



BMT Fleet Technology

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Transport Canada APPROVED ON THE AUTHORITY OF THE CANADA SHIPPING ACT AND REGULATIONS MADE THERE UNDER ON BEHALF OF THE BOARD OF STEAMSHIP INSPECTION, DEPARTMENT OF TRANSPORT <i>ASmith</i>	Transport Canada APPROVED EN VERTU DE LA LOI SUR LA MARINE MARCHANDE DU CANADA ET DES REGLE- MENTS CONNEXES POUR LE COMPTÉ DE BUREAU D'INSPECTION DES NAVIRES A VAPEUR, MINISTÈRE DES TRANSPORTS DATE JUN 26 2012
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CCGS Cygnus Stability Booklet

SUBJECT TO THE OWNER, HIS SHIPBUILDER OR NAVAL ARCHITECT BEING RESPONSIBLE FOR THE ACCURACY OF THE DESIGN PRESENTING CONDITIONS PRE- SENTED HEREIN AND OF THE BASIC DATA FROM WHICH SUCH CON- DITIONS WERE DEVELOPED. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND MASTER TO ENSURE THAT A PROPER MEASURE OF STABILITY IS MAINTAINED FOR ALL CONDITIONS OF LOADING AND BALLASTING.	SOUS RÉSERVE QUE LE PRO- PRIÉTAIRE SONT ARCHITECTE NAVAL OU LE CONSTRUCTEUR DE NAVIRES SON RESPONSABLES DE L'EXACTITUDE DES CONDITIONS D'EXPLOITATION SOUMISES ET DES DONNÉES DE BASES D'APRÈS LESQUELLES LES CONDITIONS SON ÉLABORÉES IL INCOMBE AU PROPRIÉTAIRE ET AU CAPITAINE DE MAINTENIR UN DEGRÉ APPROPRIÉ DE STABILITÉ DANS TOUTES LES CONDITIONS DE CHARGEMENT ET DE LESTAGE.
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Reference: 5970AA

Date: July 19, 2010

CCGS Cygnus Stability Booklet

July, 2010

Submitted to:

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BMT DOCUMENT QUALITY CONTROL DATA SHEET

REPORT: CCGS Cygnus Stability Booklet

DATE: July 19, 2010

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1. NOTES TO MASTER

1. Compliance with the Stability Criteria, provided in Appendix E, does not ensure immunity against capsizing regardless of the circumstances, or absolve the Master from his responsibilities. Masters should therefore exercise prudence and good seamanship having regard to the season of the year, weather forecasts and the navigational zone and should take the appropriate action as to speed and course warranted by the prevailing circumstances. ✓
2. Care should be taken to ensure that the cargo allocated to the vessel is capable of being stowed so that the compliance with the criteria can be achieved. If necessary, the amount should be limited to the extent that the ballast weight may be required. ✓
3. Before a voyage commences care should be taken to ensure that the cargo and pieces of equipment have been properly stowed or lashed so as to minimize the possibility of both longitudinal and lateral shifting while at sea under the effect of acceleration caused by rolling and pitching. ✓
4. This stability book is based on a complete reassessment of the stability of the vessel including hydrostatics, cross curves and tank capacities and taking into account current regulations. This vessel shall comply with Transport Canada Marine Safety (TCMS) regulation TP7301E Stability Subdivision and Load Line Standards. All conditions comply with STAB 4.
5. The downflooding point is considered to be the air intake to the engine room on the funnel at the bridge deck level. The master is to ensure that any watertight openings (doors or hatches) below this point are secured in a closed position when conditions are such to cause downflooding. The position of downflooding is greater than 40 degrees for all operating displacements. ✓
6. The use of the Flume Tank, referenced as STAB.C within this booklet, can result in up to a 1ft reduction in metacentric height. Its use should be consistent with the loading conditions presented herein. Due regard for the ship's stability is required anytime the flume tank contains liquid. ✓

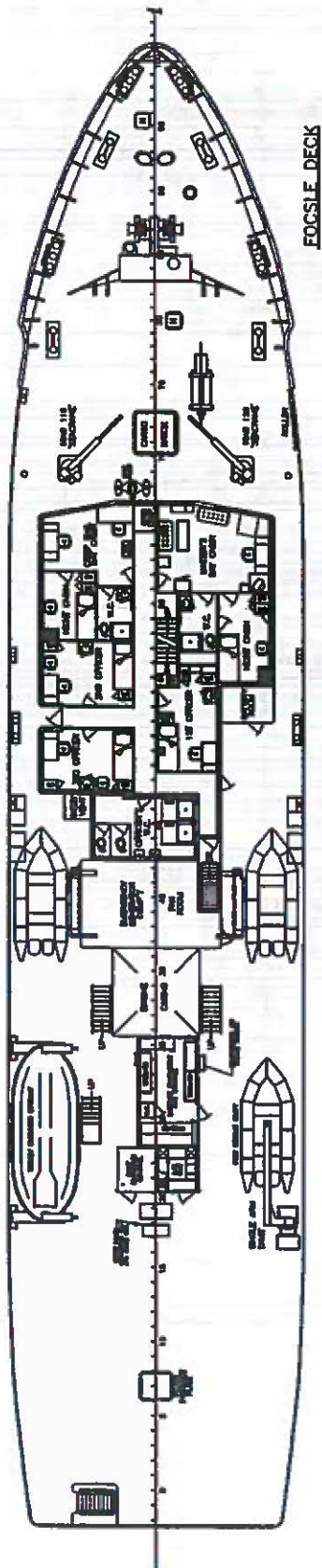
2. PRINCIPAL PARTICULARS

Ship's Name	: CCGS Cygnus
Type of Vessel	: CCG Fisheries Patrol Vessel
Port of Registry	: Ottawa, Ontario
Length Overall	: 205'
Length Between Perp.	: 187'
Breadth o.a.	: 40'
Breadth mld.	: 40'
Depth to Main Dk mld.	: 18'
Depth to Foc'sle Dk mld.	: 26'
Summer Load Draft	: <u>13' 6"</u>
Summer Load Line Δ	: 1472 LT
Lightship	: 1029.65 LT
Gross Tonnage	: 1210
Net Tonnage	: 302.48
Class of Voyages	: Home Trade 1
Date Keel Laid	: January 5, 1981
Builder's Name	: Marystown Shipyard, Marystown NL
Owner's Name	: Government of Canada

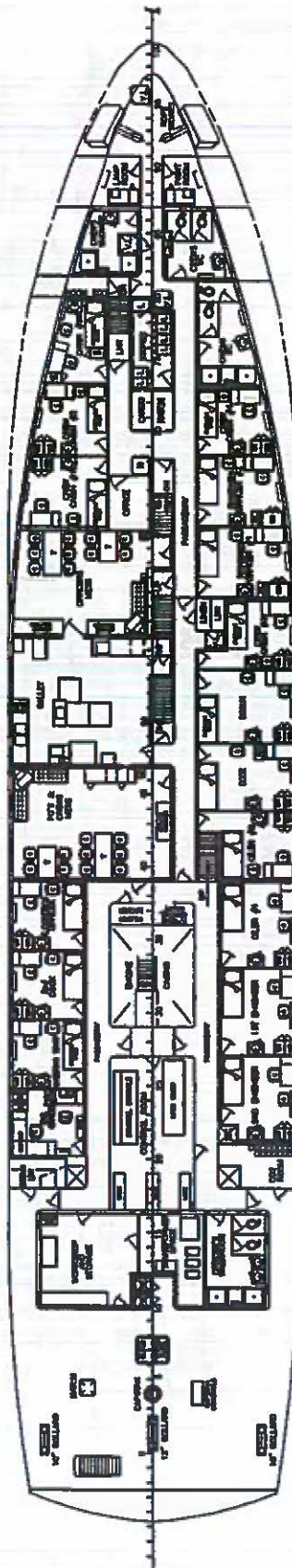
Note:

- i. Unless stated otherwise, all units in this booklet are imperial.
- ii. All measurements in this booklet are referenced from amidships and from the bottom of keel or baseline as noted
- iii. Amidships for all stability calculations is situated at 0.5 ft forward of Frame 46.

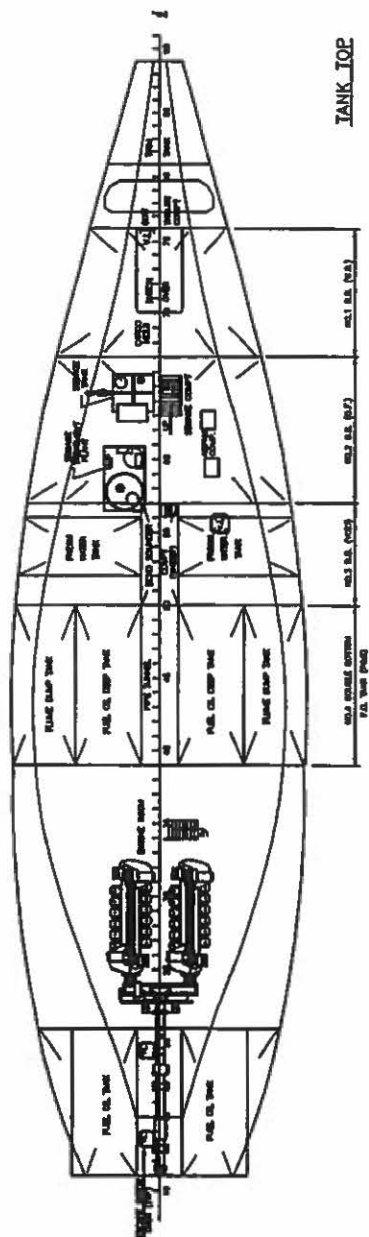
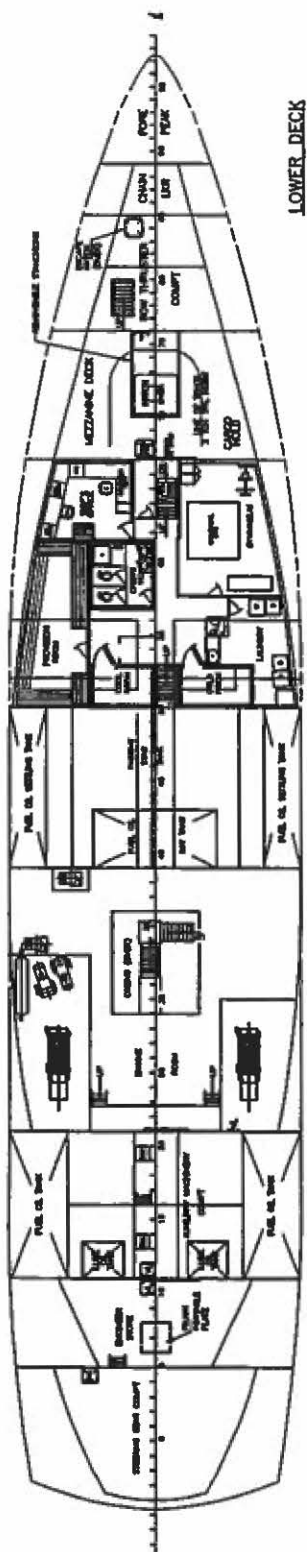
3. GENERAL ARRANGEMENT



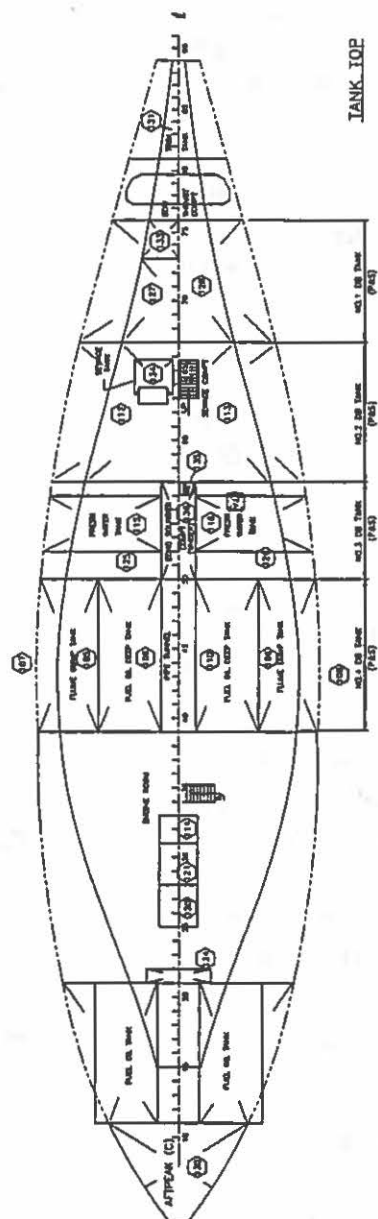
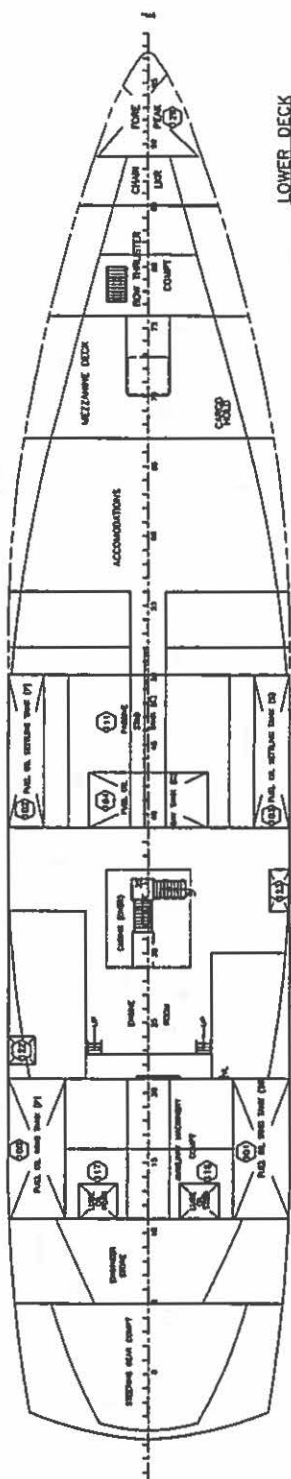
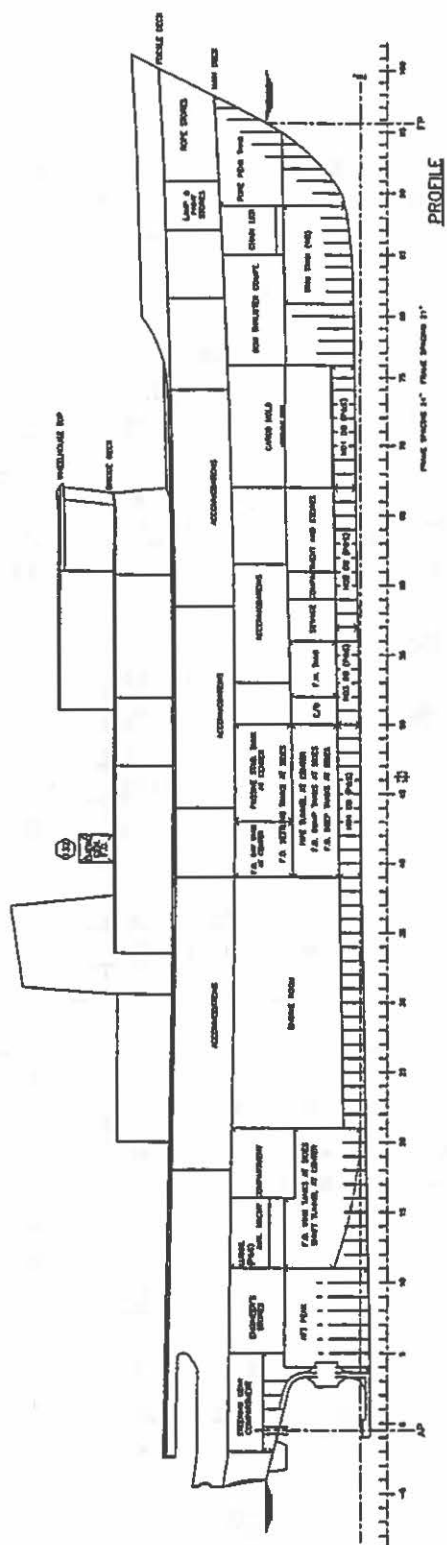
FOCSE DECK



MAIN DECK



4. TANK ARRANGEMENT DRAWING

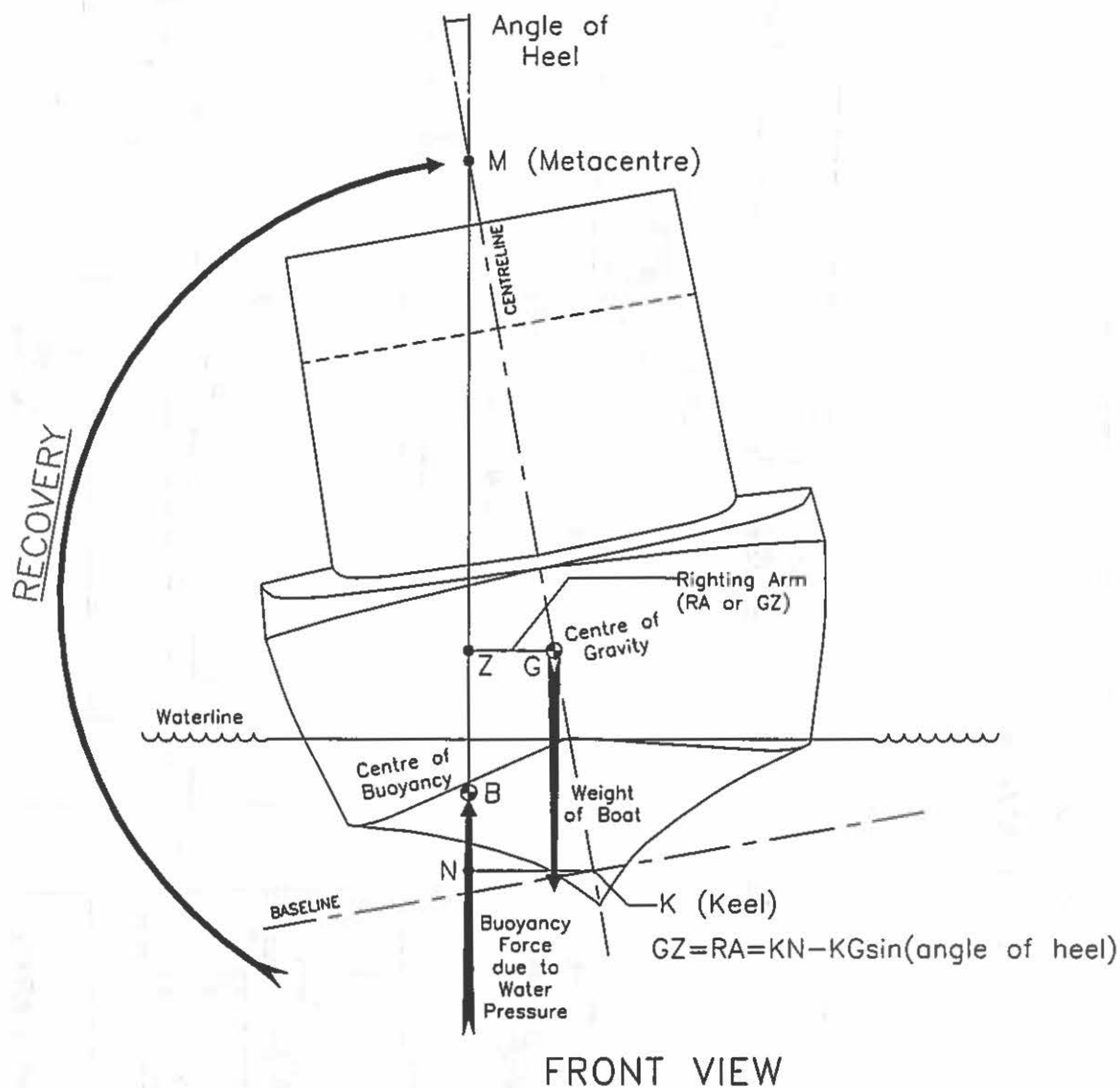


5. TANK CAPACITY TABLE

No	DESCRIPTION	CONTENTS	FRAMES	S.G.	WEIGHT (LT)	LCG (Ft)	TCG (Ft)	VCG (Ft)	MAX FSM (Ft-LT)
100	FUEL OIL WING TANK (PORT)	FUEL OIL	11-21	0.87	51.56	59.65a	11.10p	11.29	63.5
101	FUEL OIL WING TANK (STBD)	FUEL OIL	11-21	0.87	51.56	59.65a	11.10s	11.29	63.5
102	SETTLING TANK (PORT)	FUEL OIL	39-50	0.87	21.72	3.62s	17.46p	14.06	5.5
103	SETTLING TANK (STBD)	FUEL OIL	39-50	0.87	21.72	3.62a	17.46s	14.06	5.5
104	FUEL OIL DAY TANK (C)	FUEL OIL	39-43	0.87	29.35	10.51a	0.00	14.31	78.2
105	FUEL OIL DUMP TANK (PORT)	FUEL OIL	39-50	0.87	26.74	3.67a	15.22p	6.73	27
106	FUEL OIL DUMP TANK (STBD)	FUEL OIL	39-50	0.87	26.74	3.67a	15.22s	6.73	27
107	NO.4 DBL BTM TANK (PORT)	FUEL OIL	39-50	0.87	21.02	3.60a	6.96p	1.85	199.7
108	NO.4 DBL BTM TANK (STBD)	FUEL OIL	39-50	0.87	21.02	3.60a	6.96s	1.85	199.7
109	FUEL OIL DEEP TANK (PORT)	FUEL OIL	39-50	0.87	31.73	3.52a	7.00p	6.52	31.9
110	FUEL OIL DEEP TANK (STBD)	FUEL OIL	39-50	0.87	31.73	3.52a	7.00s	6.52	31.9
111	STABILIZATION TANK (C)	FUEL OIL	39-50	0.87	109.77	1.70a	0.00	14.28	1104.1
112	NO.2 DBL BTM TANK (PORT)	FUEL OIL	57-67	0.87	10.98	30.63f	4.19p	2.46	47.5
113	NO.2 DBL BTM TANK (STBD)	FUEL OIL	57-67	0.87	9.92	30.96f	4.45s	2.49	43
114	F.O. DRAIN TANK (C)	FUEL OIL	31-33	0.87	1.62	28.50a	0.00	1.23	1.3
115	FW TANK (PORT)	FRESH WATER	52-56	1	21.89	15.45f	9.94p	6.91	80
116	FW TANK (STBD)	FRESH WATER	52-56	1	20.96	15.31f	9.99s	6.91	79.1
117	LUBE OIL TANK (PORT)	LUBE OIL	11-13.5	0.924	5.99	68.01a	7.24p	15.29	1.8
118	LUBE OIL TANK (STBD)	LUBE OIL	11-13.5	0.924	5.99	68.01a	7.24s	15.29	1.8
119	GEARBOX L.O. TANK (C)	LUBE OIL	GEARBOX						
120	L.O. SLUDGE TANK (C)	LUBE OIL	25-28	0.924	2.57	39.50a	0.00	1.06	2.1
121	DIRTY L.O. TANK (C)	LUBE OIL	28-31	0.924	2.57	33.50a	0.00	1.15	2.1
122	PURIFIED L.O. TANK (PORT)	LUBE OIL	22-29						
123	RESERVE FEED WATER TK (STBD)	FRESH WATER	33-36						
124	CP PROP OIL TANK (C)	LUBE OIL	21-22	0.924	1.18	49.49a	0.00	1.11	3.3
125	NO.3 DBL BTM TANK (PORT)	VOID	50-57	1.025	13.25	14.20f	5.95p	2.12	100.3
126	NO.3 DBL BTM TANK (STBD)	VOID	50-57	1.025	13.25	14.20f	5.95s	2.12	100.3
127	NO.1 DBL BTM TANK (PORT)	W. BALLAST	67-76	1.025	4.49	46.97f	2.40p	2.8	7.3
128	NO.1 DBL BTM TANK (STBD)	W. BALLAST	67-76	1.025	5.96	49.22f	2.22s	2.84	8.8
129	FOREPEAK TANK (C)	W. BALLAST	89-STEM	1.025	22.78	86.39f	0.00	15.67	32.4
130	AFTPEAK TANK (C)	W. BALLAST	4-11	1.025	42.68	78.91a	0.00	9.33	298.9
131	TRIM TANK (C)	W. BALLAST	81-89	1.025	19.54	73.70f	0.00	7.71	29.3
132	EMERGENCY GEN. FUEL (C)	FUEL OIL	40-42	0.87	1.23	21.37f	0.00	36.37	0.9
133	SPEED LOG TANK (PORT)	VOID	73-76	1.025	1.47	56.14f	1.66p	2.97	1.2
134	SEWAGE TANK (PORT)	BLACK WATER	63-66	1	1.7	34.99f	2.50p	5.68	1.4
135	SONAR TRUNK (PORT)	VOID	59-61						
136	ECHO SOUNDER COMPT. (C)	VOID	50-57	1.025	6.02	14.49f	0.00	1.86	3.9

6. REFERENCE LINES AND DRAFT MARK LOCATIONS

6.1 Reference Lines



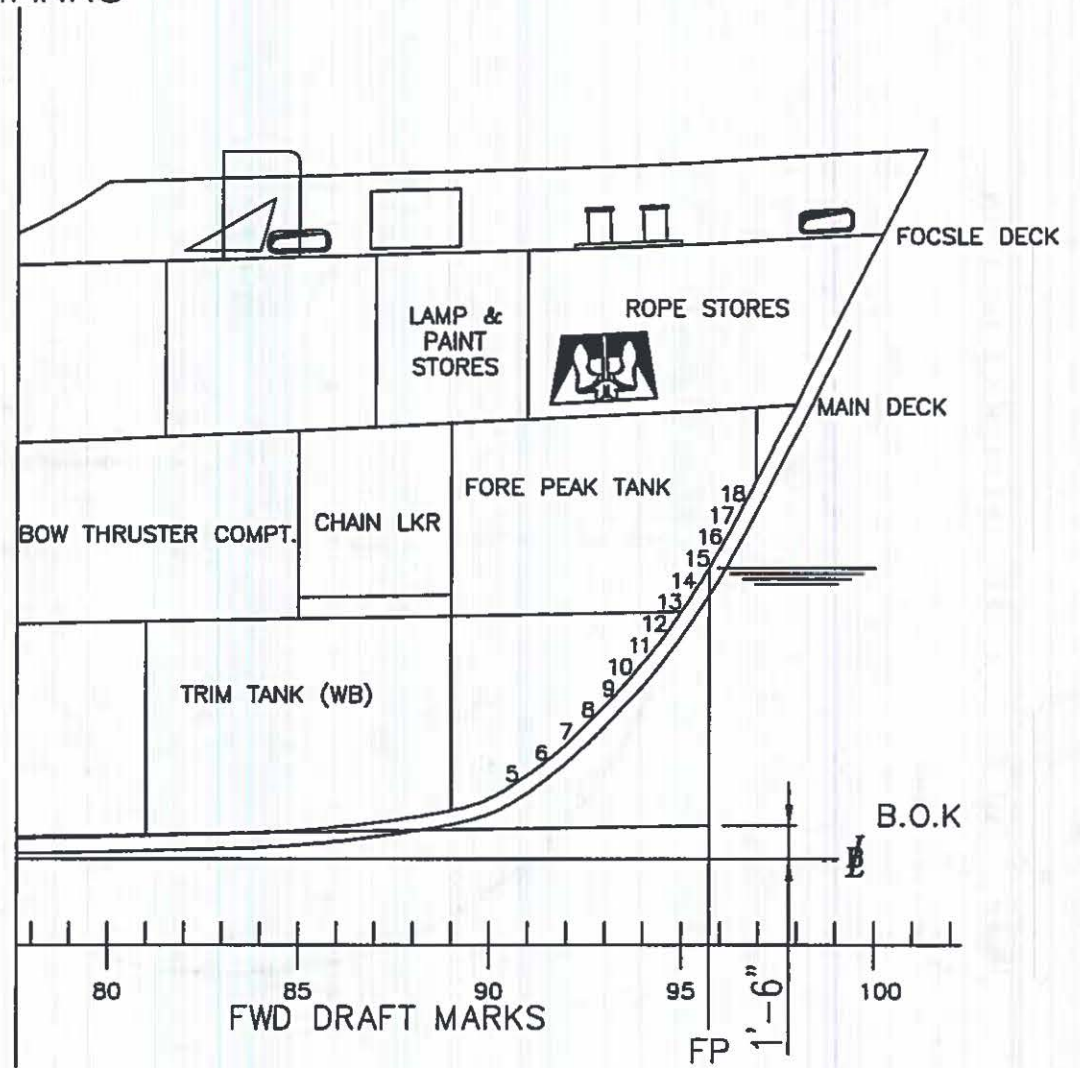
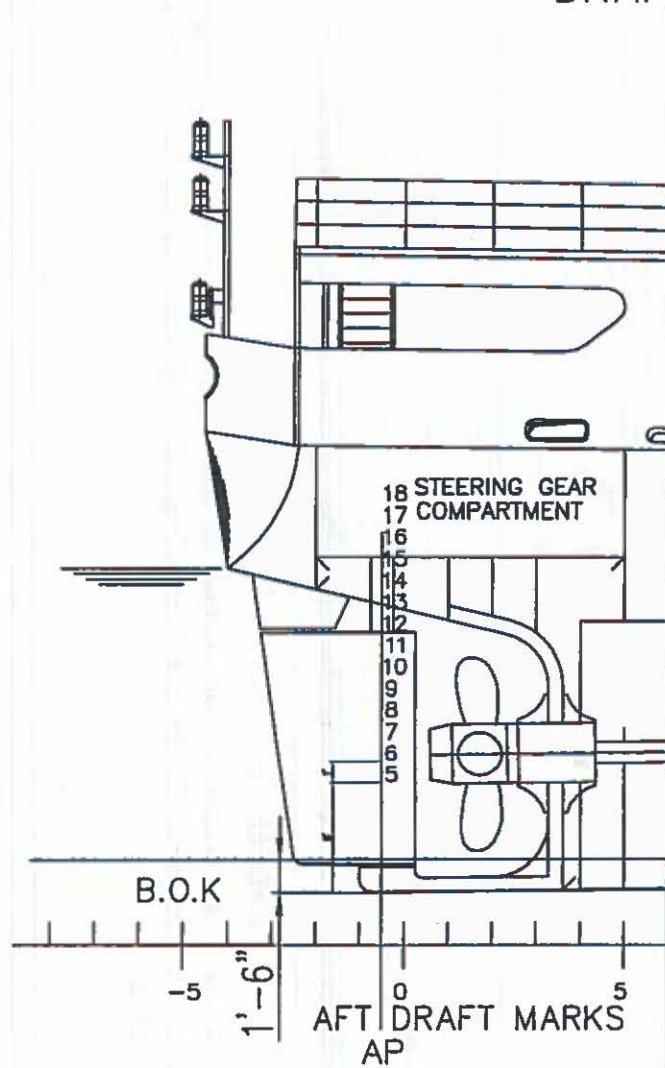
Note:

KG, KB, and KM are referenced from Baseline as shown in the diagrammatic.

6.2 Draft Marks

Draft marks are measured from a datum line called draft-BOK, which passes through a point 1.5 Ft below the baseline at 93.5 Ft aft of Amidships and 1.5 Ft above the baseline at 93.5 Ft forward of Amidships.

CCGS CYGNUS DRAFT MARKS



7. DOWNFLOODING POINTS

The position of the downflooding points are:

Name	Length to Frame 0	Breadth off C.L.	Height above Baseline
ER Casing (P&S)	22.50 Ft	6.00 Ft	38.00 Ft

8. INTACT STABILITY

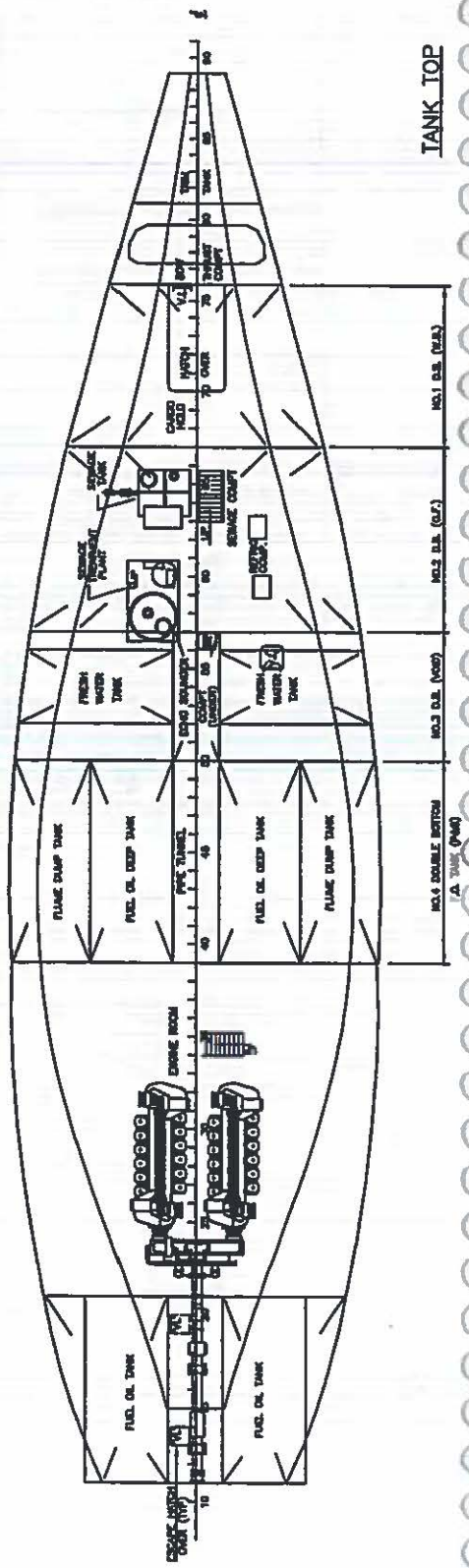
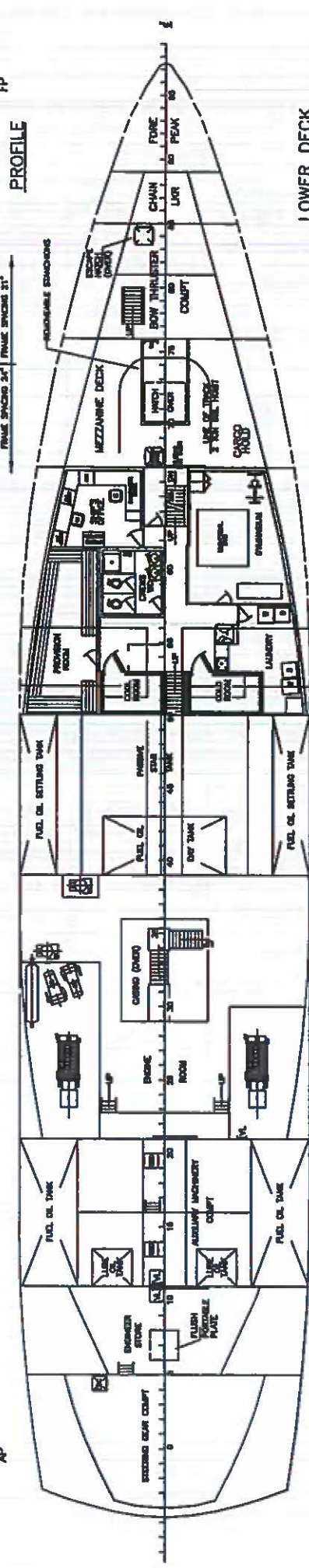
1. Condition 1 - Lightship
2. Condition 2 - Light Operating Departure
3. Condition 3 - Full Load
4. Condition 4 - Half Load, 50% Consumables, Full Cargo (Worst Operating Condition)
5. Condition 5 - Arrival, 10% Consumables, Full Cargo
6. Condition 6 - Arrival, 10% Consumables, No Cargo
7. Condition 4.1 - Half Load, 50% Consumables, Full Cargo with Ice Accumulation
8. Condition 6.1 - Arrival, 10% Consumables, No Cargo with ice Accumulation

Table 8-1: Intact Stability Summary (Operating Conditions with no Accumulated Ice)

Condition	Criteria					
	Area under RA Curve (0-30 deg) (≥ 10.34 Ft-deg)	Area under RA Curve (0-40 deg or D/F) (≥ 16.92 Ft-deg)	Area under RA Curve (30-40 deg or D/F) (≥ 5.64 Ft-deg)	RA at 30 deg. (≥ 0.66 Ft)	Angle of Max RA (≥ 25 deg)	GM _T (≥ 1.15 Ft)
2 Light Operating Departure	26.32	49.18	22.86	2.71	46.28	3.06
3 Full Load	26.20	49.28	23.08	2.73	46.63	3.16
4 Half Load, 50% Consumables, Full Cargo	18.22	34.53	16.31	2.02	45.97	1.88
5 Arrival Condition, 10% Consumables, Full Cargo	20.34	37.94	17.59	2.20	47.42	2.53
6 Arrival Condition, 10% Consumables, No Cargo (Worst Operating)	19.98	36.08	16.10	2.00	48.21	2.48

Table 8-2: Intact Stability Summary (Operating Conditions with Accumulated Ice)

Condition	Criteria					
	Area under RA Curve (0-30 deg) (≥ 7.52 Ft-deg)	Area under RA Curve (0-40 deg or D/F) (≥ 10.89 Ft-deg)	Area under RA Curve (30-40 deg or D/F) (≥ 3.01 Ft-deg)	RA at 30 deg. (≥ 0.49 Ft)	Angle of Max RA (≥ 20 deg)	GM _T (≥ 0.75 Ft)
4.1 Half Load, 50% Consumables, Full Cargo, Ice Accumulation	10.69	21.44	10.76	1.29	42.81	0.81
6.1 Arrival, 10% Consumables, No Cargo, Ice Accumulation (Worst Operating)	10.93	20.60	9.66	1.16	44.43	1.25

[illegible]

TANK TOP

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LIGHTSHIP

BoK draft refers to the line:

1.500 above baseline @ 93.50f and 1.500 below baseline @ 93.50a

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GHS 12.18B

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CFV CYGNUS

LIGHTSHIP

WEIGHT and DISPLACEMENT STATUS

BoK draft: 7.952 @ 93.50f, 12.660 @ 93.50a

Trim: Aft 1.71/187.00, Heel: Port 0.53 deg.

Part-----	Weight (LT)	LCG	TCG	VCG		
WEIGHT	1,029.65 ✓	8.52a ✓	0.02p ✓	17.58 ✓		
SpGr-----	Displ (LT)	LCB	TCB	VCB	RefHt	
HULL	1.025	1,029.66	8.62a	0.13p	6.10	-10.31

Righting Arms:

0.00

0.00p

Distances in FEET.-----

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CFV CYGNUS

CONDITION NUMBER 2
LIGHT OPERATING DEPARTURE CONDITION

HYDROSTATIC PROPERTIES

Trim: Aft 0.49/187.00, Heel: Port 1.28 deg., VCG = 15.18

Draft@ Displacement Buoyancy-Ctr. Weight/ Moment/
Origin---Weight (LT)---LCB---VCB---Inch---LCF---In trim---GML---GMT
13.295 1,481.82 7.97a 7.87 13.75 12.11a 147.33 223.1 3.06
Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.
Trim is per 187.00Ft

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 11.548 @ 93.50f, 15.042 @ 93.50a

Trim: Aft 0.49/187.00, Heel: Port 1.28 deg.

