) =	145,896	145,884	-0.01
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	56,137	56,132	-0.01
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	56,137	56,132	-0.01
FLOW IN LBS/HR (wet) =	253061	253038	-0.01
FLOW IN LBS/HR (dry) =	253061	253038	-0.01

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.028909
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.122	0.00	691	0.037	0	1.29	1.36	-0.005	0.000	1.29	1.37	0.000	
	2	0.121	-3.00	691	0.021	-0.002	1.39	1.47	-0.001	0.000	1.39	1.48	-0.095	
	3	0.126	-12.00	691	0.045	0	1.5	1.57	-0.005	0.000	1.50	1.58	0.000	
	4	0.127	-3.00	691	0.084	0	1.34	1.36	-0.005	0.000	1.34	1.36	0.000	
2	1	0.127	3.00	691	0.159	0.05	1.43	1.37	-0.010	-0.002	1.43	1.36	0.314	
	2	0.122	7.00	691	0.184	0.05	1.44	1.36	-0.010	-0.002	1.44	1.35	0.272	
	3	0.125	25.00	691	0.192	-0.043	1.61	1.53	0.001	0.000	1.61	1.52	-0.224	
	4	0.126	3.00	691	0.037	-0.004	1.58	1.66	-0.001	0.000	1.58	1.67	-0.108	
3	1	0.122	4.00	691	0.021	-0.006	1.34	1.43	0.000	0.000	1.34	1.45	-0.286	
	2	0.127	-2.00	691	0.041	-0.017	1.25	1.32	-0.003	0.000	1.25	1.33	-0.415	
	3	0.126	4.00	691	0.073	-0.025	1.35	1.38	-0.001	0.000	1.35	1.39	-0.342	
	4	0.123	8.00	691	0.126	-0.04	1.46	1.44	0.000	0.000	1.46	1.44	-0.317	
4	1	0.12	15.00	691	0.154	-0.046	1.39	1.34	0.000	0.000	1.39	1.33	-0.299	
	2	0.123	28.00	691	0.231	-0.048	1.31	1.18	0.001	0.000	1.31	1.16	-0.208	
	3	0.128	9.00	691	0.049	-0.006	1.12	1.18	0.000	0.000	1.12	1.19	-0.122	
	4	0.129	4.00	691	0.057	-0.005	1.15	1.2	-0.001	0.000	1.15	1.21	-0.088	
5	1	0.129	1.00	691	0.041	-0.007	1.06	1.13	0.000	0.000	1.06	1.14	-0.171	
	2	0.121	-1.00	691	0.066	0	1.2	1.24	-0.005	0.000	1.20	1.25	0.000	
	3	0.121	9.00	691	0.133	-0.012	1.14	1.12	-0.001	0.000	1.14	1.12	-0.090	
	4	0.126	10.00	691	0.161	-0.013	1.14	1.09	-0.001	0.000	1.14	1.08	-0.081	
6	1	0.124	25.00	691	0.232	-0.014	1.31	1.18	-0.002	0.000	1.31	1.16	-0.060	
	2	0.127	7.00	691	0.07	0.001	1.24	1.28	-0.005	0.000	1.24	1.29	0.014	
	3	0.122	2.00	691	0.065	0.003	1.27	1.3	-0.007	0.000	1.27	1.31	0.046	
	4	0.127	-5.00	691	0.052	-0.005	1.18	1.24	-0.001	0.000	1.18	1.25	-0.096	
7	1	0.124	-2.00	691	0.085	-0.002	1.2	1.22	-0.004	0.000	1.20	1.22	-0.024	
	2	0.122	-3.00	691	0.122	0.002	1.23	1.21	-0.006	-0.001	1.23	1.21	0.016	
	3	0.118	5.00	691	0.167	0.008	1.26	1.19	-0.007	-0.001	1.26	1.18	0.048	
	4	0.126	13.00	691	0.227	0.002	1.39	1.26	-0.005	-0.001	1.39	1.24	0.009	
8	1	0.13	0.00	691	0.242	-0.02	1.44	1.3	-0.001	0.000	1.44	1.28	-0.083	
	2	0.122	-5.00	691	0.205	-0.02	1.42	1.31	-0.001	0.000	1.42	1.29	-0.098	
	3	0.125	5.00	691	0.208	-0.005	1.3	1.2	-0.004	-0.001	1.30	1.18	-0.024	
	4	0.122	-4.00	691	0.204	0.01	1.4	1.3	-0.007	-0.001	1.40	1.28	0.049	
9	1	0.122	0.00	691	0.202	0.025	1.28	1.18	-0.010	-0.002	1.28	1.16	0.124	
	2	0.122	0.00	691	0.171	0.026	1.33	1.26	-0.011	-0.002	1.33	1.25	0.152	
	3	0.119	4.00	691	0.145	0.029	1.27	1.23	-0.011	-0.002	1.27	1.22	0.200	
	4	0.121	-3.00	691	0.375	-0.026	1.65	1.36	-0.002	-0.001	1.65	1.31	-0.069	
	37	0.123	-2.00	691	0.367	-0.006	1.64	1.37	-0.004	-0.001	1.64	1.32	-0.016	
	38	0.131	5.00	691	0.339	0.022	1.64	1.4	-0.008	-0.003	1.64	1.36	0.065	
	39	0.127	0.00	691	0.35	0.043	1.58	1.33	-0.010	-0.003	1.58	1.29	0.123	
	40	0.125	0.00	691	0.303	0.057	1.7	1.5	-0.011	-0.003	1.70	1.46	0.188	
	41	0.121	5.00	691	0.253	0.064	1.57	1.42	-0.010	-0.003	1.57	1.39	0.253	
	42	0.121	4.00	691	0.128	0.076	1.45	1.44	0.070	0.011	1.44	1.44	0.594	

-12.00

Avg. Duct Static = 1.31

Yaw Avg. = 3.81
Std. Dev. = 8.12

Average Temp.
691

Pitch Avg. = -1
Std. Dev. = 1

OFA NE BOTH DAMPERS OPEN 4-2-03.xls

IP7_039772

IP7_039773

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

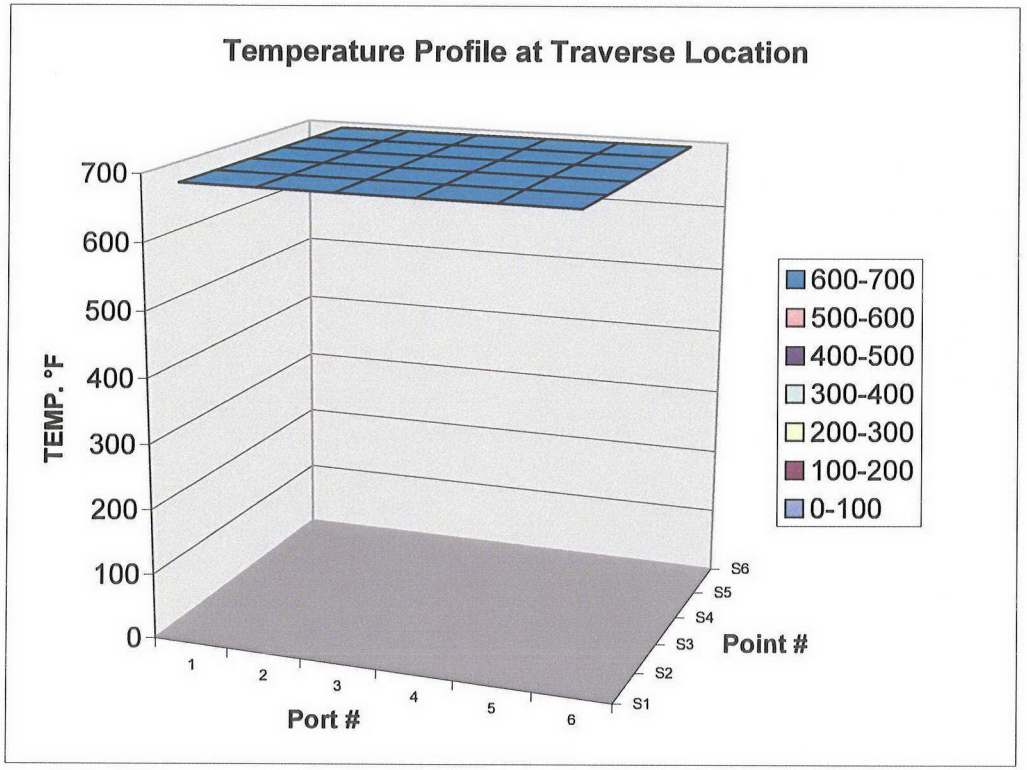
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

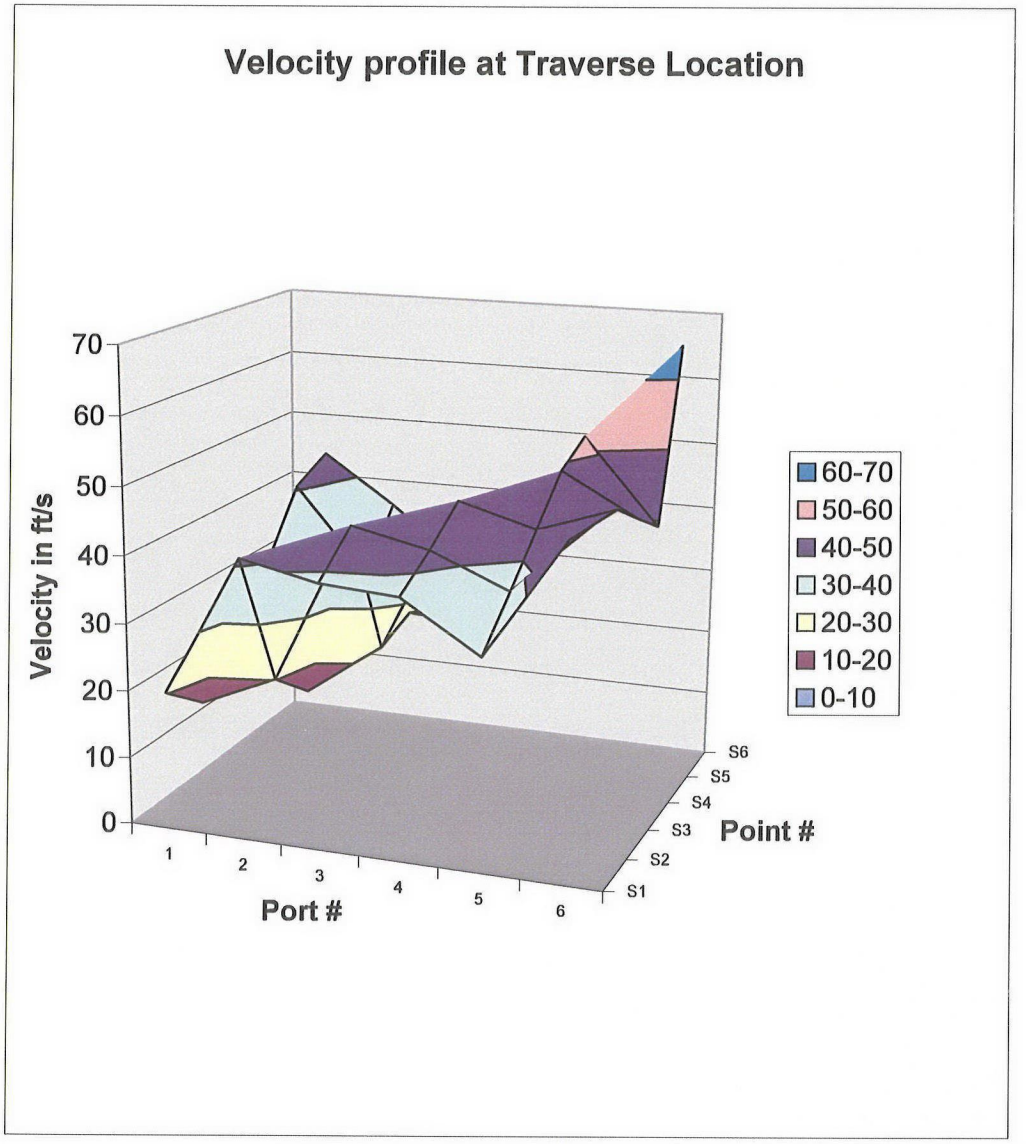
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	691	691	691	691	691	691
Point # 2	691	691	691	691	691	691
Point # 3	691	691	691	691	691	691
Point # 4	691	691	691	691	691	691
Point # 5	691	691	691	691	691	691
Point # 6	691	691	691	691	691	691



Traverse Point Velocity	Probes Point Velocity
20.42	37.57
15.31	37.41
22.02	38.17
30.73	38.33
40.52	38.33
43.47	37.57
41.35	38.02
20.29	38.16
14.88	37.57
20.21	38.33
27.39	38.18
35.93	37.72
38.92	37.26
44.32	37.74
23.08	38.49
25.22	38.64
21.25	38.65
27.28	37.42
38.14	37.43
41.88	38.20
46.31	37.89
27.87	38.34
26.98	37.57
24.04	38.34
30.95	37.88
37.02	37.58
43.11	36.96
49.28	38.19
52.11	38.79
47.72	37.57
48.26	38.04
47.70	37.57
47.07	37.58
43.07	37.58
39.20	37.11
64.83	37.42
64.30	37.73
61.29	38.93
61.96	38.34
56.91	38.02
51.27	37.41
27.72	37.41

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	20	41	39	38	31	48
Point # 2	15	20	44	42	37	48
Point # 3	22	15	23	46	43	47
Point # 4	31	20	25	28	49	43
Point # 5	41	27	21	27	52	39
Point # 6	43	36	27	24	48	65



Traverse	Probes
Avg. Velocity in ft/s	
37.90	37.89

IP7_039776

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	77.000	120.000	77.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	652				
AVERAGE PRESSURE IN. W.C. (Pg)	2.65				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.20	25.20	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	64.167	64.167	
STACK VELOCITY FT/ SEC. (Vs) =	21.18	19.58	
ACTUAL STACK VOLUME (Q acfm) =	81,532	75,391	-7.53
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	32,614	30,158	-7.53
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	32,614	30,158	-7.53
FLOW IN LBS/HR (wet) =	147021	135950	-7.53
FLOW IN LBS/HR (dry) =	147021	135950	-7.53

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.030054
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.033	-13.00	651	0.007	0.000	2.39	2.49	-0.005	0.000	2.39	2.51	0.000	
	2	0.032	0.00	651	0.023	0.000	2.43	2.51	-0.005	0.000	2.43	2.52	0.000	
	3	0.033	3.00	651	0.036	0.000	2.49	2.55	-0.005	0.000	2.49	2.56	0.000	
	4	0.031	-10.00	651	0.058	0.000	2.47	2.52	-0.005	0.000	2.47	2.53	0.000	
2	1	0.034	-5.00	651	0.063	0.000	2.61	2.65	-0.005	0.000	2.61	2.66	0.000	
	2	0.036	3.00	651	0.070	-0.054	2.53	2.57	0.000	0.000	2.53	2.58	-0.771	
	3	0.031	13.00	651	0.071	-0.025	2.63	2.67	-0.001	0.000	2.63	2.68	-0.352	
	4	0.036	-4.00	651	0.003	-0.002	2.40	2.50	0.000	0.000	2.40	2.52	-0.667	
3	1	0.032	0.00	651	0.003	0.000	2.40	2.50	-0.005	0.000	2.40	2.52	0.000	
	2	0.034	-2.00	651	0.004	0.000	2.33	2.43	-0.005	0.000	2.33	2.45	0.000	
	3	0.031	7.00	651	0.011	-0.004	2.37	2.47	-0.001	0.000	2.37	2.49	-0.364	
	4	0.038	15.00	651	0.022	-0.008	2.41	2.49	-0.001	0.000	2.41	2.50	-0.364	
4	1	0.035	15.00	651	0.044	-0.014	2.41	2.47	0.000	0.000	2.41	2.48	-0.318	
	2	0.036	20.00	651	0.078	-0.020	2.56	2.58	0.001	0.000	2.56	2.58	-0.256	
	3	0.035	3.00	651	0.011	0.006	2.54	2.63	-0.013	0.000	2.54	2.65	0.545	
	4	0.032	13.00	651	0.011	0.002	2.52	2.62	-0.011	0.000	2.52	2.64	0.182	
5	1	0.036	7.00	651	0.011	0.002	2.55	2.64	-0.011	0.000	2.55	2.66	0.182	
	2	0.034	7.00	651	0.022	0.004	2.56	2.64	-0.011	0.000	2.56	2.65	0.182	
	3	0.035	6.00	651	0.025	0.009	2.50	2.58	-0.010	0.000	2.50	2.59	0.360	
	4	0.033	11.00	651	0.026	0.006	2.55	2.63	-0.010	0.000	2.55	2.64	0.231	
6	1	0.032	23.00	651	0.033	0.001	2.66	2.73	-0.006	0.000	2.66	2.74	0.030	
	2	0.034	-18.00	651	0.071	-0.005	2.64	2.67	-0.002	0.000	2.64	2.68	-0.070	
	3	0.034	-25.00	651	0.014	0.004	2.67	2.76	-0.010	0.000	2.67	2.78	0.286	
	4	0.034	-4.00	651	0.010	0.003	2.68	2.77	-0.010	0.000	2.68	2.79	0.300	
7	1	0.035	0.00	651	0.013	0.001	2.58	2.67	-0.009	0.000	2.58	2.69	0.077	
	2	0.036	-3.00	651	0.021	0.000	2.62	2.70	-0.005	0.000	2.62	2.71	0.000	
	3	0.037	0.00	651	0.025	-0.003	2.63	2.70	0.000	0.000	2.63	2.71	-0.120	
	4	0.033	7.00	651	0.076	-0.007	2.72	2.74	-0.001	0.000	2.72	2.74	-0.092	
8	1	0.036	3.00	651	0.051	-0.001	2.68	2.73	-0.004	0.000	2.68	2.74	-0.020	
	2	0.037	1.00	651	0.068	0.002	2.59	2.62	-0.006	0.000	2.59	2.63	0.029	
	3	0.034	5.00	651	0.100	0.019	2.73	2.74	-0.011	-0.001	2.73	2.74	0.190	
	4	0.032	8.00	651	0.091	0.020	2.80	2.82	-0.010	-0.001	2.80	2.82	0.220	
9	1	0.037	0.00	651	0.081	0.018	2.80	2.81	-0.010	-0.001	2.80	2.81	0.222	
	2	0.036	1.00	651	0.062	0.016	2.65	2.69	-0.010	-0.001	2.65	2.70	0.258	
	3	0.038	6.00	651	0.059	0.014	2.66	2.70	-0.010	-0.001	2.66	2.71	0.237	
	4	0.035	3.00	651	0.127	0.006	2.70	2.67	-0.007	-0.001	2.70	2.66	0.047	
	37	0.036	0.00	652	0.153	0.017	2.83	2.77	-0.010	-0.001	2.83	2.76	0.111	
	38	0.034	6.00	653	0.167	0.030	2.76	2.69	-0.011	-0.002	2.76	2.68	0.180	
	39	0.036	2.00	654	0.157	0.038	2.86	2.80	-0.010	-0.002	2.86	2.79	0.242	
	40	0.037	2.00	655	0.127	0.034	2.81	2.78	-0.010	-0.001	2.81	2.77	0.268	
	41	0.035	1.00	656	0.106	0.030	2.68	2.68	-0.010	-0.001	2.68	2.68	0.283	
	42	0.033	1.00	657	0.053	0.026	2.65	2.69	-0.010	-0.001	2.65	2.70	0.491	

Avg. Duct Static = 2.65

Yaw Avg. = 2.57
Std. Dev. = 8.97

Average Temp.
652

Pitch Avg. = 2.
Std. Dev. = 1

IP7_039779

Traverse Point Velocity	Probes Point Velocity
8.49	19.17
15.79	18.87
19.73	19.16
24.70	18.57
26.03	19.45
26.63	20.02
25.81	18.57
5.53	20.02
5.70	18.87
6.58	19.46
10.32	18.58
14.20	20.57
20.31	19.74
26.66	20.02
9.80	19.73
10.38	18.87
10.57	20.01
14.95	19.45
15.65	19.74
15.93	19.16
17.38	18.87
26.34	19.45
10.72	19.45
9.96	19.45
11.80	19.73
15.07	20.01
16.37	20.29
28.39	19.16
23.48	20.01
27.11	20.29
31.93	19.45
30.11	18.86
28.68	20.28
24.97	20.01
24.29	20.56
36.95	19.73
40.26	20.02
41.31	19.47
39.84	20.04
35.74	20.32
32.63	19.78
22.37	19.21

Traverse	Probes
Avg. Velocity in ft/s	
21.18	19.58

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	77.000	120.000	77.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	695				
AVERAGE PRESSURE IN. W.C. (Pg)	1.92				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.14	25.14	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	64.167	64.167	
STACK VELOCITY FT/ SEC. (Vs) =	32.04	30.94	
ACTUAL STACK VOLUME (Q acfm) =	123,368	119,116	-3.45
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	47,390	45,756	-3.45
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	47,390	45,756	-3.45
FLOW IN LBS/HR (wet) =	213630	206264	-3.45
FLOW IN LBS/HR (dry) =	213630	206264	-3.45

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.028861
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.09	-2.00	695	0.007	0	2.59	2.68	-0.005	0.000	2.59	2.70	0.000	
	2	0.083	-9.00	695	0.012	-0.009	2.71	2.8	0.001	0.000	2.71	2.82	-0.750	
	3	0.079	-9.00	695	0.046	0	2.92	2.98	-0.005	0.000	2.92	2.99	0.000	
	4	0.09	-4.00	695	0.097	0	2.89	2.89	-0.005	0.000	2.89	2.89	0.000	
2	1	0.086	3.00	695	0.131	-0.101	3.13	3.1	0.000	0.000	3.13	3.09	-0.771	
	2	0.088	5.00	695	0.139	-0.085	3.12	3.07	-0.002	0.000	3.12	3.06	-0.612	
	3	0.086	17.00	695	0.143	-0.039	3.03	2.98	0.001	0.000	3.03	2.97	-0.273	
	4	0.084	10.00	695	0.03	-0.004	2.7	2.77	0.000	0.000	2.70	2.78	-0.133	
3	1	0.083	-5.00	695	0.022	-0.009	2.78	2.85	-0.003	0.000	2.78	2.86	-0.409	
	2	0.082	-7.00	695	0.03	-0.019	2.83	2.9	-0.001	0.000	2.83	2.91	-0.633	
	3	0.078	-2.00	695	0.052	-0.017	2.85	2.89	0.000	0.000	2.85	2.90	-0.327	
	4	0.081	-3.00	695	0.08	-0.023	2.58	2.6	0.000	0.000	2.58	2.60	-0.288	
4	1	0.084	9.00	695	0.117	-0.028	2.45	2.43	0.001	0.000	2.45	2.43	-0.239	
	2	0.084	8.00	695	0.162	-0.036	2.17	2.1	0.001	0.000	2.17	2.09	-0.222	
	3	0.084	22.00	695	0.057	0	1.95	1.98	-0.005	0.000	1.95	1.99	0.000	
	4	0.083	-20.00	695	0.028	-0.001	1.89	1.96	-0.003	0.000	1.89	1.97	-0.036	
5	1	0.087	-13.00	695	0.027	-0.002	1.56	1.64	-0.002	0.000	1.56	1.65	-0.074	
	2	0.085	-13.00	695	0.064	-0.007	1.61	1.65	-0.001	0.000	1.61	1.66	-0.109	
	3	0.084	-12.00	695	0.079	-0.005	1.54	1.57	-0.002	0.000	1.54	1.58	-0.063	
	4	0.082	-7.00	695	0.096	0.001	1.51	1.51	-0.005	0.000	1.51	1.51	0.010	
6	1	0.082	7.00	695	0.163	-0.007	1.56	1.5	-0.003	0.000	1.56	1.49	-0.043	
	2	0.082	8.00	695	0.065	-0.006	1.26	1.3	-0.001	0.000	1.26	1.31	-0.092	
	3	0.088	-25.00	695	0.043	-0.002	1.11	1.17	-0.003	0.000	1.11	1.18	-0.047	
	4	0.08	-4.00	695	0.039	0	1.53	1.59	-0.005	0.000	1.53	1.60	0.000	
7	1	0.078	-5.00	695	0.063	0	1.61	1.65	-0.005	0.000	1.61	1.66	0.000	
	2	0.075	-3.00	695	0.082	-0.002	1.54	1.56	-0.004	0.000	1.54	1.56	-0.024	
	3	0.083	0.00	695	0.109	0.004	1.51	1.5	-0.007	-0.001	1.51	1.50	0.037	
	4	0.084	-1.00	695	0.16	-0.002	1.35	1.29	-0.004	-0.001	1.35	1.28	-0.013	
8	1	0.082	6.00	695	0.159	-0.006	1.33	1.27	-0.003	0.000	1.33	1.26	-0.038	
	2	0.082	2.00	695	0.132	0.001	1.3	1.27	-0.005	-0.001	1.30	1.26	0.008	
	3	0.08	-5.00	695	0.117	0.008	1.33	1.31	-0.008	-0.001	1.33	1.31	0.068	
	4	0.083	0.00	695	0.131	0.012	1.23	1.2	-0.009	-0.001	1.23	1.19	0.092	
9	1	0.081	-1.00	695	0.126	0.024	1.27	1.24	-0.011	-0.001	1.27	1.23	0.190	
	2	0.086	5.00	695	0.12	0.021	1.26	1.24	-0.011	-0.001	1.26	1.24	0.175	
	3	0.079	-6.00	695	0.095	0.022	1.29	1.3	-0.010	-0.001	1.29	1.30	0.232	
	4	0.083	3.00	695	0.268	0.001	1.63	1.45	-0.005	-0.001	1.63	1.42	0.004	
	37	0.078	0.00	695	0.248	0.012	1.9	1.75	-0.007	-0.002	1.90	1.72	0.048	
	38	0.078	6.00	695	0.238	0.035	1.64	1.5	-0.010	-0.002	1.64	1.48	0.147	
	39	0.078	2.00	695	0.221	0.044	1.62	1.5	-0.011	-0.002	1.62	1.48	0.199	
	40	0.086	2.00	695	0.231	0.059	1.82	1.69	-0.010	-0.002	1.82	1.67	0.255	
	41	0.078	1.00	695	0.17	0.063	1.72	1.65	-0.010	-0.002	1.72	1.64	0.371	
	42	0.081	1.00	695	0.091	0	1.56	1.56	-0.005	0.000	1.56	1.56	0.000	

