

Nebraska Public Power District

COOPER NUCLEAR STATION
P.O. BOX 98, BROWNVILLE, NEBRASKA 68321
TELEPHONE (402) 825-3811

CNSS887288

June 8, 1988

Ramon Azua
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive
Arlington, TX 76011

Dear Mr. Azua:

Enclosed, please find the data listings for the 1988 Cooper Primary Containment Integrated Leak Rate Test. The listings contain the environmental and mass loss reports for the temperature stabilization period, the type A test, and the verification test. Also included are the mass point and total time reports for the type A and verification tests and instrument calibration records per your request. All pertinent information is included to perform an independent ILRT calculation.

As discussed in the May 27, 1988 NRC Exit meeting, Surveillance Procedure 6.3.1.3 was amended through the process of a Temporary Procedure Change to include the replacement of caps on the Post Test Manual Valve Line-up which were previously removed to provide vent paths. The replacement of the caps was also verified by the Test Director.

If additional information is required or a question arises, please contact me.

Sincerely,

G. R. Horn
Division Manager of
Nuclear Operations
Cooper Nuclear Station

GRH/RCD/kg
Attachments

9202120237 890608
PDR ADDCK 05000298
PDR

DIST. PER: KATHY GARDIN
RGN III

110088

A017
11

TEMPERATURE STABILIZATION
ENVIRONMENT LISTING

DATE - 06-06-1988

TIME - 09:44:42

REC NUM	DATE	TIME	TEMP	VAPOR PRESSURE	CORRECT. PRESSURE	RELATIVE HUMIDITY	AIR DENSITY	PSIA/HR VARIANCE
52	28	300	549.417	0.6167	72.5157	99.29	0.3563	0.00000
53	28	315	548.927	0.6289	72.4415	92.46	0.3562	-0.29678
54	28	330	548.645	0.6233	72.4063	92.45	0.3562	-0.14078
55	28	345	548.440	0.6119	72.3837	91.35	0.3562	-0.09058
56	28	400	548.263	0.5892	72.3756	88.45	0.3563	-0.03241
57	28	415	548.112	0.5860	72.3500	88.38	0.3563	-0.10220
58	28	430	547.984	0.5947	72.3273	90.06	0.3563	-0.09106
59	28	445	547.848	0.5786	72.3190	87.99	0.3563	-0.03299
60	28	500	547.737	0.6055	72.2677	92.41	0.3561	-0.20541
61	28	515	547.639	0.6040	72.2459	92.47	0.3561	-0.08691
62	28	530	547.532	0.6020	72.2264	92.47	0.3561	-0.07806
63	28	545	547.431	0.6006	72.2066	92.55	0.3560	-0.07928
64	28	600	547.349	0.5987	72.1878	92.49	0.3560	-0.07544
65	28	615	547.250	0.5961	72.1703	92.38	0.3560	-0.06859
66	28	630	547.174	0.5950	72.1518	92.44	0.3559	-0.07425
67	28	645	547.089	0.5931	72.1353	92.39	0.3559	-0.06583
68	28	700	547.010	0.5910	72.1186	92.28	0.3559	-0.06665
69	28	715	546.938	0.5883	72.1041	92.08	0.3558	-0.05817
70	28	730	546.862	0.5873	72.0875	92.14	0.3558	-0.06641
71	28	745	546.801	0.5866	72.0710	92.20	0.3558	-0.06580
72	28	800	546.735	0.5841	72.0579	92.00	0.3557	-0.05258
73	28	815	546.672	0.5815	72.0477	91.78	0.3557	-0.04083
74	28	830	546.619	0.5797	72.0375	91.65	0.3557	-0.04092
75	28	845	546.561	0.5788	72.0280	91.67	0.3557	-0.03778
76	28	900	546.506	0.5817	72.0147	92.29	0.3557	-0.05322
77	28	915	546.450	0.5773	72.0091	91.76	0.3557	-0.02258
78	28	930	546.414	0.5779	71.9993	91.95	0.3557	-0.03888
79	28	945	546.364	0.5773	71.9903	92.01	0.3556	-0.03632
80	28	1000	546.328	0.5777	71.9811	92.18	0.3556	-0.03671
81	28	1015	546.292	0.5764	71.9740	92.07	0.3556	-0.02823

TYPE A TEST
ENVIRONMENT LISTING

DATE - 06-06-1988

TIME - 09:24:54

REC NUM	DATE	TIME	TEMP	VAPOR PRESSURE	CORRECT. PRESSURE	RELATIVE HUMIDITY	AIR DENSITY	PSIA/HR VARIANCE
81	28	1015	546.292	0.5764	71.9740	92.07	0.3556	0.00000
82	28	1030	546.262	0.5764	71.9656	92.16	0.3556	-0.03378
83	28	1045	546.234	0.5758	71.9584	92.11	0.3556	-0.02866
84	28	1100	546.197	0.5756	71.9512	92.22	0.3556	-0.02875
85	28	1115	546.161	0.5755	71.9441	92.32	0.3556	-0.02672
86	28	1130	546.135	0.5747	71.9373	92.25	0.3555	-0.02682
87	28	1145	546.100	0.5738	71.9314	92.22	0.3555	-0.02374
88	28	1200	546.073	0.5727	71.9261	92.11	0.3555	-0.02118
89	28	1215	546.053	0.5715	71.9205	91.99	0.3555	-0.02261
90	28	1230	546.029	0.5716	71.9144	92.06	0.3555	-0.02414
91	28	1245	546.005	0.5706	71.9090	91.98	0.3555	-0.02182
92	28	1300	545.987	0.5702	71.9034	91.98	0.3555	-0.02219
93	28	13 5	545.965	0.5704	71.8980	92.06	0.3555	-0.02170
94	28	1330	545.944	0.5694	71.8934	91.97	0.3554	-0.01852
95	28	1345	545.922	0.5690	71.8882	91.97	0.3554	-0.02081
96	28	1400	545.910	0.5688	71.8836	91.97	0.3554	-0.01646
97	28	1415	545.907	0.5686	71.8786	91.95	0.3554	-0.01990
98	28	1430	545.899	0.5680	71.8744	91.87	0.3554	-0.01675
99	28	1445	545.878	0.5676	71.8704	91.87	0.3554	-0.01599
100	28	1500	545.864	0.5678	71.8654	91.94	0.3554	-0.01989
101	28	1515	545.857	0.5670	71.8614	91.84	0.3553	-0.01614
102	28	1530	545.851	0.5658	71.8586	91.66	0.3553	-0.01120
103	28	1545	545.824	0.5641	71.8559	91.45	0.3553	-0.01053
104	28	1600	545.817	0.5632	71.8524	91.33	0.3553	-0.01410
105	28	1615	545.811	0.5624	71.8492	91.22	0.3553	-0.01297
106	28	1630	545.803	0.5627	71.8449	91.28	0.3553	-0.01697
107	28	1645	545.802	0.5607	71.8433	90.97	0.3553	-0.00665
108	28	1700	545.792	0.5597	71.8407	90.83	0.3553	-0.01013
109	28	1715	545.785	0.5592	71.8376	90.77	0.3553	-0.01245
110	28	1730	545.781	0.5580	71.8352	90.58	0.3553	-0.00952
111	28	1745	545.780	0.5580	71.8320	90.60	0.3552	-0.01303
112	28	1800	545.763	0.5584	71.8280	90.70	0.3552	-0.01578
113	28	1815	545.760	0.5576	71.8260	90.58	0.3552	-0.00821
114	28	1830	545.754	0.5574	71.8230	90.57	0.3552	-0.01187
115	28	1845	545.759	0.5571	71.8205	90.51	0.3552	-0.01013
116	28	1900	545.751	0.5570	71.8182	90.51	0.3552	-0.00912
117	28	1915	545.750	0.5574	71.8150	90.58	0.3552	-0.01279
118	28	1930	545.735	0.5564	71.8136	90.46	0.3552	-0.00552
119	28	1945	545.738	0.5552	71.8124	90.25	0.3552	-0.00473
120	28	2000	545.732	0.5558	71.8090	90.37	0.3552	-0.01373
121	28	2015	545.734	0.5548	71.8076	90.21	0.3552	-0.00568
122	28	2030	545.726	0.5549	71.8048	90.23	0.3551	-0.01111
123	28	2045	545.728	0.5552	71.8020	90.28	0.3551	-0.01114
124	28	2100	545.718	0.5554	71.7990	90.35	0.3551	-0.01224
125	28	2115	545.713	0.5554	71.7962	90.36	0.3551	-0.01105
126	28	2130	545.718	0.5555	71.7941	90.35	0.3551	-0.00827
127	28	2145	545.709	0.5551	71.7917	90.31	0.3551	-0.00852
128	28	2200	545.703	0.5543	71.7901	90.21	0.3551	-0.00662
129	28	2215	545.699	0.5537	71.7883	90.12	0.3551	-0.00714
130	28	2230	545.696	0.5528	71.7868	89.98	0.3551	-0.00598

TYPE A TEST
ENVIRONMENT LISTING

DATE - 06-06-1988

TIME - 09:24:58

REC NUM	DATE	TIME	TEMP	VAPOR PRESSURE	CORRECT. PRESSURE	RELATIVE HUMIDITY	AIR DENSITY	PSIA/HR VARIANCE
131	28	2245	545.705	0.5540	71.7832	90.15	0.3551	-0.01437
132	28	2300	545.689	0.5537	71.7807	90.16	0.3551	-0.01019
133	28	2315	545.587	0.5529	71.7787	90.03	0.3550	-0.00803
134	28	2330	545.679	0.5536	71.7756	90.16	0.3550	-0.01215
135	28	2345	545.674	0.5534	71.7734	90.15	0.3550	-0.00909
136	29	0	545.670	0.5534	71.7706	90.16	0.3550	-0.01093
137	29	15	545.663	0.5532	71.7690	90.15	0.3550	-0.01056
138	29	30	545.654	0.5527	71.7661	90.09	0.3550	-0.00742
139	29	45	545.647	0.5528	71.7632	90.13	0.3550	-0.01190
140	29	100	545.658	0.5532	71.7608	90.16	0.3550	-0.00937
141	29	115	545.640	0.5530	71.7578	90.16	0.3550	-0.01205
142	29	130	545.629	0.5523	71.7553	90.09	0.3550	-0.00986
143	29	145	545.630	0.5543	71.7516	90.43	0.3549	-0.01474
144	29	200	545.624	0.5538	71.7490	90.36	0.3549	-0.01074
145	29	215	545.615	0.5540	71.7464	90.40	0.3549	-0.01007
146	29	230	545.611	0.5567	71.7413	90.86	0.3549	-0.02048
147	29	245	545.600	0.5583	71.7365	91.17	0.3549	-0.01944
148	29	300	545.593	0.5581	71.7343	91.15	0.3549	-0.00864
149	29	315	545.581	0.5547	71.7349	90.62	0.3549	0.00244
150	29	330	545.579	0.5545	71.7327	90.59	0.3549	-0.00873
151	29	345	545.572	0.5536	71.7308	90.48	0.3549	-0.00784
152	29	400	545.559	0.5540	71.7272	90.58	0.3549	-0.01447
153	29	415	545.551	0.5546	71.7242	90.70	0.3549	-0.01190
154	29	430	545.548	0.5545	71.7211	90.69	0.3548	-0.01251
155	29	445	545.545	0.5535	71.7197	90.53	0.3548	-0.00945
156	29	500	545.523	0.5535	71.7169	90.60	0.3548	-0.01141
157	29	515	545.519	0.5537	71.7139	90.63	0.3548	-0.01194
158	29	530	545.511	0.5536	71.7112	90.65	0.3548	-0.01089
159	29	545	545.503	0.5534	71.7086	90.64	0.3548	-0.01059
160	29	600	545.499	0.5533	71.7056	90.63	0.3548	-0.01202
161	29	615	545.498	0.5529	71.7039	90.58	0.3548	-0.00877
162	29	630	545.480	0.5529	71.7015	90.55	0.3548	-0.00928
163	29	645	545.471	0.5520	71.6992	90.50	0.3548	-0.00934
164	29	700	545.475	0.5519	71.6965	90.48	0.3548	-0.01093
165	29	717	545.461	0.5518	71.6934	90.49	0.3548	-0.01071
166	29	730	545.457	0.5519	71.6909	90.52	0.3548	-0.01201
167	29	745	545.449	0.5519	71.6885	90.55	0.3548	-0.00977
168	29	800	545.438	0.5517	71.6859	90.55	0.3547	-0.01047
169	29	815	545.429	0.5508	71.6844	90.43	0.3547	-0.00592
170	29	830	545.423	0.5513	71.6811	90.53	0.3547	-0.01321
171	29	845	545.419	0.5507	71.6789	90.43	0.3547	-0.00858
172	29	900	545.413	0.5505	71.6763	90.42	0.3547	-0.01053
173	29	915	545.406	0.5507	71.6741	90.48	0.3547	-0.00900
174	29	930	545.393	0.5506	71.6714	90.48	0.3547	-0.01044
175	29	945	545.405	0.5502	71.6694	90.39	0.3547	-0.00809
176	29	1000	545.391	0.5498	71.6678	90.37	0.3547	-0.00638
177	29	1015	545.389	0.5499	71.6657	90.39	0.3547	-0.00848

