

# Halifax Shipyard

*A Division of Irving Shipbuilding Inc.*

## MSPV MS VARIANT

FINAL  
TRIM AND STABILITY BOOKLET  
For  
MSPV "PRIVATE ROBERTSON V.C."  
HALIFAX SHIPYARD HULL 6094

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<u>SYMBOL / WORD</u>	<u>DESCRIPTION</u>
a	Aft of frame 0 (+ value)
ABL	Above Baseline
abs	Absolute
AE	Aft End
AP	After Perpendicular (FR 1)
C&P Variant	Conservation and Protection Variant
Critical Points FLOOD	Locations where unrestricted down flooding could occur
CRTPT(n)	Location where unrestricted down flooding could occur
Cu. M. or m <sup>3</sup>	Cubic metres
deg	Degree
f	Forward of frame 0 (- value)
FE	Forward End
Flood	Angle at which unrestricted down flooding could occur
FP	Forward Perpendicular (FR 40.722)
FR	Frame
FSC	Free Surface Correction
FSM	Free Surface Moment
GFE	Government Furnished Equipment
GHS 11.00	General HydroStatics Program, version 11.00
GM	Transverse Metacentric Height
GM (fluid) or GMT	"Fluid" Transverse Metacentric Height
GML	Height of Longitudinal Metacentre above the Centre of Gravity
GZ	Transverse Righting Arm
IACS	International Association of Classification Societies
IMO	International Maritime Organization
KM <sub>T</sub> or KMT	Height of Transverse Metacentre above the moulded baseline
KML	Height of Longitudinal Metacentre above the moulded baseline
KN	Transverse Righting Levers (VCG = 0)
L. Mmt.	Longitudinal Moment (weight x distance)
LBM	Length Between Marks (36.70 m)
LCB	Longitudinal Centre of Buoyancy relative to frame 0

<u>SYMBOL / WORD</u>	<u>DESCRIPTION</u>
LCF	Longitudinal Centre of Flotation relative to frame 0
LCG	Longitudinal Centre of Gravity relative to frame 0
m	Metre
MCT	Moment (tonne-metre) to change trim one centimetre
mm	Millimetre
Moulded	Dimension measured to the inside of the hull plating
MS Variant	Maritime Security Variant
MSPV	Mid Shore Patrol Vessel
MT	Metric tonne
p	Port (- value)
RHIB	Rigid Hull Inflatable Boat
s	Starboard (+ value)
sg	Specific Gravity
Stbd	Starboard
T. Mmt.	Transverse Moment (weight x distance)
T <sub>A</sub>	Trim change aft
TCG	Transverse Centre of Gravity relative to the ship's centreline
T <sub>F</sub>	Trim change forward
T <sub>m</sub>	Mean Draft
TPC	Tonne per centimetre immersion
T <sub>T</sub>	Trim Change
V. Mmt.	Vertical Moment (weight x distance)
VCB	Vertical Centre of Buoyancy relative to the moulded baseline
VCG	Vertical Centre of Gravity relative to the moulded baseline
VCG (fluid)	Vertical Centre of Gravity relative to the moulded baseline including free surface effects
θ	Heel angle in degrees

## Section 1. INTRODUCTION

The Lightship weight and centre used in this document is derived from an inclining experiment conducted by Halifax Shipyard on June 10, 2012. An approved copy of that report can be found in Annex A at the end of this document.

The void space between frames 0 and 1 within the steering gear compartment is filled with a polyurethane foam product (Demilec B352-0) and is thus considered intact under all conditions.

The stability model was developed from Dwg. No. 6094-89940-07\_0, “Offset Table”.

Stability calculations were performed using the program General HydroStatics (GHS) version 11.00.

The reference origin used throughout this document is as follows:

- |                |             |                    |
|----------------|-------------|--------------------|
| - Longitudinal | Frame 0,    | positive aft       |
| - Transverse   | Centerline, | positive starboard |
| - Vertical     | Baseline,   | positive above     |

Stability has been assessed against the criteria of TP 7301E, Stability, Subdivision, and Load Line Standards, Part I, STAB 7, Amendment No. 21, Sept 1989.

The vessel has adequate stability for the operational modes considered in this document, provided that all of the recommendations made in this document are adhered to.

Down flooding does not occur below 40 degrees of heel at any displacement between 210 and 300 tonne for trims ranging from 0.5m by the stern to 0.5m by the bow.



## Section 2. VESSEL DESCRIPTION AND GENERAL PARTICULARS

The vessel is a semi-displacement high speed steel mono hull vessel for coastal and offshore service suitable for sustained operations out to 120 nautical miles offshore.

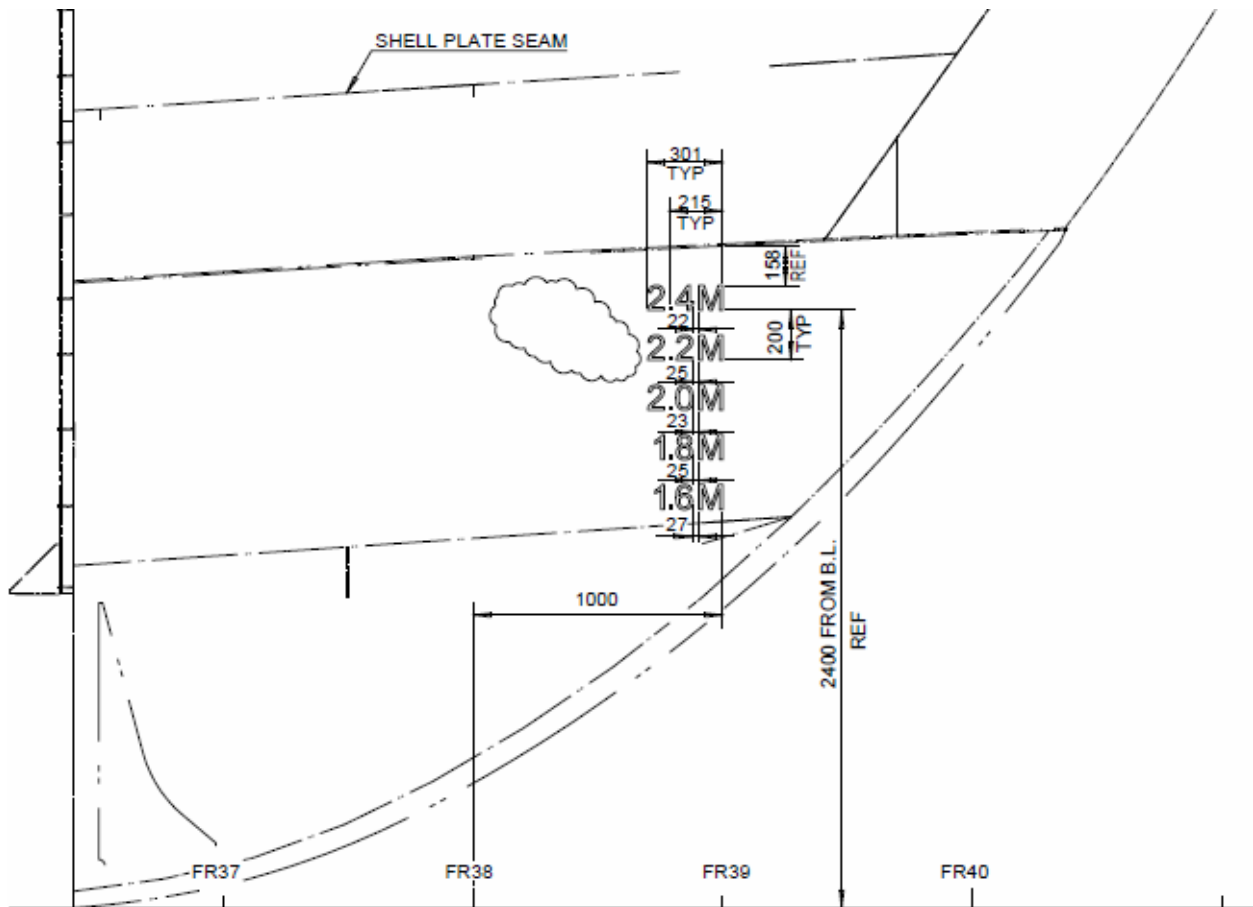
The MS variant of the MSPV is outfitted with two Zodiac H753 OB RHIBs. The C&P variant of the MSPV is outfitted with only a single Zodiac H753 OB RHIB, fitted on the port side.

The MSPV will operate on both coasts and on the Great Lakes and St. Lawrence Seaway. The operational area extends from Canada's southern border to approximately 55 degrees North latitude.

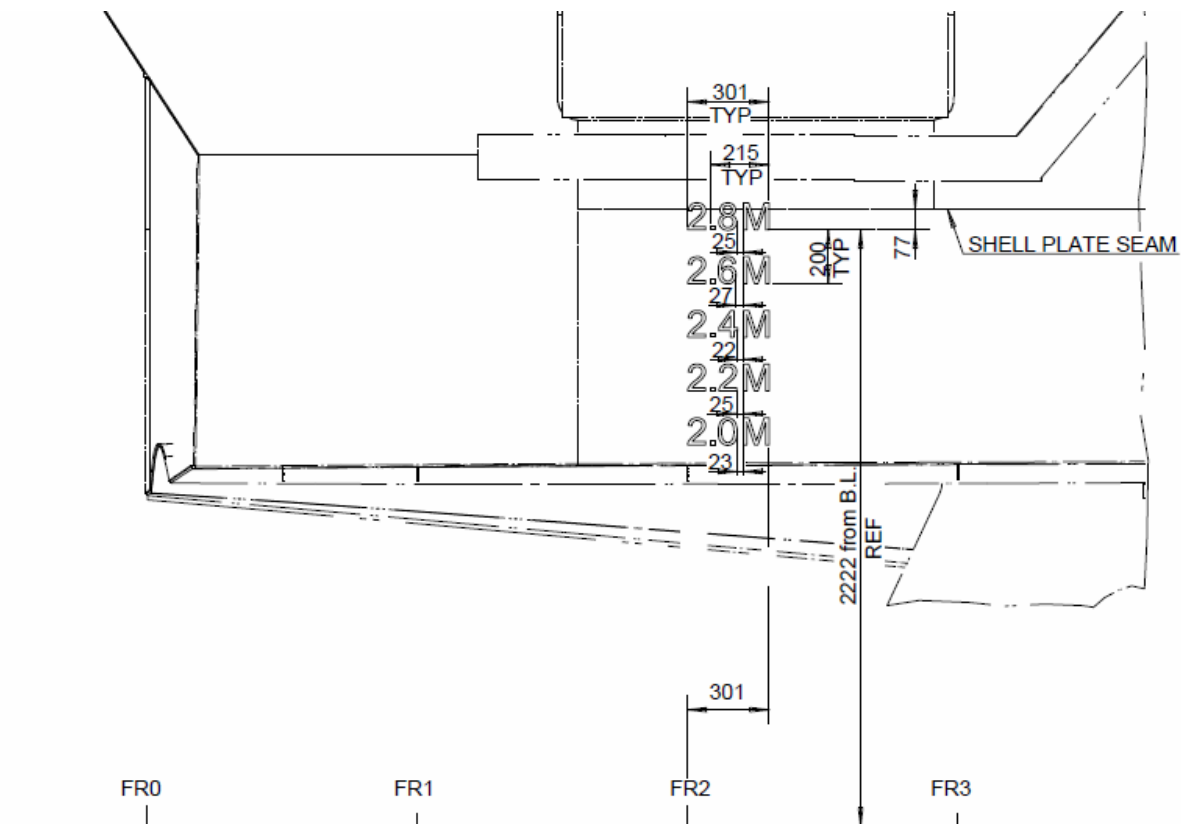
Vessel Name	PRIVATE ROBERTSON V.C.	
Port of Registry	Ottawa	
IMO Number	9586033	
Builders Hull Number	6094	
Keel Laid Date	April 2, 2011	
Class Notation	✱100A1 SSC Patrol, Mono, HSC, G4, MCH, UMS, PSMR, CCS, ICC, (EP)	
Voyage Class	Near Coastal Voyage, Class 1, Limited Home Trade 2	
Principal Design Dimensions	Length Overall	42.800 m
	Length Between Perpendiculars	39.722 m
	Length Between Draft Marks	36.700 m
	Breadth (moulded)	7.000 m
	Depth (moulded)	3.818 m
	Least Moulded Depth (FR 14)	3.771 m
	Depth at Centerline (FR 14)	3.910 m
	Frame Spacing (throughout)	1.000 m
	Load Line Draft (All Season)	2.218 m ABL
	Extreme Appendage Draft	2.796 m (no trim)
	Location of Load Line Mark	FR 20.861
	Displacement at All Season Load Line	266.8 tonne (no trim)
	Gross Tonnage / Net Tonnage	253 / 76
Lightship Particulars	Displacement	220.30 tonne
	LCG fwd of FR 0	16.069 m
	VCG above Baseline	3.145 m
	TCG	0.009 m stbd

## Section 3. DRAFT MARKS

Forward draft marks are centered at 150 mm aft of FR 39 with 0 draft at Baseline. After draft marks are centered at 150 mm forward of FR 2 with 0 draft at 578 mm below Baseline.



**ELEVATION LOOKING TO PORT**  
SHOWING STARBOARD SIDE FWD DRAFT MARKS



## ELEVATION LOOKING TO PORT

SHOWING STARBOARD SIDE AFT DRAFT MARKS

#### Section 4. NOTES REGARDING STABILITY AND LOADING OF THE VESSEL

Compliance with the stability criteria indicated 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.

Care should be taken to ensure that the cargo allocated to the vessel is capable of being stowed so that compliance with the criteria can be achieved. If necessary, the amount should be limited to the extent that ballast weight may be required.

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.

Hatches, doors, etc. which give access to the main deck should be kept closed during navigation, except when necessarily opened for the working of the vessel, and should always be ready for immediate closure and be clearly marked to indicate that these fittings are to be kept closed except for access. Flush hatches to the: fore peak; chain locker void; main machinery room; auxiliary machinery room; and forward deck house at the Bridge Deck level should be kept closed while the vessel is at sea.

Hinged watertight doors in bulkheads at frames 4, 9, 17, 25 and 31 are to be kept closed at sea except when opened for access.

When the danger of ice formation arises immediate steps should be taken to remove the ice from large surfaces of the vessel, beginning with the upper structures. All the means for combating ice formation should be ready for use.

Ice accretion for the vessel has been calculated in accordance TP 7301E, Stability, Subdivision, and Load Line Standards, Part I, STAB 7 as follows:

- 54 kg / m<sup>2</sup> of total deck area, including the superstructure and deck house tops that are exposed to the weather;
- 37 kg / m<sup>2</sup> of area exposed to the weather in the case of the superstructure and deckhouse fronts, and the deckhouse sides and bulwarks including the area of the deckhouse sides and bulwarks on both sides of the vessel except that only the inboard surfaces shall be included in computing the bulwark areas;
- 78kg / m<sup>2</sup> of area, taking into consideration overall block dimensions, in the case of the guardrails and stanchions, hatch coamings, companionways and ship fittings exposed to the weather; and
- 48 kg / m in the case of rigging, masts, derricks and similar high objects measured to a height of 6.1m above the main weather deck.

The resulting ice load is approximately 32.65 Tonne. Refer to Section 10 for details. Excessive ice accretion must be avoided and all opportunities to remove ice shall be utilized.

Loading conditions including ice accretion are only intended to show compliance with the stability criteria.

Freeing ports should be kept clear of debris and ice accretion at all times.

The number of partially filled or slack tanks should be kept to a minimum because of their adverse effect on stability.

The down flooding points used in the calculation of stability for this vessel are listed below.

<u>Critical Pt Number</u>	<u>Critical Point Description</u>	<u>Critical Point Location Long, Transv, Vert</u>
CRTPT(1)	"Steering Gear Comp Exh",	0.245a,0.297s,4.711
CRTPT(2)	"Steering Gear Comp Sup",	3.176f,0.466s,4.919
CRTPT(3)	"Bow Thruster Room Exh",	32.450f,2.666p,5.100
CRTPT(4)	"Bow Thruster Room Sup",	32.450f,2.666s,5.100
CRTPT(5)	"Fore Peak Store Sup",	40.258f,1.123p,5.604
CRTPT(6)	"Fore Peak Store Exh",	38.587f,1.604s,5.466
CRTPT(7)	"Chain Locker Void Sup",	36.539f,1.978p,5.336
CRTPT(8)	"Chain Locker Void Exh",	37.270f,1.944s,5.372
CRTPT(9)	"HVAC Room Exh",	31.338f,1.968p,6.186
CRTPT(10)	"HVAC Room AHU Sup",	30.504f,2.174p,5.443
CRTPT(11)	"HVAC Room Sup",	30.198f,2.173s,6.047
CRTPT(12)	"Washroom FR 26 Exh",	26.598f,2.522s,5.453
CRTPT(13)	"Staircase Exh",	20.603f,2.441s,6.079
CRTPT(14)	"FO Spill Ctrl Lkr Sup",	19.747f,2.452s,5.750
CRTPT(15)	"Strway&Linen-Laundry Sup",	19.746f,2.575s,5.150
CRTPT(16)	"Med Equip & SAR Lkr Exh",	18.533f,2.680p,4.717
CRTPT(17)	"FO Spill Ctrl Lkr Exh",	18.148f,2.457s,5.750
CRTPT(18)	"Linen-Laundry Cent St Exh",	18.248f,2.558s,5.376
CRTPT(19)	"Galley Exh",	17.243f,2.554p,5.424
CRTPT(20)	"Washroom Exh",	16.236f,2.396s,5.680
CRTPT(21)	"Emerg Generator Comp Exh",	13.822f,1.790s,7.141
CRTPT(22)	"Emerg Generator Comp Sup",	13.335f,2.489s,5.071
CRTPT(23)	"Emerg Generator Comp Sup",	12.690f,2.489s,5.071
CRTPT(24)	"Emerg Generator Comp Exh",	12.575f,0.863s,4.270
CRTPT(25)	"Wet Gear Store Room Exh",	12.488f,2.553p,5.524
CRTPT(26)	"Wet Gear Store Room Sup",	12.435f,1.171p,5.927
CRTPT(27)	"Trash Compactor Exh",	11.762f,2.461s,6.079
CRTPT(28)	"Aux Mach Room Sup Port",	11.148f,2.487p,5.055
CRTPT(29)	"Aux Mach Room Sup Stbd",	11.148f,2.487s,5.055
CRTPT(30)	"Main Mach Room Sup Port",	11.215f,1.200p,5.808
CRTPT(31)	"Main Mach Room Sup Stbd",	11.215f,1.200s,5.808
CRTPT(32)	"Main Mach Room Exh Port",	8.748f,0.643p,4.877
CRTPT(33)	"Main Mach Room Exh Stbd",	8.748f,0.643s,4.877
CRTPT(34)	"Main Mach Room Exh Port",	8.202f,0.509p,4.877
CRTPT(35)	"Main Mach Room Exh Stbd",	8.202f,0.509s,4.877
CRTPT(36)	"Aux Mach Room Exh Port",	7.750f,0.404p,4.877
CRTPT(37)	"Aux Mach Room Exh Stbd",	7.750f,0.404s,4.877
CRTPT(38)	"Aux Mach Room Exh",	7.498f,0.000,4.877
CRTPT(39)	"Battery Locker Exh Port",	23.823f,1.275p,8.554
CRTPT(40)	"Battery Locker Exh Stbd",	23.823f,1.275s,8.554
CRTPT(41)	"Battery Locker Sup",	24.092f,0.446s,6.511
CRTPT(42)	"Washroom FR 30-31 Exh",	30.429f,1.250s,7.108

## Section 5. STABILITY CRITERIA

The vessel has been assessed against the stability criteria presented below.

### STAB 7

LIM(1)The area under the righting arm curve (GZ curve) shall not be less than 0.055 metre-radians up to 30 degrees angle of heel.

LIM(2)The area under the righting arm curve (GZ curve) shall not be less than 0.090 metre-radians up to 40 degrees angle of heel or the angle of down flooding if this is less than 40 degrees.

LIM(3)The area under the righting arm curve (GZ curve) shall not be less than 0.030 metre-radians between 30 degrees angle of heel and 40 degrees angle of heel or the angle of down flooding if this is less than 40 degrees.

LIM(4)The righting arm (GZ) shall be at least 0.20m at an angle of heel equal to or greater than 30 degrees.

LIM(5)The maximum righting arm (GZ) shall occur at an angle of heel preferably exceeding 30 degrees but not less than 25 degrees.

LIM(6)The initial metacentric height (GM) shall not be less than 0.15m.

The minimum freeboard at the stern in all operating conditions shall not be less than 0.01L or the assigned summer freeboard, whichever is less.

## Section 6. MAXIMUM VCG

Maximum (fluid) VCG's for displacements from 210 to 300 tonne for seawater ( $sg = 1.025$ ) and fresh water ( $sg = 1.000$ ) at 0.50m Baseline trim aft, 0.25m Baseline trim aft, Level Baseline trim, 0.25m Baseline trim forward, 0.50m Baseline trim forward have been provided based on the stability criteria of STAB 7. Maintenance of the vessel's VCG (fluid) below the curves will ensure compliance with the preceding stability criteria.

MAXIMUM VCG vs. DISPLACEMENT								
Trim = Aft 0.500/36.700 at zero heel (trim righting arm held at zero)								
Displacement		Margins						
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.512	52%	33%	20%	13%	0d	426%	
215.00	3.527	45%	26%	14%	8%	0d	390%	
220.00	3.541	38%	20%	6%	4%	0d	361%	
225.00	3.554	32%	14%	0%	0%	0d	329%	
230.00	3.546	31%	13%	0%	1%	1d	312%	
235.00	3.538	30%	13%	0%	2%	2d	297%	
240.00	3.530	29%	12%	0%	3%	2d	287%	
245.00	3.520	28%	12%	0%	4%	2d	274%	
250.00	3.512	28%	11%	0%	5%	2d	262%	
255.00	3.502	27%	11%	0%	6%	2d	251%	
260.00	3.493	27%	11%	0%	6%	2d	245%	
265.00	3.483	26%	11%	0%	7%	2d	237%	
270.00	3.472	26%	10%	0%	8%	2d	229%	
275.00	3.462	26%	10%	0%	8%	2d	223%	
280.00	3.451	26%	10%	0%	9%	2d	220%	
285.00	3.440	26%	10%	0%	9%	2d	215%	
290.00	3.428	26%	10%	0%	10%	2d	211%	
295.00	3.416	26%	10%	0%	10%	1d	208%	
300.00	3.404	26%	11%	0%	10%	1d	206%	
Trim = Aft 0.250/36.700 at zero heel (trim righting arm held at zero)								
Displacement		Margins						
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.498	53%	34%	21%	11%	0d	448%	
215.00	3.510	47%	28%	15%	7%	0d	413%	
220.00	3.522	41%	23%	10%	4%	0d	380%	
225.00	3.538	35%	16%	3%	0%	0d	350%	
230.00	3.537	32%	14%	1%	0%	1d	329%	
235.00	3.533	30%	13%	0%	0%	4d	309%	
240.00	3.526	29%	12%	0%	1%	4d	298%	
245.00	3.519	28%	12%	0%	2%	2d	283%	
250.00	3.511	28%	11%	0%	3%	2d	270%	
255.00	3.503	27%	11%	0%	4%	2d	258%	
260.00	3.494	27%	11%	0%	5%	2d	251%	
265.00	3.485	26%	10%	0%	6%	2d	241%	
270.00	3.476	26%	10%	0%	7%	2d	233%	
275.00	3.466	26%	10%	0%	7%	2d	225%	
280.00	3.457	26%	10%	0%	8%	2d	221%	
285.00	3.447	26%	10%	0%	9%	2d	215%	
290.00	3.436	26%	10%	0%	9%	2d	211%	
295.00	3.425	26%	10%	0%	10%	1d	207%	
300.00	3.414	26%	10%	0%	10%	1d	205%	

continued next page



Trim = zero at zero heel (trim righting arm held at zero)								
Displacement			Margins					
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.487	53%	33%	20%	8%	0d	470%	
215.00	3.498	48%	28%	15%	6%	4d	435%	
220.00	3.510	42%	24%	10%	3%	4d	406%	
225.00	3.521	37%	19%	5%	0%	0d	374%	
230.00	3.520	35%	17%	4%	0%	4d	351%	
235.00	3.520	32%	15%	2%	0%	4d	329%	
240.00	3.519	30%	13%	1%	0%	4d	312%	
245.00	3.514	29%	12%	0%	1%	4d	296%	
250.00	3.508	28%	12%	0%	2%	4d	281%	
255.00	3.501	27%	11%	0%	3%	3d	268%	
260.00	3.494	27%	11%	0%	4%	3d	259%	
265.00	3.486	26%	11%	0%	5%	2d	249%	
270.00	3.478	26%	10%	0%	5%	2d	239%	
275.00	3.469	26%	10%	0%	6%	2d	233%	
280.00	3.460	26%	10%	0%	7%	2d	225%	
285.00	3.451	26%	10%	0%	8%	2d	219%	
290.00	3.441	26%	10%	0%	8%	2d	214%	
295.00	3.432	26%	10%	0%	9%	2d	211%	
300.00	3.422	26%	10%	0%	10%	1d	207%	

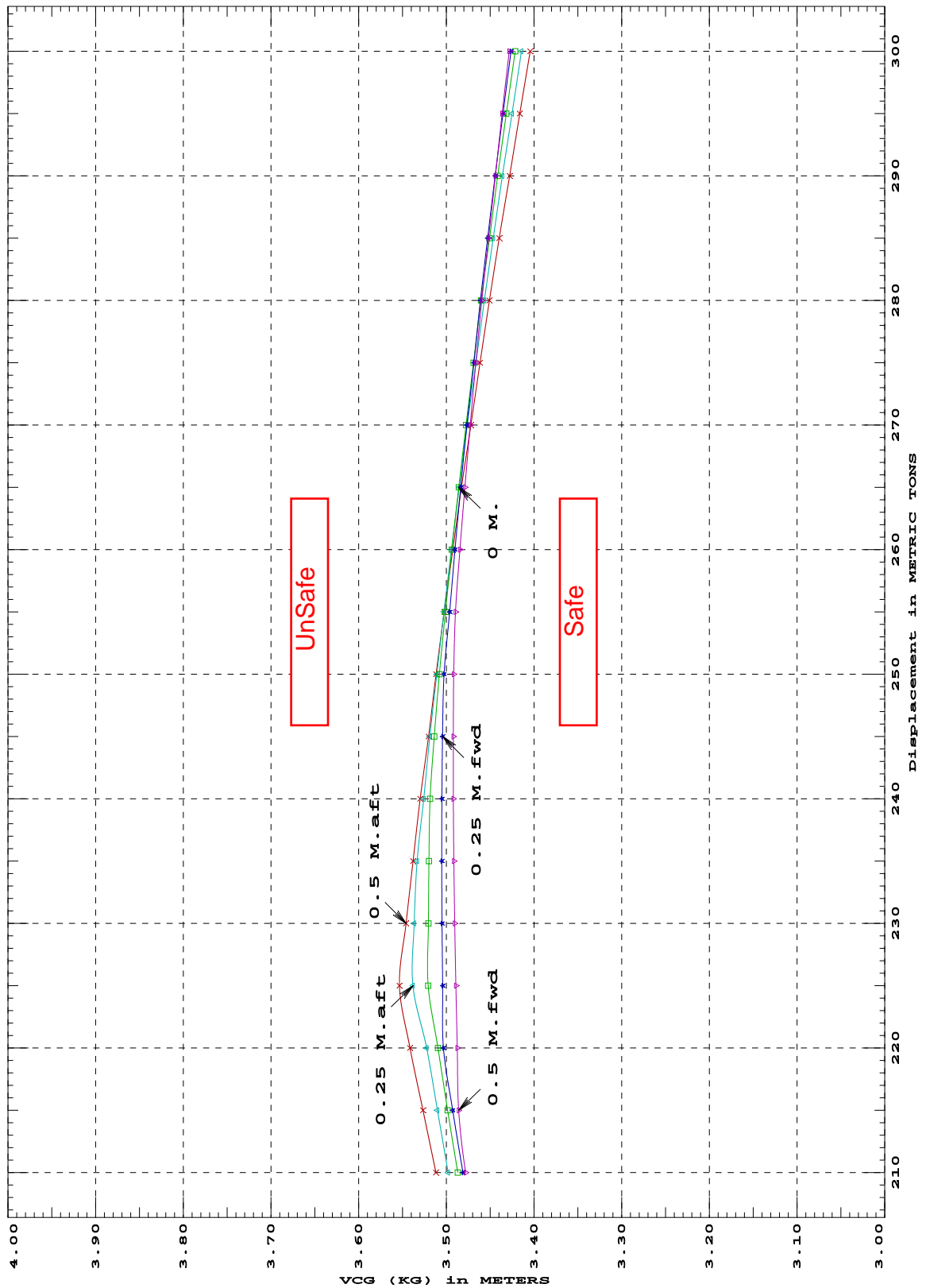
  

Trim = Fwd 0.250/36.700 at zero heel (trim righting arm held at zero)								
Displacement			Margins					
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.481	51%	31%	16%	5%	0d	489%	
215.00	3.493	46%	27%	12%	2%	0d	453%	
220.00	3.503	42%	22%	8%	0%	2d	423%	
225.00	3.504	39%	20%	6%	0%	5d	398%	
230.00	3.505	37%	19%	5%	0%	5d	373%	
235.00	3.505	34%	17%	4%	0%	5d	354%	
240.00	3.505	32%	15%	2%	0%	4d	333%	
245.00	3.504	30%	13%	1%	0%	4d	313%	
250.00	3.503	29%	12%	0%	0%	4d	296%	
255.00	3.496	28%	11%	0%	1%	4d	284%	
260.00	3.490	27%	11%	0%	2%	3d	271%	
265.00	3.484	27%	11%	0%	3%	3d	260%	
270.00	3.477	27%	11%	0%	4%	3d	251%	
275.00	3.469	26%	11%	0%	5%	2d	242%	
280.00	3.461	26%	10%	0%	6%	2d	234%	
285.00	3.453	26%	10%	0%	7%	2d	228%	
290.00	3.444	26%	10%	0%	7%	2d	222%	
295.00	3.435	26%	10%	0%	8%	2d	216%	
300.00	3.426	26%	10%	0%	9%	2d	213%	

continued next page

Trim = Fwd 0.500/36.700 at zero heel (trim righting arm held at zero)								
Displacement			Margins					
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.478	49%	28%	12%	2%	0d	508%	
215.00	3.486	45%	25%	9%	0%	0d	477%	
220.00	3.488	43%	23%	8%	0%	5d	449%	
225.00	3.489	40%	21%	7%	0%	5d	423%	
230.00	3.490	38%	20%	6%	0%	5d	400%	
235.00	3.491	36%	18%	5%	0%	5d	377%	
240.00	3.492	34%	16%	4%	0%	4d	355%	
245.00	3.492	32%	15%	2%	0%	4d	336%	
250.00	3.492	30%	13%	1%	0%	4d	318%	
255.00	3.490	29%	12%	0%	0%	4d	301%	
260.00	3.484	28%	12%	0%	1%	3d	289%	
265.00	3.479	28%	11%	0%	2%	3d	276%	
270.00	3.473	27%	11%	0%	3%	3d	266%	
275.00	3.466	27%	11%	0%	4%	3d	256%	
280.00	3.460	27%	11%	0%	5%	2d	248%	
285.00	3.452	27%	11%	0%	6%	2d	240%	
290.00	3.444	27%	11%	0%	6%	2d	233%	
295.00	3.436	27%	11%	0%	7%	2d	227%	
300.00	3.428	27%	11%	0%	8%	2d	222%	
Distances in METERS.—Specific Gravity = 1.025.—d = degrees.—								
LIM	STAB 7 CRITERION					Min/Max		
(1) Area from 0 deg to 30						>	0.0550 m.-Rad	
(2) Area from 0 deg to 40 or Flood						>	0.0900 m.-Rad	
(3) Area from 30 deg to 40 or Flood						>	0.0300 m.-Rad	
(4) Righting Arm at 30 deg						>	0.200 m.	
(5) Absolute Angle at MaxRA						>	25.00 deg	
(6) GM at 0 deg						>	0.150 m.	