Avg. Duct Static = 1.92

Yaw Avg. = -0.93
Std. Dev. = 8.82

Average Temp.
695

Pitch Avg. = -2
Std. Dev. = 1

IP7_039783

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

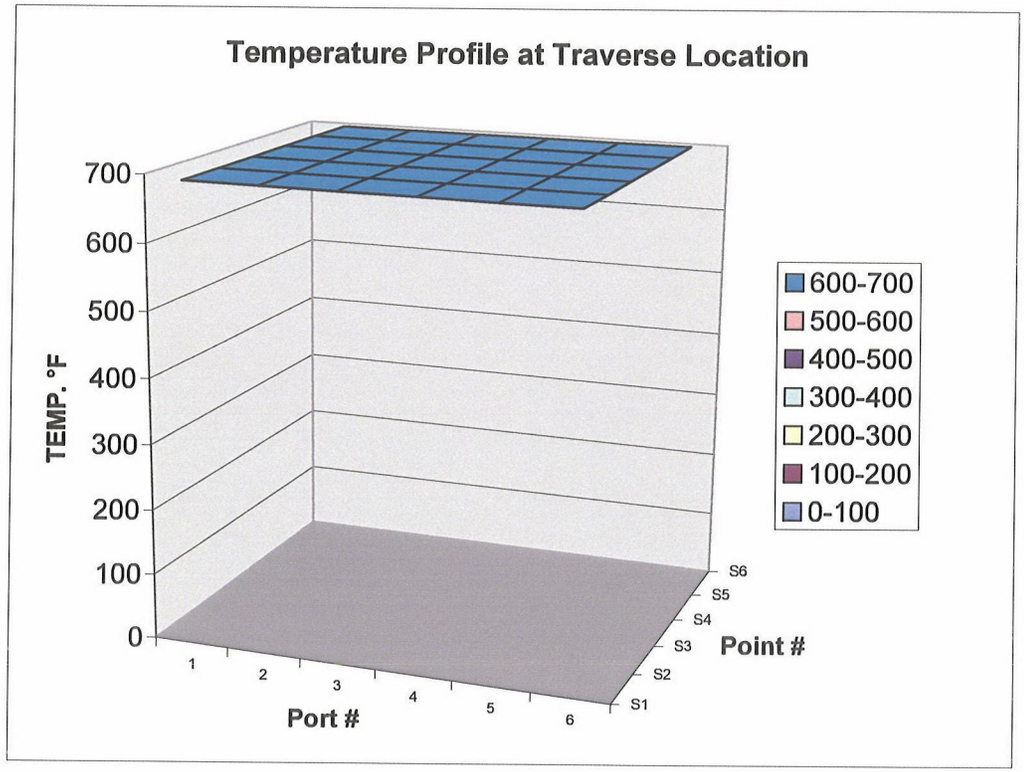
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

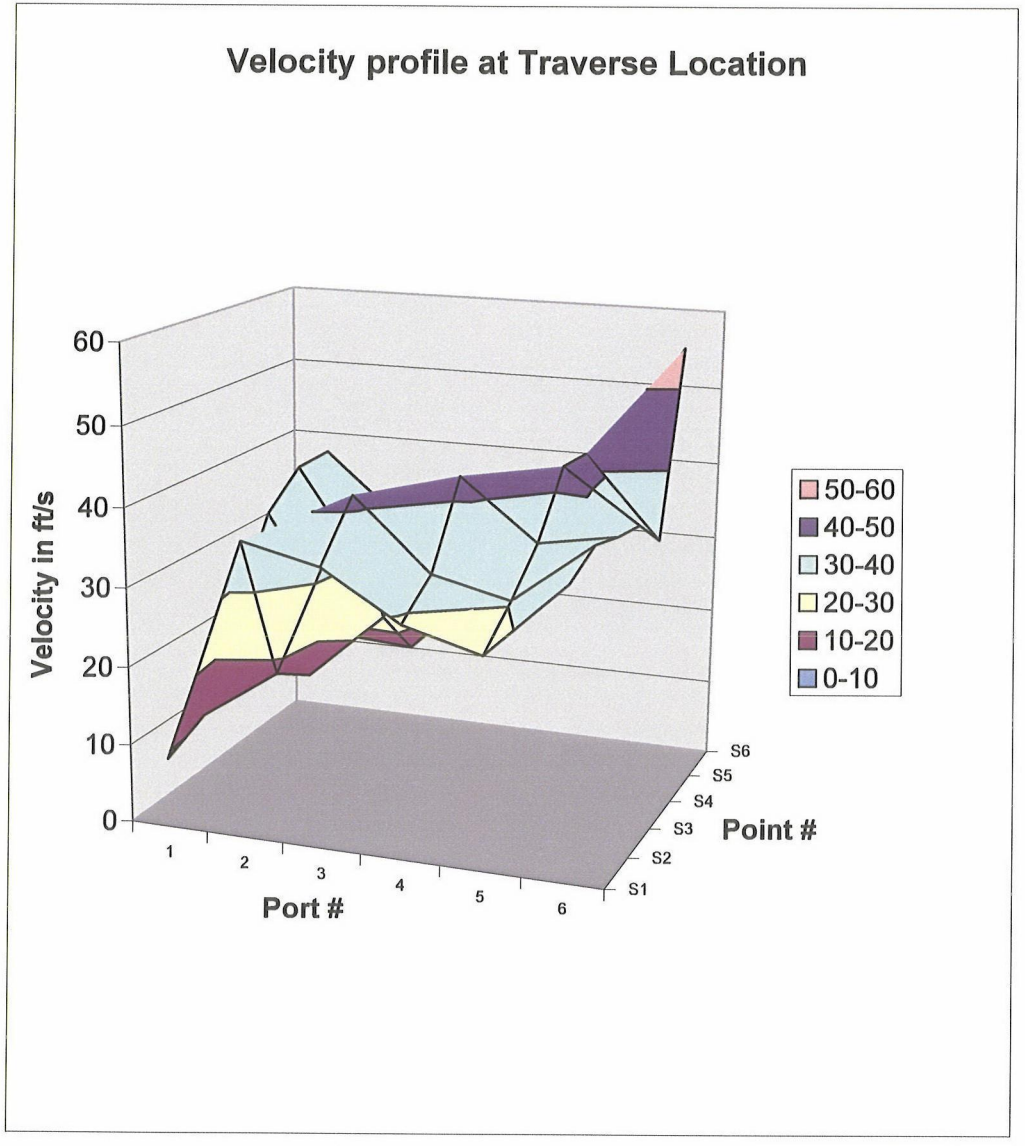
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	695	695	695	695	695	695
Point # 2	695	695	695	695	695	695
Point # 3	695	695	695	695	695	695
Point # 4	695	695	695	695	695	695
Point # 5	695	695	695	695	695	695
Point # 6	695	695	695	695	695	695



Traverse Point Velocity	Probes Point Velocity
8.88	32.26
11.28	30.98
22.48	30.21
32.97	32.25
37.13	31.52
37.34	31.88
37.31	31.52
17.98	31.16
14.76	30.97
17.45	30.79
23.23	30.03
29.07	30.61
35.10	31.18
41.55	31.20
23.52	31.20
16.71	31.02
16.99	31.77
26.08	31.40
29.20	31.22
32.69	30.85
42.60	30.85
26.77	30.86
19.99	31.97
20.95	30.47
26.58	30.08
30.41	29.50
35.04	31.04
42.55	31.23
42.18	30.86
38.61	30.86
36.06	30.48
38.18	31.05
36.75	30.67
35.84	31.60
31.52	30.29
54.97	31.04
52.78	30.08
50.65	30.09
48.56	30.09
49.20	31.58
41.85	30.08
32.07	30.66

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	9	37	35	29	27	36
Point # 2	11	18	42	33	30	38
Point # 3	22	15	24	43	35	37
Point # 4	33	17	17	27	43	36
Point # 5	37	23	17	20	42	32
Point # 6	37	29	26	21	39	55



Traverse	Probes
Avg. Velocity in ft/s	
32.04	30.94

IP7_039786

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	77.000	120.000	77.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	698				
AVERAGE PRESSURE IN. W.C. (Pg)	1.14				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.08	25.08	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	64.167	64.167	
STACK VELOCITY FT/ SEC. (Vs) =	43.22	44.01	
ACTUAL STACK VOLUME (Q acfm) =	166,393	169,421	1.82
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	63,605	64,762	1.82
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	63,605	64,762	1.82
FLOW IN LBS/HR (wet) =	286726	291941	1.82
FLOW IN LBS/HR (dry) =	286726	291941	1.82

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.028720
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.174	5.00	698	0.049	0.023	1.08	1.14	-0.009	0.000	1.08	1.15	0.469	
	2	0.174	8.00	698	0.055	0.009	1.13	1.18	-0.011	-0.001	1.13	1.19	0.164	
	3	0.17	5.00	698	0.046	-0.031	1.06	1.13	0.001	0.000	1.06	1.14	-0.674	
	4	0.171	5.00	698	0.071	-0.053	1.06	1.1	0.001	0.000	1.06	1.11	-0.746	
2	1	0.171	25.00	698	0.124	-0.059	1.18	1.16	-0.005	-0.001	1.18	1.16	-0.476	
	2	0.169	0.00	698	0.161	-0.078	1.18	1.12	-0.005	-0.001	1.18	1.11	-0.484	
	3	0.173	-7.00	698	0.168	-0.027	1.19	1.12	0.000	0.000	1.19	1.11	-0.161	
	4	0.163	2.00	698	0.064	0.006	0.95	1	-0.009	-0.001	0.95	1.01	0.094	
3	1	0.166	12.00	698	0.032	-0.007	0.94	1.02	0.001	0.000	0.94	1.03	-0.219	
	2	0.168	5.00	698	0.049	-0.015	1	1.06	0.000	0.000	1.00	1.07	-0.306	
	3	0.165	1.00	698	0.11	-0.025	1.09	1.09	0.001	0.000	1.09	1.09	-0.227	
	4	0.168	1.00	698	0.164	-0.033	1.09	1.04	0.001	0.000	1.09	1.03	-0.201	
4	1	0.161	-3.00	698	0.229	-0.048	1.25	1.12	0.001	0.000	1.25	1.10	-0.210	
	2	0.161	-10.00	698	0.237	-0.031	1.28	1.15	0.000	0.000	1.28	1.13	-0.131	
	3	0.16	1.00	698	0.107	-0.009	1.19	1.2	-0.001	0.000	1.19	1.20	-0.084	
	4	0.165	1.00	698	0.071	-0.011	1.18	1.21	0.000	0.000	1.18	1.22	-0.155	
5	1	0.172	6.00	698	0.07	-0.013	1.26	1.29	0.001	0.000	1.26	1.30	-0.186	
	2	0.17	7.00	698	0.161	-0.019	1.28	1.23	0.000	0.000	1.28	1.22	-0.118	
	3	0.164	2.00	698	0.219	-0.017	1.19	1.07	-0.001	0.000	1.19	1.05	-0.078	
	4	0.174	-2.00	698	0.243	-0.016	1.46	1.32	-0.002	0.000	1.46	1.30	-0.066	
6	1	0.173	-12.00	698	0.3	-0.01	1.45	1.26	-0.003	-0.001	1.45	1.23	-0.033	
	2	0.172	8.00	698	0.181	-0.01	1.2	1.12	-0.002	0.000	1.20	1.11	-0.055	
	3	0.169	9.00	698	0.141	-0.012	1.13	1.09	-0.001	0.000	1.13	1.08	-0.085	
	4	0.165	12.00	698	0.168	0	1.19	1.12	-0.005	-0.001	1.19	1.11	0.000	
7	1	0.162	10.00	698	0.167	-0.002	1.11	1.05	-0.004	-0.001	1.11	1.04	-0.012	
	2	0.167	13.00	698	0.214	-0.006	1.04	0.93	-0.003	-0.001	1.04	0.91	-0.028	
	3	0.162	1.00	698	0.251	0.009	1.24	1.09	-0.007	-0.002	1.24	1.06	0.036	
	4	0.159	-3.00	698	0.275	0.017	1.28	1.1	-0.008	-0.002	1.28	1.07	0.062	
8	1	0.161	10.00	698	0.271	-0.015	1.19	1.02	-0.002	-0.001	1.19	0.99	-0.055	
	2	0.16	11.00	698	0.248	-0.006	1.24	1.09	-0.004	-0.001	1.24	1.06	-0.024	
	3	0.164	13.00	698	0.276	0.004	1.38	1.21	-0.006	-0.001	1.38	1.18	0.014	
	4	0.155	10.00	698	0.274	0.022	1.46	1.28	-0.009	-0.002	1.46	1.25	0.080	
9	1	0.169	5.00	698	0.279	0.038	1.32	1.14	-0.010	-0.003	1.32	1.11	0.136	
	2	0.157	0.00	698	0.239	0.044	1.34	1.2	-0.011	-0.003	1.34	1.18	0.184	
	3	0.171	12.00	698	0.149	0.046	1.18	1.14	-0.010	-0.002	1.18	1.13	0.309	
	4	0.163	13.00	698	0.395	0.004	1.6	1.31	-0.005	-0.002	1.60	1.26	0.010	
	37	0.171	9.00	698	0.348	0.012	1.36	1.11	-0.007	-0.002	1.36	1.07	0.034	
	38	0.165	12.00	698	0.355	0.041	1.45	1.19	-0.010	-0.003	1.45	1.14	0.115	
	39	0.167	14.00	698	0.35	0.073	1.63	1.38	-0.011	-0.004	1.63	1.34	0.209	
	40	0.162	15.00	698	0.317	0.075	1.65	1.43	-0.010	-0.003	1.65	1.39	0.237	
	41	0.163	14.00	698	0.265	0.092	1.45	1.28	-0.010	-0.003	1.45	1.25	0.347	
	42	0.168	18.00	698	0.07	0.02	1.17	1.21	-0.010	-0.001	1.17	1.22	0.286	

-12.00

Avg. Duct Static = 1.14

Yaw Avg. = 6.14
Std. Dev. = 7.51

Average Temp.
698

Pitch Avg. = -1
Std. Dev. = 1

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IP7_039788

IP7_039789

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

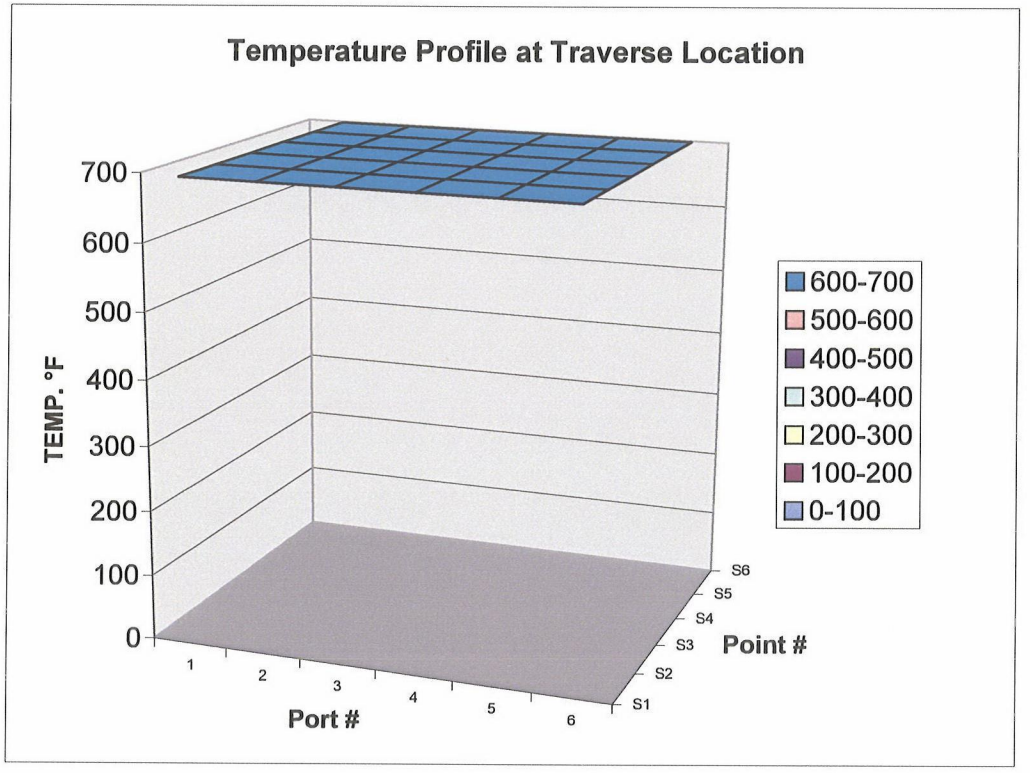
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

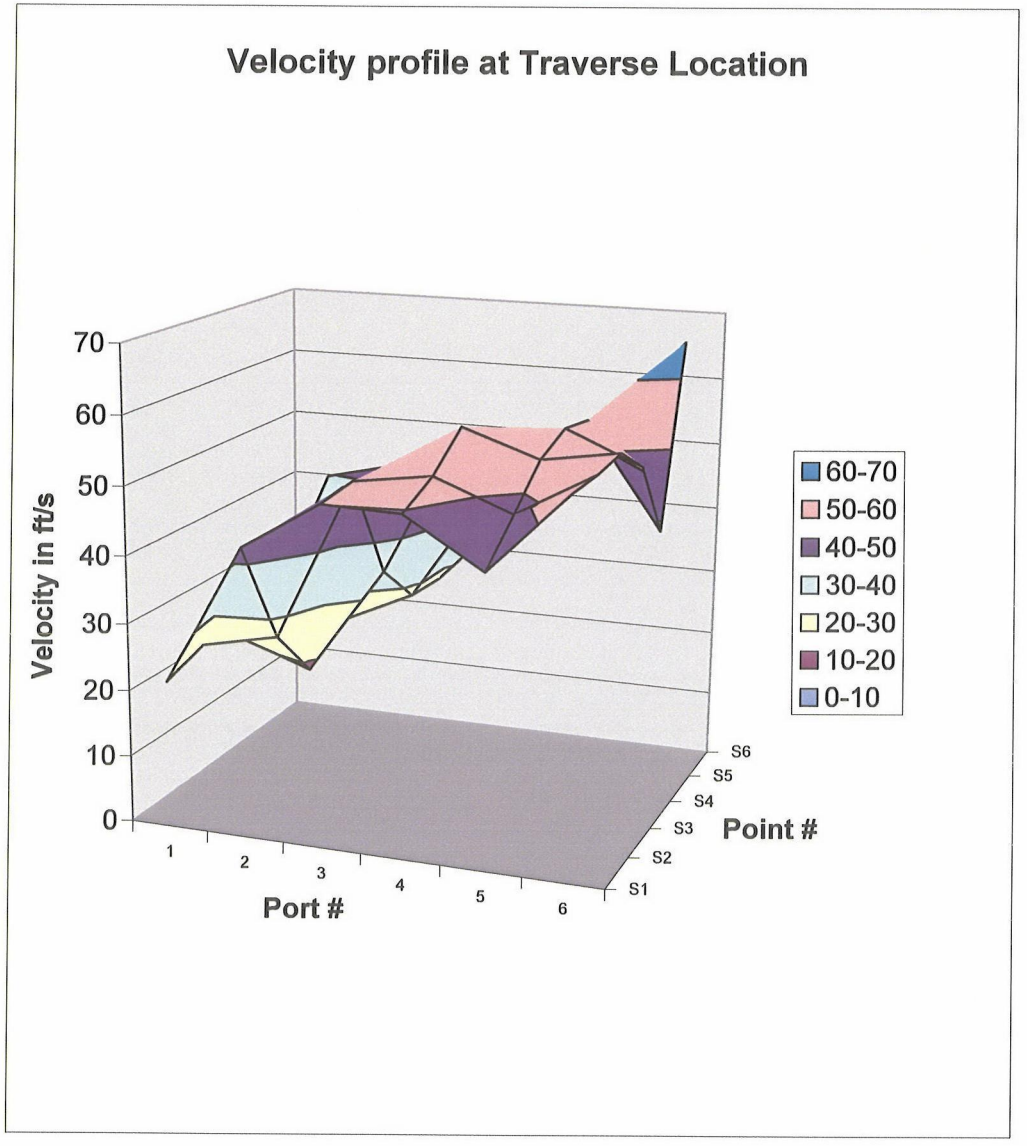
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	698	698	698	698	698	698
Point # 2	698	698	698	698	698	698
Point # 3	698	698	698	698	698	698
Point # 4	698	698	698	698	698	698
Point # 5	698	698	698	698	698	698
Point # 6	698	698	698	698	698	698



Traverse Point Velocity	Probes Point Velocity
22.04	45.02
24.21	45.02
22.18	44.50
27.81	44.63
31.61	44.63
39.71	44.37
42.90	44.89
26.70	43.58
18.30	43.98
22.68	44.24
34.64	43.84
42.47	44.24
50.06	43.31
50.73	43.31
34.75	43.17
28.11	43.83
27.65	44.75
42.19	44.49
49.73	43.71
52.40	45.01
57.07	44.88
44.85	44.76
39.41	44.37
42.71	43.84
42.89	43.45
48.04	44.12
53.27	43.44
55.55	43.04
54.58	43.31
52.09	43.18
54.50	43.70
54.54	42.48
55.15	44.37
50.76	42.76
38.56	44.63
65.20	43.57
61.97	44.63
61.32	43.84
59.32	44.09
55.94	43.42
50.88	43.57
25.74	44.23

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	22	43	50	50	43	55
Point # 2	24	27	51	52	48	55
Point # 3	22	18	35	57	53	55
Point # 4	28	23	28	45	56	51
Point # 5	32	35	28	39	55	39
Point # 6	40	42	42	43	52	65



Traverse	Probes
Avg. Velocity in ft/s	
43.22	44.01

IP7_039792

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	77.000	120.000	77.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	687				
AVERAGE PRESSURE IN. W.C. (Pg)	2.17				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.16	25.16	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	64.167	64.167	
STACK VELOCITY FT/ SEC. (Vs) =	29.06	28.56	
ACTUAL STACK VOLUME (Q acfm) =	111,897	109,943	-1.75
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	43,314	42,558	-1.75
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	43,314	42,558	-1.75
FLOW IN LBS/HR (wet) =	195256	191848	-1.75
FLOW IN LBS/HR (dry) =	195256	191848	-1.75