VERIFICATION TEST
 ENVIRONMENT LISTING

 DATE - 06-06-1986

 TIME - 09:37:40

REC NUM	DATE	TIME	TEMP	VAPOR PRESSURE	CORRECT. PRESSURE	RELATIVE HUMIDITY	AIR DENSITY	PSIA/HR VARIANCE
178	29	1030	545.383	0.5495	71.6597	90.34	0.3547	0.00000
179	29	1045	545.384	0.5495	71.6529	90.35	0.3546	-0.02750
180	29	1100	545.383	0.5499	71.6461	90.40	0.3546	-0.02692
181	29	1115	545.377	0.5493	71.6404	90.32	0.3546	-0.02310
182	29	1130	545.377	0.5496	71.6340	90.38	0.3545	-0.02557
183	29	1145	545.373	0.5495	71.6277	90.37	0.3545	-0.02493
184	29	1200	545.377	0.5493	71.6219	90.33	0.3545	-0.02325
185	29	1215	545.380	0.5493	71.6169	90.18	0.3544	-0.02014
186	29	1230	545.372	0.5493	71.6103	90.35	0.3544	-0.02646
187	29	1245	545.377	0.5480	71.6052	90.11	0.3544	-0.02020
188	29	1300	545.394	0.5488	71.5984	90.20	0.3543	-0.02728
189	29	1315	545.387	0.5480	71.5932	90.09	0.3543	-0.02097
190	29	1330	545.393	0.5478	71.5870	90.03	0.3543	-0.02127
191	29	1345	545.392	0.5485	71.5816	90.14	0.3543	-0.02521
192	29	1400	545.392	0.5476	71.5764	90.01	0.3542	-0.02078
193	29	1415	545.392	0.5476	71.5704	90.00	0.3542	-0.02368
194	29	1430	545.411	0.5479	71.5649	90.00	0.3542	-0.02228

REC	TIME	NUM	DELTA	(HOURS)	CONT	AIR	MASS	INCR	MASS	LOSS	(1 HR)	MASS	LOSS	(x 24)
52	0.00	86409.070	0.000		0.000	0.000			0.000		0.000	0.000		0.000
53	0.25	86397.797	-11.273		2.406	0.000			0.000		0.000	0.000		0.000
54	0.50	86400.203	5.273		0.000	0.000			0.000		0.000	0.000		0.000
55	0.75	86405.477	5.273		0.000	0.000			0.000		0.000	0.000		0.000
56	1.00	86423.695	18.219		-14.625	-19.109			-14.625		-14.625	-351.000		-351.000
57	1.25	85416.906	-6.789		-9.718	-383.438			-9.718		-383.438	-458.625		-458.625
58	1.50	86409.922	-5.984		-15.977	-233.250			-5.984		-15.977	-458.625		-458.625
59	1.75	86421.453	11.531		-43.613	-105.313			11.531		-43.613	-383.438		-383.438
60	2.00	86377.641	-43.613		46.055	1105.313			-43.613		46.055	1105.313		1105.313
61	2.25	86367.102	-10.939		49.805	1195.313			-10.939		49.805	1195.313		1195.313
62	2.50	86360.683	-6.414		49.234	1181.625			-6.414		49.234	1181.625		1181.625
63	2.75	86352.828	-7.859		68.625	1101.625			-7.859		68.625	1101.625		1101.625
64	3.00	86343.266	-9.563		34.375	825.000			-9.563		34.375	825.000		825.000
65	3.25	86338.039	-5.227		29.063	697.500			-5.227		29.063	697.500		697.500
66	3.50	86327.852	-10.188		32.836	788.063			-10.188		32.836	788.063		788.063
67	3.75	86321.625	-6.227		31.203	748.874			-6.227		31.203	748.874		748.874
68	4.00	86314.102	-7.523		29.164	699.938			-7.523		29.164	699.938		699.938
69	4.25	86308.102	-6.000		29.938	718.500			-6.000		29.938	718.500		718.500
70	4.50	86300.203	-7.898		27.648	663.563			-7.898		27.648	663.563		663.563
71	4.75	86290.018	-10.188		31.609	758.625			-10.188		31.609	758.625		758.625
72	5.00	86284.773	-5.242		29.328	703.875			-5.242		29.328	703.875		703.875
73	5.25	86282.555	-2.219		25.547	613.125			-2.219		25.547	613.125		613.125
74	5.50	86278.531	-4.023		21.672	520.125			-4.023		21.672	520.125		520.125
75	5.75	86276.508	-2.023		19.108	324.188			-2.023		19.108	324.188		324.188
76	6.00	86269.242	-7.266		16.531	372.750			-7.266		16.531	372.750		372.750
77	6.25	86271.203	1.961		11.352	272.438			1.961		11.352	272.438		272.438
78	6.50	86265.336	-5.867		13.195	316.628			-5.867		13.195	316.628		316.628
79	6.75	86262.250	-3.086		14.258	342.188			-3.086		14.258	342.188		342.188
80	7.00	86256.977	-5.273		12.266	294.375			-5.273		12.266	294.375		294.375
81	7.25	86254.242	-2.734		16.961	407.063			-2.734		16.961	407.063		407.063

TYPE A TEST
MASS LOSS

DATE - 06-06-1968

TIME - 10:55:19

REC NUM	TIME DELTA (HOURS)	CONT AIR MASS	MASS LOSS INCR	MASS LOSS (1 HR)	MASS LOSS (x 24)
81	0.00	86254.242	0.000	0.000	0.000
82	0.25	86248.898	-5.344	0.000	0.000
83	0.50	86244.695	-4.203	0.000	0.000
84	0.75	86241.914	-2.781	0.000	0.000
85	1.00	86239.039	-2.875	15.203	364.875
86	1.25	86235.109	-3.930	13.789	330.938
87	1.50	86233.508	-1.602	11.188	268.500
88	1.75	86231.312	-2.195	10.602	254.438
89	2.00	86227.750	-3.563	11.269	270.938
90	2.25	86224.328	-3.422	10.781	258.750
91	2.50	86221.500	-2.828	12.008	288.188
92	2.75	86217.820	-3.680	13.492	323.813
93	3.00	86214.672	-3.148	13.078	313.875
94	3.25	86212.438	-2.234	11.881	285.375
95	3.50	86209.680	-2.758	11.820	283.688
96	3.75	86206.086	-3.594	11.734	281.625
97	4.00	86200.656	-5.430	14.016	336.375
98	4.25	86196.883	-3.773	15.555	373.313
99	4.50	86195.406	-1.477	14.273	342.563
100	4.75	86191.602	-3.805	14.484	347.625
101	5.00	86187.867	-3.734	12.789	306.938
102	5.25	86185.414	-2.453	11.469	275.250
103	5.50	86186.555	1.141	8.852	212.438
104	5.75	86183.344	-3.211	8.258	198.188
105	6.00	86180.481	-2.853	7.406	177.750
106	6.25	86176.562	-3.898	8.852	212.438
107	6.50	86174.766	-1.797	11.789	282.938
108	6.75	86173.367	-1.398	9.977	239.438
109	7.00	86170.688	-2.680	9.773	234.563
110	7.25	86168.484	-2.203	8.078	193.875
111	7.50	86164.742	-3.742	10.023	240.563
112	7.75	86162.641	-2.102	10.727	257.438
113	8.00	86160.664	-1.977	10.023	240.563
114	8.25	86158.117	-2.547	10.367	248.813
115	8.50	86154.203	-3.914	10.539	252.938
116	8.75	86152.750	-1.453	9.891	237.375
117	9.00	86149.156	-3.594	11.508	276.188
118	9.25	86149.758	0.602	8.359	200.625
119	9.50	86147.984	-1.773	6.219	149.250
120	9.75	86144.773	-3.211	7.977	191.438
121	10.00	86142.734	-2.039	6.422	154.125
122	10.25	86140.719	-2.016	9.039	216.938
123	10.50	86136.945	-3.773	11.039	264.938
124	10.75	86134.875	-2.070	9.898	237.563
125	11.00	86132.461	-2.414	10.273	246.563
126	11.25	86129.359	-3.102	11.359	272.625
127	11.50	86127.608	-1.750	9.336	224.063
128	11.75	86126.688	-0.922	8.188	196.500
129	12.00	86125.172	-1.516	7.289	174.938
130	12.25	86123.844	-1.328	5.516	132.375