STAB 7 criterion MAXIMUM VCG (KG)  
at various trims (initial)



Specific Gravity = 1.025 "K" = BASELINE  
Trim is per 36.7 M.

MAXIMUM VCG vs. DISPLACEMENT								
Trim = Aft 0.500/36.700 at zero heel (trim righting arm held at zero)								
Displacement		Margins						
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.529	44%	26%	13%	8%	0d	387%	
215.00	3.545	37%	19%	5%	3%	0d	356%	
220.00	3.553	32%	14%	0%	0%	0d	328%	
225.00	3.545	31%	13%	0%	1%	2d	310%	
230.00	3.537	30%	13%	0%	2%	2d	295%	
235.00	3.528	29%	12%	0%	3%	2d	284%	
240.00	3.519	28%	12%	0%	4%	2d	271%	
245.00	3.510	27%	11%	0%	5%	2d	259%	
250.00	3.500	27%	11%	0%	6%	2d	249%	
255.00	3.490	27%	11%	0%	7%	2d	243%	
260.00	3.480	26%	11%	0%	7%	2d	234%	
265.00	3.469	26%	10%	0%	8%	2d	227%	
270.00	3.458	26%	10%	0%	8%	2d	220%	
275.00	3.447	26%	10%	0%	9%	2d	218%	
280.00	3.435	26%	10%	0%	9%	2d	213%	
285.00	3.423	26%	10%	0%	10%	1d	210%	
290.00	3.411	26%	10%	0%	10%	1d	207%	
295.00	3.399	26%	11%	0%	10%	1d	208%	
300.00	3.386	27%	11%	0%	10%	1d	207%	
Trim = Aft 0.250/36.700 at zero heel (trim righting arm held at zero)								
Displacement		Margins						
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.510	47%	28%	15%	7%	0d	412%	
215.00	3.523	41%	22%	9%	4%	0d	383%	
220.00	3.538	34%	16%	2%	0%	0d	348%	
225.00	3.536	32%	14%	1%	0%	1d	326%	
230.00	3.532	30%	13%	0%	1%	4d	307%	
235.00	3.525	29%	12%	0%	2%	4d	295%	
240.00	3.517	28%	12%	0%	3%	2d	280%	
245.00	3.509	28%	11%	0%	4%	2d	267%	
250.00	3.501	27%	11%	0%	4%	2d	256%	
255.00	3.492	26%	11%	0%	5%	2d	248%	
260.00	3.483	26%	10%	0%	6%	2d	238%	
265.00	3.473	26%	10%	0%	7%	2d	230%	
270.00	3.463	26%	10%	0%	8%	2d	223%	
275.00	3.453	26%	10%	0%	8%	2d	219%	
280.00	3.442	26%	10%	0%	9%	2d	213%	
285.00	3.432	26%	10%	0%	9%	1d	209%	
290.00	3.420	26%	10%	0%	10%	1d	205%	
295.00	3.409	26%	10%	0%	10%	1d	204%	
300.00	3.397	26%	11%	0%	11%	1d	202%	

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Trim = zero at zero heel (trim righting arm held at zero)								
Displacement		Margins						
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.499	47%	28%	15%	5%	4d	433%	
215.00	3.510	42%	23%	10%	3%	4d	403%	
220.00	3.521	37%	19%	5%	0%	4d	371%	
225.00	3.520	34%	17%	4%	0%	4d	348%	
230.00	3.520	32%	15%	2%	0%	4d	326%	
235.00	3.518	30%	13%	0%	0%	4d	309%	
240.00	3.513	29%	12%	0%	1%	4d	293%	
245.00	3.506	28%	12%	0%	2%	3d	278%	
250.00	3.499	27%	11%	0%	3%	3d	268%	
255.00	3.491	27%	11%	0%	4%	3d	256%	
260.00	3.483	26%	11%	0%	5%	3d	246%	
265.00	3.474	26%	10%	0%	6%	3d	237%	
270.00	3.465	26%	10%	0%	7%	2d	231%	
275.00	3.456	26%	10%	0%	8%	2d	224%	
280.00	3.446	26%	10%	0%	8%	2d	217%	
285.00	3.436	26%	10%	0%	9%	2d	214%	
290.00	3.426	26%	11%	0%	10%	1d	210%	
295.00	3.415	27%	11%	0%	10%	1d	206%	
300.00	3.405	27%	11%	0%	11%	1d	204%	

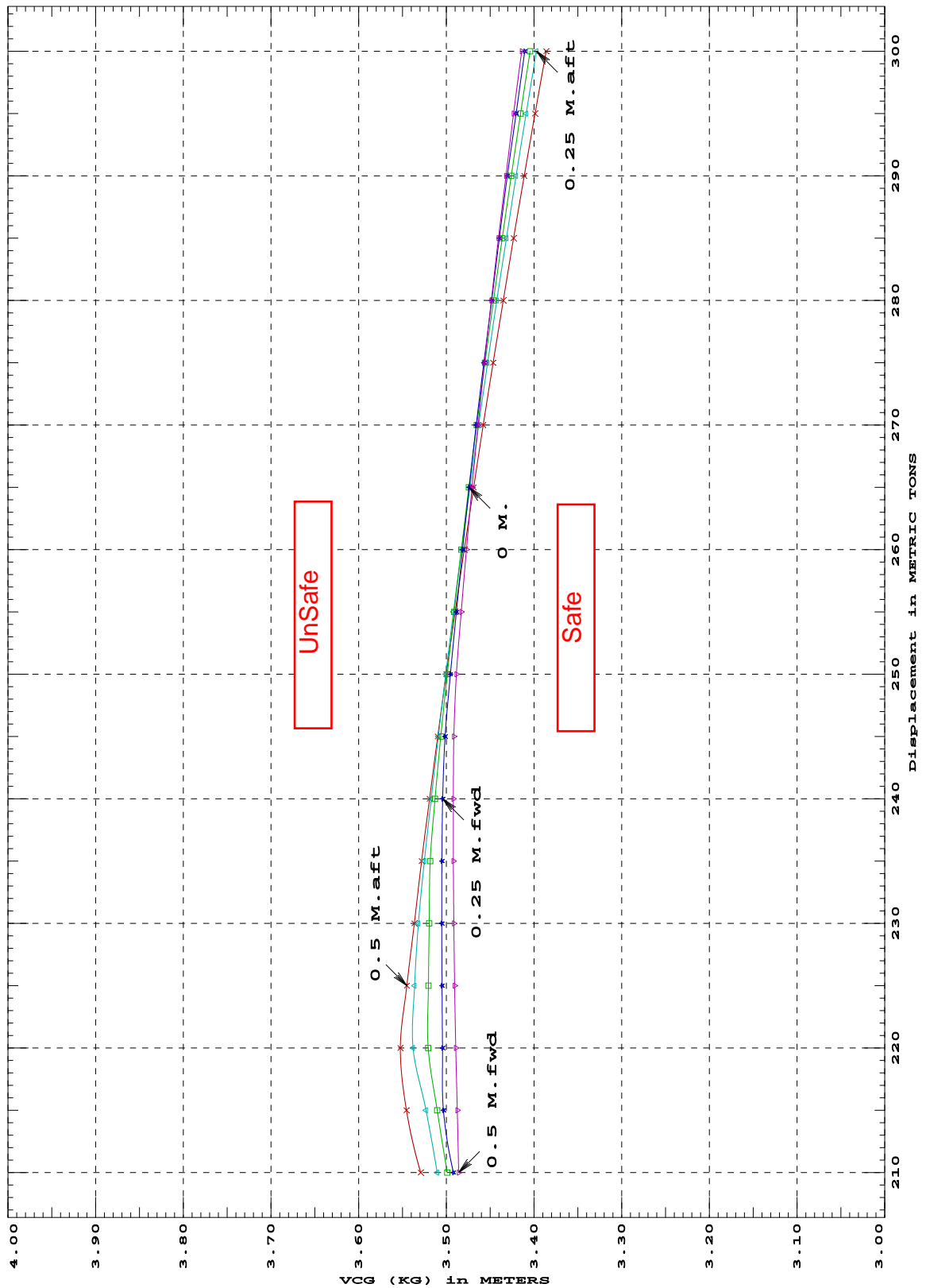
  

Trim = Fwd 0.250/36.700 at zero heel (trim righting arm held at zero)								
Displacement		Margins						
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.492	46%	27%	12%	3%	0d	453%	
215.00	3.503	41%	22%	8%	0%	3d	421%	
220.00	3.504	39%	20%	7%	0%	5d	395%	
225.00	3.505	36%	18%	5%	0%	5d	371%	
230.00	3.505	34%	17%	4%	0%	4d	350%	
235.00	3.505	32%	15%	2%	0%	4d	329%	
240.00	3.504	30%	13%	1%	0%	4d	309%	
245.00	3.501	28%	12%	0%	0%	4d	294%	
250.00	3.495	28%	11%	0%	1%	3d	280%	
255.00	3.489	27%	11%	0%	3%	3d	268%	
260.00	3.481	27%	11%	0%	4%	3d	258%	
265.00	3.474	27%	11%	0%	5%	3d	248%	
270.00	3.466	26%	11%	0%	5%	3d	239%	
275.00	3.457	26%	11%	0%	6%	2d	232%	
280.00	3.448	26%	11%	0%	7%	2d	226%	
285.00	3.440	26%	11%	0%	8%	2d	220%	
290.00	3.430	27%	11%	0%	9%	2d	216%	
295.00	3.420	27%	11%	0%	9%	2d	212%	
300.00	3.411	27%	11%	0%	10%	1d	208%	

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Trim = Fwd 0.500/36.700 at zero heel (trim righting arm held at zero)								
Displacement			Margins					
METRIC TONS	Max VCG	LIM1	LIM2	LIM3	LIM4	LIM5	LIM6	
210.00	3.486	45%	25%	9%	0%	1d	476%	
215.00	3.488	42%	23%	8%	0%	5d	447%	
220.00	3.489	40%	21%	7%	0%	5d	420%	
225.00	3.491	38%	20%	6%	0%	5d	397%	
230.00	3.492	36%	18%	5%	0%	4d	373%	
235.00	3.492	34%	16%	3%	0%	4d	351%	
240.00	3.492	32%	15%	2%	0%	4d	332%	
245.00	3.491	30%	13%	1%	0%	4d	314%	
250.00	3.489	29%	12%	0%	0%	3d	298%	
255.00	3.483	28%	12%	0%	1%	3d	285%	
260.00	3.477	28%	11%	0%	2%	3d	273%	
265.00	3.471	27%	11%	0%	3%	3d	263%	
270.00	3.464	27%	11%	0%	4%	3d	253%	
275.00	3.456	27%	11%	0%	5%	3d	245%	
280.00	3.449	27%	11%	0%	6%	2d	237%	
285.00	3.441	27%	11%	0%	7%	2d	231%	
290.00	3.432	27%	11%	0%	8%	2d	225%	
295.00	3.423	27%	11%	0%	8%	2d	221%	
300.00	3.414	28%	11%	0%	9%	1d	217%	
Distances in METERS.—Specific Gravity = 1.000.—d = degrees.—								
LIM	STAB 7 CRITERION					Min/Max		
(1) Area from 0 deg to 30						>	0.0550 m.-Rad	
(2) Area from 0 deg to 40 or Flood						>	0.0900 m.-Rad	
(3) Area from 30 deg to 40 or Flood						>	0.0300 m.-Rad	
(4) Righting Arm at 30 deg						>	0.200 m.	
(5) Absolute Angle at MaxRA						>	25.00 deg	
(6) GM at 0 deg						>	0.150 m.	

STAB 7 criterion MAXIMUM VCG (KG)  
at various trims (initial)



Specific Gravity = 1.000 "K" = BASELINE  
Trim is per 36.7 M.

## Section 7. HYDROSTATIC PROPERTIES AND THE USE OF

Hydrostatic properties are presented for seawater ( $sg = 1.025$ ) and fresh water ( $sg = 1.000$ ) at 0.50m Baseline trim aft, 0.25m Baseline trim aft, Level Baseline trim, 0.25m Baseline trim forward, 0.50m Baseline trim forward. The following are accounted for in the hydrostatic properties presented:

- deduction for forward tunnel thruster;
- deductions for three sea bays;
- additions for rudders and trunks;
- additions for stern tubes and shaft line skegs; and
- mean shell thickness of 6.2mm.

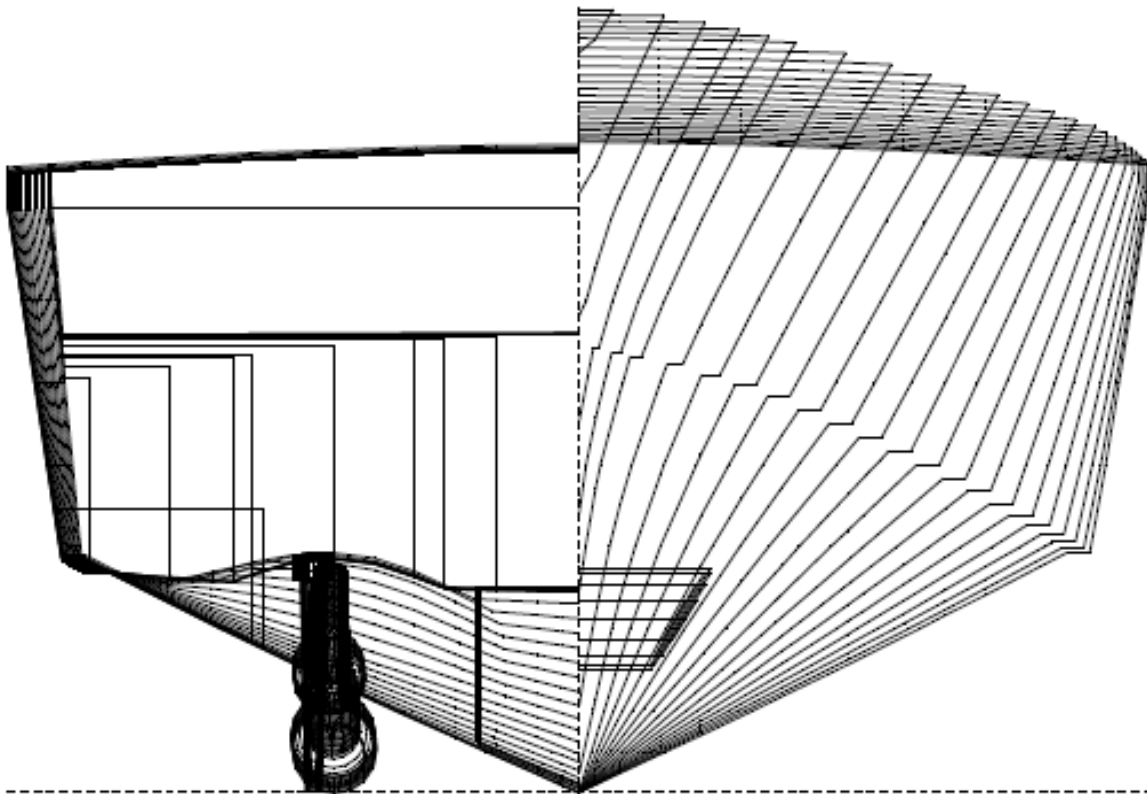
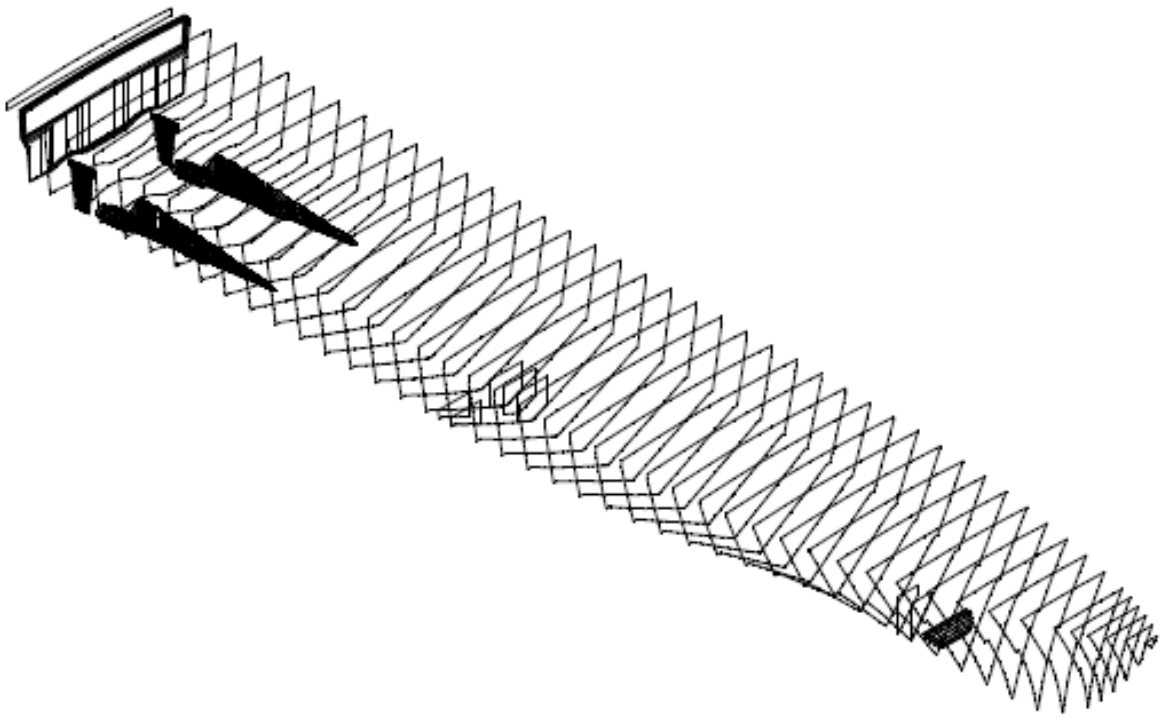
### I. To determine the vessels displacement from known drafts:

- a. Measure the drafts at the forward and after marks.
- b. Determine the mean Baseline draft and Baseline trim.  
 $\text{Draft (Baseline) Aft} = \text{Measured Draft Aft} - 0.578\text{m}$   
 $\text{Draft (Baseline) Fwd} = \text{Measured Draft Fwd}$   
 $\text{Baseline Trim} = \text{Difference (Draft (Baseline) Aft} - \text{Draft (Baseline) Fwd)}$
- c. If an approximate evaluation is desired, hydrostatic properties from the table nearest to the actual trim of the vessel may be used, or
- d. If an accurate evaluation is desired, hydrostatic properties can be interpolated between two tables of hydrostatic properties.

### II To determine the vessels drafts from a calculated displacement and LCG:

- a. Use Stability Worksheets 1 and 2, provided in Section 13, to determine the vessel's displacement and LCG.
- b. From the table of hydrostatic properties at Level Baseline Trim determine the mean draft, LCB, LCF and MCT.
- c. Use Stability Worksheet 3, also provided in Section 13, to determine the Trim, Trim Change Aft and the Trim Change Fwd.
- d. From the calculated trim and the mean draft determine the resulting forward and after drafts.



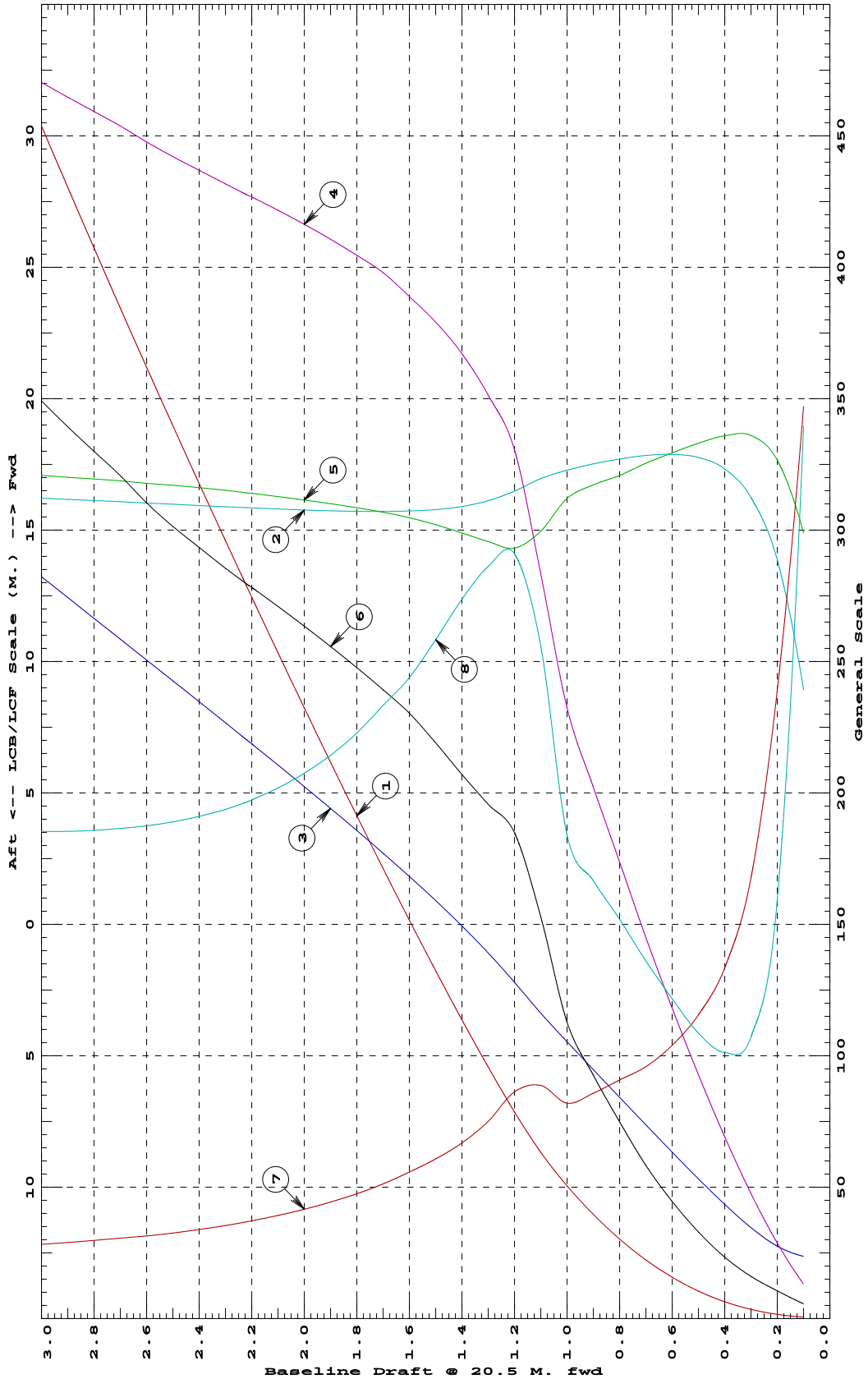


HYDROSTATIC PROPERTIES

Trim: Aft 0.500/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.59	8.921f	0.166	0.07	14.886f	0.11	694.29	6.794
0.200	1.62	13.864f	0.193	0.14	17.661f	0.21	478.49	3.192
0.300	3.52	16.240f	0.242	0.24	18.598f	0.32	335.46	2.143
0.400	6.42	17.328f	0.304	0.35	18.591f	0.47	266.97	2.025
0.500	10.46	17.763f	0.372	0.46	18.306f	0.66	231.21	2.172
0.600	15.73	17.882f	0.443	0.59	17.939f	0.89	207.99	2.434
0.700	22.30	17.839f	0.516	0.72	17.543f	1.16	191.68	2.721
0.800	30.25	17.706f	0.589	0.87	17.082f	1.50	181.58	3.038
0.900	39.63	17.518f	0.663	1.01	16.718f	1.85	171.48	3.332
1.000	50.51	17.282f	0.737	1.16	16.206f	2.26	163.89	3.681
1.100	63.23	16.959f	0.814	1.42	14.965f	3.06	177.44	5.116
1.200	78.62	16.487f	0.896	1.65	14.316f	3.70	172.51	5.819
1.300	95.69	16.121f	0.974	1.76	14.564f	3.91	150.07	5.724
1.400	113.66	15.900f	1.046	1.84	14.889f	4.14	133.67	5.474
1.500	132.35	15.782f	1.113	1.90	15.205f	4.38	121.48	5.166
1.600	151.57	15.728f	1.178	1.94	15.472f	4.61	111.52	4.878
1.700	171.22	15.710f	1.239	1.99	15.678f	4.78	102.55	4.666
1.800	191.28	15.716f	1.300	2.02	15.850f	4.95	95.02	4.457
1.900	211.66	15.737f	1.359	2.05	16.005f	5.11	88.66	4.287
2.000	232.34	15.767f	1.417	2.08	16.147f	5.27	83.22	4.150
2.100	253.30	15.805f	1.474	2.11	16.277f	5.42	78.50	4.038
2.200	274.52	15.846f	1.531	2.13	16.398f	5.56	74.38	3.947
2.218	278.36	15.854f	1.541	2.14	16.416f	5.59	73.66	3.932
2.300	295.98	15.891f	1.587	2.16	16.513f	5.71	70.80	3.875
2.400	317.71	15.937f	1.643	2.18	16.613f	5.87	67.77	3.822
2.500	339.69	15.985f	1.698	2.21	16.706f	6.03	65.12	3.780
2.600	361.94	16.032f	1.754	2.24	16.779f	6.21	62.93	3.750
2.700	384.47	16.078f	1.809	2.27	16.873f	6.41	61.22	3.730
2.800	407.29	16.125f	1.865	2.30	16.943f	6.60	59.46	3.715
2.900	430.39	16.170f	1.920	2.32	17.012f	6.79	57.86	3.708
3.000	453.76	16.216f	1.976	2.35	17.083f	6.98	56.47	3.707
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.5 M. AFT TRIM



- 1 Displacement 1=1 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=-.007 M.
- 4 Immersion 1=.005 MT/cm
- 4 WPA 1=.488 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=2 M.
- 8 KMT 1=.02 M.

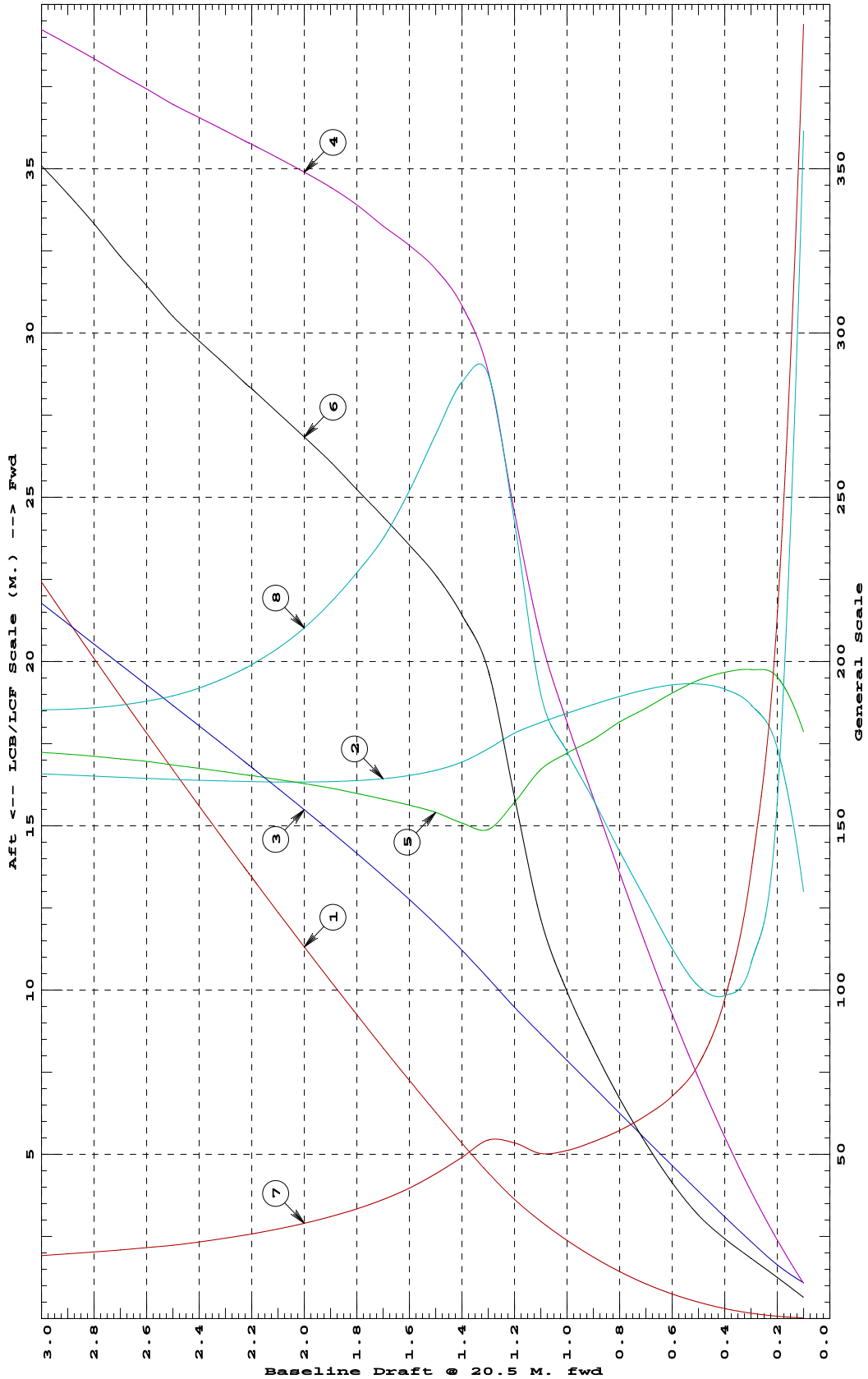
Specific Gravity = 1.025      Assumed KG = 0.00 M.  
Trim is per 36.7 M.      "K" = BASELINE

HYDROSTATIC PROPERTIES

Trim: Aft 0.250/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.40	12.994f	0.098	0.06	17.852f	0.13	1182.12	7.232
0.200	1.43	17.360f	0.147	0.14	19.526f	0.25	642.83	3.154
0.300	3.30	18.680f	0.211	0.23	19.756f	0.37	408.01	2.160
0.400	6.12	19.160f	0.279	0.33	19.673f	0.49	291.83	1.966
0.500	9.96	19.318f	0.348	0.44	19.430f	0.63	232.04	2.025
0.600	14.94	19.287f	0.419	0.56	19.039f	0.83	203.17	2.253
0.700	21.13	19.143f	0.491	0.68	18.579f	1.07	185.35	2.547
0.800	28.61	18.936f	0.563	0.81	18.161f	1.34	171.79	2.845
0.900	37.43	18.694f	0.635	0.95	17.633f	1.65	161.46	3.159
1.000	47.60	18.426f	0.707	1.09	17.212f	1.99	153.47	3.450
1.100	59.22	18.146f	0.779	1.24	16.713f	2.43	150.68	3.801
1.200	72.59	17.819f	0.853	1.47	15.716f	3.17	160.45	4.848
1.300	88.74	17.343f	0.932	1.73	14.890f	3.94	163.14	5.747
1.400	106.74	16.939f	1.009	1.85	15.085f	4.28	147.26	5.701
1.500	125.60	16.686f	1.081	1.92	15.408f	4.53	132.22	5.383
1.600	144.98	16.530f	1.148	1.96	15.628f	4.71	119.19	5.040
1.700	164.76	16.433f	1.212	2.00	15.814f	4.88	108.74	4.749
1.800	184.94	16.376f	1.274	2.03	15.982f	5.05	100.15	4.540
1.900	205.45	16.345f	1.335	2.07	16.147f	5.21	93.15	4.359
2.000	226.24	16.333f	1.394	2.09	16.282f	5.37	87.06	4.205
2.100	247.31	16.334f	1.452	2.12	16.407f	5.51	81.82	4.081
2.200	268.63	16.344f	1.510	2.14	16.526f	5.66	77.34	3.981
2.218	272.49	16.347f	1.520	2.15	16.543f	5.68	76.55	3.964
2.300	290.20	16.362f	1.567	2.17	16.640f	5.81	73.42	3.901
2.400	312.02	16.386f	1.624	2.19	16.748f	5.95	69.99	3.839
2.500	334.08	16.414f	1.680	2.22	16.850f	6.10	67.02	3.791
2.600	356.39	16.445f	1.736	2.25	16.962f	6.29	64.75	3.758
2.700	378.98	16.478f	1.792	2.27	17.038f	6.47	62.62	3.734
2.800	401.85	16.512f	1.848	2.30	17.117f	6.67	60.87	3.718
2.900	424.99	16.547f	1.904	2.33	17.180f	6.85	59.12	3.709
3.000	448.40	16.581f	1.959	2.35	17.233f	7.02	57.43	3.707
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
		Trim is per 36.70m.						
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.25 M. AFT TRIM



