

VAPOR CONTROL SYSTEM CALCULATIONS

for

200' X 35' X 12'- 6" DOUBLE SKIN TANK BARGES

HULLS 95 THROUGH 104 AND 111 THROUGH 126

for

C & C MARINE AND REPAIR, INC.

February 22, 2008

REVISED APRIL 30, 2008

Subject to comments in
Marine Safety Center letter of

APR 16 2008

EXAMINED

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TABLE 1 (HIGHEST GROWTH RATE CARGO)

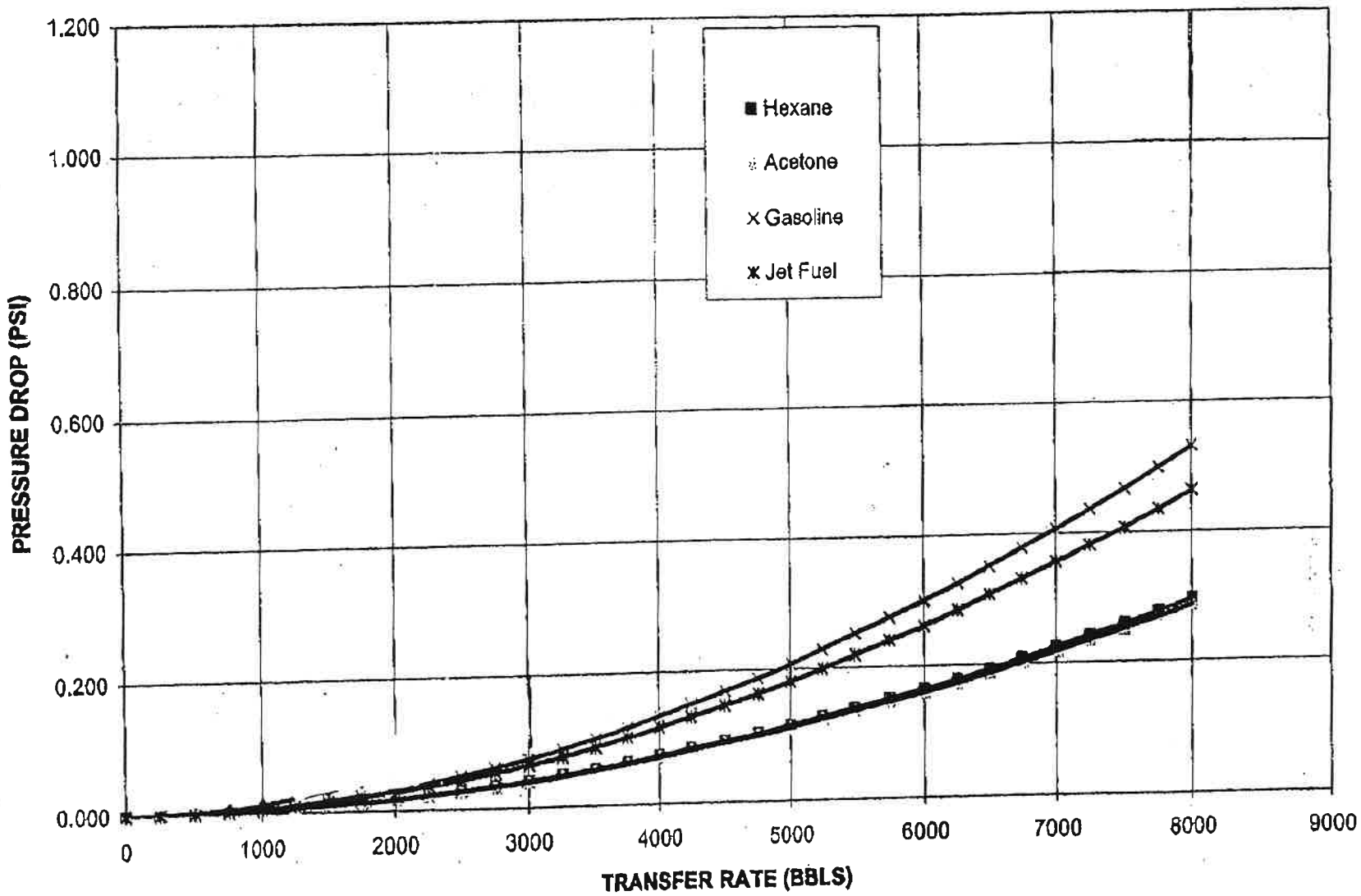
CHRIS CODE	NAME	VCS CAT	LIQ SG	VAPOR PRESS	VAPOR SG	VAPOR WEIGHT DENSITY	VAPOR GROWTH RATE	PRESSURE DROP TO PV VALVE IN VCS(psig) (LOADING)	VAPOR VOLUMETRIC FLOW RATE (bb/h)	AIR EQUIVALENT VOLUMETRIC FLOW RATE	DROP TO	PRESSURE	DROP TO
											SHORE CONNECTION IN VCS (psig) (LOADING)*	VALVE IN VCS(psig) (UNLOADING)	SHORE CONNECTION IN VCS (psig) (UNLOADING)*
1 ACT	Acetone	1	0.79	10	2	0.130	1.2000	0.007	1020	2401	0.011	0.009	0.013
2 GAK	Gasoline Blended Stocks: Alkylates	1	0.75	12.5	3.4	0.224	1.2500	0.014	2000	3282	0.021	0.016	0.024
3 GRF	Gasoline Blended Stocks: Reformate	1	0.8	12.5	3.4	0.224	1.2500	0.014	2000	3282	0.021	0.016	0.024
4 GAT	Gasolines: Automotive (containing not over 4.23 grams	1	0.74	12.5	3.4	0.224	1.2500	0.014	2000	3282	0.021	0.016	0.024
5 GAV	Gasolines: Aviation (containing not over 4.66 grams lea	1	0.71	12.5	3.4	0.224	1.2500	0.014	2000	3282	0.021	0.016	0.024
6 GCS	Gasolines: Casinghead	1	0.67	12.5	3.4	0.224	1.2500	0.014	2000	3282	0.021	0.016	0.024
7 GPL	Gasolines: Polymer	1	0.75	12.5	3.4	0.224	1.2500	0.014	2000	3282	0.021	0.016	0.024
8 GSR	Gasolines: Straight Run	1	0.68	7	3	0.149	1.1400	0.008	1824	2440	0.012	0.009	0.013
9 HXS	Hexane (all isomers)	1	0.66	7	3	0.149	1.1400	0.008	1824	2440	0.012	0.009	0.013
10 HXA	Hexane	1	0.66	7	3	0.149	1.1400	0.008	1824	2440	0.012	0.009	0.013
11 JPT	Jet Fuels: JP-3	1	0.6	8.51	4.5	0.223	1.1702	0.012	1872	3086	0.019	0.014	0.021

May. 05 2008 02:54PM P13

FAX NO. : 2813261615

FROM : SHEARER & ASSOC., INC.

LIQUID TRANSFER RATE vs PRESSURE DROP (HIGHEST GROWTH RATE CARGO)



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TABLE 1 (SUBCHAPTER "D" CARBOES)