Part-----	Weight (LT)	LCG	TCG	VCG	
LIGHT SHIP	✓1,029.65	8.52a	0.02p	17.58	
CREW AND EFFECTS	✓5.00	0.00	0.00	29.36	
STORES AND PROVISIONS	✓6.00	12.00f	5.00p	14.42	
MACHINERY SPACE	✓5.00	89.00a	6.00p	14.00	
Total Fixed----->	1,045.65	8.75a	0.08p	17.60	

	Load	SpGr	Weight (LT)	LCG	TCG	VCG	FSM
NO1_DB.P	0.950	1.025	✓4.26	46.89f	2.40p	2.74	6.0
NO2_DB.P	0.950	0.870	✓10.43	30.31f	4.22p	2.40	19.9
NO2_DB.S	0.950	0.870	✓9.43	30.68f	4.38s	2.43	28.5
NO4_DB.P	0.950	0.870	✓19.97	3.83a	7.06p	1.78	118.3
NO4_DB.S	0.950	0.870	✓19.97	3.82a	6.72s	1.78	121.4
SETTLING.P	0.950	0.870	✓20.63	3.63a	17.48p	13.85	5.5
SETTLING.S	0.950	0.870	✓20.63	3.63a	17.47s	13.85	5.5
DEEP.P	0.950	0.870	✓30.14	3.61a	7.02p	6.35	31.9
DEEP.S	0.950	0.870	✓30.14	3.61a	6.98s	6.35	31.9
WING.P	0.950	0.870	✓48.99	59.56a	10.88p	10.90	19.1
WING.S	0.950	0.870	✓48.99	59.56a	10.86s	10.90	18.8
DAYTANK.C	0.950	0.870	✓27.88	10.51a	0.06p	14.09	78.3
STAB.C	0.437	0.870	✓47.97	1.81a	0.51p	11.82	1104.8
LUBOIL.P	0.950	0.924	✓5.69	68.00a	7.26p	15.08	1.8
LUBOIL.S	0.950	0.924	✓5.69	68.00a	7.24s	15.08	1.8
FW.P	1.000	1.000	✓21.89	15.45f	9.94p	6.91	0.0
FW.S	1.000	1.000	✓20.96	15.31f	9.99s	6.91	0.0
FOREPEAK.C	1.000	1.025	✓22.78	86.39f	0.00	15.67	0.0
TRINTANK.C	1.000	1.025	✓19.54	73.70f	0.00	7.71	0.0
SWGE.P	0.100	1.000	✓0.17	34.86f	2.70p	4.56	1.4
Total Tanks----->			436.17	6.03a	0.13p	9.38	1594.9
Total Weight----->			1,481.82	7.95a	0.09p	15.18	

	Displ (LT)	LCB	TCB	VCB	RefHt
HULL	1,481.82	7.97a	0.26p	7.87	-13.29

Righting Arms: 0.00a 0.00p

Distances in FEET.-----Moments in Ft-LT.

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CONDITION NUMBER 2
LIGHT OPERATING DEPARTURE CONDITION

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 8.75a TCG = 0.08p VCG = 17.60

Origin Depth	Degrees of Trim	Displacement Heel	Weight (LT)	Righting Arms in Trim	in Heel	Flood Pt Area	Height
13.297	0.15a	0.00	1,481.84	0.00	-0.068	0.00	24.64 (1)
13.292	0.15a	1.28p	1,481.83	0.00	0.000	-0.04	24.51 (1)
13.185	0.12a	6.28p	1,481.81	0.00	0.290	0.68	23.88 (1)
12.934	0.06a	11.28p	1,481.81	0.00	0.599	2.89	23.14 (1)
12.539	0.03f	16.28p	1,481.79	0.00	0.931	6.71	22.27 (1)
12.004	0.13f	21.28p	1,481.81	0.00	1.295	12.26	21.28 (1)
11.334	0.20f	26.28p	1,481.81	0.00	1.660	19.65	20.16 (1)
10.745	0.22f	30.00p	1,481.45	0.00	1.930	26.32	19.25 (1)
10.526	0.22f	31.28p	1,481.69	0.00	2.024	28.86	18.92 (1)
9.575	0.20f	36.28p	1,482.07	0.00	2.391	39.89	17.58 (1)
8.804	0.16f	40.00p	1,482.13	0.00	2.594	49.18	16.51 (1)
8.531	0.14f	41.28p	1,481.92	0.00	2.639	52.53	16.12 (1)
7.443	0.07f	46.28p	1,481.90	0.00	2.714	65.98	14.51 (1)
7.163	0.06f	47.53p	1,481.54	0.00	2.711	69.37	14.09 (1)
6.316	0.01a	51.28p	1,482.02	0.00	2.657	79.46	12.77 (1)
5.156	0.10a	56.28p	1,481.93	0.00	2.500	92.40	10.91 (1)
3.972	0.19a	61.28p	1,481.95	0.00	2.268	104.35	8.95 (1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1045.65 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

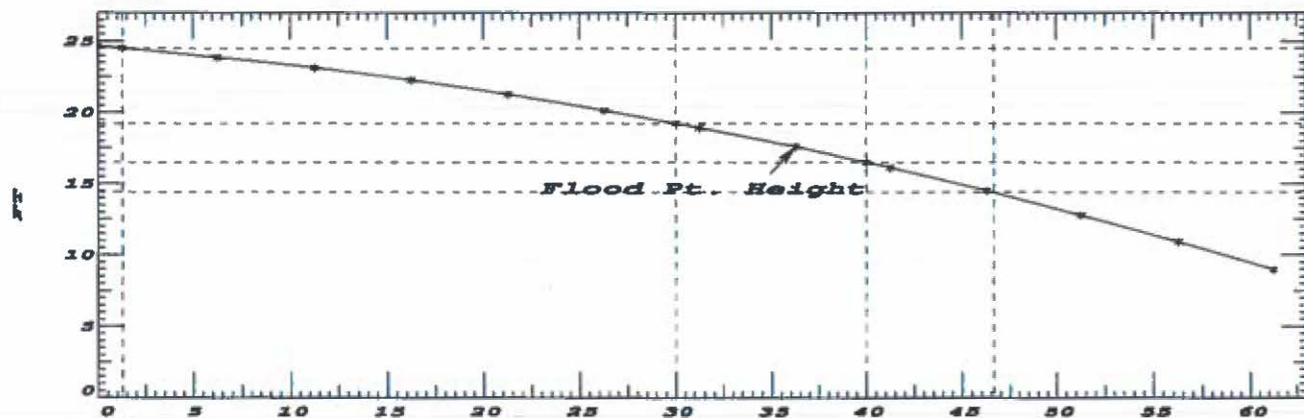
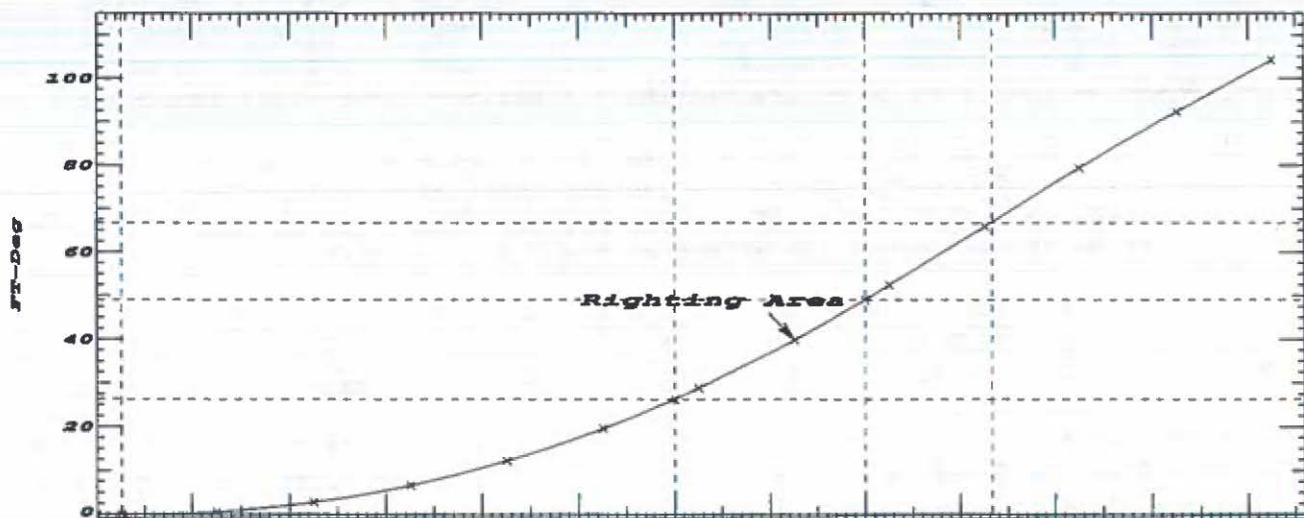
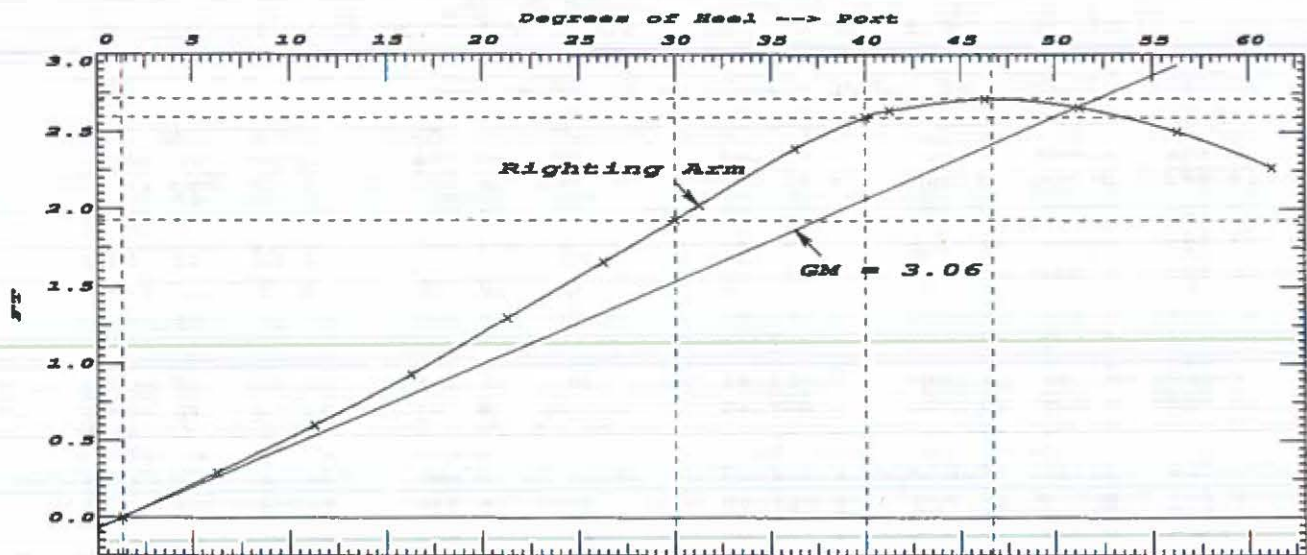
Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	FLOOD 22.50a	6.00p	38.00

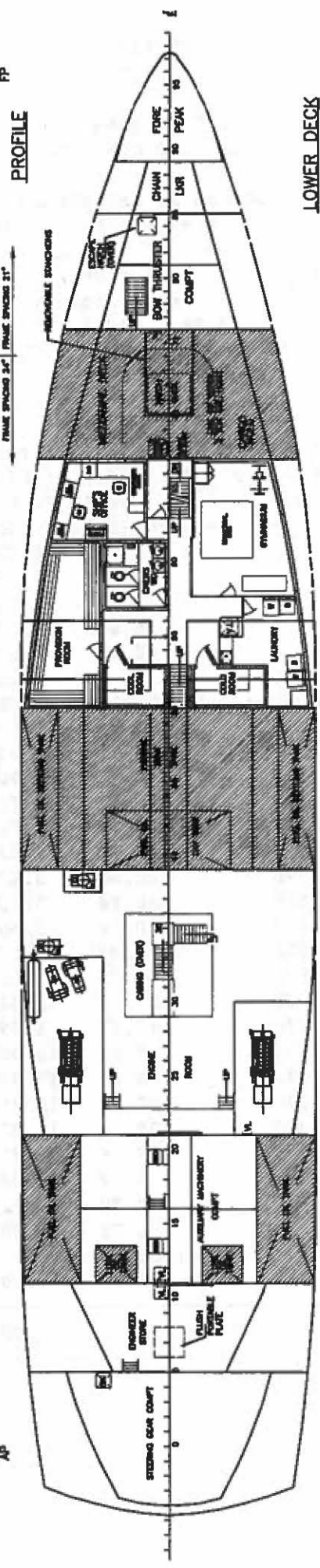
LIN	TP7301 STAB 4 CRITERION	Min/Max	Attained
(1) GM at Equilibrium	>	1.15 Ft	3.06 P ✓
(2) Area from abs 0 deg to abs 30	>	10.34 Ft-deg	26.32 P ✓
(3) Area from abs 0 deg to abs 40	>	16.91 Ft-deg	49.18 P ✓
(4) Area from abs 30 deg to abs 40	>	5.64 Ft-deg	22.86 P ✓
(5) Angle from abs 0 deg to MaxRA	>	25.00 deg	46.28 P ✓
(6) Righting Arm at abs 30 deg or MaxRA	>	0.66 Ft	2.71 P ✓

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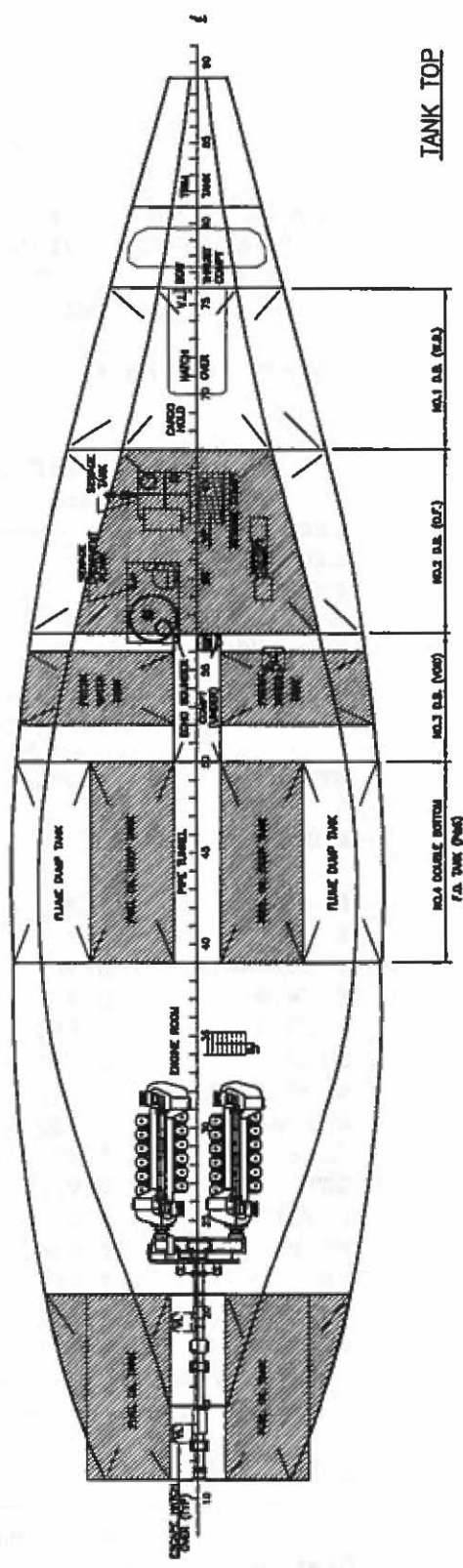
BMT Fleet
CFV CYGNUS

CONDITION NUMBER 2
LIGHT OPERATING DEPARTURE CONDITION



[illegible]

LOWER DECK



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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 3
FULL LOAD CONDITION

HYDROSTATIC PROPERTIES

Trim: Aft 0.13/187.00, Heel: Port 1.63 deg. VCG = 15.11

Draft@ Displacement Buoyancy-Ctr. Weight/ Moment/
Origin-----Weight (LT)-----LCB-----VCB-----Inch-----LCF-----In trim-----GML-----GMT
13.496 1,511.35 7.60a 7.98 13.82 11.89a 149.32 221.7 3.16
Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.
Trim is per 187.00Ft

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 11.934 @ 93.50f, 15.059 @ 93.50a

Trim: Aft 0.13/187.00, Heel: Port 1.63 deg.

Part-----	Weight (LT)	LCG	TCG	VCG	
LIGHT SHIP	1,029.65	8.52a	0.02p	17.58	
CREW AND EFFECTS	5.00	0.00	0.00	29.36	
STORES AND PROVISIONS	6.00	12.00f	5.00p	14.42	
MACHINERY SPACE	5.00	89.00a	6.00p	14.00	
CARGO	66.00	49.50f	0.50p	12.50	
Total Fixed----->	1,111.65	5.29a	0.10p	17.30	

	Load	SpGr	Weight (LT)	LCG	TCG	VCG	FSM
NO1_DB.P	0.950	1.025	4.26	46.90f	2.41p	2.74	5.6
NO2_DB.P	0.950	0.870	10.43	30.33f	4.23p	2.40	19.5
NO2_DB.S	0.950	0.870	9.43	30.72f	4.35s	2.43	31.0
NO4_DB.P	0.950	0.870	19.97	3.79a	7.10p	1.79	94.8
NO4_DB.S	0.950	0.870	19.97	3.78a	6.68s	1.79	94.4
SETTLING.P	0.950	0.870	20.63	3.62a	17.49p	13.85	5.5
SETTLING.S	0.950	0.870	20.63	3.62a	17.47s	13.85	5.5
DEEP.P	0.950	0.870	30.14	3.60a	7.03p	6.35	32.0
DEEP.S	0.950	0.870	30.14	3.60a	6.97s	6.35	32.0
WING.P	0.950	0.870	48.99	59.55a	10.88p	10.90	19.2
WING.S	0.950	0.870	48.99	59.55a	10.86s	10.90	18.8
DAYTANK.C	0.950	0.870	27.88	10.51a	0.08p	14.09	78.3
STAB.C	0.437	0.870	47.97	1.79a	0.66p	11.82	1105.3
LUBOIL.P	0.950	0.924	5.69	68.00a	7.26p	15.08	1.8
LUBOIL.S	0.950	0.924	5.69	68.00a	7.24s	15.08	1.8
FW.P	1.000	1.000	21.89	15.45f	9.94p	6.91	0.0
FW.S	1.000	1.000	20.96	15.31f	9.99s	6.91	0.0
TRINTANK.C	0.300	1.025	5.86	73.38f	0.03p	4.62	5.8
SWGE.P	0.100	1.000	0.17	34.88f	2.75p	4.56	1.4
Total Tanks----->			399.70	14.02a	0.17p	9.03	1552.6
Total Weight----->			1,511.35	7.60a	0.12p	15.11	

	Displ (LT)	LCB	TCB	VCB	RefHt
HULL	1,511.35	7.60a	0.32p	7.98	-13.49

Righting Arms:	0.00	0.00p
Distances in FEET.-----		

-----Moments in Ft-LT.

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 3
FULL LOAD CONDITION

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 5.29a TCG = 0.10p VCG = 17.30

Origin Depth	Degrees of Trim	Heel	Displacement Weight (LT)	Righting Arms in Trim	Heel	Flood Pt Area	Height
13.498	0.04a	0.00	1,511.36	0.00	-0.089	0.00	24.49(1)
13.491	0.04a	1.63p	1,511.35	0.00	0.000	-0.07	24.31(1)
13.372	0.01a	6.63p	1,511.34	0.00	0.297	0.67	23.68(1)
13.109	0.06f	11.63p	1,511.35	0.00	0.613	2.94	22.92(1)
12.701	0.14f	16.63p	1,511.32	0.00	0.953	6.84	22.05(1)
12.154	0.23f	21.63p	1,511.34	0.00	1.324	12.52	21.05(1)
11.471	0.29f	26.63p	1,511.34	0.00	1.695	20.07	19.92(1)
10.933	0.30f	30.00p	1,511.14	0.00	1.946	26.20	19.09(1)
10.649	0.30f	31.63p	1,511.11	0.00	2.069	29.48	18.68(1)
9.685	0.27f	36.63p	1,511.35	0.00	2.441	40.75	17.33(1)
8.994	0.23f	40.00p	1,511.64	0.00	2.613	49.28	16.35(1)
8.649	0.21f	41.63p	1,511.49	0.00	2.668	53.59	15.85(1)
7.565	0.13f	46.63p	1,511.32	0.00	2.726	67.14	14.22(1)
7.286	0.11f	47.88p	1,511.11	0.00	2.720	70.55	13.79(1)
6.441	0.04f	51.63p	1,511.52	0.00	2.659	80.66	12.46(1)
5.285	0.05a	56.63p	1,511.36	0.00	2.494	93.58	10.59(1)
4.103	0.14a	61.63p	1,511.19	0.00	2.255	105.49	8.62(1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1111.65 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	FLOOD 22.50a	6.00p	38.00

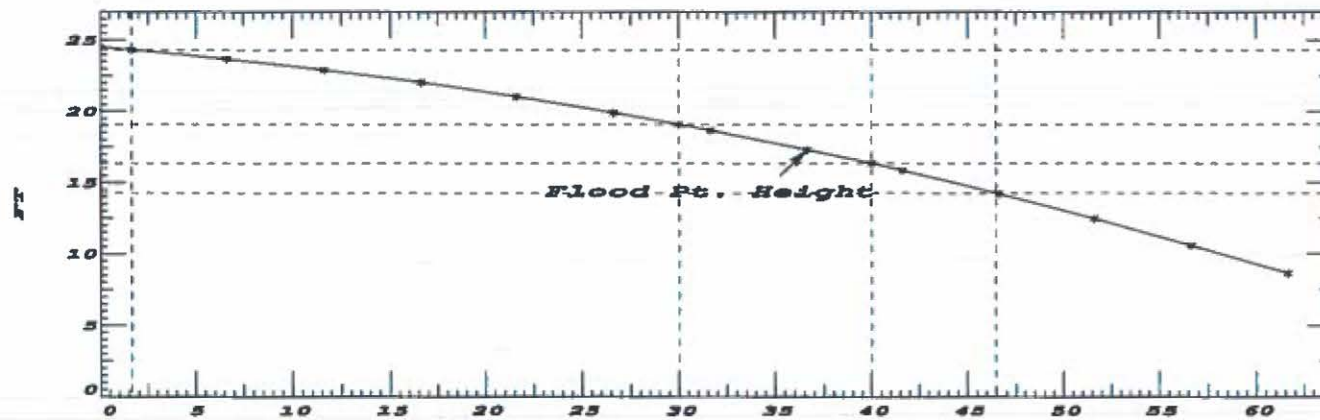
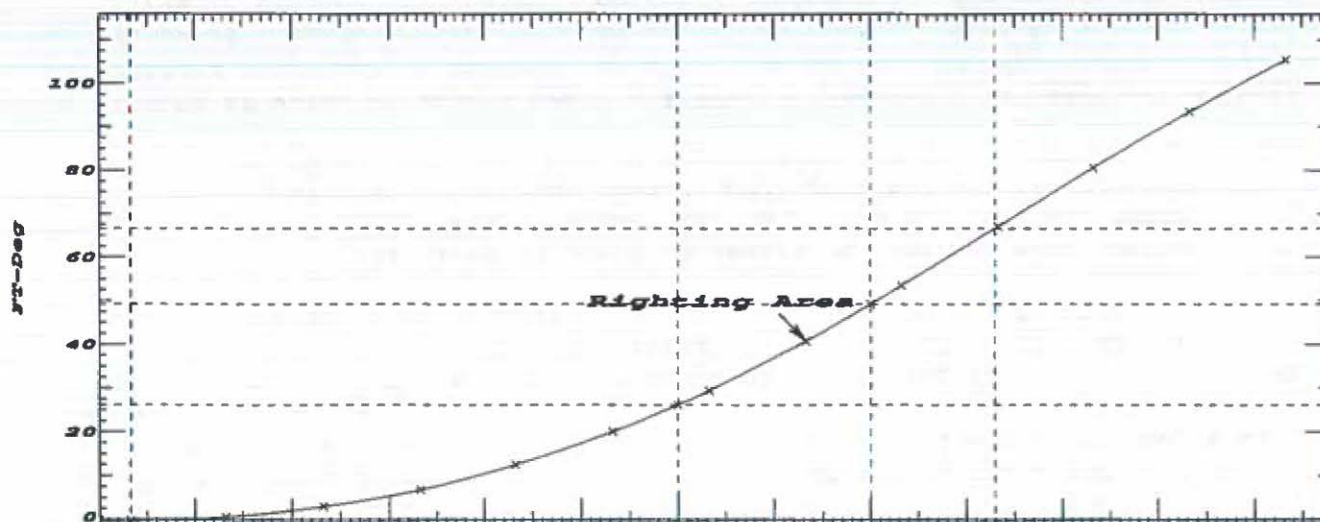
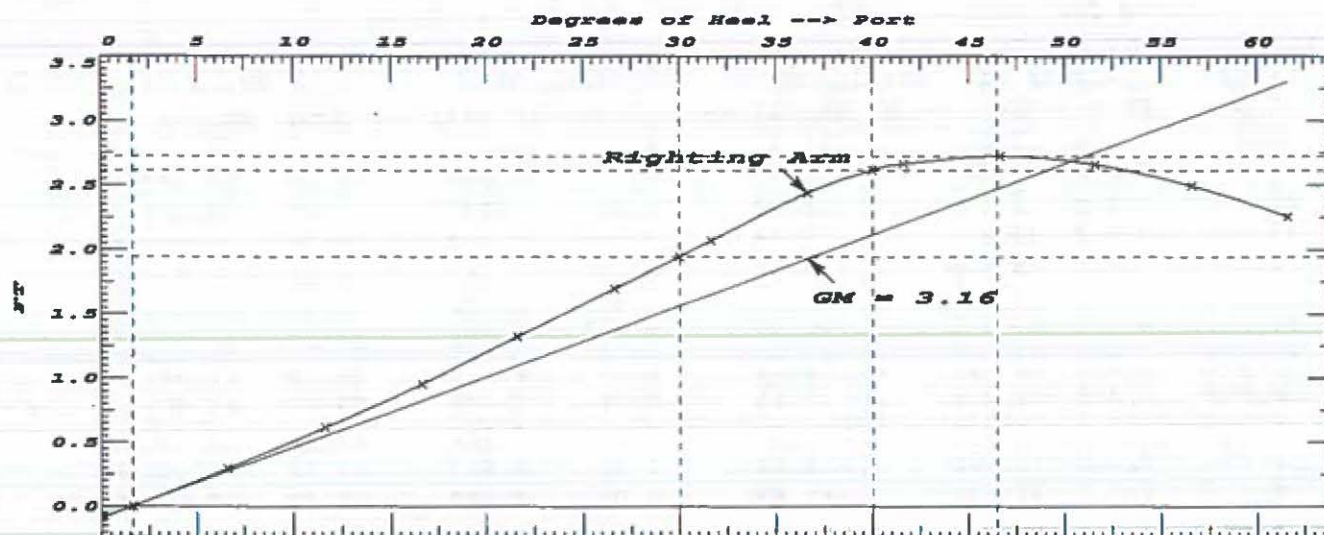
LIM-----TP7301 STAB 4 CRITERION-----Min/Max-----Attained

(1) GM at Equilibrium	>	1.15	Ft	3.16 P
(2) Area from abs 0 deg to abs 30	>	10.34	Ft-deg	26.20 P
(3) Area from abs 0 deg to abs 40	>	16.91	Ft-deg	49.28 P
(4) Area from abs 30 deg to abs 40	>	5.64	Ft-deg	23.08 P
(5) Angle from abs 0 deg to MaxRA	>	25.00	deg	46.63 P
(6) Righting Arm at abs 30 deg or MaxRA	>	0.66	Ft	2.73 P

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CONDITION NUMBER 3
FULL LOAD CONDITION



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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 4 ***WORST OPERATING***
HALF LOAD CONDITION, 50% CONSUMABLES & FULL CARGO

HYDROSTATIC PROPERTIES

Trim: Fwd 0.33/187.00, Heel: Port 0.19 deg., VCG = 16.18

Draft@	Displacement	Buoyancy-Ctr.	Weight/	Moment/				
Origin----	Weight (LT)----	LCB-----	VCB-----	Inch-----	LCF-----	In trim-----	GML-----	GMT
12.262	1,308.05	6.52a	7.21	13.00	9.38a	125.78	215.8	1.88

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.
Trim is per 187.00Ft

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 10.928 @ 93.50f, 13.597 @ 93.50a

Trim: Fwd 0.33/187.00, Heel: Port 0.19 deg.

Part-----	Weight (LT)----	LCG-----	TCG-----	VCG-----
LIGHT SHIP	1,029.65	8.52a	0.02p	17.58
CREW AND EFFECTS	5.00	0.00	0.00	29.36
STORES AND PROVISIONS	3.00	12.00f	5.00p	14.42
MACHINERY SPACE	5.00	89.00a	6.00p	14.00
CARGO	66.00	49.50f	0.50p	12.50
Total Fixed----->	1,108.65	5.33a	0.09p	17.31

	Load-----	SpGr-----	Weight (LT)----	LCG-----	TCG-----	VCG-----	FSM-----
NO4_DB.S	0.950	0.870	19.97	3.82a	6.86s	1.78	190.0
SETTLING.P	0.950	0.870	20.63	3.61a	17.48p	13.85	5.5
SETTLING.S	0.950	0.870	20.63	3.61a	17.48s	13.85	5.5
WING.P	0.334	0.870	17.22	58.22a	6.16p	6.25	53.5
WING.S	0.334	0.870	17.22	58.24a	6.14s	6.25	52.7
DAYTANK.C	0.950	0.870	27.88	10.51a	0.01p	14.09	78.2
STAB.C	0.437	0.870	47.97	1.77a	0.08p	11.81	1104.0
LUBOIL.P	0.950	0.924	5.69	68.00a	7.25p	15.08	1.8
FW.P	0.500	1.000	10.94	15.39f	9.46p	5.25	64.1
FW.S	0.500	1.000	10.48	15.25f	9.45s	5.25	63.5
SWGE.P	0.500	1.000	0.85	34.98f	2.51p	5.06	1.4
Total Tanks----->			199.50	13.22a	0.42s	9.95	1620.1
Total Weight----->			1,308.15	6.54a	0.01p	16.18	

	Displ (LT)----	LCB-----	TCB-----	VCB-----	RefHt-----
HULL	1,308.05	6.52a	0.04p	7.21	-12.26

Righting Arms:	0.00	0.00p
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Distances in FEET.-----Moments in Ft-LT.

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 4 ***WORST OPERATING***
HALF LOAD CONDITION, 50% CONSUMABLES & FULL CARGO

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 5.33a TCG = 0.09p VCG = 17.31

Origin Depth	Degrees of Trim	Displacement Heel	Weight (LT)	Righting Arms in Trim	in Heel	Flood Pt Area	Height
12.262	0.10f	0.00	1,308.04	0.00	-0.006	0.00	25.78(1)
12.262	0.10f	0.19p	1,308.05	0.00	0.000	-0.00	25.76(1)
12.190	0.12f	5.19p	1,308.15	0.00	0.173	0.43	25.16(1)
11.978	0.17f	10.19p	1,308.15	0.00	0.363	1.77	24.43(1)
11.624	0.26f	15.19p	1,308.14	0.00	0.567	4.09	23.58(1)
11.126	0.37f	20.19p	1,308.13	0.00	0.816	7.52	22.61(1)
10.481	0.49f	25.19p	1,308.14	0.00	1.098	12.30	21.54(1)
9.731	0.57f	30.00p	1,308.14	0.00	1.366	18.22	20.40(1)
9.698	0.57f	30.19p	1,308.13	0.00	1.376	18.48	20.35(1)
8.773	0.61f	35.19p	1,308.14	0.00	1.642	26.03	19.06(1)
7.749	0.61f	40.00p	1,308.14	0.00	1.891	34.53	17.74(1)
7.706	0.61f	40.19p	1,308.12	0.00	1.899	34.89	17.69(1)
6.567	0.58f	45.19p	1,308.22	0.00	2.013	44.73	16.18(1)
6.386	0.58f	45.97p	1,308.18	0.00	2.016	46.30	15.94(1)
5.396	0.54f	50.19p	1,308.37	0.00	1.971	54.75	14.53(1)
4.196	0.48f	55.19p	1,308.42	0.00	1.824	64.29	12.76(1)
2.979	0.40f	60.19p	1,308.40	0.00	1.595	72.87	10.86(1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1108.65 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	FLOOD 22.50a	6.00p	38.00

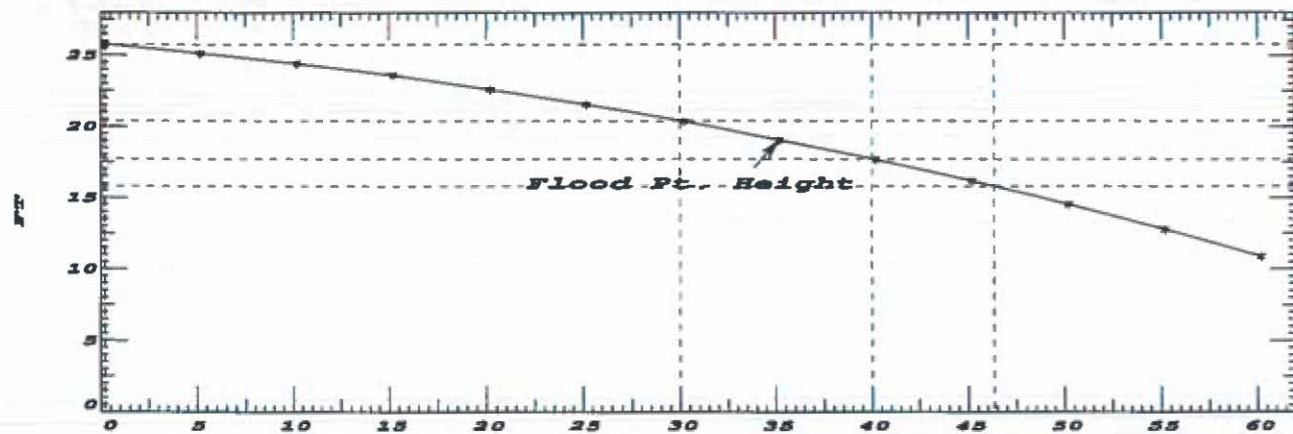
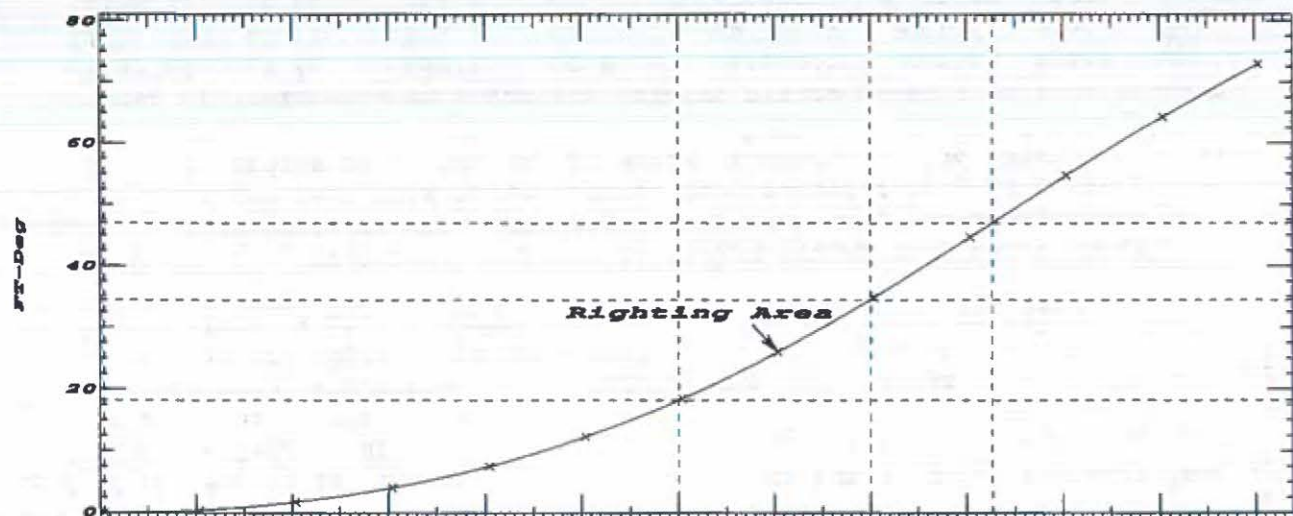
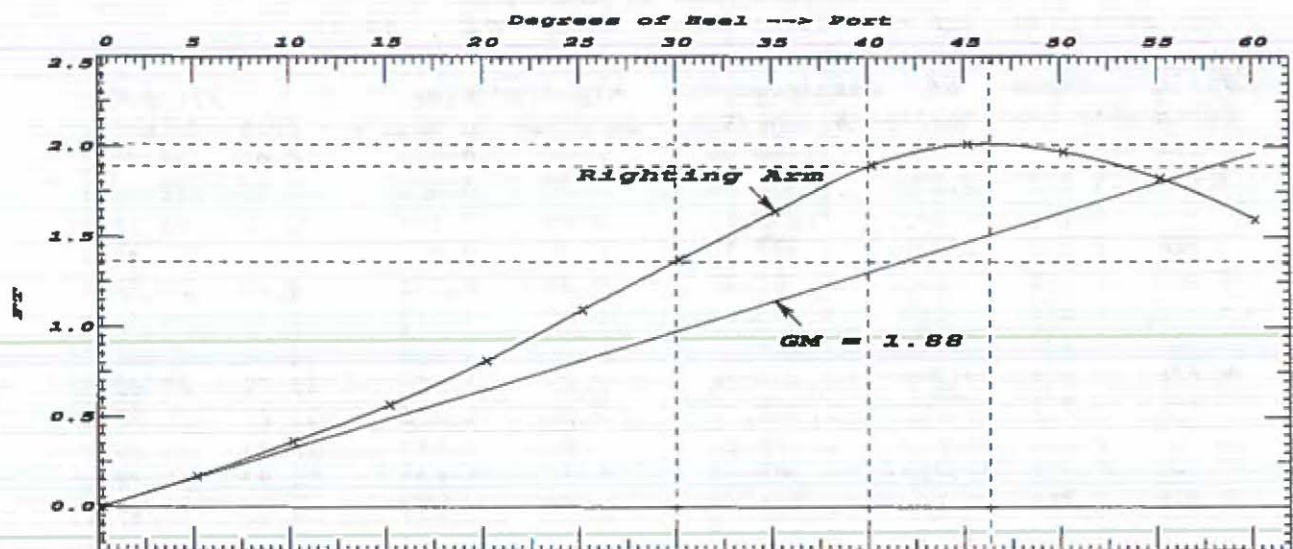
LIN-----TP7301 STAB 4 CRITERION-----Min/Max-----Attained

(1) GM at Equilibrium	>	1.15 Ft	1.88 P ✓
(2) Area from abs 0 deg to abs 30	>	10.34 Ft-deg	18.22 P ✓
(3) Area from abs 0 deg to abs 40	>	16.91 Ft-deg	34.53 P ✓
(4) Area from abs 30 deg to abs 40	>	5.64 Ft-deg	16.31 P ✓
(5) Angle from abs 0 deg to MaxRA	>	25.00 deg	45.97 P ✓
(6) Righting Arm at abs 30 deg or MaxRA	>	0.66 Ft	2.02 P ✓

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 4 ***WORST OPERATING***
HALF LOAD CONDITION, 50% CONSUMABLES & FULL CARGO



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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 5

ARRIVAL CONDITION 10% CONSUMABLES FULL CARGO
STAB TANK IS DUMPED TO THE DUMP TANKS IN ARRIVAL CONDITIONS

HYDROSTATIC PROPERTIES

Trim: Fwd 0.37/187.00, Heel: Port 1.61 deg., VCG = 16.49

Draft@	Displacement	Buoyancy-Ctr.	Weight/	Moment/				
Origin----	Weight (LT)----	LCB-----	VCB-----	Inch-----	LCF-----	In trim----	GML-----	GMT
11.661	1,215.72	6.30a	6.86	12.62	8.40a	116.51	215.1	2.53

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.
Trim is per 187.00Ft

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 10.348 @ 93.50f, 12.974 @ 93.50a

Trim: Fwd 0.37/187.00, Heel: Port 1.61 deg.