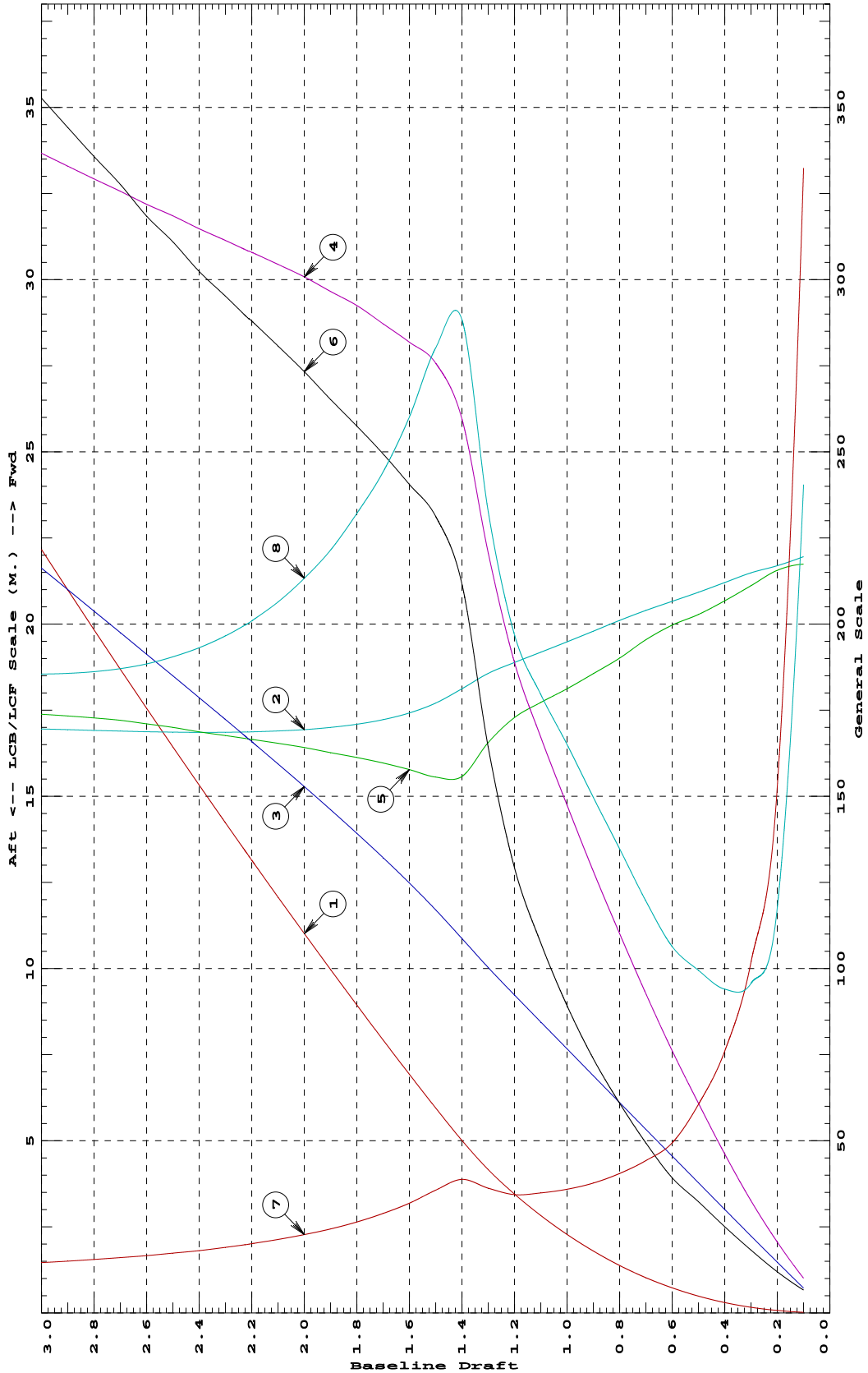
- 1 Displacement 1=2 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=.009 M.
- 4 Immersion 1=.006 MT/cm
- 4 WPA 1=.585 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=3 M.
- 8 KMT 1=.02 M.

Specific Gravity = 1.025 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

HYDROSTATIC PROPERTIES  
No Trim, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.37	21.959f	0.065	0.07	21.739f	0.13	1329.63	4.810
0.200	1.44	21.694f	0.133	0.14	21.560f	0.24	611.36	2.355
0.300	3.29	21.488f	0.201	0.23	21.116f	0.37	407.53	1.914
0.400	6.04	21.205f	0.270	0.32	20.676f	0.50	304.15	1.880
0.500	9.78	20.925f	0.340	0.43	20.277f	0.65	242.24	1.989
0.600	14.57	20.660f	0.410	0.53	19.970f	0.78	197.60	2.128
0.700	20.48	20.396f	0.480	0.65	19.545f	0.99	176.89	2.391
0.800	27.58	20.105f	0.550	0.77	19.013f	1.22	162.01	2.695
0.900	35.93	19.794f	0.620	0.90	18.562f	1.48	150.77	2.993
1.000	45.57	19.484f	0.690	1.03	18.123f	1.78	143.69	3.301
1.100	56.57	19.183f	0.760	1.17	17.723f	2.15	139.34	3.590
1.200	69.00	18.887f	0.831	1.32	17.285f	2.58	137.43	3.937
1.300	83.20	18.568f	0.902	1.54	16.561f	3.28	144.85	4.653
1.400	100.12	18.123f	0.978	1.82	15.575f	4.23	155.14	5.767
1.500	119.02	17.706f	1.053	1.93	15.556f	4.63	142.62	5.604
1.600	138.55	17.419f	1.123	1.97	15.773f	4.81	127.42	5.203
1.700	158.46	17.224f	1.190	2.01	15.966f	4.99	115.52	4.884
1.800	178.76	17.091f	1.253	2.05	16.126f	5.15	105.72	4.643
1.900	199.38	16.999f	1.315	2.08	16.268f	5.30	97.62	4.430
2.000	220.29	16.936f	1.375	2.11	16.416f	5.47	91.06	4.266
2.100	241.47	16.896f	1.435	2.13	16.538f	5.61	85.33	4.128
2.200	262.90	16.871f	1.493	2.16	16.654f	5.76	80.40	4.018
2.218	266.78	16.868f	1.503	2.16	16.670f	5.78	79.54	4.001
2.300	284.57	16.859f	1.551	2.18	16.765f	5.90	76.14	3.931
2.400	306.49	16.856f	1.608	2.20	16.872f	6.05	72.42	3.863
2.500	328.66	16.862f	1.665	2.23	17.000f	6.22	69.44	3.810
2.600	351.07	16.874f	1.721	2.25	17.103f	6.37	66.58	3.769
2.700	373.74	16.891f	1.778	2.28	17.208f	6.55	64.34	3.742
2.800	396.66	16.912f	1.834	2.30	17.276f	6.71	62.12	3.724
2.900	419.84	16.934f	1.890	2.33	17.330f	6.88	60.17	3.713
3.000	443.28	16.956f	1.946	2.36	17.384f	7.05	58.40	3.710
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at LEVEL TRIM



- 1 Displacement 1=2 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=.009 M.
- 4 Immersion 1=.007 MT/cm
- 4 WPA 1=.683 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=4 M.
- 8 KMT 1=.02 M.

Specific Gravity = 1.025 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

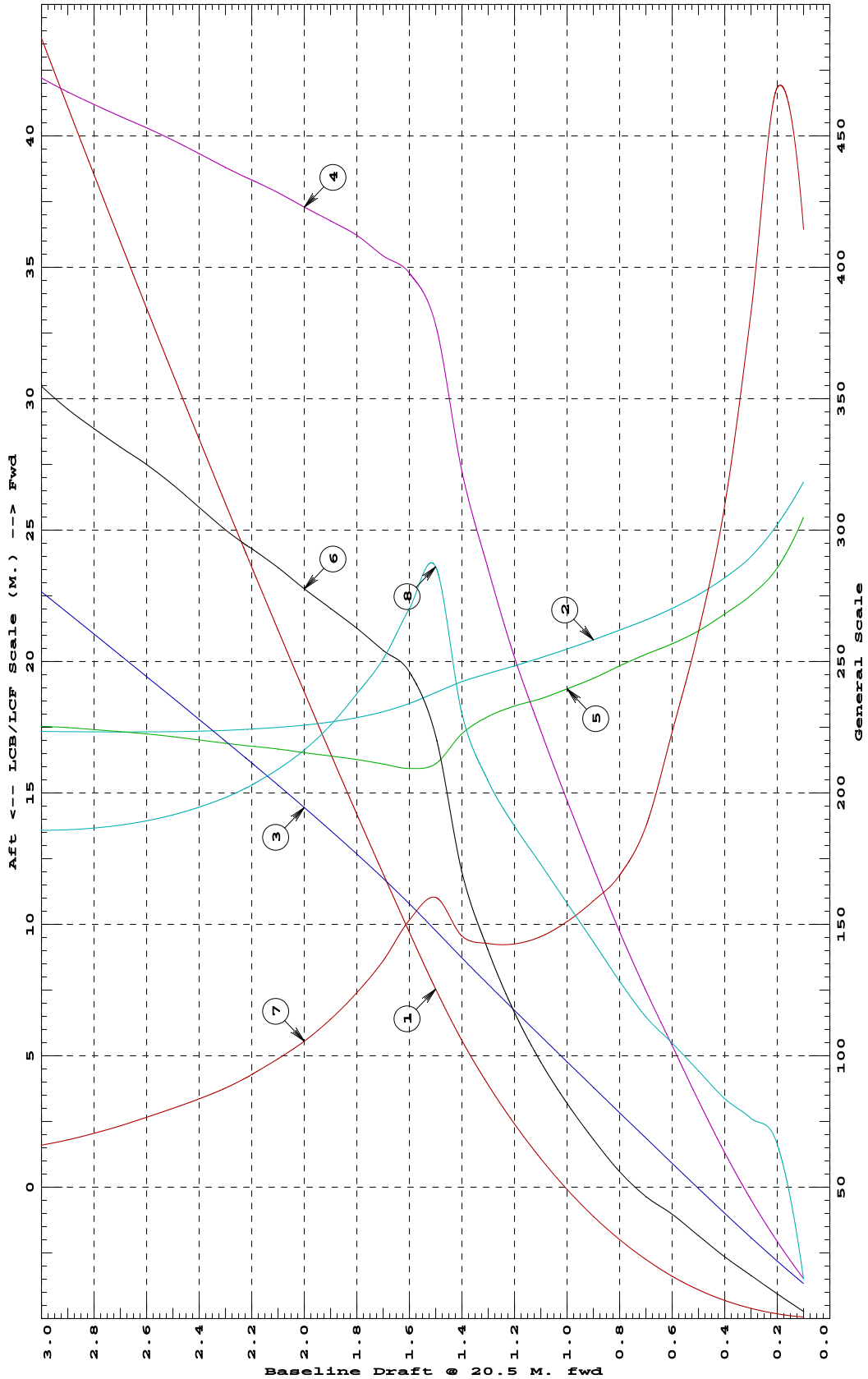
HYDROSTATIC PROPERTIES

Trim: Fwd 0.250/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.53	26.834f	0.093	0.08	25.495f	0.05	372.92	0.298
0.200	1.63	25.214f	0.153	0.15	23.566f	0.19	421.57	1.325
0.300	3.50	23.993f	0.215	0.23	22.523f	0.33	344.56	1.524
0.400	6.20	23.190f	0.280	0.32	21.811f	0.47	278.47	1.674
0.500	9.84	22.544f	0.346	0.41	21.167f	0.63	235.17	1.885
0.600	14.51	22.019f	0.413	0.52	20.677f	0.79	200.93	2.096
0.700	20.23	21.579f	0.481	0.62	20.277f	0.93	168.59	2.296
0.800	27.02	21.196f	0.548	0.74	19.836f	1.12	151.81	2.567
0.900	35.00	20.827f	0.616	0.86	19.359f	1.36	143.01	2.867
1.000	44.23	20.476f	0.684	0.99	18.958f	1.64	135.92	3.161
1.100	54.76	20.144f	0.752	1.12	18.583f	1.95	130.83	3.457
1.200	66.64	19.836f	0.821	1.26	18.303f	2.33	128.28	3.747
1.300	80.02	19.546f	0.890	1.43	17.913f	2.80	128.42	4.089
1.400	95.17	19.235f	0.960	1.61	17.257f	3.40	131.00	4.603
1.500	112.82	18.820f	1.033	1.89	16.111f	4.43	144.23	5.721
1.600	132.27	18.404f	1.105	1.99	15.932f	4.92	136.50	5.404
1.700	152.32	18.090f	1.172	2.02	16.102f	5.09	122.52	5.019
1.800	172.73	17.865f	1.237	2.06	16.269f	5.25	111.61	4.755
1.900	193.48	17.702f	1.300	2.09	16.404f	5.40	102.50	4.516
2.000	214.50	17.581f	1.361	2.11	16.531f	5.55	95.01	4.327
2.100	235.78	17.493f	1.421	2.14	16.668f	5.71	88.95	4.180
2.200	257.32	17.428f	1.480	2.17	16.780f	5.86	83.56	4.060
2.218	261.22	17.419f	1.490	2.17	16.796f	5.88	82.62	4.041
2.300	279.10	17.382f	1.538	2.19	16.888f	6.00	78.92	3.965
2.400	301.14	17.351f	1.596	2.22	17.017f	6.17	75.23	3.892
2.500	323.42	17.332f	1.653	2.24	17.140f	6.34	71.99	3.833
2.600	345.96	17.323f	1.710	2.27	17.245f	6.50	68.95	3.788
2.700	368.72	17.321f	1.767	2.29	17.331f	6.63	66.01	3.755
2.800	391.70	17.324f	1.823	2.31	17.408f	6.77	63.45	3.733
2.900	414.92	17.331f	1.879	2.33	17.483f	6.92	61.21	3.720
3.000	438.39	17.340f	1.936	2.36	17.536f	7.10	59.40	3.716
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
		Trim is per 36.70m.						
Draft is from Baseline.								



HYDROSTATIC PROPERTIES at 0.25 M. FWD TRIM



- 1 Displacement 1=.9 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=-.007 M.
- 4 Immersion 1=.005 MT/cm
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 WPA 1=.488 Sq.M.
- 8 KMT 1=.02 M.

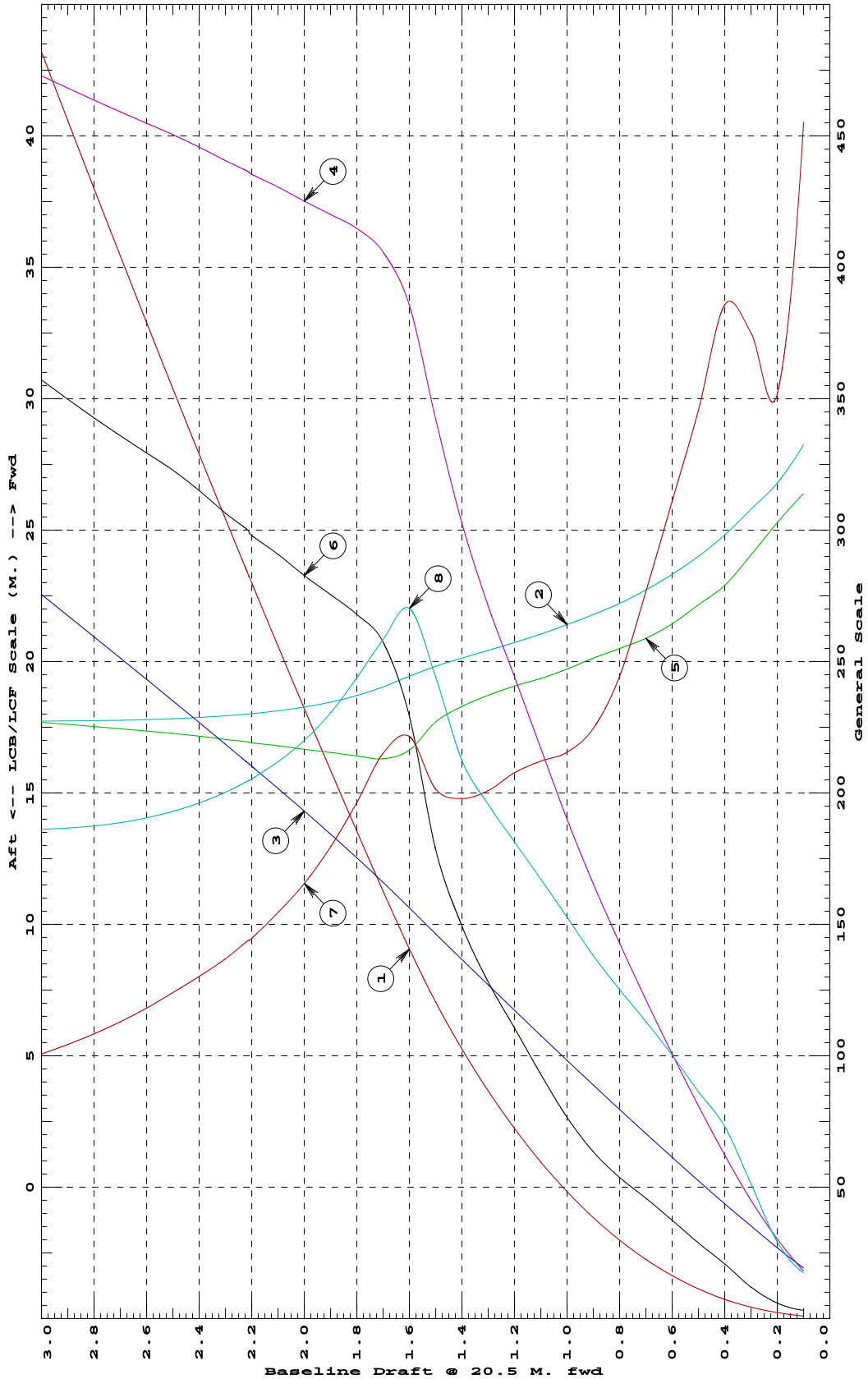
Specific Gravity = 1.025      Assumed KG = 0.00 M.  
Trim is per 36.7 M.      "K" = BASELINE

HYDROSTATIC PROPERTIES

Trim: Fwd 0.500/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.85	28.256f	0.135	0.09	26.396f	0.06	273.12	0.349
0.200	2.05	26.793f	0.188	0.15	25.285f	0.12	211.17	0.583
0.300	3.92	25.796f	0.247	0.22	24.053f	0.24	225.04	1.025
0.400	6.59	24.818f	0.306	0.31	22.902f	0.42	231.46	1.461
0.500	10.16	24.004f	0.367	0.40	22.158f	0.57	207.43	1.726
0.600	14.71	23.319f	0.429	0.50	21.437f	0.75	186.63	2.003
0.700	20.25	22.723f	0.493	0.61	20.886f	0.92	165.98	2.260
0.800	26.87	22.211f	0.557	0.71	20.495f	1.07	146.64	2.503
0.900	34.57	21.791f	0.622	0.83	20.132f	1.27	134.78	2.761
1.000	43.45	21.406f	0.688	0.95	19.714f	1.53	129.29	3.054
1.100	53.60	21.047f	0.754	1.08	19.355f	1.86	127.27	3.344
1.200	65.11	20.725f	0.821	1.22	19.067f	2.21	124.63	3.627
1.300	77.96	20.426f	0.888	1.36	18.716f	2.56	120.55	3.912
1.400	92.32	20.129f	0.956	1.51	18.291f	2.99	118.75	4.247
1.500	108.36	19.819f	1.025	1.71	17.706f	3.57	120.88	4.881
1.600	126.55	19.440f	1.094	1.93	16.630f	4.58	132.86	5.404
1.700	146.35	19.036f	1.162	2.03	16.302f	5.15	129.07	5.169
1.800	166.86	18.704f	1.227	2.07	16.411f	5.36	117.84	4.877
1.900	187.73	18.456f	1.290	2.10	16.542f	5.51	107.69	4.609
2.000	208.86	18.269f	1.352	2.13	16.662f	5.65	99.34	4.400
2.100	230.26	18.126f	1.412	2.15	16.796f	5.82	92.70	4.238
2.200	251.90	18.017f	1.471	2.18	16.905f	5.96	86.81	4.107
2.218	255.83	18.000f	1.482	2.18	16.943f	6.01	86.14	4.088
2.300	273.80	17.933f	1.529	2.20	17.034f	6.13	82.15	4.005
2.400	295.96	17.871f	1.587	2.23	17.159f	6.30	78.12	3.924
2.500	318.37	17.825f	1.645	2.25	17.266f	6.46	74.42	3.860
2.600	341.00	17.791f	1.702	2.27	17.353f	6.59	70.89	3.811
2.700	363.85	17.766f	1.759	2.30	17.439f	6.72	67.76	3.774
2.800	386.92	17.749f	1.816	2.32	17.526f	6.85	65.01	3.749
2.900	410.21	17.739f	1.872	2.34	17.608f	7.00	62.59	3.733
3.000	433.73	17.734f	1.929	2.36	17.687f	7.14	60.43	3.724
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.5 M. FWD TRIM



- 1 Displacement 1=.9 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=-.007 M.
- 4 Immersion 1=.005 MT/cm
- 4 WPA 1=.488 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=.6 M.
- 8 KMT 1=.02 M.

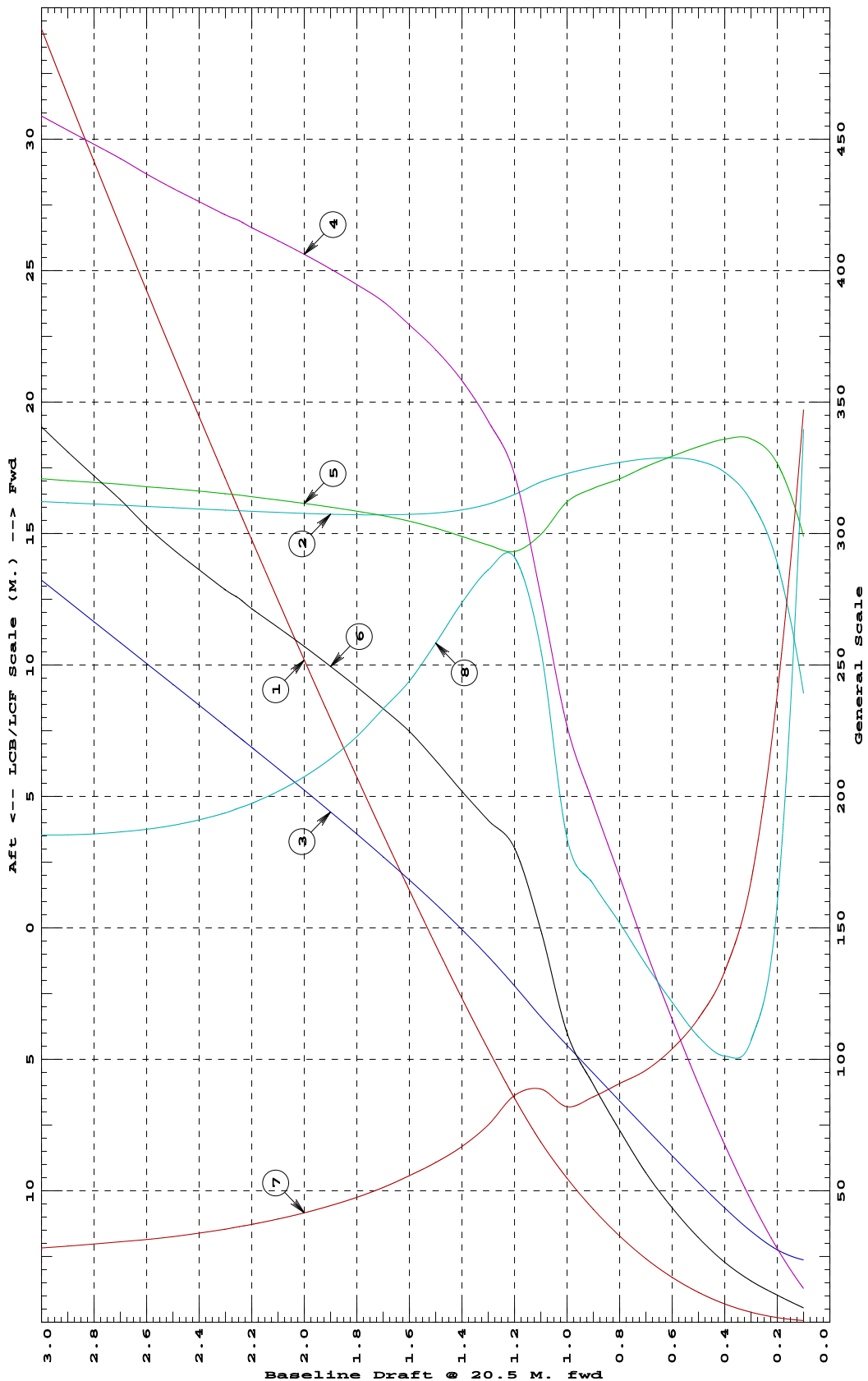
Specific Gravity = 1.025 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

HYDROSTATIC PROPERTIES

Trim: Aft 0.500/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.58	8.921f	0.166	0.06	14.886f	0.11	694.29	6.794
0.200	1.58	13.864f	0.193	0.14	17.661f	0.21	478.49	3.192
0.300	3.43	16.240f	0.242	0.23	18.598f	0.31	335.46	2.143
0.400	6.27	17.328f	0.304	0.34	18.591f	0.46	266.97	2.025
0.500	10.21	17.763f	0.372	0.45	18.306f	0.64	231.21	2.172
0.600	15.34	17.882f	0.443	0.58	17.939f	0.87	207.99	2.434
0.700	21.75	17.839f	0.516	0.71	17.543f	1.14	191.68	2.721
0.800	29.51	17.706f	0.589	0.85	17.082f	1.46	181.58	3.038
0.900	38.67	17.518f	0.663	0.99	16.718f	1.81	171.48	3.332
1.000	49.28	17.282f	0.737	1.13	16.206f	2.20	163.89	3.681
1.100	61.69	16.959f	0.814	1.38	14.965f	2.98	177.44	5.116
1.200	76.70	16.487f	0.896	1.61	14.316f	3.61	172.51	5.819
1.300	93.36	16.121f	0.974	1.71	14.564f	3.82	150.07	5.724
1.400	110.89	15.900f	1.046	1.79	14.889f	4.04	133.67	5.474
1.500	129.12	15.782f	1.113	1.85	15.205f	4.27	121.48	5.166
1.600	147.87	15.728f	1.178	1.90	15.472f	4.49	111.52	4.878
1.700	167.04	15.710f	1.239	1.94	15.678f	4.67	102.55	4.666
1.800	186.62	15.716f	1.300	1.97	15.850f	4.83	95.02	4.457
1.900	206.50	15.737f	1.359	2.00	16.005f	4.99	88.66	4.287
2.000	226.68	15.767f	1.417	2.03	16.147f	5.14	83.22	4.150
2.100	247.12	15.805f	1.474	2.06	16.277f	5.29	78.50	4.038
2.200	267.82	15.846f	1.531	2.08	16.398f	5.43	74.38	3.947
2.249	278.05	15.868f	1.558	2.10	16.464f	5.51	72.68	3.912
2.300	288.77	15.891f	1.587	2.11	16.513f	5.57	70.80	3.875
2.400	309.96	15.937f	1.643	2.13	16.613f	5.72	67.77	3.822
2.500	331.40	15.985f	1.698	2.16	16.706f	5.88	65.12	3.780
2.600	353.11	16.032f	1.754	2.18	16.779f	6.06	62.93	3.750
2.700	375.09	16.078f	1.809	2.21	16.873f	6.26	61.22	3.730
2.800	397.35	16.125f	1.865	2.24	16.943f	6.44	59.46	3.715
2.900	419.89	16.170f	1.920	2.27	17.012f	6.62	57.86	3.708
3.000	442.70	16.216f	1.976	2.29	17.083f	6.81	56.47	3.707
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.5 M. AFT TRIM



- 1 Displacement 1=.9 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=.007 M.
- 4 Immersion 1=.005 MT/cm
- 4 WPA 1=.5 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=2 M.
- 8 KMT 1=.02 M.