CHRIS CODE	NAME	VCS CAT	LIQ SG	VAPOR PRES8	VAPOR SG	VAPOR AIR WEIGHT DENSITY	VAPOR GROWTH RATE	PRESSURE DROP TO PV VALVE IN VCS (psig) (LOADING)	VAPOR VOLUMETRIC FLOW RATE (bb/h)	AIR EQUIVALENT VOLUMETRIC FLOW RATE	PRESSURE DROP TO SHORE CONNECTION IN VCS (psig) (LOADING)	PRESSURE DROP TO PV VALVE IN VCS (psig) (UNLOADING)	PRESSURE DROP TO SHORE CONNECTION IN VCS (psig) (UNLOADING)
1	NOT USED												
2 ACP	Acetophenone	1	1.03	0.9	4.14	0.092	1.0120	0.008	2328	2448	0.012	0.024	0.038
19 AAT	Amyl Acetate (iso-)	1	0.88	0.33	4.48	0.088	1.0088	0.007	2315	2388	0.011	0.022	0.034
20 AAJ	Amyl Alcohol (iso-, n-, sec-, primary) (See also IAA)	1	0.82	0.3	3.04	0.086	1.0080	0.007	2314	2363	0.011	0.022	0.033
21 AAN	Amyl Alcohol (n-)	1	0.82	0.3	3.04	0.086	1.0080	0.007	2314	2363	0.011	0.022	0.033
23 APM	Amyl Alcohol Primary	1	0.82	0.3	3.04	0.086	1.0080	0.007	2314	2363	0.011	0.022	0.033
24 ASE	Amyl Alcohol (sec-)	1	0.82	0.3	3.04	0.086	1.0080	0.007	2314	2363	0.011	0.022	0.033
26 IAA	Amyl Alcohol, (iso-)	1	0.82	0.3	3.04	0.086	1.0080	0.007	2314	2363	0.011	0.022	0.033
34 BAL	Benzyl Alcohol	1	1.05	0.1	3.73	0.084	1.0020	0.007	2305	2322	0.011	0.021	0.032
40 BAX	Butyl Acetate (iso-, n-)	1	0.87	0.6	4	0.091	1.0120	0.008	2328	2442	0.012	0.023	0.038
42 BYA	Butyl Acetate (sec-)	1	0.89	1.5	4	0.104	1.0300	0.009	2389	2652	0.014	0.028	0.042
44 IAL	Butyl Alcohol (iso-)	1	0.81	0.9	2.6	0.090	1.0180	0.008	2341	2434	0.012	0.023	0.035
46 BAS	Butyl Alcohol (sec-)	1	0.81	1.3	2.6	0.093	1.0260	0.008	2360	2494	0.012	0.024	0.037
47 BAT	Butyl Alcohol (tert-)	1	0.78	2.8	2.6	0.104	1.0560	0.010	2429	2718	0.015	0.029	0.044
48 BPH	Butyl Benzyl Phthalate	1	1.12	0.01	10.8	0.083	1.0002	0.007	2300	2309	0.010	0.021	0.032
58 BUE	Butyl Toluene	1	0.86	0.1	6.11	0.086	1.0020	0.007	2305	2331	0.011	0.021	0.032
64 CLS	Caproctam Solutions	1	1.02	0.05	3.9	0.084	1.0010	0.007	2302	2311	0.011	0.021	0.032
70 CUM	Cumene	1	0.86	0.60	4.20	0.092	1.0120	0.008	2328	2450	0.012	0.024	0.038
72 CHX	Cyclohexane	1	0.78	4.5	2.9	0.123	1.0900	0.012	2507	3052	0.018	0.037	0.056
73 CHN	Cyclohexane	1	0.85	0.15	3.45	0.086	1.0030	0.007	2307	2330	0.011	0.021	0.032
74 CPD	1,3-Cyclopentadiene dimer (mollen)	1	0.89	0.26	4.65	0.087	1.0060	0.007	2312	2368	0.011	0.022	0.033
76 CMP	Cymene (para-)	1	0.86	0.11	4.62	0.086	1.0022	0.007	2305	2330	0.011	0.021	0.032
77 DFN	Decahydronaphthalene	1	0.89	0.1	4.76	0.085	1.0020	0.007	2305	2328	0.011	0.021	0.032
78 IDA	Decaldehyde (iso-)	1	0.83	0.01	5	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
79 DAL	Decaldehyde (n-)	1	0.83	0	5.01	0.083	1.0005	0.007	2300	2299	0.010	0.021	0.032
81 DCE	Decane	1	0.74	0.12	4.9	0.085	1.0024	0.007	2306	2334	0.011	0.021	0.032
82 DAX	Decyl Alcohol (all isomers) (Decanol)	1	0.83	0.01	5.3	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
83 ISA	Decyl Alcohol (iso-)	1	0.83	0.01	5.3	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
84 DAN	Decyl Alcohol (n-)	1	0.83	0.01	5.3	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
85 DBZ	Decylbenzene (n-)	1	0.88	0.01	7.52	0.083	1.0002	0.007	2300	2304	0.010	0.021	0.032
87 DAA	Decalone Alcohol	1	0.97	0.1	4	0.084	1.0020	0.007	2305	2323	0.011	0.021	0.032
91 DPA	Di-butyl Phthalate (ortho-)	1	1.05	0	9.59	0.083	1.0000	0.007	2300	2299	0.010	0.021	0.032
92 DPT	Dicyclopentadiene, See 1,3-Cyclopentadiene Dimer (m 2)	1	0.98	0.25	4.55	0.087	1.0050	0.007	2312	2368	0.011	0.022	0.033
93 DEB	Diethylbenzene	1	0.87	0.08	4.82	0.084	1.0018	0.007	2304	2322	0.011	0.021	0.032
94 DEG	Diethylene Glycol	1	1.12	0.01	3.86	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
95 DME	Diethylene Glycol Butyl Ether	1	0.95	0.01	5.5	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
100 DGA	Diethylene Glycol Ethyl Ether Acetate	1	0.99	0.02	4.62	0.083	1.0004	0.007	2301	2305	0.010	0.021	0.032
101 DGM	Diethylene Glycol Methyl Ether	1	1.03	0.03	4.14	0.083	1.0008	0.007	2301	2307	0.010	0.021	0.032
111 DBC	Diisobutylcarbinol	1	0.81	0.09	4.97	0.085	1.0018	0.007	2304	2327	0.011	0.021	0.032
112 OBL	Diisobutylene	1	0.72	2	3.86	0.110	1.0400	0.010	2392	2751	0.015	0.030	0.045
113 DIX	Diisobutyl Ketone	1	0.81	0.19	4.9	0.086	1.0032	0.007	2307	2347	0.011	0.022	0.033
119 DIX	Diisopropylbenzene (all isomer)	1	0.85	0.03	5.0	0.084	1.0006	0.007	2301	2310	0.011	0.021	0.032
124 DTL	Dimethyl Phthalate	1	1.19	0	6.89	0.083	1.0090	0.007	2300	2299	0.010	0.021	0.032
128 DIF	Dimonyl Phthalate	1	0.97	0.01	14.4	0.084	1.0002	0.007	2300	2309	0.011	0.021	0.032
130 DOP	Dioctyl Phthalate	1	0.98	0	13.47	0.083	1.0000	0.007	2300	2299	0.010	0.021	0.032
131 DPN	Dipentene	1	0.84	0.1	4.9	0.085	1.0020	0.007	2306	2329	0.011	0.021	0.032
132 DIL	Diphenyl	1	0.99	0.01	5.31	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
133 DDO	Diphenyl Diphenyl Ether Mixture	1	1.07	0.01	5.86	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
134 DPE	Diphenyl Ether	1	1.07	0.01	5.87	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
136 DPG	Dipropylene Glycol	1	1.03	0.07	4.83	0.084	1.0014	0.007	2303	2319	0.011	0.021	0.032
139 DFF	Distillates: Freshed Feed Stocks	1	0.75	2.3	3.4	0.109	1.0480	0.010	2406	2755	0.015	0.030	0.045
140 DSR	Distillates: Straight Run	1	0.73	2.3	3.4	0.109	1.0480	0.010	2406	2755	0.015	0.030	0.045
145 DOZ	Dodecane (all isomers)	1	0.78	0.02	5.61	0.083	1.0004	0.007	2301	2307	0.010	0.021	0.032
146 DOD	Dodecane	1	0.79	0.02	5.81	0.083	1.0004	0.007	2301	2307	0.010	0.021	0.032
147	NOT USED												
155 ETG	Ethoxy Triglycol (crude)	1	1.02	0	6.14	0.083	1.0000	0.007	2300	2299	0.010	0.021	0.032
156 ETA	Ethyl Acetate	1	0.9	4.5	3.04	0.129	1.0900	0.012	2507	3089	0.019	0.037	0.057
157 EAA	Ethyl Acetoacetate	1	1.03	0.2	4.48	0.086	1.0040	0.007	2309	2354	0.011	0.022	0.033