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029083
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.076	0.00	687	0.004	0	1.89	1.99	-0.005	0.000	1.89	2.01	0.000	
	2	0.074	-5.00	687	0.007	-0.005	2.03	2.13	0.001	0.000	2.03	2.15	-0.714	
	3	0.074	5.00	687	0.031	-0.024	2.03	2.1	0.000	0.000	2.03	2.11	-0.774	
	4	0.071	3.00	687	0.05	-0.034	1.95	2	0.001	0.000	1.95	2.01	-0.680	
2	1	0.073	0.00	687	0.069	-0.044	1.95	1.98	-0.001	0.000	1.95	1.99	-0.638	
	2	0.067	0.00	687	0.084	-0.039	2.06	2.08	-0.005	0.000	2.06	2.08	-0.464	
	3	0.065	-11.00	687	0.081	-0.015	2.11	2.13	0.001	0.000	2.11	2.13	-0.185	
	4	0.071	0.00	687	0.007	-0.004	1.95	2.05	-0.004	0.000	1.95	2.07	-0.571	
3	1	0.065	2.00	687	0.017	-0.007	2.06	2.15	-0.003	0.000	2.06	2.17	-0.412	
	2	0.069	5.00	687	0.024	-0.015	2.06	2.15	-0.001	0.000	2.06	2.17	-0.625	
	3	0.071	3.00	687	0.056	-0.016	2.05	2.1	0.000	0.000	2.05	2.11	-0.286	
	4	0.075	2.00	687	0.095	-0.028	2.1	2.11	0.000	0.000	2.10	2.11	-0.295	
4	1	0.068	0.00	687	0.093	-0.028	2.03	2.04	0.000	0.000	2.03	2.04	-0.301	
	2	0.068	-15.00	687	0.112	-0.018	2.05	2.04	0.000	0.000	2.05	2.04	-0.161	
	3	0.071	6.00	687	0.032	-0.006	2.11	2.18	0.001	0.000	2.11	2.19	-0.188	
	4	0.076	8.00	687	0.027	-0.004	2.05	2.13	0.000	0.000	2.05	2.14	-0.148	
5	1	0.07	11.00	687	0.035	-0.003	2.14	2.21	-0.001	0.000	2.14	2.22	-0.086	
	2	0.072	10.00	687	0.072	-0.013	2.14	2.17	0.001	0.000	2.14	2.18	-0.181	
	3	0.067	10.00	687	0.092	-0.009	2.2	2.22	-0.001	0.000	2.20	2.22	-0.098	
	4	0.066	0.00	687	0.105	-0.006	2.35	2.35	-0.002	0.000	2.35	2.35	-0.057	
6	1	0.073	-11.00	687	0.14	-0.006	2.3	2.26	-0.003	0.000	2.30	2.25	-0.043	
	2	0.072	9.00	687	0.066	-0.001	2.23	2.27	-0.004	0.000	2.23	2.28	-0.015	
	3	0.068	3.00	687	0.061	-0.006	2.2	2.24	-0.001	0.000	2.20	2.25	-0.098	
	4	0.071	12.00	687	0.06	0.002	2.14	2.18	-0.007	0.000	2.14	2.19	0.033	
7	1	0.074	14.00	687	0.083	0.001	2.2	2.22	-0.005	0.000	2.20	2.22	0.012	
	2	0.064	15.00	687	0.082	0.002	2.07	2.09	-0.006	0.000	2.07	2.09	0.024	
	3	0.072	9.00	687	0.109	0.003	2.28	2.28	-0.006	-0.001	2.28	2.28	0.028	
	4	0.073	-3.00	687	0.125	0.006	2.35	2.33	-0.007	-0.001	2.35	2.33	0.048	
8	1	0.07	5.00	687	0.141	0	2.35	2.32	-0.005	-0.001	2.35	2.31	0.000	
	2	0.07	9.00	687	0.115	0.004	2.15	2.14	-0.007	-0.001	2.15	2.14	0.035	
	3	0.07	11.00	687	0.113	0.011	2.26	2.25	-0.009	-0.001	2.26	2.25	0.097	
	4	0.074	10.00	687	0.136	0.016	2.38	2.35	-0.010	-0.001	2.38	2.34	0.118	
9	1	0.074	5.00	687	0.135	0.024	2.28	2.25	-0.011	-0.001	2.28	2.24	0.178	
	2	0.073	5.00	687	0.114	0.024	2.17	2.16	-0.011	-0.001	2.17	2.16	0.211	
	3	0.07	8.00	687	0.061	0.021	2.04	2.08	-0.010	-0.001	2.04	2.09	0.344	
	4	0.071	5.00	687	0.223	0.008	2.31	2.19	-0.007	-0.001	2.31	2.17	0.036	
	37	0.071	10.00	687	0.201	0.018	2.27	2.17	-0.009	-0.002	2.27	2.15	0.090	
	38	0.07	10.00	687	0.187	0.03	2.28	2.2	-0.011	-0.002	2.28	2.19	0.160	
	39	0.077	15.00	687	0.19	0.043	2.37	2.28	-0.010	-0.002	2.37	2.26	0.226	
	40	0.068	8.00	687	0.165	0.048	2.28	2.21	-0.010	-0.002	2.28	2.20	0.291	
	41	0.072	10.00	687	0.13	0.054	2.22	2.19	-0.010	-0.001	2.22	2.18	0.415	
	42	0.073	12.00	687	0.043	0	2.1	2.17	-0.005	0.000	2.10	2.18	0.000	

Avg. Duct Static = 2.17

Yaw Avg. = 4.88
Std. Dev. = 6.87

Average Temp.
687

Pitch Avg. = -3
Std. Dev. = 1

OFA NW ONE THIRD OPEN 4-2-03.xls

IP7_039795

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

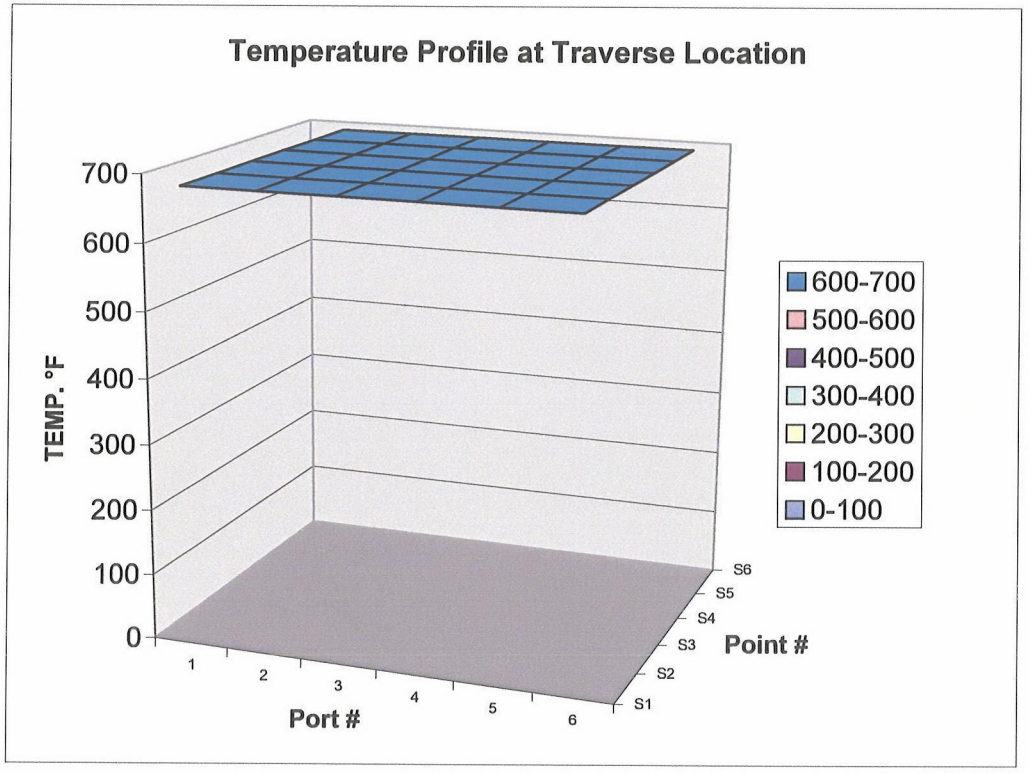
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

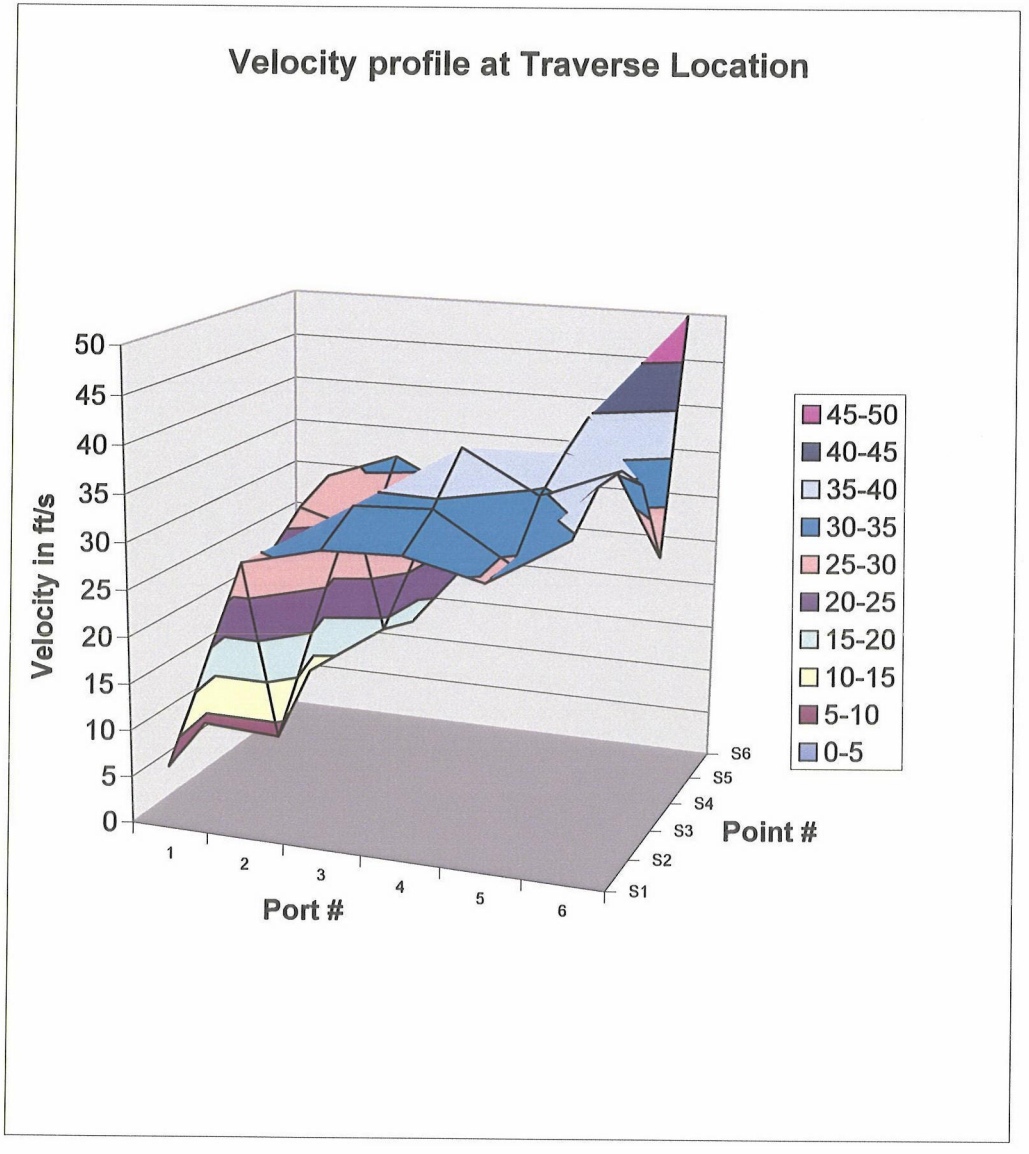
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	687	687	687	687	687	687
Point # 2	687	687	687	687	687	687
Point # 3	687	687	687	687	687	687
Point # 4	687	687	687	687	687	687
Point # 5	687	687	687	687	687	687
Point # 6	687	687	687	687	687	687



Traverse Point Velocity	Probes Point Velocity
6.70	29.57
8.70	29.18
17.92	29.18
23.10	28.58
26.66	28.99
28.58	27.76
29.18	27.35
8.28	28.58
12.98	27.34
15.57	28.17
24.26	28.58
31.56	29.37
31.21	27.97
33.88	27.97
18.58	28.58
17.08	29.57
19.39	28.37
27.62	28.78
31.50	27.76
34.27	27.55
38.87	28.97
26.86	28.77
26.01	27.96
25.32	28.58
29.58	29.17
29.25	27.14
34.47	28.77
37.26	28.97
39.59	28.37
35.40	28.38
34.60	28.37
37.95	29.17
37.81	29.17
34.54	28.98
24.77	28.38
49.71	28.58
46.36	28.58
44.14	28.38
43.12	29.76
40.88	27.97
35.72	28.78
21.47	28.98

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	7	29	31	32	30	35
Point # 2	9	8	34	34	29	38
Point # 3	18	13	19	39	34	38
Point # 4	23	16	17	27	37	35
Point # 5	27	24	19	26	40	25
Point # 6	29	32	28	25	35	50



Traverse	Probes
Avg. Velocity in ft/s	
29.06	28.56

IP7_039798

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	77.000	120.000	77.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	695				
AVERAGE PRESSURE IN. W.C. (Pg)	1.75				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.13	25.13	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	64.167	64.167	
STACK VELOCITY FT/ SEC. (Vs) =	39.50	40.10	
ACTUAL STACK VOLUME (Q acfm) =	152,070	154,387	1.52
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	58,385	59,274	1.52
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	58,385	59,274	1.52
FLOW IN LBS/HR (wet) =	263194	267202	1.52
FLOW IN LBS/HR (dry) =	263194	267202	1.52

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.028846
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.132	17.00	695	0.019	0	1.41	1.49	-0.005	0.000	1.41	1.50	0.000	
	2	0.129	0.00	695	0.025	0.007	1.48	1.55	-0.010	0.000	1.48	1.56	0.280	
	3	0.138	4.00	695	0.043	-0.03	1.53	1.59	0.001	0.000	1.53	1.60	-0.698	
	4	0.134	5.00	695	0.084	-0.044	1.64	1.66	-0.005	-0.001	1.64	1.66	-0.524	
2	1	0.137	5.00	695	0.118	-0.059	1.67	1.66	-0.005	-0.001	1.67	1.66	-0.500	
	2	0.133	0.00	695	0.166	-0.061	1.72	1.65	-0.002	0.000	1.72	1.64	-0.367	
	3	0.137	-7.00	695	0.154	-0.022	1.65	1.59	0.000	0.000	1.65	1.58	-0.143	
	4	0.136	7.00	695	0.031	0.013	1.58	1.65	-0.009	0.000	1.58	1.66	0.419	
3	1	0.141	5.00	695	0.029	-0.009	1.59	1.66	0.000	0.000	1.59	1.67	-0.310	
	2	0.138	7.00	695	0.05	-0.02	1.69	1.74	-0.003	0.000	1.69	1.75	-0.400	
	3	0.136	2.00	695	0.1	-0.018	1.81	1.81	0.001	0.000	1.81	1.81	-0.180	
	4	0.145	-1.00	695	0.13	-0.028	1.69	1.66	0.001	0.000	1.69	1.65	-0.215	
4	1	0.135	4.00	695	0.193	-0.037	1.78	1.68	0.001	0.000	1.78	1.66	-0.192	
	2	0.14	-7.00	695	0.218	-0.027	1.93	1.81	0.000	0.000	1.93	1.79	-0.124	
	3	0.144	2.00	695	0.074	-0.009	1.41	1.43	0.000	0.000	1.41	1.43	-0.122	
	4	0.137	8.00	695	0.056	-0.009	1.42	1.46	0.000	0.000	1.42	1.47	-0.161	
5	1	0.141	6.00	695	0.066	-0.013	1.3	1.34	0.001	0.000	1.30	1.35	-0.197	
	2	0.134	-2.00	695	0.126	-0.026	1.45	1.43	0.001	0.000	1.45	1.43	-0.206	
	3	0.142	2.00	695	0.176	-0.021	1.65	1.57	0.000	0.000	1.65	1.56	-0.119	
	4	0.139	-1.00	695	0.206	-0.014	1.7	1.6	-0.002	0.000	1.70	1.58	-0.068	
6	1	0.144	-11.00	695	0.265	-0.013	1.67	1.5	-0.002	-0.001	1.67	1.47	-0.049	
	2	0.132	7.00	695	0.128	-0.008	2.13	2.11	-0.002	0.000	2.13	2.11	-0.063	
	3	0.139	6.00	695	0.119	-0.008	1.93	1.92	-0.002	0.000	1.93	1.92	-0.067	
	4	0.142	9.00	695	0.12	-0.004	1.94	1.92	-0.003	0.000	1.94	1.92	-0.033	
7	1	0.141	13.00	695	0.153	0.004	1.94	1.89	-0.006	-0.001	1.94	1.88	0.026	
	2	0.137	15.00	695	0.179	0.002	1.95	1.87	-0.005	-0.001	1.95	1.86	0.011	
	3	0.14	19.00	695	0.216	0.009	1.97	1.85	-0.007	-0.001	1.97	1.83	0.042	
	4	0.146	0.00	695	0.257	0.009	1.98	1.82	-0.007	-0.002	1.98	1.79	0.035	
8	1	0.148	8.00	695	0.232	-0.01	1.62	1.5	-0.003	-0.001	1.62	1.48	-0.043	
	2	0.142	9.00	695	0.219	-0.004	1.6	1.48	-0.004	-0.001	1.60	1.46	-0.018	
	3	0.138	11.00	695	0.227	0.004	1.63	1.5	-0.006	-0.001	1.63	1.48	0.018	
	4	0.14	8.00	695	0.249	0.016	1.64	1.49	-0.008	-0.002	1.64	1.46	0.064	
9	1	0.135	4.00	695	0.228	0.025	1.71	1.58	-0.010	-0.002	1.71	1.56	0.110	
	2	0.138	6.00	695	0.199	0.037	1.72	1.62	-0.011	-0.002	1.72	1.60	0.186	
	3	0.145	10.00	695	0.114	0.043	1.75	1.74	-0.010	-0.001	1.75	1.74	0.377	
	4	0.139	9.00	695	0.327	0	2.85	2.62	-0.005	-0.002	2.85	2.58	0.000	
	37	0.131	10.00	695	0.319	0.012	2.7	2.47	-0.007	-0.002	2.70	2.43	0.038	
	38	0.141	12.00	695	0.305	0.034	2.53	2.32	-0.010	-0.003	2.53	2.28	0.111	
	39	0.137	12.00	695	0.281	0.056	2.42	2.24	-0.011	-0.003	2.42	2.21	0.199	
	40	0.138	9.00	695	0.262	0.07	2.33	2.16	-0.010	-0.003	2.33	2.13	0.267	
	41	0.145	13.00	695	0.204	0.083	2.2	2.09	-0.010	-0.002	2.20	2.07	0.407	
	42	0.139	15.00	695	0.057	0	2.06	2.11	-0.005	0.000	2.06	2.12	0.000	

Avg. Duct Static = 1.75

Yaw Avg. = 5.95
Std. Dev. = 6.42

Average Temp.
695

Pitch Avg. = -2
Std. Dev. = 1

IP7_039801

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

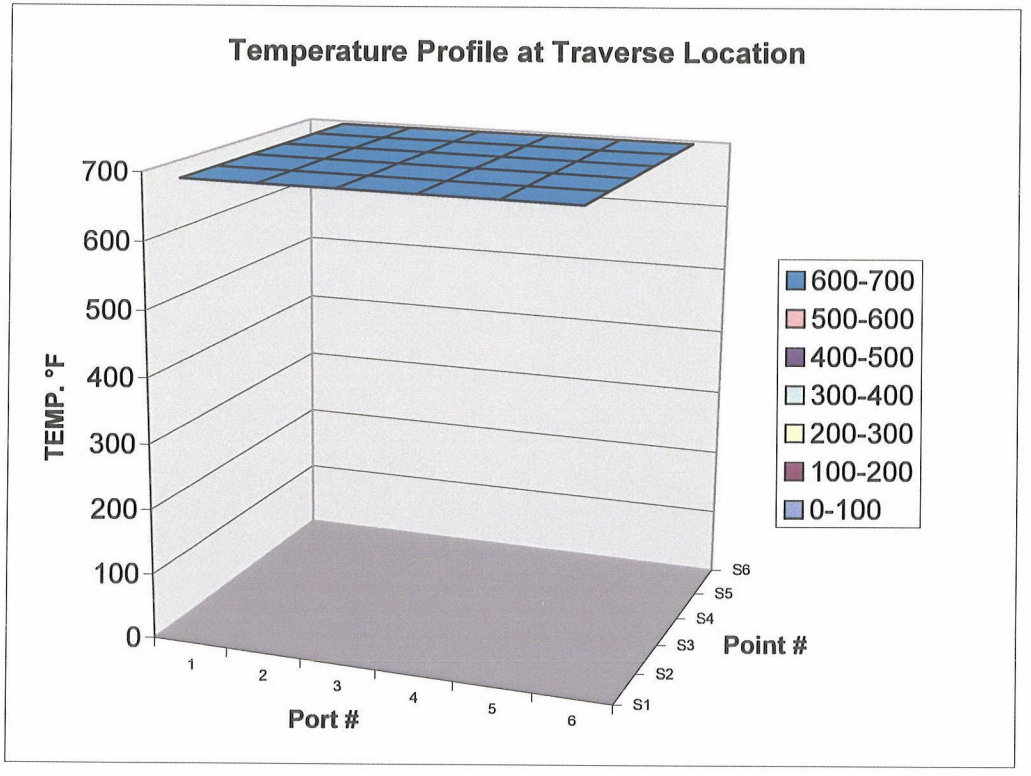
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

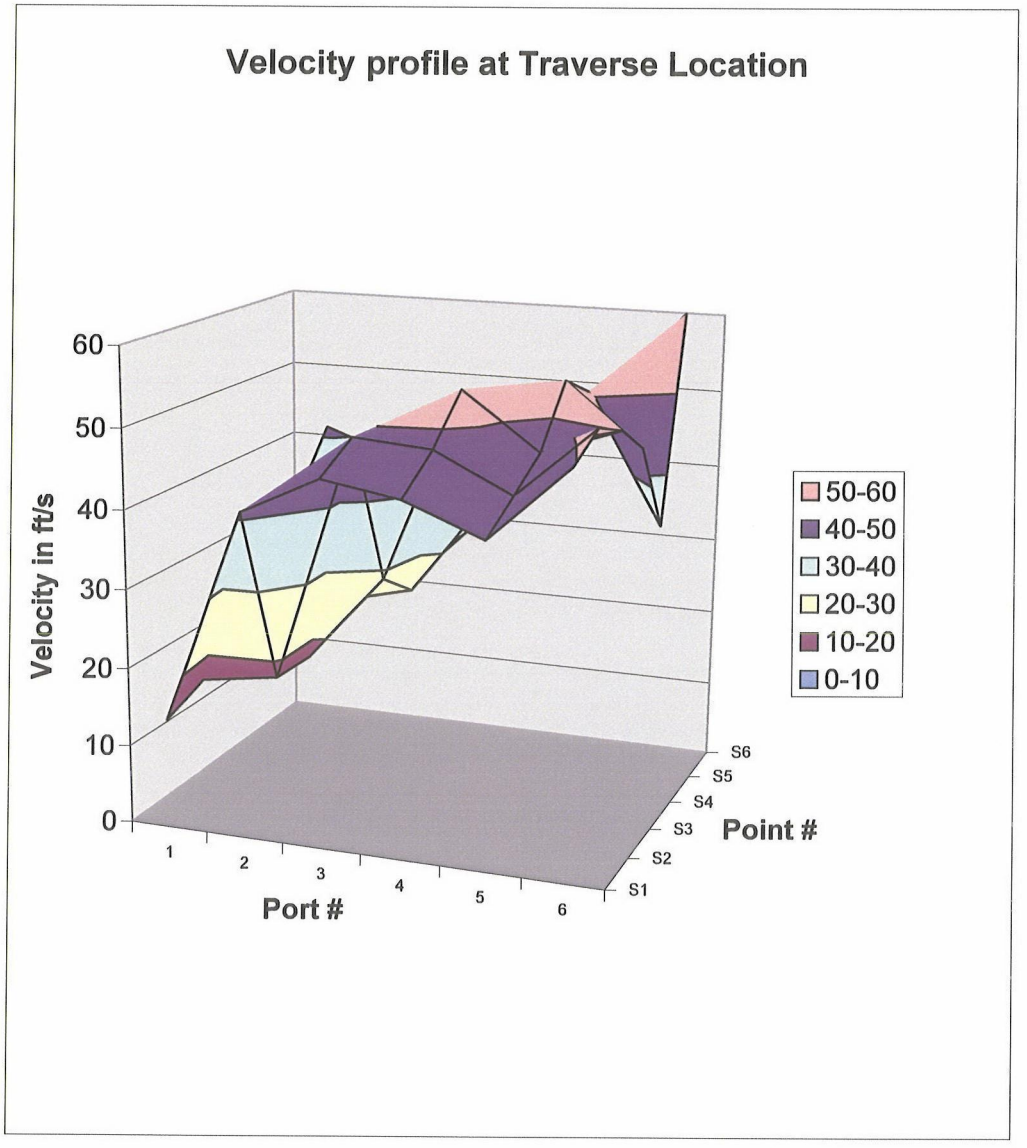
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	695	695	695	695	695	695
Point # 2	695	695	695	695	695	695
Point # 3	695	695	695	695	695	695
Point # 4	695	695	695	695	695	695
Point # 5	695	695	695	695	695	695
Point # 6	695	695	695	695	695	695