Part-----	Weight (LT)----	LCG-----	TCG-----	VCG
LIGHT SHIP	1,029.65	8.52a	0.02p	17.58
CREW AND EFFECTS	5.00	0.00	0.00	29.36
STORES AND PROVISIONS	0.60	12.00f	5.00p	14.42
MACHINERY SPACE	5.00	89.00a	6.00p	14.00
CARGO	66.00	49.50f	0.50p	12.50
Total Fixed----->	1,106.25	5.37a	0.08p	17.31

	Load-----	SpGr-----	Weight (LT)----	LCG-----	TCG-----	VCG	FSM
NO1_DB.S	0.950	1.025	5.66	49.11f	2.15s	2.78	8.1
DUMP.P	0.897	0.870	23.99	3.75a	15.21p	6.40	27.1
DUMP.S	0.897	0.870	23.98	3.75a	15.14s	6.40	27.1
DAYTANK.C	0.950	0.870	27.88	10.51a	0.08p	14.09	78.3
LUBOIL.P	0.200	0.924	1.20	68.00a	7.29p	11.86	1.8
FW.P	0.100	1.000	2.19	15.20f	9.28p	3.78	41.2
FW.S	0.100	1.000	2.10	15.09f	8.24s	3.78	37.8
AFTPEAK.C	0.500	1.000	20.82	76.08a	0.21p	6.76	154.9
SWGE.P	0.980	1.000	1.66	34.99f	2.52p	5.66	0.9
Total Tanks----->			109.48	15.87a	0.11p	8.19	377.0
Total Weight----->			1,215.73	6.32a	0.08p	16.49	

	Displ (LT)----	LCB-----	TCB-----	VCB-----	RefHt
HULL	1,215.72	6.30a	0.35p	6.86	-11.66

Righting Arms: 0.00 0.00p

Distances in FEET.-----Moments in Ft-LT.

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 5

ARRIVAL CONDITION 10% CONSUMABLES FULL CARGO
STAB TANK IS DUMPED TO THE DUMP TANKS IN ARRIVAL CONDITIONS

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 5.37a TCG = 0.08p VCG = 17.31

Origin Depth	Degrees of Trim	Displacement Heel	Weight (LT)	Righting Arms in Trim	in Heel	Flood Pt Area	Height
11.664	0.11f	0.00	1,215.73	0.00	-0.072	0.00	26.38(1)
11.656	0.11f	1.61p	1,215.72	0.00	0.000	-0.06	26.20(1)
11.546	0.14f	6.61p	1,215.73	0.00	0.226	0.51	25.57(1)
11.300	0.20f	11.61p	1,215.73	0.00	0.475	2.25	24.79(1)
10.913	0.29f	16.61p	1,215.73	0.00	0.744	5.29	23.90(1)
10.380	0.41f	21.61p	1,215.72	0.00	1.025	9.71	22.90(1)
9.700	0.53f	26.61p	1,215.72	0.00	1.318	15.56	21.79(1)
9.159	0.60f	30.00p	1,215.73	0.00	1.503	20.34	20.98(1)
8.878	0.63f	31.61p	1,215.73	0.00	1.588	22.84	20.58(1)
7.914	0.68f	36.61p	1,215.72	0.00	1.840	31.42	19.28(1)
7.177	0.69f	40.00p	1,215.58	0.00	2.010	37.94	18.35(1)
6.810	0.69f	41.61p	1,215.92	0.00	2.082	41.24	17.89(1)
5.631	0.68f	46.61p	1,215.86	0.00	2.199	51.98	16.38(1)
5.438	0.67f	47.42p	1,215.74	0.00	2.202	53.75	16.12(1)
4.427	0.65f	51.61p	1,215.92	0.00	2.154	62.93	14.72(1)
3.201	0.59f	56.61p	1,216.05	0.00	1.997	73.36	12.93(1)
1.963	0.52f	61.61p	1,215.74	0.00	1.758	82.78	11.03(1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1106.25 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	FLOOD 22.50a	6.00p	38.00

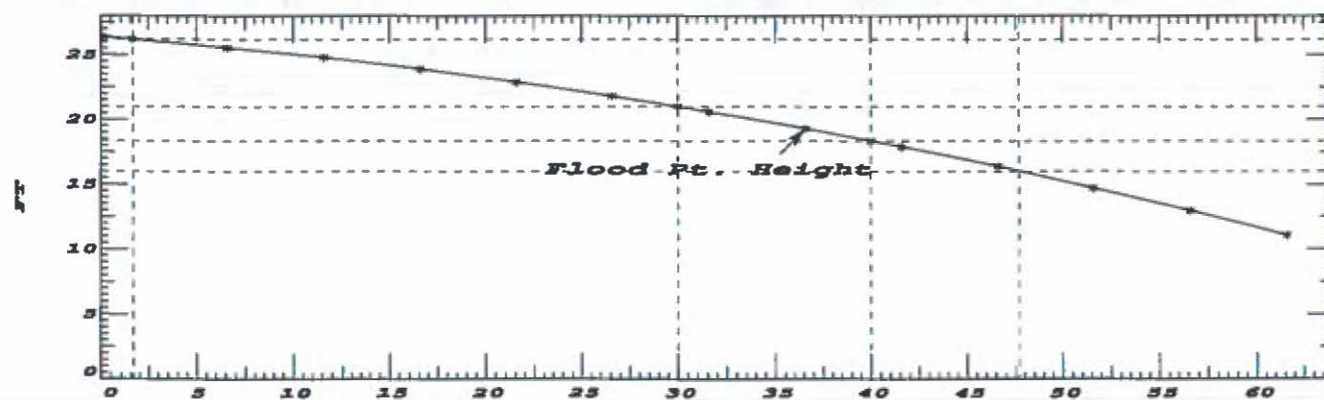
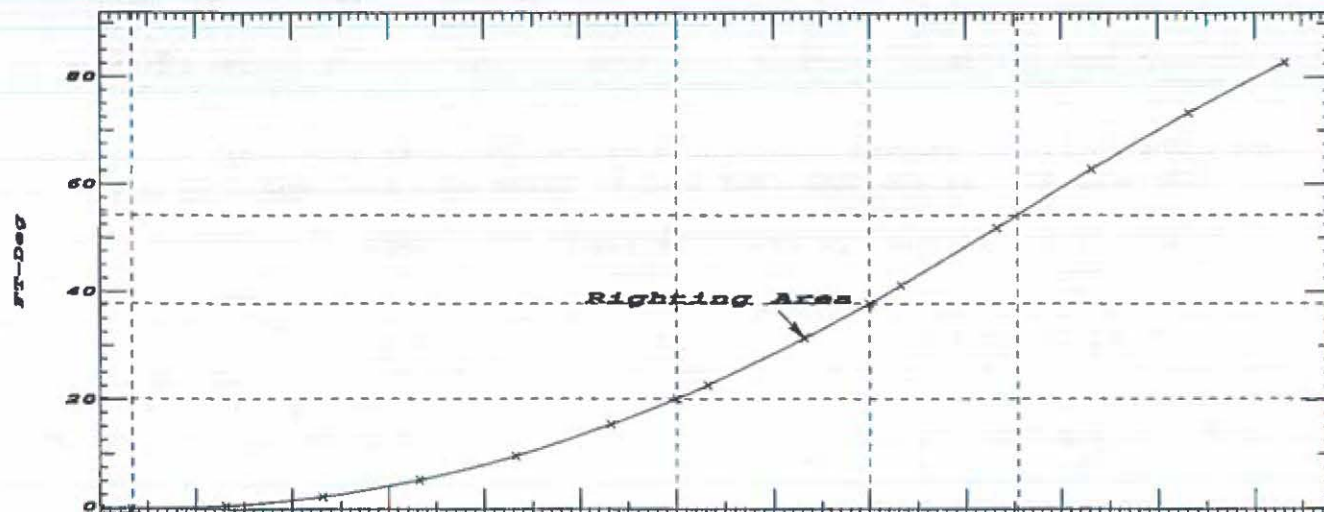
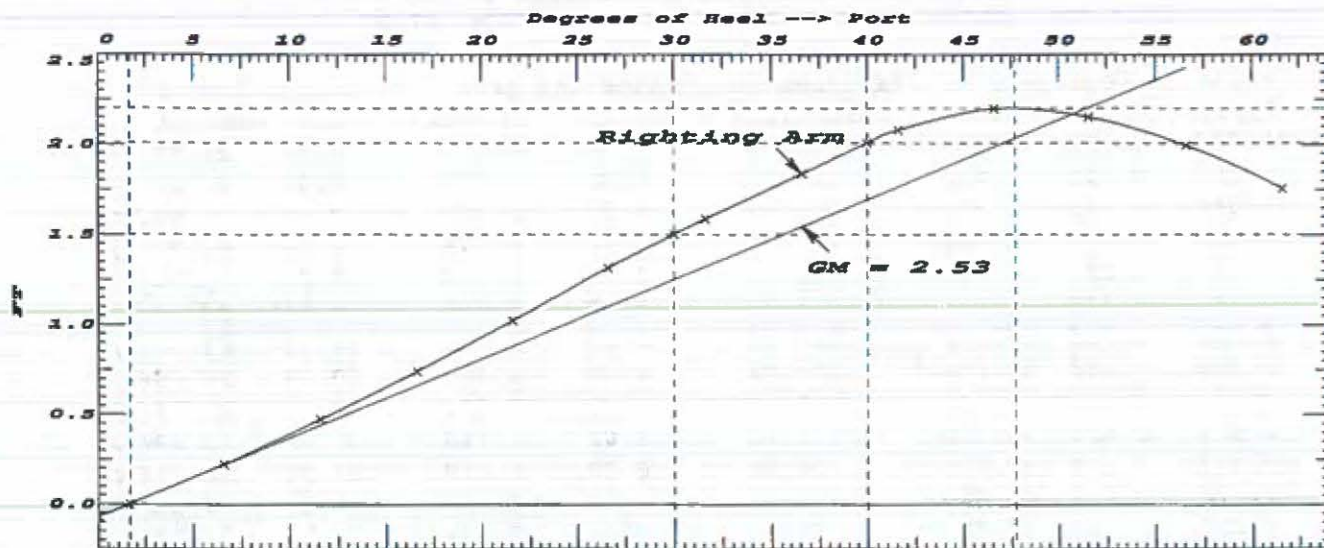
LIM-----TP7301 STAB 4 CRITERION-----Min/Max-----Attained

(1) GM at Equilibrium	>	1.15 Ft	2.53 P ✓
(2) Area from abs 0 deg to abs 30	>	10.34 Ft-deg	20.34 P ✓
(3) Area from abs 0 deg to abs 40	>	16.91 Ft-deg	37.94 P ✓
(4) Area from abs 30 deg to abs 40	>	5.64 Ft-deg	17.59 P ✓
(5) Angle from abs 0 deg to MaxRA	>	25.00 deg	47.42 P ✓
(6) Righting Arm at abs 30 deg or MaxRA	>	0.66 Ft	2.20 P ✓

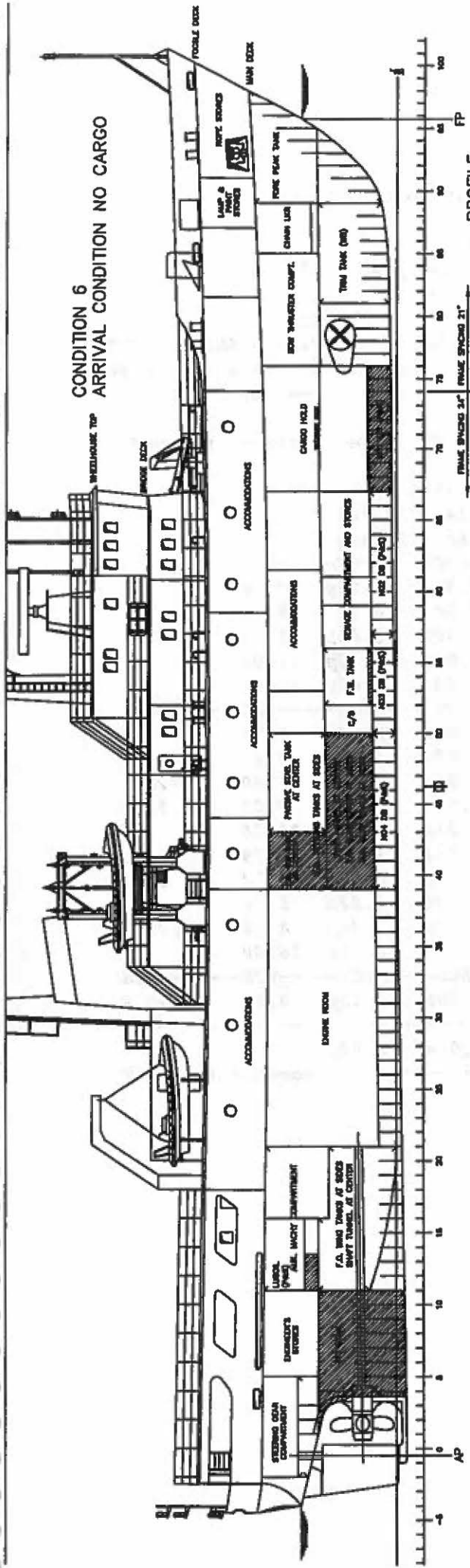
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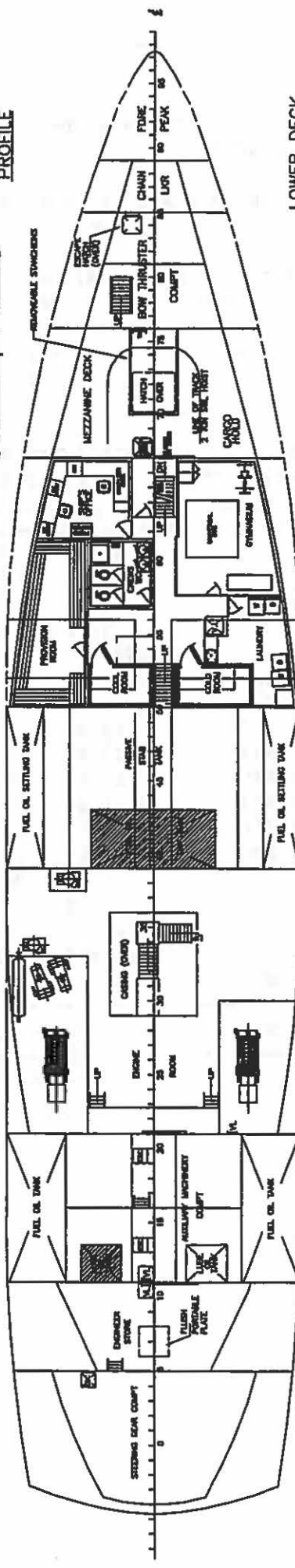
CONDITION NUMBER 5
ARRIVAL CONDITION 10% CONSUMABLES FULL CARGO
STAB TANK IS DUMPED TO THE DUMP TANKS IN ARRIVAL CONDITIONS



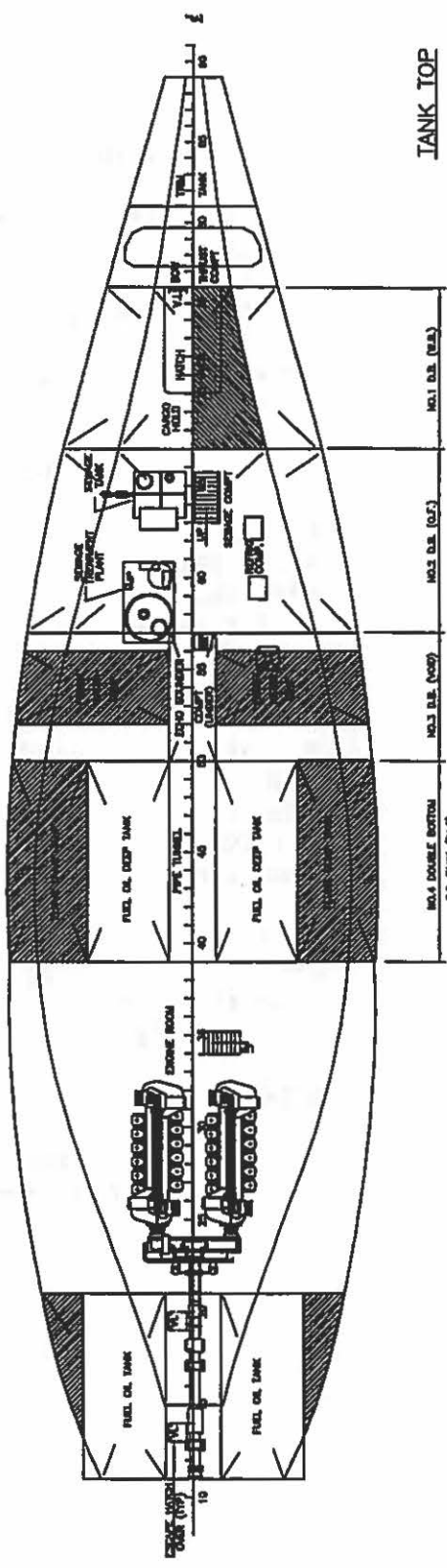
CONDITION 6 ARRIVAL CONDITION NO CARGO



PROFILE



LOWER DECK



TANK TOP

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CONDITION NUMBER 6
ARRIVAL CONDITION 10% CONSUMABLES NO CARGO

HYDROSTATIC PROPERTIES

Trim: Aft 1.43/187.00, Heel: Port 1.11 deg. VCG = 16.90

Draft@	Displacement	Buoyancy-Ctr.	Weight/	Moment/
Origin----	Weight (LT)----	LCB-----VCB-----	Inch-----	LCF-----In trim-----
10.997	1,128.90	8.38a 6.51	12.43	9.80a 112.88
Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.				
Trim is per 187.00Ft				

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 8.780 @ 93.50f, 13.214 @ 93.50a

Trim: Aft 1.43/187.00, Heel: Port 1.11 deg.

Part-----	Weight (LT)----	LCG-----	TCG-----	VCG-----
LIGHT SHIP	1,029.65	8.52a	0.02p	17.58
CREW AND EFFECTS	5.00	0.00	0.00	29.36
STORES AND PROVISIONS	0.60	12.00f	5.00p	14.42
MACHINERY SPACE	5.00	89.00a	6.00p	14.00
Total Fixed----->	1,040.25	8.85a	0.05p	17.62
Load-----SpGr-----	Weight (LT)----	LCG-----	TCG-----	VCG-----FSM-----
NO1_DB.S	0.950 1.025	5.66	49.00f	2.18s 2.78 7.7
DUMP.P	0.897 0.870	23.99	3.82a	15.20p 6.40 27.1
DUMP.S	0.897 0.870	23.98	3.82a	15.15s 6.40 27.0
DAYTANK.C	0.950 0.870	27.88	10.51a	0.05p 14.09 78.3
LUBOIL.P	0.200 0.924	1.20	68.01a	7.28p 11.86 1.8
FW.P	0.100 1.000	2.19	15.14f	9.12p 3.78 40.6
FW.S	0.100 1.000	2.10	15.03f	8.41s 3.77 38.3
SWGE.P	0.980 1.000	1.66	34.98f	2.52p 5.66 1.3
Total Tanks----->		88.66	1.78a	0.06p 8.52 222.0
Total Weight----->		1,128.91	8.30a	0.05p 16.90
		Displ (LT)----	LCB-----	TCB-----VCB-----RefHt-----
HULL	1.025	1,128.90	8.38a	0.25p 6.51 -10.99

Righting Arms:		0.00a	0.00p	
Distances in FEET.-----Moments in Ft-LT.				

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CONDITION NUMBER 6
ARRIVAL CONDITION 10% CONSUMABLES NO CARGO

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 8.85a TCG = 0.05p VCG = 17.62

Origin Depth	Degrees of Trim	Heel	Displacement Weight (LT)	Righting Arms in Trim	in Heel	Flood Pt Area	Height
10.998	0.44a	0.00	1,128.91	0.00	-0.049	0.00	26.83(1)
10.995	0.44a	1.11p	1,128.91	0.00	0.000	-0.03	26.71(1)
10.900	0.41a	6.11p	1,128.91	0.00	0.224	0.53	26.08(1)
10.672	0.34a	11.11p	1,128.91	0.00	0.459	2.24	25.32(1)
10.306	0.24a	16.11p	1,128.90	0.00	0.710	5.15	24.44(1)
9.797	0.11a	21.11p	1,128.89	0.00	0.967	9.35	23.45(1)
9.143	0.04f	26.11p	1,128.91	0.00	1.229	14.84	22.35(1)
8.538	0.15f	30.00p	1,128.91	0.00	1.410	19.98	21.43(1)
8.349	0.17f	31.11p	1,128.91	0.00	1.458	21.57	21.15(1)
7.415	0.26f	36.11p	1,128.91	0.00	1.653	29.36	19.85(1)
6.588	0.29f	40.00p	1,128.90	0.00	1.801	36.08	18.78(1)
6.337	0.30f	41.11p	1,128.90	0.00	1.845	38.10	18.47(1)
5.152	0.31f	46.11p	1,128.83	0.00	1.989	47.70	16.99(1)
4.643	0.30f	48.21p	1,128.90	0.00	2.001	51.90	16.32(1)
3.933	0.28f	51.11p	1,129.06	0.00	1.978	57.67	15.37(1)
2.695	0.24f	56.11p	1,128.97	0.00	1.840	67.28	13.61(1)
1.443	0.17f	61.11p	1,128.91	0.00	1.617	75.95	11.73(1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1040.25 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

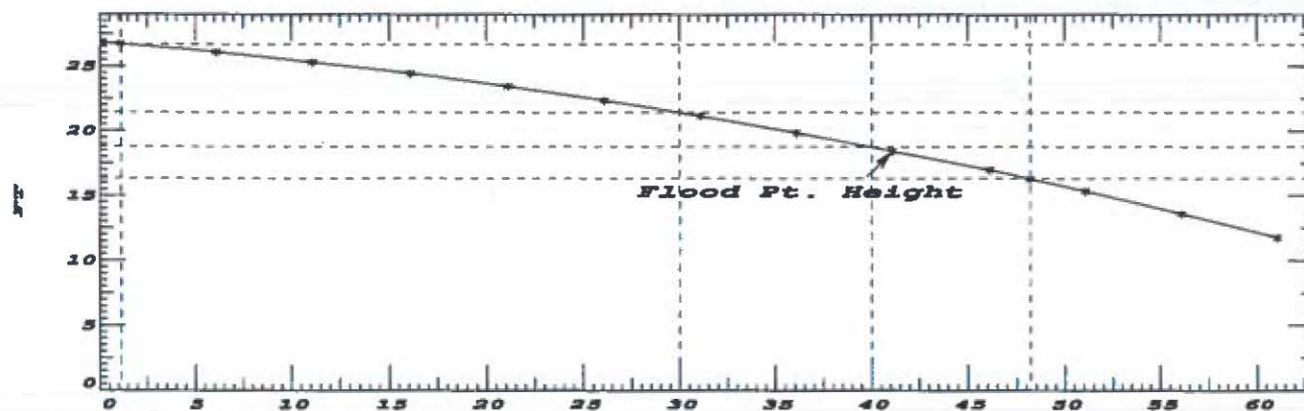
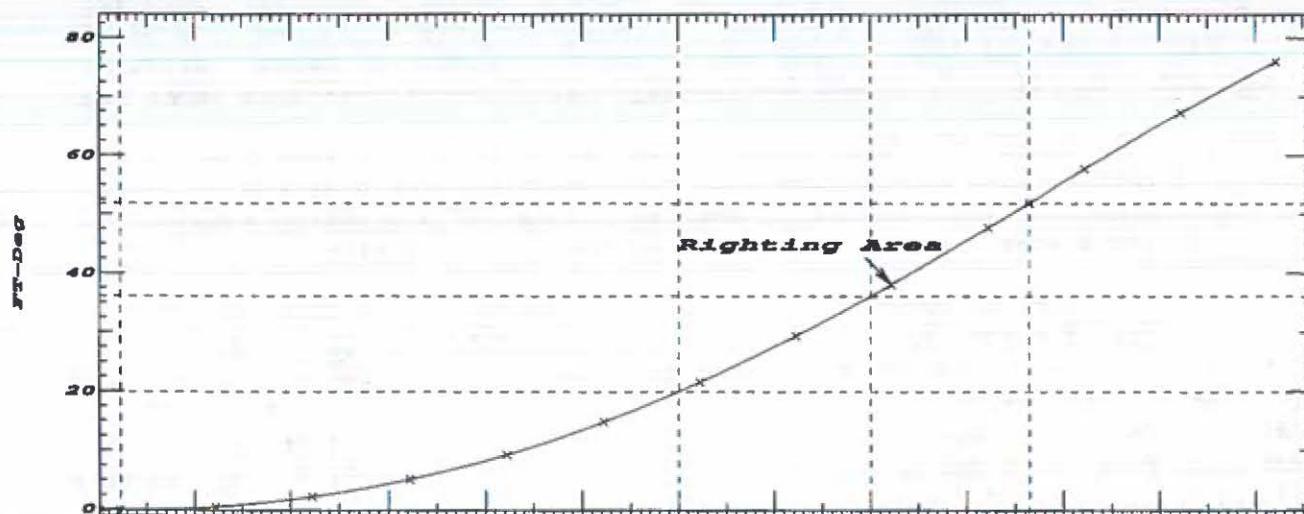
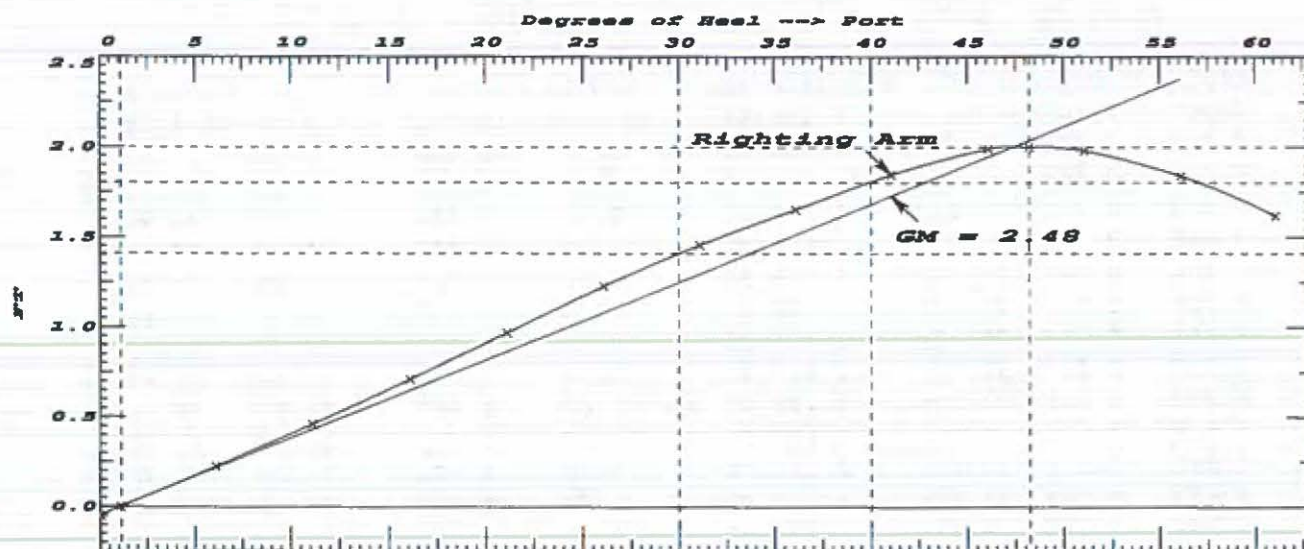
Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	FLOOD 22.50a	6.00p	38.00

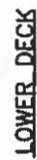
LIM	TP7301 STAB 4 CRITERION	Min/Max	Attained
(1) GM at Equilibrium	>	1.15 Ft	2.48 P ✓
(2) Area from abs 0 deg to abs 30	>	10.34 Ft-deg	19.98 P ✓
(3) Area from abs 0 deg to abs 40	>	16.91 Ft-deg	36.08 P ✓
(4) Area from abs 30 deg to abs 40	>	5.64 Ft-deg	16.10 P ✓
(5) Angle from abs 0 deg to MaxRA	>	25.00 deg	48.21 P ✓
(6) Righting Arm at abs 30 deg or MaxRA	>	0.66 Ft	2.00 P ✓

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CONDITION NUMBER 6
ARRIVAL CONDITION 10% CONSUMABLES NO CARGO



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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 4 ***WORST OPERATING***
HALF LOAD CONDITION, 50% CONSUMABLES & FULL CARGO WITH ICE ACCUMULATION

HYDROSTATIC PROPERTIES

Trim: Fwd 0.77/187.00, Heel: Port 0.41 deg., VCG = 17.20

Draft@	Displacement	Buoyancy-Ctr.	Weight/	Moment/
Origin----	Weight (LT)----	LCB-----	VCB-----	Inch-----
LCF-----	In trim----	GML-----	GMT	
12.828	1,393.76	6.19a	7.54	13.28
9.66a	132.56	213.4	0.83	

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.
Trim is per 187.00Ft

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 11.713 @ 93.50f, 13.943 @ 93.50a
Trim: Fwd 0.77/187.00, Heel: Port 0.41 deg.

Part-----	Weight (LT)-----	LCG-----	TCG-----	VCG
LIGHT SHIP	1,029.65	8.52a	0.02p	17.58
ACCUMULATED ICE	85.76	1.64a	0.00	32.73
CREW AND EFFECTS	5.00	0.00	0.00	29.36
STORES AND PROVISIONS	3.00	12.00f	5.00p	14.42
MACHINERY SPACE	5.00	89.00a	6.00p	14.00
CARGO	66.00	49.50f	0.50p	12.50
Total Fixed----->	1,194.41	5.07a	0.08p	18.41

NO CALCS SHOWN.

	Load-----	SpGr-----	Weight (LT)-----	LCG-----	TCG-----	VCG-----	FSM
NO4_DB.S	0.950	0.870	19.97	3.78a	6.82s	1.78	187.7
SETTLING.P	0.950	0.870	20.63	3.60a	17.48p	13.85	5.5
SETTLING.S	0.950	0.870	20.63	3.60a	17.48s	13.85	5.5
WING.P	0.334	0.870	17.22	58.20a	6.17p	6.25	54.1
WING.S	0.334	0.870	17.22	58.22a	6.13s	6.25	52.4
DAYTANK.C	0.950	0.870	27.88	10.50a	0.02p	14.09	78.2
STAB.C	0.437	0.870	47.97	1.75a	0.16p	11.81	1104.1
LUBOIL.P	0.950	0.924	5.69	68.00a	7.25p	15.08	1.8
FW.P	0.500	1.000	10.94	15.39f	9.48p	5.25	64.2
FW.S	0.500	1.000	10.48	15.25f	9.43s	5.25	63.3
SNGE.P	0.500	1.000	0.85	34.98f	2.51p	5.06	1.4
Total Tanks----->			199.50	13.21a	0.39s	9.95	1618.1
Total Weight----->			1,393.91	6.23a	0.01p	17.20	

	Displ (LT)-----	LCB-----	TCB-----	VCB-----	RefHt
HULL	1,393.76	6.19a	0.08p	7.54	-12.83

Righting Arms: 0.00 0.00p

Distances in FEET.-----Moments in Ft-LT.

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 4 ***WORST OPERATING***
HALF LOAD CONDITION, 50% CONSUMABLES & FULL CARGO WITH ICE ACCUMULATION

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 5.07a TCG = 0.08p VCG = 18.41

Origin Depth	Degrees of Trim	Displacement Heel	Weight (LT)	Righting Arms in Trim	in Heel	Flood Ft Area	Height
12.827	0.24f	0.00	1,393.69	0.00	-0.006	0.00	25.27(1)
12.827	0.24f	0.41p	1,393.76	0.00	0.000	-0.00	25.22(1)
12.748	0.25f	5.41p	1,393.91	0.00	0.087	0.22	24.62(1)
12.524	0.31f	10.41p	1,393.91	0.00	0.192	0.91	23.89(1)
12.158	0.39f	15.41p	1,393.90	0.00	0.316	2.17	23.03(1)
11.693	0.49f	20.00p	1,393.89	0.00	0.473	3.96	22.15(1)
11.644	0.50f	20.41p	1,393.63	0.00	0.489	4.16	22.07(1)
10.990	0.60f	25.41p	1,393.90	0.00	0.689	7.09	20.99(1)
10.266	0.65f	30.00p	1,393.90	0.00	0.876	10.69	19.90(1)
10.196	0.66f	30.41p	1,393.86	0.00	0.893	11.05	19.80(1)
9.258	0.67f	35.41p	1,393.72	0.00	1.097	16.02	18.50(1)
8.286	0.65f	40.00p	1,394.11	0.00	1.259	21.44	17.22(1)
8.196	0.65f	40.41p	1,393.94	0.00	1.267	21.96	17.10(1)
7.663	0.63f	42.81p	1,393.80	0.00	1.287	25.04	16.38(1)
7.082	0.61f	45.41p	1,394.08	0.00	1.264	28.36	15.56(1)
5.928	0.54f	50.41p	1,393.91	0.00	1.127	34.39	13.88(1)
4.748	0.47f	55.41p	1,394.07	0.00	0.893	39.48	12.07(1)
3.547	0.39f	60.41p	1,394.09	0.00	0.590	43.22	10.16(1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1194.41 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	22.50a	6.00p	38.00

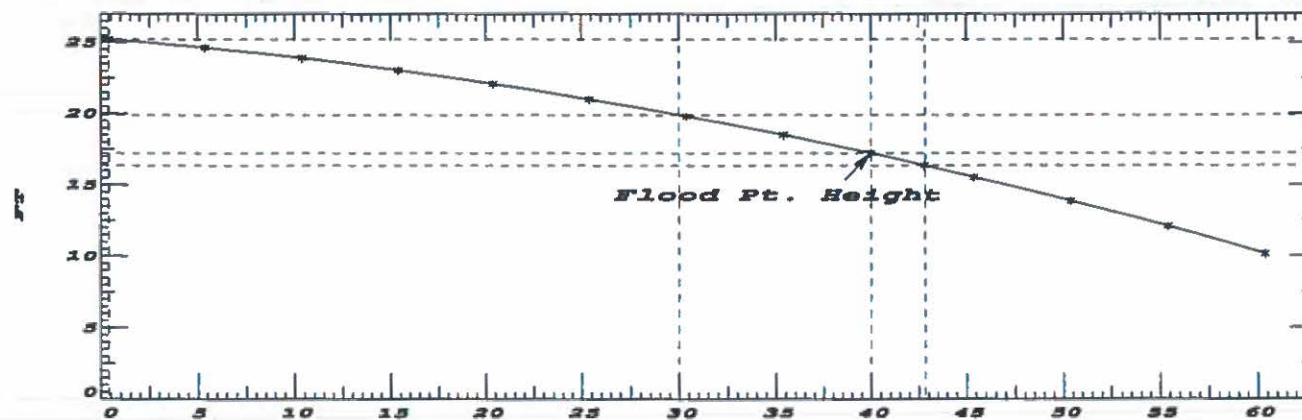
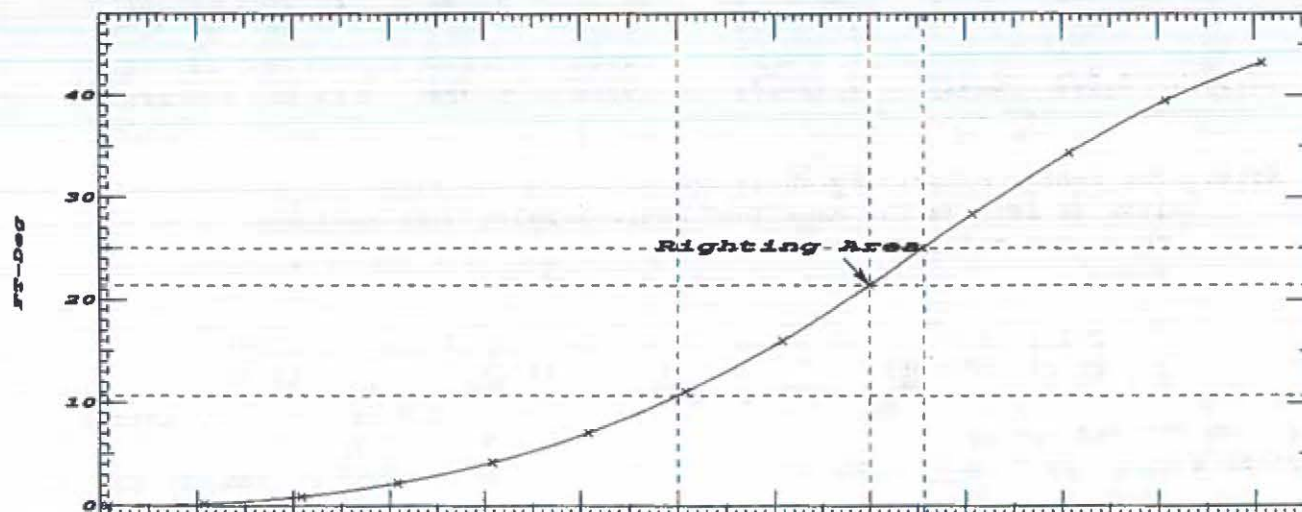
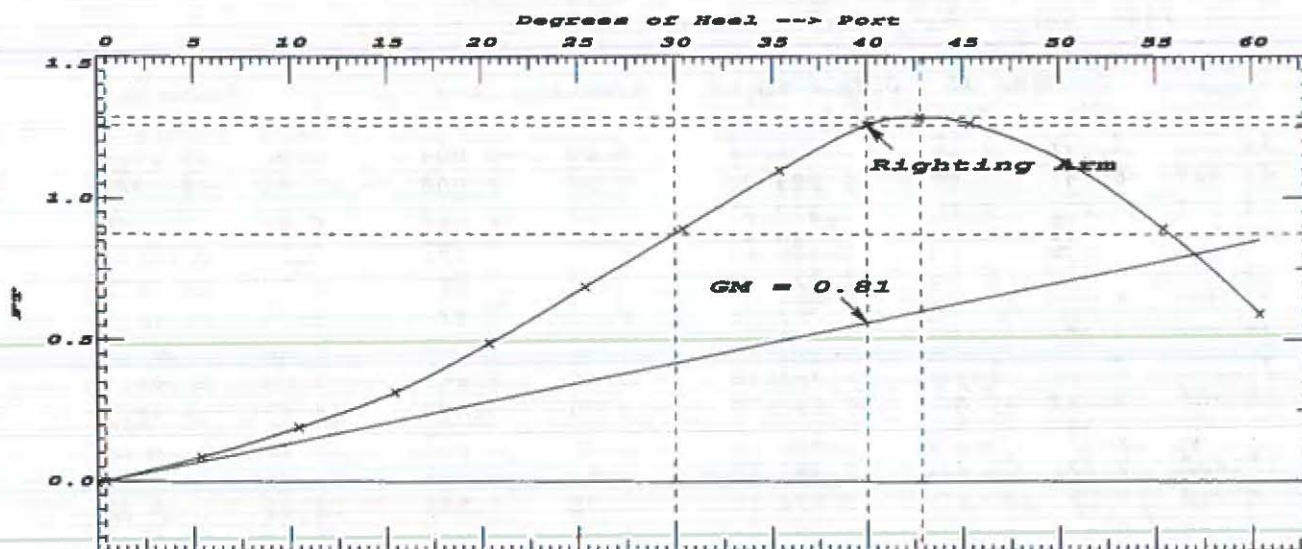
LIM-----TP7301 STAB 4 CRITERION - ICING-----Min/Max-----Attained

(1) GM at Equilibrium	>	0.75 Ft	0.81 P ✓
(2) Area from abs 0 deg to abs 30	>	7.52 Ft-deg	10.69 P ✓
(3) Area from abs 0 deg to abs 40	>	10.89 Ft-deg	21.44 P ✓
(4) Area from abs 30 deg to abs 40	>	3.01 Ft-deg	10.76 P ✓
(5) Angle from abs 0 deg to MaxRA	>	20.00 deg	42.81 P ✓
(6) Righting Arm at abs 20 deg or MaxRA	>	0.49 Ft	1.29 P ✓

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 4 ***WORST OPERATING***
HALF LOAD CONDITION, 50% CONSUMABLES & FULL CARGO WITH ICE ACCUMULATION



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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 6
ARRIVAL CONDITION 10% CONSUMABLES NO CARGO WITH ICE ACCUMULATION

HYDROSTATIC PROPERTIES

Trim: Aft 0.92/187.00, Heel: Port 2.00 deg., VCG = 18.02

Draft@	Displacement	Buoyancy-Ctr.	Weight/	Moment/	
Origin----	Weight (LT)----	LCB-----VCB-----	Inch-----	LCF-----In trim-----	GML-----GMT
11.589	1,214.66	7.88a 6.86	12.75	9.99a 119.60	220.9 1.25

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.
Trim is per 187.00Ft

Draft is from BoK.