158 EAL	Ethyl Alcohol (Ethanol)	1	0.70	3.5	1.8	0.093	1.0700	0.009	2481	2602	0.013	0.027	
160 ETB	Ethyl Benzene	1	0.87	0.8	3.58	0.090	1.0120	0.008	2328	2428	0.012	0.023	
161 EBT	Ethyl Butanol	1	0.83	0.12	3.52	0.084	1.0024	0.007	2309	2324	0.011	0.021	
162 EBR	Ethyl Butyrate	1	0.86	1	4	0.097	1.0200	0.008	2348	2538	0.013	0.025	0.038
163 ECV	Ethyl Cyclohexane	1	0.70	0.5	3.87	0.090	1.0100	0.008	2323	2416	0.011	0.023	0.035
168 EGL	Ethylene Glycol	1	1.19	0.01	2.21	0.083	1.0002	0.007	2300	2301	0.010	0.021	0.032
169 EMA	Ethylene Glycol Butyl Ether Acetate	1	0.94	0.05	5.52	0.084	1.0010	0.007	2302	2316	0.010	0.021	0.032
172 EGY	Ethylene Glycol Diacetate	1	1.1	0.01	6.03	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
178 EME	Ethylene Glycol Methyl Ether	1	1.1	0.01	4.8	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
180 EPE	Ethylene Glycol Phenyl Ether	1	1.1	0.01	4.8	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
184 EHA	2-Ethylhexaldehyde, See Octyl Aldehydes	1	0.82	0.17	4.41	0.086	1.0034	0.007	2308	2345	0.011	0.022	0.033
188 EHX	2-Ethylhexanol, see Octanol (all isomers)	1	0.84	0.02	4.5	0.083	1.0004	0.007	2301	2305	0.010	0.021	0.032
190 EPR	Ethyl Propionate	1	0.89	3.5	1.6	0.083	1.0700	0.009	2481	2602	0.013	0.027	0.038
191 ETE	Ethyl Toluene	1	0.88	0.28	4.15	0.087	1.0058	0.007	2313	2369	0.011	0.022	0.033
194 FAM	Formamide	1	1.13	0.1	1.55	0.083	1.0020	0.007	2306	2306	0.010	0.021	0.032
195 FAL	Furfuryl Alcohol	1	1.13	0.05	3.4	0.084	1.0010	0.007	2302	2309	0.011	0.021	0.032
197	NOT USED												
200	NOT USED												
201	NOT USED												
202	NOT USED												
203	NOT USED												
204 GCR	Glycerine	1	1.28	0	3.17	0.083	1.0000	0.007	2300	2290	0.010	0.021	0.032
217 HMX	Heptane (all isomers) (Methylhexane)	1	0.68	2.5	3.45	0.112	1.0500	0.010	2415	2801	0.016	0.031	0.047
218 HPT	Heptane (n-)	1	0.68	2.9	3.45	0.112	1.0500	0.010	2415	2801	0.015	0.031	0.047
219 HEP	Heptonic Acid	1	0.92	0.01	4.49	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
220 HTX	Heptanol (all isomers)	1	0.82	0.04	4	0.084	1.0008	0.007	2302	2309	0.011	0.021	0.032
221 HTN	Heptanol (all isomers)	1	0.82	0.04	4	0.084	1.0008	0.007	2302	2309	0.011	0.021	0.032
222 HPX	Heptane (all isomers)	2	0.7	2.9	3.4	0.116	1.0580	0.011	2433	2871	0.016	0.032	0.049
223 THE	Heptene (1-)	1	0.7	2.8	3.4	0.115	1.0580	0.011	2429	2852	0.016	0.032	0.049
224 HPE	Heptyl Acetate	1	0.88	0.1	5.5	0.085	1.0020	0.007	2306	2333	0.011	0.021	0.032
228	NOT USED												
230	NOT USED												
231 HXO	Hexanoic Acid	1	0.93	0.01	4	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
232	NOT USED												
234 HEX	Hexane (all isomers)	2	0.67	8	2.9	0.154	1.1800	0.017	2668	3538	0.026	0.062	0.079
235 HXE	Hexene (1-)	1	0.67	8.2	2.9	0.156	1.1840	0.017	2677	3670	0.027	0.053	0.080
236 HXT	Hexane (2-)	1	0.67	8.2	2.9	0.156	1.1840	0.017	2677	3670	0.027	0.053	0.080
238 HXG	Hexylene Glycol	4	0.92	0.01	1.1	0.083	1.0002	0.007	2300	2300	0.010	0.021	0.032
240 IPH	Isophorone	1	0.83	0.01	4.75	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
244 JPO	Jet Fuels: JP-1 (Kerosene)	1	0.8	0.14	4.5	0.085	1.0028	0.007	2308	2337	0.011	0.021	0.033
245	NOT USED												
246 JPF	Jet Fuels: JP-4	1	0.81	3.4	4	0.131	1.0880	0.012	2456	3083	0.019	0.037	0.057
247 JPV	Jet Fuels: JP-5 (Kerosene, heavy)	1	0.82	0.1	4	0.084	1.0020	0.007	2305	2323	0.011	0.021	0.032
249 KRS	Kerosene	1	0.81	0.16	4.5	0.085	1.0030	0.007	2307	2340	0.011	0.022	0.033
259 MFT	Methyl Acetate	1	0.92	6.1	2.6	0.129	1.1220	0.013	2681	3213	0.020	0.041	0.062
265 MAL	Methyl Alcohol (See Methanol)	1	0.79	6.83	1.1	0.088	1.1320	0.009	2805	2653	0.014	0.028	0.042
268 MAC	Methyl Amyl Acetate	1	0.89	0.33	4.07	0.089	1.0088	0.007	2316	2399	0.011	0.023	0.034
287 MAA	Methyl Amyl Alcohol	1	0.81	0.43	3.62	0.088	1.0088	0.007	2320	2389	0.011	0.022	0.034
271 MBK	Methyl n-Butyl Ketone	1	0.81	0.97	3.5	0.094	1.0194	0.008	2345	2499	0.012	0.026	0.037
273 MBU	Methyl Butyrate	1	0.9	1.29	3.53	0.099	1.0252	0.009	2356	2601	0.013	0.028	0.039
274 MEK	Methyl Ethyl Ketone	1	0.8	4.5	2.5	0.116	1.0900	0.011	2607	2948	0.017	0.034	0.052
275 MTF	Methyl Formal (Dimethyl Formal)	1	0.89	15.42	2.6	0.199	1.3084	0.028	3009	4655	0.043	0.085	0.129
279 MHK	Methyl Heptyl Ketone	1	0.83	0.08	4.9	0.084	1.0012	0.007	2309	2317	0.011	0.021	0.032
278 MIK	Methyl Isobutyl Ketone	1	0.8	1.15	3.45	0.098	1.0230	0.008	2363	2533	0.013	0.025	0.038
281 MNA	1-Methyl Naphthalene	1	1.02	0.01	4.91	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
283 MPN	2-Methyl-1-Pentene	1	0.89	6.3	2.9	0.139	1.1280	0.015	2580	3352	0.022	0.044	0.067
284 MYN	5-Methyl-1-Pentene	1	0.87	6.49	2.9	0.159	1.1888	0.018	2691	3719	0.027	0.054	0.082
288 MBE	Methyl Tert-Butyl Ether (MTBE)	1	0.74	0.04	3.1	0.083	1.0008	0.007	2302	2307	0.010	0.021	0.032
288 MMS	Mineral Spirits	1	0.75	0.2	4.3	0.086	1.0040	0.007	2309	2351	0.011	0.022	0.033
289 MRE	Myrcene	1	0.8	0.17	4.7	0.088	1.0034	0.007	2308	2348	0.011	0.022	0.033
295 NSV	Naphtha: Solvent	1	0.77	0.2	3.5	0.085	1.0040	0.007	2309	2341	0.011	0.022	0.033
296 NSS	Naphtha: Standard Solvent	1	0.79	0.2	4.3	0.088	1.0040	0.007	2309	2341	0.011	0.022	0.033
297 NVM	Naphtha: Varnish Maker's and Painters (75%)	1	0.77	0.19	4.3	0.086	1.0038	0.007	2309	2349	0.011	0.022	0.033
300 MAX	Nonane (all isomers)	1	0.72	0.27	4.4	0.087	1.0064	0.007	2312	2371	0.011	0.022	0.034