Traverse Point Velocity	Probes Point Velocity
14.02	39.14
16.15	38.69
21.61	40.01
28.48	39.43
33.75	39.87
41.20	39.28
41.08	39.87
17.64	39.72
17.39	40.44
22.26	40.01
33.16	39.71
37.65	41.01
45.93	39.57
48.96	40.29
28.74	40.88
24.66	39.88
26.77	40.46
37.11	39.44
44.33	40.59
48.18	40.16
53.71	40.88
37.68	39.11
36.41	40.14
36.36	40.57
40.46	40.43
43.42	39.85
46.60	40.29
53.79	41.15
50.71	41.45
49.16	40.60
49.70	40.02
52.30	40.31
50.07	39.58
45.96	40.01
33.73	41.01
59.96	40.10
58.95	38.94
56.71	40.41
53.53	39.83
51.68	39.98
44.49	40.99
24.50	40.13

VELOCITY

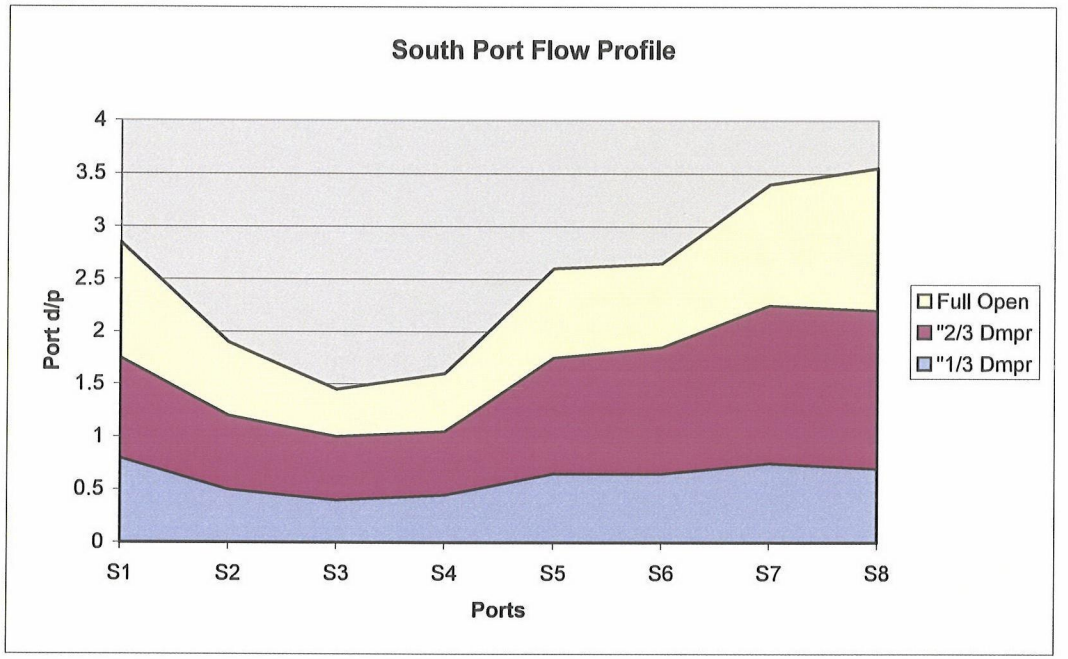
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	14	41	46	44	40	50
Point # 2	16	18	49	48	43	52
Point # 3	22	17	29	54	47	50
Point # 4	28	22	25	38	54	46
Point # 5	34	33	27	36	51	34
Point # 6	41	38	37	36	49	60

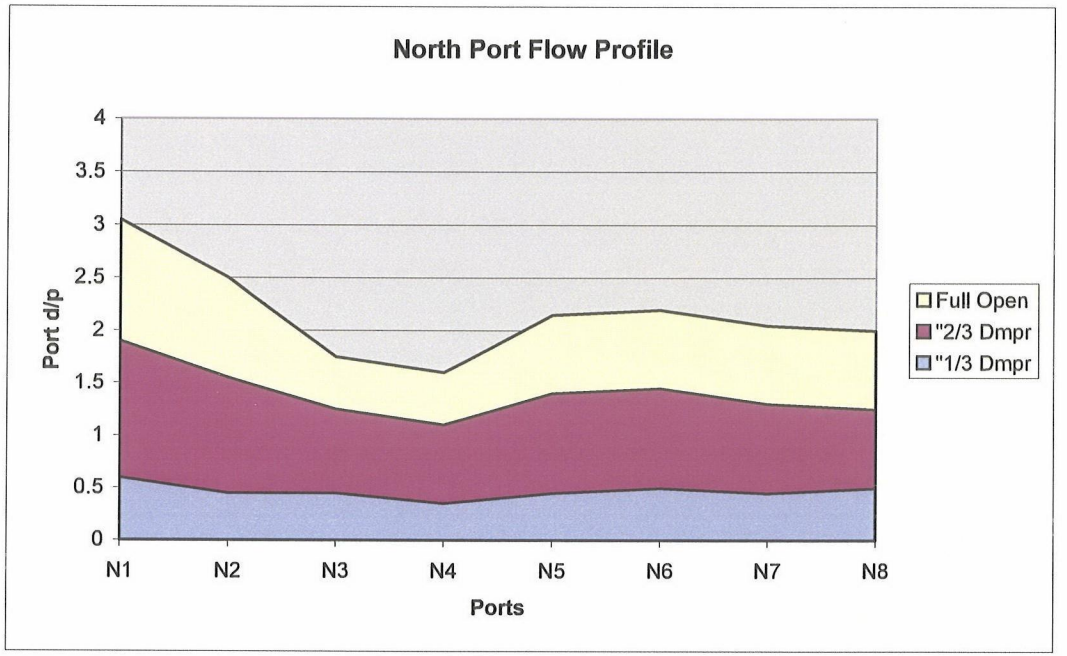


Traverse	Probes
Avg. Velocity in ft/s	
39.50	40.10

IP7_039804

OFA Port	"1/3 Dmpr	"2/3 Dmpr	Full Open
S1	0.8	0.95	1.1
S2	0.5	0.7	0.7
S3	0.4	0.6	0.45
S4	0.45	0.6	0.55
S5	0.65	1.1	0.85
S6	0.65	1.2	0.8
S7	0.75	1.5	1.15
S8	0.7	1.5	1.35
OFA Port	"1/3 Dmpr	"2/3 Dmpr	Full Open
N1	0.6	1.3	1.15
N2	0.45	1.1	0.95
N3	0.45	0.8	0.5
N4	0.35	0.75	0.5
N5	0.45	0.95	0.75
N6	0.5	0.95	0.75
N7	0.45	0.85	0.75
N8	0.5	0.75	0.75





3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	71.000	120.000	71.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	685				
AVERAGE PRESSURE IN. W.C. (Pg)	1.37				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.10	25.10	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	59.167	59.167	
STACK VELOCITY FT/ SEC. (Vs) =	35.55	29.04	
ACTUAL STACK VOLUME (Q acfm) =	126,197	103,089	-18.31
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	48,820	39,881	-18.31
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	48,820	39,881	-18.31
FLOW IN LBS/HR (wet) =	220076	179780	-18.31
FLOW IN LBS/HR (dry) =	220076	179780	-18.31

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029065
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	F
1	1	0.074	-5.00	685	0.062	-0.04	1.36	1.4	0.000	0.000	1.36	1.41	-0.645	
	2	0.072	-2.00	685	0.061	-0.05	1.44	1.48	0.046	0.002	1.44	1.49	-0.820	
	3	0.077	-3.00	685	0.069	-0.05	1.74	1.77	0.001	0.000	1.74	1.78	-0.725	
	4	0.073	4.00	685	0.095	-0.05	1.44	1.44	-0.005	-0.001	1.44	1.44	-0.526	
2	1	0.077	4.00	685	0.118	-0.091	1.39	1.38	0.000	0.000	1.39	1.38	-0.771	
	2	0.075	11.00	685	0.134	-0.064	1.45	1.42	-0.005	-0.001	1.45	1.41	-0.478	
	3	0.074	11.00	685	0.146	-0.025	1.63	1.59	0.000	0.000	1.63	1.58	-0.171	
	4	0.076	-8.00	685	0.052	-0.036	1.2	1.26	0.001	0.000	1.20	1.27	-0.692	
3	1	0.076	-4.00	685	0.061	-0.034	1.23	1.27	-0.005	0.000	1.23	1.28	-0.557	
	2	0.074	-1.00	685	0.067	-0.025	1.39	1.43	-0.002	0.000	1.39	1.44	-0.373	
	3	0.074	1.00	685	0.097	-0.033	1.42	1.43	-0.001	0.000	1.42	1.43	-0.340	
	4	0.077	5.00	685	0.123	-0.037	1.33	1.31	0.000	0.000	1.33	1.31	-0.301	
4	1	0.072	8.00	685	0.155	-0.031	1.49	1.44	0.001	0.000	1.49	1.43	-0.200	
	2	0.073	20.00	685	0.185	-0.016	1.5	1.42	-0.001	0.000	1.50	1.41	-0.086	
	3	0.072	12.00	685	0.057	0	1.46	1.51	-0.005	0.000	1.46	1.52	0.000	
	4	0.071	8.00	685	0.069	0.006	1.54	1.57	-0.009	-0.001	1.54	1.58	0.087	
5	1	0.073	2.00	685	0.059	0.006	1.21	1.26	-0.010	-0.001	1.21	1.27	0.102	
	2	0.072	6.00	685	0.07	-0.001	1.34	1.37	-0.004	0.000	1.34	1.38	-0.014	
	3	0.07	13.00	685	0.109	-0.002	1.4	1.4	-0.004	0.000	1.40	1.40	-0.018	
	4	0.072	20.00	685	0.154	0.003	1.47	1.42	-0.006	-0.001	1.47	1.41	0.019	
6	1	0.07	28.00	685	0.199	0.003	1.58	1.49	-0.006	-0.001	1.58	1.47	0.015	
	2	0.074	1.00	685	0.137	0.024	1.32	1.28	-0.011	-0.001	1.32	1.27	0.175	
	3	0.075	3.00	685	0.114	0.025	1.29	1.28	-0.010	-0.001	1.29	1.28	0.219	
	4	0.077	1.00	685	0.08	0.025	1.23	1.26	-0.010	-0.001	1.23	1.27	0.313	
7	1	0.076	6.00	685	0.078	0.021	1.18	1.2	-0.010	-0.001	1.18	1.20	0.269	
	2	0.074	10.00	685	0.112	0.021	1.37	1.36	-0.011	-0.001	1.37	1.36	0.188	
	3	0.071	14.00	685	0.158	0.024	1.45	1.4	-0.011	-0.002	1.45	1.39	0.152	
	4	0.072	15.00	685	0.184	0.017	1.42	1.35	-0.009	-0.002	1.42	1.34	0.092	
8	1	0.071	3.00	685	0.162	0.039	1.21	1.15	-0.010	-0.002	1.21	1.14	0.241	
	2	0.07	5.00	685	0.171	0.04	1.2	1.14	-0.010	-0.002	1.20	1.13	0.234	
	3	0.073	5.00	685	0.143	0.044	1.25	1.21	-0.010	-0.001	1.25	1.20	0.308	
	4	0.07	7.00	685	0.145	0.047	1.26	1.22	-0.010	-0.001	1.26	1.21	0.324	
9	1	0.07	12.00	685	0.158	0.046	1.39	1.34	-0.010	-0.002	1.39	1.33	0.291	
	2	0.07	10.00	685	0.172	0.04	1.41	1.34	-0.010	-0.002	1.41	1.33	0.233	
	3	0.072	9.00	685	0.186	0.018	1.46	1.38	-0.009	-0.002	1.46	1.37	0.097	
	4	0.076	2.00	685	0.2	0.028	1.63	1.54	-0.010	-0.002	1.63	1.52	0.140	
	37	0.078	2.00	685	0.21	0.047	1.5	1.39	-0.010	-0.002	1.50	1.37	0.224	
	38	0.076	2.00	685	0.203	0.063	1.4	1.3	-0.010	-0.002	1.40	1.28	0.310	
	39	0.072	3.00	685	0.199	0.071	1.41	1.31	-0.010	-0.002	1.41	1.29	0.357	
	40	0.071	7.00	685	0.176	0.061	1.49	1.41	-0.010	-0.002	1.49	1.40	0.347	
	41	0.072	9.00	685	0.151	0.036	1.47	1.42	-0.010	-0.002	1.47	1.41	0.238	
	42	0.074	9.00	685	0.174	0.006	1.41	1.34	-0.007	-0.001	1.41	1.33	0.034	

-12.00

Avg. Duct Static = 1.37

Yaw Avg. = 6.31
Std. Dev. = 7.06

Average Temp.
685

2

Pitch Avg. = 1.
Std. Dev. = 1

OFA SE BOTH DAMPERS OPEN 4-2-03.xls

IP7_039808

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

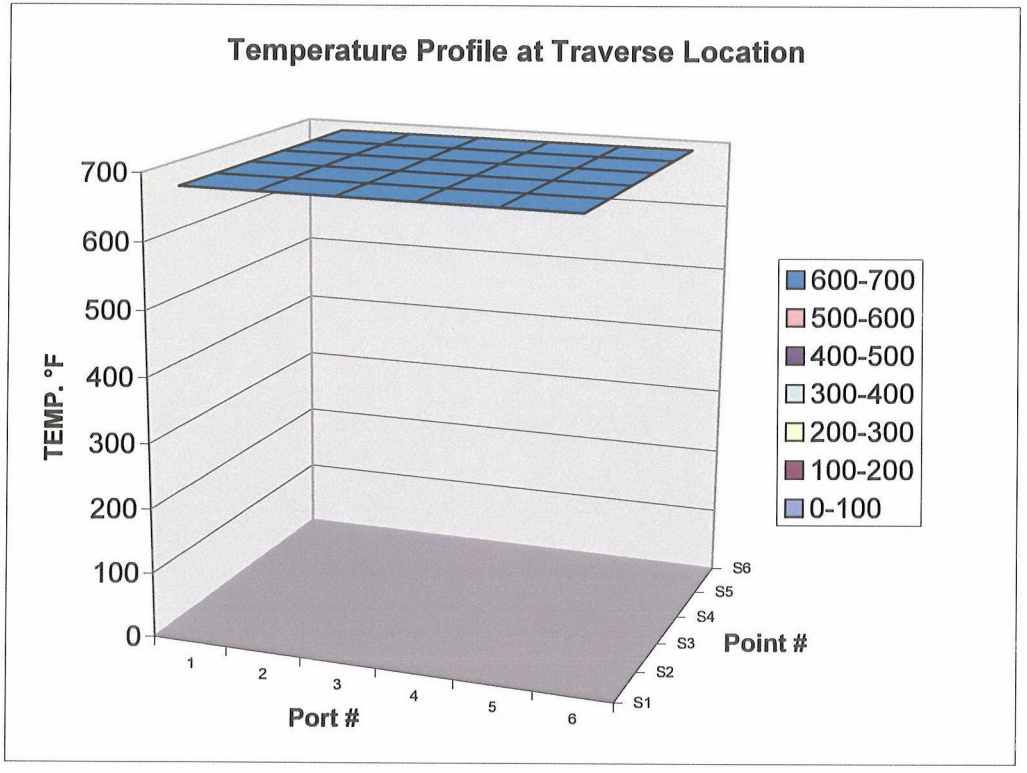
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

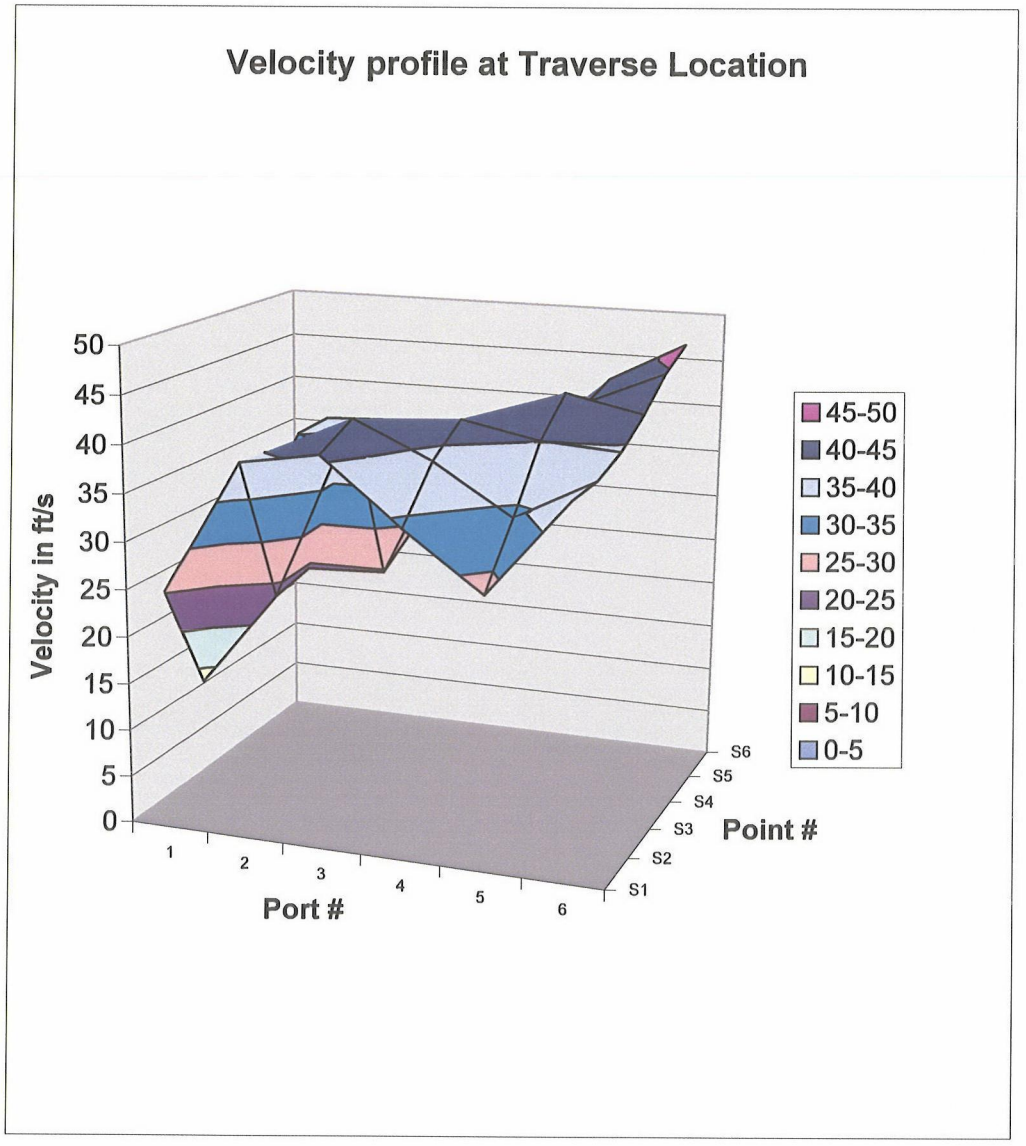
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	685	685	685	685	685	685
Point # 2	685	685	685	685	685	685
Point # 3	685	685	685	685	685	685
Point # 4	685	685	685	685	685	685
Point # 5	685	685	685	685	685	685
Point # 6	685	685	685	685	685	685



Traverse Point Velocity	Probes Point Velocity
25.27	29.18
13.27	28.78
27.38	29.75
30.21	28.98
35.13	29.77
35.37	29.38
39.25	29.17
23.46	29.58
24.32	29.58
26.03	29.18
31.57	29.18
35.76	29.77
40.64	28.78
42.68	28.98
24.72	28.78
27.33	28.58
25.45	28.99
27.87	28.79
34.07	28.38
39.02	28.79
41.68	28.38
38.27	29.19
34.59	29.38
28.71	29.77
28.30	29.58
34.00	29.18
40.06	28.59
43.50	28.79
41.10	28.60
42.17	28.39
38.26	28.99
38.34	28.39
39.53	28.39
41.81	28.39
44.69	28.79
46.52	29.57
46.94	29.96
45.71	29.58
45.09	28.79
42.17	28.59
39.25	28.79
43.56	29.19

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	25	39	41	34	28	38
Point # 2	13	23	43	39	34	38
Point # 3	27	24	25	42	40	40
Point # 4	30	26	27	38	44	42
Point # 5	35	32	25	35	41	45
Point # 6	35	36	28	29	42	47



Traverse	Probes
Avg. Velocity in ft/s	
35.55	29.04

IP7_039811

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	71.000	120.000	71.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	685				
AVERAGE PRESSURE IN. W.C. (Pg)	1.37				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.10	25.10	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	59.167	59.167	
STACK VELOCITY FT/ SEC. (Vs) =	35.52	29.04	
ACTUAL STACK VOLUME (Q acfm) =	126,083	103,089	-18.24
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	48,776	39,881	-18.24
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	48,776	39,881	-18.24
FLOW IN LBS/HR (wet) =	219878	179780	-18.24
FLOW IN LBS/HR (dry) =	219878	179780	-18.24