True Free Surface included.

WEIGHT and DISPLACEMENT STATUS

BoK draft: 9.627 @ 93.50f, 13.551 @ 93.50a

Trim: Aft 0.92/187.00, Heel: Port 2.00 deg.

Part-----	Weight (LT)---	LCG-----	TCG-----	VCG
LIGHT SHIP	1,029.65	8.52a	0.02p	17.58
ACCUMULATED ICE	85.76	1.64a	0.00	32.73
CREW AND EFFECTS	5.00	0.00	0.00	29.36
STORES AND PROVISIONS	0.60	12.00f	5.00p	14.42
MACHINERY SPACE	5.00	89.00a	6.00p	14.00
Total Fixed----->	1,126.01	8.30a	0.05p	18.77

	Load-----	SpGr-----	Weight (LT)---	LCG-----	TCG-----	VCG	FSM
NO1_DB.S	0.950	1.025	5.66	49.06f	2.15s	2.78	7.4
DUMP.P	0.897	0.870	23.99	3.80a	15.21p	6.41	27.1
DUMP.S	0.897	0.870	23.98	3.80a	15.14s	6.41	27.1
DAYTANK.C	0.950	0.870	27.88	10.51a	0.10p	14.09	78.4
LUBOIL.P	0.200	0.924	1.20	68.01a	7.30p	11.86	1.8
FW.P	0.100	1.000	2.19	15.15f	9.41p	3.78	41.6
FW.S	0.100	1.000	2.10	15.05f	8.13s	3.78	37.4
SNGE.P	0.980	1.000	1.66	34.98f	2.53p	5.66	0.6
Total Tanks----->			88.65	1.76a	0.10p	8.52	221.4
Total Weight----->			1,214.66	7.83a	0.05p	18.02	

	Displ (LT)---	LCB-----	TCB-----	VCB-----	RefHt
HULL	1.025	1,214.66	7.88a	0.44p 6.86	-11.58

Righting Arms: 0.00 0.00p

Distances in FEET.-----Moments in Ft-LT.

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 6
ARRIVAL CONDITION 10% CONSUMABLES NO CARGO WITH ICE ACCUMULATION

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 8.30a TCG = 0.05p VCG = 18.77

Origin Depth	Degrees of Trim	Displacement Heel	Weight (LT)	Righting Arms in Trim	in Heel	Flood Pt Area	Height
11.592	0.29a	0.00	1,214.67	0.00	-0.045	0.00	26.29(1)
11.582	0.28a	2.00p	1,214.67	0.00	0.000	-0.04	26.07(1)
11.461	0.25a	7.00p	1,214.67	0.00	0.116	0.24	25.43(1)
11.206	0.18a	12.00p	1,214.67	0.00	0.252	1.15	24.65(1)
10.810	0.07a	17.00p	1,214.66	0.00	0.407	2.79	23.75(1)
10.502	0.01f	20.00p	1,214.66	0.00	0.508	4.17	23.16(1)
10.267	0.07f	22.00p	1,214.66	0.00	0.578	5.25	22.75(1)
9.583	0.20f	27.00p	1,214.67	0.00	0.746	8.56	21.63(1)
9.105	0.26f	30.00p	1,214.66	0.00	0.835	10.93	20.91(1)
8.760	0.30f	32.00p	1,214.67	0.00	0.888	12.65	20.41(1)
7.793	0.35f	37.00p	1,214.66	0.00	1.017	17.42	19.08(1)
7.142	0.36f	40.00p	1,214.50	0.00	1.097	20.60	18.25(1)
6.688	0.36f	42.00p	1,214.67	0.00	1.142	22.83	17.68(1)
6.121	0.36f	44.43p	1,214.61	0.00	1.161	25.63	16.96(1)
5.515	0.34f	47.00p	1,214.78	0.00	1.140	28.58	16.15(1)
4.309	0.30f	52.00p	1,214.67	0.00	0.993	33.97	14.48(1)
3.087	0.25f	57.00p	1,214.96	0.00	0.743	38.36	12.68(1)
1.848	0.17f	62.00p	1,214.67	0.00	0.422	41.30	10.76(1)

Distances in FEET.-----Specific Gravity = 1.025.-----Area in Ft-Deg.

Note: The Center of Gravity shown above is for the Fixed Weight of 1126.01 LT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Point	LCP	TCP	VCP
(1) ER CASING PORT	FLOOD 22.50a	6.00p	38.00

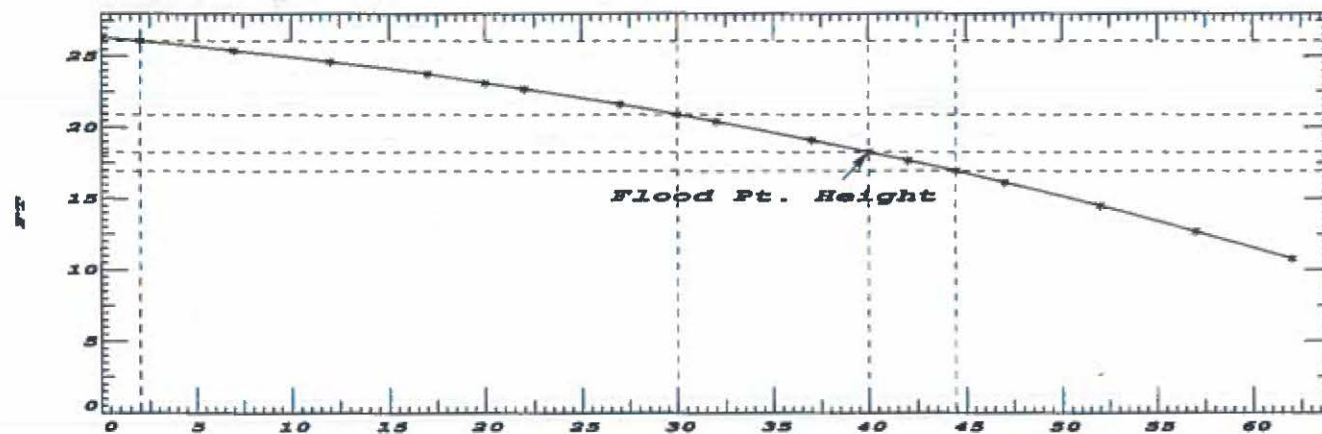
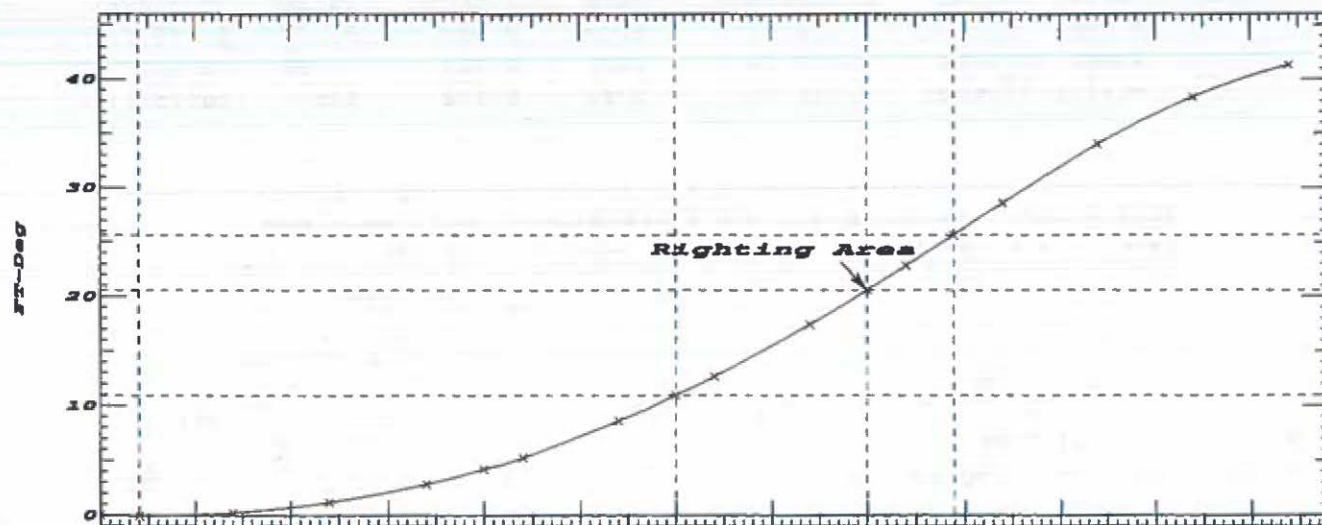
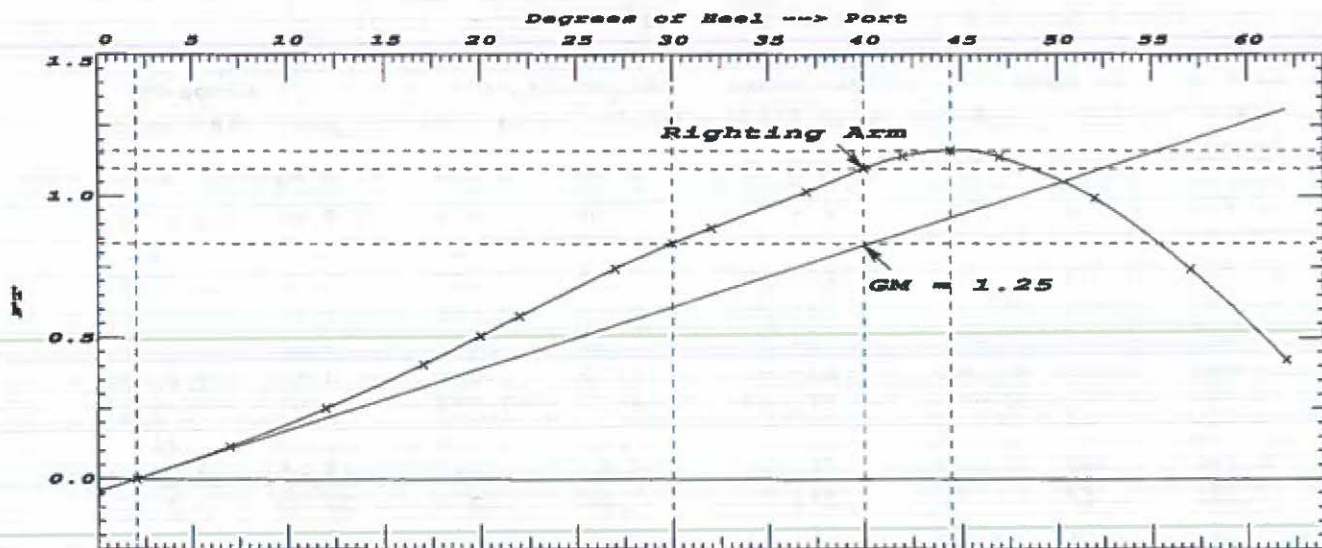
LIN-----TP7301 STAB 4 CRITERION - ICING-----Min/Max-----Attained

(1) GM at Equilibrium	>	0.75 Ft	1.25 P
(2) Area from abs 0 deg to abs 30	>	7.52 Ft-deg	10.93 P
(3) Area from abs 0 deg to abs 40	>	10.89 Ft-deg	20.60 P
(4) Area from abs 30 deg to abs 40	>	3.01 Ft-deg	9.66 P
(5) Angle from abs 0 deg to MaxRA	>	20.00 deg	44.43 P
(6) Righting Arm at abs 20 deg or MaxRA	>	0.49 Ft	1.16 P

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BMT Fleet
CFV CYGNUS

CONDITION NUMBER 6
ARRIVAL CONDITION 10% CONSUMABLES NO CARGO WITH ICE ACCUMULATION



APPENDIX A – INCLINING REPORT



BMT Fleet Technology

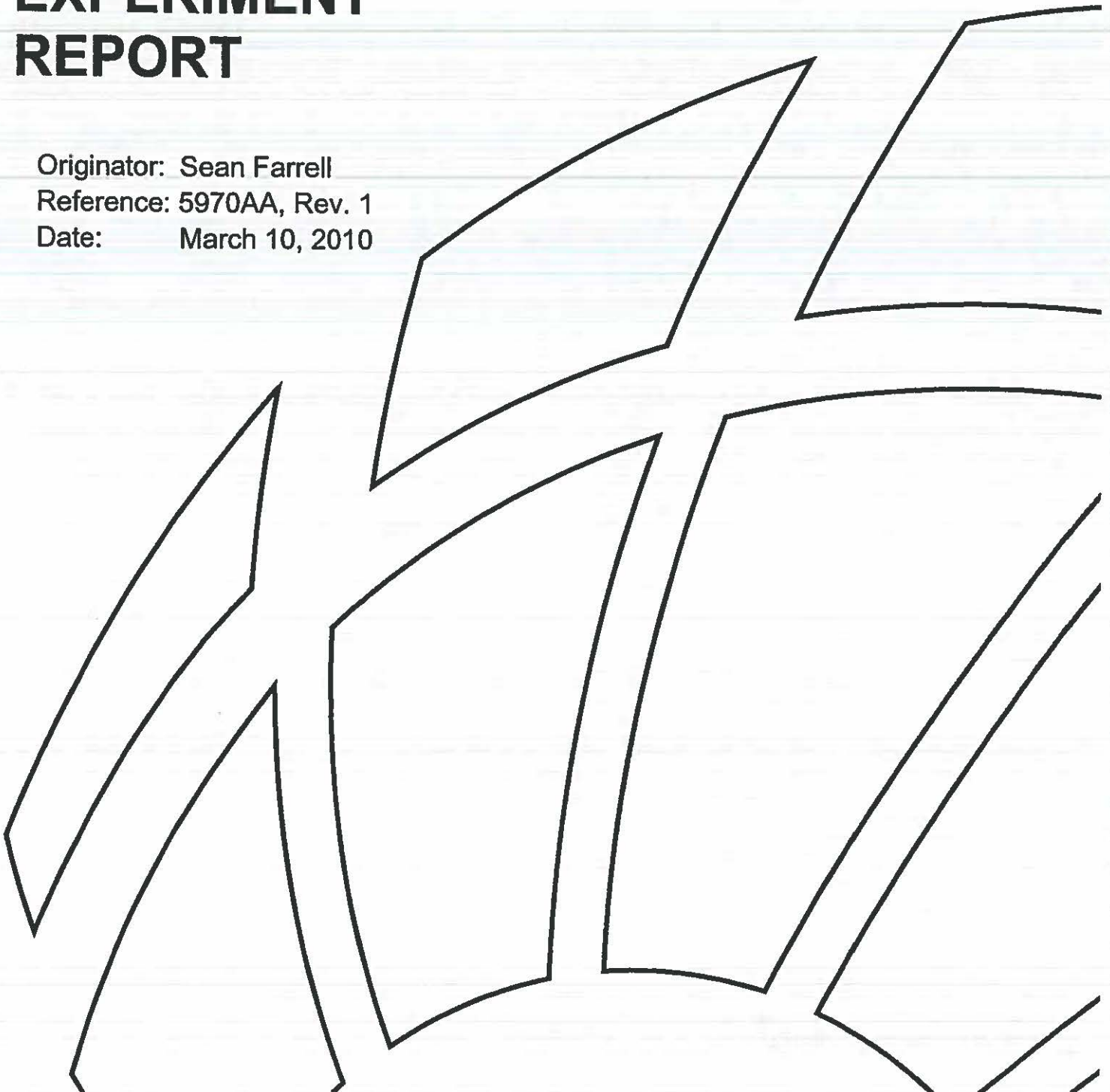
"Where will our knowledge take you?"

CCGS CYGNUS INCLINING EXPERIMENT REPORT

Originator: Sean Farrell

Reference: 5970AA, Rev. 1

Date: March 10, 2010



CCGS CYGNUS – INCLINING EXPERIMENT
REPORT

FINAL REPORT

MARCH 2010

Submitted to:

DEPARTMENT OF FISHERIES AND OCEANS
C/O Supply Depot, PO BOX 5667
South Side Road
St. John's, NL
A1C 5X1

Submitted by:

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BMT DOCUMENT QUALITY CONTROL DATA SHEET

REPORT: CCGS CYGNUS INCLINING EXPERIMENT
REPORT

DATE: March 10, 2010

PREPARED BY:

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1. PARTICULARS AT INCLINING

1.1 Location and Condition

Date: September 15th, 2007

Place: St. John's, Southside Road

Present: Sean Farrell, BMT Fleet Technology Ltd.
Gareth Igloliorte, BMT Fleet Technology Ltd.
David Squires, Transport Canada

Vessel Particulars:

Name:	CCGS CYGNUS
Port of Registration:	Ottawa
LOA:	205'-0"
LBP:	187'-0"
Breadth:	40'-0"
Depth:	18'-0"
Draft:	13'-6"

Ship Condition: Ship docked for incline experiment. All tanks sounded.

Sea Condition: Calm with vessel alongside the quay.

Weather Condition: Sunny with light wind.

Sea Water Density: 1.020 T/m³

1.2 Pendulum Particulars

The forward pendulum was located at the forward cargo hold at approximately Frame 71. It was attached to a wooden brace spanning the hatch which is roughly 24" above the forecastle deck and fell to the mezzanine deck in the stores area. A batten was secured to record the mezzanine deck pendulum shifts and an oil bath was placed to dampen its movement. The length of the pendulum from the suspension point to the batten was 208.66".

The aft pendulum was located in the engineer's stores at approximately Frame 7. It was attached to the underside of the forecastle deck and fell to the engineer's stores deck. A batten was secured roughly 48" above the engineer's stores deck to record the pendulum shift and an oil bath was placed to dampen its movement. The length of the pendulum from the suspension point to the batten was 167.32".

2. INCLINING EXPERIMENT

2.1 Methodology

The incline experiment was prepared in accordance with IACS, No.31 Inclining Test Unified Procedure and conducted with the oversight of a Transport Canada Marine Safety Inspector.

2.2 Inclining Data

Drafts: Forward 8'-5"
 Aft 13'-3"

Trim By Stern = 1'-10"
Mean Draft = 10'-10"

Δ in Sea Water using Hydrostatic Curves = 1107.63 LT
 ρ of Sea Water = 1.025 T/m³
 ρ of Harbour Water = 1.020 T/m³
 ρ correction = 0.995
 Δ with correction for density = 1102.09 LT

Table 2-1: GHS Output for Inclined Condition

03/09/10 16:36:22
GHS 11.00

BMT Fleet
CFV CYGNUS

Page 1

As inclined condition, drafts measured from BoK (inclined)

BoK draft refers to the line:

1.500 above baseline @ 93.50f and 1.500 below baseline @ 93.50a

BoK Draft @ 93.50f = 8.417
BoK Draft @ 0.00 = 10.833
BoK Draft @ 93.50a = 13.250

HYDROSTATIC PROPERTIES

Trim: Aft 1.83/187.00, No Heel

Origin	Displacement	Center of Buoyancy						
Depth	Weight (LT)	LCB	TCB	VCB	NPA	LCF	BML	BMT
10.833	1,102.09	8.85a	0.00	6.43	5197	10.10a	237.6	13.21
Distances in FEET.-----Specific Gravity = 1.020.-----								

Table 2-2: Deflections and GM Calculation

Length of Forward Pendulum 208.66 in Δ from Ship Stability GHS = 1102.09 LT
Length of Aft Pendulum 167.32 in ρ of Harbour Water = 1.020 T/m³
 Δ from Incline 1102.09 LT

Shift #	Weight #	Weight (lbs)	Shift Distance (in)	Direction of Shift	Fwd Pen. Def (in)	Aft Pen. Def (in)	Fwd tan θ	Fwd θ	Aft tan θ	Aft θ	GM Fwd	GM Aft
1	SS27, SS24, SS13 & SS11	4000	403.23	P -> S	5.24	3.66	0.03	1.44	0.02	1.25	26.02	29.87
2	SS12, SS05, SS17 & SS29	4000	402.24	P -> S	4.29	3.70	0.02	1.18	0.02	1.27	31.70	29.47
3	SS12, SS05, SS17 & SS29	4000	402.24	S -> P	5.00	3.70	0.02	1.37	0.02	1.27	27.20	29.47
4	SS27, SS24, SS13 & SS11	4000	403.23	S -> P	4.53	3.58	0.02	1.24	0.02	1.23	30.09	30.54
5	SS03, SS31, SS39 & SS09	4000	403.62	S -> P	4.96	4.02	0.02	1.36	0.02	1.38	27.51	27.22
6	SS37, SS26, SS21 & SS40	4000	404.61	S -> P	4.69	3.50	0.02	1.29	0.02	1.20	29.17	31.34
7	SS37, SS26, SS21 & SS40	4000	404.61	P -> S	4.69	3.58	0.02	1.29	0.02	1.23	29.17	30.64
8	SS03, SS31, SS39 & SS09	4000	403.62	P -> S	4.64	3.82	0.02	1.27	0.02	1.31	29.41	28.65

GM As Inclined: $GM = \frac{w \times \text{shift} \times Pdm}{\Delta \times \text{Deflection}}$

Average GM Fwd Pendulum = 28.78 in.

Average GM Aft Pendulum = 29.65 in.

Average GM = 29.22 in.

3. LIGHTSHIP SURVEY

A lightship survey was conducted on September 14th, 2007 with the oversight of a Transport Canada Marine Safety Inspector. A notation of all weights to be removed and added was made by both BMT and Transport Canada.

Soundings of all tanks were conducted on the day of the incline and were observed by the Transport Canada Marine Safety Inspector. A notation of all soundings was made by both BMT and Transport Canada.

The notations made in the survey are used to modify the lightship weight by either removing the fixed weights as shown in Table 3-1 and Table 3-2, or to add weights as shown in Table 3-3.

Table 3-1: Summary of Weights to Remove

Summary of Weights to Remove

Description	Weight (LT)	VCG (ft)	V Momt (LT-ft)	LCG (ft)	L Momt (LT-ft)	TCG (ft)	T Momt (LT-ft)
#2 Weapons	0.246	40	9.84	96	23.62	0	0.00
#5 SAR Pumps	0.089	29	2.57	48.33	4.28	-3.25	-0.29
#7 Gas Cans	0.079	28.67	2.26	-2.33	-0.18	12.5	0.98
#8 Generator	0.049	28.67	1.41	-2.33	-0.11	14	0.69
#9 SAR Pumps	0.089	29	2.57	-2.33	-0.21	15.5	1.37
#10 Water Containers	0.044	28.27	1.25	44.13	1.95	-4.5	-0.20
#11 Tools & Equipment	0.197	29	5.71	55.33	10.89	2.25	0.44
#12 Sand	0.049	27	1.33	75.5	3.72	7.5	0.37
#13 Rope & Salt	0.561	25	14.02	186	104.35	0	0.00
#14 Paint Port	0.350	24	8.40	175	61.24	-4	-1.40
#15 Paint Stbd	0.280	24	6.72	175	48.99	4	1.12
#16 Pump	0.098	28	2.76	84	8.27	-1.5	-0.15
#17 Crew Effects	3.000	29.36	88.08	0	0.00	0	0.00
#18 Records	0.295	15.5	4.58	159	46.95	-5	-1.48
#19&28 Stores & Provisions	6.000	14.42	86.52	12	72.00	-5	-30.00
#20 Extra Crew Effects	0.443	23	10.19	152.5	67.54	-4.5	-1.99
#21 Miscellaneous	0.098	22	2.17	39	3.84	0	0.00
#22 Aft Main Deck	0.640	23	14.71	19.5	12.47	8	5.12
#23 Tools	0.492	23	11.32	27	13.29	-10	-4.92
#24 Tools & Equipment	0.984	23	22.64	38.5	37.89	-17	-16.73
#25 Tools	0.098	23	2.26	74.5	7.33	-3	-0.30
#29 Spares & Stores	2.461	14	34.45	144	354.31	0	0.00
#30 Stores	1.968	7	13.78	144	283.45	0	0.00
#31 Pumps & Misc	1.476	5	7.38	133.5	197.09	3.5	5.17
#32 Miscellaneous	0.344	13.4	4.62	30	10.33	-7	-2.41
#33 Tools & Stores	2.953	13	38.38	16	47.24	0	0.00
#34 Steel Pipe & Rod	1.476	14.5	21.41	10	14.76	0	0.00
#35 Stores Port	2.214	16.75	37.09	2	4.43	-6.5	-14.39
#36 Stores Stbd	0.295	16.75	4.95	2	0.59	6.5	1.92
Two Men & Oil	0.197	16.67	3.28	15	2.95	0	0.00
Two Men & Oil	0.197	16.67	3.28	142	27.95	0	0.00
Crew Member 1	0.074	38.6	2.85	94	6.94	0	0.00
Crew Member 2	0.074	38.6	2.85	85	6.27	-2	-0.15
Crew Member 3	0.074	38.6	2.85	85	6.27	2	0.15
Incline Wt1 (SS27,24,13&11)	1.790	27.90	49.94	99.88	178.79	-16.80	-30.07
Incline Wt2 (SS12,05,17&29)	1.790	27.90	49.94	92.00	164.68	-16.76	-30.00
Incline Wt3 (SS03,31,39&09)	1.790	27.90	49.94	95.96	171.77	16.81	30.09
Incline Wt4 (SS37,26,21&40)	1.790	27.90	49.94	88.17	157.82	16.86	30.18
Total	35.15	19.30	678.22	61.57	2163.77	-1.62	-56.88

*LCG in reference to the Aft Perpendicular

Table 3-2: Summary of Tanks to Remove

Summary of Tanks to Remove

Description	Weight (LT)	VCG (ft)	V Momt (LT-ft)	LCG (ft)	L Momt (LT-ft)	TCG (ft)	T Momt (LT-ft)	FSM (LT-ft)
No 1 DB Port	4.49	2.80	12.57	140.47	630.71	-2.40	-10.78	1.60
No 1 DB Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No 2 DB Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No 2 DB Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No 3 DB Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No 3 DB Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No 4 DB Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No 4 DB Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settling Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settling Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deep Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deep Stbd	0.70	3.22	2.25	84.46	59.12	7.00	4.90	23.80
Wing Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wing Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Stbd	0.55	3.24	1.78	84.98	46.74	14.34	7.89	7.50
Day Tank	25.30	13.69	346.36	82.99	2099.65	0.00	0.00	78.20
Flume Tank	7.98	10.21	81.48	90.73	724.03	0.00	0.00	0.00
Emg-Gen Tnk	1.18	36.67	43.27	114.88	135.56	0.00	0.00	0.90
Speed Log Port	1.47	2.97	4.37	149.64	219.97	-1.66	-2.44	0.00
Lub Oil Port	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lub Oil Stbd	1.98	12.42	24.59	25.50	50.49	7.25	14.36	0.00
Aft Peak	0.68	0.50	0.34	15.53	10.56	0.00	0.00	0.10
Fore Peak	0.23	4.23	0.97	176.82	40.67	0.00	0.00	0.00
Trim Tank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW Port	8.85	4.91	43.45	108.85	963.32	-9.31	-82.39	60.10
FW Stbd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chain Locker	0.30	11.00	3.30	170.00	51.00	0.00	0.00	0.00
Hydraulic Tank 1	0.71	15.00	10.65	18.00	12.78	-8.25	-5.86	0.00
Hydraulic Tank 2	0.57	15.00	8.55	18.00	10.26	-8.25	-4.70	0.00
Hydraulic Tank 3	0.51	15.00	7.65	18.00	9.18	-8.25	-4.21	0.00
Hydraulic Tank 4	0.53	15.00	7.95	18.00	9.54	-8.25	-4.37	0.00
Bilge Retention Tank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fuel Oil Drain Tank	0.51	0.00	0.00	65.00	33.15	0.00	0.00	0.00
Sludge Tank	0.15	0.00	0.00	54.00	8.10	0.00	0.00	0.00
Lube Oil Drain Tank	0.18	0.00	0.00	60.00	10.80	0.00	0.00	0.00
Total	53.41	10.51	561.44	93.26	4980.81	-1.28	-68.47	172.20

*LCG in reference to the Aft Perpendicular

Table 3-3: Summary of Weights to Add

Summary of Weights to Add

Description	Weight (LT)	VCG (ft)	V Momt (LT-ft)	LCG (ft)	L Momt (LT-ft)	TCG (ft)	T Momt (LT-ft)
#1 HIAB 110 Crane	3.90	29.67	115.71	139.00	542.10	-11.75	-45.83
#3 FRC Stbd Side	1.96	39.00	76.44	80.00	156.80	15.67	30.71
#4 FRC Stbd Side	1.96	31.00	60.76	49.50	97.02	15.00	29.40
FRC Port Side	1.96	39.00	76.44	80.00	156.80	-15.67	-30.71
FRC Davit Port Side	4.96	35.21	174.64	80.00	396.80	-15.67	-77.72
#6 Garbage Container	0.89	30.33	26.99	-2.50	-2.23	0.00	0.00
#26 Gangway	0.49	33.50	16.42	15.00	7.35	-18.75	-9.19
Total	16.12	33.96	547.40	84.04	1354.65	-6.41	-103.34

* See Note #2 under Section 6, Notes and Symbols. LCG in reference to the Aft Perpendicular

4. LIGHTSHIP CONDITION

Table 4-1 summarizes the lightship calculation.

Table 4-1: Lightship Condition Calculation

Inclined Δ =	1102.09 LT	
GM Fluid =	2.44 ft	(As inclined)
FSM Correction =	0.16 ft	(FSM as per Table 3-2)
GM Solid =	2.59 ft	(Corrected for FSM)
KM from Hydrostatics =	19.64 ft	(Refer to Table 2-1, KM = VCB + BMT)
KG =	17.05 ft	(As inclined and corrected for FSM)

	Weight (LT)	VCG (ft)	V Momt (LT-ft)	LCG (ft)	L Momt (LT-ft)	TCG (ft)	T Momt (LT-ft)
Vessel as Inclined	1102.09	17.05	18789.26	84.65	93291.92	0.00	0.00
	1102.09		18789.26		93291.92		0.00
Total of Weights to Remove	35.15	19.30	678.22	61.57	2163.77	-1.62	-56.88
Total of Tanks to Remove	53.41	10.51	561.44	93.26	4980.81	-1.28	-68.47
Total of Weights to Add	16.12	33.96	547.40	84.04	1354.65	-6.41	-103.34
	72.44		692.25		5789.94		-22.01
Lightship	1029.65		18097.00		87501.98		-22.01

KG Lightship =	17.58 ft
LCG Lightship =	8.52 ft aft midship
TCG Lightship =	-0.02 ft (port)

5. ASSUMPTIONS MADE

In order to properly complete this calculation some assumptions had to be made. Please see the following list.

1. The hydrostatic curves for the inclined condition were developed from the GHS model supplied from the original stability booklet.
2. The free surface moments were taken from the GHS model based on recorded soundings.
3. The following is a list of tanks that were not in the GHS model. The weights and centers for these tanks were calculated based on the recorded soundings and the Tank Plan.
 - a. Emergency Generator Tank
 - b. Chain Locker
 - c. Hydraulic Tank #1
 - d. Hydraulic Tank #2
 - e. Hydraulic Tank #3
 - f. Hydraulic Tank #4
 - g. Fuel Oil Drain Tank
 - h. Sludge Tank
 - i. Lube Oil Drain Tank


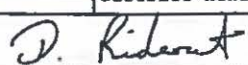
6. NOTES AND SYMBOLS

1. All values are in imperial format unless otherwise noted
2. In the "Summary of Weights to Add" table, #4 FRC Port Side was removed as it is being replaced by the new FRC and Davit.
3. List of Symbols:

ft or ' =	feet
in. or " =	inches
lbs =	pounds
LT =	Long Tons
-value =	Aft for location of LCF and Port for location of TCG
Pdm =	Pendulum
w =	weight
Δ =	Displacement

7. APPENDIX A: WEIGHT CERTIFICATE

Figure 7-1: Scan of Weight Certificate

 Measurement Canada An Agency of Industry Canada		Mesures Canada Un organisme d'Industrie Canada		CERTIFICATE OF DESIGNATION GRAVIMETRIC STANDARDS CERTIFICAT DE DÉSIGNATION ÉTALONS GRAVIMÉTRIQUES			
Issued to - Émis à The Scale Shop				Weight Set No. - N° du jeu de poids			
Address - Adresse 88 Clyde Avenue, Mount Pearl, NL A1N 4S2				Issue Date - Date d'émission 2007-01-26			
Contact - Personne-ressource		Telephone number - N° de téléphone (709) 747-2031		Expiry Date - Date d'expiration 2008-01-27			
I, the undersigned, being authorized by the Minister of Industry to exercise the power of the Minister pursuant to section 13.(1) of the Weights & Measures Act hereby				Je, soussigné(e), étant autorisé(e) par le ministre de l'Industrie à exercer les pouvoirs du ministre conformément à l'article 13.(1) de la Loi sur les poids et mesures			
a) certify that the standard(s) identified below has (have) been calibrated in accordance with Part III of the Weights and Measures Regulations in relation to Measurement Canada's reference standards which in turn have been calibrated in relation to Canada's prototype for the kilogram whose calibration is traceable to the international prototype for the kilogram maintained by the Bureau International des Poids et Mesures;				a) certifie que l'(les) étalon(s) identifié(s) ci-dessous a (ont) été étalonné(s) conformément à la Partie III du Règlement sur les poids et mesures par rapport aux étalons de référence de Mesures Canada, qui à leur tour ont été étalonnés par rapport au prototype canadien du kilogramme qui est étalonné et retraçable au prototype international du kilogramme conservé au Bureau International des Poids et Mesures;			
b) designate the said standard(s) as (a) local standard(s).				b) fixe ledit (lesdits) étalon(s) à titre d'(un) d'étalon(s) local(aux).			
Identification Number Numéro d'identification	Nominal Value Valeur nominale	Identification Number Numéro d'identification	Nominal Value Valeur nominale	Identification Number Numéro d'identification	Nominal Value Valeur nominale	Identification Number Numéro d'identification	Nominal Value Valeur nominale
SS01	10001b	SS18	10001b	SS38	10001b		
SS02	10001b	SS19	10001b	SS39	10001b		
SS03	10001b	SS21	10001b	SS40	10001b		
SS04	10001b	SS22	10001b				
SS05	10001b	SS23	10001b				
SS06	10001b	SS24	10001b				
SS07	10001b	SS25	10001b				
SS08	10001b	SS26	10001b				
SS09	10001b	SS27	10001b				
SS10	10001b	SS28	10001b				
SS11	10001b	SS30	10001b				
SS12	10001b	SS31	10001b				
SS13	10001b	SS32	10001b				
SS14	10001b	SS34	10001b				
SS15	10001b	SS35	10001b				
SS16	10001b	SS36	10001b				
SS17	10001b	SS37	10001b				
District 09		Certificate Number - N° du certificat 1262072		Position Title - Titre du poste District Manager			
Local Standard - Étalon local M753		Signature 					

IC2837bc (2005/03)

Canada



**Measurement
Canada**
An Agency of
Industry Canada

**Mesures
Canada**
Un organisme
d'Industrie Canada

**CERTIFICATE OF DESIGNATION
GRAVIMETRIC STANDARDS
CERTIFICAT DE DÉSIGNATION
ÉTALONS GRAVIMÉTRIQUES**

Issued to - Émis à The Scale Shop		Weight Set No. - N° du jeu de poids
Address - Adresse 88 Clyde Avenue, Mount Pearl, NL A1N 4S2		Issue Date - Date d'émission 2007-02-01
Contact - Personne-ressource	Telephone number - N° de téléphone (709) 747-2031	Expiry Date - Date d'expiration 2008-02-02

I, the undersigned, being authorized by the Minister of Industry to exercise the power of the Minister pursuant to section 13.(1) of the Weights & Measures Act hereby

a) certify that the standard(s) identified below has (have) been calibrated in accordance with Part III of the Weights and Measures Regulations in relation to Measurement Canada's reference standards which in turn have been calibrated in relation to Canada's prototype for the kilogram whose calibration is traceable to the international prototype for the kilogram maintained by the Bureau International des Poids et Mesures;

b) designate the said standard(s) as (a) local standard(s).

Je, soussigné(e), étant autorisé(e) par le ministre de l'Industrie à exercer les pouvoirs du ministre conformément à l'article 13.(1) de la Loi sur les poids et mesures

a) certifie que l(es) étalon(s) identifié(s) ci-dessous a (ont) été étalonné(s) conformément à la Partie III du Règlement sur les poids et mesures par rapport aux étalons de référence de Mesures Canada, qui à leur tour ont été étalonnés par rapport au prototype canadien du kilogramme qui est étalonné et retracable au prototype international du kilogramme conservé au Bureau International des Poids et Mesures;

b) fixe ledit (lesdits) étalon(s) à titre d'(un) d'étalon(s) local(aux).