TYPE A TEST
MASS LOSS

DATE - 06-06-1988

TIME - 10:55:22

REC NUM	TIME DELTA (HOURS)	CONT AIR MASS	MASS LOSS INCR	MASS LOSS (1 HR)	MASS LOSS (x 24)
131	12.50	86118.102	-5.742	9.508	228.188
132	12.75	86117.539	-0.563	9.148	219.563
133	13.00	86115.484	-2.055	9.688	232.500
134	13.25	86113.094	-2.391	10.750	258.000
135	13.50	86111.141	-1.953	8.961	167.063
136	13.75	86108.562	-2.578	8.977	215.438
137	14.00	86106.453	-2.109	9.031	216.750
138	14.25	86105.680	-0.773	7.414	177.938
139	14.50	86103.211	-2.469	7.930	190.313
140	14.75	86098.664	-4.547	9.888	237.563
141	15.00	86097.906	-0.758	8.547	205.125
142	15.25	86096.688	-1.219	8.992	215.813
143	15.50	86091.984	-4.703	11.227	269.438
144	15.75	86089.727	-2.258	8.938	214.500
145	16.00	86088.094	-1.633	9.813	235.500
146	16.25	86082.617	-5.477	14.070	337.688
147	16.50	86078.625	-3.992	13.359	320.625
148	16.75	86077.070	-1.555	12.656	303.750
149	17.00	86079.633	2.563	8.461	203.063
150	17.25	86077.328	-2.305	5.289	126.938
151	17.50	86076.172	-1.156	2.453	58.875
152	17.75	86073.836	-2.336	3.234	77.625
153	18.00	86071.570	-2.266	8.063	193.500
154	18.25	86068.211	-3.359	9.117	218.813
155	18.50	86067.156	-1.055	9.016	216.375
156	18.75	86067.164	0.008	6.672	160.125
157	19.00	86064.273	-2.891	7.297	175.125
158	19.25	86062.297	-1.977	5.914	141.938
159	19.50	86060.336	-1.961	6.820	163.688
160	19.75	86057.445	-2.891	9.719	233.250
161	20.00	86055.500	-1.945	8.773	210.563
162	20.25	86055.547	0.047	6.750	162.000
163	20.50	86054.180	-1.367	6.156	147.750
164	20.75	86050.266	-3.914	7.180	172.313
165	21.03	86048.773	-1.492	6.727	161.438
166	21.24	86046.398	-2.375	9.148	219.563
167	21.49	86044.805	-1.594	9.375	225.000
168	21.74	86043.352	-1.453	6.914	165.938
169	21.99	86043.109	-0.242	7.156	171.750
170	22.24	86040.086	-3.023	6.313	151.500
171	22.49	86038.062	-2.023	6.742	161.813
172	22.74	86035.867	-2.195	7.484	179.625
173	22.99	86034.250	-1.617	8.859	212.625
174	23.24	86033.117	-1.133	6.969	167.250
175	23.49	86028.836	-4.281	9.227	221.438
176	23.74	86028.219	0.383	6.648	159.563
177	23.99	86026.875	-2.344	7.375	177.000

VERIFICATION TEST

MASS LOSS

DATE - 06-06-1988

TIME - 10:59:18

REC NUM	TIME DELTA (HOURS)	CONT AIR MASS	MASS LOSS INCR	MASS LOSS (1 HR)	MASS LOSS (x 24)
178	0.00	85020.727	0.000	0.000	0.000
179	0.25	85012.289	-8.438	0.000	0.000
180	0.50	85004.297	-7.992	0.000	0.000
181	0.75	85998.430	-5.867	0.000	0.000
182	1.00	85990.664	-7.766	30.063	721.500
183	1.25	85983.914	-6.750	28.375	681.000
184	1.50	85976.297	-7.617	28.000	672.000
185	1.75	85969.703	-6.594	28.727	689.438
186	2.00	85963.023	-6.680	27.641	663.375
187	2.25	85956.242	-6.781	27.672	664.125
188	2.50	85945.242	-11.000	31.055	745.313
189	2.75	85940.102	-5.141	29.602	710.438
190	3.00	85932.797	-7.305	30.227	725.438
191	3.25	85925.367	-7.430	30.875	741.000
192	3.50	85919.180	-6.188	26.063	625.500
193	3.75	85912.055	-7.125	28.047	673.125
194	4.00	85902.375	-9.680	30.422	730.125

MASS POINT

DATE - 06-06-1988

TIME - 11:48:57

TIME	TEMP	VAPOR PRESS	DEW POINT	CORR. AIR PRESS	CONT AIR MASS	LEAK RATE	UPPER CONF LEVEL
1015	546.292	0.5764	83.963	71.974	86254.24	0.00000	0.00000
1030	546.262	0.5764	83.966	71.966	86248.90	0.00000	0.00000
1045	546.234	0.5756	83.920	71.958	86244.70	0.53128	0.00000
1100	546.197	0.5756	83.919	71.951	86241.81	0.45824	0.59365
1115	546.161	0.5755	83.919	71.944	86234.04	0.41807	0.50093
1130	546.135	0.5747	83.870	71.937	86235.11	0.40697	0.45936
1145	546.100	0.5738	83.823	71.931	86233.51	0.37921	0.42719
1200	546.073	0.5727	83.762	71.926	86231.31	0.35645	0.39937
1215	546.053	0.5715	83.700	71.920	86227.75	0.34860	0.38206
1230	546.029	0.5716	83.702	71.914	86224.33	0.34624	0.37251
1245	546.005	0.5706	83.650	71.909	86221.50	0.34356	0.36499
1300	545.987	0.5702	83.626	71.903	86217.82	0.34457	0.36203
1315	545.965	0.5704	83.638	71.898	86214.67	0.34536	0.36000
1330	545.944	0.5694	83.585	71.893	86212.44	0.34308	0.35594
1345	545.922	0.5690	83.563	71.888	86209.68	0.34070	0.35200
1400	545.910	0.5688	83.553	71.884	86206.09	0.34063	0.35017
1415	545.897	0.5686	83.541	71.879	86200.86	0.34541	0.35533
1430	545.899	0.5680	83.507	71.874	86196.88	0.35022	0.36023
1445	545.878	0.5676	83.485	71.870	86195.41	0.35073	0.35959
1500	545.864	0.5678	83.496	71.865	86191.60	0.35215	0.36014
1515	545.857	0.5670	83.454	71.861	86187.87	0.35400	0.36149
1530	545.851	0.5658	83.388	71.859	86185.41	0.35444	0.36129
1545	545.824	0.5641	83.290	71.856	86186.56	0.34953	0.35748
1600	545.817	0.5632	83.242	71.852	86183.34	0.34585	0.35396
1615	545.811	0.5624	83.200	71.849	86180.46	0.34275	0.35078
1630	545.803	0.5627	83.214	71.843	86176.56	0.34109	0.34865
1645	545.802	0.5607	83.106	71.843	86174.77	0.33864	0.34606
1700	545.792	0.5597	83.047	71.841	86173.37	0.33534	0.34297
1715	545.785	0.5592	83.020	71.838	86170.69	0.33241	0.34007
1730	545.781	0.5580	82.952	71.835	86168.48	0.32948	0.33717
1745	545.780	0.5580	82.955	71.832	86164.74	0.32760	0.33502
1800	545.763	0.5584	82.974	71.828	86162.64	0.32553	0.33274
1815	545.760	0.5576	82.933	71.826	86160.66	0.32324	0.33037
1830	545.754	0.5574	82.920	71.823	86158.12	0.32114	0.32814
1845	545.759	0.5571	82.905	71.820	86154.20	0.31991	0.32662
1900	545.751	0.5570	82.898	71.818	86152.75	0.31817	0.32473
1915	545.750	0.5574	82.920	71.815	86149.16	0.31705	0.32333
1930	545.735	0.5564	82.863	71.814	86149.76	0.31454	0.32097
1945	545.738	0.5552	82.795	71.812	86147.98	0.31194	0.31855
2000	545.732	0.5558	82.831	71.809	86144.77	0.30989	0.31647
2015	545.734	0.5548	82.775	71.808	86142.73	0.30782	0.31441
2030	545.728	0.5548	82.775	71.805	86140.72	0.30577	0.31235
2045	545.726	0.5552	82.796	71.802	86136.95	0.30435	0.31077
2100	545.718	0.5554	82.811	71.799	86134.88	0.30289	0.30917
2115	545.713	0.5554	82.809	71.796	86132.46	0.30152	0.30766
2130	545.716	0.5555	82.812	71.794	86129.36	0.30044	0.30641
2145	545.709	0.5551	82.789	71.792	86127.61	0.29921	0.30504
2200	545.703	0.5543	82.747	71.790	86126.69	0.29763	0.30342
2215	545.699	0.5537	82.712	71.788	86125.17	0.29592	0.30171
2230	545.696	0.5528	82.661	71.787	86123.84	0.29405	0.29991

MASS POINT

DATE - 06-08-1988

TIME - 11:42:59

TIME	TEMP	VAPOR PRESS	FW PC	CURR. AIR PRESS	CONT AIR MASS	LEAK RATE	UPPER CONT LEVEL
2245	545.705	0.5540	82.729	71.783	86118.10	0.29318	0.29886
2300	545.699	0.5537	82.715	71.781	86117.54	0.29191	0.29750
2315	545.697	0.5528	82.670	71.779	86115.48	0.29064	.29616
2330	545.679	0.5536	82.708	71.776	86113.09	0.28945	0.29489
2345	545.674	0.5534	82.698	71.773	86111.14	0.28826	0.29362
C	545.670	0.5534	82.695	71.771	86108.56	0.28718	0.29245
15	545.663	0.5532	82.686	71.766	86106.45	0.28611	0.29131
30	545.654	0.5527	82.655	71.765	86105.68	0.28481	0.28987
45	545.647	0.5526	82.665	71.763	86103.21	0.28361	0.28873
100	545.658	0.5532	82.684	71.761	86098.66	0.28290	0.28789
115	545.640	0.5530	82.674	71.758	86097.91	0.28184	0.28695
130	545.628	0.5523	82.632	71.755	86095.69	0.28084	0.28571
145	545.630	0.5543	82.749	71.752	86091.98	0.28020	0.28496
200	545.624	0.5538	82.721	71.749	86089.73	0.27958	0.28423
215	545.616	0.5540	82.727	71.746	86088.09	0.27888	0.28344
230	545.611	0.5567	82.880	71.741	86082.62	0.27870	0.28311
245	545.600	0.5533	82.672	71.736	86078.63	0.27874	0.28302
300	545.593	0.5581	82.853	71.734	86077.07	0.27863	0.28280
315	545.581	0.5547	82.768	71.735	86079.63	0.27786	0.28196
330	545.579	0.5545	82.756	71.733	86077.33	0.27712	0.28116
345	545.572	0.5536	82.709	71.731	86076.17	0.27626	0.28027
400	545.559	0.5540	82.732	71.727	86073.84	0.27545	0.27943
415	545.551	0.5546	82.765	71.724	86071.57	0.27463	0.27862
430	545.548	0.5545	82.760	71.721	86068.21	0.27403	0.27796
445	545.545	0.5535	82.699	71.720	86067.16	0.27336	0.27720
500	545.523	0.5535	82.702	71.717	86067.16	0.27241	0.27626
515	545.519	0.5537	82.711	71.714	86064.27	0.27159	0.27542
530	545.511	0.5536	82.707	71.711	86062.30	0.27078	0.27459
545	545.502	0.5534	82.698	71.709	86060.74	0.26997	0.27377
600	545.499	0.5533	82.688	71.706	86057.45	0.26928	0.27304
615	545.498	0.5523	82.671	71.704	86055.50	0.26859	0.27231
630	545.480	0.5525	82.643	71.702	86055.55	0.26770	0.27143
645	545.471	0.5520	82.617	71.699	86054.18	0.26678	0.27053
700	545.475	0.5519	82.613	71.696	86050.27	0.26607	0.26979
717	545.451	0.5518	82.605	71.693	86048.77	0.26529	0.26899
730	545.457	0.5519	82.610	71.691	86046.40	0.26460	0.26828
745	545.449	0.5519	82.613	71.688	86044.81	0.26388	0.26755
800	545.438	0.5517	82.602	71.686	86043.35	0.26314	0.26679
815	545.429	0.5508	82.550	71.684	86043.11	0.26227	0.26584
830	545.423	0.5513	82.579	71.681	86040.09	0.26151	0.26517
845	545.413	0.5507	82.542	71.679	86038.06	0.26078	0.26442
900	545.417	0.5505	82.532	71.676	86035.87	0.26008	0.26371
915	545.409	0.5507	82.542	71.674	86034.25	0.25937	0.26298
930	545.393	0.5506	82.536	71.671	86033.12	0.25861	0.26222
945	545.405	0.5502	82.516	71.669	86028.84	0.25804	0.26162
1000	545.391	0.5498	82.492	71.668	86029.22	0.25732	0.26089
1015	545.389	0.5499	82.498	71.666	86026.88	0.25664	0.26020

MAX ALLOWABLE LEAK RATE : .635

75% OF MAX ALLOWABLE LEAK RATE

.47625

EPRI EQUATION #6 IS SATISFIED.