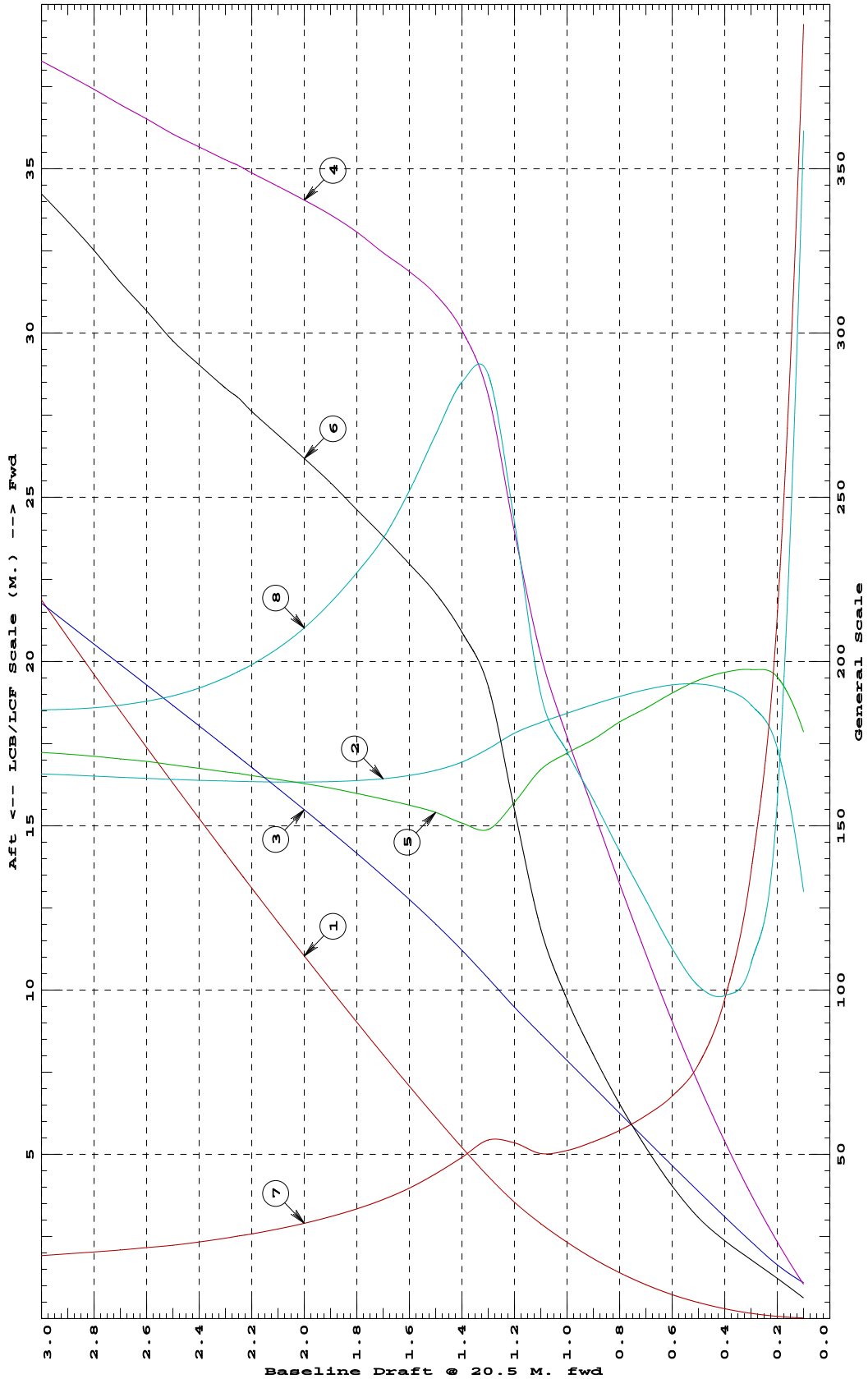
Specific Gravity = 1.000 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

HYDROSTATIC PROPERTIES

Trim: Aft 0.250/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.39	12.994f	0.098	0.06	17.852f	0.13	1182.12	7.232
0.200	1.40	17.360f	0.147	0.14	19.526f	0.24	642.83	3.154
0.300	3.22	18.680f	0.211	0.23	19.756f	0.36	408.01	2.160
0.400	5.97	19.160f	0.279	0.32	19.673f	0.47	291.83	1.966
0.500	9.72	19.318f	0.348	0.43	19.430f	0.61	232.04	2.025
0.600	14.58	19.287f	0.419	0.54	19.039f	0.81	203.17	2.253
0.700	20.62	19.143f	0.491	0.67	18.579f	1.04	185.35	2.547
0.800	27.92	18.936f	0.563	0.79	18.161f	1.31	171.79	2.845
0.900	36.51	18.694f	0.635	0.93	17.633f	1.61	161.46	3.159
1.000	46.44	18.426f	0.707	1.06	17.212f	1.94	153.47	3.450
1.100	57.78	18.146f	0.779	1.21	16.713f	2.37	150.68	3.801
1.200	70.82	17.819f	0.853	1.44	15.716f	3.10	160.45	4.848
1.300	86.58	17.343f	0.932	1.69	14.890f	3.85	163.14	5.747
1.400	104.14	16.939f	1.009	1.80	15.085f	4.18	147.26	5.701
1.500	122.54	16.686f	1.081	1.87	15.408f	4.41	132.22	5.383
1.600	141.44	16.530f	1.148	1.91	15.628f	4.59	119.19	5.040
1.700	160.74	16.433f	1.212	1.95	15.814f	4.76	108.74	4.749
1.800	180.43	16.376f	1.274	1.98	15.982f	4.92	100.15	4.540
1.900	200.44	16.345f	1.335	2.02	16.147f	5.09	93.15	4.359
2.000	220.72	16.333f	1.394	2.04	16.282f	5.24	87.06	4.205
2.100	241.27	16.334f	1.452	2.07	16.407f	5.38	81.82	4.081
2.200	262.08	16.344f	1.510	2.09	16.526f	5.52	77.34	3.981
2.249	272.36	16.352f	1.538	2.11	16.593f	5.60	75.49	3.941
2.300	283.12	16.362f	1.567	2.12	16.640f	5.66	73.42	3.901
2.400	304.41	16.386f	1.624	2.14	16.748f	5.81	69.99	3.839
2.500	325.93	16.414f	1.680	2.16	16.850f	5.95	67.02	3.791
2.600	347.70	16.445f	1.736	2.19	16.962f	6.13	64.75	3.758
2.700	369.74	16.478f	1.792	2.22	17.038f	6.31	62.62	3.734
2.800	392.05	16.512f	1.848	2.24	17.117f	6.50	60.87	3.718
2.900	414.63	16.547f	1.904	2.27	17.180f	6.68	59.12	3.709
3.000	437.47	16.581f	1.959	2.30	17.233f	6.85	57.43	3.707
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
		Trim is per 36.70m.						
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.25 M. AFT TRIM



- 1 Displacement 1=2 MT  
 2 LCB (use top scale)  
 3 VCB (KB) 1=.009 M.  
 4 Immersion 1=.006 MT/cm  
 4 WPA 1=.6 Sq.M.  
 5 LCF (use top scale)  
 6 Moment/Trim 1=.02 M.-MT/cm  
 7 KML 1=3 M.  
 8 KMT 1=.02 M.

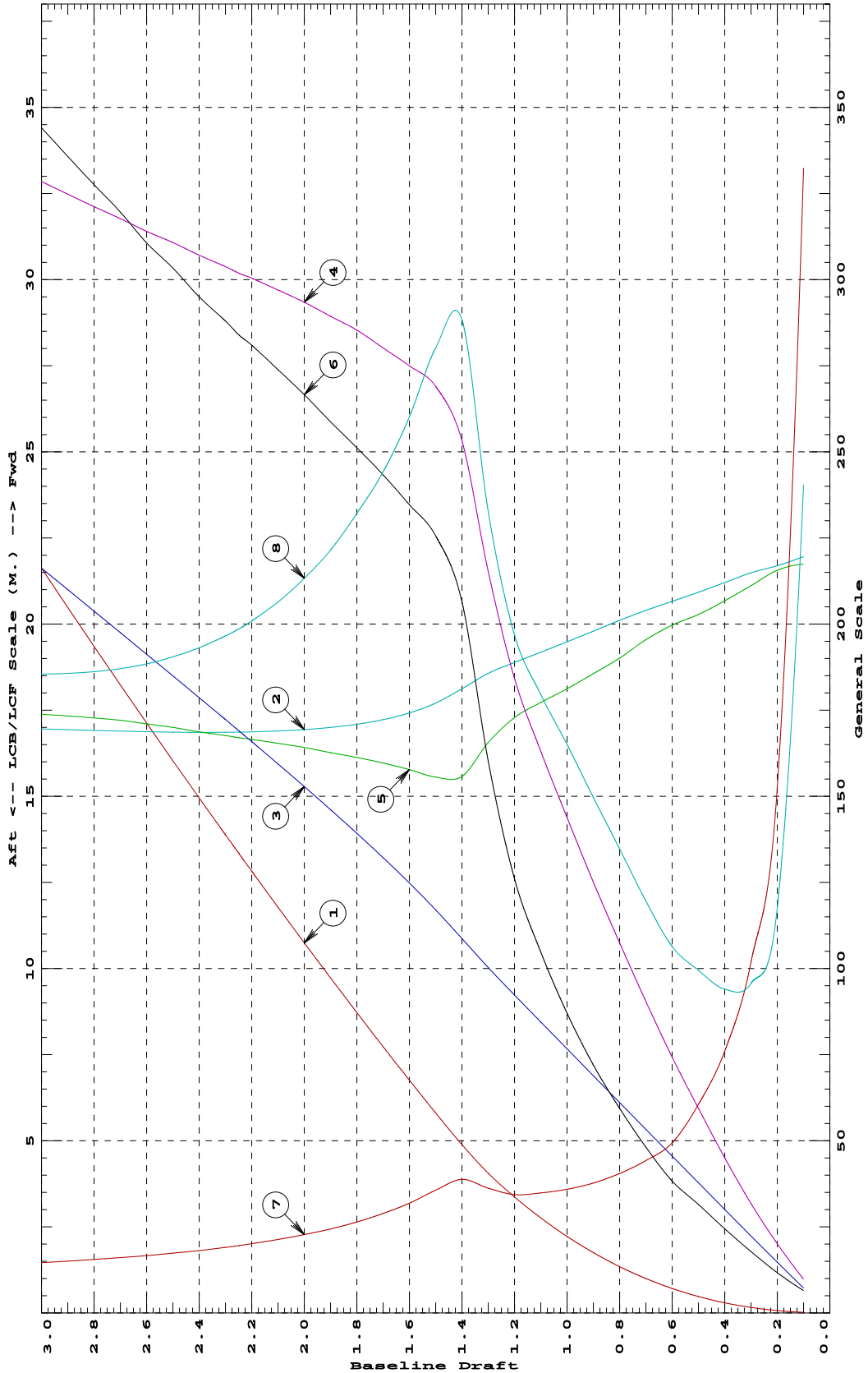
Specific Gravity = 1.000 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

HYDROSTATIC PROPERTIES  
No Trim, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.36	21.959f	0.065	0.07	21.739f	0.13	1329.63	4.810
0.200	1.40	21.694f	0.133	0.14	21.560f	0.23	611.36	2.355
0.300	3.21	21.488f	0.201	0.22	21.116f	0.36	407.53	1.914
0.400	5.89	21.205f	0.270	0.32	20.676f	0.49	304.15	1.880
0.500	9.54	20.925f	0.340	0.42	20.277f	0.63	242.24	1.989
0.600	14.22	20.660f	0.410	0.52	19.970f	0.77	197.60	2.128
0.700	19.98	20.396f	0.480	0.63	19.545f	0.96	176.89	2.391
0.800	26.91	20.105f	0.550	0.75	19.013f	1.19	162.01	2.695
0.900	35.05	19.794f	0.620	0.88	18.562f	1.44	150.77	2.993
1.000	44.46	19.484f	0.690	1.01	18.123f	1.74	143.69	3.301
1.100	55.19	19.183f	0.760	1.14	17.723f	2.10	139.34	3.590
1.200	67.32	18.887f	0.831	1.29	17.285f	2.52	137.43	3.937
1.300	81.17	18.568f	0.902	1.51	16.561f	3.20	144.85	4.653
1.400	97.68	18.123f	0.978	1.77	15.575f	4.13	155.14	5.767
1.500	116.12	17.706f	1.053	1.88	15.556f	4.51	142.62	5.604
1.600	135.17	17.419f	1.123	1.92	15.773f	4.69	127.42	5.203
1.700	154.60	17.224f	1.190	1.96	15.966f	4.87	115.52	4.884
1.800	174.40	17.091f	1.253	2.00	16.126f	5.02	105.72	4.643
1.900	194.52	16.999f	1.315	2.03	16.268f	5.17	97.62	4.430
2.000	214.92	16.936f	1.375	2.05	16.416f	5.33	91.06	4.266
2.100	235.58	16.896f	1.435	2.08	16.538f	5.48	85.33	4.128
2.200	256.48	16.871f	1.493	2.10	16.654f	5.62	80.40	4.018
2.249	266.81	16.864f	1.521	2.11	16.698f	5.68	78.11	3.972
2.300	277.63	16.859f	1.551	2.13	16.765f	5.76	76.14	3.931
2.400	299.02	16.856f	1.608	2.15	16.872f	5.90	72.42	3.863
2.500	320.64	16.862f	1.665	2.18	17.000f	6.07	69.44	3.810
2.600	342.51	16.874f	1.721	2.20	17.103f	6.21	66.58	3.769
2.700	364.63	16.891f	1.778	2.22	17.208f	6.39	64.34	3.742
2.800	386.99	16.912f	1.834	2.25	17.276f	6.55	62.12	3.724
2.900	409.60	16.934f	1.890	2.27	17.330f	6.72	60.17	3.713
3.000	432.47	16.956f	1.946	2.30	17.384f	6.88	58.40	3.710
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								



HYDROSTATIC PROPERTIES at LEVEL TRIM



- 1 Displacement 1=2 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=.009 M.
- 4 Immersion 1=.007 MT/cm
- 4 WPA 1=.7 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=4 M.
- 8 KMT 1=.02 M.

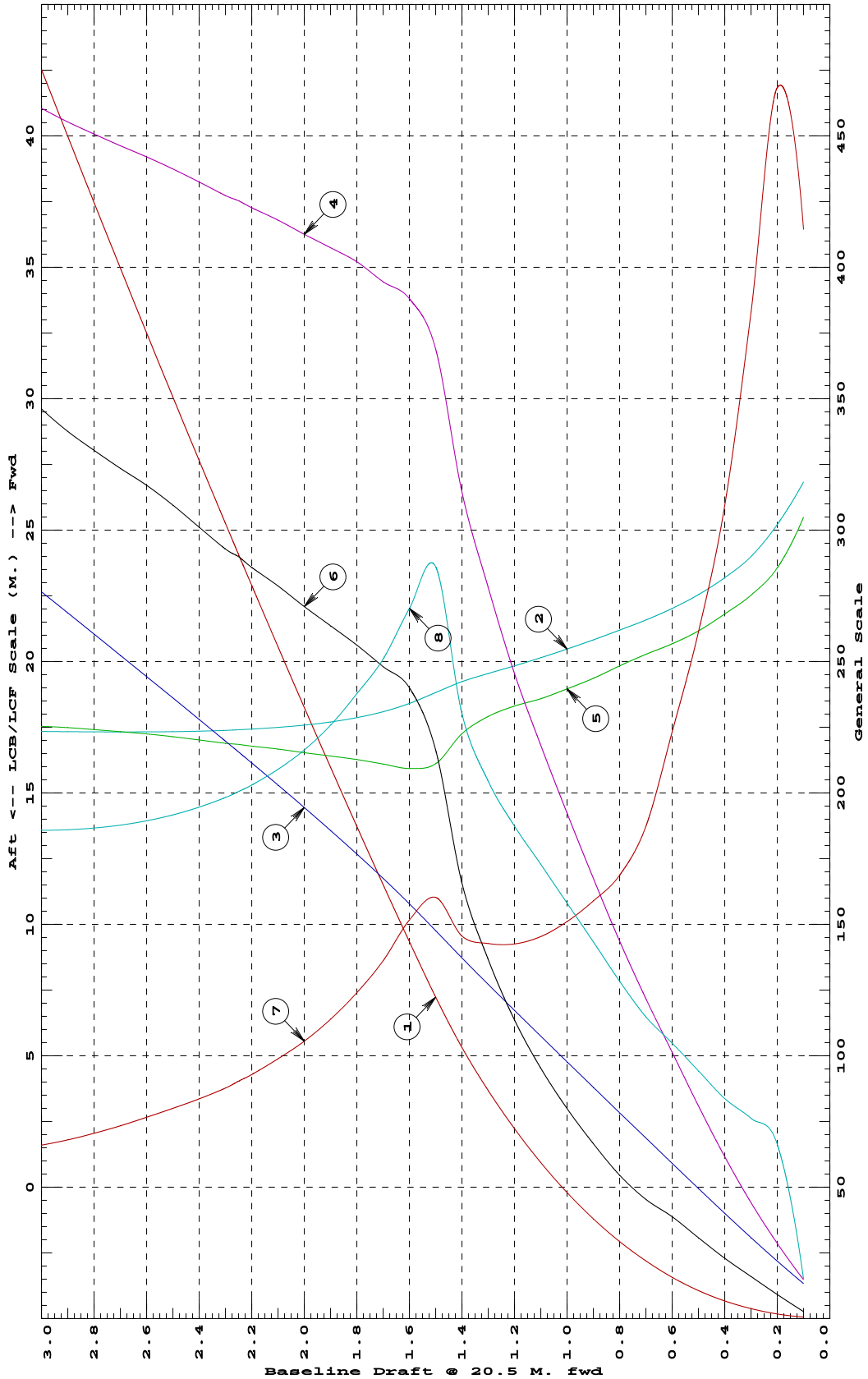
Specific Gravity = 1.000 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

HYDROSTATIC PROPERTIES

Trim: Fwd 0.250/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.52	26.834f	0.093	0.07	25.495f	0.05	372.92	0.298
0.200	1.59	25.214f	0.153	0.14	23.566f	0.18	421.57	1.325
0.300	3.41	23.993f	0.215	0.22	22.523f	0.32	344.56	1.524
0.400	6.04	23.190f	0.280	0.31	21.811f	0.46	278.47	1.674
0.500	9.60	22.544f	0.346	0.40	21.167f	0.62	235.17	1.885
0.600	14.15	22.019f	0.413	0.51	20.677f	0.77	200.93	2.096
0.700	19.74	21.579f	0.481	0.61	20.277f	0.91	168.59	2.296
0.800	26.36	21.196f	0.548	0.72	19.836f	1.09	151.81	2.567
0.900	34.15	20.827f	0.616	0.84	19.359f	1.33	143.01	2.867
1.000	43.15	20.476f	0.684	0.96	18.958f	1.60	135.92	3.161
1.100	53.43	20.144f	0.752	1.09	18.583f	1.90	130.83	3.457
1.200	65.01	19.836f	0.821	1.23	18.303f	2.27	128.28	3.747
1.300	78.07	19.546f	0.890	1.39	17.913f	2.73	128.42	4.089
1.400	92.84	19.235f	0.960	1.57	17.257f	3.31	131.00	4.603
1.500	110.07	18.820f	1.033	1.84	16.111f	4.33	144.23	5.721
1.600	129.04	18.404f	1.105	1.94	15.932f	4.80	136.50	5.404
1.700	148.61	18.090f	1.172	1.97	16.102f	4.96	122.52	5.019
1.800	168.52	17.865f	1.237	2.01	16.269f	5.12	111.61	4.755
1.900	188.76	17.702f	1.300	2.04	16.404f	5.27	102.50	4.516
2.000	209.27	17.581f	1.361	2.06	16.531f	5.42	95.01	4.327
2.100	230.03	17.493f	1.421	2.09	16.668f	5.58	88.95	4.180
2.200	251.04	17.428f	1.480	2.11	16.780f	5.72	83.56	4.060
2.249	261.42	17.404f	1.508	2.13	16.845f	5.80	81.37	4.012
2.300	272.29	17.382f	1.538	2.14	16.888f	5.86	78.92	3.965
2.400	293.79	17.351f	1.596	2.16	17.017f	6.02	75.23	3.892
2.500	315.53	17.332f	1.653	2.19	17.140f	6.19	71.99	3.833
2.600	337.52	17.323f	1.710	2.21	17.245f	6.34	68.95	3.788
2.700	359.72	17.321f	1.767	2.23	17.331f	6.47	66.01	3.755
2.800	382.15	17.324f	1.823	2.25	17.408f	6.61	63.45	3.733
2.900	404.80	17.331f	1.879	2.28	17.483f	6.75	61.21	3.720
3.000	427.69	17.340f	1.936	2.30	17.536f	6.92	59.40	3.716
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.25 M. FWD TRIM



- 1 Displacement 1=.9 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=.007 M.
- 4 Immersion 1=.005 MT/cm
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 WPA 1=.5 Sq.M.
- 8 KMT 1=.02 M.

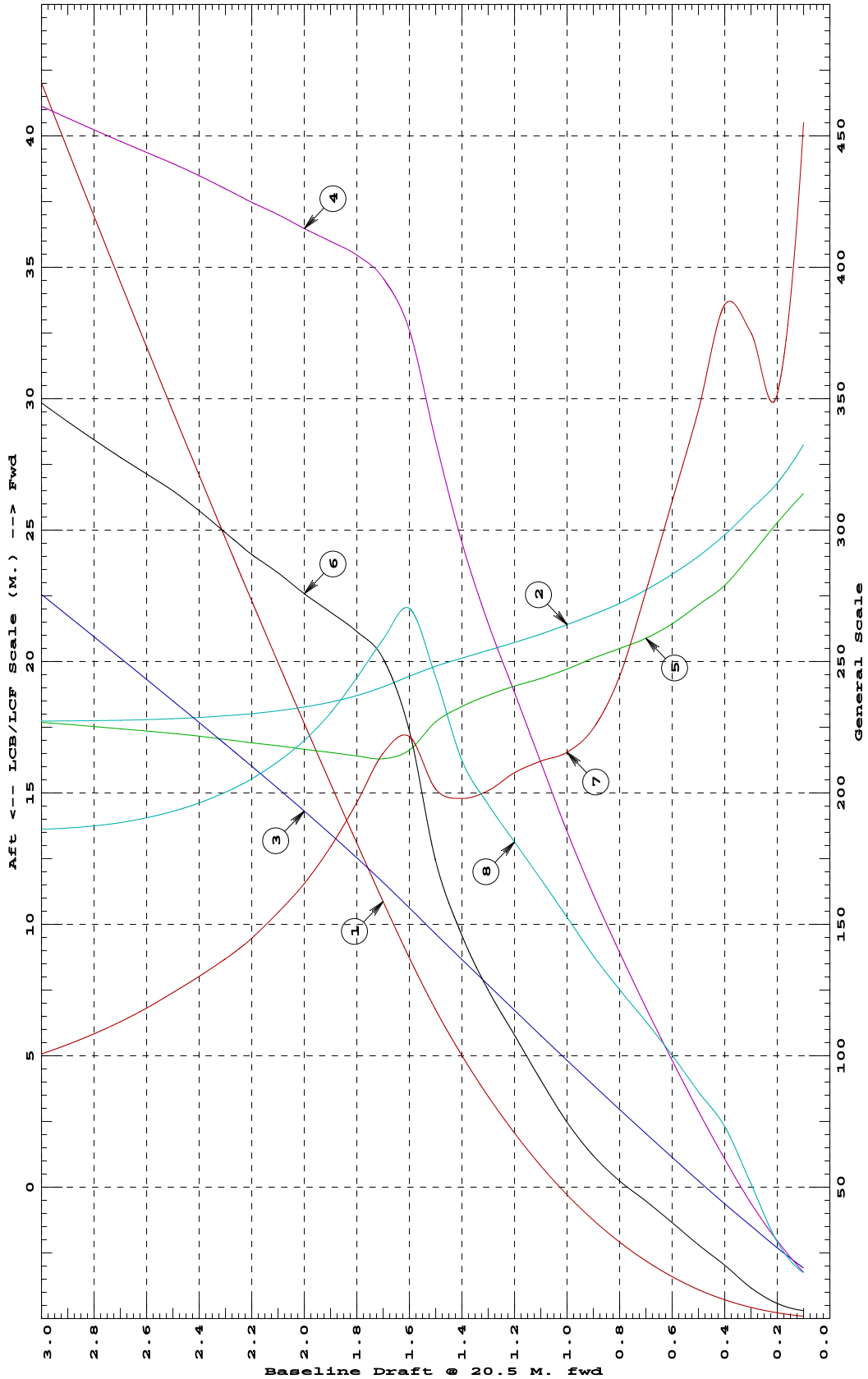
Specific Gravity = 1.000 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

HYDROSTATIC PROPERTIES

Trim: Fwd 0.500/36.700, No Heel, VCG = 0.000

Draft@	Displacement	Buoyancy-Ctr.		Weight/	Moment/			
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	KML	KMT
0.100	0.82	28.256f	0.135	0.09	26.396f	0.06	273.12	0.349
0.200	2.00	26.793f	0.188	0.15	25.285f	0.11	211.17	0.583
0.300	3.82	25.796f	0.247	0.22	24.053f	0.23	225.04	1.025
0.400	6.43	24.818f	0.306	0.30	22.902f	0.41	231.46	1.461
0.500	9.92	24.004f	0.367	0.39	22.158f	0.56	207.43	1.726
0.600	14.35	23.319f	0.429	0.49	21.437f	0.73	186.63	2.003
0.700	19.76	22.723f	0.493	0.59	20.886f	0.89	165.98	2.260
0.800	26.21	22.211f	0.557	0.70	20.495f	1.05	146.64	2.503
0.900	33.72	21.791f	0.622	0.81	20.132f	1.24	134.78	2.761
1.000	42.39	21.406f	0.688	0.93	19.714f	1.49	129.29	3.054
1.100	52.29	21.047f	0.754	1.06	19.355f	1.81	127.27	3.344
1.200	63.52	20.725f	0.821	1.19	19.067f	2.16	124.63	3.627
1.300	76.06	20.426f	0.888	1.32	18.716f	2.50	120.55	3.912
1.400	90.07	20.129f	0.956	1.48	18.291f	2.91	118.75	4.247
1.500	105.72	19.819f	1.025	1.67	17.706f	3.48	120.88	4.881
1.600	123.47	19.440f	1.094	1.88	16.630f	4.47	132.86	5.404
1.700	142.78	19.036f	1.162	1.98	16.302f	5.02	129.07	5.169
1.800	162.79	18.704f	1.227	2.02	16.411f	5.23	117.84	4.877
1.900	183.15	18.456f	1.290	2.05	16.542f	5.37	107.69	4.609
2.000	203.77	18.269f	1.352	2.07	16.662f	5.52	99.34	4.400
2.100	224.64	18.126f	1.412	2.10	16.796f	5.67	92.70	4.238
2.200	245.76	18.017f	1.471	2.12	16.905f	5.81	86.81	4.107
2.249	256.20	17.973f	1.500	2.14	16.969f	5.89	84.43	4.055
2.300	267.13	17.933f	1.529	2.15	17.034f	5.98	82.15	4.005
2.400	288.74	17.871f	1.587	2.17	17.159f	6.15	78.12	3.924
2.500	310.61	17.825f	1.645	2.20	17.266f	6.30	74.42	3.860
2.600	332.69	17.791f	1.702	2.22	17.353f	6.43	70.89	3.811
2.700	354.98	17.766f	1.759	2.24	17.439f	6.55	67.76	3.774
2.800	377.48	17.749f	1.816	2.26	17.526f	6.69	65.01	3.749
2.900	400.20	17.739f	1.872	2.28	17.608f	6.83	62.59	3.733
3.000	423.16	17.734f	1.929	2.31	17.687f	6.97	60.43	3.724
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

HYDROSTATIC PROPERTIES at 0.5 M. FWD TRIM

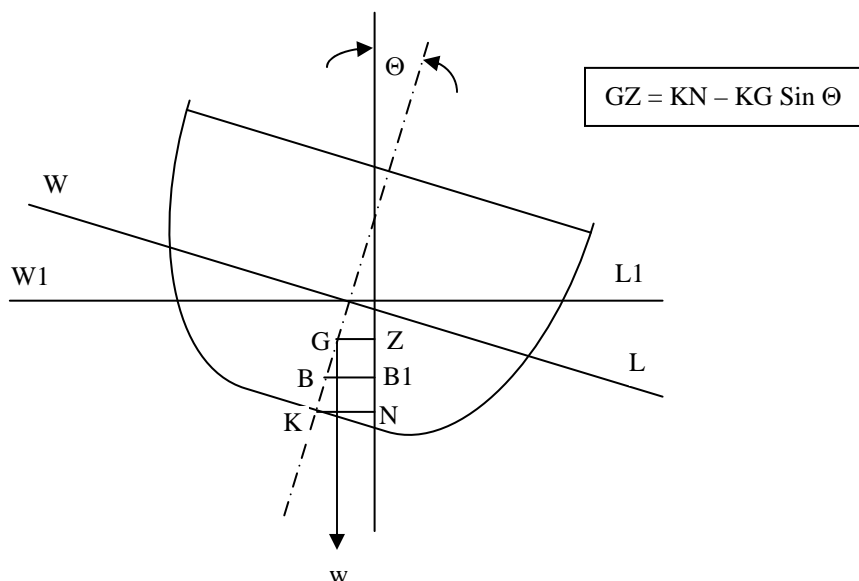


- 1 Displacement 1=.9 MT
- 2 LCB (use top scale)
- 3 VCB (KB) 1=.007 M.
- 4 Immersion 1=.005 MT/cm
- 4 WPA 1=.5 Sq.M.
- 5 LCF (use top scale)
- 6 Moment/Trim 1=.02 M.-MT/cm
- 7 KML 1=.6 M.
- 8 KMT 1=.02 M.

Specific Gravity = 1.000 Assumed KG = 0.00 M.  
Trim is per 36.7 M. "K" = BASELINE

## Section 8. RIGHTING LEVERS (KN) AND THE USE OF

Righting Levers are presented for seawater (sg = 1.025) and fresh water (sg = 1.000) at 0.50m Baseline trim aft, 0.25m Baseline trim aft, Level Baseline trim, 0.25m Baseline trim forward, 0.50m Baseline trim forward. The Righting Levers and the Cross Curves include the buoyancy of the hull with deductions and appendages as noted in Section 7. The “Flood” Line shown on the Cross Curves indicates the angle at which down flooding would occur at a given displacement. The down flooding locations are listed in Section 4.



The Tables of Righting Levers (KN) and the above figure provide the necessary information to derive a static stability (GZ) curve for all operating conditions.

The GZ curve is determined as follows:

- Determine the vessel's displacement, KG (corrected for free surface effects) and trim (See Section 7 and Section 9).
- Interpolate between appropriate displacements at the trim closest to the actual trim to determine the KN values at each angle of heel including the limiting flooding angle.
- Use the formula shown above to determine the GZ values at each angle of heel.
- Plot the GZ values (Y) against the angle of heel (X) to derive the static stability curve.
- The resulting curve must satisfy the criteria presented in Section 5. Refer to Worksheet No. 4, contained in Section 13, for more complete details.