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029065
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	F
1	1	0.074	-5.00	685	0.062	-0.03	1.36	1.4	-0.005	0.000	1.36	1.41	-0.484	
	2	0.072	-2.00	685	0.061	-0.05	1.44	1.48	0.046	0.002	1.44	1.49	-0.820	
	3	0.077	-3.00	685	0.069	-0.02	1.74	1.77	0.000	0.000	1.74	1.78	-0.290	
	4	0.073	4.00	685	0.095	-0.05	1.44	1.44	-0.005	-0.001	1.44	1.44	-0.526	
2	1	0.077	4.00	685	0.118	-0.091	1.39	1.38	0.000	0.000	1.39	1.38	-0.771	
	2	0.075	11.00	685	0.134	-0.064	1.45	1.42	-0.005	-0.001	1.45	1.41	-0.478	
	3	0.074	11.00	685	0.146	-0.025	1.63	1.59	0.000	0.000	1.63	1.58	-0.171	
	4	0.076	-8.00	685	0.052	-0.036	1.2	1.26	0.001	0.000	1.20	1.27	-0.692	
3	1	0.076	-4.00	685	0.061	-0.034	1.23	1.27	-0.005	0.000	1.23	1.28	-0.557	
	2	0.074	-1.00	685	0.067	-0.025	1.39	1.43	-0.002	0.000	1.39	1.44	-0.373	
	3	0.074	1.00	685	0.097	-0.033	1.42	1.43	-0.001	0.000	1.42	1.43	-0.340	
	4	0.077	5.00	685	0.123	-0.037	1.33	1.31	0.000	0.000	1.33	1.31	-0.301	
4	1	0.072	8.00	685	0.155	-0.031	1.49	1.44	0.001	0.000	1.49	1.43	-0.200	
	2	0.073	20.00	685	0.185	-0.016	1.5	1.42	-0.001	0.000	1.50	1.41	-0.086	
	3	0.072	12.00	685	0.057	0	1.46	1.51	-0.005	0.000	1.46	1.52	0.000	
	4	0.071	8.00	685	0.069	0.006	1.54	1.57	-0.009	-0.001	1.54	1.58	0.087	
5	1	0.073	2.00	685	0.059	0.006	1.21	1.26	-0.010	-0.001	1.21	1.27	0.102	
	2	0.072	6.00	685	0.07	-0.001	1.34	1.37	-0.004	0.000	1.34	1.38	-0.014	
	3	0.07	13.00	685	0.109	-0.002	1.4	1.4	-0.004	0.000	1.40	1.40	-0.018	
	4	0.072	20.00	685	0.154	0.003	1.47	1.42	-0.006	-0.001	1.47	1.41	0.019	
6	1	0.07	28.00	685	0.199	0.003	1.58	1.49	-0.006	-0.001	1.58	1.47	0.015	
	2	0.074	1.00	685	0.137	0.024	1.32	1.28	-0.011	-0.001	1.32	1.27	0.175	
	3	0.075	3.00	685	0.114	0.025	1.29	1.28	-0.010	-0.001	1.29	1.28	0.219	
	4	0.077	1.00	685	0.08	0.025	1.23	1.26	-0.010	-0.001	1.23	1.27	0.313	
7	1	0.076	6.00	685	0.078	0.021	1.18	1.2	-0.010	-0.001	1.18	1.20	0.269	
	2	0.074	10.00	685	0.112	0.021	1.37	1.36	-0.011	-0.001	1.37	1.36	0.188	
	3	0.071	14.00	685	0.158	0.024	1.45	1.4	-0.011	-0.002	1.45	1.39	0.152	
	4	0.072	15.00	685	0.184	0.017	1.42	1.35	-0.009	-0.002	1.42	1.34	0.092	
8	1	0.071	3.00	685	0.162	0.039	1.21	1.15	-0.010	-0.002	1.21	1.14	0.241	
	2	0.07	5.00	685	0.171	0.04	1.2	1.14	-0.010	-0.002	1.20	1.13	0.234	
	3	0.073	5.00	685	0.143	0.044	1.25	1.21	-0.010	-0.001	1.25	1.20	0.308	
	4	0.07	7.00	685	0.145	0.047	1.26	1.22	-0.010	-0.001	1.26	1.21	0.324	
9	1	0.07	12.00	685	0.158	0.046	1.39	1.34	-0.010	-0.002	1.39	1.33	0.291	
	2	0.07	10.00	685	0.172	0.04	1.41	1.34	-0.010	-0.002	1.41	1.33	0.233	
	3	0.072	9.00	685	0.186	0.018	1.46	1.38	-0.009	-0.002	1.46	1.37	0.097	
	4	0.076	2.00	685	0.2	0.028	1.63	1.54	-0.010	-0.002	1.63	1.52	0.140	
	37	0.078	2.00	685	0.21	0.047	1.5	1.39	-0.010	-0.002	1.50	1.37	0.224	
	38	0.076	2.00	685	0.203	0.063	1.4	1.3	-0.010	-0.002	1.40	1.28	0.310	
	39	0.072	3.00	685	0.199	0.071	1.41	1.31	-0.010	-0.002	1.41	1.29	0.357	
	40	0.071	7.00	685	0.176	0.061	1.49	1.41	-0.010	-0.002	1.49	1.40	0.347	
	41	0.072	9.00	685	0.151	0.036	1.47	1.42	-0.010	-0.002	1.47	1.41	0.238	
	42	0.074	9.00	685	0.174	0.006	1.41	1.34	-0.007	-0.001	1.41	1.33	0.034	

-12.00

Avg. Duct Static = 1.37

Yaw Avg. = 6.31
Std. Dev. = 7.06

Average Temp.
685

Pitch Avg. = 0.
Std. Dev. = 1

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y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

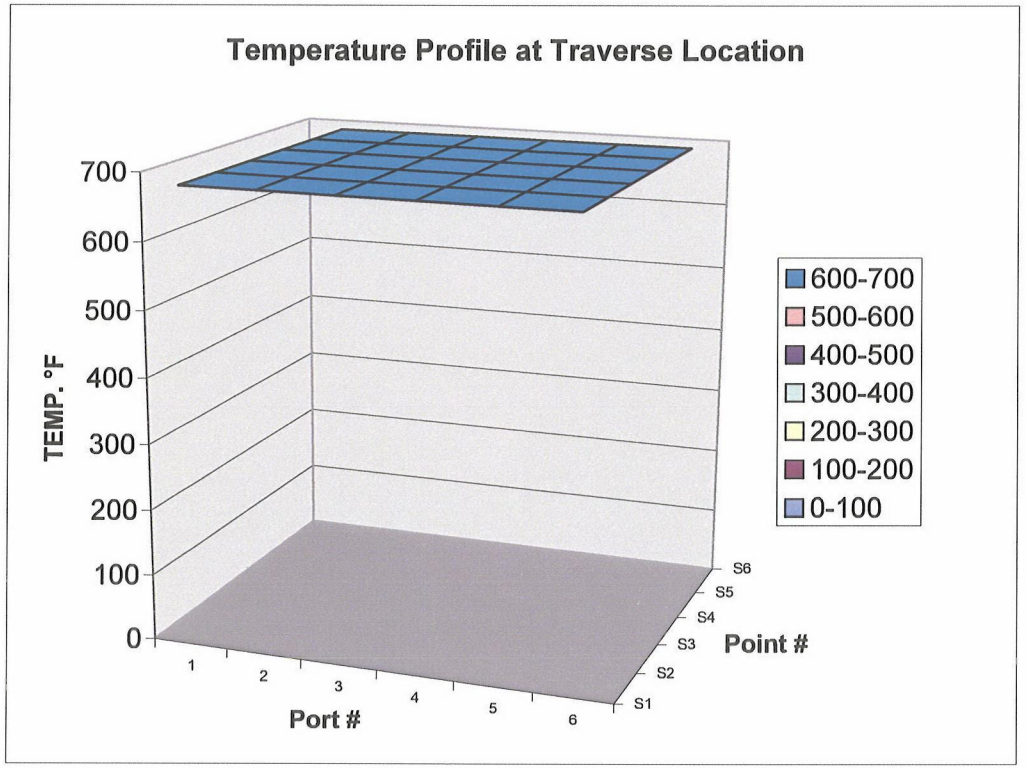
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	685	685	685	685	685	685
Point # 2	685	685	685	685	685	685
Point # 3	685	685	685	685	685	685
Point # 4	685	685	685	685	685	685
Point # 5	685	685	685	685	685	685
Point # 6	685	685	685	685	685	685

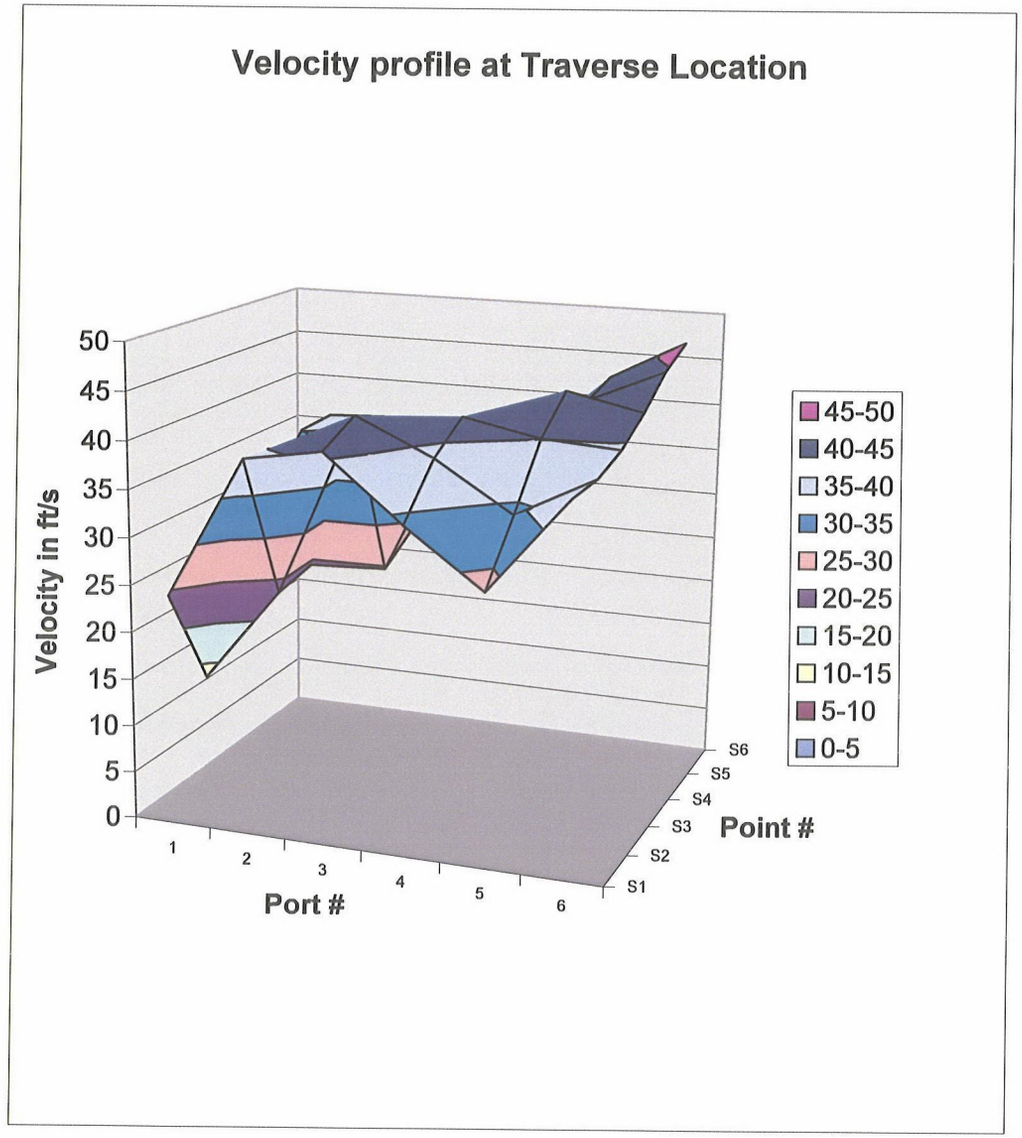


1/6/2011

Traverse Point Velocity	Probes Point Velocity
24.40	29.18
13.27	28.78
26.90	29.75
30.21	28.98
35.13	29.77
35.37	29.38
39.25	29.17
23.46	29.58
24.32	29.58
26.03	29.18
31.57	29.18
35.76	29.77
40.64	28.78
42.68	28.98
24.72	28.78
27.33	28.58
25.45	28.99
27.87	28.79
34.07	28.38
39.02	28.79
41.68	28.38
38.27	29.19
34.59	29.38
28.71	29.77
28.30	29.58
34.00	29.18
40.06	28.59
43.50	28.79
41.10	28.60
42.17	28.39
38.26	28.99
38.34	28.39
39.53	28.39
41.81	28.39
44.69	28.79
46.52	29.57
46.94	29.96
45.71	29.58
45.09	28.79
42.17	28.59
39.25	28.79
43.56	29.19

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	24	39	41	34	28	38
Point # 2	13	23	43	39	34	38
Point # 3	27	24	25	42	40	40
Point # 4	30	26	27	38	44	42
Point # 5	35	32	25	35	41	45
Point # 6	35	36	28	29	42	47



Traverse	Probes
Avg. Velocity in ft/s	
35.52	29.04

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3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	71.000	120.000	71.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	685				
AVERAGE PRESSURE IN. W.C. (Pg)	1.98				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.15	25.15	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	59.167	59.167	
STACK VELOCITY FT/ SEC. (Vs) =	23.08	18.80	
ACTUAL STACK VOLUME (Q acfm) =	81,938	66,724	-18.57
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	31,755	25,859	-18.57
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	31,755	25,859	-18.57
FLOW IN LBS/HR (wet) =	143149	116570	-18.57
FLOW IN LBS/HR (dry) =	143149	116570	-18.57

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029117
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	F
1	1	0.031	1.00	685	0.018	0	1.9	1.98	-0.005	0.000	1.90	1.99	0.000	
	2	0.031	5.00	685	0.025	0	2	2.08	-0.005	0.000	2.00	2.09	0.000	
	3	0.031	7.00	685	0.032	-0.02	2.1	2.17	-0.001	0.000	2.10	2.18	-0.625	
	4	0.033	3.00	685	0.047	0	1.87	1.93	-0.005	0.000	1.87	1.94	0.000	
2	1	0.032	5.00	685	0.053	0	1.94	1.99	-0.005	0.000	1.94	2.00	0.000	
	2	0.03	8.00	685	0.065	-0.041	1.91	1.95	-0.001	0.000	1.91	1.96	-0.631	
	3	0.031	12.00	685	0.074	-0.018	2.06	2.09	0.001	0.000	2.06	2.10	-0.243	
	4	0.031	-5.00	685	0.021	-0.01	1.86	1.94	-0.005	0.000	1.86	1.95	-0.476	
3	1	0.032	6.00	685	0.026	-0.015	1.74	1.82	-0.004	0.000	1.74	1.83	-0.577	
	2	0.031	5.00	685	0.026	-0.014	1.97	2.04	-0.005	0.000	1.97	2.05	-0.538	
	3	0.031	0.00	685	0.041	-0.015	2.05	2.12	-0.002	0.000	2.05	2.13	-0.366	
	4	0.031	5.00	685	0.05	-0.018	1.94	1.99	-0.001	0.000	1.94	2.00	-0.360	
4	1	0.032	12.00	685	0.07	-0.019	1.92	1.95	0.001	0.000	1.92	1.96	-0.271	
	2	0.031	30.00	685	0.086	-0.011	1.83	1.84	0.000	0.000	1.83	1.84	-0.128	
	3	0.03	8.00	685	0.02	-0.001	1.76	1.84	-0.002	0.000	1.76	1.85	-0.050	
	4	0.028	3.00	685	0.019	0	1.82	1.91	-0.005	0.000	1.82	1.93	0.000	
5	1	0.032	4.00	685	0.013	0.001	1.82	1.9	-0.009	0.000	1.82	1.91	0.077	
	2	0.031	6.00	685	0.032	0	1.89	1.96	-0.005	0.000	1.89	1.97	0.000	
	3	0.03	10.00	685	0.04	0	1.94	2	-0.005	0.000	1.94	2.01	0.000	
	4	0.029	13.00	685	0.064	0.001	1.98	2.02	-0.006	0.000	1.98	2.03	0.016	
6	1	0.029	37.00	685	0.082	0.001	2.03	2.05	-0.005	0.000	2.03	2.05	0.012	
	2	0.031	0.00	685	0.036	0.006	1.84	1.9	-0.011	0.000	1.84	1.91	0.167	
	3	0.033	7.00	685	0.036	0.006	1.78	1.85	-0.011	0.000	1.78	1.86	0.167	
	4	0.029	4.00	685	0.034	0.012	1.98	2.05	-0.010	0.000	1.98	2.06	0.353	
7	1	0.033	5.00	685	0.037	0.01	1.78	1.85	-0.010	0.000	1.78	1.86	0.270	
	2	0.029	12.00	685	0.042	0.009	1.75	1.81	-0.010	0.000	1.75	1.82	0.214	
	3	0.029	12.00	685	0.05	0.007	1.75	1.8	-0.010	-0.001	1.75	1.81	0.140	
	4	0.029	25.00	685	0.073	0.006	1.88	1.91	-0.009	-0.001	1.88	1.92	0.082	
8	1	0.03	1.00	685	0.071	0.025	1.81	1.84	-0.010	-0.001	1.81	1.85	0.352	
	2	0.029	7.00	685	0.065	0.021	1.85	1.89	-0.010	-0.001	1.85	1.90	0.323	
	3	0.032	7.00	685	0.068	0.03	1.97	2	-0.009	-0.001	1.97	2.01	0.441	
	4	0.032	11.00	685	0.068	0.028	1.97	2.01	-0.010	-0.001	1.97	2.02	0.412	
9	1	0.033	10.00	685	0.076	0.026	2.07	2.1	-0.010	-0.001	2.07	2.11	0.342	
	2	0.03	15.00	685	0.066	0.02	1.91	1.95	-0.010	-0.001	1.91	1.96	0.303	
	3	0.03	22.00	685	0.083	0.013	1.9	1.93	-0.011	-0.001	1.90	1.94	0.157	
	4	0.03	-2.00	685	0.091	0.023	2.04	2.06	-0.010	-0.001	2.04	2.06	0.253	
	37	0.031	5.00	685	0.114	0.036	1.96	1.95	-0.010	-0.001	1.96	1.95	0.316	
	38	0.031	1.00	685	0.105	0.047	1.87	1.87	-0.009	-0.001	1.87	1.87	0.448	
	39	0.029	6.00	685	0.1	0.048	1.98	1.98	-0.009	-0.001	1.98	1.98	0.480	
	40	0.032	6.00	685	0.089	0.042	2.08	2.1	-0.009	-0.001	2.08	2.10	0.472	
	41	0.032	8.00	685	0.079	0.03	2.11	2.13	-0.010	-0.001	2.11	2.13	0.380	
	42	0.031	7.00	685	0.085	0.006	2.09	2.1	-0.008	-0.001	2.09	2.10	0.071	

-12.00

Avg. Duct Static = 1.98

Yaw Avg. = 8.19
Std. Dev. = 8.06

Average Temp.
685

Pitch Avg. = 3.
Std. Dev. = 1

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IP7_039820

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

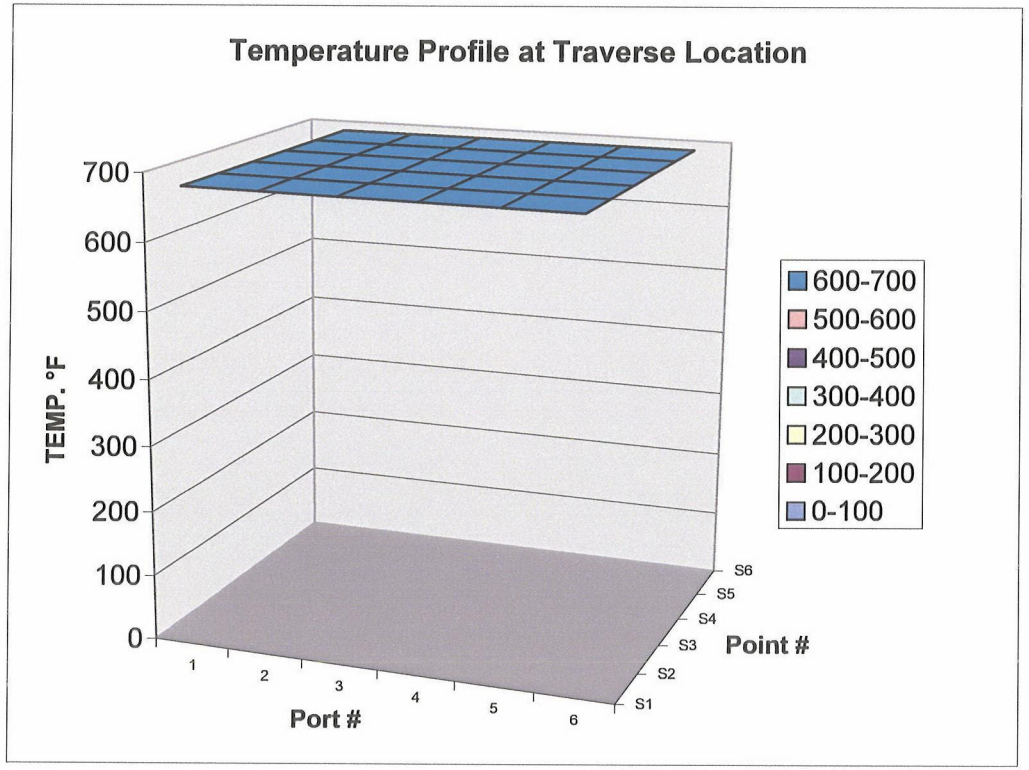
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

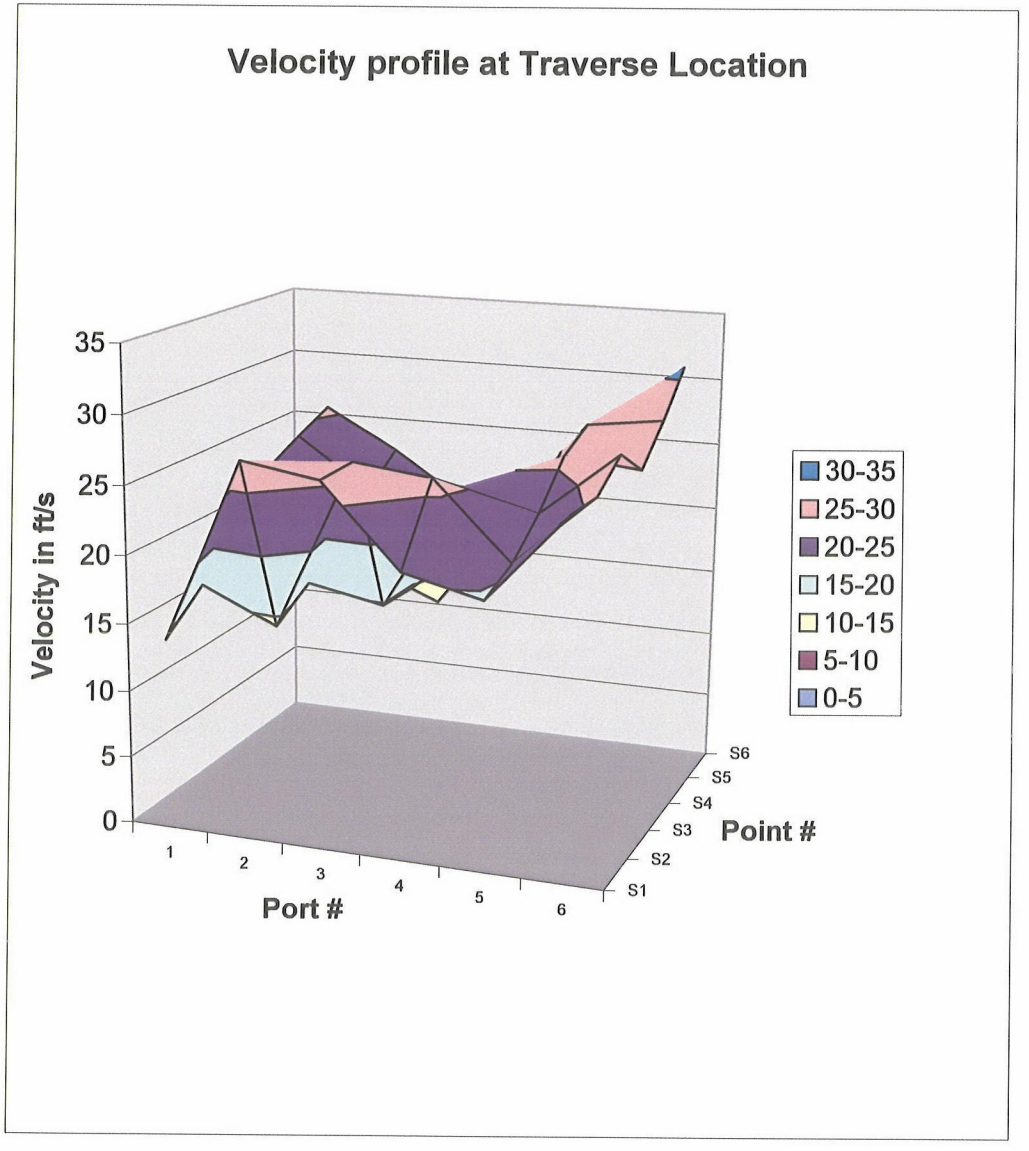
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	685	685	685	685	685	685
Point # 2	685	685	685	685	685	685
Point # 3	685	685	685	685	685	685
Point # 4	685	685	685	685	685	685
Point # 5	685	685	685	685	685	685
Point # 6	685	685	685	685	685	685



Traverse Point Velocity	Probes Point Velocity
14.19	18.87
16.66	18.87
17.90	18.87
22.91	19.47
24.26	19.17
25.52	18.57
27.52	18.87
14.20	18.87
15.89	19.18
15.79	18.87
20.38	18.87
22.46	18.87
26.63	19.17
26.70	18.88
14.81	18.57
14.56	17.94
11.96	19.18
18.82	18.87
20.84	18.56
26.06	18.25
24.18	18.25
19.63	18.87
19.49	19.47
18.60	18.25
19.50	19.47
20.56	18.26
22.76	18.26
25.73	18.25
26.95	18.57
25.65	18.26
25.90	19.17
25.75	19.17
27.47	19.47
25.18	18.57
27.70	18.57
30.74	18.56
34.10	18.87
32.37	18.88
31.10	18.25
29.42	19.17
28.09	19.17
30.44	18.87