301 NAN	Nonane	0.72	0.27	4.4	0.087	1.0054	0.007	2312	2371	0.011	0.022	0.032
304 NON	Nonane	0.73	0.35	4.3	0.088	1.0070	0.007	2318	2390	0.011	0.022	0.032
305 NNS	Nonyl Alcohol (all isomers)	0.84	0.1	5	0.085	1.0020	0.007	2305	2330	0.011	0.021	0.032
308 NNN	Nonyl Alcohol	0.84	0.1	5	0.085	1.0020	0.007	2305	2330	0.011	0.021	0.032
307 NNI	Nonyl Alcohol (iso-)	0.85	0.01	7.6	0.083	1.0002	0.007	2300	2304	0.010	0.024	0.037
309 NNP	Nonyl Phenol	0.7	0.79	3.9	0.094	1.0158	0.008	2338	2482	0.012	0.024	0.037
315 OAX	Octane (all isomers)	0.7	0.70	3.9	0.094	1.0158	0.008	2338	2482	0.012	0.024	0.037
317 OAN	Octane	0.91	0.01	4.48	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
318 OAA	Octanoic Acid (all isomers)	0.83	0.01	4.48	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
319 OCX	Octanol (all isomers)	0.83	0.01	4.48	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
320 OTA	Octanol	0.72	0.9	3.9	0.085	1.0160	0.008	2341	2507	0.013	0.025	0.038
321 OTX	Octane (all isomers)	0.72	1	3.88	0.096	1.0200	0.008	2348	2528	0.010	0.021	0.032
322 OTE	Octane (1-)	0.83	0.01	4.48	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
324 OCX	Octyl Alcohol (iso-, n-) (all isomers). See Octanol (all isomers)	0.83	0.01	4.48	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
325 IOA	Octyl Alcohol	0.88	0.58	8	0.101	1.0112	0.009	2326	2570	0.013	0.021	0.032
364 OTW	Fuel: No. 2	0.9	0.15	3.4	0.085	1.0030	0.007	2307	2330	0.011	0.021	0.032
368 OFR	Fuel: No. 4	0.94	0.15	3.4	0.085	1.0030	0.007	2307	2330	0.011	0.021	0.032
367 OFV	Fuel: No. 5	0.95	0.15	3.4	0.085	1.0030	0.007	2307	2330	0.011	0.021	0.032
369 OSX	Fuel: No. 6	0.94	0.15	3.4	0.085	1.0030	0.007	2307	2330	0.011	0.021	0.032
382 OIL	OIL, Misc: Crude	0.9	0.99	3.4	0.091	1.0138	0.008	2832	2438	0.012	0.023	0.035
383 ODS	OIL, Misc: Diesel	0.9	0.15	1	0.083	1.0030	0.007	2307	2308	0.010	0.021	0.032
389 OLB	OIL, Misc: Lubricating	1.02	0.15	1	0.083	1.0030	0.007	2307	2308	0.010	0.021	0.032
403 ORS	OIL, Misc: Resin	0.87	0.3	5.4	0.089	1.0080	0.007	2314	2398	0.011	0.023	0.034
418 OTB	OIL, Misc: Turbine	0.83	0.01	7.88	0.083	1.0002	0.007	2300	2304	0.010	0.021	0.032
429 PDC	Pentadecanol. See Alcohols (C13 and above)											
432	NOT USED											
437	NOT USED											
442 PIN	Pinene	0.86	0.35	4.7	0.089	1.0070	0.007	2318	2399	0.011	0.023	0.034
448 PLB	Polybutane	0.81	0.01	79.3	0.087	1.0092	0.007	2300	2350	0.011	0.022	0.033
457 PGC	Polypropylene Glycol	1.01	0.1	1	0.083	1.0020	0.007	2305	2304	0.010	0.021	0.032
458 PGM	Polypropylene Glycol Methyl Ether	0.82	0.8	3.11	0.091	1.0160	0.008	2337	2445	0.012	0.023	0.038
484 IAC	Propyl Acetate (iso-)	0.89	1.8	3.52	0.104	1.0380	0.008	2383	2870	0.014	0.028	0.043
485 PAT	Propyl Acetate (n-)	0	1.85	3.52	0.105	1.0370	0.009	2385	2880	0.014	0.028	0.042
486 IPA	Propyl Alcohol (iso-)	0.79	3	2.07	0.098	1.0830	0.009	2434	2649	0.014	0.028	0.035
487 PAL	Propyl Alcohol (n-)	0.8	1.2	2.07	0.089	1.0240	0.008	2355	2438	0.012	0.023	0.033
488 PBZ	Propylbenzene (n-)	0.86	0.2	4.14	0.088	1.0040	0.007	2309	2349	0.011	0.022	0.033
489 IPX	Iso-Propylcyclohexane	0.8	0.01	4.35	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
478 PPG	Propylene Glycol (1,2-Propandiol)	1.04	0.01	2.62	0.083	1.0002	0.007	2300	2301	0.010	0.021	0.032
479 PME	Propylene Glycol Methyl Ether	0.92	0.7	3.11	0.090	1.0140	0.008	2332	2427	0.012	0.023	0.035
478 PTT	Propylene Tetramer	0.29	0.02	1	0.083	1.0004	0.007	2301	2300	0.010	0.021	0.032
488 SFL	Sulfolene	1.25	0.01	4.14	0.083	1.0002	0.007	2300	2302	0.010	0.021	0.032
493 TYN	Tetradecanol	0.82	0	7.39	0.083	1.0000	0.007	2300	2299	0.010	0.021	0.032
494 TTD	t-Tetradecane. See the olefin or Alpha-Olefin Entries	0.77	0.01	6.77	0.083	1.0002	0.007	2300	2304	0.010	0.021	0.032
496 TTG	Tetraethylene Glycol	1.12	0.01	6.7	0.083	1.0002	0.007	2302	2310	0.011	0.021	0.032
497 THN	Tetrahydronaphthalene	0.97	0.04	4.68	0.084	1.0008	0.007	2388	2674	0.013	0.026	0.040
499 TOL	Toluene	0.87	1.5	3.14	0.098	1.0300	0.009	2388	2674	0.013	0.026	0.040
502 TCP	Tricresyl Phosphate (less than 1% of the ortho isomer)	0.87	0.01	12.89	0.084	1.0002	0.007	2300	2307	0.010	0.021	0.032
503 TRD	Tridecane	1.16	0.01	8.4	0.084	1.0004	0.007	2301	2307	0.010	0.021	0.032
506 TDN	Tridecanol. See Alcohols (C13 and above)	0.78	0.02	8.4	0.084	1.0004	0.007	2301	2307	0.010	0.021	0.032
509 TDC	1-Tridecane	0.85	0.01	6.91	0.083	1.0002	0.007	2300	2303	0.010	0.021	0.032
508 TEB	Triethylbenzene	0.77	0.01	6.29	0.083	1.0002	0.007	2301	2308	0.010	0.021	0.032
509 TEG	Triethylene Glycol	0.86	0.02	5.6	0.083	1.0004	0.007	2300	2303	0.010	0.021	0.032
518 TRE	Trimethylbenzenes (all isomers)	1.12	0.01	5.17	0.083	1.0002	0.007	2306	2335	0.011	0.021	0.032
520 TMB	Trimethyl Benzene (1,2,5-)	0.89	0.14	4.2	0.085	1.0028	0.007	2308	2334	0.011	0.021	0.032
521 TMO	Trimethyl Benzene (1,2,3-)	0.89	0.14	4.14	0.085	1.0028	0.007	2308	2334	0.011	0.021	0.032
522 TME	Trimethyl Benzene (1,2,4-) (Pseudocumene)	0.89	0.14	4.14	0.085	1.0028	0.007	2308	2334	0.011	0.021	0.032
529 TRP	Trixylenyl Phosphate	1.16	0	14.2	0.093	1.0000	0.007	2300	2316	0.011	0.021	0.032
533 UDC	Undecene (1-)	0.75	0.05	5.32	0.084	1.0010	0.007	2300	2303	0.010	0.021	0.032
534 UNO	Undecyl Alcohol	0.84	0.01	5.94	0.083	1.0002	0.007	2323	2410	0.011	0.023	0.035
548 XLX	Xylenes (Ortho-, meta-, para-)	0.89	0.51	3.68	0.089	1.0102	0.008	2323	2410	0.011	0.023	0.035
547 XLM	Xylene (M-)	0.87	0.51	3.66	0.089	1.0102	0.008	2316	2386	0.011	0.023	0.035
548 XLO	Xylene (O-)	0.89	0.4	3.66	0.089	1.0102	0.008	2323	2410	0.011	0.023	0.035
549 XLP	Xylene (P-)	0.86	0.61	3.66	0.089	1.0102	0.008	2305	2321	0.011	0.021	0.032
550 XYL	Xylenol	1.01	0.1	3.60	0.084	1.0020	0.007					

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Zinc Dialkylthiophosphate

Max.	1.280	15.420	79.300	0.109	1.306	0.028	3009	4855	0.043	0.055
Min.	0.000	0.000	1.000	0.083	1.000	0.007	2300	2299	0.010	0.800

*When barge vapor piping is connected to facility vapor recovery system.