CROSS CURVES OF STABILITY

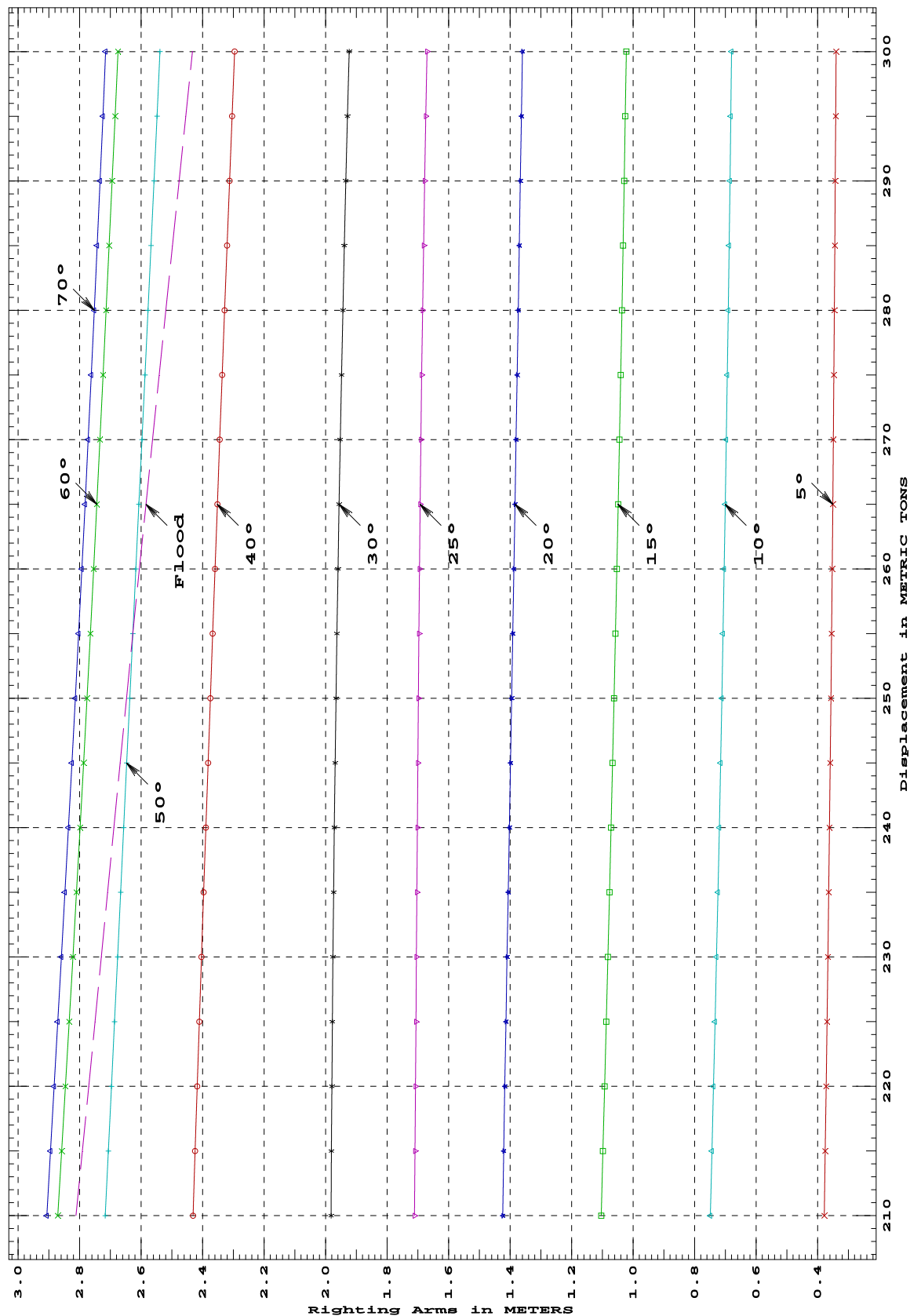
Showing righting arms in heel at VCG = 0.00  
Trim: Aft 0.500/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.379p	0.749p	1.104p	1.424p	1.711p	1.982p
215.00	0.375p	0.744p	1.098p	1.421p	1.709p	1.981p
220.00	0.372p	0.739p	1.093p	1.417p	1.708p	1.980p
225.00	0.370p	0.734p	1.087p	1.414p	1.706p	1.978p
230.00	0.367p	0.729p	1.082p	1.410p	1.705p	1.976p
235.00	0.364p	0.724p	1.077p	1.406p	1.703p	1.974p
240.00	0.362p	0.720p	1.072p	1.403p	1.702p	1.972p
245.00	0.359p	0.716p	1.067p	1.399p	1.700p	1.969p
250.00	0.357p	0.712p	1.062p	1.395p	1.698p	1.966p
255.00	0.355p	0.708p	1.058p	1.391p	1.697p	1.963p
260.00	0.353p	0.704p	1.053p	1.388p	1.695p	1.960p
265.00	0.351p	0.701p	1.049p	1.384p	1.693p	1.956p
270.00	0.349p	0.697p	1.044p	1.381p	1.690p	1.952p
275.00	0.347p	0.694p	1.040p	1.377p	1.688p	1.948p
280.00	0.346p	0.691p	1.036p	1.374p	1.685p	1.944p
285.00	0.344p	0.688p	1.033p	1.370p	1.681p	1.939p
290.00	0.343p	0.685p	1.029p	1.367p	1.678p	1.934p
295.00	0.342p	0.683p	1.026p	1.363p	1.674p	1.929p
300.00	0.340p	0.680p	1.022p	1.360p	1.670p	1.923p

METRIC TONS	@ Flooding					
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.431p	2.716p	2.871p	2.906p	2.811p	55.23p
215.00	2.424p	2.706p	2.858p	2.894p	2.791p	54.63p
220.00	2.418p	2.696p	2.846p	2.883p	2.770p	54.04p
225.00	2.411p	2.686p	2.834p	2.871p	2.750p	53.45p
230.00	2.404p	2.676p	2.822p	2.859p	2.729p	52.86p
235.00	2.397p	2.666p	2.810p	2.847p	2.709p	52.28p
240.00	2.389p	2.656p	2.798p	2.836p	2.689p	51.70p
245.00	2.382p	2.647p	2.787p	2.825p	2.668p	51.12p
250.00	2.375p	2.637p	2.776p	2.814p	2.647p	50.56p
255.00	2.367p	2.627p	2.765p	2.803p	2.627p	50.00p
260.00	2.360p	2.617p	2.754p	2.792p	2.605p	49.42p
265.00	2.352p	2.607p	2.744p	2.782p	2.584p	48.86p
270.00	2.344p	2.597p	2.734p	2.772p	2.563p	48.30p
275.00	2.336p	2.587p	2.724p	2.762p	2.541p	47.75p
280.00	2.328p	2.578p	2.714p	2.752p	2.520p	47.20p
285.00	2.320p	2.568p	2.704p	2.743p	2.498p	46.66p
290.00	2.312p	2.558p	2.694p	2.733p	2.476p	46.12p
295.00	2.304p	2.548p	2.684p	2.724p	2.455p	45.58p
300.00	2.296p	2.539p	2.675p	2.715p	2.433p	45.05p

Distances in METERS. — Specific Gravity = 1.025. —

CROSS CURVES OF STABILITY - Port Heel  
at 0.5 M. AFT TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 M.  
"K" = BASELINE



CROSS CURVES OF STABILITY

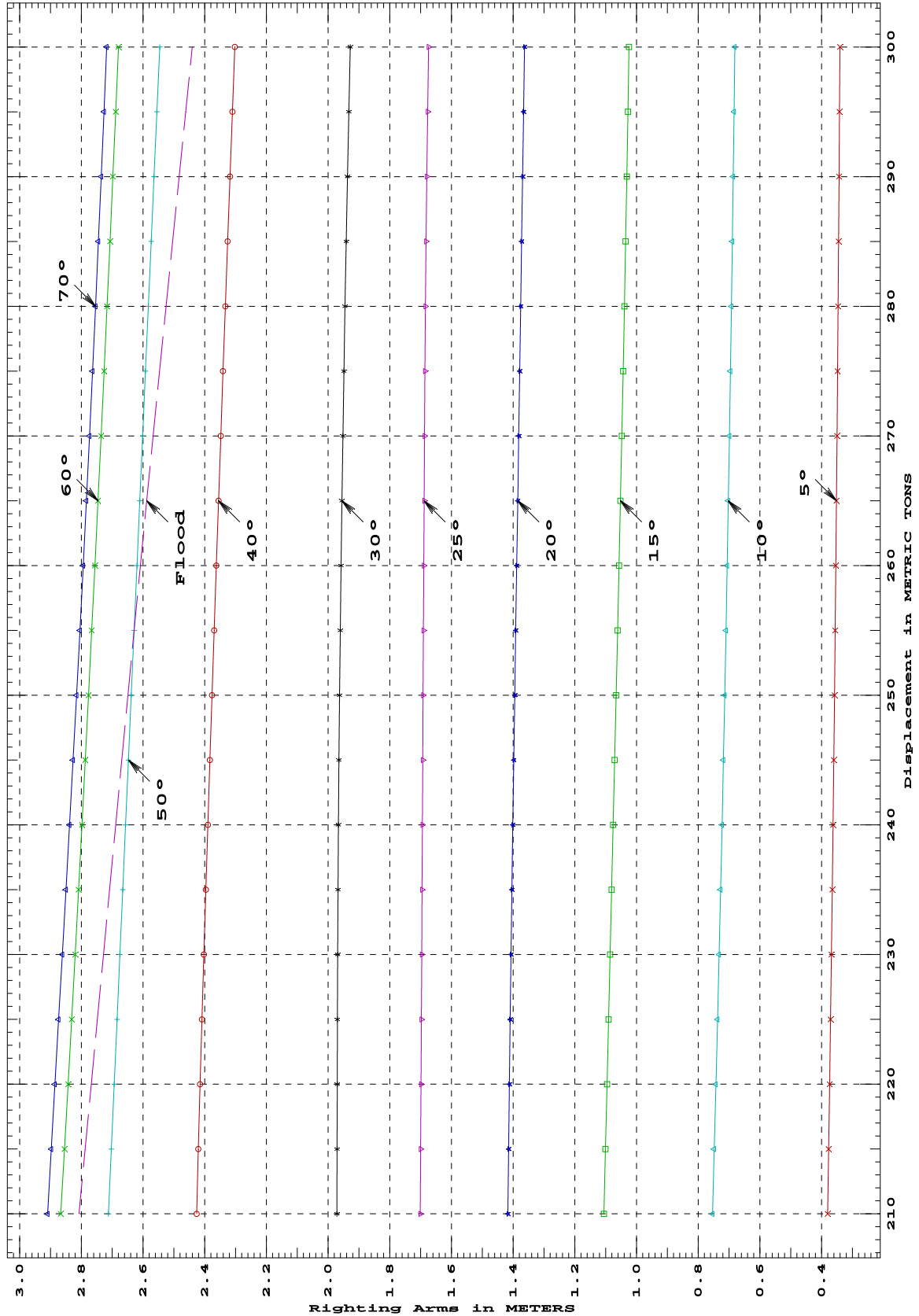
Showing righting arms in heel at VCG = 0.00  
Trim: Aft 0.250/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.380p	0.754p	1.106p	1.417p	1.701p	1.971p
215.00	0.377p	0.748p	1.101p	1.415p	1.700p	1.971p
220.00	0.374p	0.743p	1.096p	1.412p	1.699p	1.970p
225.00	0.371p	0.737p	1.091p	1.410p	1.698p	1.970p
230.00	0.368p	0.732p	1.086p	1.407p	1.697p	1.969p
235.00	0.366p	0.727p	1.081p	1.404p	1.696p	1.968p
240.00	0.363p	0.723p	1.076p	1.401p	1.694p	1.967p
245.00	0.360p	0.718p	1.071p	1.398p	1.693p	1.965p
250.00	0.358p	0.714p	1.066p	1.395p	1.692p	1.963p
255.00	0.356p	0.710p	1.061p	1.392p	1.691p	1.961p
260.00	0.354p	0.706p	1.057p	1.388p	1.690p	1.958p
265.00	0.352p	0.703p	1.052p	1.385p	1.689p	1.955p
270.00	0.350p	0.699p	1.048p	1.382p	1.688p	1.952p
275.00	0.348p	0.696p	1.044p	1.379p	1.686p	1.949p
280.00	0.347p	0.692p	1.040p	1.376p	1.684p	1.945p
285.00	0.345p	0.689p	1.036p	1.373p	1.682p	1.941p
290.00	0.343p	0.686p	1.032p	1.370p	1.680p	1.937p
295.00	0.342p	0.684p	1.028p	1.366p	1.677p	1.933p
300.00	0.341p	0.681p	1.024p	1.363p	1.674p	1.928p

METRIC TONS						@ Flooding
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.426p	2.712p	2.867p	2.910p	2.808p	55.24p
215.00	2.421p	2.703p	2.855p	2.898p	2.788p	54.64p
220.00	2.415p	2.694p	2.843p	2.886p	2.768p	54.05p
225.00	2.409p	2.684p	2.831p	2.874p	2.748p	53.46p
230.00	2.403p	2.675p	2.820p	2.862p	2.728p	52.87p
235.00	2.397p	2.666p	2.809p	2.850p	2.709p	52.29p
240.00	2.390p	2.657p	2.798p	2.838p	2.689p	51.72p
245.00	2.383p	2.647p	2.787p	2.827p	2.669p	51.14p
250.00	2.376p	2.638p	2.777p	2.816p	2.649p	50.57p
255.00	2.369p	2.629p	2.766p	2.805p	2.629p	50.00p
260.00	2.362p	2.620p	2.756p	2.794p	2.609p	49.44p
265.00	2.355p	2.611p	2.746p	2.784p	2.588p	48.87p
270.00	2.348p	2.601p	2.736p	2.774p	2.567p	48.31p
275.00	2.341p	2.592p	2.726p	2.764p	2.547p	47.76p
280.00	2.333p	2.583p	2.717p	2.754p	2.525p	47.21p
285.00	2.326p	2.574p	2.707p	2.745p	2.504p	46.67p
290.00	2.318p	2.564p	2.698p	2.736p	2.483p	46.13p
295.00	2.310p	2.555p	2.689p	2.727p	2.462p	45.59p
300.00	2.303p	2.546p	2.680p	2.718p	2.440p	45.06p

Distances in METERS. — Specific Gravity = 1.025. —

CROSS CURVES OF STABILITY - Port Heel  
at 0.25 M. AFT TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 M.  
"K" = BASELINE

CROSS CURVES OF STABILITY

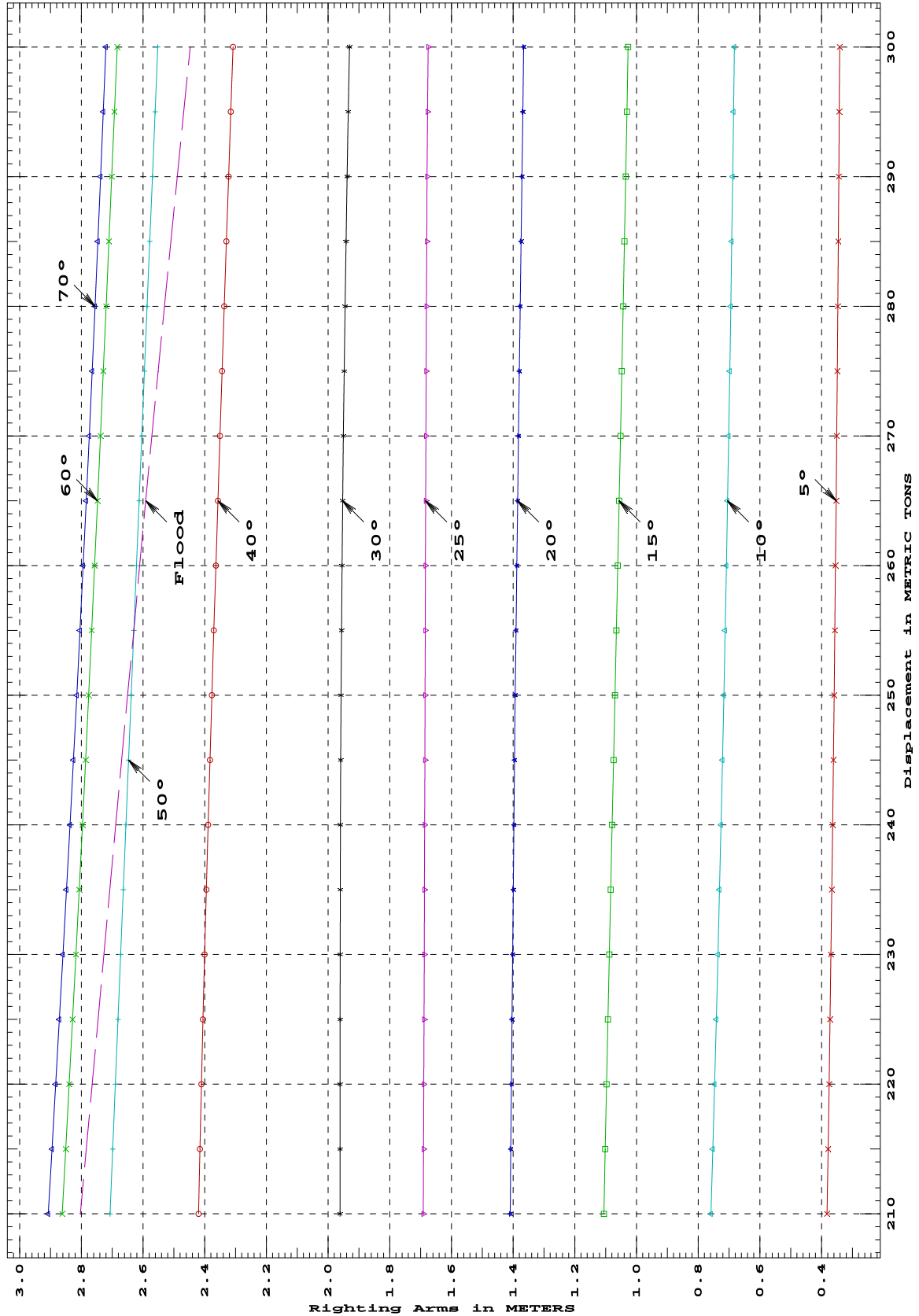
Showing righting arms in heel at VCG = 0.00  
Trim: zero at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.382p	0.759p	1.106p	1.410p	1.692p	1.961p
215.00	0.379p	0.753p	1.102p	1.408p	1.691p	1.961p
220.00	0.376p	0.747p	1.097p	1.406p	1.690p	1.961p
225.00	0.373p	0.742p	1.093p	1.404p	1.689p	1.961p
230.00	0.370p	0.736p	1.088p	1.402p	1.688p	1.961p
235.00	0.367p	0.731p	1.084p	1.400p	1.688p	1.961p
240.00	0.364p	0.726p	1.079p	1.398p	1.687p	1.960p
245.00	0.362p	0.722p	1.075p	1.396p	1.686p	1.959p
250.00	0.359p	0.717p	1.070p	1.393p	1.686p	1.958p
255.00	0.357p	0.713p	1.066p	1.391p	1.685p	1.957p
260.00	0.355p	0.709p	1.061p	1.388p	1.684p	1.955p
265.00	0.353p	0.705p	1.057p	1.386p	1.684p	1.953p
270.00	0.351p	0.701p	1.052p	1.383p	1.683p	1.950p
275.00	0.349p	0.698p	1.048p	1.380p	1.682p	1.948p
280.00	0.348p	0.695p	1.043p	1.377p	1.681p	1.945p
285.00	0.346p	0.691p	1.039p	1.374p	1.680p	1.942p
290.00	0.344p	0.688p	1.035p	1.372p	1.679p	1.938p
295.00	0.343p	0.686p	1.031p	1.369p	1.677p	1.935p
300.00	0.342p	0.683p	1.028p	1.366p	1.676p	1.931p

METRIC TONS	@ Flooding					
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.420p	2.707p	2.862p	2.907p	2.803p	55.29p
215.00	2.415p	2.698p	2.851p	2.895p	2.784p	54.69p
220.00	2.411p	2.690p	2.840p	2.883p	2.765p	54.10p
225.00	2.406p	2.681p	2.829p	2.871p	2.746p	53.51p
230.00	2.400p	2.673p	2.818p	2.860p	2.727p	52.92p
235.00	2.395p	2.664p	2.807p	2.848p	2.708p	52.34p
240.00	2.389p	2.656p	2.797p	2.837p	2.689p	51.76p
245.00	2.383p	2.647p	2.786p	2.826p	2.669p	51.18p
250.00	2.377p	2.638p	2.776p	2.815p	2.650p	50.61p
255.00	2.370p	2.630p	2.767p	2.804p	2.630p	50.00p
260.00	2.364p	2.621p	2.757p	2.794p	2.611p	49.48p
265.00	2.357p	2.613p	2.748p	2.784p	2.591p	48.91p
270.00	2.351p	2.604p	2.738p	2.774p	2.571p	48.35p
275.00	2.344p	2.596p	2.729p	2.765p	2.551p	47.79p
280.00	2.337p	2.587p	2.720p	2.756p	2.531p	47.24p
285.00	2.330p	2.578p	2.711p	2.747p	2.510p	46.70p
290.00	2.323p	2.570p	2.702p	2.738p	2.489p	46.16p
295.00	2.316p	2.561p	2.693p	2.729p	2.468p	45.62p
300.00	2.308p	2.552p	2.684p	2.721p	2.447p	45.09p

Distances in METERS. Specific Gravity = 1.025.

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



Specific Gravity = 1.025 Assumed KG = 0.00 M.  
"K" = BASELINE

CROSS CURVES OF STABILITY

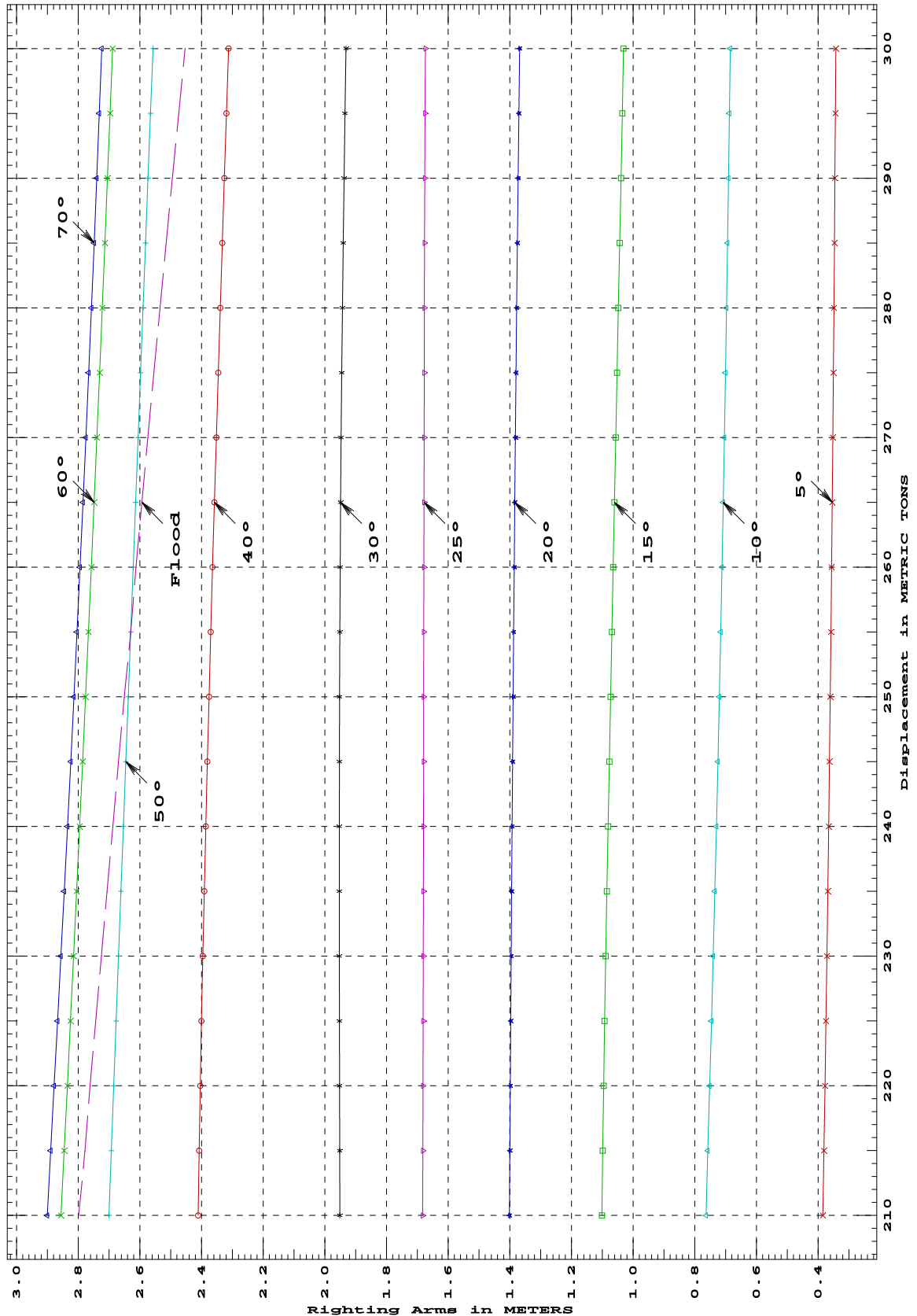
Showing righting arms in heel at VCG = 0.00  
Trim: Fwd 0.250/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.385p	0.763p	1.101p	1.401p	1.683p	1.951p
215.00	0.381p	0.758p	1.099p	1.400p	1.682p	1.952p
220.00	0.378p	0.752p	1.096p	1.399p	1.682p	1.952p
225.00	0.375p	0.746p	1.093p	1.397p	1.681p	1.953p
230.00	0.372p	0.740p	1.089p	1.396p	1.681p	1.953p
235.00	0.369p	0.735p	1.085p	1.394p	1.680p	1.953p
240.00	0.366p	0.730p	1.081p	1.393p	1.680p	1.953p
245.00	0.363p	0.725p	1.077p	1.391p	1.680p	1.953p
250.00	0.361p	0.721p	1.073p	1.389p	1.679p	1.952p
255.00	0.359p	0.716p	1.069p	1.388p	1.679p	1.951p
260.00	0.357p	0.712p	1.065p	1.386p	1.679p	1.950p
265.00	0.354p	0.708p	1.061p	1.384p	1.678p	1.949p
270.00	0.352p	0.704p	1.057p	1.382p	1.678p	1.947p
275.00	0.351p	0.701p	1.052p	1.380p	1.678p	1.945p
280.00	0.349p	0.697p	1.048p	1.378p	1.677p	1.943p
285.00	0.347p	0.694p	1.044p	1.376p	1.677p	1.941p
290.00	0.346p	0.691p	1.039p	1.373p	1.676p	1.938p
295.00	0.344p	0.688p	1.035p	1.371p	1.675p	1.935p
300.00	0.343p	0.685p	1.031p	1.368p	1.674p	1.931p

METRIC TONS	@ Flooding					
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.411p	2.700p	2.856p	2.900p	2.798p	55.37p
215.00	2.408p	2.692p	2.845p	2.889p	2.778p	54.66p
220.00	2.404p	2.685p	2.835p	2.878p	2.761p	54.17p
225.00	2.400p	2.677p	2.825p	2.867p	2.743p	53.58p
230.00	2.396p	2.669p	2.815p	2.856p	2.725p	52.99p
235.00	2.391p	2.661p	2.805p	2.845p	2.706p	52.41p
240.00	2.386p	2.653p	2.795p	2.835p	2.688p	51.83p
245.00	2.381p	2.645p	2.786p	2.824p	2.669p	51.25p
250.00	2.376p	2.638p	2.776p	2.814p	2.651p	50.68p
255.00	2.370p	2.630p	2.767p	2.804p	2.630p	50.00p
260.00	2.364p	2.622p	2.758p	2.794p	2.613p	49.54p
265.00	2.358p	2.614p	2.748p	2.784p	2.593p	48.97p
270.00	2.352p	2.606p	2.739p	2.775p	2.574p	48.40p
275.00	2.346p	2.598p	2.731p	2.766p	2.554p	47.85p
280.00	2.339p	2.590p	2.722p	2.757p	2.535p	47.29p
285.00	2.333p	2.582p	2.713p	2.748p	2.515p	46.74p
290.00	2.326p	2.574p	2.705p	2.740p	2.494p	46.20p
295.00	2.319p	2.565p	2.697p	2.731p	2.474p	45.66p
300.00	2.312p	2.557p	2.688p	2.723p	2.453p	45.13p

Distances in METERS. Specific Gravity = 1.025.

CROSS CURVES OF STABILITY - Port Heel  
at 0.25 M. FWD TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 M.  
"K" = BASELINE

CROSS CURVES OF STABILITY

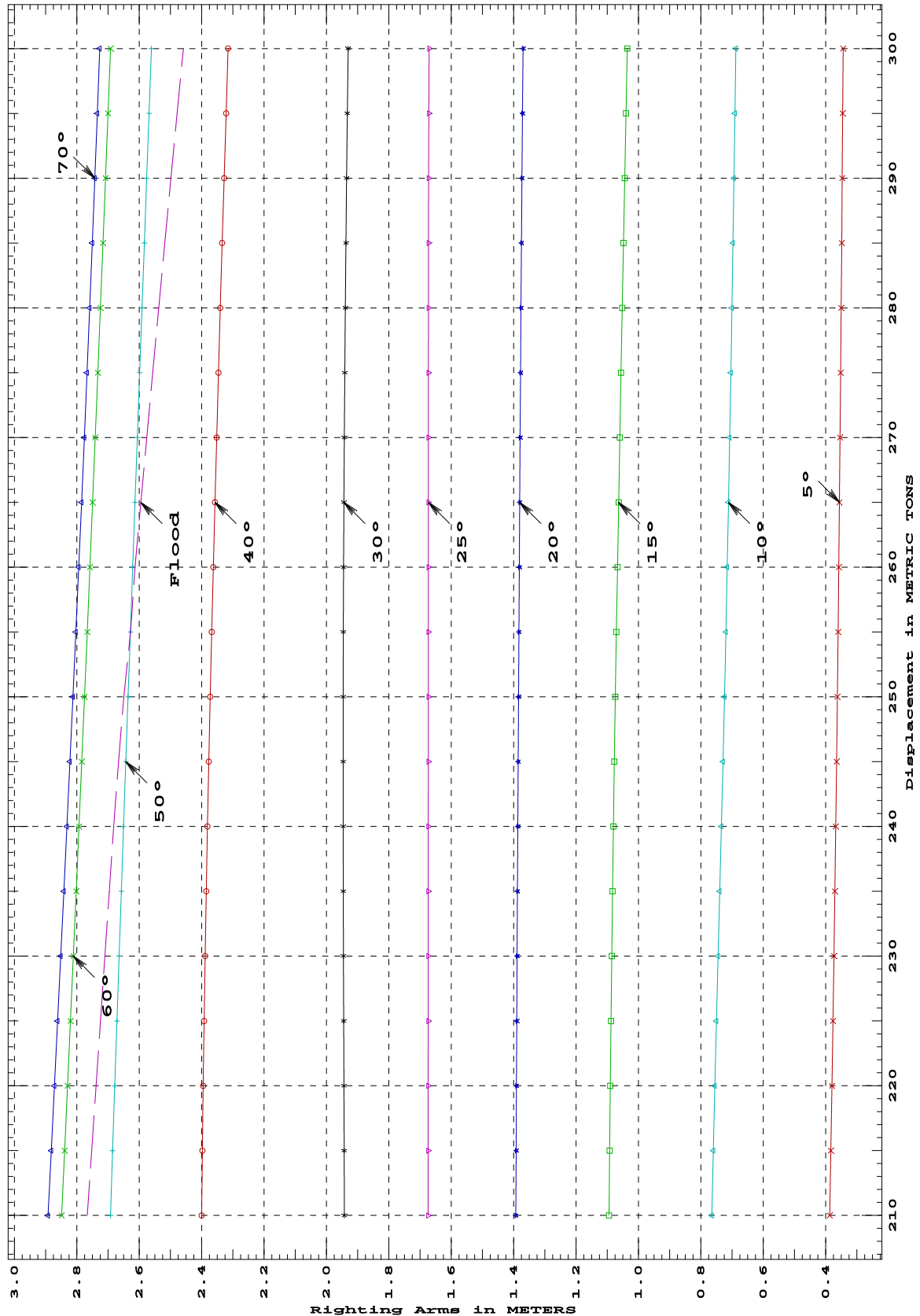
Showing righting arms in heel at VCG = 0.00  
Trim: Fwd 0.500/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.387p	0.765p	1.094p	1.393p	1.674p	1.943p
215.00	0.384p	0.760p	1.092p	1.392p	1.674p	1.943p
220.00	0.380p	0.755p	1.090p	1.391p	1.674p	1.944p
225.00	0.377p	0.750p	1.088p	1.390p	1.674p	1.945p
230.00	0.374p	0.745p	1.086p	1.389p	1.674p	1.946p
235.00	0.371p	0.739p	1.083p	1.388p	1.674p	1.946p
240.00	0.368p	0.734p	1.080p	1.387p	1.674p	1.946p
245.00	0.365p	0.729p	1.078p	1.386p	1.674p	1.946p
250.00	0.363p	0.725p	1.074p	1.385p	1.674p	1.946p
255.00	0.360p	0.720p	1.071p	1.383p	1.674p	1.946p
260.00	0.358p	0.716p	1.067p	1.382p	1.673p	1.945p
265.00	0.356p	0.712p	1.064p	1.381p	1.673p	1.944p
270.00	0.354p	0.708p	1.060p	1.379p	1.673p	1.943p
275.00	0.352p	0.704p	1.056p	1.378p	1.673p	1.941p
280.00	0.350p	0.700p	1.052p	1.376p	1.673p	1.940p
285.00	0.349p	0.697p	1.048p	1.375p	1.673p	1.938p
290.00	0.347p	0.694p	1.044p	1.373p	1.673p	1.935p
295.00	0.346p	0.691p	1.040p	1.372p	1.672p	1.933p
300.00	0.344p	0.688p	1.036p	1.370p	1.671p	1.930p