VELOCITY

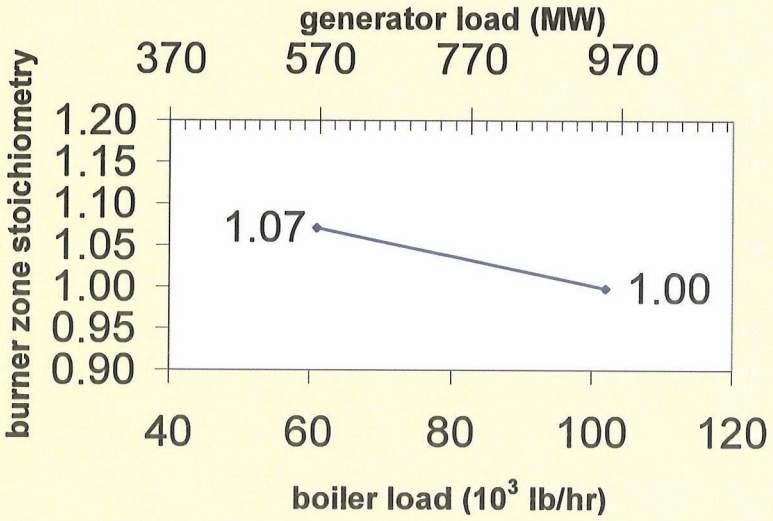
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	14	28	27	21	20	26
Point # 2	17	14	27	26	21	26
Point # 3	18	16	15	24	23	27
Point # 4	23	16	15	20	26	25
Point # 5	24	20	12	19	27	28
Point # 6	26	22	19	19	26	31

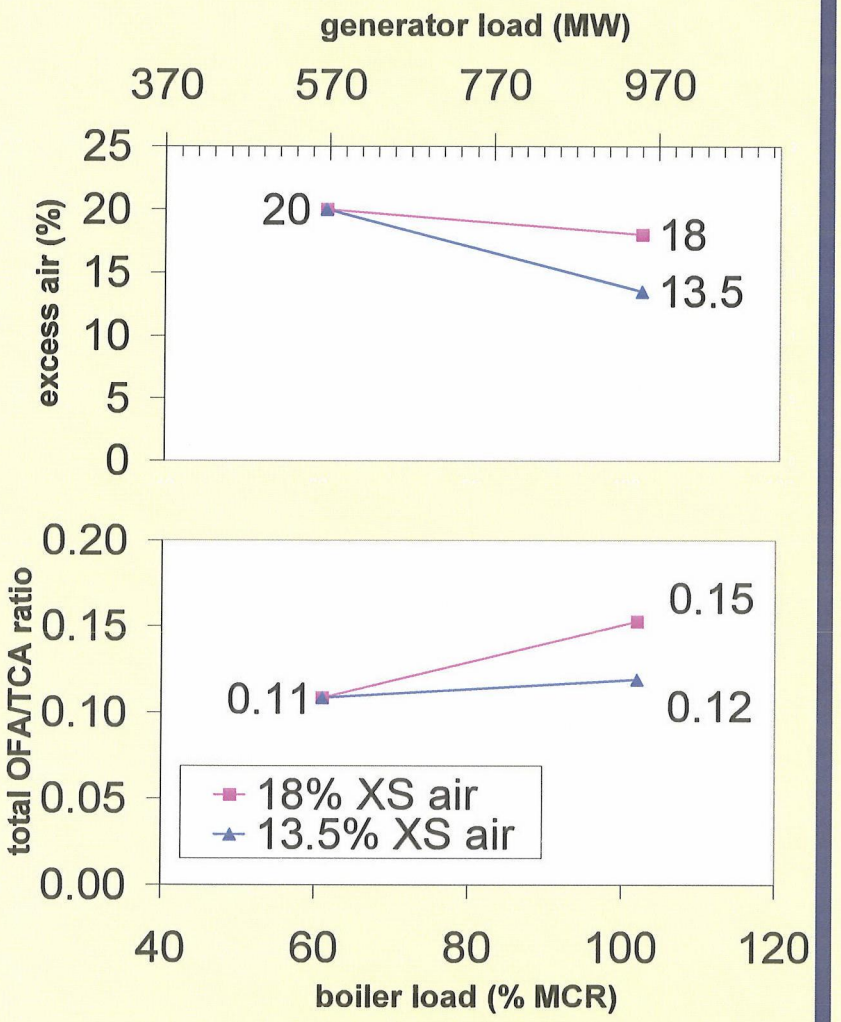


Traverse	Probes
Avg. Velocity in ft/s	
23.08	18.80

IP7_039823

Preliminary OFA Ratio Control Curve





TCA = total combustion air

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	71.000	120.000	71.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	685				
AVERAGE PRESSURE IN. W.C. (Pg)	1.68				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.12	25.12	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	59.167	59.167	
STACK VELOCITY FT/ SEC. (Vs) =	52.71	47.30	
ACTUAL STACK VOLUME (Q acfm) =	187,118	167,904	-10.27
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	72,470	65,028	-10.27
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	72,470	65,028	-10.27
FLOW IN LBS/HR (wet) =	326688	293141	-10.27
FLOW IN LBS/HR (dry) =	326688	293141	-10.27

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029098
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	F
1	1	0.198	10.00	675	0.101	-0.05	1.56	1.56	-0.005	-0.001	1.56	1.56	-0.495	
	2	0.193	10.00	685	0.137	-0.096	1.7	1.66	0.001	0.000	1.70	1.65	-0.701	
	3	0.192	15.00	685	0.168	-0.105	1.83	1.76	-0.001	0.000	1.83	1.75	-0.625	
	4	0.192	3.00	685	0.176	-0.1	1.87	1.79	-0.004	-0.001	1.87	1.78	-0.568	
2	1	0.193	0.00	685	0.208	-0.105	1.87	1.76	-0.005	-0.001	1.87	1.74	-0.505	
	2	0.193	4.00	685	0.255	-0.075	1.92	1.76	0.000	0.000	1.92	1.73	-0.294	
	3	0.201	-5.00	685	0.309	-0.035	1.98	1.77	0.000	0.000	1.98	1.73	-0.113	
	4	0.198	-4.00	685	0.098	-0.052	1.6	1.6	-0.005	-0.001	1.60	1.60	-0.531	
3	1	0.202	14.00	685	0.111	-0.042	1.62	1.61	-0.002	0.000	1.62	1.61	-0.378	
	2	0.191	13.00	685	0.127	-0.034	1.62	1.59	0.001	0.000	1.62	1.58	-0.268	
	3	0.194	9.00	685	0.174	-0.037	1.7	1.63	0.001	0.000	1.70	1.62	-0.213	
	4	0.192	-3.00	685	0.231	-0.038	1.79	1.66	0.000	0.000	1.79	1.64	-0.165	
4	1	0.192	-4.00	685	0.295	-0.024	1.86	1.67	-0.001	0.000	1.86	1.64	-0.081	
	2	0.194	-3.00	685	0.377	-0.009	2.08	1.8	-0.004	-0.001	2.08	1.75	-0.024	
	3	0.199	-2.00	685	0.147	0.009	1.87	1.82	-0.008	-0.001	1.87	1.81	0.061	
	4	0.195	1.00	685	0.156	0.013	1.85	1.79	-0.009	-0.001	1.85	1.78	0.083	
5	1	0.194	4.00	685	0.143	0.011	1.84	1.8	-0.009	-0.001	1.84	1.79	0.077	
	2	0.195	5.00	685	0.143	0.015	1.82	1.78	-0.010	-0.001	1.82	1.77	0.105	
	3	0.198	0.00	685	0.214	0.013	1.91	1.79	-0.008	-0.002	1.91	1.77	0.061	
	4	0.192	-7.00	685	0.304	0.009	1.95	1.74	-0.006	-0.002	1.95	1.70	0.030	
6	1	0.195	-12.00	685	0.373	0.013	2.04	1.76	-0.007	-0.002	2.04	1.71	0.035	
	2	0.192	-1.00	685	0.278	0.052	1.84	1.66	-0.011	-0.003	1.84	1.63	0.187	
	3	0.196	1.00	685	0.227	0.061	1.84	1.72	-0.010	-0.002	1.84	1.70	0.269	
	4	0.196	4.00	685	0.226	0.061	1.88	1.75	-0.010	-0.002	1.88	1.73	0.270	
7	1	0.199	-1.00	685	0.237	0.064	1.9	1.76	-0.010	-0.002	1.90	1.74	0.270	
	2	0.198	-3.00	685	0.259	0.06	1.99	1.84	-0.010	-0.003	1.99	1.81	0.232	
	3	0.197	-20.00	685	0.307	0.057	1.74	1.53	-0.011	-0.003	1.74	1.49	0.186	
	4	0.198	-20.00	685	0.357	0.039	2.05	1.79	-0.010	-0.003	2.05	1.74	0.109	
8	1	0.186	6.00	685	0.417	0.1	2.02	1.69	-0.010	-0.004	2.02	1.63	0.240	
	2	0.191	0.00	685	0.395	0.101	2	1.69	-0.010	-0.004	2.00	1.64	0.256	
	3	0.193	3.00	685	0.354	0.113	2.05	1.8	-0.010	-0.004	2.05	1.76	0.319	
	4	0.191	-3.00	685	0.382	0.123	2.1	1.81	-0.010	-0.004	2.10	1.76	0.322	
9	1	0.193	2.00	685	0.392	0.124	1.97	1.66	-0.010	-0.004	1.97	1.61	0.316	
	2	0.197	-3.00	685	0.4	0.114	1.96	1.66	-0.010	-0.004	1.96	1.61	0.285	
	3	0.197	0.00	685	0.385	0.071	1.99	1.7	-0.011	-0.004	1.99	1.65	0.184	
	4	0.198	4.00	685	0.459	0.084	1.97	1.6	-0.011	-0.005	1.97	1.54	0.183	
	37	0.192	4.00	685	0.45	0.101	2.04	1.68	-0.010	-0.005	2.04	1.62	0.224	
	38	0.193	8.00	685	0.445	0.128	2.01	1.66	-0.010	-0.005	2.01	1.60	0.288	
	39	0.198	4.00	685	0.439	0.132	2.15	1.8	-0.010	-0.004	2.15	1.74	0.301	
	40	0.198	2.00	685	0.415	0.113	2.08	1.75	-0.010	-0.004	2.08	1.69	0.272	
	41	0.189	0.00	685	0.35	0.078	1.94	1.68	-0.010	-0.004	1.94	1.63	0.223	
	42	0.188	2.00	685	0.284	0.014	1.83	1.65	-0.007	-0.002	1.83	1.62	0.049	

-12.00

Avg. Duct Static = 1.68

Yaw Avg. = 0.88
Std. Dev. = 7.31

Average Temp.
685

Pitch Avg. = 3.
Std. Dev. = 1

OFA SW BOTH DAMPERS OPEN 4-2-03.xls

IP7_039826

IP7_039827

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

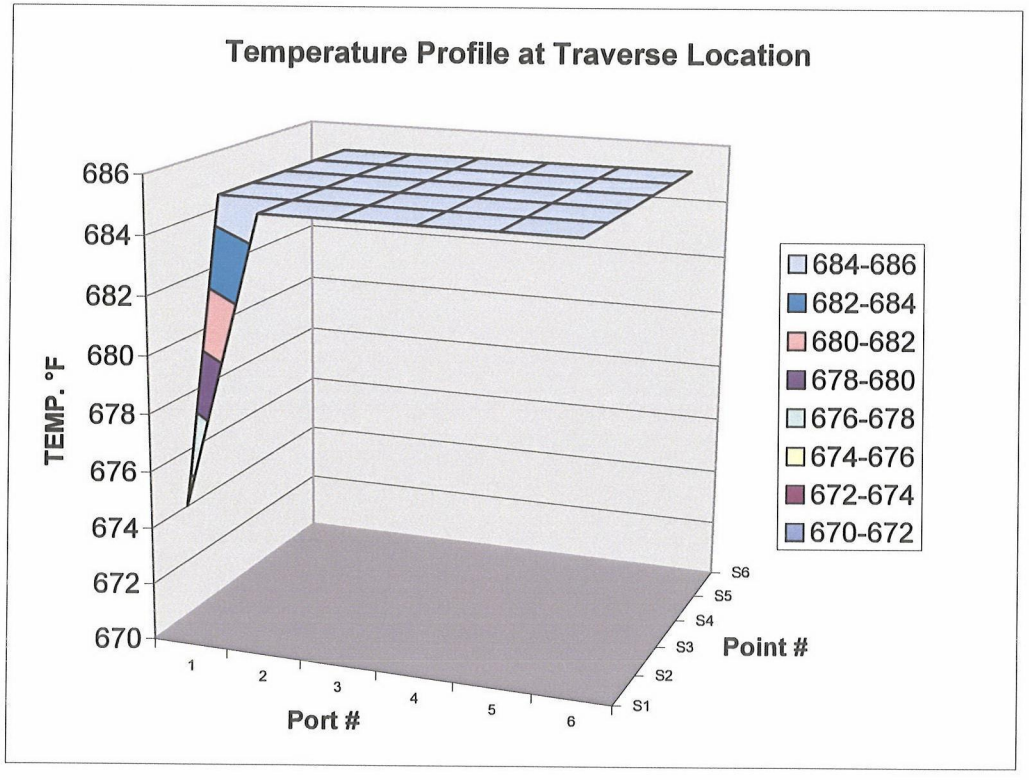
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

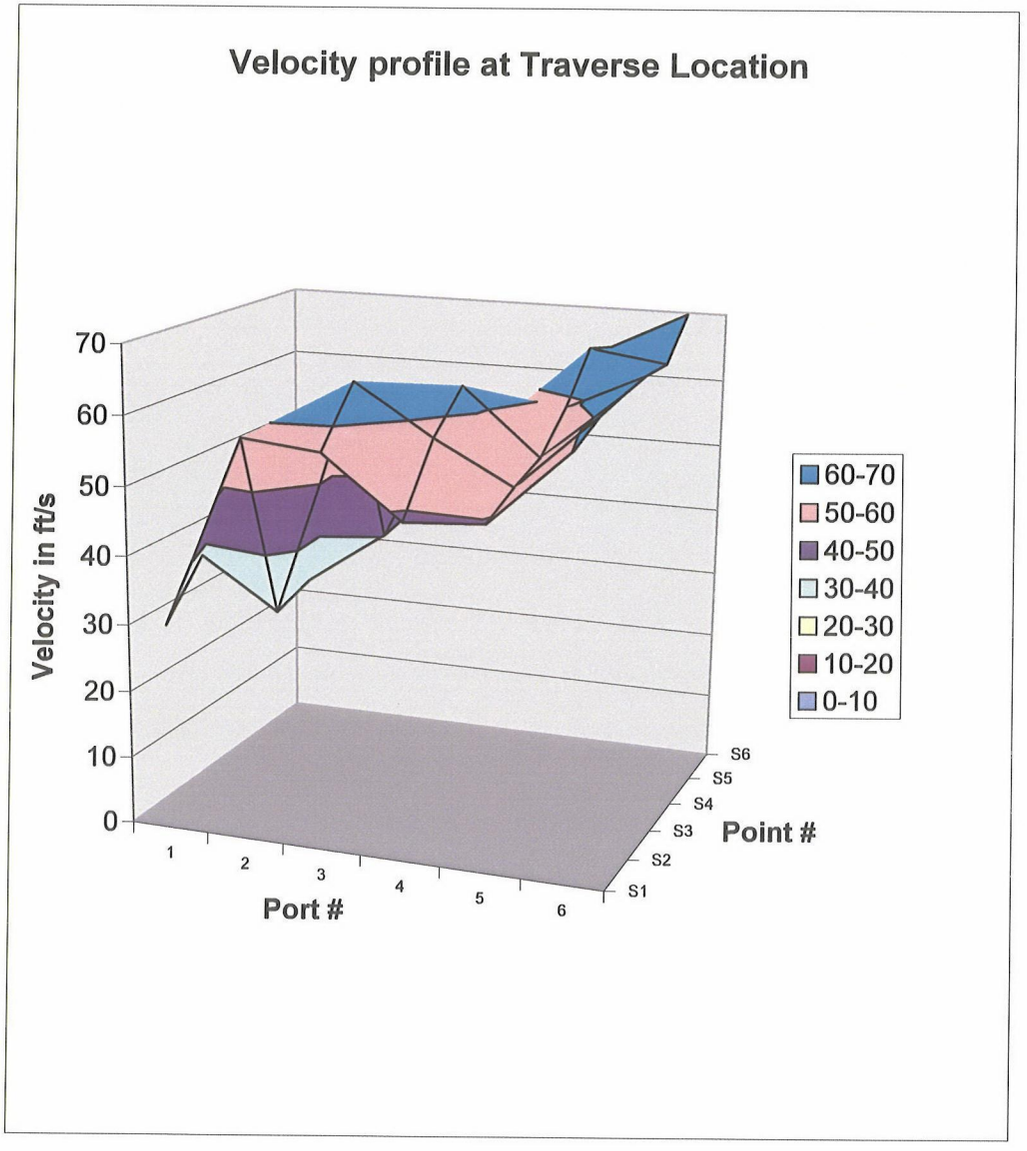
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	675	685	685	685	685	685
Point # 2	685	685	685	685	685	685
Point # 3	685	685	685	685	685	685
Point # 4	685	685	685	685	685	685
Point # 5	685	685	685	685	685	685
Point # 6	685	685	685	685	685	685



Traverse Point Velocity	Probes Point Velocity
30.62	47.52
37.94	47.11
39.93	46.98
41.42	46.98
44.78	47.11
51.61	47.11
58.31	48.07
30.69	47.72
32.46	48.20
35.78	46.87
42.86	47.24
50.26	46.99
57.22	46.99
64.90	47.23
40.38	47.83
41.49	47.35
39.67	47.22
39.45	47.35
48.75	47.71
57.84	46.99
63.12	47.35
54.36	46.99
48.51	47.47
48.28	47.47
49.55	47.83
51.99	47.71
53.71	47.61
58.75	47.71
65.64	46.25
64.10	46.87
60.24	47.10
62.57	46.86
63.47	47.11
64.22	47.60
64.01	47.60
69.75	47.73
68.55	46.99
67.15	47.12
67.10	47.71
65.53	47.72
60.62	46.62
56.21	46.50

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	31	58	57	49	50	60
Point # 2	38	31	65	58	52	63
Point # 3	40	32	40	63	54	63
Point # 4	41	36	41	54	59	64
Point # 5	45	43	40	49	66	64
Point # 6	52	50	39	48	64	70



Traverse	Probes
Avg. Velocity in ft/s	
52.71	47.30

IP7_039830

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain**
Date:....
Load:.....

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse 71.000	120.000	71.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	659				
AVERAGE PRESSURE IN. W.C. (Pg)	1.94				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.14	25.14	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	59.167	59.167	
STACK VELOCITY FT/ SEC. (Vs) =	30.10	25.44	
ACTUAL STACK VOLUME (Q acfm) =	106,851	90,328	-15.46
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	42,368	35,816	-15.46
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	42,368	35,816	-15.46
FLOW IN LBS/HR (wet) =	190991	161455	-15.46
FLOW IN LBS/HR (dry) =	190991	161455	-15.46

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029791
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	I F
1	1	0.056	5.00	659	0.046	-0.02	2.01	2.07	-0.004	0.000	2.01	2.08	-0.435	
	2	0.054	3.00	659	0.051	-0.02	1.95	2.01	-0.002	0.000	1.95	2.02	-0.392	
	3	0.053	11.00	659	0.057	-0.038	1.92	1.96	0.000	0.000	1.92	1.97	-0.667	
	4	0.058	4.00	659	0.068	-0.04	1.9	1.94	-0.003	0.000	1.90	1.95	-0.588	
2	1	0.055	5.00	659	0.075	-0.038	1.75	1.78	-0.005	0.000	1.75	1.79	-0.507	
	2	0.055	-2.00	659	0.085	-0.028	1.82	1.84	0.000	0.000	1.82	1.84	-0.329	
	3	0.058	1.00	659	0.104	-0.012	1.97	1.97	0.000	0.000	1.97	1.97	-0.115	
	4	0.059	13.00	659	0.027	-0.017	1.77	1.85	-0.001	0.000	1.77	1.86	-0.630	
3	1	0.06	2.00	659	0.036	-0.023	1.82	1.89	-0.001	0.000	1.82	1.90	-0.639	
	2	0.06	6.00	659	0.06	-0.022	1.88	1.93	-0.002	0.000	1.88	1.94	-0.367	
	3	0.06	11.00	659	0.073	-0.02	1.87	1.9	0.001	0.000	1.87	1.91	-0.274	
	4	0.06	10.00	659	0.094	-0.02	1.92	1.93	0.001	0.000	1.92	1.93	-0.213	
4	1	0.063	3.00	659	0.116	-0.011	1.99	1.98	-0.001	0.000	1.99	1.98	-0.095	
	2	0.06	-2.00	659	0.14	-0.002	1.96	1.92	-0.004	-0.001	1.96	1.91	-0.014	
	3	0.06	-10.00	659	0.025	-0.001	1.84	1.92	-0.003	0.000	1.84	1.93	-0.040	
	4	0.055	7.00	659	0.032	0.002	1.86	1.93	-0.008	0.000	1.86	1.94	0.063	
5	1	0.055	2.00	659	0.039	-0.001	1.75	1.82	-0.003	0.000	1.75	1.83	-0.026	
	2	0.053	0.00	659	0.067	0.001	1.92	1.95	-0.006	0.000	1.92	1.96	0.015	
	3	0.052	-5.00	659	0.076	0	1.81	1.84	-0.005	0.000	1.81	1.85	0.000	
	4	0.05	-9.00	659	0.109	-0.001	1.74	1.74	-0.004	0.000	1.74	1.74	-0.009	
6	1	0.055	-15.00	659	0.133	0.002	1.94	1.91	-0.006	-0.001	1.94	1.90	0.015	
	2	0.048	0.00	659	0.036	0.006	1.83	1.9	-0.011	0.000	1.83	1.91	0.167	
	3	0.06	2.00	659	0.06	0.019	1.85	1.9	-0.010	-0.001	1.85	1.91	0.317	
	4	0.06	6.00	659	0.067	0.023	2.01	2.06	-0.010	-0.001	2.01	2.07	0.343	
7	1	0.06	12.00	659	0.083	0.024	1.8	1.82	-0.010	-0.001	1.80	1.82	0.289	
	2	0.067	9.00	659	0.095	0.019	2.15	2.16	-0.011	-0.001	2.15	2.16	0.200	
	3	0.072	2.00	659	0.134	0.023	2.37	2.34	-0.011	-0.001	2.37	2.33	0.172	
	4	0.074	-15.00	659	0.153	0.015	2.41	2.36	-0.009	-0.001	2.41	2.35	0.098	
8	1	0.07	6.00	659	0.155	0.05	2.33	2.28	-0.010	-0.002	2.33	2.27	0.323	
	2	0.063	4.00	659	0.146	0.057	2.23	2.19	-0.010	-0.001	2.23	2.18	0.390	
	3	0.061	5.00	659	0.114	0.047	2.11	2.1	-0.010	-0.001	2.11	2.10	0.412	
	4	0.059	5.00	659	0.107	0.046	2.03	2.03	-0.009	-0.001	2.03	2.03	0.430	
9	1	0.057	-5.00	659	0.122	0.049	1.98	1.96	-0.010	-0.001	1.98	1.96	0.402	
	2	0.059	-7.00	659	0.135	0.05	1.97	1.93	-0.010	-0.001	1.97	1.92	0.370	
	3	0.056	-2.00	659	0.136	0.031	1.91	1.88	-0.010	-0.001	1.91	1.87	0.228	
	4	0.055	0.00	659	0.154	0.045	1.78	1.73	-0.010	-0.002	1.78	1.72	0.292	
	37	0.05	-3.00	659	0.124	0.05	1.76	1.74	-0.010	-0.001	1.76	1.74	0.403	
	38	0.052	2.00	659	0.136	0.065	1.83	1.8	-0.009	-0.001	1.83	1.79	0.478	
	39	0.05	2.00	659	0.134	0.062	1.92	1.89	-0.009	-0.001	1.92	1.88	0.463	
	40	0.053	-2.00	659	0.132	0.056	1.82	1.79	-0.009	-0.001	1.82	1.78	0.424	
	41	0.056	-3.00	659	0.122	0.035	1.76	1.74	-0.010	-0.001	1.76	1.74	0.287	
	42	0.054	3.00	659	0.107	0.009	1.89	1.89	-0.009	-0.001	1.89	1.89	0.084	