Identification Number Numéro d'identification	Nominal Value Valeur nominale	Identification Number Numéro d'identification	Nominal Value Valeur nominale	Identification Number Numéro d'identification	Nominal Value Valeur nominale	Identification Number Numéro d'identification	Nominal Value Valeur nominale
SS20	10001b						
SS29	10001b						
SS33	10001b						

District 09	Certificate Number - N° du certificat 1262074	Position Title - Titre du poste District Manager
Local Standard - Étalon local M753	Signature <i>D. Rideout</i>	

IC2837bc (2005/03)

Canada

BMT Group is an international design, engineering and risk management consultancy, working principally in the maritime transport, ports and logistics, marine risk and insurance, energy and environment and defence sectors. BMT invests significantly in research. Its customers are served through a network of international subsidiary companies. The assets are held in beneficial ownership for its staff.

BMT Fleet Technology Limited is an innovative leader in providing through-life engineering support from concept development through design, operational and maintenance management. Operating across a range of industries, we are committed to retaining and applying practical knowledge of sector-specific factors in developing responsive solutions to customers' needs.

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ISO 9001:2000



Cert. 8025198

Certified to ISO 9001:2000, we are dedicated to ongoing quality and management systems.

APPENDIX B – HYDROSTATIC PARTICULARS**Note:**

- Displacement in seawater, Specific Gravity 1.025
- Hydrostatic Particulars are provided at zero heel for the following trims:
 - 0.0 Ft
 - 1.0 Ft Aft
 - 2.0 Ft Aft
 - 3.0 Ft Aft
 - 4.0 Ft Aft
 - 5.0 Ft Aft

04/12/10 12:01:17
GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES
No Trim, No Heel, VCG = 0.00

LCF	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
Draft	Weight (LT)	LCB	VCB	Inch	LCF	In trim	KML	KMT
9.500	906.41	6.41a	5.57	11.31	7.16a	95.85	237.3	19.91
9.750	940.62	6.44a	5.72	11.49	7.15a	99.81	238.1	19.77
10.000	975.36	6.46a	5.86	11.67	7.17a	104.03	239.3	19.68
10.250	1,010.64	6.49a	6.01	11.83	7.34a	107.80	239.3	19.59
10.500	1,046.37	6.52a	6.16	11.97	7.54a	110.70	237.4	19.51
10.750	1,082.52	6.56a	6.31	12.12	7.84a	114.18	236.7	19.45
11.000	1,119.05	6.60a	6.46	12.24	7.95a	116.70	234.0	19.41
11.250	1,156.02	6.65a	6.61	12.40	8.28a	120.42	233.8	19.38
11.500	1,193.48	6.70a	6.76	12.56	8.64a	124.37	233.8	19.37
11.750	1,231.44	6.77a	6.91	12.73	9.06a	128.72	234.6	19.37
12.000	1,269.87	6.84a	7.06	12.89	9.42a	132.81	234.7	19.38
12.250	1,308.79	6.92a	7.21	13.04	9.80a	136.96	234.8	19.33
12.500	1,348.17	7.01a	7.37	13.19	10.22a	141.46	235.5	19.29
12.750	1,388.01	7.11a	7.52	13.33	10.51a	145.32	234.9	19.26
13.000	1,428.25	7.21a	7.67	13.49	10.97a	150.29	236.1	19.25
13.250	1,468.98	7.32a	7.82	13.65	11.42a	155.38	237.4	19.25
13.500	1,510.18	7.44a	7.97	13.80	11.73a	159.77	237.4	19.26
13.750	1,551.81	7.56a	8.12	13.94	12.00a	164.05	237.2	19.28
14.000	1,593.85	7.68a	8.28	14.08	12.25a	168.18	236.8	19.31
14.250	1,636.31	7.80a	8.43	14.22	12.48a	172.29	236.3	19.35
14.500	1,679.18	7.92a	8.58	14.35	12.66a	176.11	235.4	19.40
14.750	1,722.44	8.04a	8.73	14.48	12.81a	179.92	234.4	19.45
15.000	1,766.08	8.16a	8.89	14.61	12.95a	183.67	233.4	19.51

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.

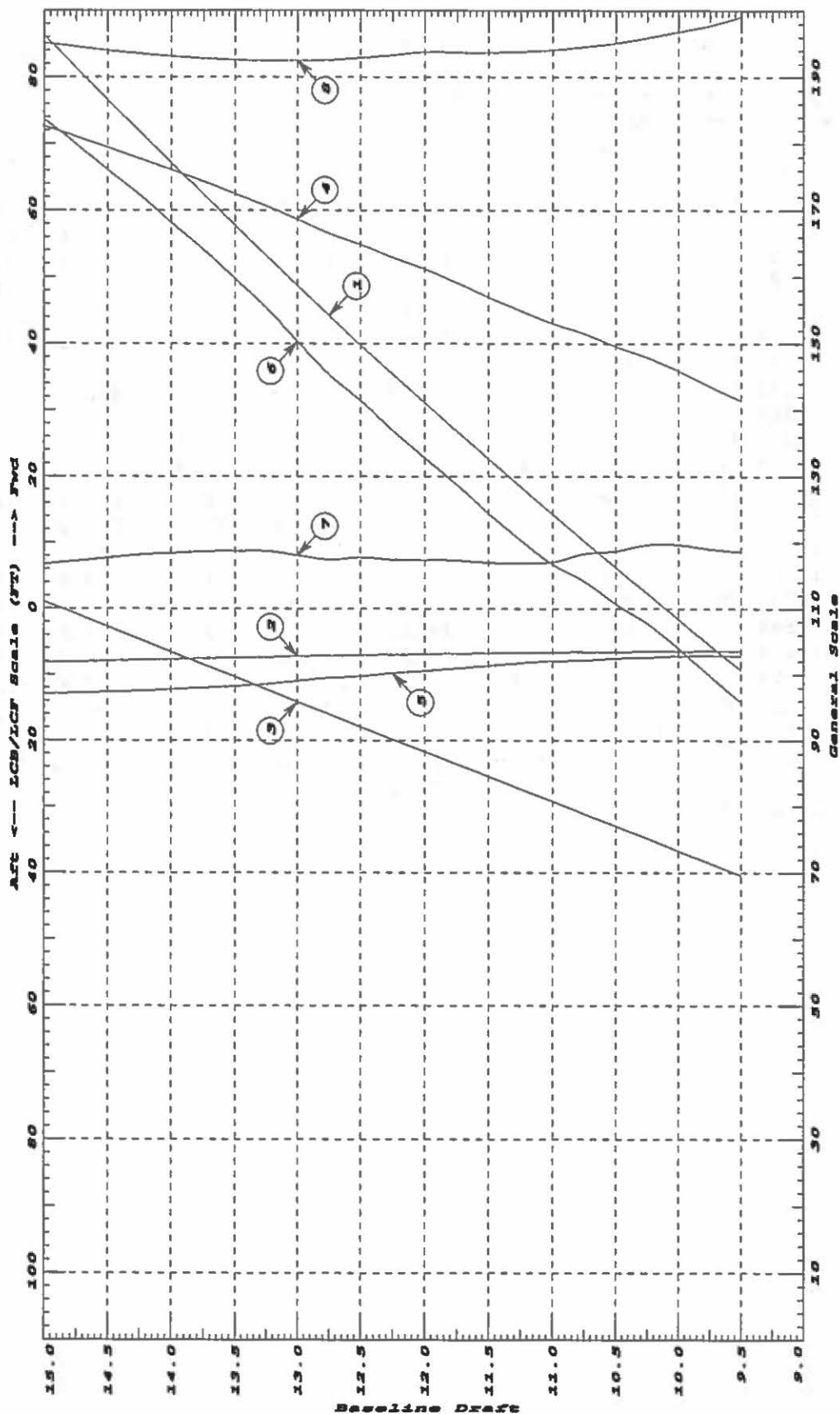
Trim is per 187.00Ft

Draft is from Baseline.

04/12/10 12:01:17
GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES at LEVEL TRIM



- 1 Displacement 1=9 LT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=0.08 FT
- 4 Immersion 1=0.08 LT/IN
- 4 WPA 1=33.6 Sq.Ft
- 5 LCF (use top scale)
- 6 Moment/Trim 1=1 FT-LT/IN
- 7 KML 1=2 FT
- 8 KMT 1=.1 FT

Specific Gravity = 1.025 Assumed KG = 0.00 FT
Trim is per 187 FT "K" = Baseline

04/12/10 12:01:17
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BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES

Trim: Aft 1.00/187.00, No Heel, VCG = 0.00

LCF	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
Draft	Weight (LT)	LCB	VCB	Inch	LCF	In trim	KML	KMT
9.500	906.02	7.65a	5.57	11.36	8.20a	96.82	239.8	20.02
9.750	940.13	7.67a	5.72	11.51	8.47a	100.14	239.0	19.89
10.000	974.87	7.70a	5.87	11.68	8.62a	104.02	239.4	19.77
10.250	1,010.14	7.73a	6.02	11.85	8.59a	108.03	240.0	19.67
10.500	1,046.02	7.76a	6.17	12.02	8.45a	111.65	239.5	19.61
10.750	1,082.05	7.79a	6.31	12.17	8.77a	115.25	239.0	19.56
11.000	1,118.59	7.82a	6.46	12.33	9.12a	119.10	238.9	19.52
11.250	1,155.54	7.87a	6.61	12.50	9.53a	123.28	239.4	19.50
11.500	1,192.98	7.93a	6.76	12.66	9.90a	127.33	239.5	19.48
11.750	1,230.91	8.00a	6.91	12.83	10.31a	131.69	240.1	19.48
12.000	1,269.35	8.07a	7.06	13.00	10.70a	136.15	240.7	19.45
12.250	1,308.30	8.16a	7.22	13.16	11.15a	141.02	241.9	19.42
12.500	1,347.66	8.24a	7.37	13.30	11.45a	144.77	241.1	19.38
12.750	1,387.40	8.34a	7.52	13.46	11.92a	149.66	242.1	19.36
13.000	1,427.64	8.45a	7.67	13.62	12.41a	154.76	243.2	19.35
13.250	1,468.49	8.56a	7.82	13.75	12.59a	158.05	241.5	19.35
13.500	1,509.72	8.67a	7.97	13.88	12.85a	161.99	240.8	19.36
13.750	1,551.30	8.78a	8.13	14.02	13.10a	165.97	240.1	19.39
14.000	1,593.39	8.90a	8.28	14.15	13.30a	169.79	239.1	19.42
14.250	1,635.87	9.02a	8.43	14.28	13.46a	173.48	238.0	19.46
14.500	1,678.74	9.13a	8.58	14.40	13.62a	177.18	236.8	19.50
14.750	1,722.05	9.25a	8.73	14.52	13.74a	180.71	235.5	19.54
15.000	1,765.74	9.36a	8.89	14.63	13.79a	184.00	233.8	19.56

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.

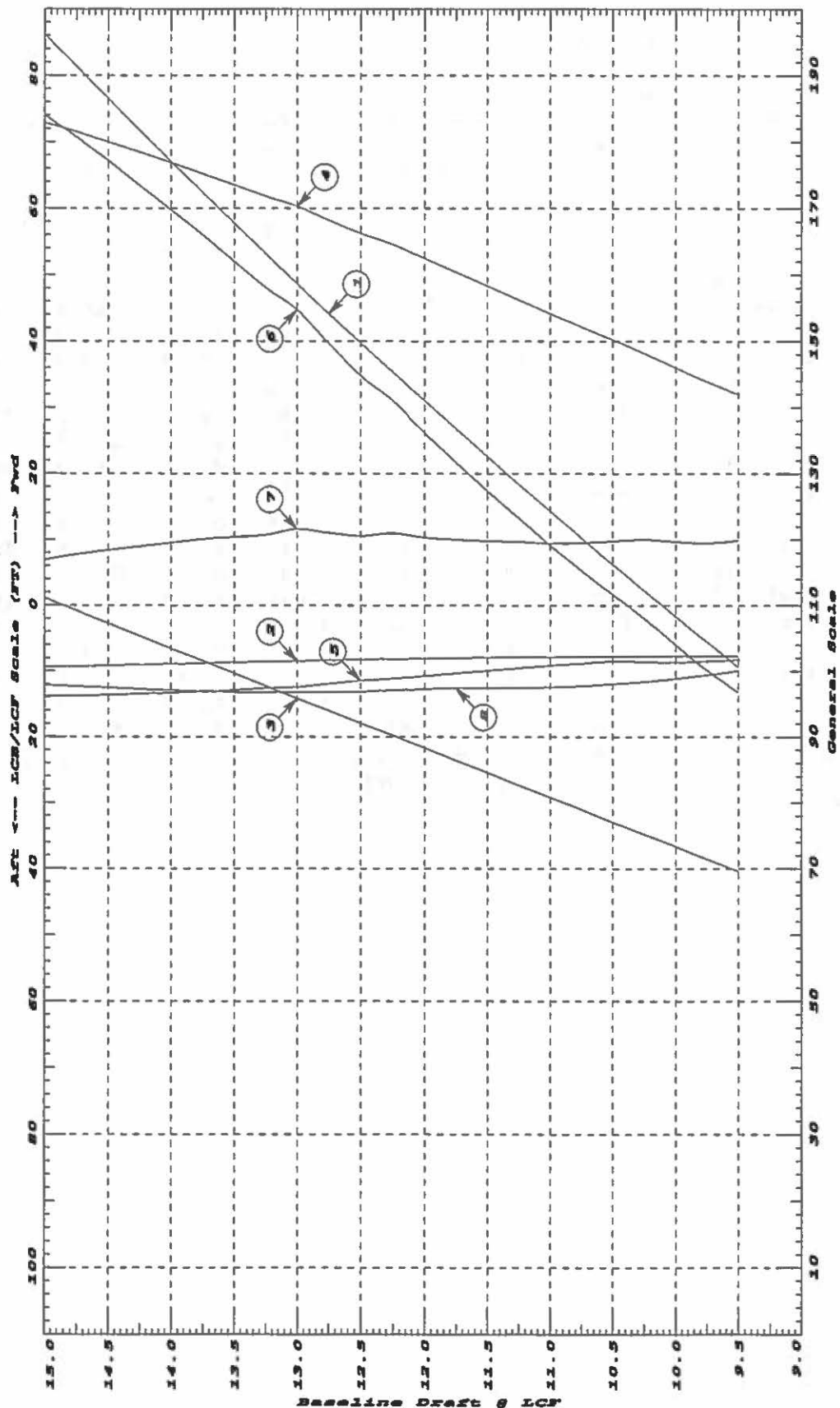
Trim is per 187.00Ft

Draft is from Baseline.

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GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES at 1 FT AFT TRIM



- | | | |
|-------------------------|----------------------------|------------------------------|
| (1) Displacement 1=9 LT | (4) Immersion 1=0.08 LT/IN | (6) Moment/Trim 1=1 FT-LT/IN |
| (2) LCB (use top scale) | (4) WPA 1=33.6 Sq.FT | (7) KMT 1=2 FT |
| (3) VCB (KB) 1=0.08 FT | (5) LCF (use top scale) | (8) KMT 1=1.2 FT |

Specific Gravity = 1.025 Assumed KG = 0.00 FT
Trim is per 187 FT "K" = Baseline

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GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES

Trim: Aft 2.00/187.00, No Heel, VCG = 0.00

LCF	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
Draft	Weight (LT)	LCB	VCB	Inch	LCF	In trim	KML	KMT
9.500	904.77	8.90a	5.57	11.42	9.35a	97.99	243.0	20.14
9.750	939.04	8.92a	5.72	11.56	9.51a	101.03	241.4	20.00
10.000	973.81	8.94a	5.87	11.68	9.59a	103.58	238.7	19.88
10.250	1,008.68	8.97a	6.02	11.84	9.86a	107.15	238.4	19.79
10.500	1,044.27	9.00a	6.17	12.03	10.01a	111.80	240.2	19.71
10.750	1,080.46	9.04a	6.32	12.24	10.15a	117.08	243.1	19.68
11.000	1,117.17	9.08a	6.47	12.43	10.36a	121.70	244.4	19.65
11.250	1,154.00	9.12a	6.62	12.60	10.80a	126.13	245.3	19.63
11.500	1,191.38	9.18a	6.77	12.77	11.23a	130.57	245.9	19.61
11.750	1,229.24	9.25a	6.92	12.95	11.68a	135.32	247.0	19.58
12.000	1,267.82	9.33a	7.07	13.09	11.95a	139.19	246.3	19.54
12.250	1,306.60	9.41a	7.22	13.26	12.40a	144.13	247.5	19.51
12.500	1,345.83	9.51a	7.37	13.43	12.86a	149.18	248.7	19.50
12.750	1,385.93	9.60a	7.52	13.56	13.08a	152.66	247.2	19.48
13.000	1,426.32	9.71a	7.68	13.69	13.36a	156.39	246.0	19.47
13.250	1,467.12	9.81a	7.83	13.82	13.64a	160.15	244.9	19.48
13.500	1,508.36	9.92a	7.98	13.95	13.88a	163.81	243.7	19.49
13.750	1,550.07	10.02a	8.13	14.07	14.07a	167.29	242.2	19.51
14.000	1,592.16	10.13a	8.28	14.20	14.25a	170.81	240.7	19.54
14.250	1,634.66	10.24a	8.44	14.32	14.40a	174.33	239.3	19.57
14.500	1,677.58	10.35a	8.59	14.43	14.50a	177.68	237.7	19.60
14.750	1,721.02	10.45a	8.74	14.53	14.53a	180.76	235.7	19.60
15.000	1,764.78	10.55a	8.89	14.63	14.52a	183.60	233.4	19.61

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.

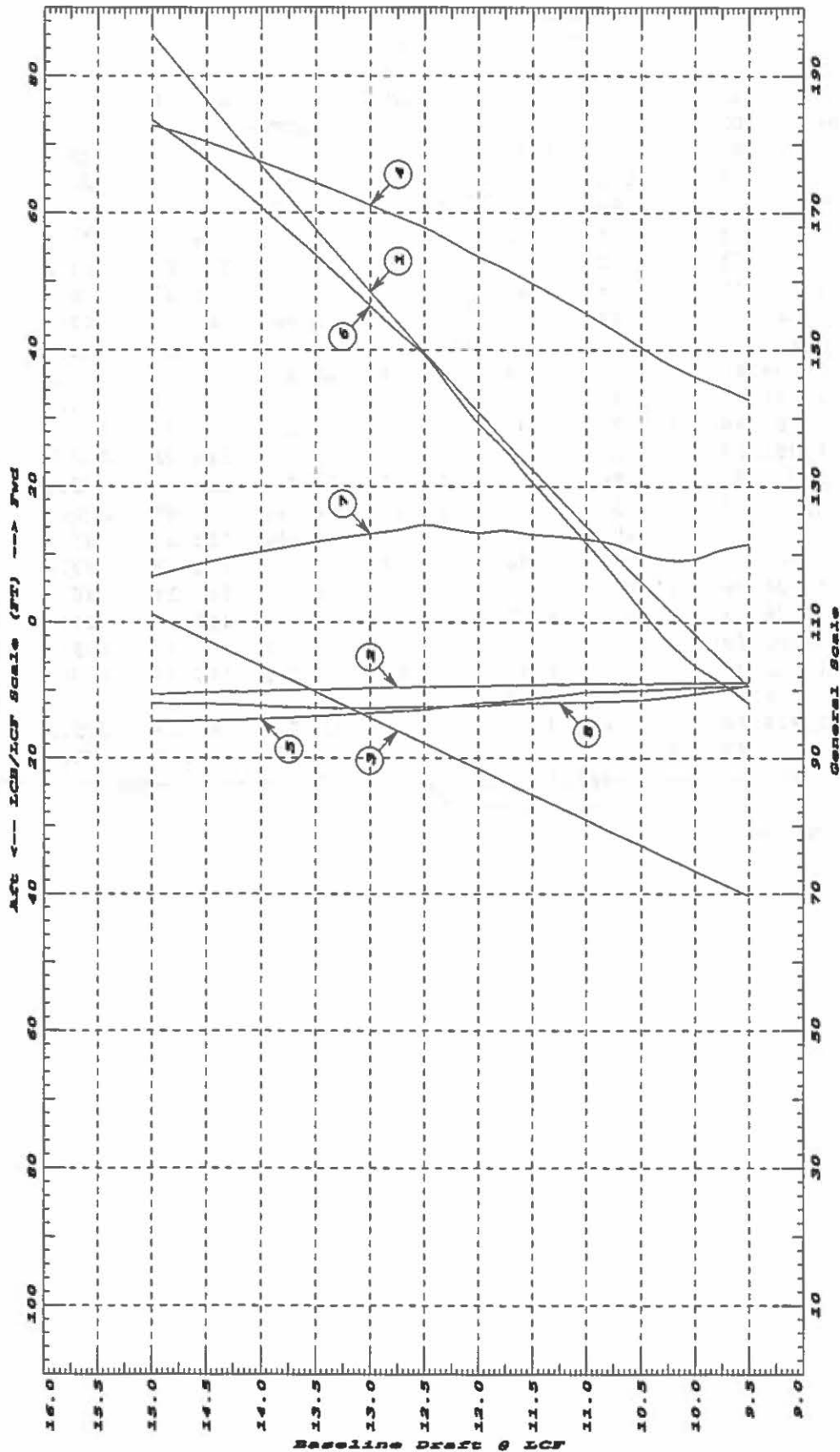
Trim is per 187.00Ft

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GHS 11.00

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CFV CYGNUS

HYDROSTATIC PROPERTIES at 2 FT AFT TRIM



- (1) Displacement 1=9 LT
- (2) LCB (use top scale)
- (3) VCB (KB) 1=0.08 FT
- (4) Immersion 1=0.08 LT/IN
- (5) LCB (use top scale)
- (6) Moment/Trim 1=1 FT-LT/IN
- (7) KML 1=2 FT
- (8) KMT 1=2 FT

Specific Gravity = 1.025 Assumed KG = 0.00 FT
Trim is per 187 FT "K" = Baseline

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BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES

Trim: Aft 3.00/187.00, No Heel, VCG = 0.00

LCF	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
Draft	Weight (LT)	LCB	VCB	Inch	LCF	In trim	KML	KMT
9.500	902.81	10.16a	5.58	11.46	10.44a	98.65	245.2	20.26
9.750	937.24	10.17a	5.73	11.59	10.49a	101.29	242.5	20.13
10.000	971.61	10.18a	5.88	11.75	10.78a	105.01	242.5	20.02
10.250	1,006.34	10.21a	6.03	11.91	11.12a	108.95	242.9	19.94
10.500	1,041.61	10.25a	6.17	12.08	11.44a	112.82	243.0	19.87
10.750	1,077.18	10.30a	6.32	12.27	11.83a	117.63	245.0	19.82
11.000	1,113.82	10.35a	6.47	12.48	12.04a	123.07	247.9	19.77
11.250	1,151.06	10.41a	6.62	12.70	12.26a	129.11	251.7	19.76
11.500	1,188.86	10.47a	6.78	12.87	12.49a	133.42	251.8	19.73
11.750	1,226.57	10.54a	6.92	13.04	12.95a	138.29	253.0	19.69
12.000	1,264.80	10.62a	7.07	13.21	13.40a	143.18	254.0	19.65
12.250	1,304.00	10.70a	7.23	13.35	13.64a	146.96	252.9	19.63
12.500	1,343.62	10.79a	7.38	13.49	13.89a	150.82	251.9	19.62
12.750	1,383.66	10.89a	7.53	13.63	14.14a	154.64	250.8	19.61
13.000	1,424.12	10.98a	7.68	13.76	14.38a	158.37	249.5	19.61
13.250	1,465.05	11.08a	7.84	13.89	14.58a	161.79	247.8	19.61
13.500	1,506.36	11.18a	7.99	14.01	14.78a	165.14	246.0	19.62
13.750	1,548.05	11.27a	8.14	14.13	14.97a	168.44	244.1	19.64
14.000	1,590.19	11.37a	8.29	14.24	15.12a	171.67	242.2	19.66
14.250	1,632.76	11.47a	8.45	14.34	15.22a	174.67	240.0	19.67
14.500	1,675.95	11.57a	8.60	14.44	15.24a	177.39	237.5	19.67
14.750	1,719.44	11.66a	8.75	14.53	15.23a	180.17	235.1	19.67
15.000	1,763.23	11.74a	8.90	14.62	15.22a	182.98	232.8	19.67

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.

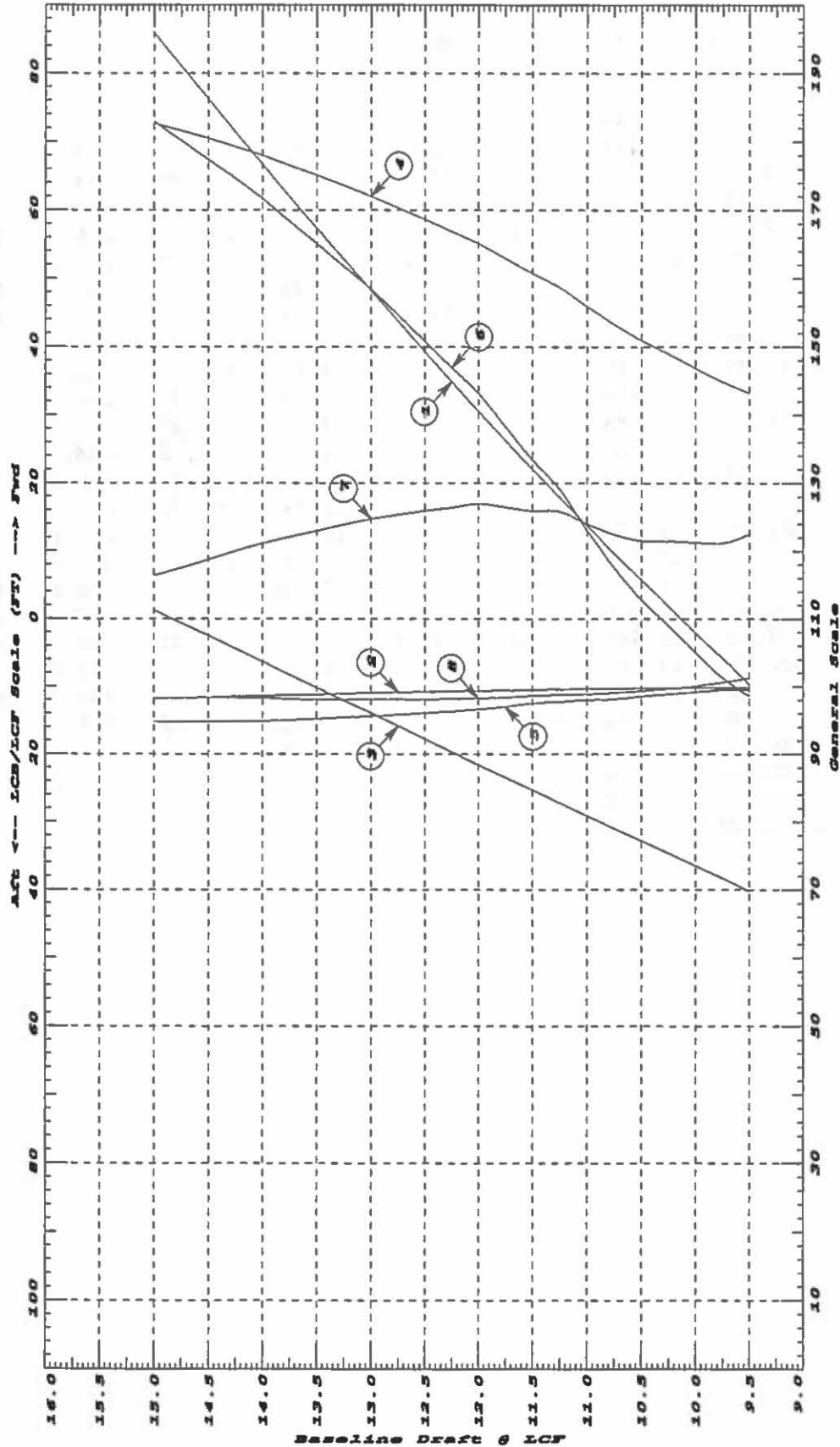
Trim is per 187.00Ft

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GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES at 3 FT AFT TRIM



- 1 Displacement 1=9 LT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=0.08 FT
- 4 Immersion 1=0.08 LT/IN
- 4 WPA 1=33.6 Sq.Ft
- 5 LCF (use top scale)
- 6 Moment/Trim 1=1 FT-LT/IN
- 7 KML 1=2 FT
- 8 KMT 1=2 FT

Specific Gravity = 1.025 Assumed KG = 0.00 FT
Trim is per 187 FT "X" = Baseline

04/12/10 12:01:17
GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES

Trim: Aft 4.00/187.00, No Heel, VCG = 0.00

LCF	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
Draft	Weight (LT)	LCB	VCB	Inch	LCF	In trim	KML	KMT
9.500	900.30	11.43a	5.60	11.49	11.42a	98.98	246.7	20.38
9.750	934.05	11.43a	5.74	11.65	11.74a	102.66	246.6	20.28
10.000	968.15	11.45a	5.89	11.83	12.11a	106.84	247.6	20.19
10.250	1,002.78	11.48a	6.04	12.00	12.47a	110.97	248.3	20.10
10.500	1,037.76	11.52a	6.18	12.17	12.86a	115.35	249.4	20.03
10.750	1,073.26	11.57a	6.33	12.35	13.29a	119.91	250.7	19.98
11.000	1,109.56	11.64a	6.48	12.52	13.61a	124.01	250.7	19.94
11.250	1,146.20	11.71a	6.63	12.72	13.97a	129.46	253.4	19.89
11.500	1,183.87	11.78a	6.78	12.93	14.20a	135.48	256.7	19.84
11.750	1,222.83	11.86a	6.94	13.12	14.23a	140.93	258.6	19.82
12.000	1,261.59	11.94a	7.09	13.27	14.49a	144.95	257.8	19.78
12.250	1,300.79	12.02a	7.24	13.41	14.72a	148.72	256.5	19.76
12.500	1,340.42	12.10a	7.39	13.55	14.96a	152.50	255.2	19.75
12.750	1,380.63	12.18a	7.54	13.68	15.14a	156.03	253.5	19.75
13.000	1,421.25	12.27a	7.70	13.81	15.31a	159.50	251.8	19.75
13.250	1,462.26	12.36a	7.85	13.94	15.48a	162.92	250.0	19.75
13.500	1,503.68	12.44a	8.00	14.05	15.64a	166.20	248.0	19.76
13.750	1,545.52	12.53a	8.16	14.17	15.77a	169.28	245.7	19.77
14.000	1,587.94	12.62a	8.31	14.26	15.83a	171.91	242.9	19.76
14.250	1,630.71	12.70a	8.46	14.35	15.87a	174.42	240.0	19.75
14.500	1,673.79	12.78a	8.61	14.44	15.89a	177.01	237.3	19.75
14.750	1,717.28	12.86a	8.77	14.52	15.90a	179.59	234.6	19.74
15.000	1,760.96	12.93a	8.92	14.61	15.90a	182.26	232.2	19.74

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.

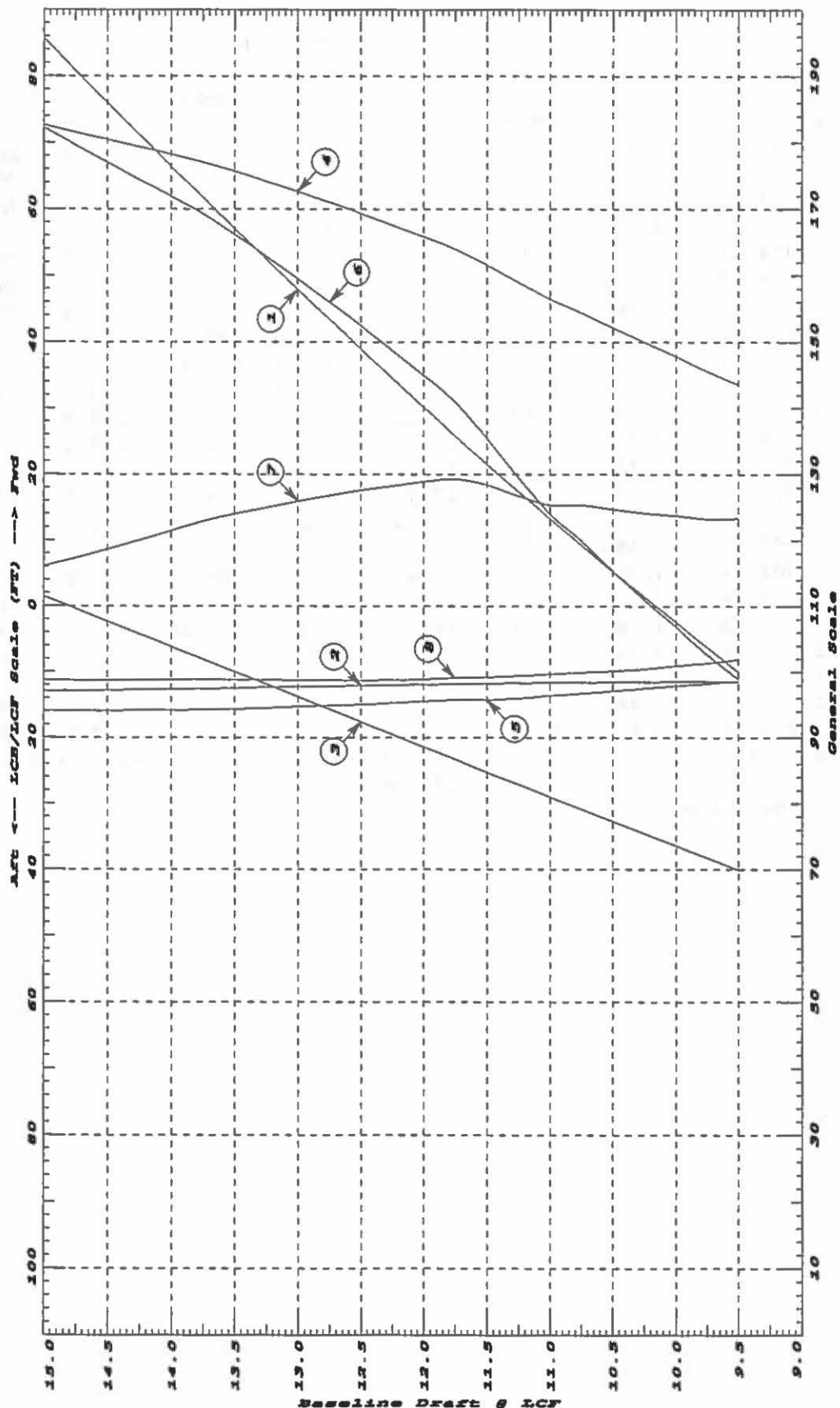
Trim is per 187.00Ft

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GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES at 4 FT AFT TRIM



- (1) Displacement 1=9 LT
- (2) LCB (use top scale)
- (3) VCB (KB) 1=0.08 FT
- (4) Immersion 1=0.08 LT/IN
- (4) WPA 1=33.6 SQ.FT
- (5) LCB (use top scale)
- (6) Moment/Trim 1=1 FT-LT/IN
- (7) KML 1=2 FT
- (8) RMT 1=2 FT

Specific Gravity = 1.025 Assumed KG = 0.00 FT
Trim is per 187 FT "K" = Baseline

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GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES

Trim: Aft 5.00/187.00, No Heel, VCG = 0.00

LCF	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
Draft	Weight (LT)	LCB	VCB	Inch	LCF	In trim	RML	RMT
9.500	896.36	12.72a	5.61	11.57	12.60a	101.05	252.9	20.54
9.750	929.84	12.73a	5.76	11.73	12.99a	104.68	252.5	20.44
10.000	963.48	12.75a	5.90	11.90	13.47a	108.78	253.3	20.36
10.250	997.86	12.78a	6.05	12.08	13.88a	113.14	254.3	20.28
10.500	1,033.16	12.83a	6.20	12.25	14.20a	117.16	254.4	20.21
10.750	1,068.29	12.88a	6.34	12.44	14.67a	122.05	256.3	20.16
11.000	1,104.08	12.94a	6.49	12.62	15.11a	126.95	257.9	20.10
11.250	1,140.99	13.02a	6.64	12.78	15.41a	131.10	257.7	20.05
11.500	1,178.36	13.10a	6.79	12.93	15.69a	135.34	257.6	20.00
11.750	1,217.04	13.18a	6.94	13.10	15.78a	139.93	257.9	19.95
12.000	1,256.57	13.27a	7.10	13.28	15.79a	145.00	258.8	19.91
12.250	1,296.86	13.34a	7.26	13.46	15.75a	150.03	259.5	19.91
12.500	1,336.69	13.42a	7.41	13.59	15.92a	153.48	257.6	19.90
12.750	1,376.93	13.49a	7.56	13.72	16.08a	156.92	255.7	19.89
13.000	1,417.62	13.57a	7.72	13.85	16.23a	160.30	253.6	19.89
13.250	1,458.76	13.64a	7.87	13.97	16.36a	163.57	251.5	19.90
13.500	1,500.53	13.72a	8.02	14.08	16.42a	166.47	248.9	19.89
13.750	1,542.78	13.79a	8.18	14.18	16.45a	169.13	245.9	19.88
14.000	1,585.33	13.86a	8.33	14.27	16.47a	171.72	243.0	19.86
14.250	1,628.16	13.93a	8.48	14.36	16.50a	174.25	240.1	19.84
14.500	1,671.28	14.00a	8.63	14.44	16.51a	176.73	237.2	19.83
14.750	1,714.67	14.06a	8.79	14.52	16.52a	179.17	234.4	19.82
15.000	1,758.34	14.12a	8.94	14.61	16.52a	181.65	231.7	19.82

Distances in FEET.-----Specific Gravity = 1.025.-----Moment in Ft-LT.

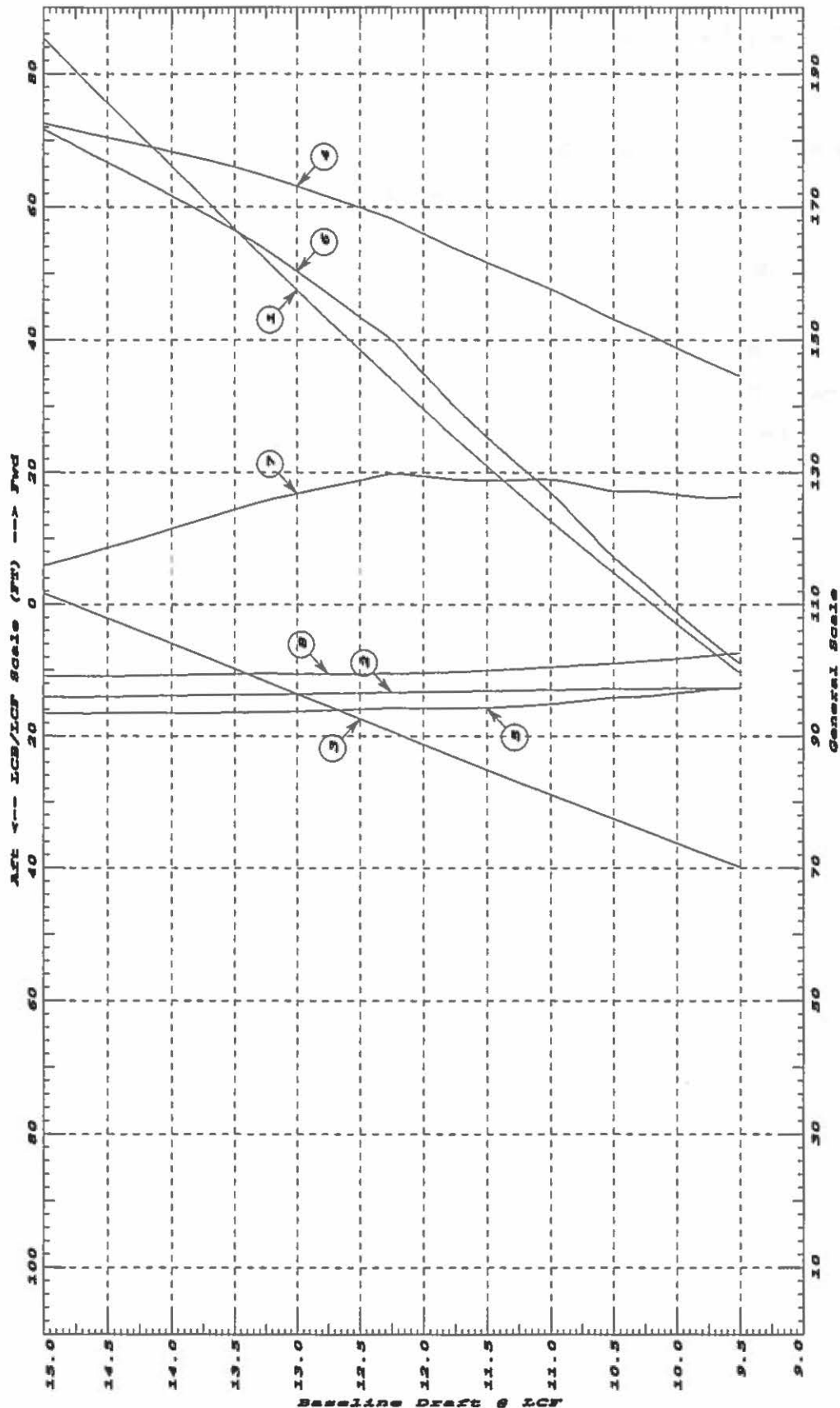
Trim is per 187.00Ft

Draft is from Baseline.