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LIQUID TRANSFER RATE vs PRESSURE DROP

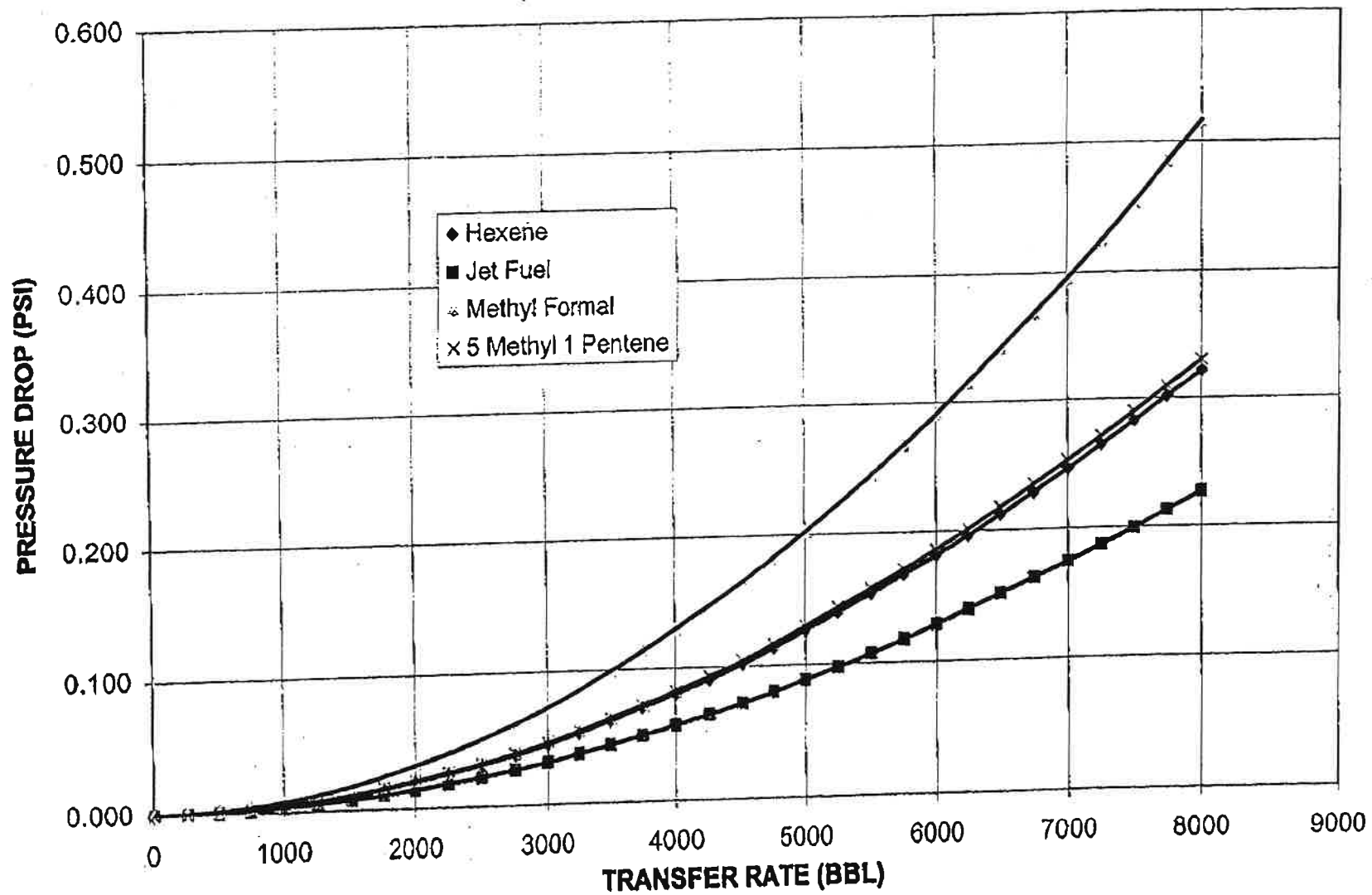


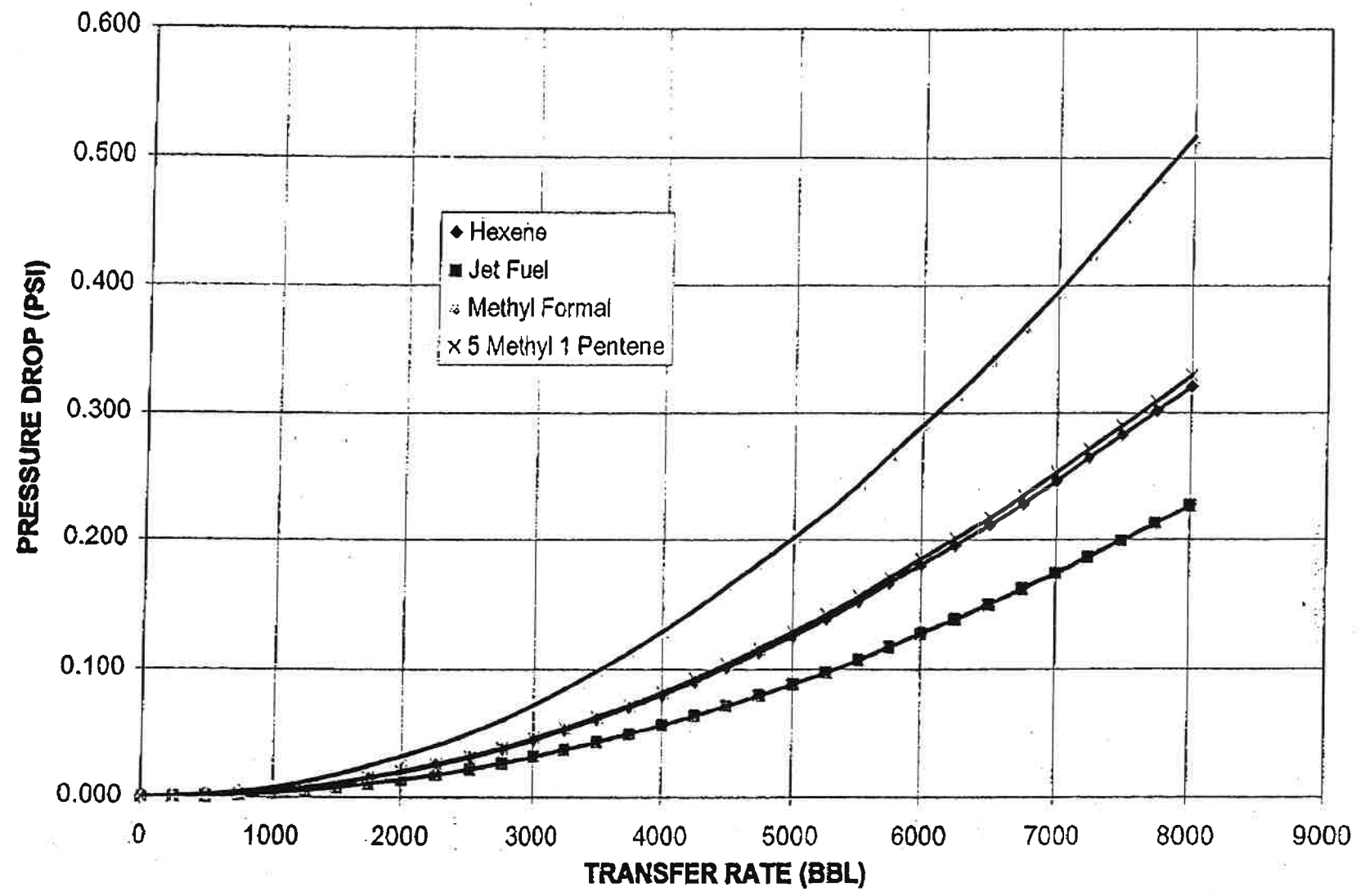
TABLE 3 (SUB CHAPTER "O" CARGOES)