Avg. Duct Static = 1.94

Yaw Avg. = 1.45
Std. Dev. = 6.54

Average Temp.
659

Pitch Avg. = 3.
Std. Dev. = 1

OFA SW ONE THIRD OPEN 4-2-03.xls

IP7_039833

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

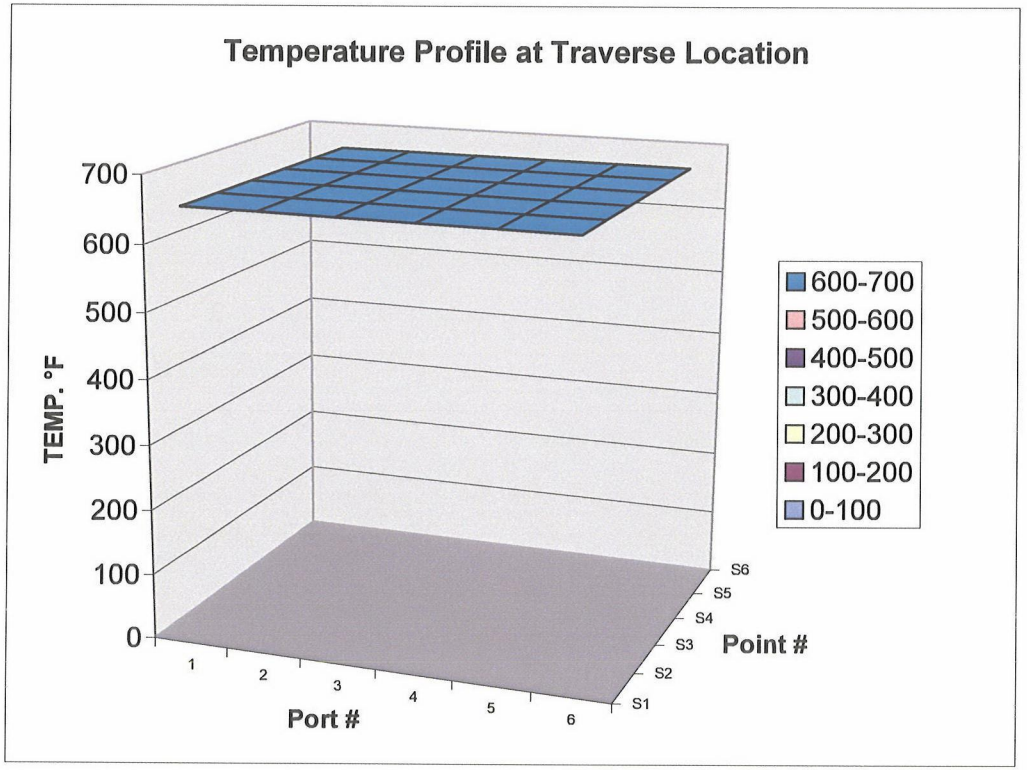
A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

TEMPERATURE

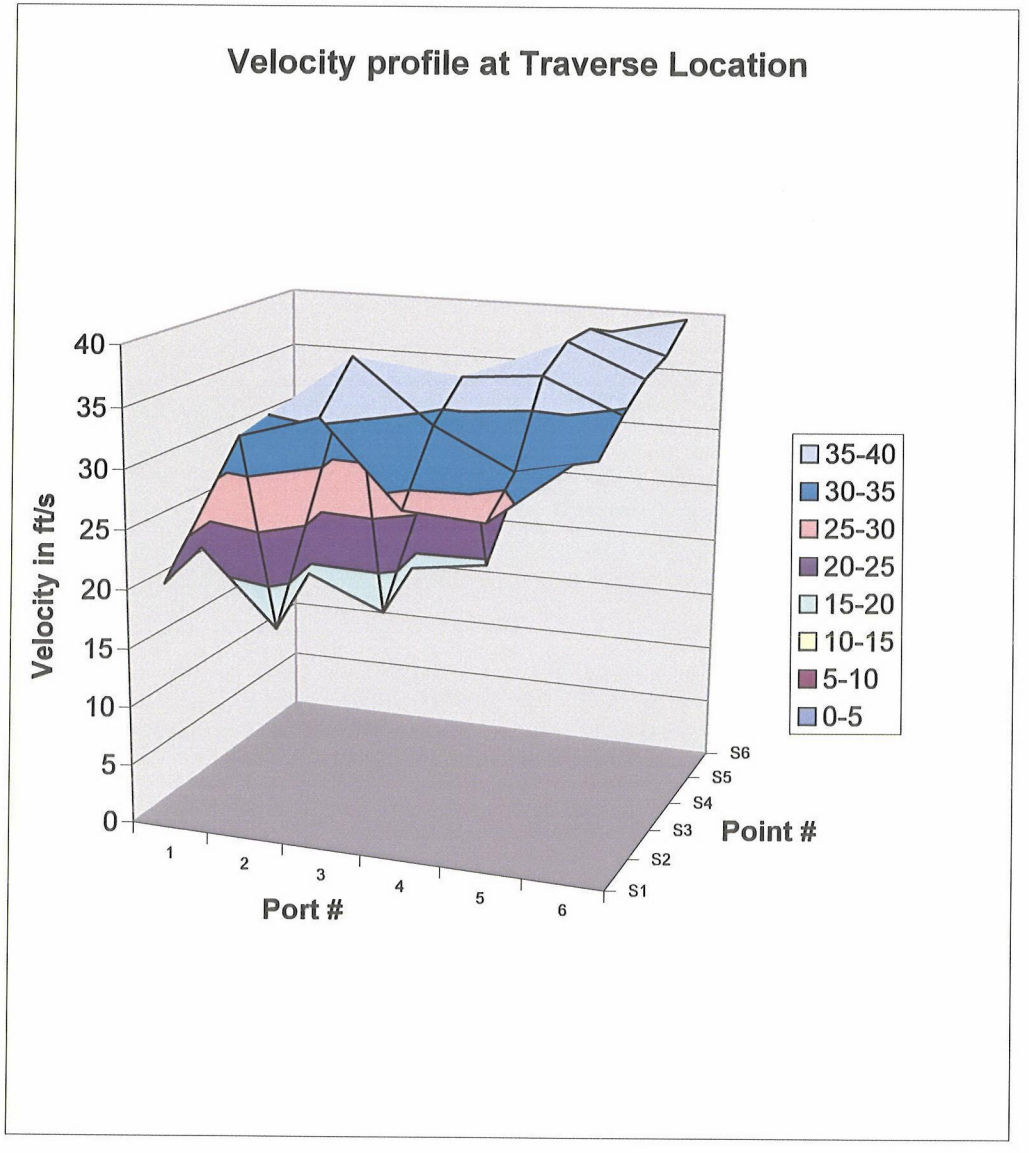
	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	659	659	659	659	659	659
Point # 2	659	659	659	659	659	659
Point # 3	659	659	659	659	659	659
Point # 4	659	659	659	659	659	659
Point # 5	659	659	659	659	659	659
Point # 6	659	659	659	659	659	659



Traverse Point Velocity	Probes Point Velocity
20.92	25.07
22.30	24.62
23.82	24.39
25.56	25.52
26.48	24.86
29.27	24.86
33.55	25.52
15.99	25.74
19.02	25.96
24.24	25.96
26.97	25.96
31.04	25.96
35.45	26.60
39.12	25.96
16.28	25.96
18.49	24.85
20.65	24.86
27.06	24.40
28.73	24.17
34.12	23.70
36.83	24.85
19.41	23.22
24.54	25.96
25.75	25.95
28.31	25.96
30.93	27.42
37.36	28.42
39.12	28.81
39.21	28.02
37.99	26.59
33.44	26.17
32.31	25.74
34.65	25.30
36.43	25.74
37.29	25.08
39.41	24.86
35.02	23.70
36.07	24.17
35.99	23.70
36.05	24.40
35.05	25.08
33.92	24.63

VELOCITY

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	21	34	35	29	28	33
Point # 2	22	16	39	34	31	32
Point # 3	24	19	16	37	37	35
Point # 4	26	24	18	19	39	36
Point # 5	26	27	21	25	39	37
Point # 6	29	31	27	26	38	39



Traverse	Probes
Avg. Velocity in ft/s	
30.10	25.44

IP7_039836

Test #	OFA Position (%)	Load	SA Bias	Description & other conditions
1	1/3 Dmprs = 100 2/3 Dmprs = 0 Inlt Dmprs = 100	950	* ***	Steady State Test 1/3 Open Data taken
2	1/3 Dmprs = 100 2/3 Dmprs = 0 Inlt Dmprs = 100	950	Clsd H ***	Investigation of East West Imbalance OFA flows equaled out east to west.. Temperature on H burner row increased to alarm levels. Bias on FD-A removed.
3	1/3 Dmprs = 0 2/3 Dmprs = 100 Inlt Dmprs = 100	950	** ***	Steady State Test 2/3 open OFA Flows slightly improved. Burner temps down, but slightly higher than before test #2.
4	1/3 Dmprs = 100 2/3 Dmprs = 100 Inlt Dmprs = 100	950	** ***	Steady State with Port Dampers Full Open Unusually low increase in flow to N side. S.side showed step change.
5	1/3 Dmprs = 100 2/3 Dmprs = 100 Inlt Dmprs = 100	950	** ***	Adjust for 15% OFA Flow OFA flow measured at 17% of total air. No SA damper bias required or implemented.
6	1/3 Dmprs = 0 2/3 Dmprs = 100 Inlt Dmprs = 100	950	** ***	Adjust for 15% OFA Flow Measured OFA at 14.5 to 14.8 % with 2/3 full open. No SA bias required.
7	1/3 Dmprs = 100 2/3 Dmprs = 0 Inlt Dmprs = 100	950	** ***	Adjust for 10% OFA Flow Measured OFA at 9.5% with 1/3 open and 2/3 closed. No SA bias required.
8	1/3 Dmprs = 0 2/3 Dmprs = 100 Inlt Dmprs = 100		** ***	Adjust for 5% OFA Flow Adjusted OFA 1/3 ports to 50% open, Flow = 8.0%. Adjusted OFA 1/3 ports to 40% open, Flow = 7.0%. Adjusted OFA 1/3 ports to 30% open, Flow = 6.2%, NOx = .436 Adjusted OFA 1/3 ports to 20% open, Flow = 5.2%, NOx = .44
9	1/3 Dmprs = 100 2/3 Dmprs = 0 Inlt Dmprs = 100		** ***	Magnehelic Distribution with 1/3 ports open only. See Chart.
10	1/3 Dmprs = 0 2/3 Dmprs = 100 Inlt Dmprs = 100		** ***	Magnehelic Distribution with 2/3 ports open only. See Chart.
11	1/3 Dmprs = 100 2/3 Dmprs = 100 Inlt Dmprs = 100		** ***	Magnehelic Distribution with ports full open. See Chart
12	1/3 Dmprs = 0 2/3 Dmprs = 0 Inlt Dmprs = 0		** ***	Steady State with OFA OOS. NOx = .476; Temps: SW=962 DegF, SC=988 DegF, SE=856 DegF. NW=OOS, NC= 1073 DegF, NE=947 DegF.
13	1/3 Dmprs = 0 2/3 Dmprs = 100 Inlt Dmprs = 100		** ***	Temperature Tests Temps: SW=787 DegF, SC=816 DegF, SE=720 DegF. NW=OOS, NC= 873 DegF, NE=764 DegF. Further temp tests not recorded 1/3 closed and OFA OOS are most severe temp conditions with T/C mounted on port upper side.

* H Mill OOS w/ west damper at 10% and East damper at 50%. FD 1A with + 6% bias. Duct pressure low and OFA flow low on east side.

** H Level SA east side dampers opened to 30% and west left at 10%. FD 1A bias = 0%.

*** An error found later revealed that the max. 10% SA dmpr. position bias for OFA flow enhancement was in throughout the duration of the tests.

3D PROBE WORK SHEET

PROJECT:--- **Inter-Mountain** **OFA SW**
Date:.... **4/2/2003**
Load:..... **Damper 1/3**

STD. TEMP. DEGREES F (t std)	68				
STD. BAROMETRIC PRESSURE " Hg (Pstd)	29.92				
DUCT SIZE (D)	Traverse	71.000	120.000	71.000	120.000	Flow Element
AVERAGE TEMPERATURE DEGREES F (ts)	659				
AVERAGE PRESSURE IN. W.C. (Pg)	1.94				
ACTUAL BAROMETRIC PRESSURE " Hg (Pbar)	25.00				
% O2 (20.95)	20.95				
% N2 (78.09)	78.09				
% CO2 (0.03)	0.03				
% CO (0.0)	0.00				
%A (0.93)	0.93				
% H2O (0.0)	0.00				

CALCULATIONS

	Traverse	Flow Elem.	% Difference
DRY MOLE FRACTION OF STACK (Mfd) =	1.000	1.000	
STACK PRESSURE " Hg (Ps) =	25.14	25.14	
DRY MOLECULAR WT. OF STACK GAS Lb / Lb -Mole(Md)=	28.966	28.966	
WET MOLECULAR WT. OF STACK GAS Lb / Lb -Mole (Ms)=	28.966	28.966	
STACK AREA SQ. FT (As) =	59.167	59.167	
STACK VELOCITY FT/ SEC. (Vs) =	30.10	25.44	
ACTUAL STACK VOLUME (Q acfm) =	106,851	90,328	-15.46
DRY STANDARD VOLUMETRIC STACK FLOW (Q scfmd) =	42,368	35,816	-15.46
WET STANDARD VOLUMETRIC STACK FLOW (Q scfmw) =	42,368	35,816	-15.46
FLOW IN LBS/HR (wet) =	190991	161455	-15.46
FLOW IN LBS/HR (dry) =	190991	161455	-15.46

GAS DENSITY AT ACTUAL CONDITIONS, LBS/CU.FT.(wet)	0.029791
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (wet)	0.075132
GAS DENSITY AT STANDARD CONDITIONS, LBS/CU.FT. (dry)	0.075132

1/6/2011

Port #	Depth#	Probes Vp In. W.C.	Measured Yaw Angle Degrees	Air Temp. °F	P1 - P23 In.W.C.	Pitch Press. P4 - P5 In.W.C.	P1-Patm (Pt) In. W.C.	P23-Patm Ps Choke In w.c.	From Chart P1-Pt/Pt-Ps TP Coeff.	TP Coeff. * Corrected Pv P1-Pt	(P1-Patm) Minus P1-Pt	P23 Corrected In w.c.	Calculated P4-P5/P1-P23 F1	F
1	1	0.056	5.00	659	0.046	-0.02	2.01	2.07	-0.004	0.000	2.01	2.08	-0.435	
	2	0.054	3.00	659	0.051	-0.02	1.95	2.01	-0.002	0.000	1.95	2.02	-0.392	
	3	0.053	11.00	659	0.057	-0.038	1.92	1.96	0.000	0.000	1.92	1.97	-0.667	
	4	0.058	4.00	659	0.068	-0.04	1.9	1.94	-0.003	0.000	1.90	1.95	-0.588	
	5	0.055	5.00	659	0.075	-0.038	1.75	1.78	-0.005	0.000	1.75	1.79	-0.507	
	6	0.055	-2.00	659	0.085	-0.028	1.82	1.84	0.000	0.000	1.82	1.84	-0.329	
	7	0.058	1.00	659	0.104	-0.012	1.97	1.97	0.000	0.000	1.97	1.97	-0.115	
2	1	0.059	13.00	659	0.027	-0.017	1.77	1.85	-0.001	0.000	1.77	1.86	-0.630	
	2	0.06	2.00	659	0.036	-0.023	1.82	1.89	-0.001	0.000	1.82	1.90	-0.639	
	3	0.06	6.00	659	0.06	-0.022	1.88	1.93	-0.002	0.000	1.88	1.94	-0.367	
	4	0.06	11.00	659	0.073	-0.02	1.87	1.9	0.001	0.000	1.87	1.91	-0.274	
	5	0.06	10.00	659	0.094	-0.02	1.92	1.93	0.001	0.000	1.92	1.93	-0.213	
	6	0.063	3.00	659	0.116	-0.011	1.99	1.98	-0.001	0.000	1.99	1.98	-0.095	
	7	0.06	-2.00	659	0.14	-0.002	1.96	1.92	-0.004	-0.001	1.96	1.91	-0.014	
3	1	0.06	-10.00	659	0.025	-0.001	1.84	1.92	-0.003	0.000	1.84	1.93	-0.040	
	2	0.055	7.00	659	0.032	0.002	1.86	1.93	-0.008	0.000	1.86	1.94	0.063	
	3	0.055	2.00	659	0.039	-0.001	1.75	1.82	-0.003	0.000	1.75	1.83	-0.026	
	4	0.053	0.00	659	0.067	0.001	1.92	1.95	-0.006	0.000	1.92	1.96	0.015	
	5	0.052	-5.00	659	0.076	0	1.81	1.84	-0.005	0.000	1.81	1.85	0.000	
	6	0.05	-9.00	659	0.109	-0.001	1.74	1.74	-0.004	0.000	1.74	1.74	-0.009	
	7	0.055	-15.00	659	0.133	0.002	1.94	1.91	-0.006	-0.001	1.94	1.90	0.015	
4	1	0.048	0.00	659	0.036	0.006	1.83	1.9	-0.011	0.000	1.83	1.91	0.167	
	2	0.06	2.00	659	0.06	0.019	1.85	1.9	-0.010	-0.001	1.85	1.91	0.317	
	3	0.06	6.00	659	0.067	0.023	2.01	2.06	-0.010	-0.001	2.01	2.07	0.343	
	4	0.06	12.00	659	0.083	0.024	1.8	1.82	-0.010	-0.001	1.80	1.82	0.289	
	5	0.067	9.00	659	0.095	0.019	2.15	2.16	-0.011	-0.001	2.15	2.16	0.200	
	6	0.072	2.00	659	0.134	0.023	2.37	2.34	-0.011	-0.001	2.37	2.33	0.172	
	7	0.074	-15.00	659	0.153	0.015	2.41	2.36	-0.009	-0.001	2.41	2.35	0.098	
5	1	0.07	6.00	659	0.155	0.05	2.33	2.28	-0.010	-0.002	2.33	2.27	0.323	
	2	0.063	4.00	659	0.146	0.057	2.23	2.19	-0.010	-0.001	2.23	2.18	0.390	
	3	0.061	5.00	659	0.114	0.047	2.11	2.1	-0.010	-0.001	2.11	2.10	0.412	
	4	0.059	5.00	659	0.107	0.046	2.03	2.03	-0.009	-0.001	2.03	2.03	0.430	
	5	0.057	-5.00	659	0.122	0.049	1.98	1.96	-0.010	-0.001	1.98	1.96	0.402	
	6	0.059	-7.00	659	0.135	0.05	1.97	1.93	-0.010	-0.001	1.97	1.92	0.370	
	7	0.056	-2.00	659	0.136	0.031	1.91	1.88	-0.010	-0.001	1.91	1.87	0.228	
6	1	0.055	0.00	659	0.154	0.045	1.78	1.73	-0.010	-0.002	1.78	1.72	0.292	
	2	0.05	-3.00	659	0.124	0.05	1.76	1.74	-0.010	-0.001	1.76	1.74	0.403	
	3	0.052	2.00	659	0.136	0.065	1.83	1.8	-0.009	-0.001	1.83	1.79	0.478	
	4	0.05	2.00	659	0.134	0.062	1.92	1.89	-0.009	-0.001	1.92	1.88	0.463	
	5	0.053	-2.00	659	0.132	0.056	1.82	1.79	-0.009	-0.001	1.82	1.78	0.424	
	6	0.056	-3.00	659	0.122	0.035	1.76	1.74	-0.010	-0.001	1.76	1.74	0.287	
	7	0.054	3.00	659	0.107	0.009	1.89	1.89	-0.009	-0.001	1.89	1.89	0.084	

Avg. Duct Static = 1.94

Yaw Avg. = 1.45
Std. Dev. = 6.54

Average Temp.
659

Pitch Avg. = 3
Std. Dev. = 1

Yellow Highlight means number was changed to make spreadsheet workk P4-P4 changed
Note: Temp. taken from CAMM T/C on probe not working

OFA Trverse Worksheet w corr SE & SW duct size.xls

IP7_039840

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.4239	84.367215	82.799129	-296.2101895	-1214.828153	1118.31943	4756.491711	-1253.798168	-4858.589489

#11

P4-P5	Pitch
P1-P23	Angle in °
-0.810	-40.000

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
0.974	-0.000721	0.000105	1.96389E-06	-1.43747E-08	-2.653E-09	1.5E-10	1.32937E-12	-7.04364E-14

#12

Pitch	Pt-Ps
Angle in °	P1-P23
-10.000	0.990

y = A + Bx + C x^2 + Dx^3 +Ex^4 + Fx^5 + Gx^6 + Hx^7 + Ix^8

A	B	C	D	E	F	G	H	I
-0.005	-0.000617	-5.82E-07	1.26249E-06	7.60667E-09	-9.583E-10	-1.87525E-11	2.38095E-13	8.43334E-15

#7

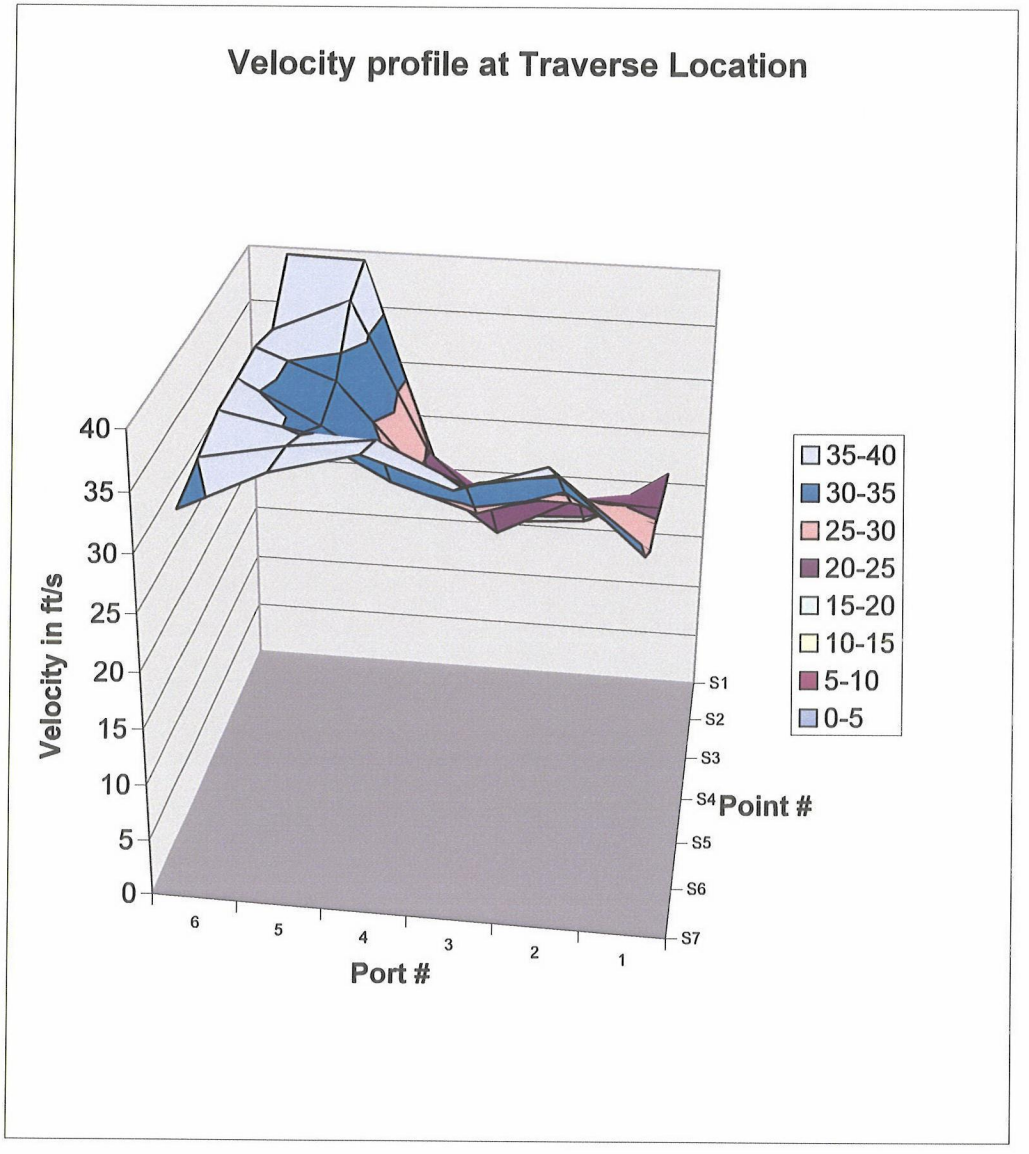
Pitch	P1-Pt
Angle in °	Pt-Ps
40.000	-0.011