EPRI EQUATION #7 IS SATISFIED

***** TOTAL TIME WITH VERIFICATION TEST *****
 DATE - 05-06-1988 TIME - 11:45:48

TIME	MASS	TOTAL TIME		SCFM	VERIFICATION	
		GROSS LSF	GROSS 95% UCL		NET LSF	NET 95% UCL
1045	86012	0.0000	0.0000	5.147	-0.6477	-0.427
1100	86004	0.8158	0.0000	5.148	0.2679	-0.6479
1115	85998	0.8355	1.1002	5.147	0.1917	0.4524
1130	85991	0.8220	0.8728	5.145	0.1744	0.3252
1145	85984	0.8058	0.8148	5.147	0.1578	0.2669
1200	85978	0.8015	0.9087	5.145	0.1537	0.2609
1215	85970	0.7940	0.8864	5.221	0.1565	0.2290
1230	85963	0.7866	0.8706	5.220	0.1294	0.2193
1245	85956	0.7804	0.8590	5.225	0.1225	0.2011
1300	85945	0.7815	0.8939	5.228	0.1333	0.2357
1315	85940	0.7921	0.8822	5.225	0.1340	0.2241
1330	85933	0.7827	0.8794	5.228	0.1344	0.2211
1345	85925	0.7837	0.8776	5.225	0.1356	0.2184
1400	85918	0.7924	0.8715	5.225	0.1341	0.2173
1415	85912	0.7812	0.8673	5.228	0.1325	0.2087
1430	85902	0.7943	0.8720	5.225	0.1360	0.2136

LEAK RATE < MAX AND > MIN ALLOWED
 (Lo + Lam - .25 Ls) <= Lc <= (Lo + Lam + .25 Ls)
 0.7562 <= 0.7943 <= 1.0737

 DATE - 05-05-1988

MASS POINT WITH VERIFICATION TEST

 TIME - 11:46:19

TIME	MASS	MASS POINT		SCFM	VERIFICATION	
		GROSS LSF	GROSS 95% UCL		NET LSF	NET 95 UCL
1030	86020.7	0.0000	0.0000	5.145	-0.6474	-0.6474
1045	86012.3	0.0000	0.0000	5.147	-0.6477	-0.6477
1100	86004.3	0.9168	0.0000	5.148	0.2688	-0.6479
1115	85998.4	0.8359	0.9703	5.147	0.1881	0.3225
1130	85990.7	0.8258	0.8884	5.145	0.1701	0.2417
1145	85983.9	0.9125	0.8525	5.147	0.1647	0.2046
1200	85976.3	0.8119	0.6386	5.145	0.1641	0.1908
1215	85969.7	0.8052	0.8268	5.221	0.1478	0.1693
1230	85963.0	0.7981	0.8162	5.220	0.1409	0.1589
1245	85956.2	0.7923	0.8079	5.225	0.1343	0.1500
1300	85945.2	0.8088	0.8307	5.226	0.1506	0.1725
1315	85940.1	0.8094	0.3274	5.225	0.1513	0.1694
1330	85932.8	0.8099	0.8250	5.226	0.1516	0.1867
1345	85925.4	0.8108	0.8235	5.225	0.1526	0.1653
1400	85919.2	0.8083	0.8195	5.225	0.1501	0.1612
1415	85912.1	0.8084	0.8166	5.228	0.1477	0.1579
1430	85902.4	0.8105	0.8203	5.225	0.1521	0.1619

LEAK RATE < MAX AND > MIN ALLOWED
 (Lc + Lam - .25 La) <= Lc <= (Lc + Lam + .25 La)
 0.7562 <= 0.8105 <= 1.0737

P1

VOLUMETRICS

STATEMENT OF CONFORMANCE

VOLUMETRICS CERTIFIED THAT THE LISTED EQUIPMENT AND REQUIRED DOCUMENTATION FOR THE SAME MEET THE REQUIREMENTS OF PURCHASE ORDER AND APPLICABLE SPECIFICATIONS.

CUSTOMER: NEBRASKA PUBLIC POWER DISTRICT

P.O. NO.: TER-87-086 NEB 277855 REV. 0

WORK ORDER NO.: 17-9740-2

DESCRIPTION OF EQUIPMENT: (2) PRESSURE GAUGE

M/N: PMM-1000

S/N: 9793-1, 9793-2

COMMENTS: THE STANDARDS USED IN PERFORMING ALL CALIBRATIONS ARE N.B.S. TRACEABLE. ALL REQUIREMENTS OF THE PURCHASE ORDER HAVE BEEN MET UNLESS OTHERWISE NOTED.

R. Johns
VOLUMETRICS REPRESENTATIVE
Q.A. MANAGER
TITLE
3/1/88
DATE

CERTIFICATION
Craig W. [Signature]
3/1/88



CALIBRATION SERVICES DIVISION VOLUMETRICS, INC.

CALIBRATION REPORT

P.O. BOX 2084 • 3025 BUENA VISTA • PASO ROBLES, CA 93447
(805) 239-0110

CUSTOMER Nebraska Public Power District			WORK ORDER NO.: 06/9793		
			DOCUMENT NO.:		
ASSET NO. N/A		MANUFACTURER Volumetric	MODEL PPM-1000	DESCRIPTION Precision Pressure Monitor	SERIAL NO. 9793-2
TEMP. 23 °C	HUMIDITY 41 %	ACCURACY ±.015% Rdg ±.005% FS	PRIOR CAL. N/A	CALIB. FREQUENCY 6 months	DATE OF TEST 3-1-88
NEXT TEST DUE 9-1-88			CUST. P.O. NO. 277855/TER-87-086		

WORK REQUESTED

ESTIMATE

REPAIR

CALIBRATE

CONDITION AS RECEIVED	PHYSICAL	FUNCTIONAL
<input checked="" type="checkbox"/> NEW EQUIPMENT	<input checked="" type="checkbox"/> GOOD CONDITION	<input checked="" type="checkbox"/> WITHIN TOLERANCE
	<input type="checkbox"/> POOR CONDITION	<input type="checkbox"/> OUT OF TOLERANCE
	<input type="checkbox"/> MISHANDLING	<input type="checkbox"/> REPAIR REQUIRED
	<input type="checkbox"/> OVERLOAD/MISUSE	NOTE: WHAT AREA WAS OUT OF TOLERANCE
	<input type="checkbox"/> AGE AND LONG SERVICE	

CALIBRATION EQUIPMENT						
MANUFACTURER	MODEL	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE	DESCRIPTION
VMC B1-	144	2560-6408	±.015% Rdg ±.002% FS	10-12-87	4-11-88	Press. Trans. Std.

REMARKS: PPM indicated readings recorded to 3 decimals because the 4th digit is not significant in the calibration.

FOR PNEUMATICS USE ONLY	<input type="checkbox"/> CLEANED	<input type="checkbox"/> REPAIRED	<input type="checkbox"/> CALIBRATION CHECKED TO	SPECIFICATIONS
GRAVITY 979.7148	CN'S'	<input type="checkbox"/> MODIFIED	<input type="checkbox"/> ADJUSTED TO	SPECIFICATIONS
LATITUDE 35°40'40"	NORTH	<input type="checkbox"/> WASHED	<input type="checkbox"/> CROSS CHECKED TO	SPECIFICATIONS
BARO PRES 14.372	PSIA	<input type="checkbox"/> PAINTED	PROCEDURE USED CP 9006, Rev. 1	
TECHNICIAN D. Hergert	NBS TEST NO.	O.C. INSPEC P. Johnson		

VOLUMETRIC'S LABORATORY CERTIFIES THAT ALL CALIBRATION EQUIPMENT USED IN THE TEST IS TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS AND THAT ALL MATERIALS USED ARE EQUAL TO OR SUPERIOR TO ORIGINAL MANUFACTURER'S EQUIPMENT.

FUNCTION TESTED Hysteresis Calibration RANGE TESTED .400 to 100 PSIA

9793-2

STEP	NOMINAL True PSIA	MEASURED READING		LIMITS OF ACCEPTANCE $\pm .015\% R_d \pm .005\% F.S.$	Deviation	
		Increasing	Decreasing			
1	.400	.402	.400	$\pm .005$	+ .002	\emptyset
2	5.000	5.004	5.002	$\pm .006$	+ .004	+ .002
3	10.000	10.005	10.002	$\pm .007$	+ .005	+ .002
4	14.984	14.989	14.986	$\pm .007$	+ .005	+ .002
5	19.973	19.976	19.970	$\pm .008$	+ .003	- .003
6	24.972	24.975	24.970	$\pm .009$	+ .003	- .002
7	29.972	29.977	29.970	$\pm .009$	+ .005	- .002
8	34.984	34.992	34.985	$\pm .010$	+ .003	- .004
9	39.983	39.985	39.978	$\pm .011$	+ .002	- .005
10	44.977	44.981	44.970	$\pm .012$	+ .004	- .007
11	49.971	49.977	49.970	$\pm .012$	+ .006	- .001
12	54.965	54.966	54.961	$\pm .013$	+ .001	- .004
13	59.959	59.964	59.956	$\pm .014$	+ .005	- .003
14	64.951	64.954	64.948	$\pm .015$	+ .003	- .003
15	69.945	69.948	69.941	$\pm .015$	+ .003	- .004
16	74.990	74.990	74.982	$\pm .016$	\emptyset	- .008
17	79.984	79.985	79.976	$\pm .017$	- .001	- .008
18	84.978	84.977	84.969	$\pm .018$	- .001	- .009
19	89.972	89.966	89.962	$\pm .018$	- .006	- .010
20	94.963	94.960	94.955	$\pm .019$	- .003	- .008
21	100.007	100.008	100.006	$\pm .020$	+ .001	- .001
22	58.000	58.001	57.997	$\pm .014$	+ .001	- .003

Calibrated By: D. Zupet
 Approved By: R. Johnson

This calibration was accomplished using laboratory standards which are traceable to the National Bureau of Standards in Washington, D.C. Traceability records are on file and are available for your inspection at our laboratory.