CHRIS CODE	NAME	VCS CAT	LIQ SG	VAPOR PRESS	VAPOR SG	VAPOR AIR WEIGHT DENSITY	VAPOR GROWTH RATE	PRESSURE DROP TO PV VALVE IN VCS (psig) (LOADING)	VAPOR VOLUMETRIC FLOW RATE (bbbl/h)	AIR EQUIVALENT VOLUMETRIC FLOW RATE	PRESSURE DROP TO SHORE CONNECTION IN VCS (psig) (LOADING)*	PRESSURE DROP TO PV VALVE IN VCS (psig) (UNLOADING)	PRESSURE DROP TO SHORE CONNECTION IN VCS (psig) (UNLOADING)*
1 ACN	Acrylonitrile	4	0.81	5.80	1.80	0.102	1.1000	0.011	2840	2922	0.017	0.008	0.009
2	NOT USED												
3 ADN	Adiponitrile	1	0.95	0.01	3.73	0.083	1.0002	0.007	2400	2402	0.011	0.004	0.008
4 ATN	Acetonitrile	3	0.78	0.03	1.41	0.083	1.0006	0.007	2401	2402	0.011	0.004	0.006
5 BAD	Iso-Butyraldehyde	1	0.80	7.80	2.50	0.138	1.1560	0.017	2774	3575	0.025	0.008	0.013
6 BAN	Butyl alcohol (n-)	1	0.81	0.50	2.60	0.087	1.0100	0.008	2424	2477	0.012	0.004	0.006
7 BAR	Butyl acrylate (iso-, n-)	2	0.90	0.60	4.42	0.083	1.0120	0.009	2429	2565	0.013	0.004	0.007
8 BCN	Butyl acetate (n-)	1	0.89	0.80	4.00	0.084	1.0160	0.009	2438	2588	0.013	0.004	0.007
9 BNZ	Benzene	1	0.88	4.50	2.80	0.121	1.0900	0.013	2816	3157	0.020	0.007	0.010
10 BTR	n-Butyraldehyde	1	0.80	7.80	2.50	0.138	1.1560	0.017	2774	3575	0.025	0.008	0.013
11 BTX	Benzene, Toluene, Xylene m&dures (10% Benzene or more)	1	0.84	7.30	2.80	0.145	1.1460	0.017	2750	3629	0.028	0.009	0.013
12 CCH	Cyclohexanone	1	0.95	0.20	3.40	0.085	1.0040	0.008	2410	2441	0.012	0.004	0.006
13 CHA	Cyclohexylamine	1	0.87	0.82	3.42	0.090	1.0124	0.008	2430	2530	0.013	0.004	0.006
14 CHX	Cyclohexane	1	0.78	4.50	2.90	0.123	1.0900	0.013	2816	3185	0.020	0.007	0.010
15 CPD	1,3-Cyclohexadiene dimer (molten)	2	0.89	0.25	4.55	0.087	1.0050	0.008	2412	2471	0.012	0.004	0.006
16 CRB	Chlorobenzene	1	1.11	0.60	3.88								
17 CRS	Cresols	1	1.05	0.06	3.72								
18 DAN	Decyl alcohol (n-)	1	0.83	0.01	5.30	0.083	1.0002	0.007	2400	2403	0.011	0.004	0.006
19 DCH	1,1-Dichloroethane	1	1.18	9.90	3.41	0.195	1.1980	0.025	2675	4404	0.038	0.013	0.020
20 DDB	Dodecylbenzene	1	0.86	4.70	8.40	0.248	1.0040	0.027	2628	4520	0.040	0.014	0.021
21 DEG	Diethylene glycol	1	1.12	0.01	3.66	0.083	1.0002	0.007	2400	2402	0.011	0.004	0.006
22 DEN	Diethylamine	3	0.71	1.00	2.50	0.090	1.0200	0.008	2448	2540	0.013	0.004	0.007
23 DIP	Diisopropanolamine	1	0.88	0.01	4.59	0.083	1.0002	0.007	2400	2402	0.011	0.004	0.006
24 DMF	Dimethylformamide	1	0.85	0.30	2.51	0.083	1.0080	0.009	2414	2444	0.012	0.004	0.006
25 DOD	Dodecene	1	0.76	0.02	5.81	0.083	1.0004	0.008	2401	2407	0.011	0.004	0.006
26 DPG	Dipropylene glycol	1	1.03	0.07	4.83	0.084	1.0014	0.008	2403	2420	0.012	0.004	0.006
27 DPX	1,1-, 1,2-, or 1,3-Dichloropropane	3	1.16	6.30	3.90	0.169	1.1280	0.019	2702	3851	0.029	0.010	0.016
28 EAC	Ethyl acrylate	2	0.93	2.00	3.50	0.109	1.0400	0.010	2486	2828	0.018	0.005	0.008
29 EAL	2-Ethylhexyl acrylate	2	0.89	0.02	6.35	0.084	1.0004	0.008	2401	2408	0.011	0.004	0.006
30 EDC	Ethylene dichloride	1	1.25	4.00	3.42	0.129	1.0800	0.013	2592	3223	0.020	0.007	0.010
31 EOL	Ethylene glycol	1	1.13	0.01	2.21	0.083	1.0002	0.007	2400	2401	0.011	0.004	0.006
32 EHX	2-Ethyl hexanol	1	0.84	0.02	4.50	0.083	1.0004	0.008	2401	2405	0.011	0.004	0.006
33 ETA	Ethyl acetate	1	0.90	4.50	3.04	0.129	1.0900	0.013	2816	3223	0.020	0.007	0.010
34 FFA	Furfural	1	1.20	0.15	3.31	0.085	1.0030	0.008	2407	2430	0.012	0.004	0.006
35 FMS	Formaldehyde solution (37% to 50%)	1	1.13	0.15	1.03	0.083	1.0030	0.008	2407	2407	0.011	0.004	0.006
36	NOT USED												
37	NOT USED												
38	NOT USED												
39	NOT USED												
40	NOT USED												
41	NOT USED												
42	NOT USED												
43	NOT USED												
44 HMX	Heptane (all isomers)	1	0.68	2.50	3.45	0.112	1.0500	0.011	2520	2923	0.017	0.006	0.009
45 HPX	Heptane (all isomers)	2	0.70	2.90	3.40	0.116	1.0580	0.012	2539	2996	0.018	0.006	0.009
46	NOT USED												
47 HXN	Hexanol	1	0.82	1.00	3.62	0.095	1.0200	0.009	2448	2818	0.013	0.006	0.007
48 IPA	Propyl alcohol (iso)	1	0.79	3.00	2.07	0.098	1.0500	0.010	2544	2764	0.015	0.006	0.008
49 KRS	Kerosene	1	0.81	0.15	4.50	0.085	1.0030	0.008	2407	2442	0.012	0.004	0.006
50 MAL	Methyl alcohol	1	0.79	6.63	1.10	0.086	1.1328	0.010	2718	2768	0.018	0.005	0.008
51 MAM	Methyl acrylate	2	0.85	4.10	3.00	0.121	1.0820	0.013	2597	3140	0.019	0.007	0.010
52 MBE	Methyl tert-butyl ether	1	0.74	0.04	3.10	0.083	1.0008	0.008	2402	2407	0.011	0.004	0.006

		0.00	0.00	4.00	0.110	1.0000	0.012	2018	3074	0.010	0.008	0.01	
54 MMM	Methyl methacrylate	2	0.94	2.02	3.46	0.109	1.0404	0.010	2497	2824	0.010	0.005	0.008
55 MNS	Mineral spirits	1	0.75	0.20	4.30	0.086	1.0040	0.008	2410	2463	0.012	0.004	0.008
56 MPL	Morpholine	1	1.00	0.80	3.00	0.091	1.0160	0.008	2438	2548	0.013	0.004	0.007
57 MTT	Methyl acetate	1	0.82	6.10	2.60	0.129	1.1220	0.015	2693	3363	0.022	0.007	0.011
58 NNN	Nonyl alcohol	1	0.94	0.10	6.00	0.085	1.0020	0.008	2406	2431	0.012	0.004	0.008
59 NON	Nonene	2	0.73	0.35	4.30	0.088	1.0070	0.008	2417	2494	0.012	0.004	0.008
60 NPM	1- or 2-Nitropropane	1	0.89	1.05	3.04	0.093	1.0210	0.009	2460	2595	0.013	0.004	0.007
61 NSV	Naphtha: Solvent	1	0.87	0.20	1.60	0.085	1.0040	0.008	2410	2443	0.012	0.004	0.008
62 NVM	Naphtha: VM & P (75% Naphtha)	1	0.77	0.19	4.30	0.086	1.0038	0.008	2409	2451	0.012	0.004	0.008
63 OIL	Oil, misc: Crude	1	0.95	0.15	3.40	0.085	1.0030	0.008	2407	2431	0.012	0.004	0.008
64 OTW	OIL, Fuel No. 2	1	0.88	0.58	6.00	0.101	1.0112	0.009	2427	2981	0.014	0.005	0.007
65 PRD	Pyridine	1	0.98	1.30	2.72	0.093	1.0280	0.009	2482	2813	0.013	0.005	0.007
66 PBY	Propylbenzene	1	0.85	0.60	4.20	0.092	1.0120	0.008	2420	2556	0.013	0.004	0.007
67 STY	Styrene	2	0.92	0.40	3.60	0.088	1.0080	0.008	2419	2489	0.012	0.004	0.008
68 TCN	1,2,3-Trichloropropane	3	1.39	0.15	5.60	0.086	1.0030	0.008	2407	2463	0.012	0.004	0.008
69 TEN	Triethylamine	3	0.73	2.50	3.49	0.112	1.0500	0.011	2620	2929	0.017	0.008	0.009
70 THF	Tetrahydrofuran	1	0.89	8.50	1.35	0.097	1.1700	0.012	2808	3034	0.018	0.006	0.009
71 TOL	Toluene	1	0.87	1.50	3.14	0.098	1.0300	0.009	2472	2659	0.014	0.005	0.007
72 VAM	Vinyl acetate	2	0.94	5.80	2.97	0.137	1.1160	0.015	2878	3435	0.023	0.006	0.012
	Max.		1.39	12.5	8.40	0.246	1.198	0.027	2876	4520	0.040	0.014	0.021
	Min.		0.63	0.01	1.03	0.083	1.000	0.007	2400	2401	0.011	0.004	0.008

*when berge vapor piping is connected to facility vapor recovery system.