04/12/10 12:01:17
GHS 11.00

BMT Fleet
CFV CYGNUS

HYDROSTATIC PROPERTIES at 5 FT AFT TRIM



- (1) Displacement 1=9 LT
- (2) ICB (use top scale)
- (3) VCB (KB) 1=0.08 FT
- (4) Immersion 1=0.08 LT/IN
- (4) WPA 1=33.6 sq.ft
- (5) LCB (use top scale)
- (6) Moment/Trim 1=1 FT-LT/IN
- (7) RML 1=2 FT
- (8) RMT 1=2 FT

Specific Gravity = 1.025 Assumed KG = 0.00 FT
Trim is per 187 FT "X" = Baseline

APPENDIX C – CROSS CURVES

Note:

- Displacement in seawater, Specific Gravity 1.020
- Cross Curves are provided at zero heel for the following trims:
 - 0.0 Ft
 - 1.0 Ft Aft
 - 2.0 Ft Aft
 - 3.0 Ft Aft
 - 4.0 Ft Aft
 - 5.0 Ft Aft

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: zero at zero heel (trim righting arm held at zero)

Displacement LONG TONS	Heel Angles in Degrees					
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s
950.00	1.73s	3.44s	5.13s	6.78s	8.39s	9.92s
1,000.00	1.72s	3.42s	5.11s	6.76s	8.37s	9.92s
1,050.00	1.71s	3.41s	5.09s	6.75s	8.36s	9.91s
1,100.00	1.70s	3.40s	5.08s	6.74s	8.36s	9.91s
1,150.00	1.70s	3.39s	5.07s	6.73s	8.35s	9.91s
1,200.00	1.69s	3.38s	5.06s	6.72s	8.35s	9.90s
1,250.00	1.69s	3.38s	5.05s	6.72s	8.35s	9.90s
1,300.00	1.69s	3.37s	5.05s	6.72s	8.35s	9.90s
1,350.00	1.68s	3.37s	5.05s	6.72s	8.35s	9.90s
1,400.00	1.68s	3.37s	5.05s	6.73s	8.34s	9.89s
1,450.00	1.69s	3.37s	5.06s	6.73s	8.34s	9.89s
1,500.00	1.69s	3.37s	5.06s	6.73s	8.34s	9.88s
1,550.00	1.69s	3.38s	5.07s	6.73s	8.34s	9.88s
1,600.00	1.69s	3.38s	5.07s	6.73s	8.33s	9.87s

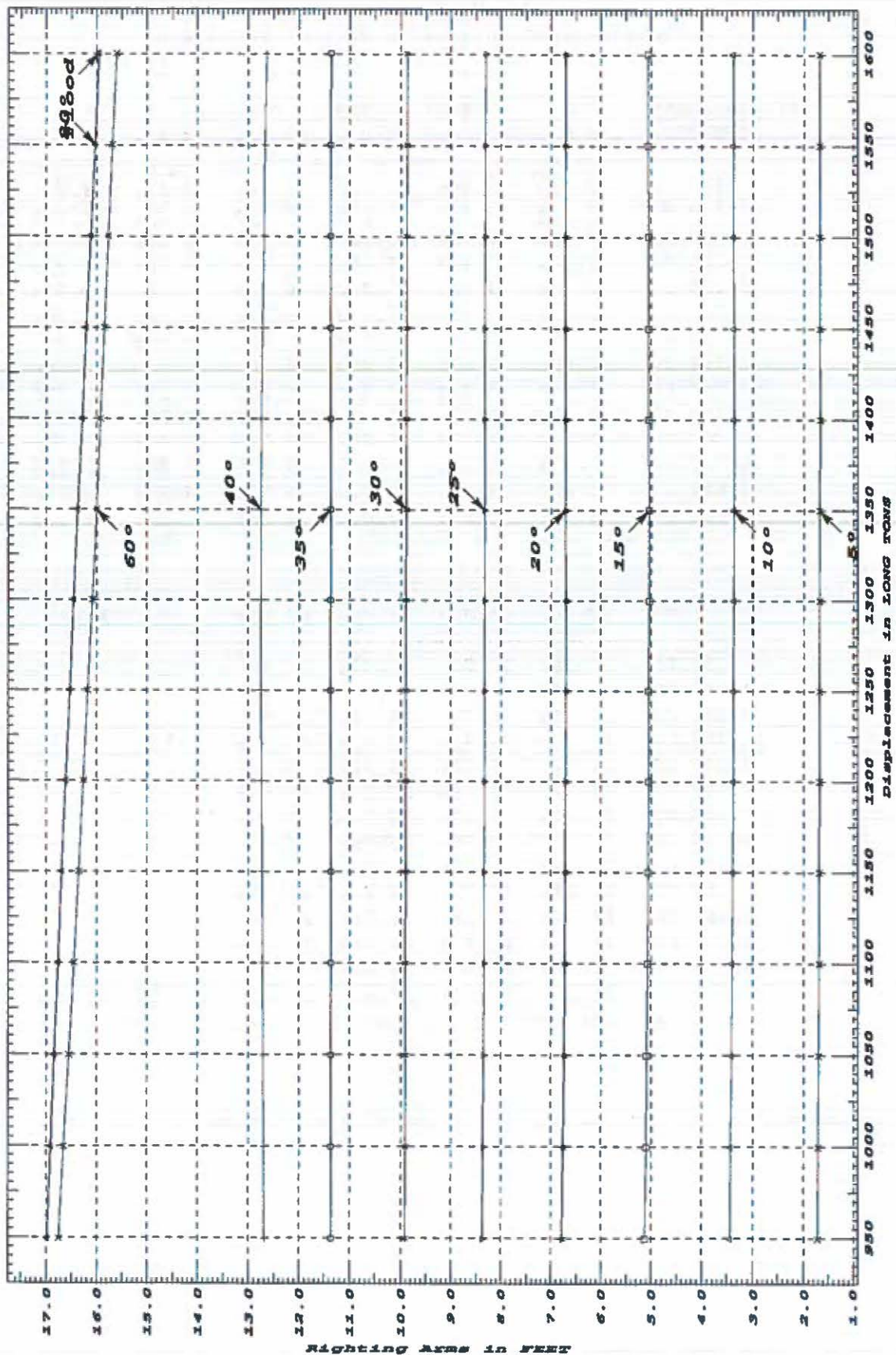
LONG TONS					@ Flooding	
	35.00s	40.00s	60.00s	80.00s	Arm	Angle
950.00	11.36s	12.70s	16.75s	16.99s		
1,000.00	11.36s	12.71s	16.65s	16.91s		
1,050.00	11.36s	12.72s	16.55s	16.84s		
1,100.00	11.36s	12.73s	16.46s	16.76s		
1,150.00	11.37s	12.74s	16.36s	16.69s		
1,200.00	11.37s	12.75s	16.27s	16.61s		
1,250.00	11.37s	12.76s	16.18s	16.53s		
1,300.00	11.37s	12.76s	16.09s	16.46s		
1,350.00	11.37s	12.76s	16.00s	16.38s		
1,400.00	11.37s	12.75s	15.92s	16.29s		
1,450.00	11.37s	12.73s	15.84s	16.21s		
1,500.00	11.37s	12.71s	15.76s	16.12s		
1,550.00	11.37s	12.68s	15.68s	16.03s		
1,600.00	11.36s	12.64s	15.61s	15.95s	15.95s	80.00s

Distances in FEET.---Specific Gravity = 1.025.-----

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY - Stbd Heel
at LEVEL TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 FT
"K" = Baseline

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: Aft 1.00/187.00 at zero heel (trim righting arm held at zero)

Displacement LONG TONS	Heel Angles in Degrees					
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s
950.00	1.73s	3.46s	5.16s	6.81s	8.42s	9.96s
1,000.00	1.73s	3.44s	5.14s	6.79s	8.41s	9.95s
1,050.00	1.72s	3.43s	5.12s	6.78s	8.40s	9.95s
1,100.00	1.71s	3.41s	5.11s	6.77s	8.39s	9.94s
1,150.00	1.70s	3.40s	5.09s	6.76s	8.39s	9.93s
1,200.00	1.70s	3.40s	5.09s	6.75s	8.38s	9.93s
1,250.00	1.70s	3.39s	5.08s	6.75s	8.38s	9.92s
1,300.00	1.69s	3.39s	5.08s	6.75s	8.37s	9.92s
1,350.00	1.69s	3.39s	5.08s	6.75s	8.37s	9.91s
1,400.00	1.69s	3.39s	5.08s	6.75s	8.36s	9.90s
1,450.00	1.69s	3.39s	5.08s	6.75s	8.36s	9.89s
1,500.00	1.70s	3.39s	5.08s	6.75s	8.35s	9.89s
1,550.00	1.70s	3.39s	5.09s	6.75s	8.34s	9.87s
1,600.00	1.70s	3.40s	5.09s	6.74s	8.33s	9.86s

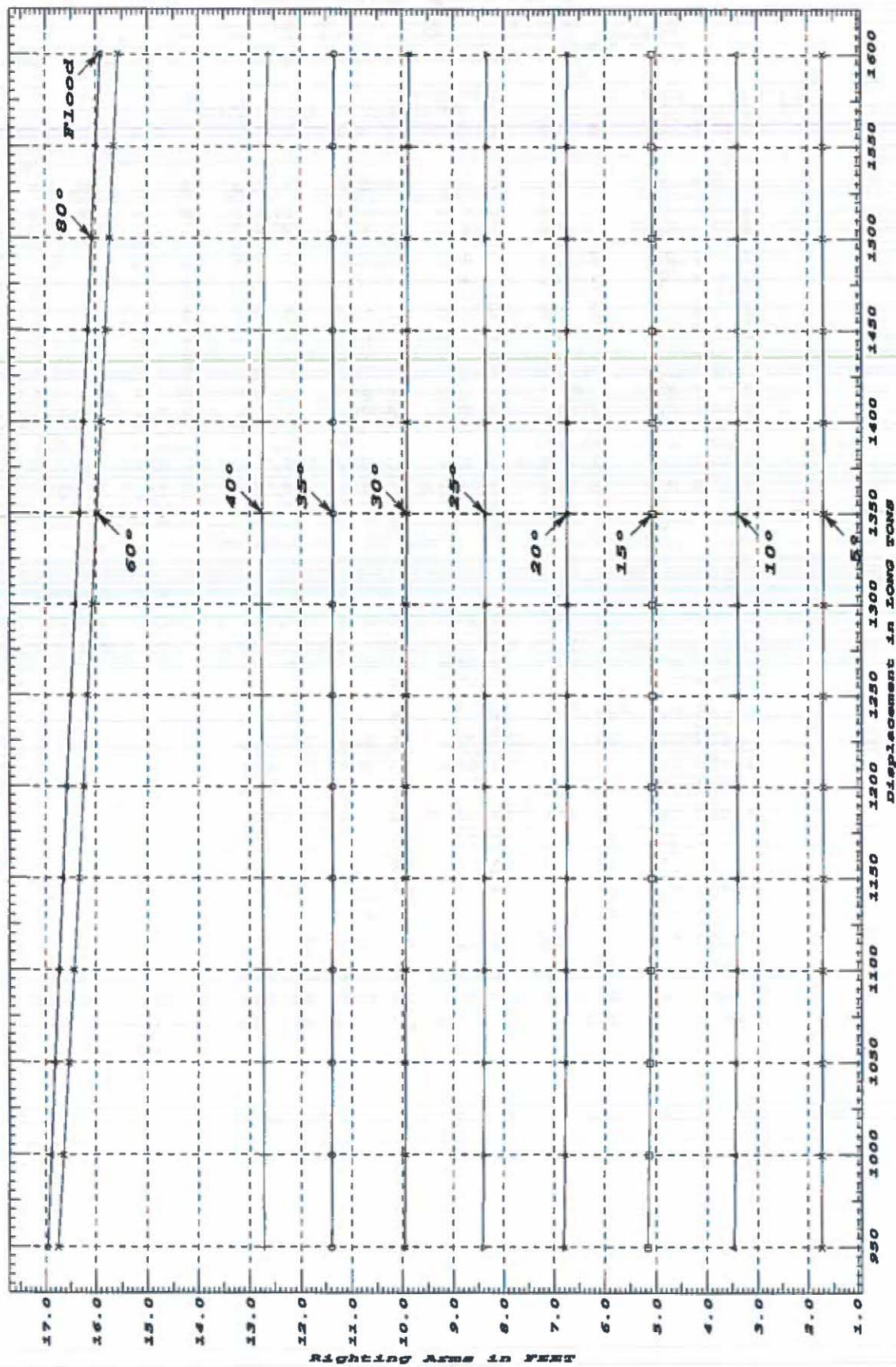
LONG TONS					θ Flooding	
	35.00s	40.00s	60.00s	80.00s	Arm	Angle
950.00	11.39s	12.72s	16.75s	16.96s		
1,000.00	11.39s	12.73s	16.64s	16.88s		
1,050.00	11.39s	12.73s	16.54s	16.81s		
1,100.00	11.38s	12.74s	16.44s	16.73s		
1,150.00	11.38s	12.75s	16.34s	16.65s		
1,200.00	11.38s	12.75s	16.25s	16.58s		
1,250.00	11.38s	12.76s	16.16s	16.50s		
1,300.00	11.38s	12.76s	16.07s	16.42s		
1,350.00	11.37s	12.75s	15.98s	16.33s		
1,400.00	11.37s	12.74s	15.90s	16.25s		
1,450.00	11.37s	12.72s	15.82s	16.15s		
1,500.00	11.36s	12.69s	15.74s	16.07s		
1,550.00	11.36s	12.66s	15.66s	15.99s		
1,600.00	11.34s	12.62s	15.58s	15.91s	15.92s	79.77s

Distances in FEET.---Specific Gravity = 1.025.

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY - Stbd Heel
at 1 FT AFT TRIM (Initial)



Specific Gravity = 1.025 Assumed KG = 0.00 FT
"K" = Baseline

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: Aft 2.00/187.00 at zero heel (trim righting arm held at zero)

Displacement LONG TONS	Heel Angles in Degrees					
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s
950.00	1.74s	3.47s	5.18s	6.85s	8.46s	10.00s
1,000.00	1.73s	3.46s	5.16s	6.83s	8.45s	9.99s
1,050.00	1.73s	3.44s	5.15s	6.81s	8.44s	9.98s
1,100.00	1.72s	3.43s	5.13s	6.80s	8.43s	9.97s
1,150.00	1.71s	3.42s	5.12s	6.79s	8.42s	9.96s
1,200.00	1.71s	3.42s	5.11s	6.79s	8.42s	9.95s
1,250.00	1.71s	3.41s	5.11s	6.79s	8.41s	9.94s
1,300.00	1.71s	3.41s	5.11s	6.79s	8.40s	9.93s
1,350.00	1.70s	3.41s	5.11s	6.78s	8.39s	9.92s
1,400.00	1.70s	3.41s	5.11s	6.78s	8.38s	9.91s
1,450.00	1.70s	3.41s	5.11s	6.78s	8.37s	9.90s
1,500.00	1.71s	3.41s	5.11s	6.77s	8.36s	9.88s
1,550.00	1.71s	3.41s	5.11s	6.76s	8.35s	9.87s
1,600.00	1.71s	3.41s	5.11s	6.75s	8.33s	9.86s

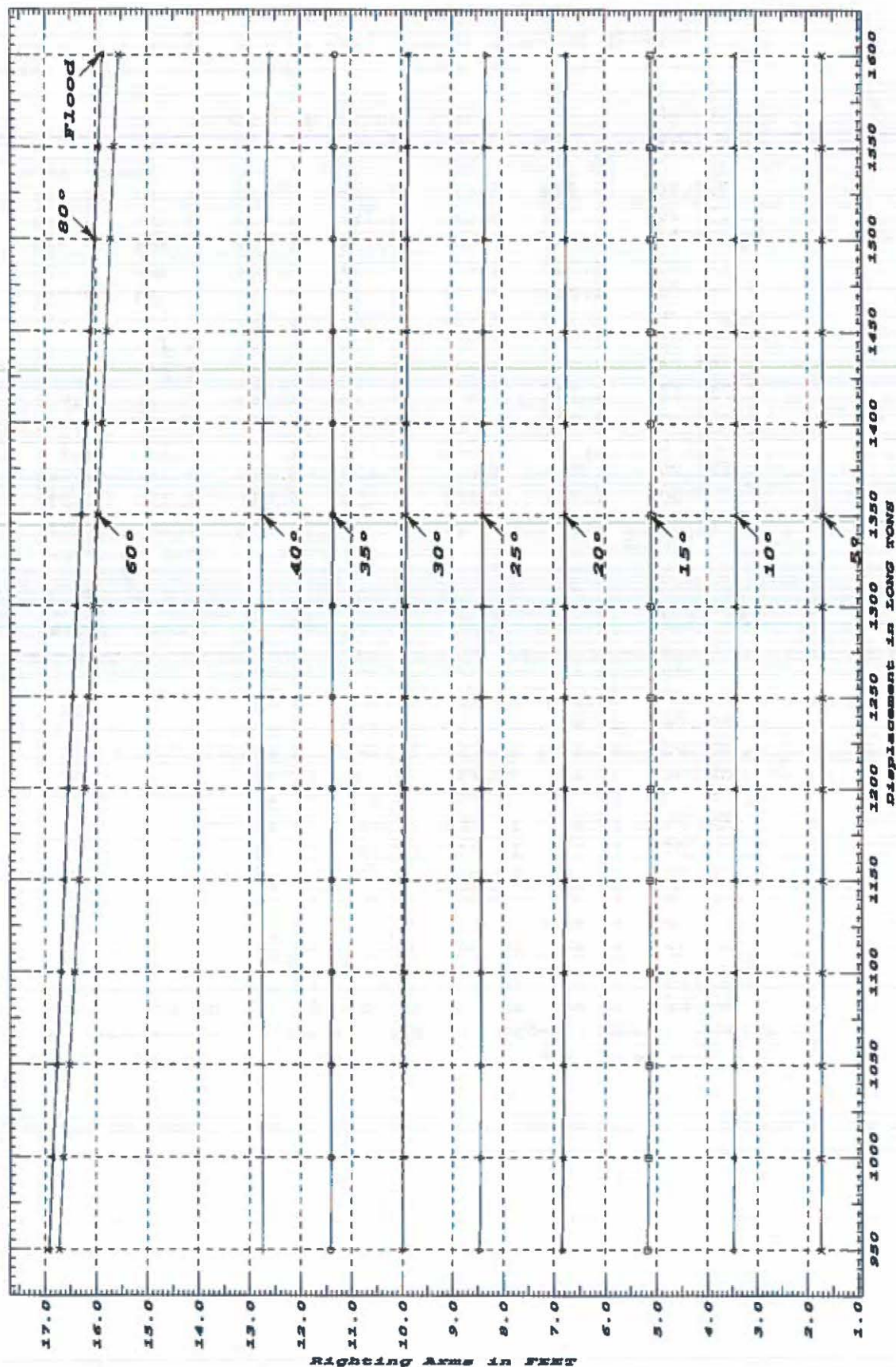
LONG TONS					@ Flooding	
	35.00s	40.00s	60.00s	80.00s	Arm	Angle
950.00	11.42s	12.74s	16.73s	16.92s		
1,000.00	11.42s	12.74s	16.63s	16.85s		
1,050.00	11.41s	12.75s	16.52s	16.77s		
1,100.00	11.41s	12.75s	16.42s	16.69s		
1,150.00	11.40s	12.75s	16.32s	16.61s		
1,200.00	11.39s	12.76s	16.23s	16.54s		
1,250.00	11.39s	12.76s	16.14s	16.45s		
1,300.00	11.38s	12.76s	16.05s	16.37s		
1,350.00	11.38s	12.74s	15.96s	16.28s		
1,400.00	11.37s	12.73s	15.88s	16.19s		
1,450.00	11.36s	12.70s	15.79s	16.10s		
1,500.00	11.35s	12.67s	15.71s	16.02s		
1,550.00	11.34s	12.64s	15.63s	15.94s		
1,600.00	11.33s	12.60s	15.55s	15.87s	15.89s	79.41s

Distances in FEET.---Specific Gravity = 1.025.-----

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

**CROSS CURVES OF STABILITY - Stbd Heel
at 2 FT AFT TRIM (initial)**



Specific Gravity = 1.025 Assumed KG = 0.00 FT
"K" = Baseline

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: Aft 3.00/187.00 at zero heel (trim righting arm held at zero)

Displacement LONG TONS	Heel Angles in Degrees					
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s
950.00	1.76s	3.49s	5.21s	6.89s	8.51s	10.04s
1,000.00	1.75s	3.48s	5.19s	6.87s	8.49s	10.03s
1,050.00	1.74s	3.46s	5.18s	6.85s	8.48s	10.02s
1,100.00	1.73s	3.45s	5.16s	6.84s	8.47s	10.00s
1,150.00	1.72s	3.45s	5.15s	6.83s	8.46s	9.99s
1,200.00	1.72s	3.44s	5.15s	6.83s	8.45s	9.98s
1,250.00	1.72s	3.44s	5.14s	6.82s	8.44s	9.96s
1,300.00	1.72s	3.43s	5.14s	6.82s	8.43s	9.95s
1,350.00	1.72s	3.43s	5.14s	6.82s	8.41s	9.93s
1,400.00	1.72s	3.43s	5.13s	6.81s	8.40s	9.92s
1,450.00	1.72s	3.43s	5.13s	6.80s	8.38s	9.90s
1,500.00	1.72s	3.43s	5.13s	6.79s	8.37s	9.88s
1,550.00	1.72s	3.43s	5.13s	6.77s	8.35s	9.86s
1,600.00	1.72s	3.43s	5.13s	6.76s	8.33s	9.85s

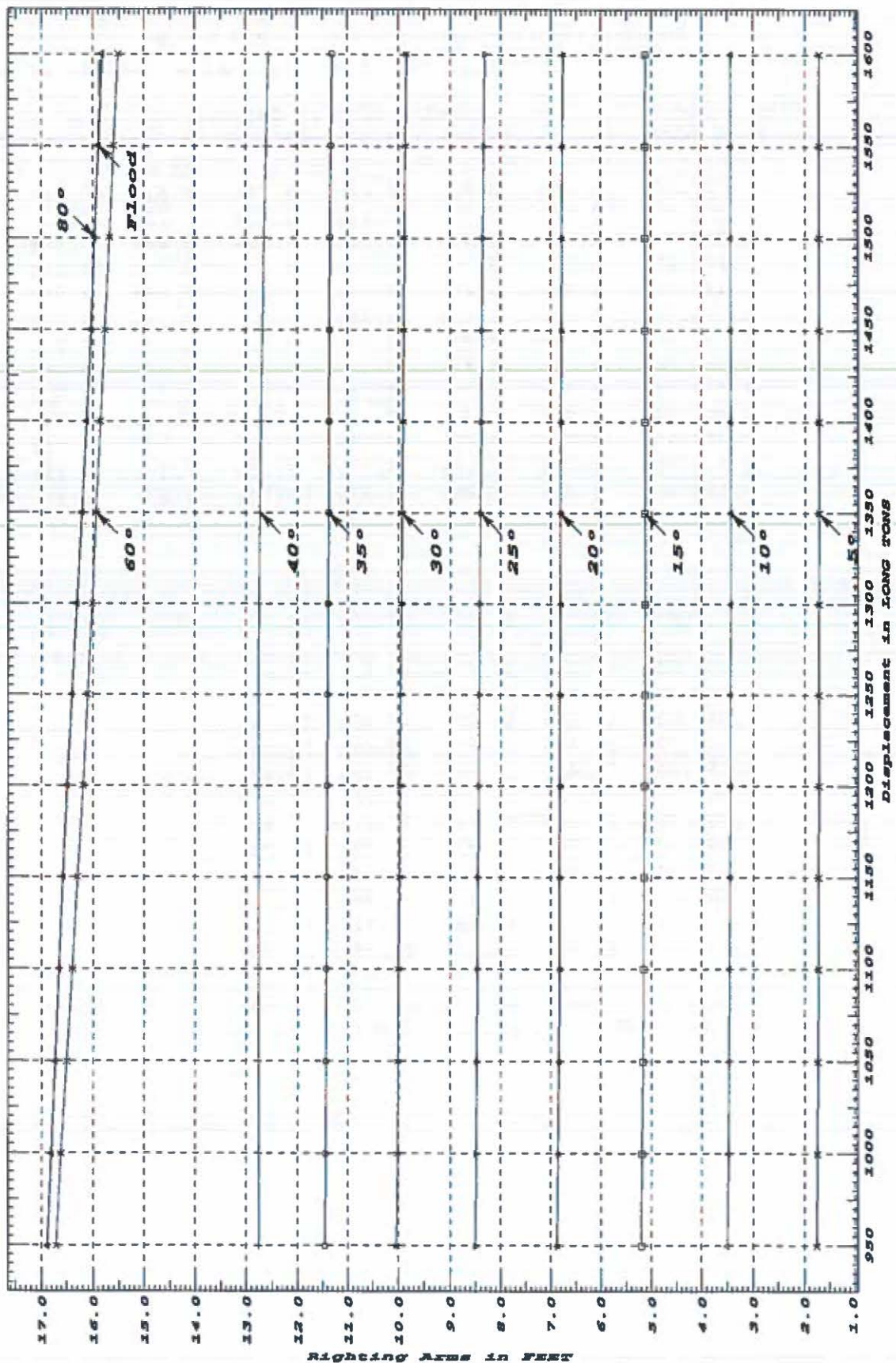
LONG TONS						@ Flooding	
	35.00s	40.00s	60.00s	80.00s		Arm	Angle
950.00	11.45s	12.76s	16.71s	16.89s			
1,000.00	11.44s	12.76s	16.61s	16.81s			
1,050.00	11.44s	12.76s	16.50s	16.73s			
1,100.00	11.43s	12.76s	16.40s	16.65s			
1,150.00	11.42s	12.76s	16.30s	16.57s			
1,200.00	11.41s	12.76s	16.21s	16.49s			
1,250.00	11.40s	12.76s	16.11s	16.41s			
1,300.00	11.39s	12.75s	16.02s	16.31s			
1,350.00	11.38s	12.74s	15.94s	16.22s			
1,400.00	11.37s	12.71s	15.85s	16.13s			
1,450.00	11.36s	12.69s	15.77s	16.05s			
1,500.00	11.34s	12.65s	15.68s	15.97s			
1,550.00	11.33s	12.61s	15.60s	15.89s	15.89s		80.00s
1,600.00	11.31s	12.57s	15.52s	15.83s	15.87s		79.03s

Distances in FEET.---Specific Gravity = 1.025.-----

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY - Stbd Heel
at 3 FT AFT TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 FT
"K" = Baseline

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: Aft 4.00/187.00 at zero heel (trim righting arm held at zero)

Displacement LONG TONS	Heel Angles in Degrees					
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s
950.00	1.77s	3.52s	5.25s	6.93s	8.55s	10.08s
1,000.00	1.76s	3.50s	5.23s	6.91s	8.54s	10.07s
1,050.00	1.75s	3.49s	5.21s	6.89s	8.53s	10.05s
1,100.00	1.74s	3.48s	5.20s	6.88s	8.51s	10.03s
1,150.00	1.74s	3.47s	5.19s	6.87s	8.50s	10.02s
1,200.00	1.73s	3.46s	5.18s	6.87s	8.48s	10.00s
1,250.00	1.73s	3.46s	5.17s	6.86s	8.47s	9.98s
1,300.00	1.73s	3.46s	5.17s	6.85s	8.45s	9.96s
1,350.00	1.73s	3.45s	5.17s	6.84s	8.43s	9.94s
1,400.00	1.73s	3.45s	5.16s	6.83s	8.41s	9.92s
1,450.00	1.73s	3.45s	5.16s	6.82s	8.39s	9.90s
1,500.00	1.73s	3.45s	5.16s	6.80s	8.37s	9.88s
1,550.00	1.72s	3.45s	5.15s	6.78s	8.34s	9.85s
1,600.00	1.72s	3.45s	5.14s	6.76s	8.32s	9.83s

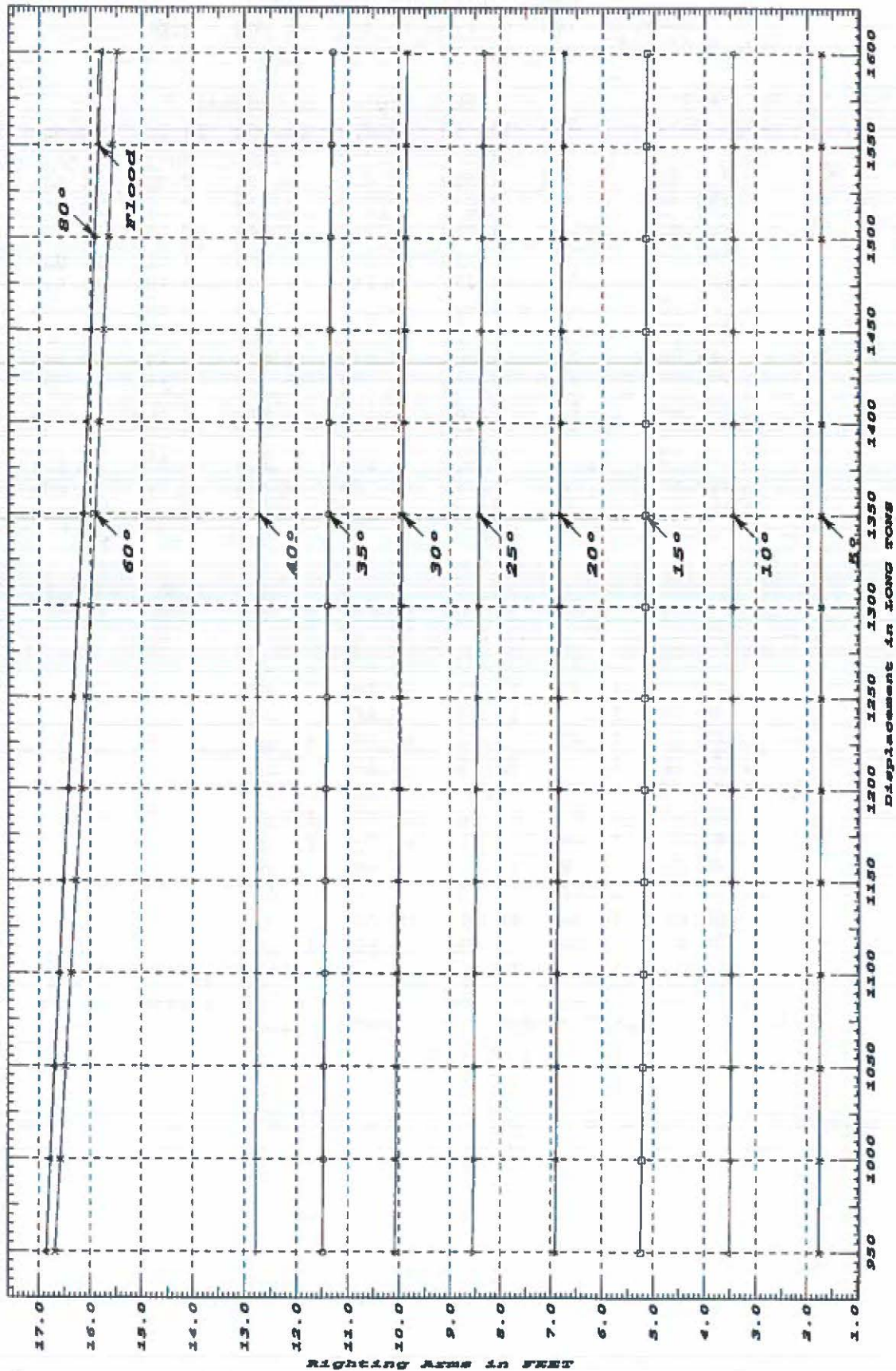
LONG TONS					@ Flooding	
	35.00s	40.00s	60.00s	80.00s	Arm	Angle
950.00	11.49s	12.79s	16.68s	16.85s		
1,000.00	11.47s	12.78s	16.58s	16.77s		
1,050.00	11.46s	12.77s	16.48s	16.69s		
1,100.00	11.45s	12.77s	16.38s	16.60s		
1,150.00	11.43s	12.77s	16.28s	16.52s		
1,200.00	11.42s	12.76s	16.18s	16.44s		
1,250.00	11.41s	12.76s	16.09s	16.34s		
1,300.00	11.39s	12.74s	16.00s	16.25s		
1,350.00	11.38s	12.73s	15.91s	16.15s		
1,400.00	11.36s	12.70s	15.83s	16.07s		
1,450.00	11.35s	12.67s	15.74s	15.99s		
1,500.00	11.33s	12.63s	15.66s	15.92s		
1,550.00	11.31s	12.59s	15.57s	15.85s	15.86s	79.74s
1,600.00	11.28s	12.54s	15.49s	15.78s	15.84s	78.65s

Distances in FEET.---Specific Gravity = 1.025.-----

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY - Stbd Heel
at 4 FT AFT TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 FT
"K" = Baseline

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: Aft 5.00/187.00 at zero heel (trim righting arm held at zero)

Displacement LONG TONS	Heel Angles in Degrees					
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s
950.00	1.78s	3.54s	5.28s	6.97s	8.60s	10.13s
1,000.00	1.77s	3.53s	5.26s	6.95s	8.59s	10.11s
1,050.00	1.76s	3.51s	5.25s	6.94s	8.57s	10.09s
1,100.00	1.76s	3.50s	5.23s	6.93s	8.55s	10.06s
1,150.00	1.75s	3.50s	5.22s	6.92s	8.54s	10.04s
1,200.00	1.75s	3.49s	5.22s	6.91s	8.52s	10.02s
1,250.00	1.74s	3.48s	5.21s	6.90s	8.49s	10.00s
1,300.00	1.74s	3.48s	5.20s	6.89s	8.47s	9.97s
1,350.00	1.74s	3.47s	5.20s	6.87s	8.45s	9.95s
1,400.00	1.74s	3.47s	5.19s	6.85s	8.42s	9.92s
1,450.00	1.74s	3.47s	5.19s	6.83s	8.39s	9.90s
1,500.00	1.74s	3.47s	5.18s	6.81s	8.37s	9.87s
1,550.00	1.73s	3.46s	5.17s	6.78s	8.34s	9.84s
1,600.00	1.73s	3.46s	5.15s	6.76s	8.31s	9.82s

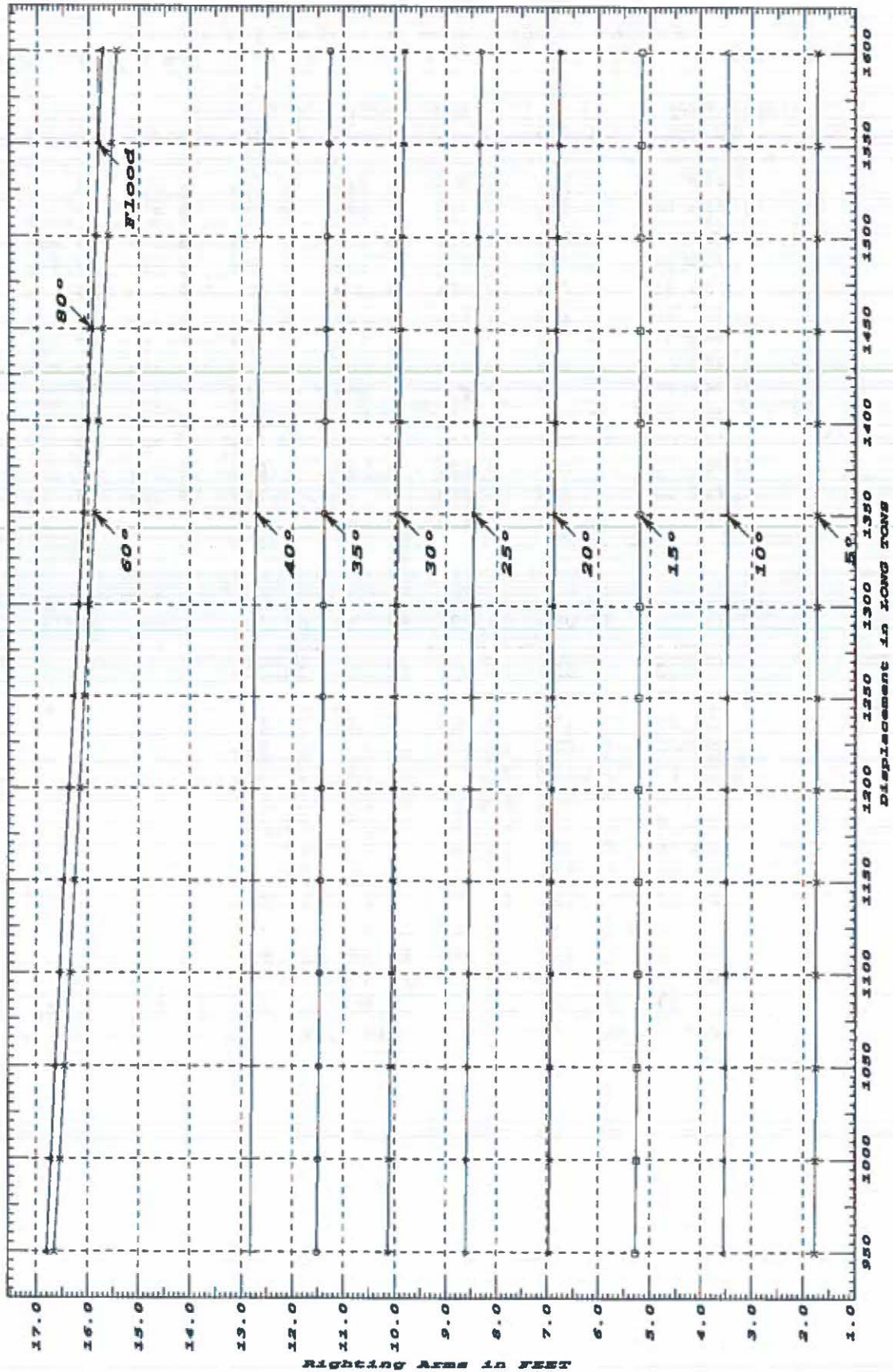
LONG TONS						@ Flooding	
	35.00s	40.00s	60.00s	80.00s		Arm	Angle
950.00	11.52s	12.81s	16.65s	16.80s			
1,000.00	11.50s	12.80s	16.55s	16.72s			
1,050.00	11.48s	12.79s	16.45s	16.64s			
1,100.00	11.47s	12.78s	16.35s	16.55s			
1,150.00	11.45s	12.77s	16.25s	16.47s			
1,200.00	11.43s	12.77s	16.16s	16.37s			
1,250.00	11.41s	12.75s	16.07s	16.27s			
1,300.00	11.40s	12.74s	15.97s	16.18s			
1,350.00	11.38s	12.71s	15.88s	16.09s			
1,400.00	11.36s	12.68s	15.80s	16.01s			
1,450.00	11.34s	12.65s	15.71s	15.93s			
1,500.00	11.32s	12.61s	15.62s	15.86s			
1,550.00	11.29s	12.56s	15.54s	15.80s	15.82s	79.37s	
1,600.00	11.26s	12.51s	15.45s	15.73s	15.81s	78.25s	