IP7_039841

VELOCITY

Traverse Point Velocity	Probes Point Velocity
20.92	25.07
22.30	24.62
23.82	24.39
25.56	25.52
26.48	24.86
29.27	24.86
33.55	25.52
15.99	25.74
19.02	25.96
24.24	25.96
26.97	25.96
31.04	25.96
35.45	26.60
39.12	25.96
16.28	25.96
18.49	24.85
20.65	24.86
27.06	24.40
28.73	24.17
34.12	23.70
36.83	24.85
19.41	23.22
24.54	25.96
25.75	25.95
28.31	25.96
30.93	27.42
37.36	28.42
39.12	28.81
39.21	28.02
37.99	26.59
33.44	26.17
32.31	25.74
34.65	25.30
36.43	25.74
37.29	25.08
39.41	24.86
35.02	23.70
36.07	24.17
35.99	23.70
36.05	24.40
35.05	25.08
33.92	24.63

	Port # 1	Port # 2	Port # 3	Port # 4	Port # 5	Port # 6
Point # 1	21	16	16	19	39	39
Point # 2	22	19	18	25	38	35
Point # 3	24	24	21	26	33	36
Point # 4	26	27	27	28	32	36
Point # 5	26	31	29	31	35	36
Point # 6	29	35	34	37	36	35
Point # 7	34	39	37	39	37	34



Traverse	Probes
Avg. Velocity in ft/s	
30.10	25.44

IP7_039843

*-10D
*

	[redacted]																									
	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	23-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04	24-May-04
1SGAPT0173	0.83	1.19	1.37	1.63	1.75	1.77	1.82	1.79	1.81	1.85	1.50	1.31	1.97	1.63	1.51	1.57	1.60	1.47	1.57	1.72	1.55	1.58	1.52	1.58
2SGAPT0173	3.49	3.12	3.14	3.16	3.16	3.17	3.06	2.89	2.80	2.90	2.48	2.04	2.88	2.49	0.12	0.12	0.13	0.13	2.49	2.87	2.69	2.80	2.73	2.74
1SGAPT0174	1.00	1.35	1.54	1.81	1.94	1.97	2.02	2.00	2.01	2.05	1.67	1.48	2.18	1.81	1.67	1.75	1.78	1.65	1.74	1.87	1.73	1.76	1.70	1.76
2SGAPT0174	4.10	3.70	3.73	3.76	3.78	3.79	3.67	3.48	3.38	3.48	3.04	2.55	3.48	3.22	2.89	3.14	3.05	3.51	3.44	3.45	3.24	3.35	3.27	3.28
1SGAPT0175	0.62	1.04	1.25	1.60	1.73	1.77	1.83	1.82	1.83	1.89	1.46	1.22	2.03	1.63	1.48	1.57	1.60	1.45	1.57	1.70	1.59	1.60	1.53	1.60
2SGAPT0175	2.52	3.77	3.79	3.81	3.81	3.81	3.70	3.51	3.42	3.51	2.24	1.98	3.50	3.29	3.13	3.37	3.31	3.74	0.49	0.02	0.04	0.02	0.00	0.00
1SGAPT0176	0.83	1.20	1.39	1.68	1.79	1.83	1.88	1.86	1.87	1.92	1.56	1.35	2.06	1.70	1.58	1.65	1.68	1.55	1.65	1.79	1.64	1.66	1.60	1.66
2SGAPT0176	4.16	3.84	3.88	3.88	3.89	3.90	3.78	3.58	3.49	3.60	3.13	2.65	3.60	3.40	3.28	3.48	3.43	3.87	3.47	3.44	3.26	3.38	3.31	3.30
1SGAPT0177	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2SGAPT0177	2.67	2.41	2.42	2.43	2.40	2.41	2.26	2.10	2.02	2.05	1.76	1.46	2.02	1.99	1.83	2.00	2.05	2.31	2.26	2.12	1.99	2.11	2.06	2.08
1SGAPT0178	1.02	1.41	1.60	1.86	1.98	2.00	2.05	2.02	2.03	2.08	1.74	1.54	2.20	1.87	1.75	1.81	1.84	1.71	1.80	1.95	1.78	1.80	1.75	1.81
2SGAPT0178	4.00	3.62	3.65	3.67	3.69	3.70	3.55	3.38	3.29	3.39	2.69	1.97	2.91	2.61	2.43	2.88	3.15	3.59	3.38	3.34	3.13	3.25	3.17	3.18
1SGAPT0179	0.36	0.48	0.54	0.64	0.68	0.68	0.71	0.69	0.70	0.72	0.59	0.52	0.76	0.64	0.60	0.62	0.62	0.57	0.59	0.64	0.58	0.59	0.57	0.58
2SGAPT0179	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.32	0.50	0.55	0.35	0.24	0.55	0.51	3.08	3.32	3.27	3.69	3.49	3.44	3.26	3.39	3.32	3.33
1SGAPT0180	0.99	1.32	1.49	1.73	1.83	1.85	1.90	1.87	1.88	1.93	1.60	1.44	2.05	1.73	1.61	1.67	1.71	1.58	1.67	1.82	1.64	1.67	1.61	1.67
2SGAPT0180	3.98	3.63	3.63	3.63	3.61	3.61	3.50	3.32	3.24	3.32	2.95	2.53	3.31	3.18	3.21	3.42	3.38	3.78	3.61	3.54	3.37	3.49	3.43	3.45
1SGBPT0256	5.87	6.18	6.52	6.83	7.08	7.13	7.23	7.21	7.25	7.32	6.72	6.38	7.59	6.98	6.71	6.80	6.89	6.69	6.75	7.20	6.67	6.72	6.59	6.71
2SGBPT0256	6.42	6.06	6.15	6.11	6.12	6.01	5.89	5.59	5.42	5.56	5.18	4.64	5.50	5.56	5.23	5.46	5.51	5.94	2.91	1.46	5.50	5.64	5.58	5.62
1SGBPT0257	6.45	6.53	7.18	7.57	7.86	7.90	8.01	7.94	8.03	8.07	7.41	7.02	8.29	7.60	7.37	7.44	7.56	7.32	7.36	7.88	7.28	7.35	7.25	7.40
2SGBPT0257	6.73	6.42	6.29	6.27	6.26	6.32	6.18	5.84	5.62	5.65	5.44	5.03	5.84	5.79	5.60	5.70	5.82	6.27	6.21	5.99	5.84	5.89	5.91	5.98

IP7_039844

Interim Control Guidelines for OverFire Air System

The interim guidelines can be used for OFA operation. Final guidelines will be forthcoming following additional testing and system evaluation.

Set Point guidelines:

1. Implement OFA at 60% load if needed to maintain .37 NOx.

2. Start at 11% total OFA air flow at 60% load.

3. OFA can be increased to 13% at 80% load.

4. OFA can be increase to a maximum of 15% of total flow at 100% load.

5. Do Not Exceed 15% OFA at Maximum load.

* See OFA PI trend screens under =U1 Powerblock/=U1-PwrBk6 menu page for OFA data.
** See PI point 1COAXI172B for OFA flow %.

Operational Guidelines:

1. Run in Manual.

2. Start with the following Damper Positions:
   a. Inlet dampers: 100% - OPEN.
   b. 2/3 dampers: 100% - OPEN.
   c. 1/3 dampers: 0% - CLOSED.

3. Adjust/throttle south 2/3 dampers to achieve balanced flows between North and South sides. This will likely required driving the South 2/3 OFA dampers to a position somewhere between 45 to 60%.

4. With North to South approximately balanced, trim 2/3 dampers east to west to get and east/west balance.

5. If needed to get additional OFA flow to get to NOx levels down to .37 lb/MBtu, open the 1/3 OFA dampers to 100% and throttle/balance flow with the 2/3 dampers.

6. DO NOT exceed the OFA flow limits listed above.

PRELIMINARY OPTIMIZATION TEST MATRIX
INTERMOUNTAIN POWER UNIT 2 (100210)

Test #	Main Steam Flow (10^3 lb/hr)	Boiler Load (% MCR)	Approx. Generator Load (MWg)	Excess Air (%)	Target Total OFA Flow (10^3 lb/hr)	Approx. Burner Zone Stoich., SR_B	Maximum Allowable OFA Flow for $SR_B = 0.95$ (10^3 lb/hr)	OFA Damper(s) Open	Mill Out of Service	Data [1]
1	6,285	95	900	18	1,100	1.0	1,400	1/3 & 2/3	G	All
2				16	980		1,280			BR, B, G, FO, FA
3				13.5	825		1,125			
4	5,940	90	850	16	925		1,190			
5	4,950	75	710	18	550	1.06	1,090	2/3		
6	4,055	61	575	20	220	1.15	970	1/3		
7	6,750	102	950	16	1,040	1.0	1,360	1/3 & 2/3		All
8	6,285	95	900		optimum	optimum	1,280			BR, B, G, FO, FA
9	4,055	61	575	20			970	1/3		All
10	6,750	102	950	16			1,360	1/3 & 2/3	E	
11	6,285	95	900	18			1,400			BR, B, G, FO, FA
12				16			1,280			
13				13.5			1,125			
14	5,940	90	850	16			1,190			
15	4,950	75	710	18			1,090	2/3		
16	4,055	61	575	20			970	1/3		All

BR = burner data
B = boiler data
G= gas analysis grid data
FO = furnace observations
FA = fly ash sample
FL = fuel sample

IP7_039846

AIR MONITOR CORPORATION

TRANSMITTER SPAN/MASS FLOW CALCULATIONS

PROJECT: **Interstate Paper**
WORK ORDER: _____ *REV:* _____
TAG(S): _____

Given Information:

Fluid:	AIR	
Standard Temperature (T_{std}):	68	(deg. F)
Standard Barometric Pressure (P_{std}):	29.921	(in. Hg)
Air Temperature (T):	750	**(deg. F)**
Stack/Duct Pressure (P_g):	0.00	(in. w.c.)
Actual Barometric Pressure (P_{bar}):	25.500	**(in. Hg)**
Air Density at Standard Conditions, DRY:	0.07513	(lbs/ft^3)
Duct Shape:	RECT	
Duct Height:	75.000	**(in.)**
Duct Width:	120.000	**(in.)**

% H_2O (by volume): 0.00 (%, by volume)

Maximum Flow: 387,000 (lb/hr)
Wet (Wet/Dry)

Square Root Extraction? (Yes/No): Yes

Output: 4-20 mADC

Calculations:

Duct Area (A_s):	62.500	(ft^2)
Maximum Actual Velocity:	3,694	(AFPM)
Absolute Duct Pressure (P_s):	25.500	(in. Hg)
Dry Mole Fraction of Duct (Mfd):	1.000	
Dry Molecular Wt. Of Air (Md):	28.965	(lb/lb-mole)
Wet Molecular Wt. Of Air (Ms):	28.965	(lb/lb-mole)
Air Density at Standard Conditions, WET:	0.07513	(lbs/ft^3)
Air Density at Actual Conditions, WET:	0.02794	(lbs/ft^3)

K-Factor: OFF

% FLOW (%)	Diff. Press. (in. w.c.)	Output (mADC)	Actual Flow (ACFM)	Std.Flow/Dry (SCFM)	Std.Flow/Wet (SCFM)	MassFlow/Dry (Lbs/Hr)	MassFlow/Wet (Lbs/Hr)
0	0.0000	4.00	0	0	0	0	0
10	0.0032	5.60	23,085	8,585	8,585	38,700	38,700
20	0.0127	7.20	46,170	17,170	17,170	77,400	77,400
30	0.0285	8.80	69,255	25,755	25,755	116,100	116,100
40	0.0506	10.40	92,340	34,340	34,340	154,800	154,800
50	0.0791	12.00	115,427	42,926	42,926	193,500	193,500
60	0.1139	13.60	138,512	51,511	51,511	232,200	232,200
70	0.1551	15.20	161,597	60,096	60,096	270,900	270,900
80	0.2026	16.80	184,682	68,681	68,681	309,600	309,600
90	0.2564	18.40	207,767	77,266	77,266	348,300	348,300
100	0.3165	20.00	230,852	85,851	85,851	387,000	387,000

Transmitter:	CAMM	Power (voltage/type):	24VAC
Flow Element:	VOLU-probe/SS w/Temp Probe	Power Configuration:	4-Wire
Transmitter Maximum Range:	0-387,000 lbs/hr	Square Root:	ON
Temperature Range:	0 to 750 DegF.	Density Compensation:	ON
Pressure Comp. Range:	24.00 to 32.00in. Hg		

Temperature Sensor: 3-Pt. Type "T" T/C Probe with remote 4-20mADC temperature transmitter.

Display Line #1:	0-387,000 lbs/hr	(FLOW)
Display Line #2:	0 to 750 DegF.	(TEMPERATURE)
Display Line #3:	24.00 to 32.00in. Hg	(ABSOLUTE PRESSURE)
Display Line #4:	0.000 to .7528 IN w.c.	(DIFFERENTIAL PRESSURE)

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AIR MONITOR CORPORATION

K-FACTOR FLOW WORKSHEET

PROJECT: _____
WORK ORDER: _____ *REV:* _____
TAG(S): _____

Station: CA Station w/Temp Probe
Transmitter Model: MASS-tron II
Traverse Probe Type:
Test Technician:

Given:

Point #	*% Flow*	*Measured*	*Reference*
Low	50	116,570	143,149
Mid	71	179,780	219,878
*High**	100	237,770	287,479

Transmitter Full Scale (Calibrated): 387,000
Engineering Units: SCFM

K-FACTOR - **3 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING **WITH BIAS**
(K-Factor Gain and Bias applied prior to square root)

Point	*Measured*	*Reference*	*Eng. Units*	*% Error*	*Correceted Flow*	*Eng. Units*	*% Error*
Low	116,570	143,149	SCFM	-18.57	143,704	SCFM	0.39
Mid	179,780	219,878	SCFM	-18.24	219,023	SCFM	-0.39
High	237,770	287,479	SCFM	-17.29	288,593	SCFM	0.39

Uncorrected Full Scale = 387,000 SCFM
Corrected Full Scale, Using Original Max DP = 468,257 SCFM
Gain = 1.45846
% Bias = 0.55575

K-FACTOR - **3 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING AND **BIAS = 0**
(K-Factor Gain applied prior to square root)

				(Gain 1) 1.50190		*(Gain 2)* 1.47868		*(Gain 3)* 1.48465	
Point	*Measured*	*Reference*	*% Error*	*M1*	*% Error*	*M2*	*% Error*	*M3*	*% Error*
Low	116,570	143,149	-18.6	142,859	-0.2	141,750	-1.0	142,036	-0.8
Mid	179,780	219,878	-18.2	220,324	0.2	218,614	-0.6	219,055	-0.4
High	237,770	287,479	-17.3	291,392	1.4	289,131	0.6	289,714	0.8

K-FACTOR - **2 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING AND **BIAS = 0**
(K-Factor Gain applied prior to square root)

Point #	*Measured*	*Reference*	*Eng. Units*	*% Error*	*Corrected Flow*	*Eng. Units*	*% Error*
1	116,570	143,149	SCFM	-18.57	142,859	SCFM	-0.20
2	179,780	219,878	SCFM	-18.24	220,324	SCFM	0.20

Uncorrected Full Scale = 387,000 SCFM
Corrected Full Scale = 474,276 SCFM
(using max. DP)
Gain = 1.50190

* "High" value not used in 2-pt.correction.

Custom Transmitter: (Not supplied by Air Monitor)
Custom Flow Element: (Not supplied by Air Monitor)

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K-FACTOR FLOW WORKSHEET

PROJECT: _____

WORK ORDER: _____ *REV:* _____

TAG(S): _____

Station: CA Station w/Temp Probe

Transmitter Model: MASS-tron II

Traverse Probe Type:

Test Technician:

Given:

Point #	*% Flow*	*Measured*	*Reference*
Low	50	116,570	143,149
Mid	71	179,780	219,878
*High**	100	237,770	286,216

Transmitter Full Scale (Calibrated): 387,000

Engineering Units: SCFM

K-FACTOR - **3 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING **WITH BIAS**
(K-Factor Gain and Bias applied prior to square root)

Point	*Measured*	*Reference*	*Eng. Units*	*% Error*	*Correceted Flow*	*Eng. Units*	*% Error*
Low	116,570	143,149	SCFM	-18.57	143,941	SCFM	0.55
Mid	179,780	219,878	SCFM	-18.24	218,655	SCFM	-0.56
High	237,770	286,216	SCFM	-16.93	287,799	SCFM	0.55

Uncorrected Full Scale = 387,000 SCFM

Corrected Full Scale, Using Original Max DP = 466,547 SCFM

Gain = 1.44622

% Bias = 0.71236

K-FACTOR - **3 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING AND **BIAS = 0**
(K-Factor Gain applied prior to square root)

				(Gain 1) 1.50190		*(Gain 2)* 1.47214		*(Gain 3)* 1.47807	
Point	*Measured*	*Reference*	*% Error*	*M1*	*% Error*	*M2*	*% Error*	*M3*	*% Error*
Low	116,570	143,149	-18.6	142,859	-0.2	141,437	-1.2	141,721	-1.0
Mid	179,780	219,878	-18.2	220,324	0.2	218,130	-0.8	218,569	-0.6
High	237,770	286,216	-16.9	291,392	1.8	288,491	0.8	289,071	1.0

K-FACTOR - **2 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING AND **BIAS = 0**
(K-Factor Gain applied prior to square root)

Point #	*Measured*	*Reference*	*Eng. Units*	*% Error*	*Corrected Flow*	*Eng. Units*	*% Error*
1	116,570	143,149	SCFM	-18.57	142,859	SCFM	-0.20
2	179,780	219,878	SCFM	-18.24	220,324	SCFM	0.20

Uncorrected Full Scale = 387,000 SCFM

Corrected Full Scale = 474,276 SCFM
(using max. DP)

Gain = 1.50190

* "High" value not used in 2-pt.correction.

Custom Transmitter: (Not supplied by Air Monitor)

Custom Flow Element: (Not supplied by Air Monitor)

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K-FACTOR FLOW WORKSHEET

PROJECT: _____
WORK ORDER: _____ *REV:* _____
TAG(S): _____

Station: CA Station w/Temp Probe
Transmitter Model: MASS-tron II
Traverse Probe Type:
Test Technician:

Given:

Point #	*% Flow*	*Measured*	*Reference*
Low	50	161,455	190,991
Mid	71	233,005	261,747
*High**	100	293,141	326,688

Transmitter Full Scale (Calibrated): 387,000
Engineering Units: SCFM

K-FACTOR - **3 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING **WITH BIAS**
(K-Factor Gain and Bias applied prior to square root)

Point	*Measured*	*Reference*	*Eng. Units*	*% Error*	*Correceted Flow*	*Eng. Units*	*% Error*
Low	161,455	190,991	SCFM	-15.46	190,239	SCFM	-0.39
Mid	233,005	261,747	SCFM	-10.98	262,773	SCFM	0.39
High	293,141	326,688	SCFM	-10.27	325,402	SCFM	-0.39

Uncorrected Full Scale = 387,000 SCFM
Corrected Full Scale, Using Original Max DP = 424,509 SCFM
Gain = 1.16423
% Bias = 3.90072

K-FACTOR - **3 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING AND **BIAS = 0**
(K-Factor Gain applied prior to square root)

Point	*Measured*	*Reference*	*% Error*	*(Gain 1)* 1.32797 *M1*	*% Error*	*(Gain 2)* 1.25189 *M2*	*% Error*	*(Gain 3)* 1.31714 *M3*	*% Error*
Low	161,455	190,991	-15.5	186,057	-2.6	180,649	-5.4	185,297	-3.0
Mid	233,005	261,747	-11.0	268,509	2.6	260,704	-0.4	267,412	2.2
High	293,141	326,688	-10.3	337,808	3.4	327,989	0.4	336,428	3.0

K-FACTOR - **2 POINTS** - BEST FIT WHERE ERRORS ARE EQUAL IN % OF READING AND **BIAS = 0**
(K-Factor Gain applied prior to square root)

Point #	*Measured*	*Reference*	*Eng. Units*	*% Error*	*Corrected Flow*	*Eng. Units*	*% Error*
1	161,455	190,991	SCFM	-15.46	186,057	SCFM	-2.58
2	233,005	261,747	SCFM	-10.98	268,509	SCFM	2.58

Uncorrected Full Scale = 387,000 SCFM
Corrected Full Scale = 445,969 SCFM
(using max. DP)
Gain = 1.32797

* "High" value not used in 2-pt.correction.

Custom Transmitter: (Not supplied by Air Monitor)
Custom Flow Element: (Not supplied by Air Monitor)

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IGS02-14 OFA PROJECT
CCS SOFTWARE
DBC CONFIGURATION

DFILE	PAGL	TYPE	TAGN	AUTMN	BIAS	BLKTP	CUALM	CUALM1	CUALM2	CUALM3	DB	DB1
DB1	L826	IND	COAXI156A	M		IOBK	0				2	
DB1	L825	IND	COAXI157A	M		IOBK	0				2	
DB1	L828	IND	COAXI158A	M		IOBK	0				2	
DB1	L827	IND	COAXI159A	M		IOBK	0				2	
DB1	L846	IND	COAXI160A	M		IOBK	0				2	
DB1	L856	IND	COAXI161A	M		IOBK	0				2	
DB1	L845	IND	COAXI162A	M		IOBK	0				2	
DB1	L855	IND	COAXI163A	M		IOBK	0				2	
DB1	L848	IND	COAXI164A	M		IOBK	0				2	
DB1	L815	MID	COAXI172B					0	0	0		2
DB1	L813	MID	COAXI175A					0	0	0		2
DB1	L814	MID	COAXI177A					0	0	0		2
DB1	L817	MID	COAXI179A					0	0	0		2
DB1	L818	IND	COAXI181A	M		CHAR	0				2	
DB1	L858	IND	COAXI182A	M		IOBK	0				2	
DB1	L816	IND	COAXI182B	M		CALC	0				2	
DB1	L847	IND	COAXI183A	M		IOBK	0				2	
DB1	L857	IND	COAXI184A	M		IOBK	0				2	
DB1	L811	ESL	SGBKS155A	M	0	PID	0				2	
DB1	L822	BIS	SGBKS156A	M		AMB	7				2	
DB1	L831	BIS	SGBKS157A	M		AMB	7				2	
DB1	L821	BIS	SGBKS158A	M		AMB	7				2	
DB1	L832	BIS	SGBKS159A	M		AMB	7				2	
DB1	L824	BIS	SGBKS160A	M		AMB	7				2	
DB1	L833	BIS	SGBKS161A	M		AMB	7				2	
DB1	L823	BIS	SGBKS162A	M		AMB	7				2	
DB1	L834	BIS	SGBKS163A	M		AMB	7				2	
DB1	L842	BIS	SGBKS164A	M		AMB	0				2	
DB1	L852	BIS	SGBKS165A	M		AMB	0				2	
DB1	L841	BIS	SGBKS166A	M		AMB	0				2	
DB1	L851	BIS	SGBKS167A	M		AMB	0				2	
DB1	L844	BIS	SGBKS168A	M		AMB	0				2	
DB1	L854	BIS	SGBKS169A	M		AMB	0				2	
DB1	L843	BIS	SGBKS170A	M		AMB	0				2	
DB1	L853	BIS	SGBKS171A	M		AMB	0				2	
DB1	L812	BIS	SGBKS182A	M		AMB	0				2	

IGS02-14 OFA PROJECT
CCS SOFTWARE
DBC CONFIGURATION