METRIC TONS						@ Flooding
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.400p	2.692p	2.849p	2.892p	2.766p	53.83p
215.00	2.398p	2.685p	2.839p	2.882p	2.752p	53.48p
220.00	2.395p	2.678p	2.830p	2.872p	2.738p	53.12p
225.00	2.392p	2.671p	2.820p	2.861p	2.724p	52.76p
230.00	2.389p	2.664p	2.811p	2.851p	2.710p	52.39p
235.00	2.385p	2.657p	2.802p	2.841p	2.696p	52.02p
240.00	2.381p	2.650p	2.793p	2.832p	2.682p	51.66p
245.00	2.377p	2.643p	2.784p	2.822p	2.666p	51.21p
250.00	2.372p	2.636p	2.775p	2.812p	2.649p	50.70p
255.00	2.368p	2.628p	2.767p	2.803p	2.628p	50.00p
260.00	2.362p	2.621p	2.758p	2.794p	2.613p	49.62p
265.00	2.357p	2.613p	2.749p	2.785p	2.595p	49.04p
270.00	2.352p	2.606p	2.741p	2.776p	2.576p	48.48p
275.00	2.346p	2.599p	2.733p	2.767p	2.557p	47.91p
280.00	2.340p	2.591p	2.724p	2.759p	2.537p	47.36p
285.00	2.334p	2.584p	2.716p	2.750p	2.518p	46.81p
290.00	2.328p	2.576p	2.708p	2.742p	2.498p	46.26p
295.00	2.322p	2.568p	2.700p	2.734p	2.478p	45.72p
300.00	2.315p	2.561p	2.692p	2.727p	2.458p	45.19p

Distances in METERS. — Specific Gravity = 1.025. —

CROSS CURVES OF STABILITY - Port Heel  
at 0.5 M. FWD TRIM (initial)



Specific Gravity = 1.025 Assumed KG = 0.00 M.  
"K" = BASELINE



CROSS CURVES OF STABILITY

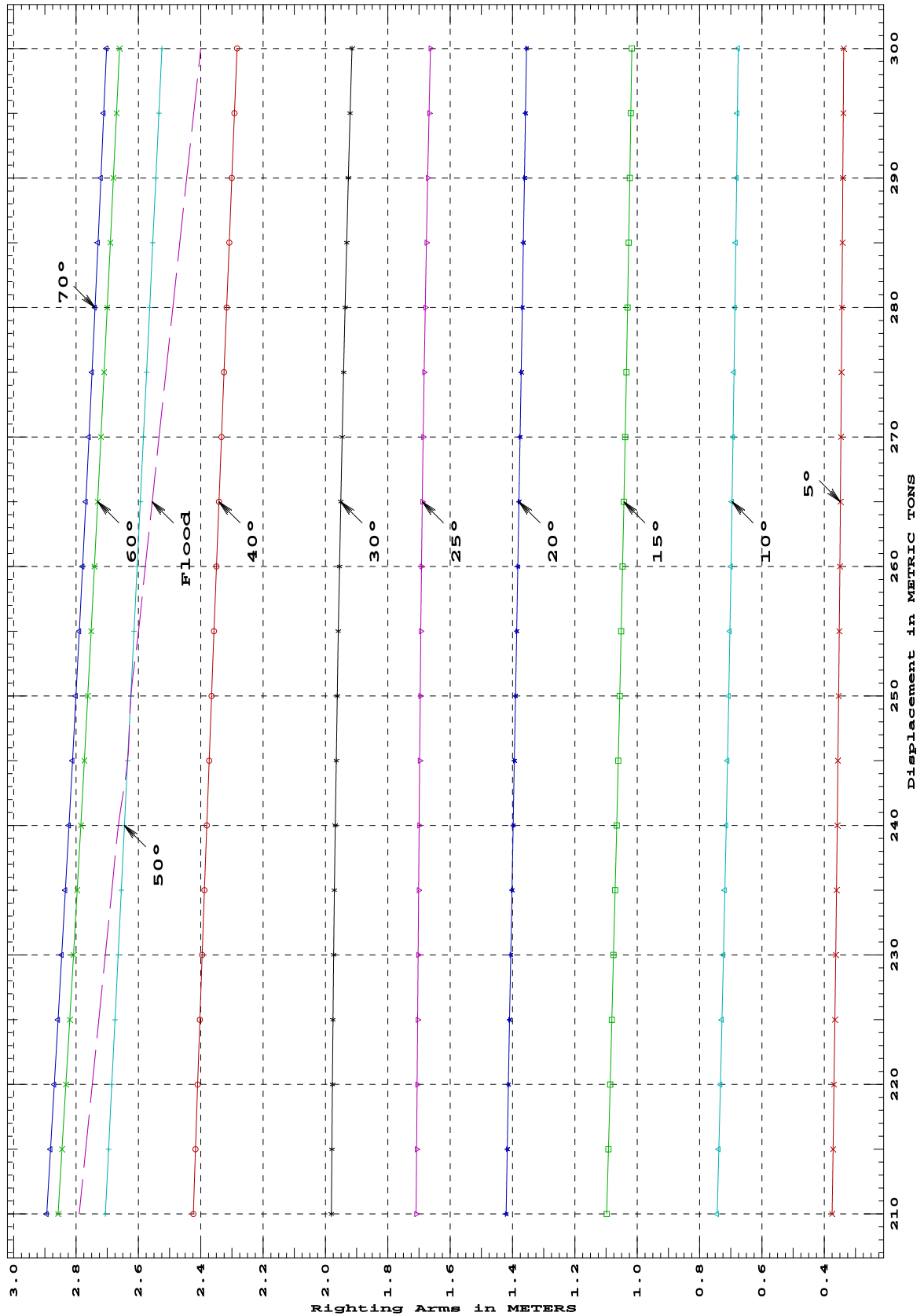
Showing righting arms in heel at VCG = 0.00  
Trim: Aft 0.500/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.375p	0.744p	1.098p	1.421p	1.709p	1.981p
215.00	0.372p	0.738p	1.092p	1.417p	1.708p	1.980p
220.00	0.369p	0.733p	1.087p	1.413p	1.706p	1.978p
225.00	0.366p	0.728p	1.082p	1.410p	1.705p	1.976p
230.00	0.364p	0.724p	1.076p	1.406p	1.703p	1.974p
235.00	0.361p	0.719p	1.071p	1.402p	1.701p	1.971p
240.00	0.359p	0.715p	1.066p	1.398p	1.700p	1.969p
245.00	0.357p	0.711p	1.061p	1.394p	1.698p	1.966p
250.00	0.354p	0.707p	1.056p	1.391p	1.696p	1.962p
255.00	0.352p	0.703p	1.052p	1.387p	1.694p	1.959p
260.00	0.350p	0.700p	1.047p	1.383p	1.692p	1.955p
265.00	0.349p	0.696p	1.043p	1.380p	1.689p	1.951p
270.00	0.347p	0.693p	1.039p	1.376p	1.687p	1.947p
275.00	0.345p	0.690p	1.035p	1.372p	1.683p	1.942p
280.00	0.344p	0.687p	1.031p	1.369p	1.680p	1.937p
285.00	0.342p	0.684p	1.028p	1.365p	1.676p	1.932p
290.00	0.341p	0.681p	1.024p	1.362p	1.672p	1.926p
295.00	0.340p	0.679p	1.021p	1.359p	1.668p	1.921p
300.00	0.338p	0.677p	1.018p	1.355p	1.664p	1.915p

METRIC TONS	@ Flooding					
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.424p	2.706p	2.858p	2.894p	2.790p	54.60p
215.00	2.417p	2.696p	2.845p	2.882p	2.769p	53.99p
220.00	2.410p	2.685p	2.832p	2.870p	2.748p	53.39p
225.00	2.403p	2.675p	2.820p	2.858p	2.727p	52.79p
230.00	2.396p	2.665p	2.808p	2.846p	2.706p	52.19p
235.00	2.388p	2.655p	2.796p	2.834p	2.685p	51.60p
240.00	2.381p	2.645p	2.785p	2.823p	2.664p	51.01p
245.00	2.373p	2.634p	2.773p	2.811p	2.634p	50.00p
250.00	2.365p	2.624p	2.762p	2.800p	2.624p	50.00p
255.00	2.358p	2.614p	2.751p	2.790p	2.600p	49.27p
260.00	2.350p	2.604p	2.741p	2.779p	2.578p	48.69p
265.00	2.342p	2.594p	2.730p	2.769p	2.556p	48.12p
270.00	2.334p	2.584p	2.720p	2.759p	2.534p	47.56p
275.00	2.325p	2.574p	2.710p	2.749p	2.511p	47.00p
280.00	2.317p	2.564p	2.700p	2.739p	2.489p	46.44p
285.00	2.309p	2.554p	2.690p	2.729p	2.467p	45.89p
290.00	2.300p	2.544p	2.680p	2.720p	2.445p	45.34p
295.00	2.292p	2.534p	2.670p	2.711p	2.422p	44.80p
300.00	2.283p	2.524p	2.660p	2.702p	2.400p	44.26p

Distances in METERS. Specific Gravity = 1.000.

CROSS CURVES OF STABILITY - Port Heel  
at 0.5 M. AFT TRIM (initial)



Specific Gravity = 1.000 Assumed KG = 0.00 M.  
"K" = BASELINE

CROSS CURVES OF STABILITY

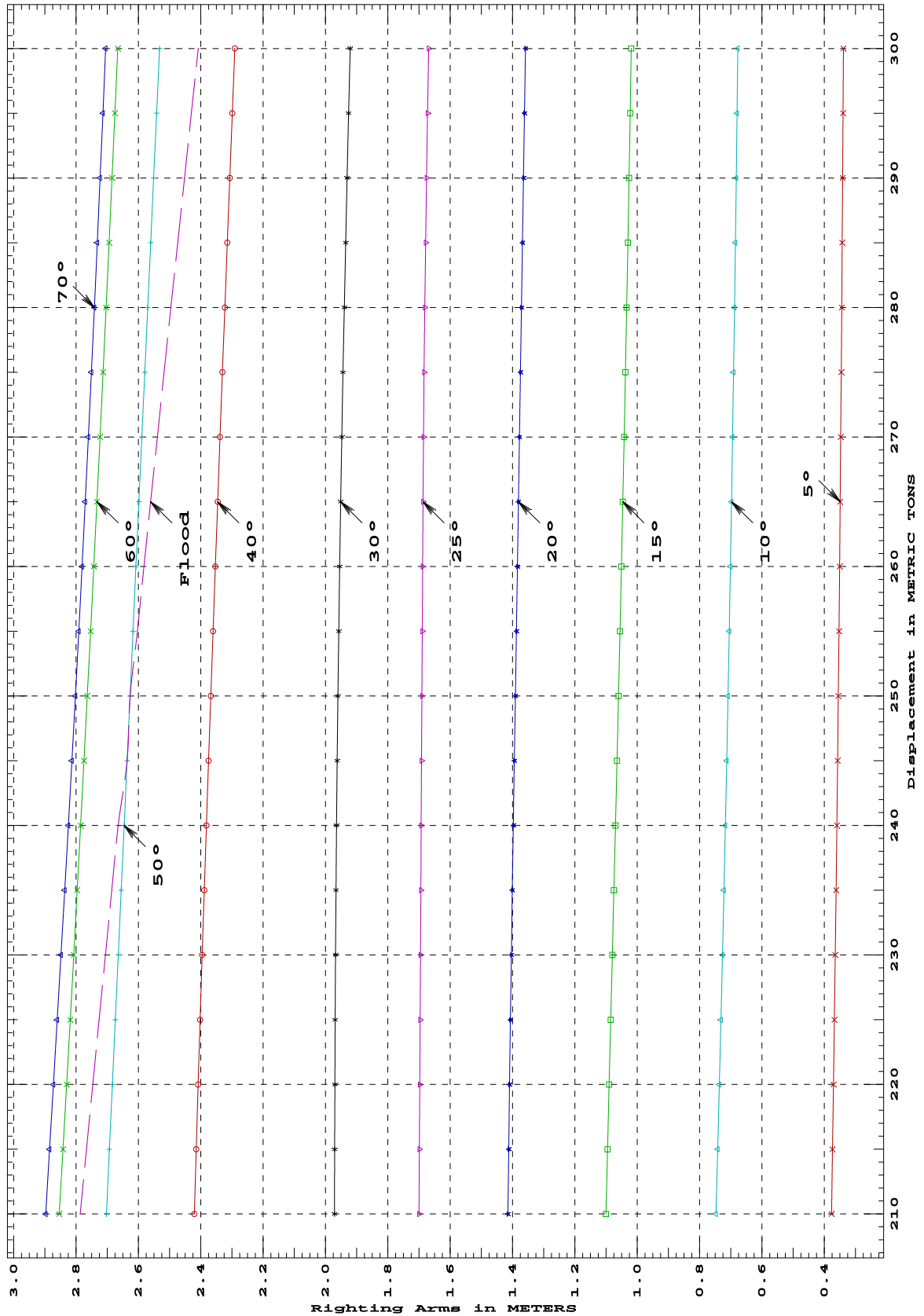
Showing righting arms in heel at VCG = 0.00  
Trim: Aft 0.250/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.377p	0.748p	1.101p	1.415p	1.700p	1.971p
215.00	0.374p	0.742p	1.095p	1.412p	1.699p	1.970p
220.00	0.371p	0.737p	1.090p	1.410p	1.698p	1.970p
225.00	0.368p	0.732p	1.085p	1.407p	1.696p	1.969p
230.00	0.365p	0.727p	1.080p	1.404p	1.695p	1.968p
235.00	0.362p	0.722p	1.075p	1.401p	1.694p	1.966p
240.00	0.360p	0.718p	1.070p	1.398p	1.693p	1.964p
245.00	0.358p	0.713p	1.065p	1.394p	1.692p	1.962p
250.00	0.355p	0.709p	1.060p	1.391p	1.691p	1.960p
255.00	0.353p	0.705p	1.056p	1.388p	1.690p	1.957p
260.00	0.351p	0.701p	1.051p	1.384p	1.688p	1.954p
265.00	0.349p	0.698p	1.046p	1.381p	1.687p	1.951p
270.00	0.348p	0.694p	1.042p	1.378p	1.686p	1.948p
275.00	0.346p	0.691p	1.038p	1.375p	1.684p	1.944p
280.00	0.344p	0.688p	1.034p	1.371p	1.682p	1.940p
285.00	0.343p	0.685p	1.030p	1.368p	1.679p	1.935p
290.00	0.341p	0.683p	1.026p	1.365p	1.676p	1.931p
295.00	0.340p	0.680p	1.023p	1.362p	1.673p	1.926p
300.00	0.339p	0.678p	1.020p	1.359p	1.669p	1.921p

METRIC TONS	@ Flooding					
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.421p	2.703p	2.854p	2.897p	2.787p	54.61p
215.00	2.415p	2.693p	2.842p	2.885p	2.766p	54.00p
220.00	2.408p	2.683p	2.830p	2.873p	2.746p	53.40p
225.00	2.402p	2.674p	2.819p	2.860p	2.726p	52.80p
230.00	2.396p	2.664p	2.807p	2.848p	2.706p	52.21p
235.00	2.389p	2.655p	2.796p	2.836p	2.685p	51.61p
240.00	2.382p	2.646p	2.785p	2.824p	2.665p	51.03p
245.00	2.375p	2.636p	2.774p	2.813p	2.636p	50.00p
250.00	2.368p	2.627p	2.764p	2.802p	2.627p	50.00p
255.00	2.360p	2.617p	2.753p	2.791p	2.603p	49.28p
260.00	2.353p	2.608p	2.743p	2.781p	2.582p	48.70p
265.00	2.346p	2.598p	2.733p	2.770p	2.561p	48.13p
270.00	2.338p	2.589p	2.723p	2.760p	2.539p	47.57p
275.00	2.330p	2.579p	2.713p	2.751p	2.518p	47.01p
280.00	2.323p	2.570p	2.703p	2.741p	2.496p	46.45p
285.00	2.315p	2.560p	2.694p	2.732p	2.474p	45.90p
290.00	2.307p	2.551p	2.685p	2.723p	2.452p	45.35p
295.00	2.299p	2.542p	2.675p	2.714p	2.430p	44.81p
300.00	2.291p	2.532p	2.666p	2.705p	2.408p	44.28p

Distances in METERS. — Specific Gravity = 1.000. —

CROSS CURVES OF STABILITY - Port Heel  
at 0.25 M. AFT TRIM (initial)



Specific Gravity = 1.000 Assumed KG = 0.00 M.  
"K" = BASELINE

CROSS CURVES OF STABILITY

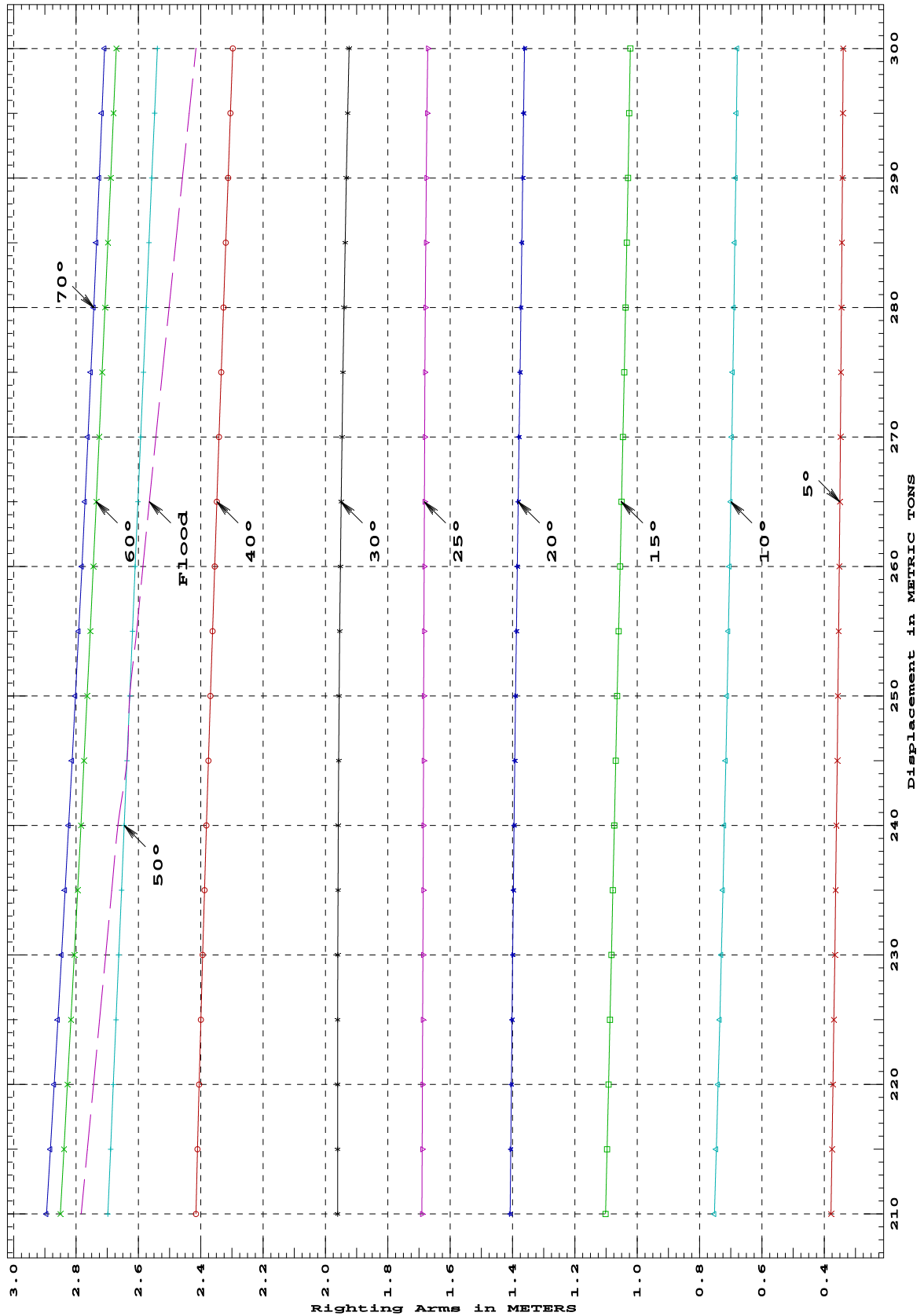
Showing righting arms in heel at VCG = 0.00  
Trim: zero at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.379p	0.753p	1.102p	1.408p	1.691p	1.961p
215.00	0.376p	0.747p	1.097p	1.406p	1.690p	1.961p
220.00	0.372p	0.741p	1.092p	1.404p	1.689p	1.961p
225.00	0.369p	0.736p	1.088p	1.402p	1.688p	1.961p
230.00	0.367p	0.730p	1.083p	1.400p	1.688p	1.960p
235.00	0.364p	0.725p	1.078p	1.397p	1.687p	1.960p
240.00	0.361p	0.721p	1.074p	1.395p	1.686p	1.959p
245.00	0.359p	0.716p	1.069p	1.393p	1.686p	1.958p
250.00	0.357p	0.712p	1.064p	1.390p	1.685p	1.956p
255.00	0.355p	0.708p	1.060p	1.388p	1.684p	1.954p
260.00	0.352p	0.704p	1.055p	1.385p	1.683p	1.952p
265.00	0.351p	0.700p	1.051p	1.382p	1.683p	1.950p
270.00	0.349p	0.697p	1.046p	1.379p	1.682p	1.947p
275.00	0.347p	0.693p	1.042p	1.376p	1.681p	1.944p
280.00	0.345p	0.690p	1.038p	1.373p	1.680p	1.940p
285.00	0.344p	0.687p	1.033p	1.370p	1.678p	1.937p
290.00	0.342p	0.684p	1.030p	1.368p	1.677p	1.933p
295.00	0.341p	0.682p	1.026p	1.365p	1.675p	1.929p
300.00	0.340p	0.679p	1.022p	1.362p	1.672p	1.924p

METRIC TONS						@ Flooding
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.415p	2.698p	2.850p	2.895p	2.783p	54.66p
215.00	2.410p	2.689p	2.839p	2.882p	2.764p	54.05p
220.00	2.405p	2.680p	2.827p	2.870p	2.744p	53.45p
225.00	2.400p	2.672p	2.816p	2.858p	2.724p	52.85p
230.00	2.394p	2.663p	2.805p	2.846p	2.705p	52.25p
235.00	2.388p	2.654p	2.795p	2.835p	2.685p	51.66p
240.00	2.382p	2.645p	2.784p	2.824p	2.666p	51.07p
245.00	2.375p	2.637p	2.774p	2.813p	2.637p	50.00p
250.00	2.369p	2.628p	2.764p	2.802p	2.628p	50.00p
255.00	2.362p	2.619p	2.754p	2.791p	2.606p	49.32p
260.00	2.355p	2.610p	2.745p	2.781p	2.585p	48.74p
265.00	2.348p	2.601p	2.735p	2.771p	2.565p	48.17p
270.00	2.341p	2.593p	2.726p	2.762p	2.544p	47.60p
275.00	2.334p	2.584p	2.716p	2.752p	2.523p	47.04p
280.00	2.327p	2.575p	2.707p	2.743p	2.502p	46.48p
285.00	2.320p	2.566p	2.698p	2.734p	2.480p	45.93p
290.00	2.312p	2.557p	2.689p	2.725p	2.459p	45.38p
295.00	2.305p	2.548p	2.680p	2.717p	2.437p	44.84p
300.00	2.297p	2.539p	2.671p	2.708p	2.415p	44.30p

Distances in METERS. Specific Gravity = 1.000.

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



Specific Gravity = 1.000 Assumed KG = 0.00 M.  
"K" = BASELINE

CROSS CURVES OF STABILITY

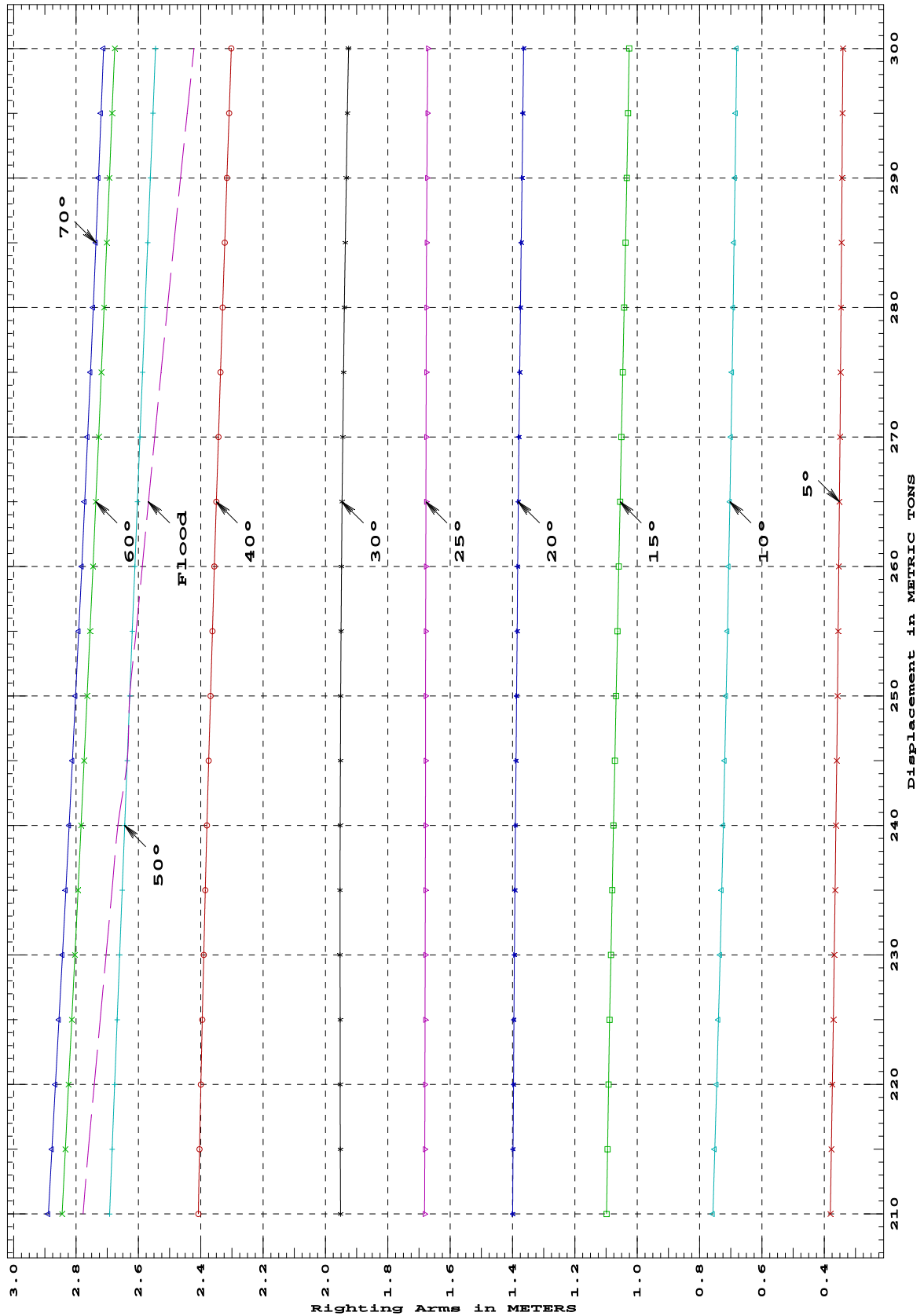
Showing righting arms in heel at VCG = 0.00  
Trim: Fwd 0.250/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.381p	0.758p	1.099p	1.400p	1.682p	1.952p
215.00	0.378p	0.751p	1.096p	1.398p	1.682p	1.952p
220.00	0.374p	0.745p	1.092p	1.397p	1.681p	1.953p
225.00	0.371p	0.740p	1.089p	1.395p	1.681p	1.953p
230.00	0.368p	0.734p	1.085p	1.394p	1.680p	1.953p
235.00	0.366p	0.729p	1.080p	1.392p	1.680p	1.953p
240.00	0.363p	0.724p	1.076p	1.391p	1.680p	1.953p
245.00	0.360p	0.720p	1.072p	1.389p	1.679p	1.952p
250.00	0.358p	0.715p	1.068p	1.387p	1.679p	1.951p
255.00	0.356p	0.711p	1.064p	1.385p	1.679p	1.950p
260.00	0.354p	0.707p	1.059p	1.384p	1.678p	1.948p
265.00	0.352p	0.703p	1.055p	1.382p	1.678p	1.947p
270.00	0.350p	0.699p	1.051p	1.379p	1.678p	1.945p
275.00	0.348p	0.696p	1.046p	1.377p	1.677p	1.942p
280.00	0.347p	0.693p	1.042p	1.375p	1.677p	1.939p
285.00	0.345p	0.690p	1.038p	1.372p	1.676p	1.936p
290.00	0.344p	0.687p	1.034p	1.370p	1.675p	1.933p
295.00	0.342p	0.684p	1.030p	1.367p	1.673p	1.930p
300.00	0.341p	0.681p	1.026p	1.365p	1.672p	1.926p

METRIC TONS						@ Flooding Arm Angle
	40.00p	50.00p	60.00p	70.00p		
210.00	2.408p	2.692p	2.845p	2.889p	2.777p	54.63p
215.00	2.404p	2.684p	2.834p	2.877p	2.760p	54.13p
220.00	2.400p	2.676p	2.824p	2.866p	2.741p	53.52p
225.00	2.395p	2.668p	2.814p	2.855p	2.722p	52.92p
230.00	2.390p	2.660p	2.804p	2.844p	2.704p	52.32p
235.00	2.385p	2.652p	2.794p	2.833p	2.685p	51.73p
240.00	2.380p	2.644p	2.784p	2.822p	2.666p	51.14p
245.00	2.374p	2.636p	2.774p	2.812p	2.636p	50.00p
250.00	2.369p	2.628p	2.764p	2.801p	2.628p	50.00p
255.00	2.363p	2.619p	2.755p	2.791p	2.607p	49.38p
260.00	2.356p	2.611p	2.746p	2.782p	2.587p	48.80p
265.00	2.350p	2.603p	2.736p	2.772p	2.568p	48.22p
270.00	2.343p	2.595p	2.728p	2.763p	2.548p	47.65p
275.00	2.337p	2.587p	2.719p	2.754p	2.527p	47.09p
280.00	2.330p	2.578p	2.710p	2.745p	2.507p	46.53p
285.00	2.323p	2.570p	2.701p	2.736p	2.486p	45.97p
290.00	2.316p	2.562p	2.693p	2.728p	2.465p	45.42p
295.00	2.309p	2.553p	2.684p	2.720p	2.443p	44.88p
300.00	2.302p	2.545p	2.676p	2.712p	2.422p	44.34p

Distances in METERS. Specific Gravity = 1.000.