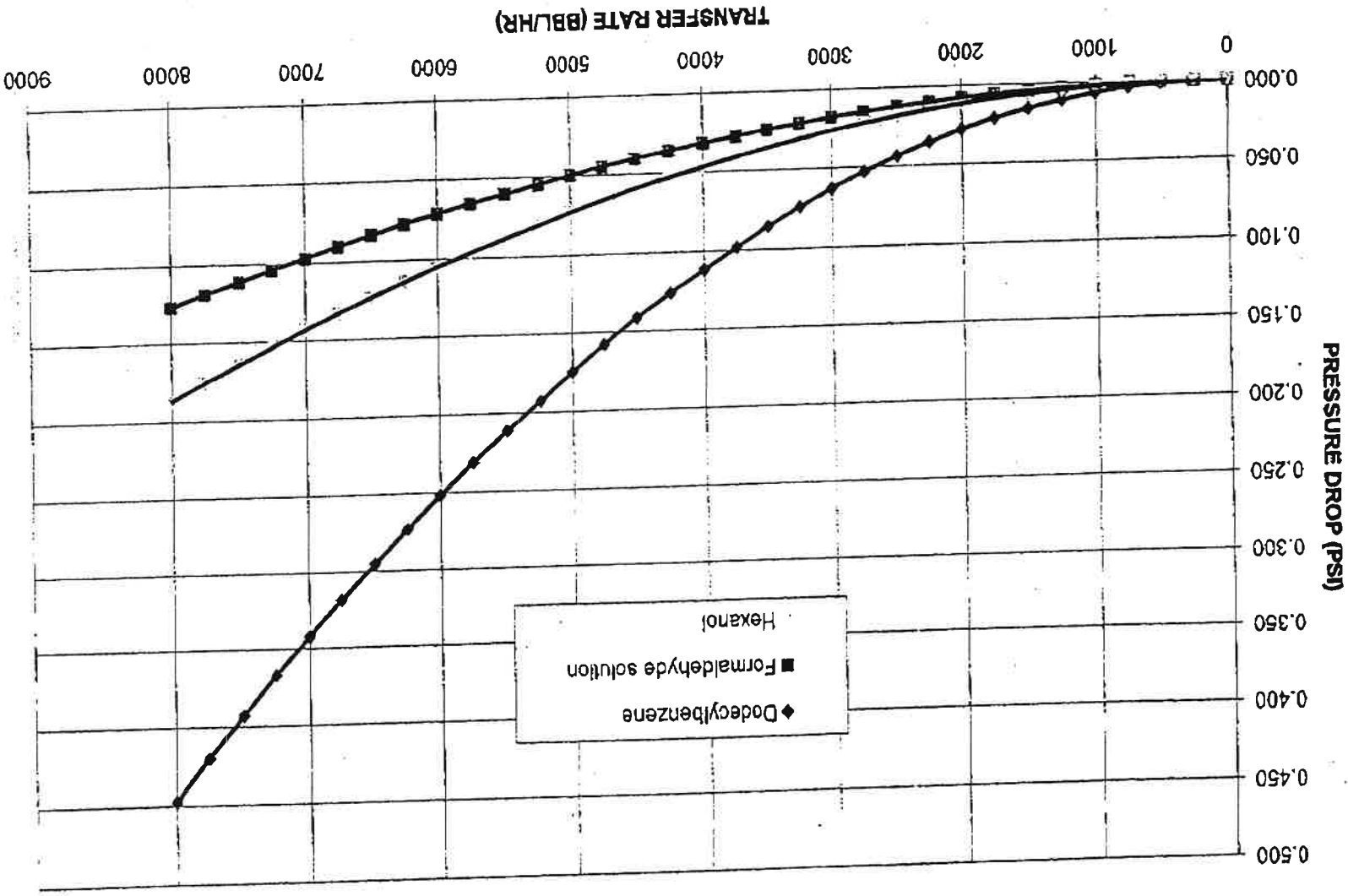
LIQUID TRANSFER RATE vs PRESSURE DROP



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**LIQUID TRANSFER RATE vs PRESSURE DROP
(SUBCHAPTER "O" CARGOES)**



070101-2.....CARGO PIPING ARRANGEMENT
 070101-4.....HEATING SYSTEM ARRANGEMENT

GENERAL NOTES

1. P/V VALVES SHALL BE SET @ 2.0 PSIG PRES. & -.5 PSIG VAC.
2. ENDS OF THE VAPOR MANIFOLD SHOULD BE PAINTED AS SHOWN IN DETAIL "1" IN ACCORDANCE WITH CRF 46 PART 39.20-D-(d).
3. THE VAPOR COLLECTION PIPING MUST BE ELECTRICALLY CONTINUOUS AND BONDED TO THE HULL.
4. NO VAPOR COLLECTION HOSES ARE TO BE CARRIED ABOARD THE BARGE.
5. PIPING SYSTEM TO BE U.S.C.G. CLASS II SYSTEM.
6. PIPING SYSTEM TO BE AIR TESTED TO 1.5 PSI IN ASSOCIATION WITH SOAPY WATER SOLUTION.

Subject to comments in
 Marine Safety Center letter of

APR 16 2008

APPROVED

2	INCORPORATED USCG COMMENTS PER LETTER 16710/P013823 DATED 3/24/08	RF	4/1/08
1	INCORPORATED USCG COMMENTS.	RF	8/22/07
NO.	REVISION	BY	DATE

PREPARED FOR:



SHEARER & ASSOC., INC.
NAVAL ARCHITECTS
 NEW ORLEANS • HOUSTON • NASHVILLE

200'-0" x 35'-0" x 12'-6"
 DOUBLE SKIN TANK BARGE

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SCALE: 1/8"=1'-0" U.N.	APPROVED BY:	DRAWN BY: KTS
DATE: 11/08/07		REV. No. 2

VAPOR CONTROL SYSTEM ARRANGEMENT

JOB A-1182	HULL 95-104 HULL 111-126	DRAWING NUMBER 070101-3
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TABLE 3 (SUB CHAPTER 'O' CARGOES)