Tested by: D. Harget

Date: 3-1-88

<u>CHART 1</u>	PI-1 S/N <u>9793-2</u> counts	PI-2 S/N <u>N/A</u> counts	Secondary Gauge S/N <u>Vmc 815</u>
Capsule Temperature (step 5)	<u>N/A</u>	<u>N/A</u>	<u>50.1°C</u>
First Reading (step 9)	<u>49.9773</u>	{	<u>49.393</u>
Second Reading (step 11)	<u>49.9778</u>		<u>49.393</u>

<u>CHART 2</u>	Repeatability Values of step 12	
PI-1 S/N <u>9793-2</u>	<u>.0005</u>	PSIA
PI-2 S/N <u>N/A</u>	<u>N/A</u>	PSIA
Secondary Gauge S/N <u>Vmc 815</u>	<u>0.000</u>	PSIA

ILRT SENSITIVITY REPORT

SHEET 4 OF 6

REQUESTOR	Nebraska Public Power District	CUSTOMER P.O. NO.	277855/TER-86-08 ^{B7 DH}
MODEL NO.	PPM-1000	SER. NO.	9793-2
		W.O. NO.	06/9793
PROCEDURE NO.	CP2019, Rev. B.	ANSI REQUIREMENTS*	.001PS/A
		ACTUAL SPEC'B	.0004 PS/A

The equipment listed below has been tested for sensitivity of response in accordance with the above referenced procedure to demonstrate compliance with ANSI/ANS-56.8-1981.

INSTRUMENT TESTED	NOMINAL TEST VALUE	OBSERVED SENSITIVITY
S/N 9793-2	80.0000 PS/A	.0004 PS/A

COMMENTS

TESTED BY	APPR. BY
/DATE <i>L. Ziegler 3/1/88</i>	/DATE <i>R. Johnson 3/2/88</i>

GENERAL CALIBRATION REPORT

5 OF 6

REQUESTER	Nebraska Public Power District	CUBT. P.O. NO.	277855/TER-87-081
MODEL	TPM-1000	SERIAL NO.	9793-Z
		W.O. NO.	06/9793
MEDIA	N/A	TEMP.	72°F

FUNCTION TESTED Transducer Parameters	MEASURED VALUES			
0 (m)	130.759			
1 (s)	10006-6			
2 (k00)	94			
3 (k01)	4344			
4 (k02)	-1489			
5 (k03)	-168			
6 (k04)	-513			
7 (k10)	988338			
8 (k11)	12258			
9 (k12)	3872			
10 (k13)	1363			
11 (k14)	1300			
12 (k20)	19031			
13 (k21)	8840			
14 (k22)	2594			
15 (k23)	1005			
16 (k24)	658			
17 (k30)	118			
18 (k31)	0			
19 (k32)	0			

Transducer Parameters - Cont						
20 (K33)	\emptyset					
21 (K34)	\emptyset					
22 (C)	-95000E-5					
23 (V)	5965E-4					
24 (VR)	5920E-4					

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet				

WORK PERFORMED/COMMENTS

TESTED BY		APPR. BY	
/DATE		/DATE	
D. August	3/1/88	R. Johnson	3/2/88

TEST STANDARDS USED: ILRTS

NBS#	EQUIPMENT#	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
5211682	VMC 202 MANUF:KEITHLEY OHMMETER	+/- .012% Rdg	01-14-88	01-14-89
521168	VMC 202A MANUF:KEITHLEY OHMMETER	+/- .012% Rdg	03-03-87	03-03-88
238286 238764 236368 238969	VMC 203 MANUF:KEITHLEY OHMMETER	+/- .012% Rdg	09-10-87	09-10-88
N/A	VMC 205 MANUF:CRONUS STOPWATCH	+/-0.02 Sec/Hr.	08-03-87	08-03-88
N/A	VMC 207 MANUF:VMC TIMER	+/-0.02 Sec/Hr	12-03-87	12-03-88
1089	VMC 208 MANUF:GEN.RESISTANCE DECADE BOX	+/-0.54 Deg.F	02-26-87	02-26-88
1089	VMC 209 MANUF:GEN.RESISTANCE DECADE BOX	+/-0.54 Deg.f	02-24-87	02-24-88
521-07-87	VMC 210 MANUF:KEITHLEY OHMMETER	+/-0.012% Rdg	09-26-87	09-25-88
238368 229434 236368 233560	VMC 211 MANUF:KEITHLEY OHMMETER	+/-0.012% Rdg	08-06-87	08-06-88
N/A	VMC 212 MANUF:CRONUS STOPWATCH	+/-0.02 Sec/Hr	08-03-87	08-03-88
1089	VMC 215 MANUF:GEN.RESISTANCE DECADE BOX	+/-0.01% Rdg	07-07-87	07-07-88

TEST STANDARDS USED: ILRTS

NBS#	EQUIPMENT #	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
209527	VMC 308			
222173	MANUF:E.G.G.	+/-0.54 Deg F.	09-02-87	03-03-88
5211682	CHILLED MIRROR DEWPOINT SENSOR			
5211682	VMC 309			
209527	MANUF:BACHARACH			
222173	SLING PSYCHROMETER	+/-1.0 Deg. F.	07-10-87	01-10-88
738/220675				
738/227675	VMC 510			
209527	MANUF:COLLINS INC.			
222173	BELL PROVER	+/-0.2% Rdg.	04-22-87	04-22-88
209527	VMC 702			
222173	MANUF:BURN			
5211682	RTD	+/-0.2% Rdg.	09-03-87	09-03-88
209527	VMC 702B			
222173	MANUF:BURNS			
87KD	RTD	+/-0.2% Rdg.	11-25-86	11-25-87
5211682				
222173	VMC 704			
209527	MANUF:BRDCLYN			
87KD	THERMOMETER	+/-0.1 DEGREE C	10-01-87	10-01-88
5211682				
222173	VMC 710A			
209527	MANUF:BRDCLYN			
87KS	THERMOMETER	+/-0.1 DEGREE C	01-07-88	07-07-88
209527	VMC 803			
222173	MANUF:SENSOR			
5211682	QUARTZ MANOMETER			
737/0658-W51		+/-0.015% Rdg.		
232526		+/-0.002% F.S.	12-07-87	06-06-88
209527	VMC 813			
222173	MANUF:SENSOR			
5211682	QUARTZ MANOMETER			
737/0658-W51		+/-0.015% Rdg.		
232526		+/-0.002% F.S.	01-06-88	07-06-88

TEST STANDARDS USED: ILRT

NBS#	EQUIPMENT #	CERTIFIED ACCURACY	CERTIFICATION DATE	DUE DATE
209527	VMC B15			
222173	MANUF:MENSOR			
5211682	QUARTZ MANOMETER			
737/0658-W51		+/- .015% Rdg.		
232526		+/- .002% F.S.	10-12-87	03-11-88
N/A	VMC B16			
	MANUF:MCLEOD			
	VACUUM GAUGE		03-25-87	03-26-90
209527	VMC B23			
222173	MANUF:MENSOR			
5211682	QUARTZ MANOMETER			
737/0658-W51		+/- .015% Rdg.		
232526		+/- .002% F.S.	09-14-87	03-14-88

QUALITY ASSURANCE APPROVAL

R. Johnson

afb
 B: ILRTTEST.TXT
 DSK: MISC#1
 12/19/88

P2

VOLUMETRICS

STATEMENT OF CONFORMANCE

VOLUMETRICS CERTIFIED THAT THE LISTED EQUIPMENT AND REQUIRED DOCUMENTATION FOR THE SAME MEET THE REQUIREMENTS OF THE PURCHASE ORDER AND APPLICABLE SPECIFICATIONS.

CUSTOMER: NEBRASKA PUBLIC POWER DISTRICT

P.O. NO.: TER-87-086 NEB 277855 REV. 0

WORK ORDER NO.: 17-9740-2

DESCRIPTION OF EQUIPMENT: (2) PRESSURE GAUGE

M/N: PPM-1000

S/N: 9793-1, 9793-2

COMMENTS: THE STANDARDS USED IN PERFORMING ALL CALIBRATIONS ARE N.B.S. TRACEABLE. ALL REQUIREMENTS OF THE PURCHASE ORDER HAVE BEEN MET UNLESS OTHERWISE NOTED.

R. Jones
VOLUMETRICS REPRESENTATIVE
Q.A. MANAGER
TITLE
3/1/88
DATE

CERTIFICATION
ISSUED
Long
3/1/88



CALIBRATION SERVICES DIVISION VOLUMETRICS, INC.

CALIBRATION REPORT

P.O. BOX 2084 • 3025 BUENA VISTA • PASO ROBLES, CA 93447
(805) 239-0110

CUSTOMER <i>Nebraska Public Power District</i>			WORK ORDER NO.: <i>06/9793</i>		
			DOCUMENT NO.: <i>85389793</i>		
ASSET NO. <i>N/A</i>		MANUFACTURER <i>Volumetrics</i>	MODEL <i>PPM-1000</i>	DATE RECEIVED <i>N/A</i>	CUST. P.O. NO. <i>277855/TER-87-086</i>
TEMP. <i>23°C</i>	HUMIDITY <i>41%</i>	ACCURACY <i>±0.015% R_d ±0.005% FS</i>	PRIOR CAL <i>N/A</i>	DESCRIPTION <i>Precision Pressure Monitor</i>	SERIAL NO. <i>9793-1</i>
CUSTOMER ACCESSORIES RECEIVED WITH UNIT			CALIB. FREQUENCY <i>6 months</i>	DATE OF TEST <i>3-1-88</i>	NEXT TEST DUE <i>9-1-88</i>

WORK REQUESTED

- ESTIMATE
- REPAIR
- CALIBRATE

CONDITION AS RECEIVED

NEW EQUIPMENT

PHYSICAL

- GOOD CONDITION
- POOR CONDITION
- MISHAP/DLING
- OVERLOAD/MISUSE
- AGE AND LONG SERVICE

FUNCTIONAL

- WITHIN TOLERANCE
- OUT OF TOLERANCE
- REPAIR REQUIRED

NOTE: WHAT AREA WAS OUT OF TOLERANCE

CALIBRATION EQUIPMENT

MANUFACTURER	MODEL	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE	DESCRIPTION
<i>VMC 815</i>	<i>144</i>	<i>2560-6408</i>	<i>±0.015% R_d ±0.002% FS</i>	<i>10-12-87</i>	<i>4-11-88</i>	<i>Press. Trans. Std.</i>

REMARKS

PPM indicated readings recorded to 3 decimals because the 4th digit is not significant in the calibration.