CROSS CURVES OF STABILITY - Port Heel  
at 0.25 M. FWD TRIM (initial)



Specific Gravity = 1.000 Assumed KG = 0.00 M.  
"K" = BASELINE



CROSS CURVES OF STABILITY

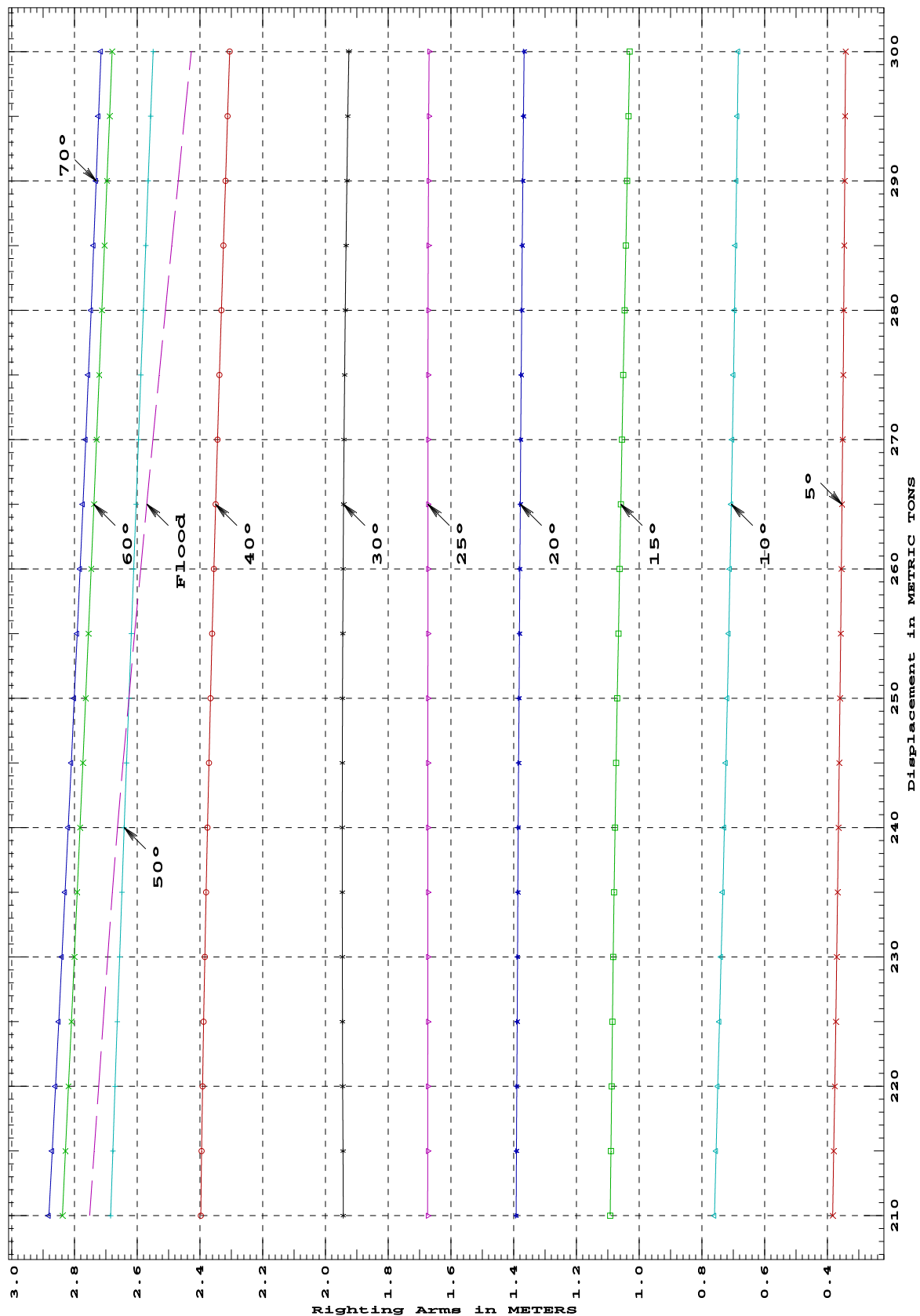
Showing righting arms in heel at VCG = 0.00  
Trim: Fwd 0.500/36.700 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees					
	5.00p	10.00p	15.00p	20.00p	25.00p	30.00p
210.00	0.383p	0.760p	1.092p	1.392p	1.674p	1.943p
215.00	0.380p	0.755p	1.090p	1.391p	1.674p	1.944p
220.00	0.376p	0.750p	1.088p	1.390p	1.674p	1.945p
225.00	0.373p	0.744p	1.085p	1.389p	1.674p	1.946p
230.00	0.370p	0.739p	1.083p	1.388p	1.674p	1.946p
235.00	0.367p	0.733p	1.080p	1.387p	1.674p	1.946p
240.00	0.365p	0.728p	1.077p	1.385p	1.674p	1.946p
245.00	0.362p	0.723p	1.074p	1.384p	1.674p	1.946p
250.00	0.360p	0.719p	1.070p	1.383p	1.673p	1.946p
255.00	0.358p	0.715p	1.066p	1.382p	1.673p	1.945p
260.00	0.356p	0.710p	1.062p	1.380p	1.673p	1.944p
265.00	0.354p	0.706p	1.059p	1.379p	1.673p	1.942p
270.00	0.352p	0.703p	1.055p	1.377p	1.673p	1.941p
275.00	0.350p	0.699p	1.051p	1.376p	1.673p	1.939p
280.00	0.348p	0.696p	1.047p	1.374p	1.673p	1.937p
285.00	0.346p	0.693p	1.042p	1.373p	1.672p	1.934p
290.00	0.345p	0.690p	1.038p	1.371p	1.672p	1.932p
295.00	0.344p	0.687p	1.034p	1.369p	1.671p	1.929p
300.00	0.342p	0.684p	1.030p	1.367p	1.670p	1.925p

METRIC TONS	@ Flooding					
	40.00p	50.00p	60.00p	70.00p	Arm	Angle
210.00	2.397p	2.685p	2.839p	2.881p	2.752p	53.46p
215.00	2.395p	2.678p	2.829p	2.871p	2.737p	53.09p
220.00	2.392p	2.671p	2.819p	2.860p	2.723p	52.72p
225.00	2.388p	2.664p	2.810p	2.850p	2.708p	52.35p
230.00	2.385p	2.656p	2.800p	2.840p	2.694p	51.97p
235.00	2.380p	2.649p	2.791p	2.830p	2.679p	51.59p
240.00	2.376p	2.641p	2.782p	2.820p	2.663p	51.11p
245.00	2.371p	2.634p	2.773p	2.810p	2.645p	50.58p
250.00	2.366p	2.626p	2.764p	2.801p	2.626p	50.00p
255.00	2.361p	2.619p	2.756p	2.791p	2.608p	49.46p
260.00	2.356p	2.611p	2.747p	2.782p	2.589p	48.87p
265.00	2.350p	2.604p	2.738p	2.773p	2.569p	48.29p
270.00	2.344p	2.596p	2.730p	2.764p	2.550p	47.72p
275.00	2.338p	2.588p	2.721p	2.755p	2.530p	47.15p
280.00	2.332p	2.580p	2.713p	2.747p	2.510p	46.59p
285.00	2.325p	2.573p	2.704p	2.739p	2.490p	46.03p
290.00	2.319p	2.565p	2.696p	2.731p	2.469p	45.48p
295.00	2.312p	2.557p	2.688p	2.723p	2.449p	44.93p
300.00	2.305p	2.549p	2.680p	2.715p	2.428p	44.39p

Distances in METERS. Specific Gravity = 1.000.

CROSS CURVES OF STABILITY - Port Heel  
at 0.5 M. FWD TRIM (initial)



Specific Gravity = 1.000 Assumed KG = 0.00 M.  
"K" = BASELINE

## Section 9. NOTES ON THE EFFECT OF FREE SURFACE ON STABILITY

Free surface moments occur when a tank is not completely full or not completely empty. When a tank is in this intermediate condition and the vessel heels, the tank contents shift in the same direction as the heel. The centre of gravity of the vessel shifts off the centre line thus causing a reduction in the righting lever and increases the angle of heel. This is known as “Free Surface Effect”.

The net effect of free surface moments is a reduction in the stability of the vessel. The initial stability of a vessel is measured in terms of “GM”. The free surface moments cause a virtual rise in the vertical centre of gravity of the vessel, thus lowering the “GM”. This loss in “GM” may be calculated as follows:

$$\text{Loss in GM} = \frac{\text{Total free surface moment (Tonne metre)}}{\text{Displacement of Vessel (Tonne)}} = \text{Virtual rise in KG}$$

Free surface moments for each tank, at various levels, are given in Section 12.

The “Free Surface Effect” should be accounted for in all loading conditions. (The conditions included in this Manual account for the “Free Surface Effect”).

Bilges should be routinely checked and pumped when necessary.

Freeing ports must be kept clear to prevent free surface moments as a result of trapped water on the deck.

In the event of a fire inside the vessel quick action should be taken to relieve the accumulation of any water, resulting from the fire fighting, by discharging over the side or allowing the water to drain to the lower decks to reduce the vertical centre of gravity.

### Section 10. ICE ACCRETION CALCULATIONS

<b>Description</b>	<b>Area (m<sup>2</sup>)</b>	<b>Rate</b>	<b>Weight (tonne)</b>	<b>LCG (m)</b>	<b>TCG (m)</b>	<b>VCG (m)</b>
Main Deck	144.8	54 kg/m <sup>2</sup>	7.819	17.80	0.00	3.90
Bridge Deck	69.2	54 kg/m <sup>2</sup>	3.738	19.50	0.00	6.25
Top of Bridge Deck	44.8	54 kg/m <sup>2</sup>	2.419	17.00	0.00	8.60
Superstructure Front	7.5	37 kg/m <sup>2</sup>	0.278	32.20	0.00	5.40
Superstructure Sides (P&S)	142.4	37 kg/m <sup>2</sup>	5.270	21.50	0.00	5.05
Superstructure Back	10.7	37 kg/m <sup>2</sup>	0.396	13.00	0.00	5.20
Bridge Front & Back	24.4	37 kg/m <sup>2</sup>	0.905	18.50	0.00	7.50
Bridge Sides (P&S)	25.2	37 kg/m <sup>2</sup>	0.932	18.50	0.00	7.50
Bulwarks (P&S)	38.2	37 kg/m <sup>2</sup>	1.415	33.00	0.00	4.90
Mast	2.5	48 kg/m	0.120	15.00	0.00	14.50
Guardrails (P&S)	110.0	78 kg/m <sup>2</sup>	8.580	8.00	0.00	6.00
Small Items	10.0	78 kg/m <sup>2</sup>	0.780	8.00	0.00	6.00
<b>TOTAL</b>	<b>629.8</b>		<b>32.652</b>	<b>16.48</b>	<b>0.00</b>	<b>5.62</b>

## Section 11. LOADING CONDITIONS

Stability calculations have been performed for the following loading conditions:

- Case S1: Lightship (Salt Water)
- Case S2: Departure (Salt Water)
- Case S3: Load Line (Salt Water)
- Case S4: Arrival (Salt Water)
- Case S5: Arrival with Ice Accretion (Salt Water)
- Case S6: Departure – Launching RHIB (Salt Water)
- Case S7: Arrival – Launching RHIB (Salt Water)
- Case S8: Departure – RHIB Departed (Salt Water)
- Case S9: Arrival – RHIB Departed (Salt Water)
  
- Case F1: Lightship (Fresh Water)
- Case F2: Departure (Fresh Water)
- Case F3: Load Line (Fresh Water)
- Case F4: Arrival (Fresh Water)
- Case F5: Arrival with Ice Accretion (Fresh Water)
- Case F6: Departure – Launching RHIB (Fresh Water)
- Case F7: Arrival – Launching RHIB (Fresh Water)
- Case F8: Departure – RHIB Departed (Fresh Water)
- Case F9: Arrival – RHIB Departed (Fresh Water)

All conditions satisfy the relevant criteria. The tables presented on the following page provide a summary of the results. Lightship is a non-operational condition and as such has not been evaluated against the stability criteria.

## STABILITY CALCULATION SUMMARY TABLE (Salt Water)

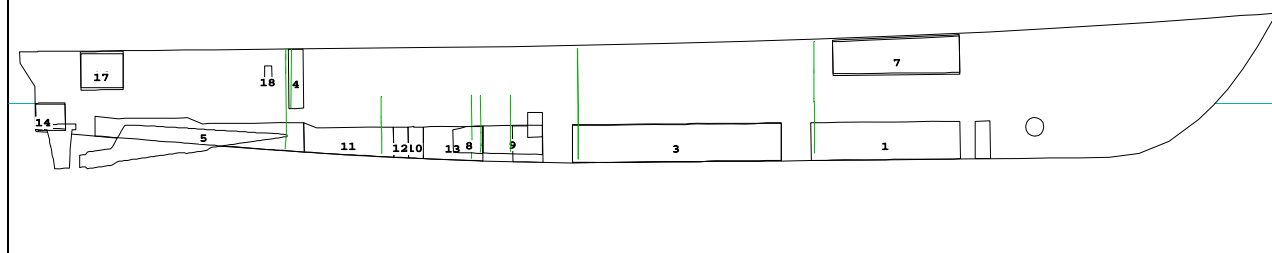
		CASE (Salt Water)							
LIM #	Required	S2	S3	S4	S5	S6	S7	S8	S9
LIM(1)	$\geq 0.055\text{mrad}$	0.1445	0.1429	0.1363	0.0852	0.1392	0.1255	0.1506	0.1426
LIM(2)	$\geq 0.090\text{mrad}$	0.2305	0.2278	0.2146	0.1268	0.2115	0.1889	0.2405	0.2248
LIM(3)	$\geq 0.030\text{mrad}$	0.0860	0.0849	0.0783	0.0416	0.0723	0.0634	0.0899	0.0822
LIM(4)	$\geq 0.2\text{m}$	0.489	0.485	0.443	0.271	0.431	0.380	0.510	0.464
LIM(5)	$\geq 25\text{deg}$	33.91	33.53	34.29	28.22	34.47	34.89	34.42	35.37
LIM(6)	$\geq 0.15\text{m}$	1.049	1.026	1.079	0.609	1.044	1.073	1.092	1.127
Min Freeboard	$\geq 0.01\text{L}$ (0.40m)	1.548	1.525	1.581	1.427	1.296	1.311	1.544	1.570
Down Flood Angle (Deg)		49.01	48.51	52.12	48.41	49.01	52.12	54.12	57.65

## STABILITY CALCULATION SUMMARY TABLE (Fresh Water)

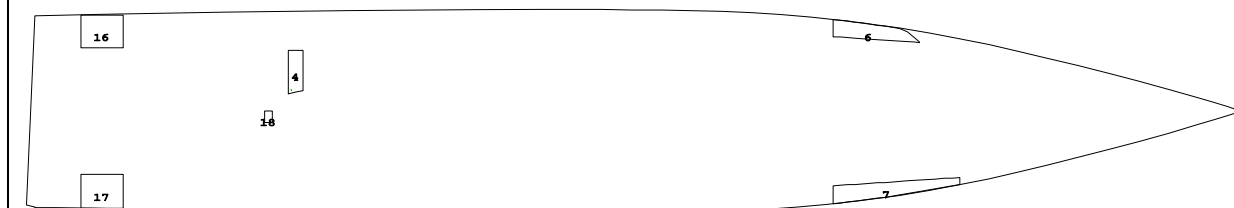
		CASE (Fresh Water)							
LIM #	Required	F2	F3	F4	F5	F6	F7	F8	F9
LIM(1)	$\geq 0.055\text{mrad}$	0.1428	0.1412	0.1345	0.0834	0.1380	0.1245	0.1488	0.1409
LIM(2)	$\geq 0.090\text{mrad}$	0.2277	0.2248	0.2118	0.1236	0.2087	0.1865	0.2376	0.2220
LIM(3)	$\geq 0.030\text{mrad}$	0.0849	0.0836	0.0772	0.0402	0.0707	0.0620	0.0887	0.0811
LIM(4)	$\geq 0.2\text{m}$	0.486	0.481	0.441	0.266	0.425	0.375	0.506	0.461
LIM(5)	$\geq 25\text{deg}$	33.43	33.02	33.82	27.86	34.44	34.81	33.97	34.38
LIM(6)	$\geq 0.15\text{m}$	1.020	0.997	1.049	0.581	1.015	1.039	1.062	1.092
Min Freeboard	$\geq 0.01\text{L}$ (0.40m)	1.517	1.494	1.552	1.393	1.259	1.274	1.513	1.541
Down Flood Angle (Deg)		48.27	47.77	51.43	47.67	48.27	51.43	53.62	57.00

CG - Draft: 1.772 @ 38.850f, 2.143 @ 2.150f Heel: stbd 0.65 deg.

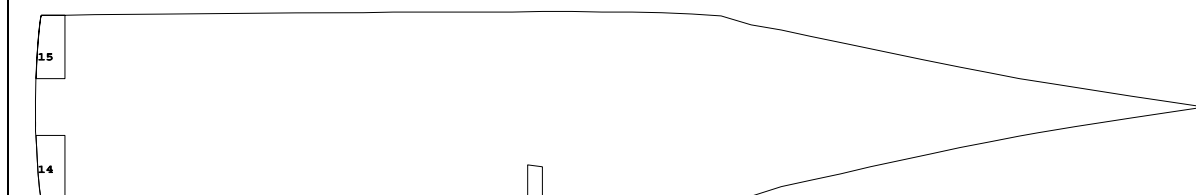
Profile View @ 4.000s and beyond



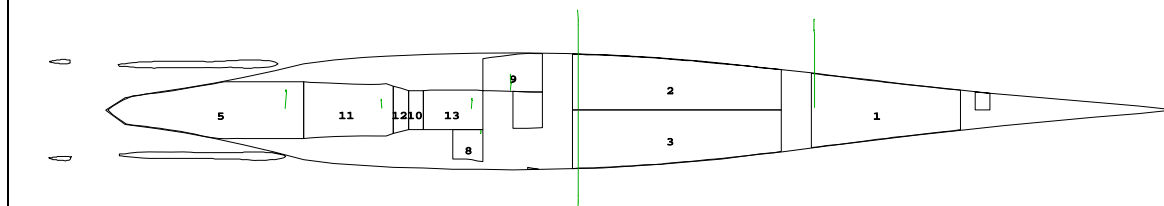
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....0% FUEL OIL	7 FW-TK12.S.....0% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....0% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....0% GASOLINE
4 FO-TK8A.P.....0% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....0% DG LO
6 FW-TK11.P.....0% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

WEIGHT STATUS						
Baseline draft: 1.772 @ 38.85f, 2.143 @ 2.15f						
Trim: Aft 0.370/36.700, Heel: Stbd 0.65 deg.						
Part	Weight(MT)	LCG	TCG	VCG	FSM	
WEIGHT	220.30	16.069f	0.009s	3.145		
Load	SpGr	Weight(MT)	LCG	TCG	VCG	
Total Tanks	>	0.00				0.00
Distances in METERS.				Moments in m.-MT.		

HYDROSTATIC PROPERTIES								
Trim: Aft 0.370/36.700, Heel: Stbd 0.65 deg., VCG = 3.145								
Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
1.958	220.32	16.051f	1.380	2.08	16.159f	5.07	84.38	1.091
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

#### DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.772 @ 38.85f, 2.721 @ 2.15f

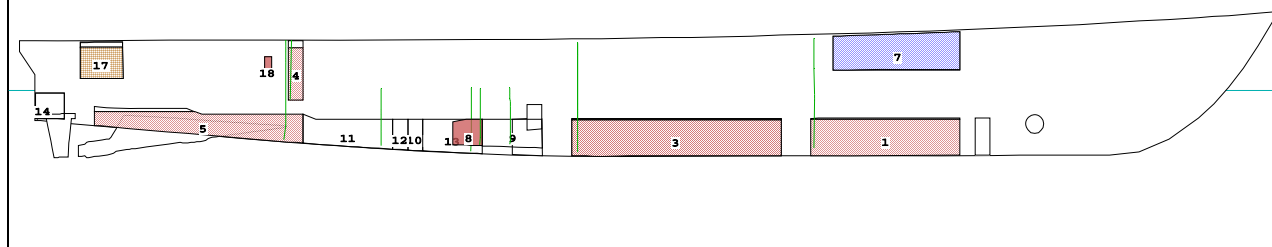
Baseline Draft at Fwd Draft Marks (FR 38.85)	1.772
Baseline Draft at Aft Draft Marks (FR 2.15)	2.143
Baseline Draft at Load Line Mark (FR 20.86)	1.954
Baseline Draft at AP (FR 1)	2.154
Baseline Draft at FP (FR 40.721)	1.754

FREEBOARD STATUS	
BASELINE draft: 1.772 @ 38.85f, 2.143 @ 2.15f	
Trim: Aft 0.370/36.700, Heel: Stbd 0.65 deg.	
Least freeboard is 1.589 m. located at 0.500a	
Least extra freeboard (to margin line) is 1.513 m. located at 0.500a	

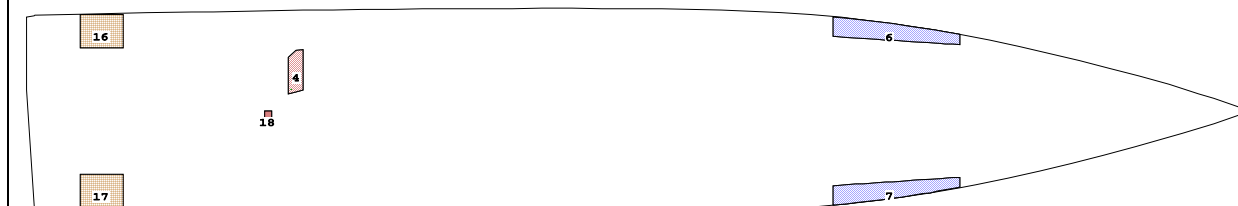


CG - Draft: 2.159 @ 38.850f, 2.236 @ 2.150f Heel: port 0.09 deg.

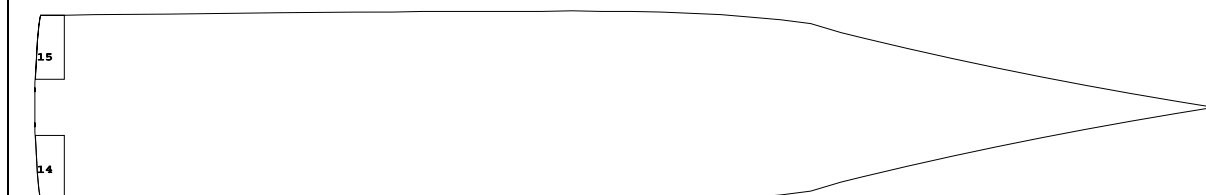
Profile View @ 4.000s and beyond



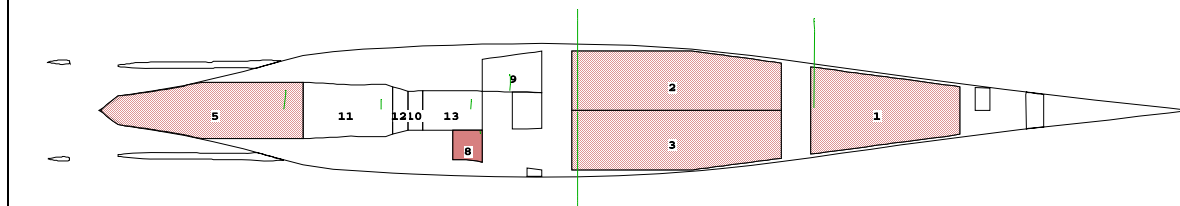
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
3.91 MT of Misc. Weights	

WEIGHT STATUS

BASELINE draft: 2.159 @ 38.85f, 2.236 @ 2.15f  
Trim: Aft 0.077/36.700, Heel: Port 0.09 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 100%			1.50	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Total Fixed		>	224.21	16.137f	0.003p	3.171	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.950	0.840	7.05	28.259f	0.001p	0.786	4.33
FO-TK2.P	0.950	0.840	8.19	21.355f	0.758p	0.789	3.41
FO-TK3.S	0.950	0.840	8.19	21.355f	0.756s	0.789	3.41
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.312p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.54	5.898f	0.000	1.147	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.744p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.744s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks		>	39.83	19.926f	0.016p	1.455	13.36
Total Weight		>	264.04	16.709f	0.005p	2.912	
Free Surface Adjustment		>				0.051	
Adjusted CG		>		16.709f	0.004p	2.963	
Distances in METERS.						Moments in m.-MT.	

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

HYDROSTATIC PROPERTIES

Trim: Aft 0.077/36.700, Heel: Port 0.09 deg., VCG = 2.912

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.197	264.04	16.706f	1.496	2.15	16.619f	5.49	76.33	1.047
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.159 @ 38.85f, 2.814 @ 2.15f

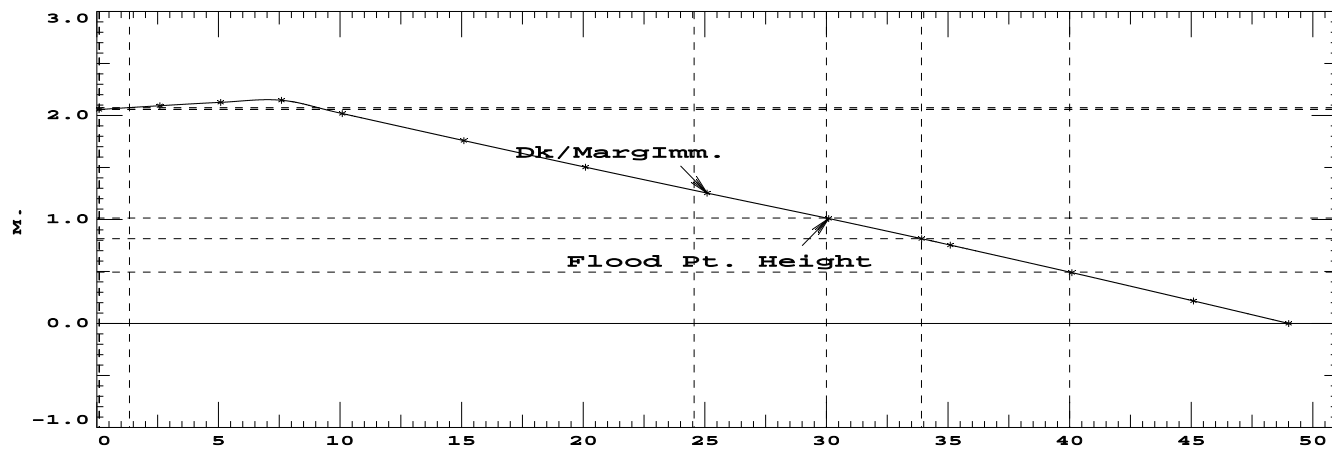
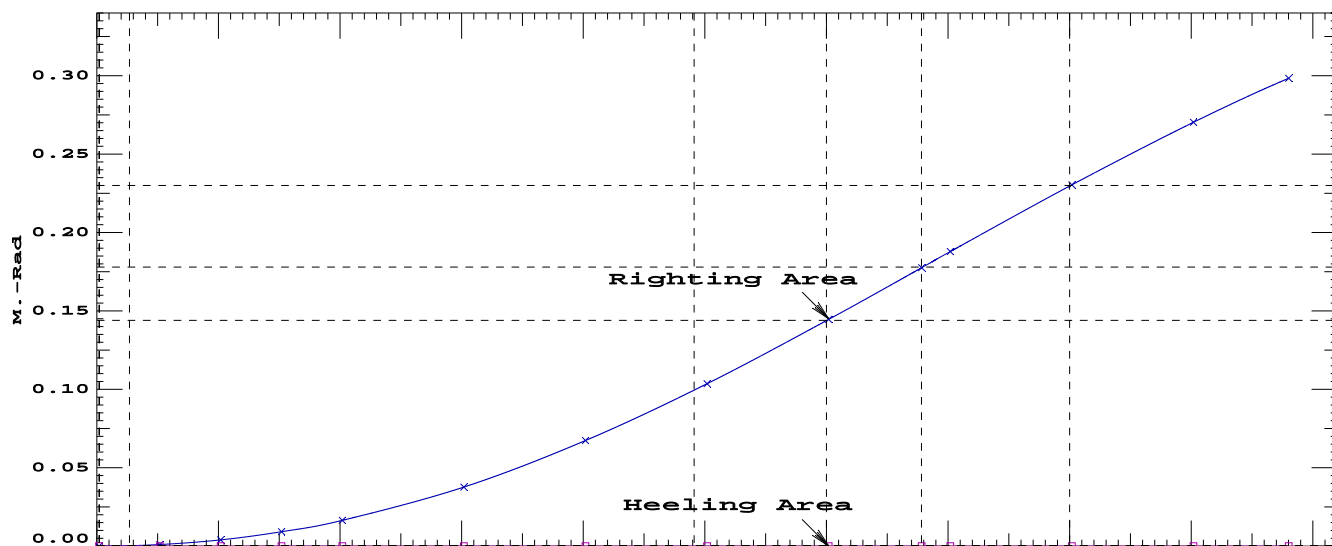
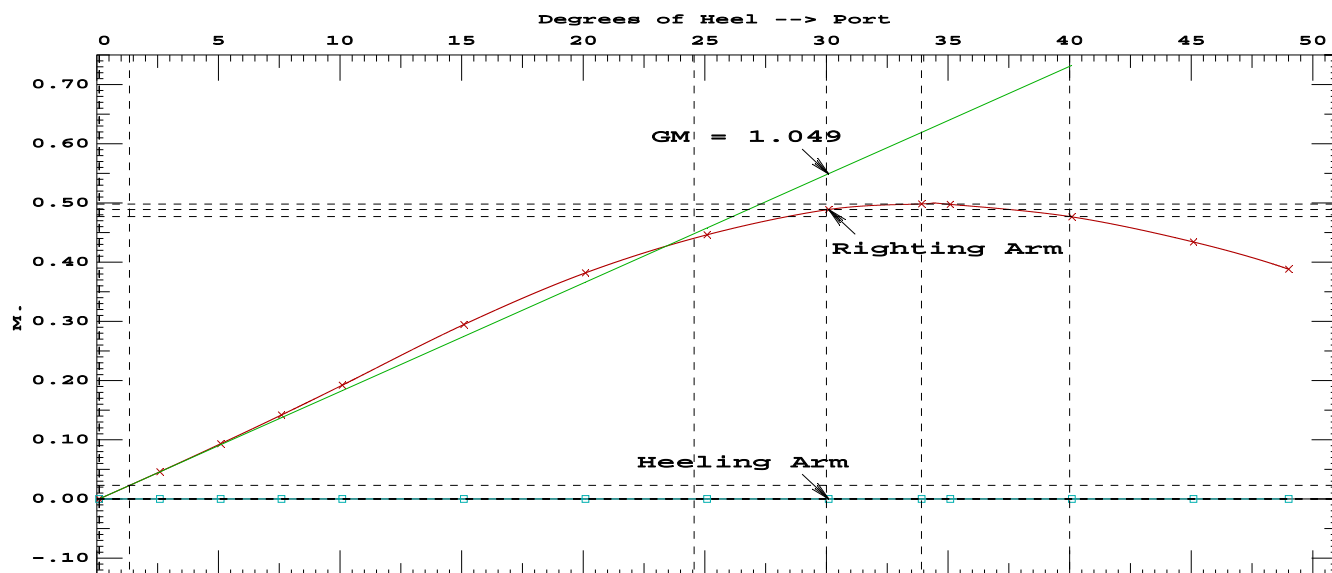
Baseline Draft at Fwd Draft Marks (FR 38.85)	2.159
Baseline Draft at Aft Draft Marks (FR 2.15)	2.236
Baseline Draft at Load Line Mark (FR 20.86)	2.196
Baseline Draft at AP (FR 1)	2.238
Baseline Draft at FP (FR 40.721)	2.155

FREEBOARD STATUS

BASELINE draft: 2.159 @ 38.85f, 2.236 @ 2.15f  
Trim: Aft 0.077/36.700, Heel: Port 0.09 deg.  
Least freeboard is 1.548 m. located at 0.000  
Least extra freeboard (to margin line) is 1.472 m. located at 0.000

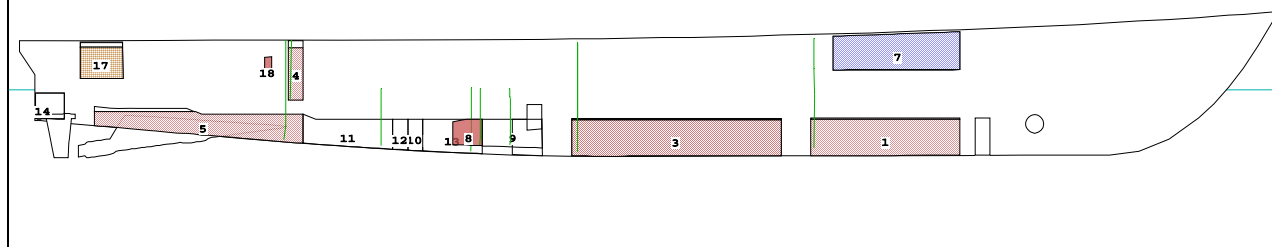
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.137f TCG = 0.003p VCG = 3.171

Origin	Degrees of		Displacement	Residual Arms			Flood Pt
Depth	Trim	Heel	Weight(MT)	in Trim	in Heel	> Area	Height
2.240	0.12a	0.09p	264.04	0.000	0.000	0.0000	2.058(24)
2.238	0.12a	2.59p	264.04	0.000	0.046	0.0010	2.094(24)
2.231	0.13a	5.09p	264.05	0.000	0.093	0.0040	2.127(24)
2.219	0.13a	7.59p	264.04	0.000	0.142	0.0092	2.146(16)
2.203	0.14a	10.09p	264.04	0.000	0.192	0.0164	2.018(16)
2.155	0.18a	15.09p	264.04	0.000	0.295	0.0377	1.759(16)
2.072	0.20a	20.09p	264.04	0.000	0.382	0.0673	1.503(16)
1.952	0.17a	24.56p	264.04	0.000	0.440	0.0995	Dk/MargImm.
1.935	0.17a	25.09p	264.04	0.000	0.446	0.1036	1.254(16)
1.769	0.12a	30.09p	264.04	0.000	0.489	0.1445	1.009(16)
1.641	0.11a	33.91p	264.04	0.000	0.498	0.1776	0.815(16)
1.602	0.11a	35.09p	264.04	0.000	0.497	0.1878	0.754(16)
1.433	0.12a	40.09p	264.04	0.000	0.477	0.2305	0.489(16)
1.261	0.14a	45.09p	264.04	0.000	0.434	0.2704	0.216(16)
1.122	0.16a	49.01p	264.04	0.000	0.388	0.2986	0.000(16)
Distances in METERS.			Specific Gravity = 1.025.			Area in m.-Rad.	
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh				FLOOD	18.533f	2.680p	4.717
(24) Emerg Generator Comp Exh				FLOOD	12.575f	0.863s	4.270
LIM	STAB 7 CRITERION				Min/Max		Attained
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1445 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2305 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0860 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.489 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	33.91 P
(6)	GM at 0 deg				>	0.150 m.	1.049 P
Relative angles measured from 0.092							

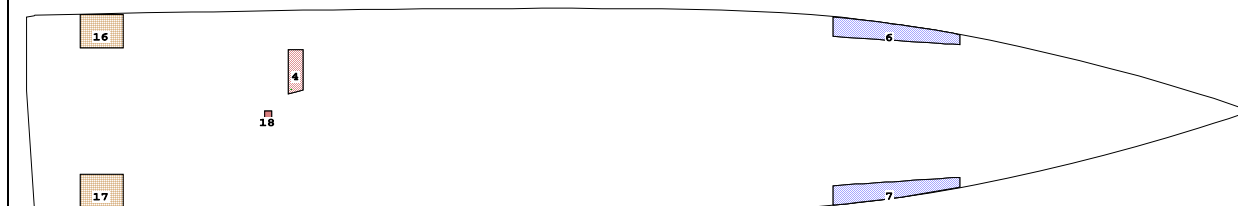


CG - Draft: 2.177 @ 38.850f, 2.258 @ 2.150f Heel: port 0.09 deg.