Distances in FEET.---Specific Gravity = 1.025.-----

04/12/10 12:10:42
GHS 11.00

BMT Fleet
CFV CYGNUS

CROSS CURVES OF STABILITY - Stbd Heel
at 5 FT AFT TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 FT
"K" = Baseline

APPENDIX D – TANK SOUNDING TABLES

Note:

- Soundings are measured with sounding pipes except in the following cases where the soundings are measured from the bottom of the respective tanks
 - Fuel Oil Day Tank (C) - DAYTANK.C
 - Emergency Gen. Fuel (C) - EMERG.C
 - Speed Log Tank - SPEEDLOG_TAN.P
 - Lube Oil Tank (Port) - LUBOIL.P
 - Lube Oil Tank (Port) - LUBOIL.S
 - Sewage Tank (Port) - SWGE.P
 - F.O. Drain Tank (C) - FO_DRAIN.C
 - Dirty L.O. Tank (C) - DIRT_LO.C
 - L.O. Sludge Tank (C) - LO_SLUDGE.C
 - CP Prop Oil Tank (C) - CP_PROP.C
 - Echo Sounder Compt. (C) - ECHO_SDR.C
- Soundings are provided at zero heel for the following trims:
 - 0.0 Ft Aft

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: NO1_DB.P, Contents: SALT WATER at 1.025 Specific Gravity
NO 1 DOUBLE BOTTOM T

Snding	Load	Weight	Center of Gravity			GML	FSM Ft-LT
		LONG TONS	LCG	TCG	VCG		
0' 1	.012	0.05	46.26f	0.51p	0.86	82.9	0.1
0' 2	.020	0.09	46.42f	0.57p	0.90	59.7	0.1
0' 3	.029	0.13	46.50f	0.64p	0.95	47.4	0.2
0' 4	.040	0.18	46.54f	0.71p	1.01	39.5	0.2
0' 5	.052	0.23	46.57f	0.78p	1.06	34.1	0.3
0' 6	.065	0.29	46.59f	0.85p	1.11	29.9	0.4
0' 7	.080	0.36	46.61f	0.92p	1.16	26.5	0.5
0' 8	.095	0.43	46.63f	0.98p	1.21	23.7	0.6
0' 9	.112	0.50	46.66f	1.04p	1.27	21.5	0.7
0'10	.130	0.58	46.68f	1.10p	1.32	19.7	0.9
0'11	.149	0.67	46.70f	1.16p	1.37	18.1	1.0
1' 0	.169	0.76	46.72f	1.22p	1.42	16.9	1.1
1' 1	.190	0.85	46.74f	1.27p	1.48	15.8	1.3
1' 2	.212	0.95	46.76f	1.33p	1.53	14.8	1.5
1' 3	.234	1.05	46.77f	1.38p	1.58	13.9	1.6
1' 4	.258	1.16	46.79f	1.43p	1.63	13.2	1.8
1' 5	.283	1.27	46.80f	1.48p	1.68	12.4	2.0
1' 6	.308	1.38	46.81f	1.53p	1.74	11.8	2.3
1' 7	.334	1.50	46.82f	1.58p	1.79	11.2	2.5
1' 8	.361	1.62	46.83f	1.62p	1.84	10.7	2.7
1' 9	.389	1.75	46.83f	1.67p	1.89	10.3	3.0
1'10	.418	1.87	46.84f	1.72p	1.94	9.9	3.3
1'11	.447	2.01	46.85f	1.77p	2.00	9.5	3.6
2' 0	.478	2.14	46.85f	1.81p	2.05	9.1	3.9
2' 1	.509	2.28	46.85f	1.86p	2.10	8.8	4.2
2' 2	.541	2.43	46.86f	1.90p	2.15	8.4	4.5
2' 3	.574	2.58	46.86f	1.95p	2.20	8.1	4.8
2' 4	.607	2.73	46.87f	1.99p	2.26	7.8	5.1
2' 5	.642	2.88	46.87f	2.03p	2.31	7.6	5.4
2' 6	.677	3.04	46.88f	2.08p	2.36	7.3	5.7
2' 7	.712	3.20	46.88f	2.12p	2.41	7.1	5.9
2' 8	.748	3.36	46.89f	2.16p	2.46	6.9	6.2
2' 9	.785	3.52	46.89f	2.20p	2.52	6.7	6.6
2'10	.823	3.69	46.90f	2.24p	2.57	6.5	6.9
2'11	.861	3.86	46.90f	2.27p	2.62	6.3	7.2
3' 0	.900	4.04	46.91f	2.31p	2.67	6.1	7.6
3' 1	.939	4.21	46.91f	2.35p	2.72	6.0	7.9
3' 2	.978	4.39	46.92f	2.38p	2.77	3.7	6.4
3' 3	1.001	4.49	46.98f	2.40p	2.80	0.3	1.9
3' 3	1.001	4.49	46.98f	2.40p	2.80	0.3	2.0

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: DEEP.S, Contents: FUEL OIL at 0.870 Specific Gravity

FUEL OIL DEEP TANK S

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
0' 1	.034	1.09	6.11a	7.00s	3.26	174.4	31.9
0' 2	.047	1.49	5.42a	7.00s	3.31	128.2	31.9
0' 3	.059	1.88	5.02a	7.00s	3.35	101.3	31.9
0' 4	.072	2.28	4.76a	7.00s	3.40	83.8	31.9
0' 5	.084	2.67	4.57a	7.00s	3.44	71.4	31.9
0' 6	.097	3.07	4.43a	7.00s	3.48	62.2	31.9
0' 7	.109	3.46	4.33a	7.00s	3.52	55.1	31.9
0' 8	.121	3.85	4.24a	7.00s	3.57	49.5	31.9
0' 9	.134	4.25	4.17a	7.00s	3.61	44.9	31.9
0'10	.146	4.64	4.12a	7.00s	3.65	41.1	31.9
0'11	.159	5.04	4.07a	7.00s	3.69	37.9	31.9
1' 0	.171	5.43	4.03a	7.00s	3.74	35.1	31.9
1' 1	.184	5.83	3.99a	7.00s	3.78	32.7	31.9
1' 2	.196	6.22	3.96a	7.00s	3.82	30.7	31.9
1' 3	.208	6.62	3.93a	7.00s	3.86	28.8	31.9
1' 4	.221	7.01	3.91a	7.00s	3.90	27.2	31.9
1' 5	.233	7.40	3.89a	7.00s	3.94	25.8	31.9
1' 6	.246	7.80	3.87a	7.00s	3.99	24.5	31.9
1' 7	.258	8.19	3.85a	7.00s	4.03	23.3	31.9
1' 8	.271	8.59	3.83a	7.00s	4.07	22.2	31.9
1' 9	.283	8.98	3.82a	7.00s	4.11	21.2	31.9
1'10	.295	9.38	3.80a	7.00s	4.15	20.3	31.9
1'11	.308	9.77	3.79a	7.00s	4.20	19.5	31.9
2' 0	.320	10.16	3.78a	7.00s	4.24	18.8	31.9
2' 1	.333	10.56	3.77a	7.00s	4.28	18.1	31.9
2' 2	.345	10.95	3.76a	7.00s	4.32	17.4	31.9
2' 3	.358	11.35	3.75a	7.00s	4.36	16.8	31.9
2' 4	.370	11.74	3.74a	7.00s	4.40	16.2	31.9
2' 5	.382	12.14	3.74a	7.00s	4.45	15.7	31.9
2' 6	.395	12.53	3.73a	7.00s	4.49	15.2	31.9
2' 7	.407	12.92	3.72a	7.00s	4.53	14.8	31.9
2' 8	.420	13.32	3.71a	7.00s	4.57	14.3	31.9
2' 9	.432	13.71	3.71a	7.00s	4.61	13.9	31.9
2'10	.445	14.11	3.70a	7.00s	4.66	13.5	31.9
2'11	.457	14.50	3.70a	7.00s	4.70	13.2	31.9
3' 0	.469	14.90	3.69a	7.00s	4.74	12.8	31.9
3' 1	.482	15.29	3.69a	7.00s	4.78	12.5	31.9
3' 2	.494	15.69	3.68a	7.00s	4.82	12.2	31.9
3' 3	.507	16.08	3.68a	7.00s	4.86	11.9	31.9
3' 4	.519	16.47	3.67a	7.00s	4.91	11.6	31.9
3' 5	.532	16.87	3.67a	7.00s	4.95	11.3	31.9
3' 6	.544	17.26	3.67a	7.00s	4.99	11.0	31.9

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: DEEP.S, Contents: FUEL OIL at 0.870 Specific Gravity

FUEL OIL DEEP TANK S

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
3' 7	.556	17.66	3.66a	7.00s	5.03	10.8	31.9
3' 8	.569	18.05	3.66a	7.00s	5.07	10.6	31.9
3' 9	.581	18.45	3.65a	7.00s	5.11	10.3	31.9
3' 10	.594	18.84	3.65a	7.00s	5.16	10.1	31.9
3' 11	.606	19.23	3.65a	7.00s	5.20	9.9	31.9
4' 0	.619	19.63	3.65a	7.00s	5.24	9.7	31.9
4' 1	.631	20.02	3.64a	7.00s	5.28	9.5	31.9
4' 2	.644	20.42	3.64a	7.00s	5.32	9.3	31.9
4' 3	.656	20.81	3.64a	7.00s	5.36	9.2	31.9
4' 4	.668	21.21	3.63a	7.00s	5.41	9.0	31.9
4' 5	.681	21.60	3.63a	7.00s	5.45	8.8	31.9
4' 6	.693	22.00	3.63a	7.00s	5.49	8.7	31.9
4' 7	.706	22.39	3.63a	7.00s	5.53	8.5	31.9
4' 8	.718	22.78	3.63a	7.00s	5.57	8.4	31.9
4' 9	.731	23.18	3.62a	7.00s	5.61	8.2	31.9
4' 10	.743	23.57	3.62a	7.00s	5.66	8.1	31.9
4' 11	.755	23.97	3.62a	7.00s	5.70	8.0	31.9
5' 0	.768	24.36	3.62a	7.00s	5.74	7.8	31.9
5' 1	.780	24.76	3.62a	7.00s	5.78	7.7	31.9
5' 2	.793	25.15	3.61a	7.00s	5.82	7.6	31.9
5' 3	.805	25.54	3.61a	7.00s	5.87	7.5	31.9
5' 4	.818	25.94	3.61a	7.00s	5.91	7.4	31.9
5' 5.1	.830	26.33	3.61a	7.00s	5.95	7.2	31.9
5' 6.1	.842	26.73	3.61a	7.00s	5.99	7.1	31.9
5' 7.1	.855	27.12	3.61a	7.00s	6.03	7.0	31.9
5' 8.1	.867	27.52	3.60a	7.00s	6.07	6.9	31.9
5' 9.1	.880	27.91	3.60a	7.00s	6.12	6.8	31.9
5' 10.1	.892	28.31	3.60a	7.00s	6.16	6.7	31.9
5' 11.1	.905	28.70	3.60a	7.00s	6.20	6.6	31.9
6' 0.1	.917	29.09	3.60a	7.00s	6.24	6.6	31.9
6' 1.1	.929	29.49	3.60a	7.00s	6.28	6.5	31.9
6' 2.1	.942	29.88	3.60a	7.00s	6.32	6.4	31.9
6' 3.1	.954	30.28	3.59a	7.00s	6.37	6.3	31.9
6' 4.1	.967	30.67	3.59a	7.00s	6.41	6.2	31.9
6' 5.1	.979	31.07	3.59a	7.00s	6.45	6.1	31.9
6' 6.1	.990	31.42	3.58a	7.00s	6.49	2.3	23.2
6' 7.1	.997	31.64	3.55a	7.00s	6.51	0.4	12.5
6' 8.1	1.000	31.73	3.52a	7.00s	6.52	0.0	1.9

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: DUMP.S, Contents: FUEL OIL at 0.870 Specific Gravity

FUEL OIL DUMP TANK S

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
0' 1	.031	0.82	5.94a	14.30s	3.28	144.1	8.9
0' 2	.040	1.08	5.44a	14.31s	3.33	111.1	9.2
0' 3	.050	1.34	5.13a	14.32s	3.37	90.6	9.5
0' 4	.060	1.60	4.92a	14.33s	3.42	76.6	9.8
0' 5	.070	1.87	4.77a	14.34s	3.46	66.5	10.1
0' 6	.080	2.14	4.65a	14.35s	3.50	58.8	10.4
0' 7	.090	2.41	4.55a	14.37s	3.55	52.8	10.7
0' 8	.100	2.68	4.48a	14.38s	3.59	47.9	11.0
0' 9	.111	2.96	4.42a	14.40s	3.64	43.9	11.4
0'10	.121	3.23	4.36a	14.41s	3.68	40.5	11.7
0'11	.132	3.52	4.32a	14.43s	3.72	37.7	12.0
1' 0	.142	3.80	4.28a	14.44s	3.77	35.2	12.4
1' 1	.153	4.09	4.24a	14.46s	3.81	33.1	12.7
1' 2	.164	4.38	4.21a	14.47s	3.85	31.2	13.1
1' 3	.175	4.67	4.18a	14.49s	3.90	29.6	13.5
1' 4	.186	4.97	4.16a	14.50s	3.94	28.1	13.8
1' 5	.197	5.27	4.14a	14.52s	3.99	26.8	14.2
1' 6	.208	5.57	4.12a	14.54s	4.03	25.6	14.6
1' 7	.220	5.87	4.10a	14.55s	4.08	24.5	15.0
1' 8	.231	6.18	4.08a	14.57s	4.12	23.5	15.4
1' 9	.243	6.49	4.06a	14.59s	4.17	22.6	15.8
1'10	.254	6.80	4.05a	14.60s	4.21	21.7	16.2
1'11	.266	7.11	4.03a	14.62s	4.26	21.0	16.7
2' 0	.278	7.43	4.02a	14.64s	4.30	20.3	17.1
2' 1	.290	7.75	4.01a	14.65s	4.35	19.6	17.5
2' 2	.302	8.08	4.00a	14.67s	4.39	19.0	18.0
2' 3	.314	8.40	3.99a	14.69s	4.44	18.4	18.5
2' 4	.327	8.73	3.98a	14.70s	4.48	17.9	18.9
2' 5	.339	9.06	3.97a	14.72s	4.53	17.4	19.4
2' 6	.351	9.40	3.96a	14.74s	4.57	16.9	19.9
2' 7	.364	9.73	3.95a	14.75s	4.62	16.5	20.4
2' 8	.377	10.07	3.94a	14.77s	4.66	16.0	20.8
2' 9	.390	10.42	3.93a	14.79s	4.71	15.6	20.9
2'10	.402	10.76	3.92a	14.80s	4.76	15.1	21.1
2'11	.415	11.10	3.92a	14.82s	4.80	14.7	21.3
3' 0	.428	11.44	3.91a	14.83s	4.85	14.3	21.4
3' 1	.441	11.79	3.90a	14.85s	4.89	13.9	21.6
3' 2	.454	12.14	3.89a	14.86s	4.94	13.6	21.7
3' 3	.467	12.48	3.89a	14.87s	4.98	13.2	21.9
3' 4	.480	12.83	3.88a	14.89s	5.03	12.9	22.1
3' 5	.493	13.18	3.88a	14.90s	5.07	12.6	22.2
3' 6	.506	13.53	3.87a	14.91s	5.12	12.3	22.4

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: DUMP.S, Contents: FUEL OIL at 0.870 Specific Gravity

FUEL OIL DUMP TANK S

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
3' 7	.519	13.88	3.87a	14.92s	5.16	12.0	22.6
3' 8	.532	14.23	3.86a	14.93s	5.21	11.8	22.7
3' 9	.545	14.58	3.86a	14.95s	5.25	11.5	22.9
3' 10	.558	14.93	3.85a	14.96s	5.30	11.3	23.1
3' 11	.572	15.29	3.85a	14.97s	5.34	11.0	23.2
4' 0	.585	15.64	3.84a	14.98s	5.39	10.8	23.4
4' 1	.598	16.00	3.84a	14.99s	5.43	10.6	23.6
4' 2	.612	16.35	3.83a	15.00s	5.48	10.4	23.8
4' 3	.625	16.71	3.83a	15.01s	5.52	10.2	23.9
4' 4	.638	17.07	3.82a	15.02s	5.56	10.0	24.1
4' 5	.652	17.43	3.82a	15.03s	5.61	9.9	24.3
4' 6	.665	17.79	3.82a	15.04s	5.65	9.7	24.5
4' 7	.679	18.15	3.81a	15.04s	5.70	9.5	24.6
4' 8	.692	18.51	3.81a	15.05s	5.74	9.4	24.8
4' 9	.706	18.88	3.81a	15.06s	5.79	9.2	25.0
4' 10	.719	19.24	3.80a	15.07s	5.83	9.1	25.2
4' 11	.733	19.60	3.80a	15.08s	5.88	8.9	25.4
5' 0	.747	19.97	3.80a	15.09s	5.92	8.8	25.6
5' 1	.760	20.33	3.79a	15.10s	5.97	8.6	25.7
5' 2	.774	20.70	3.79a	15.11s	6.01	8.5	25.9
5' 3	.788	21.07	3.79a	15.11s	6.05	8.4	26.1
5' 4	.802	21.44	3.78a	15.12s	6.10	8.3	26.3
5' 5.1	.816	21.81	3.78a	15.13s	6.14	8.1	26.5
5' 6.1	.829	22.18	3.78a	15.14s	6.19	8.0	26.7
5' 7.1	.843	22.55	3.77a	15.15s	6.23	7.9	26.9
5' 8.1	.857	22.92	3.77a	15.15s	6.28	7.8	27.0
5' 9.1	.871	23.30	3.77a	15.16s	6.32	7.7	27.0
5' 10.1	.885	23.67	3.76a	15.17s	6.37	7.6	27.0
5' 11.1	.899	24.04	3.76a	15.18s	6.41	7.4	27.0
6' 0.1	.913	24.42	3.76a	15.18s	6.46	7.3	27.1
6' 1.1	.927	24.79	3.76a	15.19s	6.50	7.2	27.1
6' 2.1	.941	25.16	3.75a	15.20s	6.54	7.1	27.1
6' 3.1	.955	25.54	3.75a	15.20s	6.59	7.0	27.1
6' 4.1	.969	25.91	3.75a	15.21s	6.63	6.9	27.1
6' 5.1	.983	26.28	3.75a	15.21s	6.68	5.2	24.7
6' 6.1	.993	26.56	3.72a	15.22s	6.71	1.3	15.4
6' 7.1	.999	26.71	3.68a	15.22s	6.73	0.1	6.2
6' 7.8	1.000	26.74	3.67a	15.22s	6.73		

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: STAB.C, Contents: FUEL OIL at 0.870 Specific Gravity

PASSIVE STAB TANK FR

Snding	Load	Weight	Center of Gravity			GML	FSM Ft-LT
		LONG TONS	LCG	TCG	VCG		
0' 1	.050	5.48	2.55a	0.00	10.11	76.3	1104.0
0' 2	.059	6.52	2.41a	0.00	10.15	64.1	1104.0
0' 3	.069	7.57	2.31a	0.00	10.19	55.2	1104.0
0' 4	.078	8.61	2.23a	0.00	10.24	48.6	1104.0
0' 5	.088	9.65	2.18a	0.00	10.28	43.3	1104.0
0' 6	.097	10.70	2.13a	0.00	10.32	39.1	1104.0
0' 7	.107	11.74	2.09a	0.00	10.36	35.6	1104.0
0' 8	.116	12.78	2.05a	0.00	10.40	32.7	1104.0
0' 9	.126	13.83	2.03a	0.00	10.45	30.2	1104.0
0' 10	.135	14.87	2.00a	0.00	10.49	28.1	1104.0
0' 11	.145	15.91	1.98a	0.00	10.53	26.3	1104.0
1' 0	.154	16.96	1.96a	0.00	10.57	24.6	1104.0
1' 1	.164	18.00	1.95a	0.00	10.61	23.2	1104.0
1' 2	.174	19.05	1.93a	0.00	10.66	21.9	1104.0
1' 3	.183	20.09	1.92a	0.00	10.70	20.8	1104.0
1' 4	.193	21.13	1.91a	0.00	10.74	19.8	1104.0
1' 5	.202	22.18	1.90a	0.00	10.78	18.8	1104.0
1' 6	.212	23.22	1.89a	0.00	10.82	18.0	1104.0
1' 7	.221	24.26	1.88a	0.00	10.86	17.2	1104.0
1' 8	.231	25.31	1.87a	0.00	10.91	16.5	1104.0
1' 9	.240	26.35	1.86a	0.00	10.95	15.9	1104.0
1' 10	.250	27.40	1.86a	0.00	10.99	15.3	1104.0
1' 11	.259	28.44	1.85a	0.00	11.03	14.7	1104.0
2' 0	.269	29.48	1.84a	0.00	11.07	14.2	1104.0
2' 1	.278	30.53	1.84a	0.00	11.11	13.7	1104.0
2' 2	.288	31.57	1.83a	0.00	11.16	13.2	1104.0
2' 3	.297	32.61	1.83a	0.00	11.20	12.8	1104.0
2' 4	.307	33.66	1.82a	0.00	11.24	12.4	1104.0
2' 5	.316	34.70	1.82a	0.00	11.28	12.0	1104.0
2' 6	.326	35.75	1.82a	0.00	11.32	11.7	1104.0
2' 7	.335	36.79	1.81a	0.00	11.36	11.4	1104.0
2' 8	.345	37.83	1.81a	0.00	11.41	11.0	1104.0
2' 9	.354	38.88	1.81a	0.00	11.45	10.8	1104.0
2' 10	.364	39.92	1.80a	0.00	11.49	10.5	1104.0
2' 11	.373	40.96	1.80a	0.00	11.53	10.2	1104.0
3' 0	.383	42.01	1.80a	0.00	11.57	9.9	1104.0
3' 1	.392	43.05	1.79a	0.00	11.62	9.7	1104.0
3' 2	.402	44.09	1.79a	0.00	11.66	9.5	1104.0
3' 3	.411	45.14	1.79a	0.00	11.70	9.3	1104.0
3' 4	.421	46.18	1.79a	0.00	11.74	9.1	1104.0
3' 5	.430	47.23	1.78a	0.00	11.78	8.9	1104.0
3' 6	.440	48.27	1.78a	0.00	11.82	8.7	1104.0

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: STAB.C, Contents: FUEL OIL at 0.870 Specific Gravity

PASSIVE STAB TANK FR

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
3' 7	.449	49.31	1.78a	0.00	11.87	8.5	1104.0
3' 8	.459	50.36	1.78a	0.00	11.91	8.3	1104.0
3' 9	.468	51.40	1.78a	0.00	11.95	8.1	1104.0
3' 10	.478	52.44	1.77a	0.00	11.99	8.0	1104.0
3' 11	.487	53.49	1.77a	0.00	12.03	7.8	1104.0
4' 0	.497	54.53	1.77a	0.00	12.07	7.7	1104.0
4' 1	.506	55.58	1.77a	0.00	12.12	7.5	1104.0
4' 2	.516	56.62	1.77a	0.00	12.16	7.4	1104.0
4' 3	.525	57.66	1.77a	0.00	12.20	7.2	1104.0
4' 4	.535	58.71	1.76a	0.00	12.24	7.1	1104.0
4' 5	.544	59.75	1.76a	0.00	12.28	7.0	1104.0
4' 6	.554	60.79	1.76a	0.00	12.32	6.9	1104.0
4' 7	.563	61.84	1.76a	0.00	12.37	6.8	1104.0
4' 8	.573	62.88	1.76a	0.00	12.41	6.6	1104.0
4' 9	.582	63.92	1.76a	0.00	12.45	6.5	1104.0
4' 10	.592	64.97	1.76a	0.00	12.49	6.4	1104.0
4' 11	.601	66.01	1.76a	0.00	12.53	6.3	1104.0
5' 0	.611	67.06	1.75a	0.00	12.57	6.2	1104.0
5' 1	.620	68.10	1.75a	0.00	12.62	6.1	1104.0
5' 2	.630	69.14	1.75a	0.00	12.66	6.0	1104.0
5' 3	.639	70.19	1.75a	0.00	12.70	6.0	1104.0
5' 4	.649	71.23	1.75a	0.00	12.74	5.9	1104.0
5' 5.1	.658	72.27	1.75a	0.00	12.78	5.8	1104.0
5' 6.1	.668	73.32	1.75a	0.00	12.82	5.7	1104.0
5' 7.1	.677	74.36	1.75a	0.00	12.87	5.6	1104.0
5' 8.1	.687	75.41	1.75a	0.00	12.91	5.5	1104.0
5' 9.1	.696	76.45	1.75a	0.00	12.95	5.5	1104.0
5' 10.1	.706	77.49	1.74a	0.00	12.99	5.4	1104.0
5' 11.1	.715	78.54	1.74a	0.00	13.03	5.3	1104.0
6' 0.1	.725	79.58	1.74a	0.00	13.07	5.3	1104.0
6' 1.1	.734	80.62	1.74a	0.00	13.12	5.2	1104.0
6' 2.1	.744	81.67	1.74a	0.00	13.16	5.1	1104.0
6' 3.1	.754	82.71	1.74a	0.00	13.20	5.1	1104.0
6' 4.1	.763	83.76	1.74a	0.00	13.24	5.0	1104.0
6' 5.1	.773	84.80	1.74a	0.00	13.28	4.9	1104.0
6' 6.1	.782	85.84	1.74a	0.00	13.33	4.9	1104.0
6' 7.1	.792	86.89	1.74a	0.00	13.37	4.8	1104.0
6' 8.1	.801	87.93	1.74a	0.00	13.41	4.8	1104.0
6' 9.1	.811	88.97	1.74a	0.00	13.45	4.7	1104.0
6' 10.1	.820	90.02	1.74a	0.00	13.49	4.6	1104.0
6' 11.1	.830	91.06	1.74a	0.00	13.53	4.6	1104.0
7' 0.1	.839	92.10	1.73a	0.00	13.58	4.5	1104.0

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: STAB.C, Contents: FUEL OIL at 0.870 Specific Gravity
PASSIVE STAB TANK FR

Snding	Load	Weight		Center of Gravity			GML	FSM Ft-LT
		LONG	TONS	LCG	TCG	VCG		
7' 1.1	.849	93.15		1.73a	0.00	13.62	4.5	1104.0
7' 2.1	.858	94.19		1.73a	0.00	13.66	4.4	1104.0
7' 3.1	.868	95.24		1.73a	0.00	13.70	4.4	1104.0
7' 4.1	.877	96.28		1.73a	0.00	13.74	4.3	1104.0
7' 5.1	.887	97.32		1.73a	0.00	13.78	4.3	1104.0
7' 6.1	.896	98.37		1.73a	0.00	13.83	4.2	1104.0
7' 7.1	.906	99.41		1.73a	0.00	13.87	4.2	1104.0
7' 8.1	.915	100.45		1.73a	0.00	13.91	4.2	1104.0
7' 9.1	.925	101.50		1.73a	0.00	13.95	4.1	1104.0
7' 10.1	.934	102.54		1.73a	0.00	13.99	4.1	1104.0
7' 11.1	.944	103.59		1.73a	0.00	14.03	4.0	1104.0
8' 0.1	.953	104.63		1.73a	0.00	14.08	4.0	1104.0
8' 1.1	.963	105.67		1.73a	0.00	14.12	4.0	1104.0
8' 2.1	.972	106.70		1.73a	0.00	14.16	3.8	959.8
8' 3.1	.980	107.62		1.73a	0.00	14.20	3.1	657.3
8' 4.1	.988	108.40		1.72a	0.00	14.23	2.4	417.2
8' 5.1	.993	109.04		1.72a	0.00	14.25	1.6	213.4
8' 6.1	.997	109.49		1.71a	0.00	14.27	0.7	62.6
8' 7.1	1.000	109.75		1.70a	0.00	14.28	0.3	7.2

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: AFTPEAK.C, Contents: FRESH WATER at 1.000 Specific Gravity
AFT PEAK NON POTABLE

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
0' 1	.015	0.62	77.89a	0.00	-0.57	15.8	0.1
0' 2	.016	0.65	77.86a	0.00	-0.53	15.1	0.1
0' 3	.017	0.69	77.83a	0.00	-0.49	14.5	0.1
0' 4	.017	0.73	77.80a	0.00	-0.45	13.9	0.1
0' 5	.018	0.76	77.77a	0.00	-0.41	13.4	0.1
0' 6	.019	0.80	77.74a	0.00	-0.37	12.9	0.1
0' 7	.020	0.84	77.71a	0.00	-0.33	12.5	0.1
0' 8	.021	0.88	77.68a	0.00	-0.30	12.0	0.1
0' 9	.022	0.92	77.65a	0.00	-0.26	11.6	0.1
0' 10	.023	0.96	77.62a	0.00	-0.22	11.3	0.1
0' 11	.024	1.01	77.59a	0.00	-0.18	10.9	0.1
1' 0	.025	1.05	77.57a	0.00	-0.13	10.6	0.1
1' 1	.026	1.09	77.54a	0.00	-0.09	10.3	0.1
1' 2	.027	1.13	77.51a	0.00	-0.05	10.0	0.1
1' 3	.028	1.18	77.48a	0.00	-0.01	9.7	0.2
1' 4	.029	1.22	77.46a	0.00	0.03	9.5	0.2
1' 5	.030	1.27	77.43a	0.00	0.07	9.2	0.2
1' 6	.032	1.31	77.40a	0.00	0.11	9.0	0.2
1' 7	.033	1.36	77.38a	0.00	0.15	8.8	0.2
1' 8	.034	1.41	77.35a	0.00	0.20	8.6	0.2
1' 9	.035	1.46	77.33a	0.00	0.24	8.4	0.2
1' 10	.036	1.51	77.30a	0.00	0.28	8.2	0.2
1' 11	.037	1.56	77.28a	0.00	0.32	8.0	0.2
2' 0	.039	1.61	77.25a	0.00	0.37	7.9	0.2
2' 1	.040	1.66	77.23a	0.00	0.41	7.7	0.3
2' 2	.041	1.71	77.21a	0.00	0.45	7.6	0.3
2' 3	.042	1.76	77.19a	0.00	0.50	7.4	0.3
2' 4	.044	1.81	77.17a	0.00	0.54	7.3	0.3
2' 5	.045	1.87	77.15a	0.00	0.58	7.2	0.3
2' 6	.046	1.92	77.13a	0.00	0.63	7.0	0.3
2' 7	.047	1.98	77.11a	0.00	0.67	6.9	0.3
2' 8	.049	2.03	77.09a	0.00	0.71	6.8	0.4
2' 9	.050	2.09	77.07a	0.00	0.76	6.7	0.4
2' 10	.052	2.15	77.05a	0.00	0.80	6.6	0.4
2' 11	.053	2.21	77.03a	0.00	0.85	6.4	0.4
3' 0	.054	2.26	77.01a	0.00	0.89	6.3	0.4
3' 1	.056	2.32	76.99a	0.00	0.94	6.2	0.4
3' 2	.057	2.38	76.98a	0.00	0.98	6.1	0.5
3' 3	.059	2.44	76.96a	0.00	1.02	6.1	0.5
3' 4	.060	2.51	76.94a	0.00	1.07	6.0	0.5
3' 5	.062	2.57	76.93a	0.00	1.11	5.9	0.5
3' 6	.063	2.63	76.91a	0.00	1.16	5.8	0.5

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: AFTPEAK.C, Contents: FRESH WATER at 1.000 Specific Gravity
AFT PEAK NON POTABLE

Snding	Load	Weight		Center of Gravity			GML	FSM Ft-LT
		LONG	TONS	LCG	TCG	VCG		
3' 7	.065	2.70	76.90a	0.00	1.20	5.8	0.6	
3' 8	.066	2.76	76.88a	0.00	1.25	5.7	0.6	
3' 9	.068	2.83	76.86a	0.00	1.30	5.7	0.7	
3' 10	.070	2.90	76.85a	0.00	1.34	5.6	0.7	
3' 11	.071	2.97	76.83a	0.00	1.39	5.6	0.7	
4' 0	.073	3.04	76.82a	0.00	1.44	5.5	0.8	
4' 1	.075	3.11	76.80a	0.00	1.49	5.5	0.8	
4' 2	.077	3.19	76.79a	0.00	1.54	5.4	0.9	
4' 3	.078	3.27	76.77a	0.00	1.59	5.3	1.0	
4' 4	.080	3.34	76.76a	0.00	1.63	5.3	1.0	
4' 5	.082	3.42	76.74a	0.00	1.68	5.2	1.1	
4' 6	.084	3.50	76.73a	0.00	1.73	5.2	1.1	
4' 7	.086	3.58	76.72a	0.00	1.78	5.1	1.2	
4' 8	.088	3.67	76.70a	0.00	1.84	5.1	1.3	
4' 9	.091	3.77	76.69a	0.00	1.90	5.0	1.3	
4' 10	.093	3.87	76.67a	0.00	1.95	5.0	1.4	
4' 11	.095	3.97	76.65a	0.00	2.01	4.9	1.5	
5' 0	.098	4.08	76.64a	0.00	2.07	4.9	1.6	
5' 1	.100	4.18	76.62a	0.00	2.13	4.8	1.7	
5' 2	.103	4.29	76.61a	0.00	2.19	4.7	1.8	
5' 3	.106	4.40	76.60a	0.00	2.25	4.7	1.9	
5' 4	.108	4.51	76.58a	0.00	2.31	4.6	2.0	
5' 5.1	.111	4.63	76.57a	0.00	2.37	4.6	2.2	
5' 6.1	.114	4.74	76.55a	0.00	2.43	4.6	2.3	
5' 7.1	.117	4.86	76.54a	0.00	2.49	4.5	2.5	
5' 8.1	.120	4.98	76.52a	0.00	2.55	4.5	2.7	
5' 9.1	.123	5.11	76.51a	0.00	2.61	4.5	2.9	
5' 10.1	.126	5.23	76.49a	0.00	2.67	4.4	3.1	
5' 11.1	.129	5.36	76.48a	0.00	2.74	4.4	3.4	
6' 0.1	.132	5.49	76.46a	0.00	2.80	4.4	3.7	
6' 1.1	.135	5.63	76.45a	0.00	2.86	4.3	4.0	
6' 2.1	.139	5.77	76.43a	0.00	2.92	4.3	4.3	
6' 3.1	.142	5.91	76.42a	0.00	2.99	4.3	4.7	
6' 4.1	.145	6.06	76.40a	0.00	3.05	4.2	5.1	
6' 5.1	.149	6.20	76.38a	0.00	3.12	4.2	5.5	
6' 6.1	.153	6.36	76.37a	0.00	3.18	4.2	5.9	
6' 7.1	.156	6.51	76.35a	0.00	3.25	4.1	6.4	
6' 8.1	.160	6.67	76.33a	0.00	3.31	4.1	6.9	
6' 9.1	.164	6.84	76.32a	0.00	3.38	4.1	7.4	
6' 10.1	.168	7.01	76.30a	0.00	3.45	4.1	8.0	
6' 11.1	.172	7.18	76.29a	0.00	3.51	4.0	8.6	
7' 0.1	.177	7.36	76.27a	0.00	3.58	4.0	9.2	

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: AFTPEAK.C, Contents: FRESH WATER at 1.000 Specific Gravity
AFT PEAK NON POTABLE

Snding	Load	Weight	Center of Gravity			GML	FSM Ft-LT
		LONG TONS	LCG	TCG	VCG		
7' 1.1	.181	7.54	76.26a	0.00	3.65	4.0	9.8
7' 2.1	.185	7.72	76.25a	0.00	3.72	3.9	10.5
7' 3.1	.190	7.91	76.23a	0.00	3.79	3.9	11.2
7' 4.1	.195	8.11	76.22a	0.00	3.86	3.9	12.0
7' 5.1	.199	8.31	76.21a	0.00	3.92	3.9	12.7
7' 6.1	.204	8.51	76.19a	0.00	3.99	3.8	13.5
7' 7.1	.209	8.72	76.18a	0.00	4.06	3.8	14.4
7' 8.1	.214	8.93	76.17a	0.00	4.13	3.8	15.3
7' 9.1	.220	9.14	76.16a	0.00	4.20	3.8	16.2
7'10.1	.225	9.36	76.15a	0.00	4.27	3.8	17.2
7'11.1	.230	9.59	76.14a	0.00	4.34	3.8	18.3
8' 0.1	.236	9.82	76.13a	0.00	4.41	3.7	19.5
8' 1.1	.241	10.05	76.12a	0.00	4.48	3.7	20.8
8' 2.1	.247	10.29	76.11a	0.00	4.55	3.7	22.2
8' 3.1	.253	10.54	76.10a	0.00	4.62	3.7	23.7
8' 4.1	.259	10.79	76.09a	0.00	4.69	3.7	25.4
8' 5.1	.265	11.05	76.08a	0.00	4.76	3.7	27.1
8' 6.1	.272	11.31	76.07a	0.00	4.84	3.7	29.0
8' 7.1	.278	11.58	76.06a	0.00	4.91	3.7	31.1
8' 8.1	.285	11.86	76.06a	0.00	4.98	3.7	33.3
8' 9.1	.291	12.14	76.05a	0.00	5.05	3.7	35.7
8'10.1	.298	12.43	76.04a	0.00	5.12	3.8	38.3
8'11.1	.305	12.72	76.04a	0.00	5.20	3.8	41.0
9' 0.1	.313	13.02	76.03a	0.00	5.27	3.8	43.9
9' 1.1	.320	13.34	76.02a	0.00	5.34	3.8	47.0
9' 2.1	.328	13.65	76.02a	0.00	5.42	3.8	50.4
9' 3.1	.336	13.98	76.01a	0.00	5.49	3.8	53.9
9' 4.1	.344	14.32	76.01a	0.00	5.56	3.9	57.7
9' 5.1	.352	14.66	76.00a	0.00	5.64	3.9	61.7
9' 6.1	.361	15.02	76.00a	0.00	5.71	4.0	66.0
9' 7.1	.369	15.38	76.00a	0.00	5.79	4.0	70.6
9' 8.1	.378	15.75	76.00a	0.00	5.87	4.1	75.6
9' 9.1	.388	16.14	76.00a	0.00	5.94	4.1	80.8
9'10.1	.397	16.53	76.00a	0.00	6.02	4.2	86.3
9'11.1	.407	16.94	76.00a	0.00	6.10	4.3	92.1
10' 0	.416	17.32	76.01a	0.00	6.17	4.4	97.6