FOR PNEUMATICS USE ONLY

<input type="checkbox"/> CLEANED	<input type="checkbox"/> REPAIRED	<input type="checkbox"/> CALIBRATION CHECKED TO	SPECIFICATIONS
GRAVITY <i>979.7148</i>	<input type="checkbox"/> MODIFIED	<input type="checkbox"/> ADJUSTED TO	SPECIFICATIONS
LATITUDE <i>35°40'40"</i>	<input type="checkbox"/> WASHED	<input type="checkbox"/> CROSS CHECKED TO	SPECIFICATIONS
BARO. PRES. <i>14.372</i>	<input type="checkbox"/> PAINTED	PROCEDURE USED <i>CP9006, Rev. 1</i>	
TECHNICIAN <i>D. Hecpat</i>	NBS TEST NO.	QC INSPECTION <i>R. Johnson</i>	

FUNCTION TESTED Hysteresis Calibration RANGE TESTED .400 to 100 PSIA

9793-1

STEP	NOMINAL True PSIA	MEASURED READING		LIMITS OF ACCEPTANCE $\pm .015\% \text{ Rdg} \pm .005\% \text{ F.S.}$	Deviation	
		Increasing	Decreasing			
1	.400	.404	.401	$\pm .005$	+ .004	+ .001
2	5.000	5.005	5.002	$\pm .006$	+ .005	+ .002
3	10.000	10.005	10.002	$\pm .007$	+ .005	+ .002
4	14.984	14.988	14.986	$\pm .007$	+ .004	+ .002
5	19.973	19.976	19.969	$\pm .008$	+ .003	- .004
6	24.972	24.975	24.969	$\pm .009$	+ .003	- .003
7	29.972	29.977	29.969	$\pm .009$	+ .005	- .003
8	34.989	34.992	34.984	$\pm .010$	+ .003	- .005
9	39.983	39.985	39.977	$\pm .011$	+ .002	- .006
10	44.977	44.981	44.970	$\pm .012$	+ .004	- .007
11	49.971	49.976	49.968	$\pm .012$	+ .005	- .003
12	54.965	54.966	54.960	$\pm .013$	+ .001	- .005
13	59.959	59.964	59.957	$\pm .014$	+ .005	- .002
14	64.951	64.955	64.948	$\pm .015$	+ .004	- .003
15	69.945	69.949	69.941	$\pm .015$	+ .004	- .004
16	74.990	74.990	74.983	$\pm .016$	0	- .007
17	79.984	79.984	79.976	$\pm .017$	0	- .008
18	84.978	84.979	84.969	$\pm .018$	+ .001	- .009
19	89.972	89.966	89.962	$\pm .018$	- .006	- .010
20	94.963	94.960	94.955	$\pm .019$	- .003	- .008
21	100.007	100.008	100.006	$\pm .020$	+ .001	- .001
	True PSIG					
22	58.000	58.001	57.997	$\pm .014$	+ .001	- .003

Calibrated By: *D. Zupit*
 Approved By: *R. Johnson*

This calibration was accomplished using laboratory standards which are traceable to the National Bureau of Standards in Washington, D.C. Traceability records are on file and are available for your inspection at our location.

Tested by: D. Harget Date: 3-1-88

CHART 1

	PI-1 S/N <u>9793-1</u> counts	PI-2 S/N <u>N/A</u> counts	Secondary Gauge S/N <u>VMC 815</u>
Capsule Temperature (step 5)	<u>N/A</u>	<u>N/A</u>	<u>50.1°C</u>
First Reading (step 9)	<u>49.9766</u>	~	<u>49.393</u>
Second Reading (step 11)	<u>49.9771</u>		<u>49.393</u>

CHART 2

	Repeatability Values of step 12
PI-1 S/N <u>9793-1</u>	<u>.0005</u> PSIA
PI-2 S/N <u>N/A</u>	<u>N/A</u> PSIA
Secondary Gauge S/N <u>VMC 815</u>	<u>0.000</u> PSIA

GENERAL CALIBRATION REPORT

5 OF 6

REQUESTER <i>Nebraska Public Power District</i>	CUST. P.O. NO. <i>277855/TER-B7-080</i>
MODEL <i>PPM-1000</i>	SERIAL NO. <i>9793-1</i>
MEDIA <i>N/A</i>	W.O. NO. <i>06/9793</i>
	TEMP. <i>72°F</i>

FUNCTION TESTED	MEASURED VALUES				
<i>0 (m)</i>	<i>130.751</i>				
<i>1 (s)</i>	<i>1000E-6</i>				
<i>2 (K00)</i>	<i>-109</i>				
<i>3 (K01)</i>	<i>4600</i>				
<i>4 (K02)</i>	<i>-1647</i>				
<i>5 (K03)</i>	<i>-206</i>				
<i>6 (K04)</i>	<i>-391</i>				
<i>7 (K10)</i>	<i>988837</i>				
<i>8 (K11)</i>	<i>12445</i>				
<i>9 (K12)</i>	<i>3955</i>				
<i>10 (K13)</i>	<i>1026</i>				
<i>11 (K14)</i>	<i>1025</i>				
<i>12 (K20)</i>	<i>18654</i>				
<i>13 (K21)</i>	<i>9017</i>				
<i>14 (K22)</i>	<i>2392</i>				
<i>15 (K23)</i>	<i>669</i>				
<i>16 (K24)</i>	<i>568</i>				
<i>17 (K30)</i>	<i>124</i>				
<i>18 (K31)</i>	<i>Ø</i>				
<i>19 (K32)</i>	<i>Ø</i>				

Transducer Parameters - cont.						
20 (K33)	Ø					
21 (K34)	Ø					
22 (C)	-7500E-5					
23 (V)	5970E-4					
24 (VR)	5820E-4					

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet.				

WORK PERFORMED/COMMENTS

TESTED BY		APPR. BY	
/DATE		/DATE	
<i>D. August</i>	<i>3/1/88</i>	<i>R. Johnson</i>	<i>3/2/88</i>

TEST STANDARDS USED: ILRTS

NBS#	EQUIPMENT#	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
5217682	VMC 202 MANUF:KEITHLEY OHMMETER	+/- .012% Rdg	01-14-88	01-14-89
5211682	VMC 202A MANUF:KEITHLEY OHMMETER	+/- .012% Rdg	03-03-87	03-03-88
238286 238764 236368 238969	VMC 203 MANUF:KEITHLEY OHMMETER	+/- .012% Rdg	09-10-87	09-10-88
N/A	VMC 205 MANUF:CRONUS STOPWATCH	+/- 0.02 Sec/Hr	08-03-87	09-03-88
N/A	VMC 207 MANUF:VMC TIMER	+/- 0.02 Sec/Hr	12-03-87	12-03-88
1089	VMC 208 MANUF:GEN. RESISTANCE DECADE BOX	+/- 0.54 Deg. F	02-26-87	02-26-88
1089	VMC 209 MANUF:GEN. RESISTANCE DECADE BOX	+/- 0.54 Deg. f	02-24-87	02-24-88
521-07-87	VMC 210 MANUF:KEITHLEY OHMMETER	+/- 0.012% Rdg	09-26-87	09-25-88
238568 229437 23637 2335	VMC 211 MANUF:KEITHLEY OHMMETER	+/- 0.012% Rdg	08-06-87	08-06-88
N/A	VMC 212 MANUF:CRONUS STOPWATCH	+/- 0.02 Sec/Hr	08-03-87	08-03-88
1089	VMC 215 MANUF:GEN. RESISTANCE DECADE BOX	+/- 0.01% Rdg	07-07-87	07-07-88

TEST STANDARDS USED: ILRTS

NBS#	EQUIPMENT #	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
209527	VMC 308			
222173	MANUF: E.G.G.	+/-0.54 Deg F.	09-02-87	03-03-88
5211602	CHILLED MIRROR DEWPOINT SENSOR			
5211602	VMC 309			
209527	MANUF: BACHARACH			
222173	SLING PSYCHROMETER	+/-1.0 Deg. F.	07-10-87	01-10-88
738/220675				
738/227675	VMC 510			
209527	MANUF: COLLINS INC.			
222173	BELL PROVER	+/-0.2% Rdg.	04-22-87	04-22-88
209527	VMC 702			
222173	MANUF: BURN			
5211602	RTD	+/-0.2% Rdg.	09-03-87	09-03-88
209527	VMC 702B			
222173	MANUF: BURNS			
87KD	RTD	+/-0.2% Rdg.	11-25-86	11-25-87
5211602	VMC 704			
222173	MANUF: BROOKLYN			
209527	THERMOMETER	+/-0.1 DEGREE C	10-01-87	10-01-88
87KS				
5211602	VMC 710A			
222173	MANUF: BROOKLYN			
209527	THERMOMETER	+/-0.1 DEGREE C	01-07-88	07-07-88
87KS				
209527	VMC 803			
222173	MANUF: MENSOR			
5211602	QUARTZ MANOMETER			
737/0658-W		+/-0.015% Rdg.		
232526		+/-0.002% F.S.	12-07-87	06-06-88
209527	VMC 813			
222173	MANUF: MENSOR			
5211602	QUARTZ MANOMETER			
737/0658-W		+/-0.015% Rdg.		
232526		+/-0.002% F.S.	01-06-88	07-06-88

TEST STANDARDS USED: ILRT

NBS#	EQUIPMENT #	CERTIFIED ACCURACY	CERTIFICATION DATE	DUE DATE
209527	VMC 815			
222173	MANUF:MENSOR			
5211682	QUARTZ MANOMETER			
737/0658-W51		+/- .015% Rdg.		
232526		+/- .002% F.S.	10-12-87	04-11-88
	VMC 816			
	MANUF:MCLEOD			
N/A	VACUUM GAUGE		03-26-87	03-26-90
209527	VMC 823			
222173	MANUF:MENSOR			
5211682	QUARTZ MANOMETER			
737/0658-W51		+/- .015% Rdg.		
232526		+/- .002% F.S.	09-14-87	03-14-88

QUALITY ASSURANCE APPROVAL

R. Johnson

afb
 B: ILRTTEST.TXT
 DSK: MISC#1
 12/19/88

FR1

CERTIFICATE OF CALIBRATION
VOLUMETRICS
3025 BUENA VISTA, PASO ROBLES, CA
(805) 239-0110

DATE: 1/15/88 RETAIL: 2/15/88

PURCHASER: Nebraska Public Power P.O. NO.: 277855

TEST TITLE: Flow Calibration

MODEL #: 2010 JOB NO.: 06/7993

SERIAL NO.: 9793-3 GOV'T CON. NO. N/A DOC. NO.: 85319793

This is to certify that the enclosed Test Data Sheet(s) contain correct and true data obtained in the performance of this test program as set forth in your Purchase Order.

Instrumentation used in obtaining this data has been calibrated using standards which are traceable to the National Bureau of Standards.