CHRIS CODE	NAME	VCS CAT	LIQ SG	VAPOR PRES	VAPOR SG	VAPOR	VAPOR	PRESSURE	VAPOR	AIR	PRESSURE	PRESSURE	PRESSURE
						AIR WEIGHT DENSITY	GROWTH RATE	DROP TO PV VALVE IN VCS(psig) (LOADING)	VOLUMETRIC FLOW RATE (bb/h)	EQUIVALENT VOLUMETRIC FLOW RATE	DROP TO SHORE CONNECTION IN VCS (psig) (LOADING)*	DROP TO PV VALVE IN VCS(psig) (UNLOADING)	DROP TO SHORE CONNECTION IN VCS (psig) (UNLOADING)*
1 ACN	Acrylonitrile	4	0.81	5.00	1.80	0.102	1.1000	0.011	2640	2922	0.017	0.006	0.009
2	NOT USED												
3 ADN	Adiponitrile	1	0.95	0.01	3.73	0.083	1.0002	0.007	2400	2402	0.011	0.004	0.006
4 ATN	Acetonitrile	3	0.78	0.03	1.41	0.083	1.0006	0.007	2401	2402	0.011	0.004	0.006
5 BAD	Iso-Butylaldehyde	1	0.80	7.80	2.50	0.138	1.1580	0.017	2774	3575	0.025	0.008	0.013
6 BAN	Butyl alcohol (n-)	1	0.81	0.60	2.60	0.087	1.0100	0.008	2424	2477	0.012	0.004	0.006
7 BAR	Butyl acrylate (iso-, n-)	2	0.90	0.80	4.42	0.093	1.0120	0.009	2428	2586	0.013	0.004	0.007
8 BON	Butyl acetate (n-)	1	0.88	0.80	4.00	0.094	1.0180	0.009	2438	2598	0.013	0.004	0.007
9 BNZ	Benzene	1	0.88	4.50	2.80	0.121	1.0900	0.013	2616	3157	0.020	0.007	0.010
10 BTR	n-Butylaldehyde	1	0.80	7.80	2.50	0.138	1.1580	0.017	2774	3575	0.025	0.008	0.013
11 BTX	Benzene, Toluene, Xylene mixtures (10% Benzene or more)	1	0.84	7.30	2.80	0.145	1.1480	0.017	2750	3628	0.025	0.009	0.013
12 OCH	Cyclohexanone	1	0.95	0.20	3.40	0.085	1.0040	0.008	2410	2441	0.012	0.004	0.006
13 CHA	Cyclohexylamine	1	0.87	0.62	3.42	0.090	1.0124	0.008	2430	2530	0.013	0.004	0.006
14 CHX	Cyclohexane	1	0.78	4.50	2.90	0.123	1.0800	0.013	2616	3185	0.020	0.007	0.010
15 CPD	1,3-Cyclopentadiene dimer (molten)	2	0.69	0.26	4.55	0.087	1.0050	0.008	2412	2471	0.012	0.004	0.006
16 CRB	Chlorobenzene	1	1.11	0.80	3.86								
17 CRS	Cresols	1	1.05	0.06	3.72								
18 DAN	Decyl alcohol (n-)	1	0.83	0.01	5.30	0.083	1.0002	0.007	2400	2403	0.011	0.004	0.006
19 DCH	1,1-Dichloroethane	1	1.18	8.90	3.41	0.195	1.1880	0.025	2875	4404	0.038	0.013	0.020
20 DDB	Dodecylbenzene	1	0.88	4.70	8.40	0.248	1.0940	0.027	2626	4520	0.040	0.014	0.021
21 DEG	Diethylene glycol	1	1.12	0.01	3.66	0.083	1.0002	0.007	2400	2402	0.011	0.004	0.006
22 DEN	Diethylamine	3	0.71	1.00	2.50	0.090	1.0200	0.008	2448	2549	0.013	0.004	0.007
23 DIP	Dilaopropanolamine	1	0.69	0.01	4.69	0.083	1.0002	0.007	2400	2402	0.011	0.004	0.006
24 DMF	Dimethylformamide	1	0.95	0.30	2.51	0.085	1.0060	0.008	2414	2444	0.012	0.004	0.006
25 DOD	Dodecane	1	0.76	0.02	5.81	0.083	1.0004	0.008	2401	2407	0.011	0.004	0.006
26 DPG	Dipropylene glycol	1	1.03	0.07	4.63	0.084	1.0014	0.008	2403	2420	0.012	0.004	0.006
27 DPX	1,1-, 1,2-, or 1,3-Dichloropropane	3	1.16	8.30	3.90	0.189	1.1280	0.019	2702	3851	0.029	0.010	0.016
28 EAC	Ethyl acrylate	2	0.93	2.00	3.60	0.108	1.0400	0.010	2408	2828	0.016	0.005	0.008
29 EAI	2-Ethylhexyl acrylate	2	0.89	0.02	6.35	0.084	1.0004	0.008	2401	2408	0.011	0.004	0.006
30 EDC	Ethylene dichloride	1	1.26	4.00	3.42	0.128	1.0800	0.013	2592	3223	0.020	0.007	0.010
31 EGL	Ethylene glycol	1	1.13	0.01	2.21	0.083	1.0002	0.007	2400	2401	0.011	0.004	0.006
32 EHX	2-Ethyl hexanol	1	0.84	0.02	4.50	0.083	1.0004	0.008	2401	2405	0.011	0.004	0.006
33 ETA	Ethyl acetate	1	0.90	4.50	3.04	0.126	1.0800	0.013	2616	3223	0.020	0.007	0.010
34 FFA	Formal	1	1.20	0.15	3.31	0.085	1.0030	0.008	2407	2430	0.012	0.004	0.006
35 FMS	Formaldehyde solution (37% to 50%)	1	1.13	0.15	1.03	0.083	1.0030	0.008	2407	2407	0.011	0.004	0.006
36	NOT USED												
37	NOT USED												
38	NOT USED												
39	NOT USED												
40	NOT USED												
41	NOT USED												
42	NOT USED												
43	NOT USED												
44 HMX	Heptane (all isomers)	1	0.68	2.50	3.45	0.112	1.0500	0.011	2520	2923	0.017	0.006	0.009
45 HPX	Heptane (all isomers)	2	0.70	2.90	3.40	0.116	1.0580	0.012	2539	2986	0.018	0.006	0.009
46	NOT USED												
47 HXN	Hexanol	1	0.82	1.00	3.62	0.095	1.0200	0.009	2448	2616	0.013	0.006	0.007
48 IPA	Propyl alcohol (iso)	1	0.79	3.00	2.07	0.098	1.0600	0.010	2644	2764	0.015	0.003	0.006
49 KRS	Kerosene	1	0.81	0.15	4.50	0.085	1.0030	0.008	2407	2442	0.012	0.004	0.006
80 MAL	Methyl alcohol	1	0.79	8.63	1.10	0.086	1.1328	0.010	2718	2788	0.016	0.006	0.008
81 MAM	Methyl acrylate	2	0.95	4.10	3.00	0.121	1.0820	0.013	2597	3140	0.019	0.007	0.010
82 MBE	Methyl tert-butyl ether	1	0.74	0.04	3.10	0.083	1.0008	0.008	2402	2407	0.011	0.004	0.006



Marine Safety Center Vapor Control System (VCS) Plan Review Information Sheet (PRIS)



Vessel Name	CBC 1331-CBC 1334, unnamed	Shipyard	C&C Marine and Repair, Inc.
Official Number	Unassigned	Hull Number	130 through 137

1. This sheet consolidates critical VCS parameters for MSC Staff Engineers and CG Field Inspectors dealing with Vapor Control Systems. CG Inspectors should verify the vessel's VCS design is consistent with the information listed in boxes 2, 6, 7 & 8 prior to updating the vapor control endorsement on the vessel's Certificate of Inspection. For cases where the information in the VCS PRIS does not reflect the vessel's design the CG Inspector should contact the Marine Safety Center.

2. Tank Maximum Design Working Pressure 3.25 psig

3. Authorized Maximum Cargo Transfer Rate(s)

2400	bbl/hr loading
2400	bbl/hr discharging

4. Authorized Maximum Cargo Density 0.246 lbm/ft³

5. Authorized VCS Categories 1 through 4

6. Cargoes with the highest vapor density and/or pressure drop:

a. Cargo Name DDB

b. Cargo Name GAK

7. Pressure Vacuum Valve:		8. VCS Pipe Sizes:	
Manufacturer	BERGEN	Settings in psig:	Approx. Inside Diameter
Size	KLPH-6	Pressure-side	Longitudinal Header (inches)
CG Approval	162.017/144	Vacuum-side	Transverse Header (Inches)
		2	8
		0.5	8
Required Venting Capacity of Pressure-Side of P/V valve		5094	bbl/hr (air)
Required Venting Capacity of Vacuum-Side of P/V valve		2400	bbl/hr (air)

9. Tank Overfill Protection System (check appropriate box or boxes)

a. High Level/Tank Overfill Alarm	<input checked="" type="checkbox"/>	Type	BERGEN
b. Overfill Control Shutdown	<input checked="" type="checkbox"/>	Type	BERGEN
c. Spill Valve	<input type="checkbox"/>	Type	N/A
d. Rupture Disk	<input type="checkbox"/>	Type	N/A

Setting in psig N/A

10. Closed Gauging Verify the vessel has closed gauging that satisfies 46 CFR 39.20-3 and 151.15-10(c).

11. Instructions/Guidelines for the OCMI:

11a. The following is the Marine Safety Center's recommended COI endorsement

Only those hazardous cargoes named in the vessel's Cargo Authority Attachment, Serial # C1-0801180 dated 4/16/2008, may be carried and then only in the tanks indicated.

When the vessel is carrying cargoes containing greater than 0.5% benzene, the person in charge is responsible for ensuring the provisions of 46 US Code of Federal Regulations Part 197, Subpart C are applied.

In accordance with 46 CFR Part 39, excluding part 39.40, this vessel's vapor control system has been inspected to the plans approved by Marine Safety Center letter Serial # C1-0801180 dated 4/16/2008, and found acceptable for collection of bulk liquid cargo vapors annotated with "Yes" in the CAA's VCS column.

11b. The MSC approval letter/s must be available at the OCMI's request.

11c. Verify isolation valve at the vapor connection flange is manually operable and designed in a way it is "clearly" open or closed.

11d. Previous applicable approval letters:

None	

VCS Approval Letter C1-0801180 dated 4/16/2008	MSC Plan Reviewer: Marcus Ewardo
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