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FOREPEAK.C, Contents: SALT WATER at 1.025 Specific Gravity
FOREPEAK TANK FRMS 8

Snding	Load	Weight	Center of Gravity			GML	FSM Ft-LT
		LONG TONS	LCG	TCG	VCG		
0' 1	.000	0.01	82.61f	0.00	2.86	2.1	0.0
0' 2	.001	0.01	82.67f	0.00	2.91	1.8	0.0
0' 3	.001	0.02	82.72f	0.00	2.97	1.7	0.0
0' 4	.001	0.02	82.76f	0.00	3.02	1.6	0.0
0' 5	.001	0.03	82.80f	0.00	3.07	1.5	0.0
0' 6	.001	0.03	82.83f	0.00	3.12	1.4	0.0
0' 7	.002	0.04	82.87f	0.00	3.17	1.4	0.0
0' 8	.002	0.04	82.90f	0.00	3.22	1.4	0.0
0' 9	.002	0.05	82.93f	0.00	3.28	1.4	0.0
0'10	.002	0.06	82.95f	0.00	3.33	1.0	0.0
0'11	.003	0.06	82.97f	0.00	3.38	1.1	0.0
1' 0	.003	0.07	82.99f	0.00	3.44	1.2	0.0
1' 1	.003	0.08	83.01f	0.00	3.49	1.2	0.0
1' 2	.004	0.09	83.03f	0.00	3.55	1.2	0.0
1' 3	.004	0.10	83.05f	0.00	3.60	1.2	0.0
1' 4	.005	0.11	83.08f	0.00	3.66	1.2	0.0
1' 5	.005	0.12	83.10f	0.00	3.71	1.2	0.0
1' 6	.006	0.13	83.13f	0.00	3.77	1.2	0.0
1' 7	.006	0.14	83.15f	0.00	3.83	1.2	0.0
1' 8	.007	0.15	83.18f	0.00	3.88	1.2	0.0
1' 9	.007	0.16	83.20f	0.00	3.94	1.2	0.0
1'10	.008	0.17	83.23f	0.00	4.00	1.2	0.0
1'11	.008	0.19	83.26f	0.00	4.05	1.2	0.0
2' 0	.009	0.20	83.28f	0.00	4.11	1.2	0.0
2' 1	.009	0.21	83.31f	0.00	4.17	1.1	0.0
2' 2	.010	0.23	83.33f	0.00	4.22	1.2	0.0
2' 3	.011	0.24	83.35f	0.00	4.28	1.2	0.0
2' 4	.011	0.26	83.37f	0.00	4.34	1.2	0.0
2' 5	.012	0.27	83.38f	0.00	4.39	1.3	0.0
2' 6	.013	0.29	83.40f	0.00	4.45	1.3	0.0
2' 7	.014	0.31	83.42f	0.00	4.51	1.3	0.1
2' 8	.014	0.33	83.45f	0.00	4.57	1.3	0.1
2' 9	.015	0.34	83.47f	0.00	4.62	1.3	0.1
2'10	.016	0.36	83.49f	0.00	4.68	1.3	0.1
2'11	.017	0.38	83.51f	0.00	4.74	1.3	0.1
3' 0	.018	0.40	83.53f	0.00	4.80	1.3	0.1
3' 1	.019	0.43	83.56f	0.00	4.86	1.4	0.1
3' 2	.020	0.45	83.58f	0.00	4.92	1.4	0.1
3' 3	.021	0.47	83.60f	0.00	4.98	1.4	0.1
3' 4	.022	0.49	83.63f	0.00	5.04	1.4	0.1
3' 5	.023	0.52	83.65f	0.00	5.09	1.4	0.1
3' 6	.024	0.54	83.67f	0.00	5.15	1.4	0.1

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: FOREPEAK.C, Contents: SALT WATER at 1.025 Specific Gravity
FOREPEAK TANK FRMS 8

Snding	Load	Weight	Center of Gravity			GML	FSM
		LONG TONS	LCG	TCG	VCG		Ft-LT
3' 7	.025	0.57	83.69f	0.00	5.21	1.4	0.1
3' 8	.026	0.59	83.71f	0.00	5.27	1.5	0.1
3' 9	.027	0.62	83.73f	0.00	5.33	1.5	0.1
3'10	.028	0.65	83.75f	0.00	5.39	1.5	0.1
3'11	.030	0.67	83.77f	0.00	5.45	1.5	0.1
4' 0	.031	0.70	83.79f	0.00	5.51	1.5	0.2
4' 1	.032	0.73	83.81f	0.00	5.57	1.5	0.2
4' 2	.034	0.76	83.83f	0.00	5.63	1.6	0.2
4' 3	.035	0.80	83.85f	0.00	5.69	1.6	0.2
4' 4	.036	0.83	83.87f	0.00	5.75	1.6	0.2
4' 5	.038	0.86	83.89f	0.00	5.81	1.6	0.2
4' 6	.039	0.89	83.91f	0.00	5.87	1.6	0.2
4' 7	.041	0.93	83.93f	0.00	5.93	1.6	0.2
4' 8	.042	0.96	83.95f	0.00	5.99	1.6	0.2
4' 9	.044	1.00	83.97f	0.00	6.05	1.6	0.3
4'10	.046	1.04	83.99f	0.00	6.11	1.6	0.3
4'11	.047	1.08	84.01f	0.00	6.17	1.7	0.3
5' 0	.049	1.12	84.03f	0.00	6.23	1.7	0.3
5' 1	.051	1.16	84.05f	0.00	6.29	1.7	0.3
5' 2	.052	1.20	84.08f	0.00	6.35	1.7	0.3
5' 3	.054	1.24	84.10f	0.00	6.41	1.7	0.3
5' 4	.056	1.28	84.12f	0.00	6.47	1.7	0.4
5' 5.1	.058	1.32	84.14f	0.00	6.53	1.6	0.4
5' 6.1	.060	1.37	84.15f	0.00	6.59	1.6	0.4
5' 7.1	.062	1.41	84.17f	0.00	6.65	1.6	0.4
5' 8.1	.064	1.46	84.19f	0.00	6.71	1.6	0.4
5' 9.1	.066	1.51	84.21f	0.00	6.77	1.6	0.5
5'10.1	.068	1.55	84.23f	0.00	6.83	1.6	0.5
5'11.1	.070	1.60	84.25f	0.00	6.89	1.7	0.5
6' 0.1	.072	1.65	84.26f	0.00	6.95	1.7	0.5
6' 1.1	.075	1.70	84.28f	0.00	7.01	1.7	0.6
6' 2.1	.077	1.75	84.30f	0.00	7.07	1.7	0.6
6' 3.1	.079	1.81	84.32f	0.00	7.13	1.7	0.6
6' 4.1	.082	1.86	84.33f	0.00	7.19	1.6	0.6
6' 5.1	.084	1.91	84.35f	0.00	7.25	1.6	0.7
6' 6.1	.086	1.97	84.37f	0.00	7.31	1.6	0.7
6' 7.1	.089	2.03	84.38f	0.00	7.37	1.6	0.7
6' 8.1	.091	2.08	84.40f	0.00	7.43	1.6	0.7
6' 9.1	.094	2.14	84.41f	0.00	7.49	1.7	0.8
6'10.1	.097	2.20	84.43f	0.00	7.55	1.7	0.8
6'11.1	.099	2.26	84.44f	0.00	7.61	1.7	0.8
7' 0.1	.102	2.32	84.46f	0.00	7.67	1.7	0.9

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: FOREPEAK.C, Contents: SALT WATER at 1.025 Specific Gravity
FOREPEAK TANK FRMS 8

Snding	Load	Weight	Center of Gravity			GML	FSM Ft-LT
		LONG TONS	LCG	TCG	VCG		
7' 1.1	.105	2.38	84.47f	0.00	7.73	1.7	0.9
7' 2.1	.107	2.45	84.49f	0.00	7.79	1.7	0.9
7' 3.1	.110	2.51	84.50f	0.00	7.85	1.7	1.0
7' 4.1	.113	2.57	84.52f	0.00	7.91	1.7	1.0
7' 5.1	.116	2.64	84.53f	0.00	7.97	1.6	1.0
7' 6.1	.119	2.70	84.54f	0.00	8.03	1.6	1.1
7' 7.1	.122	2.77	84.56f	0.00	8.09	1.6	1.1
7' 8.1	.125	2.84	84.57f	0.00	8.14	1.6	1.2
7' 9.1	.128	2.91	84.58f	0.00	8.20	1.6	1.2
7'10.1	.131	2.98	84.60f	0.00	8.26	1.5	1.2
7'11.1	.134	3.05	84.61f	0.00	8.32	1.5	1.3
8' 0.1	.137	3.12	84.62f	0.00	8.38	1.5	1.3
8' 1.1	.140	3.19	84.63f	0.00	8.44	1.5	1.4
8' 2.1	.143	3.26	84.64f	0.00	8.49	1.5	1.4
8' 3.1	.146	3.34	84.65f	0.00	8.55	1.5	1.5
8' 4.1	.150	3.41	84.66f	0.00	8.61	1.5	1.5
8' 5.1	.153	3.48	84.66f	0.00	8.67	1.5	1.5
8' 6.1	.156	3.56	84.67f	0.00	8.73	1.5	1.6
8' 7.1	.160	3.64	84.68f	0.00	8.79	1.5	1.6
8' 8.1	.163	3.72	84.69f	0.00	8.84	1.5	1.7
8' 9.1	.167	3.79	84.70f	0.00	8.90	1.5	1.7
8'10.1	.170	3.87	84.71f	0.00	8.96	1.5	1.8
8'11.1	.174	3.95	84.72f	0.00	9.02	1.5	1.9
9' 0.1	.177	4.04	84.73f	0.00	9.08	1.5	1.9
9' 1.1	.181	4.12	84.74f	0.00	9.13	1.5	2.0
9' 2.1	.184	4.20	84.75f	0.00	9.19	1.5	2.0
9' 3.1	.188	4.29	84.76f	0.00	9.25	1.5	2.1
9' 4.1	.192	4.37	84.77f	0.00	9.31	1.5	2.2
9' 5.1	.196	4.46	84.78f	0.00	9.37	1.5	2.2
9' 6.1	.200	4.55	84.79f	0.00	9.42	1.5	2.3
9' 7.1	.203	4.64	84.80f	0.00	9.48	1.5	2.4
9' 8.1	.207	4.73	84.81f	0.00	9.54	1.5	2.5
9' 9.1	.212	4.82	84.82f	0.00	9.60	1.5	2.6
9'10.1	.216	4.92	84.83f	0.00	9.66	1.5	2.7
9'11.1	.220	5.01	84.84f	0.00	9.72	1.6	2.8
10' 0	.224	5.10	84.85f	0.00	9.78	1.6	2.9

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FW.P, Contents: FRESH WATER at 1.000 Specific Gravity
POTABLE FRESH WATER

Snding	Load	Weight		Center of Gravity			GML	FSM Ft-LT
		LONG	TONS	LCG	TCG	VCG		
0' 1	.037		0.81	14.86f	8.66p	3.52	17.8	34.9
0' 2	.046		1.02	14.97f	8.67p	3.56	14.3	35.6
0' 3	.056		1.22	15.04f	8.68p	3.59	12.0	36.3
0' 4	.065		1.43	15.10f	8.70p	3.63	10.3	37.0
0' 5	.075		1.64	15.14f	8.72p	3.67	9.0	37.6
0' 6	.084		1.84	15.17f	8.73p	3.71	8.1	38.3
0' 7	.094		2.06	15.19f	8.75p	3.75	7.3	39.0
0' 8	.104		2.27	15.21f	8.77p	3.79	6.6	39.7
0' 9	.113		2.48	15.23f	8.79p	3.83	6.1	40.4
0'10	.123		2.69	15.25f	8.81p	3.86	5.7	41.1
0'11	.133		2.91	15.26f	8.83p	3.90	5.3	41.8
1' 0	.143		3.13	15.27f	8.84p	3.94	4.9	42.5
1' 1	.153		3.34	15.28f	8.86p	3.98	4.6	43.2
1' 2	.163		3.56	15.29f	8.88p	4.02	4.4	43.9
1' 3	.173		3.78	15.30f	8.90p	4.06	4.1	44.6
1' 4	.183		4.01	15.30f	8.92p	4.10	3.9	45.3
1' 5	.193		4.23	15.31f	8.94p	4.14	3.7	46.1
1' 6	.203		4.45	15.31f	8.96p	4.18	3.6	46.8
1' 7	.214		4.68	15.32f	8.98p	4.21	3.4	47.6
1' 8	.224		4.90	15.32f	8.99p	4.25	3.3	48.3
1' 9	.234		5.13	15.33f	9.01p	4.29	3.2	49.1
1'10	.245		5.36	15.33f	9.03p	4.33	3.0	49.8
1'11	.255		5.59	15.34f	9.05p	4.37	2.9	50.6
2' 0	.266		5.82	15.34f	9.07p	4.41	2.8	51.4
2' 1	.277		6.05	15.34f	9.09p	4.45	2.7	52.2
2' 2	.287		6.29	15.35f	9.11p	4.49	2.6	53.0
2' 3	.298		6.52	15.35f	9.13p	4.53	2.6	53.8
2' 4	.309		6.76	15.35f	9.15p	4.57	2.5	54.6
2' 5	.320		7.00	15.36f	9.17p	4.61	2.4	55.5
2' 6	.331		7.23	15.36f	9.19p	4.65	2.3	56.3
2' 7	.341		7.47	15.36f	9.20p	4.69	2.3	57.1
2' 8	.352		7.71	15.36f	9.22p	4.73	2.2	58.0
2' 9	.364		7.96	15.37f	9.24p	4.77	2.2	58.5
2'10	.375		8.20	15.37f	9.26p	4.81	2.1	59.0
2'11	.386		8.44	15.37f	9.28p	4.85	2.0	59.4
3' 0	.397		8.68	15.37f	9.30p	4.89	2.0	59.9
3' 1	.408		8.93	15.37f	9.31p	4.93	1.9	60.3
3' 2	.419		9.17	15.37f	9.33p	4.96	1.9	60.7
3' 3	.430		9.42	15.38f	9.35p	5.00	1.8	61.2
3' 4	.442		9.67	15.38f	9.36p	5.04	1.8	61.6
3' 5	.453		9.91	15.38f	9.38p	5.08	1.8	62.0
3' 6	.464	10.16		15.38f	9.40p	5.12	1.7	62.5

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: FW.P, Contents: FRESH WATER at 1.000 Specific Gravity
POTABLE FRESH WATER

Snding	Load	Weight	Center of Gravity			GML	FSM Ft-LT
		LONG TONS	LCG	TCG	VCG		
3' 7	.476	10.41	15.38f	9.41p	5.16	1.7	62.9
3' 8	.487	10.66	15.38f	9.43p	5.20	1.7	63.4
3' 9	.498	10.90	15.38f	9.44p	5.24	1.6	63.8
3'10	.510	11.15	15.39f	9.45p	5.28	1.6	64.3
3'11	.521	11.40	15.39f	9.47p	5.32	1.6	64.7
4' 0	.533	11.65	15.39f	9.48p	5.36	1.5	65.2
4' 1	.544	11.91	15.39f	9.50p	5.40	1.5	65.7
4' 2	.556	12.16	15.39f	9.51p	5.44	1.5	66.1
4' 3	.567	12.41	15.39f	9.52p	5.48	1.4	66.6
4' 4	.579	12.66	15.39f	9.54p	5.52	1.4	67.1
4' 5	.590	12.92	15.39f	9.55p	5.56	1.4	67.5
4' 6	.602	13.17	15.40f	9.56p	5.60	1.4	68.0
4' 7	.613	13.43	15.40f	9.58p	5.64	1.3	68.5
4' 8	.625	13.68	15.40f	9.59p	5.68	1.3	68.9
4' 9	.637	13.94	15.40f	9.60p	5.72	1.3	69.4
4'10	.649	14.20	15.40f	9.62p	5.76	1.3	69.9
4'11	.660	14.45	15.40f	9.63p	5.80	1.3	70.4
5' 0	.672	14.71	15.40f	9.64p	5.84	1.2	70.9
5' 1	.684	14.97	15.40f	9.65p	5.88	1.2	71.4
5' 2	.696	15.23	15.40f	9.67p	5.92	1.2	71.8
5' 3	.708	15.49	15.40f	9.68p	5.95	1.2	72.3
5' 4	.720	15.75	15.40f	9.69p	5.99	1.2	72.8
5' 5.1	.731	16.01	15.40f	9.70p	6.03	1.2	73.3
5' 6.1	.743	16.27	15.41f	9.71p	6.07	1.1	73.8
5' 7.1	.755	16.53	15.41f	9.73p	6.11	1.1	74.3
5' 8.1	.767	16.79	15.41f	9.74p	6.15	1.1	74.8
5' 9.1	.779	17.06	15.41f	9.75p	6.19	1.1	75.3
5'10.1	.791	17.32	15.41f	9.76p	6.23	1.1	75.8
5'11.1	.804	17.59	15.41f	9.77p	6.27	1.1	76.3
6' 0.1	.816	17.85	15.41f	9.78p	6.31	1.1	76.9
6' 1.1	.828	18.12	15.41f	9.80p	6.35	1.0	77.2
6' 2.1	.840	18.38	15.41f	9.81p	6.39	1.0	77.4
6' 3.1	.852	18.65	15.41f	9.82p	6.43	1.0	77.7
6' 4.1	.864	18.92	15.41f	9.83p	6.47	1.0	78.0
6' 5.1	.876	19.18	15.41f	9.84p	6.51	1.0	78.3
6' 6.1	.889	19.45	15.41f	9.85p	6.55	1.0	78.5
6' 7.1	.901	19.72	15.41f	9.86p	6.59	1.0	78.8
6' 8.1	.913	19.98	15.42f	9.87p	6.63	1.0	79.1
6' 9.1	.925	20.25	15.42f	9.88p	6.67	0.9	79.4
6'10.1	.938	20.52	15.42f	9.89p	6.71	0.9	79.6
6'11.1	.950	20.79	15.42f	9.90p	6.75	0.9	79.9
7' 0.1	.962	21.06	15.42f	9.91p	6.79	0.9	80.2

Soundings in feet & inches.---Other distances in FEET.-----

04/12/10 12:16:08
GHS 11.00

BMT Fleet
CFV CYGNUS

TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: FW.P, Contents: FRESH WATER at 1.000 Specific Gravity
POTABLE FRESH WATER

Snding	Load	Weight		Center of Gravity			GML	FSM Ft-LT
		LONG	TONS	LCG	TCG	VCG		
7' 1.1	.974	21.33		15.42f	9.92p	6.83	0.9	80.5
7' 2.1	.986	21.58		15.42f	9.93p	6.87	0.5	65.9
7' 3.1	.994	21.76		15.43f	9.94p	6.89	0.1	41.0
7' 4.1	.999	21.86		15.44f	9.94p	6.91	0.0	4.3
7' 4.8	1.000	21.89		15.45f	9.94p	6.91		

Soundings in feet & inches.---Other distances in FEET.-----

APPENDIX E – STABILITY CRITERIA

Applicable Stability Criteria – Intact Stability

The vessel shall operate in all loading conditions to comply with the criteria of Transport Canada – Marine Safety TP 7301 Standard STAB 4, “Stability Standards for Fishing Vessels”, as outlined below:

Standard: STAB 4

Stability Standards for Fishing Vessels:

- a) subject to compliance with the Large Fishing Vessel Inspection Regulations, or
- b) required to submit stability data by the Small Fishing Vessel Inspection Regulations.

Operating Conditions with no Accumulated Ice

1. The following minimum intact stability criteria are to be used in the approval of stability data for the above vessels:
 - i. The area under the righting lever (GZ) curve should not be less than 0.055 metre-radians (10.34 Ft-deg) up to $\angle = 30^\circ$ angle of heel, and not less than 0.09 metre-radians (16.91 Ft-deg) up to $\angle = 40^\circ$, or the angle of downflooding \angle_f if this angle is less than 40° .
Additionally, the area under the righting lever (GZ) curve between the angles of heel of 30° and 40° or between 30° and \angle_f if this angle is less than 40° should not be less than 0.03 metre-radians (5.64 Ft-deg).
 - ii. The righting lever GZ should be at least 0.20 metres (0.66 Ft) at an angle of heel equal to or greater than 30° .
 - iii. The maximum righting arm should occur at an angle of heel preferably exceeding 30° but not less than 25° .
 - iv. The initial metacentric height (GM) should not be less than 0.35 metres (1.15 Ft).

Worst Operating Condition with Accumulated Ice

2. Using the ice accumulation weights and vertical centres of gravity requires by the appropriate fishing vessel inspection regulations:
 - i. The area under the righting lever (GZ) curve should not be less than 0.04 metre-radians up to 30 degrees angle of heel and not less than 0.058 metre-radians up to 40 degrees or the angle of downflooding if this angle is less than 40 degrees.
Additionally, the area under the righting lever (GZ) curve between the angles of heel of 30 degrees and 40 degrees or between 30 degrees and the angle of downflooding, if this angle is less than 40 degrees, should not be less than 0.016 metre-radians.
 - ii. The righting lever (GZ) should be at least 0.15 metres at an angle of heel equal to or greater than 20 degrees.
 - iii. The maximum righting lever (GZ) should occur at an angle of heel not less than 20 degrees.
 - iv. The initial metacentric height (GM) should not be less than 0.23 metres.
3. Hydrostatic and stability curves should normally be prepared on a designed trim basis. However, where the operating trim or the form and arrangement of the ship are such that

change in trim has an appreciable effect on righting arms, such change of trim is to be taken into account.

4. The calculations may take into account the volume to the upper surface of the deck sheathing, if fitted. In the case of wood ships the dimensions should be taken to the outside of hull and deck planking.
5. Cross Curves of Stability may take the following into account and a note to this effect must be shown:
 - a. Enclosed weathertight superstructures and enclosed weathertight deckhouses of similar construction,
 - b. Weathertight trunks, and
 - c. Hatchways having regard to the effectiveness of the closures.
6. Definitions for paragraph 5 are as follows:

SUPERSTRUCTURE means a decked structure on the bulkhead deck extending from side to side of the ship, or with the side plating not being inboard of the shell plating more than 4 per cent of the maximum moulded breadth of the vessel measured at mid-ships. A raised quarter deck is regarded as a superstructure.

WEATHERTIGHT means that in any sea conditions water will not penetrate into the ship.
7. In cases where a ship would flood through an opening, the stability curve is to be cut short at the corresponding angle of flooding and the ship is to be considered as having entirely lost her stability at that angle.
8. In the calculations for loading conditions an allowance is to be made for the weight of the wet fishing nets and tackle.
9. In all cases the cargo should be assumed to be homogenous unless this is inconsistent with practice.
10. The following conditions are not considered as operating conditions. Therefore the above criteria are not applicable and the standard to be obtained in these conditions is a positive.GM:
 - a. Lightship
 - b. Port after discharge of cargo with 10% of fuel, fresh water and stores remaining and accumulated ice on top-sides and rigging.

(The lightship condition is defined as the condition of a vessel ready for sea with no stores, consumables, fluid ballast or crew on board).

APPENDIX F – SAMPLE STABILITY CALCULATION

To calculate the stability for a condition of loading other than shown in this booklet, the following procedure is suggested.

F.1 Displacement, LCG, VCG, and FSM

Prepare a table similar to the following:

Item	(1) Weight (LT)	(2) LCG (Ft)	(1) x (2) L-Mom (LT-Ft)	(3) TCG (Ft)	(1) x (3) T-Mom (LT-Ft)	(4) VCG (Ft)	(1) x (4) V-Mom (LT-Ft)	(5) FSM
Lightship	1029.65	-8.52	-8772.62	-0.02	-20.59	17.58	18101.25	-
Crew and Effects								
Stores and Provisions								
Machinery Space								
CARGO								
NO1 DB.P								
DUMP.P								
DUMP.S								
DAYTANK.C								
LUBOIL.P								
FW.P								
FW.S								
AFTPEAK.C								
SWGE.P								
Total	(A)	(B)=(C)/(A)	(C)	(D)=(E)/(A)	(E)	(F)=(G)/(A)	(G)	(H)=(H)/(A)

List the weight, longitudinal centre of gravity (LCG), transverse centre of gravity (TCG) and vertical centre of gravity (VCG) against each weight item – i.e. crew and effects, stores and provisions and tanks, etc. Refer to the Tank Sounding Tables (Appendix D) to complete the table with appropriate values of LCG, TCG, VCG and FSM (free surface moment) at the measured tank fluid level. Then calculate the moments using the columns as indicated.

The estimated Total Weight is the Displacement of the vessel.

Note that '+' in the table indicates the centre of gravity is forward of the origin (amidships) and results in a positive moment, and '-' in the table indicates the centre of gravity is aft of the origin (amidships) and results in a negative moment.

Similarly, '+' for transverse moments indicates that the centre of gravity is starboard of the Centerline and '-' indicates that the centre of gravity is port of the Centerline.

Use the following formulae to calculate the LCG, TCG, VCG and FSC (free surface correction) of the vessel:

$$\text{LCG} = \frac{\text{Total Longitudinal Moment (C)}}{\text{Total Weight (A)}} \quad \text{TCG} = \frac{\text{Total Transverse Moment (E)}}{\text{Total Weight (A)}}$$

$$\text{VCG} = \frac{\text{Total Vertical Moment (G)}}{\text{Total Weight (A)}} \quad \text{FSC} = \frac{\text{Total Free Surface Moment (H)}}{\text{Total Weight (A)}}$$

F.2 Draft and Trim

Refer to the hydrostatic tables in Appendix B. Based on the Displacement determine, by interpolation if necessary:

- Draft at the Longitudinal Centre of Floatation (T_{LCF})
- The Longitudinal Centre of Floatation (LCF)
- The Longitudinal Centre of Buoyancy (LCB)
- Moment per Inch of Trim (MPI)

Calculate Trim:

$$\text{Trim} = \frac{(\text{LCG} - \text{LCB}) \times \text{Total Weight}}{\text{MPI}}$$

Calculate Draft at A.P. (Corrected to Bottom of Keel)

$$\text{Draft at A.P.} = T_{LCF} + 1.5\text{ft} - \frac{\text{Trim} \times (\text{LBP}/2 + \text{LCF})}{\text{LBP}}$$

Calculate Draft at F.P. (Corrected to Bottom of Keel)

$$\text{Draft at A.P.} = T_{LCF} - 1.5\text{ft} + \frac{\text{Trim} \times (\text{LBP}/2 - \text{LCF})}{\text{LBP}}$$

F.3 Metacentric Height (GM)

Refer to the hydrostatic tables in Appendix B. Based on the displacement, determine, by interpolation if necessary:

- Transverse Metacentric Height (KMT)

The GM fluid (GM_f) is then found using the following formula:

$$GM_f = \text{KMT} - \text{VCG} + \text{FSM}/\text{Total Weight}$$

GM_f should be greater than 1.15ft.

F.4 Estimation of Righting Arm at Large Angles of Heel

For the construction of a GZ Curve, a Righting Arm (GZ) must be estimated at high angles of heel. To estimate the Righting Arm (GZ) for a given angle of heel, refer to the Cross Curves of Stability in Appendix C. Based on the trim displacement and angle of heel (θ), determine:

- Righting Arm relative to the keel (KN)

Estimate GZ:

$$GZ = KN - KG \sin(\theta)$$

F.5 Sample Calculation

As an example, the Arrival Condition 10% Consumables Full Cargo will be re-calculated, using the enclosed hydrostatics and cross curves. (Note that the answer will not be precisely as calculated by GHS, due to simplifications of the hand calculations method.)

Item	(A) Weight (LT) (1)	(B) LCG (Ft) (2)	(C) L-Mom (LT-Ft) (1) x (2)	(D) TCG (Ft) (3)	(E) T-Mom (LT-Ft) (1) x (3)	(F) VCG (Ft) (4)	(G) V-Mom (LT-Ft) (1) x (4)	(H) FSM (5)
Lightship	1029.65	-8.52	-8772.62	-0.02	-20.59	17.58	18101.25	
Crew and Effects	5.00	0.00	0.00	0.00	0.00	29.36	146.80	
Stores and Provisions	0.60	12.00	7.20	-5.00	-3.00	14.42	8.65	
Machinery Space	5.00	-89.00	-445.00	-6.00	-30.00	14.00	70.00	
CARGO	66.00	49.50	3267.00	-0.50	-33.00	12.50	825.00	
No1. DB.S	5.66	49.11	278.0	2.15	12.2	2.78	15.7	8.1
DUMP.P	23.99	-3.75	-89.96	-15.21	-364.89	6.40	153.54	27.10
DUMP.S	23.98	-3.75	-89.92	15.14	363.06	6.40	153.47	27.10
DAYTANK.C	27.88	-10.51	-293.02	-0.08	-2.23	14.09	392.83	78.30
LUBOIL.P	1.20	-68.00	-81.60	-7.29	-8.75	11.86	14.23	1.80
FW.P	2.19	15.20	33.29	-9.28	-20.32	3.78	8.28	41.20
FW.S	2.10	15.09	31.69	8.24	17.30	3.78	7.94	37.80
AFTPEAK.C	20.82	-76.26	-1904.97	-0.30	-7.49	7.35	183.60	154.9
SWGE.P	1.66	34.99	58.08	-2.52	-4.18	5.66	9.40	0.80
Total	1215.67	-6.32	-8279.8	-0.08	-114.1	16.5	20074.9	377

F.5.1 Trim and Draft

LCF Draft	=	11.64	ft at LCF
LCG	=	-6.32	ft aft of Amidships
LCB (Appendix B)	=	-6.74	ft aft of Amidships

$$\begin{aligned}
 BG = LCG - LCB &= 0.42 \text{ ft} \\
 \text{Trim Mom} = BG \times \text{Disp} &= 510.6 \text{ ft} \\
 \text{Moment/In trim} &= 126.56 \text{ ft-LT/in} \\
 \text{Trim} &= 4 \text{ in} = 0.33 \text{ Ft by Aft} \\
 \text{LCF (Appendix B)} &= 8.67 \text{ ft aft of Amidships}
 \end{aligned}$$

$$\text{Draft at F.P.} = 11.64 - 1.5 + \frac{0.33(187/2 - 8.67)}{187} = 10.3 \text{ ft}$$

$$\text{Draft at A.P.} = 11.64 + 1.5 - \frac{0.33(187/2 + 8.67)}{187} = 13.0 \text{ ft}$$

F.5.2 GM

Using the displacement, find the KMT from the hydrostatic curves (Appendix B) and use it to calculate GM as follows:

$$\begin{aligned}
 \text{KMT} &= 19.37 \text{ Ft} \\
 \text{VCG} &= 16.5 \text{ Ft} \\
 \text{GMs (Solid)} = \text{KMT} - \text{VCG} &= 2.87 \text{ Ft} \\
 \text{FSC (FSM/Displacement)} &= 0.31 \text{ Ft} \\
 \text{GMf (fluid)} = \text{GMs} - \text{FSC} &= 2.56 \text{ Ft}
 \end{aligned}$$

F.5.3 Development of Righting Arm Curve

To determine large angle stability of the vessel at the Arrival Condition 10% Consumables Full Cargo, see the following:

$$\text{VCG}_f = \text{VCG} + \text{FSC} = 16.90 \text{ Ft}$$

Angle θ°	$\sin\theta$	KN	KGsin θ	GZ = KN - KGsin θ
10	0.174	3.38	2.935	0.45
20	0.342	6.72	5.780	0.94
30	0.500	9.90	8.450	1.45
40	0.643	12.75	10.863	1.89

Area to 30 Degrees

Angle θ° GZ

0	0.00	x	1	=	0.00
10	0.45	x	3	=	1.48
20	0.94	x	3	=	2.82
30	1.45	x	1	=	1.45
					<hr/>
					5.61

$$\text{Area} = 3/8 \times 10 \times 5.61$$

$$= 21.02 \text{ Ft-Deg}$$

Area to 40 Degrees

Angle \emptyset° GZ

0	0.00	x	1	=	0.00
10	0.45	x	4	=	1.78
20	0.94	x	2	=	1.88
30	1.45	x	4	=	5.80
40	1.89	x	1	=	1.89
					<hr/>
					11.35

$$\text{Area} = 1/3 \times 10 \times 11.35$$

$$= 37.83 \text{ Ft-Deg}$$

APPENDIX G – GLOSSARY OF TERMS AND ABBREVIATIONS

Aft	In, near, or toward the stern of the boat
Baseline (BPL)	The lower virtual horizontal reference plane of the boat from which vertical dimensions are measured. Inside of the boat's hull at the keel plate on the centreline running forward and aft. Used for calculation purposes.
Beam	Maximum width of the hull measured between the inboard surfaces of the side shell (hull) plating of a boat
BML	Height of the Longitudinal Metacentre above the boat's centre of Buoyancy. Used for calculation purposes
BMT	Height of the Transverse Metacentre above the boat's centre of Buoyancy. Used for calculation purposes
BoK	Datum line for measurement of drafts at draft marks.
Bow	Front of the boat
Bulkhead	Any vertical partition which separates different compartments or spaces from one another. WTB – Water Tight Bulkhead NWTB – Non-Water Tight Bulkhead
CB	Block coefficient Used for calculation purposes.
CP	Prismatic coefficient Used for calculation purposes.
CWP	Waterplane area coefficient Used for calculation purposes.
CX	Midship section coefficient Used for calculation purposes.
Deck	The plating supported on any level of beam structure in the hull or house structure.
DISPL	Displacement. The quantity or weight of fluid the boat displaces, which in turn, is always equal to the weight of the boat and all it contains.
Downflooding	The point at which water can first enter the interior (non-draining) part of the boat
Draft (Draft)	Vertical distance from the waterline to the lower reference of the boat at a specific reference point along the length of the boat (eg: fwd draft, aft draft, midship draft. Also the depth of water needed to float a boat.
Even Keel	When the draft of a boat fore and aft are the same, or in this case, the keel is horizontal. Also, when the boat is not heeled to port or starboard.
Forward	In, near, or toward the bow of the boat
Freeboard	Distance from the waterline to lowest point of the boat, at it's side, where water could come onboard
FSM	Free Surface Moment. The effect of an entrained fluids surface inertia on the ability of a boat to right itself. Used for calculation purposes.
FSC	Free Surface Correction Used for calculation purposes.

GMT	Transverse Metacentric height. The height of the Transverse Metacentre above the boat's center of Gravity. Used for calculation purposes.
Heel	Angular Inclination of the boat about the longitudinal (front to back) centreline plane either to port or to starboard.
Hull	The structural body of a boat; including shell plating, framing, decks, bulkheads within this envelope
Hull WS	Hull Wetted Surface
Keel	The principal forward and aft component of the boat's framing, located along the centerline of the bottom.
KG	Height of the centre of gravity above a given reference, in this case, baseline. Used for calculation purposes.
KML	Height of the Longitudinal Metacentre above a given reference, in this case, baseline. Used for calculation purposes.
KMT	Height of the Transverse Metacentre above a given reference, in this case, baseline. Used for calculation purposes.
LCB	Longitudinal Center of Buoyancy. The longitudinal distance from the center of the volume of water displaced by the boat's hull to a determined reference plane. LCB in the Intact and Damaged Static Stability Conditions is referenced to the midship (middle between front and back) plane of the boat.
LCF	Longitudinal Centre of Floatation. The longitudinal distance from the point in the boat's waterplane through which the axis of rotation passes when the boat is inclined in the forward and aft direction (front to back) to a determined reference plane. LCF in the Intact and Damaged Static Stability Conditions is referenced to the midship (middle between front and back) plane of the boat [positive (+'ve) forward, negative (-'ve) aft.] Used for calculation purposes.
LCG	Longitudinal Center of Gravity. The longitudinal distance from the center of gravity of an object to a determined reference plane. LCG in the Intact and Damaged Static Stability Conditions is referenced to the midship (middle between front to back) plane of the boat [positive (+'ve) forward, negative (-'ve) aft]. Used for calculation purposes.
Master (Operator)	The person who is responsible for the operation of the boat and ensures that all crew and supernumeraries are trained to the appropriate level. The person who is in charge of the boat during an emergency incident.

Metacentre (M)	The point where the line of the buoyancy force of the boat in the heeled position intersects the line of the buoyancy force of the boat in the upright position, usually on the boat's vertical centreline plane.
Midships	Approximately in the location equidistant from the bow and stern (front and back) of the boat.
MCT1	Moment to Change Trim 1 unit (1 inch or 1 cm). Used for calculation purposes.
Pitching	The dynamic motion of the boat as it rocks back and forth from forward (front) end to after (back) end about the midship (middle) line of the boat.
Port	Left side of the boat when standing on deck looking forward.
RA (also GZ)	Righting Arm. The lever arm of the righting moment (torque) used by the boat to right itself. Used for calculation purposes.
RA Area	Righting Arm Area. Indicates the amount of energy required to heel the boat to a given angle of heel, and in turn, return the boat back to the upright position. Used for calculation purposes.
Rolling	The dynamic motion of the boat as it rocks from side to side about the longitudinal (front to back) centerline of the boat.
SP GR (sg)	Specific Gravity. The ratio of the density of a material to the density of freshwater (sg of seawater=1.025). Used for calculation purposes.
Starboard	Right side of the boat when standing on deck looking forward.
Stern	Back of the boat
TCB	Transverse Center of Buoyancy. The transverse distance from the center of the volume of water displaced by the boat's hull to a determined reference plane. TCB in the Intact and Damaged Static Stability Conditions is referenced to the forward to aft (front to back) vertical centerline plane of the boat [positive (+'ve) to starboard, negative (-'ve) to port]. Used for calculation purposes.
TCG	Transverse Center of Gravity. The transverse distance from the center of gravity of an object to a determined reference plane. TCG in the Intact and Damaged Static Stability Conditions is referenced to the forward to aft (front to back) vertical centerline plane of the boat [positive (+'ve) to starboard, negative (-'ve) to port]. Used for calculation purposes.
Tonnage (Gross or Net)	A volume measurement of 100 cubic feet (2.832 m ³). One (1) tonnage unit equals 100 cubic feet or 2.832 m ³ Used for calculation purposes.
TP1	Weight per unit of immersion. The weight (in tonnes or long tons) of fluid displaced by the boat sinking 1 unit (1 inch or 1 cm) into the fluid. Used for calculation purposes.

Trim	Defines the longitudinal (front to back) inclination of the boat. The difference between the forward and aft (front and back) Drafts at defined reference points.
VCB	Vertical Center of Buoyancy. The vertical distance from the center of the volume of water displaced by the boat's hull to a determined reference plane. VCB in the Intact and Damaged Static Stability Conditions is referenced to the baseline [positive (+'ve) upward, negative (-'ve) downward]. Used for calculation purposes.
VCG	Vertical Center of Gravity. The vertical distance from the center of gravity of an object to a determined reference plane. VCG in the Intact and Damaged Static Stability Conditions is referenced to the baseline [positive (+'ve) upwards, negative (-'ve) downwards]. Used for calculation purposes.