CALIBRATION PROCEDURE(S): CP 2005 Rev. 5
CP 5402 Rev. 3

TEST STANDARDS USED:

EQUIPMENT NO.	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
<u>VMC510 Bell Flower</u>	<u>± 0.2% Rdg.</u>	<u>4/22/87</u>	<u>4/22/88</u>
<u>VMC202 Timer</u>	<u>± 0.02 ^{sec}/hr</u>	<u>12/3/87</u>	<u>12/3/88</u>
<u>VMC 704 Thermometer</u>	<u>± 0.1° F</u>	<u>10/1/87</u>	<u>9/1/88</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

CERTIFICATION

[Signature]

Wester

ENCLOSURES: DATA SHEETS (2 PAGES)

QUALITY ASSURANCE APPROVAL [Signature]

FLOW CALIBRATION REPORT

REQUESTER <u>Nebraska Public Power</u>	CUST. P.O. NO. <u>277855</u>			
MODEL <u>2010</u>	SERIAL NO. <u>9793-3</u>	W.O. NO. <u>06/9793</u>		
TEST PRESSURE <u>50 PSIG</u>	PSIA <u>14.48</u>	CERTIFIED ACCURACY <u>± 1% F.S.</u>		
	MEASURED VALUES			
FUNCTION TESTED	ACTUAL FLOW	INDICATED FLOW	TEMP	TOLERANCE % F.S.
FLOW CALIBRATION	[SCFM]	[SCFM]	(°F)	
	9.99	10.00	71.0	0.10
	6.97	7.00	"	0.30
	6.47	6.50	70.8	0.30
	5.99	6.01	"	0.20
	5.48	5.50	"	0.20
	5.01	5.01	"	0.00
	4.51	4.50	"	0.10
	4.00	4.00	"	0.00
	3.50	3.50	"	0.00
	2.99	3.00	"	0.10
	0.00	0.00	"	0.00

FLOW RANGE 0 TO 10 SCFM

FLOW INTEGRITY CHECK

CHECK PRESSURE N/A PSIG
 FLOW RATE INDICATION N/A TO N/A

ELECTRICAL INTEGRITY CHECK

FLOW RATE INDICATION N/A TO N/A

TEST REPORT

PAGE 2 OF 2

STANDARDS USED TRACEABLE TO NBS

see cover sheet

WORK PERFORMED/COMMENTS

N/A

TESTED BY: K Clark DATE 1/15/88

APPROVED BY: [Signature] DATE 1/15/88

TEST STANDARDS USED : LRM/FLOW

NRS#	EQUIPMENT#	CERTIFIED CALIBRATION		DUE DATE
		ACCURACY	DATE	
N/A	MANUF: CRONUS VMC 205 STOPWATCH	+/-0.02 SEC/HR	08-03-88	08-03-88
N/A	VMC 207 TIMER	+/-0.02 SEC/HR	12-03-87	12-03-88
N/A	MANUF: CRONUS VMC 212 STOPWATCH	+/-0.02 SEC/HR	08-03-87	08-03-88
738/228675	MANUF: BROOKS	S/N: N/A		
738/227675	VMC 501 VOLUMETER	+/-0.2% Rdg.	01-27-86	01-27-88
738/228675	MANUF: BROOKS	S/N: 6511-90392		
738/227675	VMC 502 VOLUMETER	+/-0.2% Rdg.	01-27-86	01-27-88
738/228675	MANUF: BROOKS	S/N: 6511-34096		
738/227675	VMC 503 VOLUMETER	+/-0.2% Rdg.	01-27-86	01-27-88
738/228675	MANUF: COLLINS INC.	S/N: 2778		
738/227675	VMC 510 BELL PROVER	+/-0.2% Rdg.	04-22-87	04-22-88
209527	COMPONENT OF 502	S/N: 7411-34096		
7222173	VMC 206/703			
5211682 89	GAS TEMP	+/-0.1 F	07-07-87	01-07-88
209527	MANUF: BROOKLYN	S/N: A09452		
7222173				
5211682	VMC 704 THERMOMETER	+/-0. F	10-01-87	04-01-88
209527	MANUF: BROOKLYN	S/N: 57447		
7222173	VMC 705-B			
5211682	THERMOMETER	+/-0.1 F	10-01-87	04-01-88
737/0658				
-WSI	VMC 801 DCV	+/-0.1 F.S.	01-20-87	7-20-87
737/0658				
WSI				
209527/	VMC 813 T.I.	+/-0.015% Rdg	07-14-87	01-12-88
222173	GAUGE	+/-0.002 F.S.		
1-3050 &	VMC 901			
1-3537	PRIMARY DWT	+/-0.015% Rdg.	03-06-85	03-06-88

NOTE: THIS IS A STANDARD LRM/FLOW SHEET. USE THE STANDARDS THAT APPLY TO YOUR CALIBRATION REPORT.

QUALITY ASSURANCE APPROVAL

R. Johnson

41b
1024

FR 2

CERTIFICATE OF CALIBRATION
VOLUMETRICS
3025 BUENA VISTA, PASO ROBLES, CA
(805) 239-0110

DATE: 1/15/88 RECAL: 7/15/88

PURCHASER: Nebraska Public Power P.O. NO.: 299855

TEST TITLE: Flow Calibration

MODEL #: 2010 JOB NO.: 06/9998

SERIAL NO.: 9993-4 GOV'T CON. NO. N/A DOC. NO.: 85319793

This is to certify that the enclosed Test Data Sheet(s) contain correct and true data obtained in the performance of this test program as set forth in your Purchase Order.

Instrumentation used in obtaining this data has been calibrated using standards which are traceable to the National Bureau of Standards.

CALIBRATION PROCEDURE(S): CP 2005 Rev. 5
CP 5402 Rev. 3

TEST STANDARDS USED:

EQUIPMENT NO.	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
<u>VMA 510 Bell Prover</u>	<u>±0.2% Rdg.</u>	<u>4/22/87</u>	<u>4/22/88</u>
<u>VMA 207 Timer</u>	<u>±0.05^{sec}/hr</u>	<u>12/3/87</u>	<u>12/3/88</u>
<u>VMA 204 Thermometer</u>	<u>±0.1°F.</u>	<u>10/1/87</u>	<u>4/1/88</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

CERTIFICATION

[Signature]

1/12/88

ENCLOSURES: DATA SHEETS (2 PAGES)

QUALITY ASSURANCE APPROVAL *[Signature]*

FLOW CALIBRATION REPORT

REQUESTER <u>Nebraska Public Power</u>	DUST. P.O. NO. <u>277855</u>
MODEL <u>14342-3</u>	SERIAL NO. <u>9793-4</u>
	W.O. NO. <u>06/9793</u>
TEST PRESSURE <u>50 PSIG</u>	PSIA <u>14.49</u>
	CERTIFIED ACCURACY <u>±1% F.S.</u>

FUNCTION TEST:	MEASURED VALUES			
	ACTUAL FLOW	INDICATED FLOW	TEMP	TOLERANCE % F.S.
FLOW CALIBRATION	(SCFM)	(SCFM)	(°F)	
	9.99	10.01	67.4	0.30
	6.97	7.00	"	0.30
	6.48	6.50	66.6	0.30
	5.97	5.99	"	0.30
	5.48	5.50	"	0.30
	5.03	5.00	"	0.30
	4.52	4.51	"	0.10
	3.97	3.99	66.8	0.30
	3.48	3.50	"	0.30
	2.99	3.01	"	0.30
	0.00	0.00	"	0.00

FLOW RANGE 0 TO 10 SCFM

FLOW INTEGRITY CHECK

CHECK PRESSURE N/A PSIG
 FLOW RATE INDICATION N/A TO N/A

ELECTRICAL INTEGRITY CHECK

FLOW RATE INDICATION N/A TO N/A

TEST REPORT

PAGE 2 OF 2

STANDARDS USED TRACEABLE TO NBS

see cover sheet

WORK PERFORMED/COMMENTS

1/A

TESTED BY: W. Clark DATE 1/15/88

APPROVED BY: [Signature] DATE 1/15/88

TEST STANDARDS USED : LRM/FLOW

NBS#	EQUIPMENT#	ACCURACY	CERTIFIED CALIBRATION DATE	DUE DATE
N/A	MANUF: CRONUS VMC 205 STOPWATCH	+/-0.02 SEC/HR	08-03-88	08-03-88
N/A	VMC 207 TIMER	+/-0.02 SEC/HR	12-03-87	12-03-88
N/A	MANUF: CRONUS VMC 212 STOPWATCH	+/-0.02 SEC/HR	08-03-87	08-03-88
738/228675	MANUF: BROOKS	S/N: N/A		
738/227675	VMC 501 VOLUMETER	+/-0.2% Rdg.	01-27-86	01-27-88
738/228675	MANUF: BROOKS	S/N: 6511-90392		
738/227675	VMC 502 VOLUMETER	+/-0.2% Rdg.	01-27-86	01-27-88
738/228675	MANUF: BROOKS	S/N: 6511-34096		
738/227675	VMC 503 VOLUMETER	+/-0.2% Rdg.	01-27-86	01-27-88
738/228675	MANUF: COLLINS INC.	S/N: 2778		
738/227675	VMC 510 BELL PROVER	+/-0.2% Rdg	04-22-87	04-22-88
209527	COMPONENT OF 502	S/N: 7411-34096		
7222173	VMC 206/703			
5211682 89	GAS TEMP	+/-0.1 F	07-07-87	01-07-88
209527	MANUF: BROOKLYN	S/N: A08452		
7222173				
5211682	VMC 704 THERMOMETER	+/-0.1 F	10-01-87	04-01-88
209527	MANUF: BROOKLYN	S/N: 57447		
7222173	VMC 705-B			
5211682	THERMOMETER	+/-0.1 F	10-01-87	04-01-88
73770658				
-WSI	VMC 801 BCV	+/-0.1 F.S.	01-20-87	7-20-87
73770658				
WSI				
209527/	VMC 813 T.F.	+/-0.015% Rdg	07-14-87	01-12-88
222173	GAUGE	+/-0.002 F.S.		
1-3050 &	VMC 901			
1-3537	PRIMARY DWT	+/-0.015% Rdg.	03-06-85	03-06-88

NOTE: THIS IS A STANDARD LRM/FLOW SHEET. USE THE STANDARDS THAT APPLY TO YOUR CALIBRATION REPORT.

QUALITY ASSURANCE APPROVAL

R. Johnson

#1b
1024

CERTIFICATE OF CALIBRATION
VOLUMETRICS
3025 BUENA VISTA, PASO ROBLES, CA
(805) 239-0110

DATE: 1/7/88 RECALL: 7/7/88

PURCHASER: Nebraska Power P.O. NO.: 277855

TEST TITLE: Accuracy Sensitivity & Repeatability for Dexcel Sensors

MODEL #: 1010 JOB NO.: 06/9793-2

SERIAL NO.: See Report COV'T CON. NO. 11A DOC. NO.: 85-209793-2

This is to certify that the enclosed Test Data Sheet(s) contain correct and true data obtained in the performance of this test program as set forth in your Purchase Order.

Instrumentation used in obtaining this data has been calibrated using standards which are traceable to the National Bureau of Standards.

CALIBRATION PROCEDURE(S): 2022 Rev. 3; 2025 Rev 5
2030 Rev 0

TEST STANDARDS USED:

EQUIPMENT NO.	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
<u>VMC 210</u>	<u>CO71.PDG ± 20</u>	<u>9-23-87</u>	<u>9-25-88</u>
<u>VMC 714</u>	<u>± .02°C</u>	<u>1-23-87</u>	<u>1-23-88</u>
<u>VMC 202</u>	<u>.0121.PDG ± 20</u>	<u>1-9-87</u>	<u>1-9-88</u>
<u>VMC 215</u>	<u>± .01 Stg</u>	<u>7-7-87</u>	<u>7-7-88</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ENCLOSURES: DATA SHEETS (11/ PAGES)

QUALITY ASSURANCE APPROVAL

* See Comment section, page 10 of 112

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. (Ohms)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet for standards used				

WORK PERFORMED/COMMENTS

TESTED BY <i>C. M. ...</i>	DATE <i>1/17/88</i>	APPR. BY <i>[Signature]</i>	DATE <i>1/17/88</i>

ILRT CALIBRATION REPORT

REQUESTOR	Nebraska Power			CUSTOMER P.O. NO.	277855		
MODEL NO.	6160	SERIAL NO. SEE BELOW		W.O. NO.	061 9793-2		
PROCEDURE NC	2025 Rev 5	ANSI REQUIREMENTS	$\pm 2.0^{\circ}\text{F}$	ACTUAL SPEC'S:	$\pm 0.54^{\circ}\text{F}$		
	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS						
DEWCELL SERIAL NO.	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. ($^{\circ}\text{F}$)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)	
368	101.798	40.18	40.00	101.75	+0.04	101.79	
0439	108.413	70.07	70.00	108.31	+0.02	108.33	
	114.991	100.03	100.00	114.83	+0.01	114.84	
			Corrected PRT Resistance	Indicated Dewpoint $^{\circ}\text{C}$			
			101.79	4.4			
			108.33	21.1			
			114.84	37.7			

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. (Ohms)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet for standards used				

WORK PERFORMED/COMMENTS

TESTED BY <i>C. Morones</i>	DATE <i>1/7/88</i>	APPR. BY <i>[Signature]</i>	DATE <i>1/7/88</i>

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. (Ohms)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet for standards used.				

WORK PERFORMED/COMMENTS

TESTED BY C. Morones	DATE 1/17/88	APPR. BY <i>[Signature]</i>	DATE 1/17/88
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ILRT CALIBRATION REPORT

REQUESTOR Nehnaoka Power	CUSTOMER P.O. NO. 277855
MODEL NO. ldd	SERIAL NO. SEE BELOW W.O. NO. 06/9793-2
PROCEDURE NO 2025 Rev 5	ANSI REQUIREMENTS: $\pm 2.0^{\circ}\text{F}$ ACTUAL SPEC'S: $\pm 0.54^{\circ}\text{F}$

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. ($^{\circ}\text{F}$)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)
527c	101.798	39.95	40.00	101.75	-0.01	101.74
0457	108.413	69.90	70.00	108.31	-0.02	108.29
	114.991	99.85	100.00	114.83	-0.03	114.80
			Corrected PRT Resistance	Indicated Dewpoint $^{\circ}\text{C}$		
			101.74	4.3		
			108.29	21.1		
			114.80	37.7		

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. (Ohms)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet for standards used				

WORK PERFORMED/COMMENTS

TESTED BY	DATE	APPR BY	DATE
CMarmon	1/7/88	al. August	1/7/88

ILRT CALIBRATION REPORT

REQUESTOR: <u>Nebraska Power</u>		CUSTOMER P.O. NO. <u>277855</u>				
MODEL NO. <u>1610</u>		SERIAL NO. SEE BELOW		W.O. NO. <u>0619793-2</u>		
PROCEDURE NO. <u>2025 Rev. 5</u>		ANSI REQUIREMENTS: $\pm 2.0^\circ\text{F}$		ACTUAL SPEC'S: $\pm 0.54^\circ\text{F}$		
FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS						
DEWCELL SERIAL NO.	STANDARD R.T.D. RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. ($^\circ\text{F}$)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)
* 1282	101.798	40.02	40.00	101.75	.00	101.75
0215	108.413	69.68	70.00	108.31	-.07	108.24
	114.991	99.60	100.00	114.83	-.09	114.74
			CORRECTED PRT Resistance	Indicated Dewpoint		
			101.75	4.4		
			108.24	21.1		
			114.74	37.7		

* see page 10 of 16 for Comments

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. (Ohms)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See cover sheet for standards used				

WORK PERFORMED/COMMENTS

*Although sensor 1282 was calibrated and the board aligned, Unit 0215 with sensor 1282 is inoperable as a standard.

NOTE: New sensor (S/N 2005R) Purchased per NAPP P.O. # 279435 & installed on Dewcell S/N 0215 & recalibrated.

TESTED BY C. Marone	DATE 1/17/88	APPR. BY d. [signature]	DATE 1/17/88
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ILRT CALIBRATION REPORT

REQUESTOR <u>Nebraska Power</u>		CUSTOMER P.O. NO. <u>277855</u>				
MODEL NO. <u>leleD</u>		SERIAL NO. SEE BELOW		W.O. NO. <u>0619793-2</u>		
PROCEDURE NC <u>2025 Rev. 5</u>		ANSI REQUIREMENTS: $\pm 2.0^{\circ}\text{F}$		ACTUAL SPEC'S: $\pm 0.54^{\circ}\text{F}$		
FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS						
DEWCELL SERIAL NO.	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. ($^{\circ}\text{F}$)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)
<u>1554</u>	<u>101.798</u>	<u>40.07</u>	<u>40.00</u>	<u>101.75</u>	<u>.02</u>	<u>101.77</u>
<u>04166</u>	<u>108.413</u>	<u>69.68</u>	<u>70.00</u>	<u>108.31</u>	<u>-.07</u>	<u>108.24</u>
	<u>114.991</u>	<u>99.75</u>	<u>100.00</u>	<u>114.83</u>	<u>-.05</u>	<u>114.78</u>
			Corrected PRT Resistance	Indicated Dewpoint $^{\circ}\text{C}$		
			<u>101.77</u>	<u>4.4</u>		
			<u>108.24</u>	<u>21.0</u>		
			<u>114.78</u>	<u>37.7</u>		

ILRT CALIBRATION REPORT













REQUESTOR <u>Nebraska Power</u>		CUSTOMER P.O. NO. <u>277855</u>				
MODEL NO. <u>166D</u>		SERIAL NO. SEE BELOW		W.O. NO. <u>0619793-2</u>		
PROCEDURE NC <u>2025 Part 5</u>		ANSI REQUIREMENTS: $\pm 2.0^{\circ}\text{F}$		ACTUAL SPEC'S: $\pm 0.54^{\circ}\text{F}$		
FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS						
DEWCELL SERIAL NO.	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. ($^{\circ}\text{F}$)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)
<u>1571</u>	<u>101.798</u>	<u>39.91</u>	<u>40.00</u>	<u>101.75</u>	<u>-.02</u>	<u>101.73</u>
<u>0010697</u>	<u>108.413</u>	<u>69.88</u>	<u>70.00</u>	<u>108.31</u>	<u>-.03</u>	<u>108.28</u>
	<u>114.991</u>	<u>99.79</u>	<u>100.00</u>	<u>114.83</u>	<u>-.05</u>	<u>114.88</u>
			Corrected	Indicated		
			PRT	Dewpoint		
			<u>Resistance</u>	<u>$^{\circ}\text{C}$</u>		
			<u>101.73</u>	<u>4.4</u>		
			<u>108.28</u>	<u>21.0</u>		
			<u>114.88</u>	<u>37.6</u>		

ILRT SENSITIVITY REPORT

SHEET 16 OF 16

REQUESTOR <i>Nebraska Power</i>	CUSTOMER P.O. NO. <i>277855</i>
MODEL NO. <i>660</i>	BER. NO. <i>See Below</i> W.O. NO. <i>0619793-2</i>
PROCEDURE NO. <i>2036 Rev 1</i>	ANSI REQUIREMENTS <i>0.5°F</i> ACTUAL SPEC'S <i>0.1°F</i>

The equipment listed below has been tested for sensitivity of response in accordance with the above referenced procedure to demonstrate compliance with ANSI/ANS-56.8-1981.

INSTRUMENT TESTED	NOMINAL TEST VALUE	OBSERVED SENSITIVITY
<i>SIM 220</i>	<i>900</i>	<i>1°F</i>
<i>368</i>		
<i>458</i>		
<i>527C</i>		
<i>1282</i>		
<i>1554</i>		
<i>1571</i>		

COMMENTS

TESTED BY / DATE <i>CMerones 1/7/88</i>	APPR. BY / DATE <i>al. Hargis 1/7/88</i>
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Calibration report for
Dewell # 0216 with
new sensor (# 5205R)

CERTIFICATE OF CALIBRATION
VOLUMETRICS
3025 NUENA VISTA, PASO ROBLES, CA
(805) 239-0110

DATE: 2/19/88 RECAL.: 8/19/88

PURCHASER: Nebraska Power P.O. NO.: 277855

TEST TITLE: Accuracy Sensitivity & Repeatability for Dewell Sensor

MODEL #: 1060 JOB NO.: 06/9793

SERIAL NO.: See Report GOV'T CON. NO. N.A. DOC. NO.: 85209793

This is to certify that the enclosed Test Data Sheet(s) contain correct and true data obtained in the performance of this test program as set forth in your Purchase Order.

Instrumentation used in obtaining this data has been calibrated using standards which are traceable to the National Bureau of Standards.

CALIBRATION PROCEDURE(S): 2022 Rev 3; 2025 Rev 5
2036, Rev 0

TEST STANDARDS USED:

EQUIPMENT NO.	CERTIFIED ACCURACY	CALIBRATION DATE	DUE DATE
<u>VMC 714</u>	<u>± .02 °C</u>	<u>2-1-88</u>	<u>2-1-89</u>
<u>VMC 202</u>	<u>.012% R2-20</u>	<u>1-14-88</u>	<u>1-13-89</u>
<u>VMC 203</u>	<u>.011% R2-20</u>	<u>9-10-87</u>	<u>9-10-88</u>
<u>VMC 209</u>	<u>± .01% Sty</u>	<u>2-24-87</u>	<u>2-24-88</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ENCLOSURES: DATA SHEETS (4 PAGES)

QUALITY ASSURANCE APPROVAL [Signature]

DEWCELL SERIAL NO.	FUNCTION TESTED: PRT ACCURACY FOR DEWCELL SENSORS					
	STANDARD RTD RESISTANCE (Ohms)	INDICATED READING (mVDC)	TRUE WATERBATH TEMP. (Ohms)	STANDARD CURVE RESISTANCE (Ohms)	PRT RESISTANCE DEVIATION (Ohms)	CORRECTED PRT RESISTANCE (Ohms)

LIST OF STANDARDS TRACEABLE TO NBS

EQUIPMENT	SERIAL	ACCURACY	DATE CALIBRATED	RECALL DATE
See Cover Sheet for Standards used				

WORK PERFORMED/COMMENTS

TESTED BY	DATE	APPR. BY	DATE
CM [Signature]	2/19/88	[Signature]	2/19/88

ILRT SENSITIVITY REPORT

SHEET 4 OF 4

REQUESTOR <i>Nebraska Power</i>	CUSTOMER P.O. NO. <i>277855</i>	
MODEL NO. <i>660</i>	SER. NO. <i>See Report</i>	W.O. NO. <i>file 9793</i>
PROCEDURE NO. <i>2036 Rev 1</i>	ANSI REQUIREMENTS* <i>0.5°F</i>	ACTUAL SPEC'S <i>0.1°F</i>

The equipment listed below has been tested for sensitivity of response in accordance with the above referenced procedure to demonstrate compliance with ANSI/ANS-56.8-1981.

INSTRUMENT TESTED	NOMINAL TEST VALUE	OBSERVED SENSITIVITY
<i>0215 - 52005R</i>	<i>80.00</i>	<i>0.1</i>

COMMENTS

TESTED BY /DATE <i>C. Malone 2/19/88</i>	APPR. BY /DATE <i>D. E. King 2/19/88</i>
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