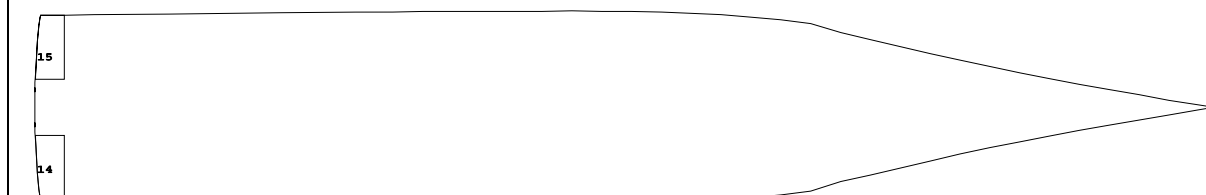
Profile View @ 4.000s and beyond



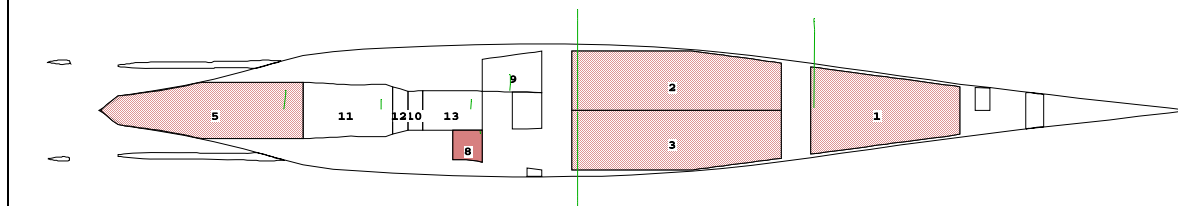
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
3.91 MT of Misc. Weights	4.50 MT of Additional Weight

WEIGHT STATUS

BASELINE draft: 2.177 @ 38.85f, 2.258 @ 2.15f  
Trim: Aft 0.082/36.700, Heel: Port 0.09 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 100%			1.50	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Additional Weight			4.50	16.069f	0.000	3.145	
Total Fixed			228.71	16.136f	0.003p	3.171	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.950	0.840	7.05	28.259f	0.001p	0.786	4.33
FO-TK2.P	0.950	0.840	8.19	21.354f	0.758p	0.789	3.41
FO-TK3.S	0.950	0.840	8.19	21.354f	0.756s	0.789	3.41
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.312p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.54	5.898f	0.000	1.147	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.744p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.744s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks			39.83	19.926f	0.016p	1.455	13.36
Total Weight			268.54	16.698f	0.005p	2.916	
Free Surface Adjustment						0.050	
Adjusted CG				16.698f	0.004p	2.966	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

HYDROSTATIC PROPERTIES

Trim: Aft 0.082/36.700, Heel: Port 0.09 deg., VCG = 2.916

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.218	268.54	16.695f	1.508	2.16	16.635f	5.51	75.33	1.024
Distances in METERS.		Specific Gravity = 1.025.					Moment in m.-MT.	
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.177 @ 38.85f, 2.836 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	2.177
Baseline Draft at Aft Draft Marks (FR 2.15)	2.258
Baseline Draft at Load Line Mark (FR 20.86)	2.217
Baseline Draft at AP (FR 1)	2.261
Baseline Draft at FP (FR 40.721)	2.173

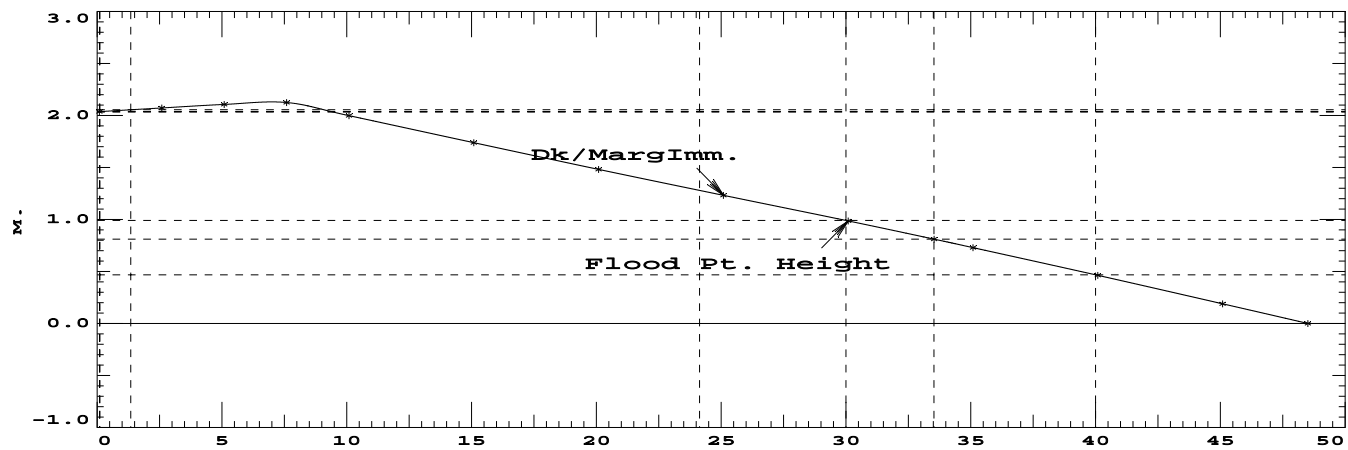
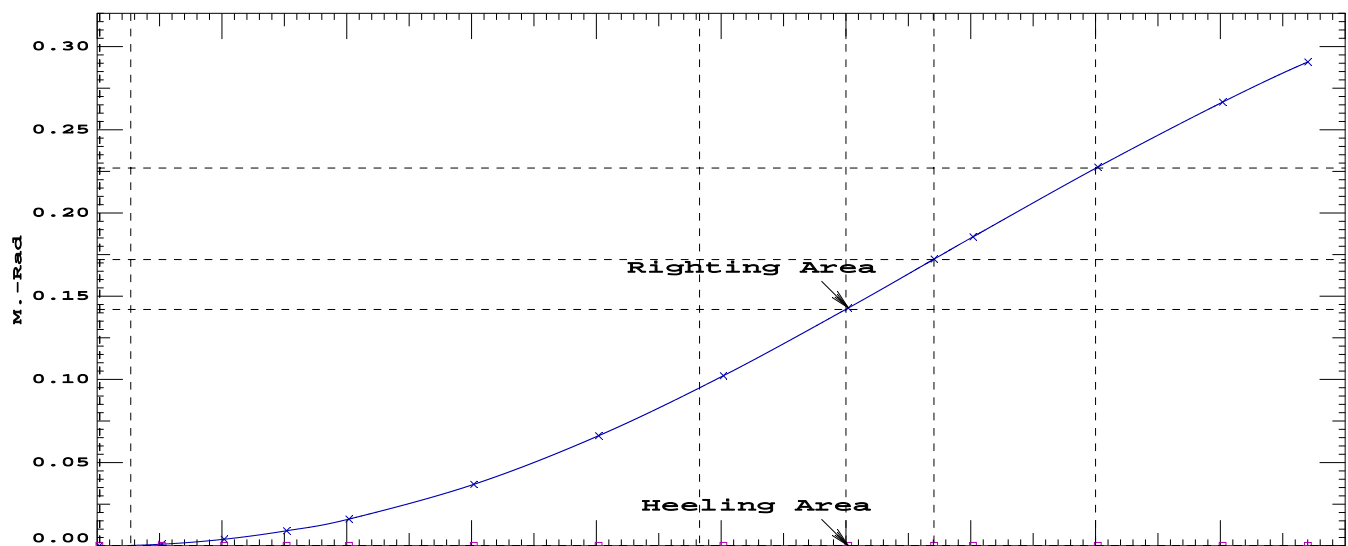
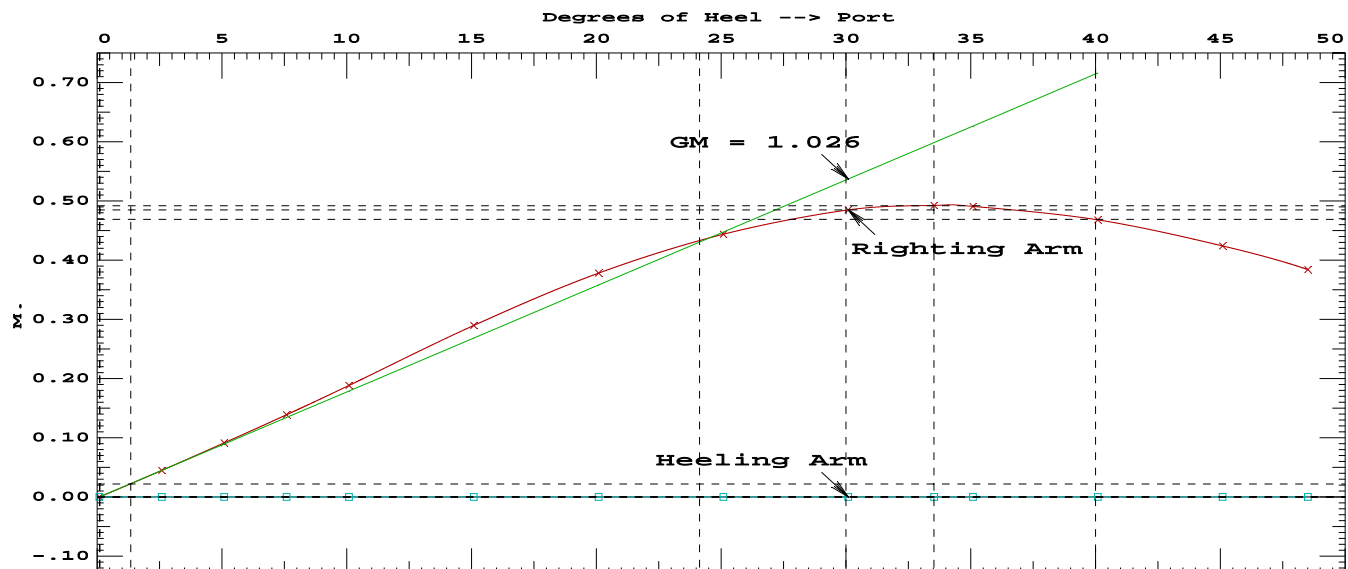
FREEBOARD STATUS

BASELINE draft: 2.177 @ 38.85f, 2.258 @ 2.15f  
Trim: Aft 0.082/36.700, Heel: Port 0.09 deg.  
Least freeboard is 1.525 m. located at 0.000  
Least extra freeboard (to margin line) is 1.449 m. located at 0.000



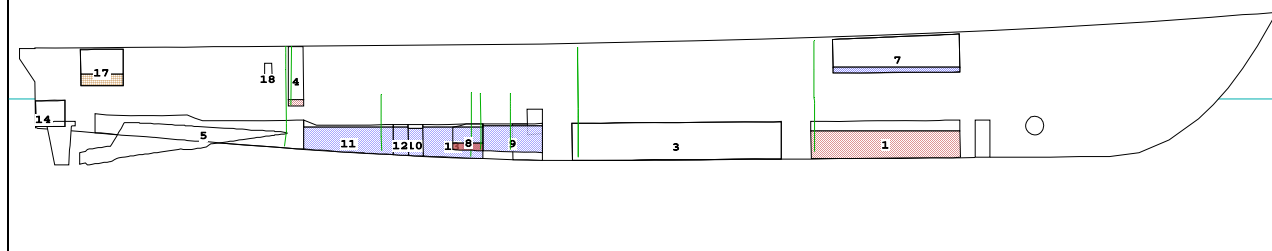
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.136f TCG = 0.003p VCG = 3.171

Origin	Degrees of	Displacement	Residual Arms	Flood Pt			
Depth	Trim	Heel	Weight(MT)	in Trim in Heel	Area	Height	
2.263	0.13a	0.09p	268.54	0.000	0.000	0.0000	2.036(24)
2.261	0.13a	2.59p	268.54	0.000	0.045	0.0010	2.072(24)
2.253	0.13a	5.09p	268.55	0.000	0.091	0.0039	2.105(24)
2.242	0.14a	7.59p	268.54	0.000	0.139	0.0090	2.125(16)
2.225	0.15a	10.09p	268.54	0.000	0.188	0.0161	1.998(16)
2.177	0.18a	15.09p	268.54	0.000	0.290	0.0369	1.739(16)
2.095	0.21a	20.09p	268.54	0.000	0.378	0.0662	1.482(16)
1.991	0.19a	24.13p	268.54	0.000	0.433	0.0948	Dk/MargImm.
1.961	0.18a	25.09p	268.54	0.000	0.444	0.1022	1.233(16)
1.797	0.14a	30.09p	268.54	0.000	0.485	0.1429	0.986(16)
1.685	0.14a	33.53p	268.54	0.000	0.492	0.1723	0.811(16)
1.634	0.14a	35.09p	268.54	0.000	0.491	0.1857	0.730(16)
1.468	0.15a	40.09p	268.54	0.000	0.468	0.2278	0.463(16)
1.300	0.18a	45.09p	268.54	0.000	0.424	0.2668	0.190(16)
1.181	0.20a	48.51p	268.54	0.000	0.384	0.2909	0.000(16)
Distances in METERS.			Specific Gravity = 1.025.		Area in m.-Rad.		
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points			LCP	TCP	VCP		
(16) Med Equip & SAR Lkr Exh			FLOOD	18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh			FLOOD	12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION			Min/Max		Attained	
(1)	Area from 0 deg to 30			>	0.0550	m.-Rad	0.1429 P
(2)	Area from 0 deg to 40 or Flood			>	0.0900	m.-Rad	0.2278 P
(3)	Area from 30 deg to 40 or Flood			>	0.0300	m.-Rad	0.0849 P
(4)	Righting Arm at 30 deg			>	0.200	m.	0.485 P
(5)	Absolute Angle at MaxRA			>	25.00	deg	33.53 P
(6)	GM at 0 deg			>	0.150	m.	1.026 P
Relative angles measured from 0.093							

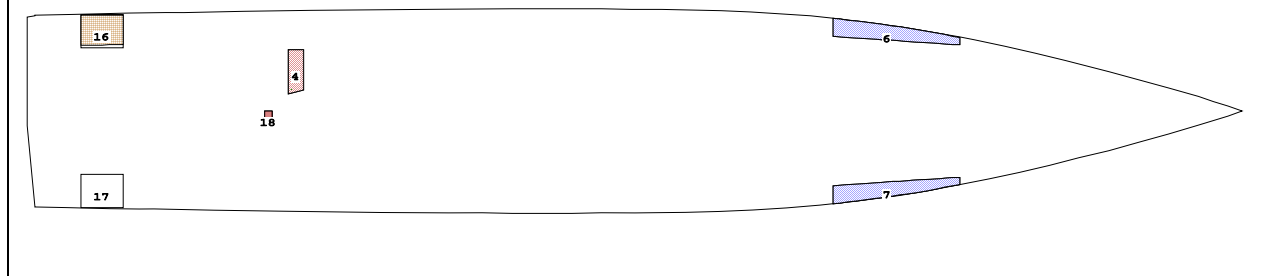


CG - Draft: 1.899 @ 38.850f, 2.190 @ 2.150f Heel: port 0.05 deg.

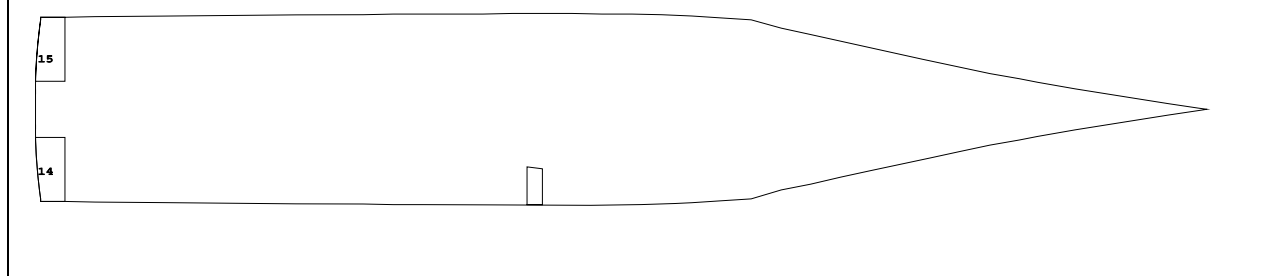
Profile View @ 4.000s and beyond



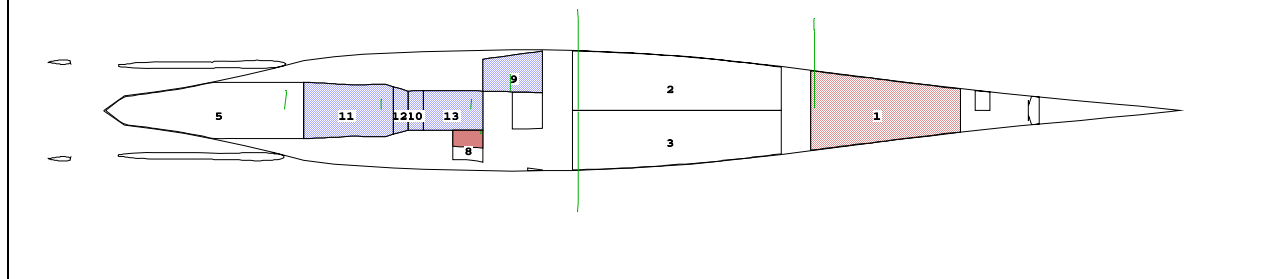
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
2.56 MT of Misc. Weights	

WEIGHT STATUS

BASELINE draft: 1.899 @ 38.85f, 2.190 @ 2.15f  
Trim: Aft 0.291/36.700, Heel: Port 0.05 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 10%			0.15	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Total Fixed			222.86	16.141f	0.006s	3.161	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.570	0.840	4.23	28.236f	0.001	0.604	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.746f	1.314p	2.026	0.10*
FW-TK11.P	0.100	1.000	0.32	28.531f	2.628p	2.962	0.08*
FW-TK12.S	0.100	1.000	0.32	28.533f	2.627s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.522f	0.854s	0.528	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.036f	1.152p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.000	0.724	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.000	0.834	1.37
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.000	0.759	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.015f	0.000	0.703	0.38*
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.875p	2.898	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.187s	2.685	0.00
Total Tanks			13.66	18.071f	0.171p	0.875	6.75
Total Weight			236.52	16.252f	0.004p	3.029	
Free Surface Adjustment						0.029	
Adjusted CG				16.252f	0.004p	3.057	
Distances in METERS.						Moments in m.-MT.	

Distances in METERS. Moments in m.-MT.

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

HYDROSTATIC PROPERTIES

Trim: Aft 0.291/36.700, Heel: Port 0.05 deg., VCG = 3.029

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.044	236.52	16.240f	1.423	2.10	16.312f	5.21	80.83	1.079
Distances in METERS.		Specific Gravity = 1.025.					Moment in m.-MT.	
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.899 @ 38.85f, 2.768 @ 2.15f

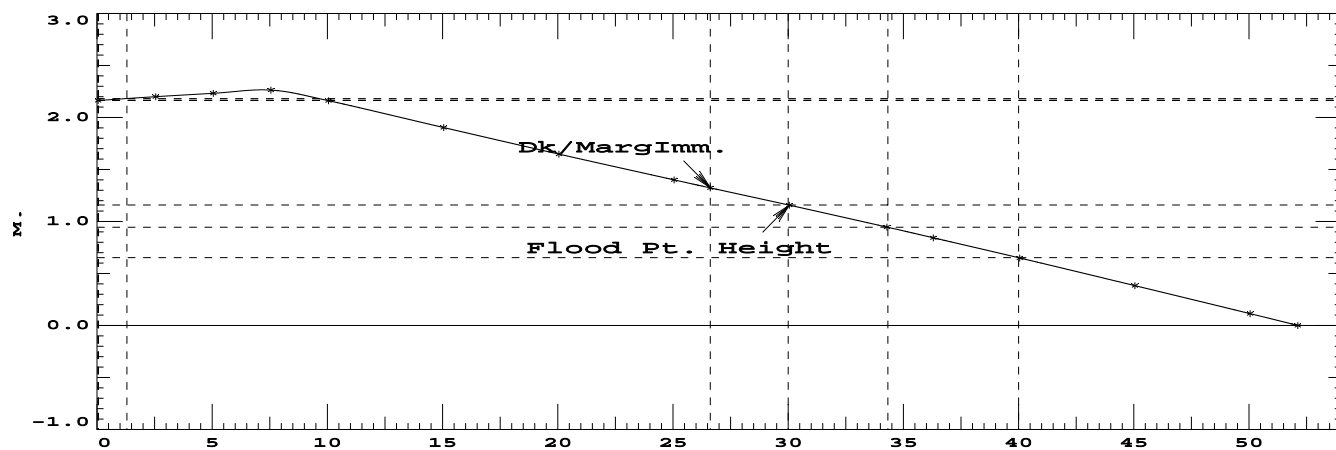
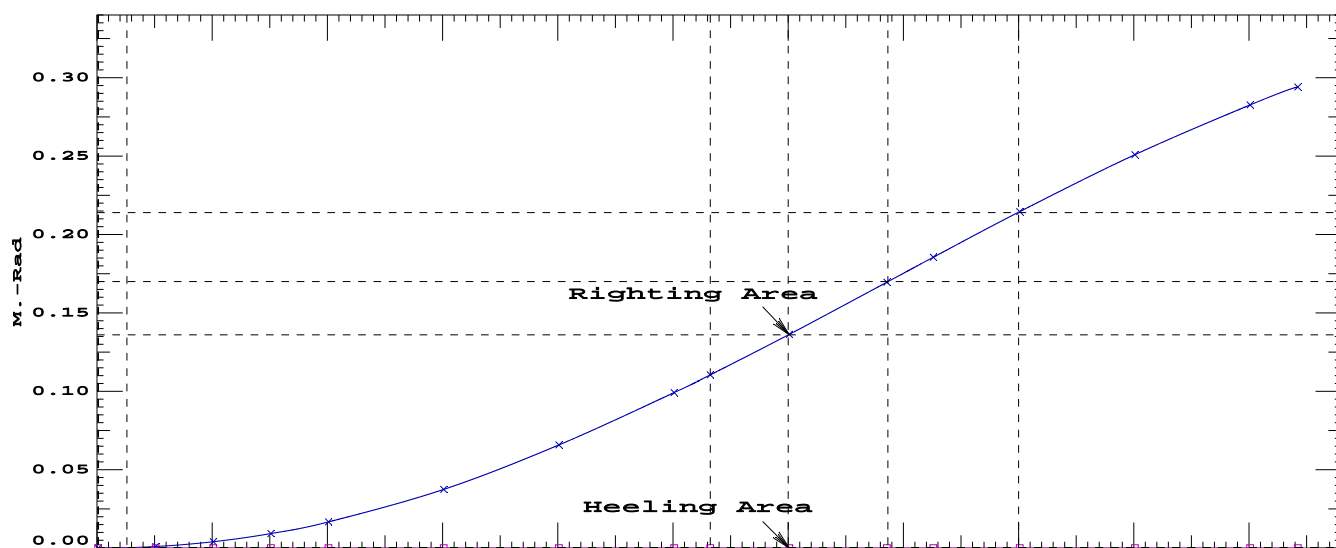
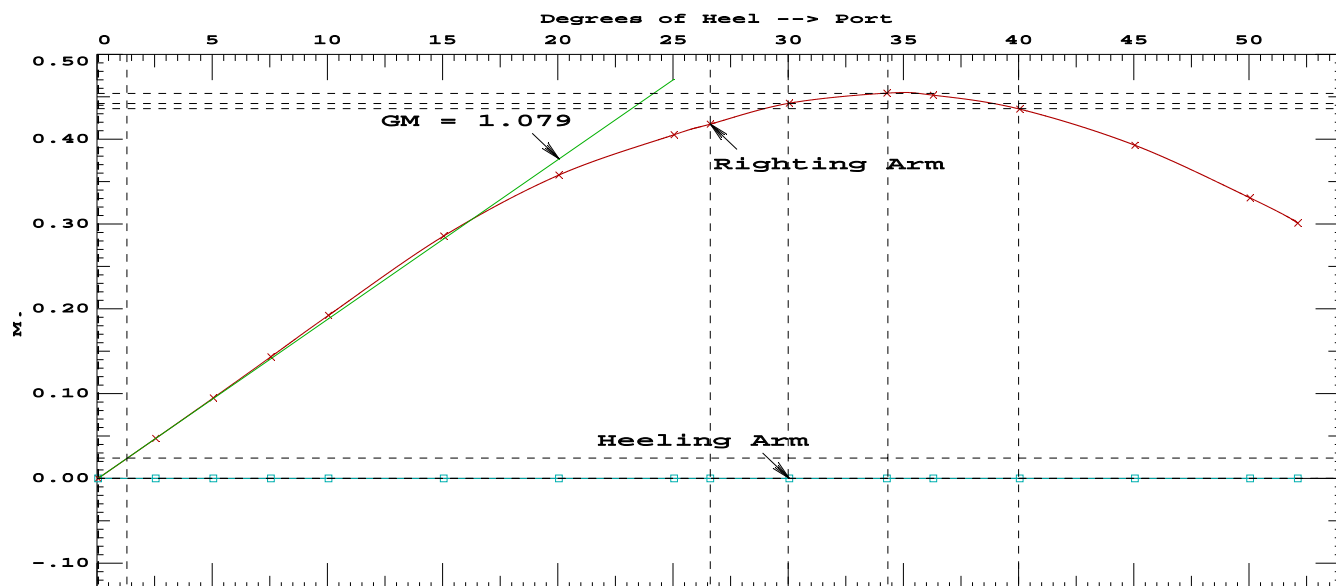
Baseline Draft at Fwd Draft Marks (FR 38.85)	1.899
Baseline Draft at Aft Draft Marks (FR 2.15)	2.190
Baseline Draft at Load Line Mark (FR 20.86)	2.041
Baseline Draft at AP (FR 1)	2.199
Baseline Draft at FP (FR 40.721)	1.884

FREEBOARD STATUS

BASELINE draft: 1.899 @ 38.85f, 2.190 @ 2.15f  
Trim: Aft 0.291/36.700, Heel: Port 0.05 deg.  
Least freeboard is 1.581 m. located at 0.500a  
Least extra freeboard (to margin line) is 1.505 m. located at 0.500a

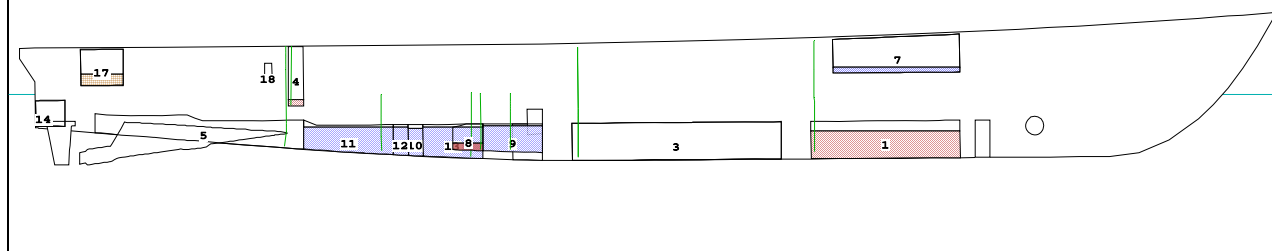
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.141f TCG = 0.006s VCG = 3.161

Origin	Degrees of		Displacement	Residual Arms			Flood Pt
Depth	Trim	Heel	Weight(MT)	in Trim	in Heel	→ Area	Height
2.207	0.45a	0.05p	236.53	0.000	0.000	0.0000	2.164(24)
2.204	0.46a	2.55p	236.52	0.000	0.047	0.0010	2.200(24)
2.198	0.46a	5.05p	236.52	0.000	0.095	0.0041	2.233(24)
2.186	0.47a	7.55p	236.52	0.000	0.143	0.0093	2.262(24)
2.171	0.48a	10.05p	236.52	0.000	0.192	0.0166	2.161(16)
2.123	0.52a	15.05p	236.52	0.000	0.286	0.0375	1.904(16)
2.033	0.52a	20.05p	236.52	0.000	0.358	0.0658	1.648(16)
1.890	0.47a	25.05p	236.51	0.000	0.405	0.0992	1.400(16)
1.837	0.45a	26.62p	236.51	0.000	0.418	0.1105	Dk/MargImm.
1.713	0.40a	30.05p	236.51	0.000	0.443	0.1363	1.157(16)
1.559	0.36a	34.29p	236.52	0.000	0.454	0.1695	0.946(16)
1.532	0.36a	35.05p	236.52	0.000	0.454	0.1756	0.907(16)
1.486	0.35a	36.30p	236.52	0.000	0.452	0.1855	0.844(16)
1.349	0.35a	40.05p	236.52	0.000	0.435	0.2146	0.649(16)
1.164	0.34a	45.05p	236.52	0.000	0.393	0.2509	0.383(16)
0.970	0.34a	50.05p	236.52	0.000	0.331	0.2826	0.113(16)
0.889	0.33a	52.12p	236.52	0.000	0.301	0.2940	0.000(16)
Distances in METERS.			Specific Gravity = 1.025.			Area in m.-Rad.	
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh FLOOD				18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh FLOOD				12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION				Min/Max	Attained	
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1363 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2146 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0783 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.443 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	34.29 P
(6)	GM at 0 deg				>	0.150 m.	1.079 P
Relative angles measured from 0.048							

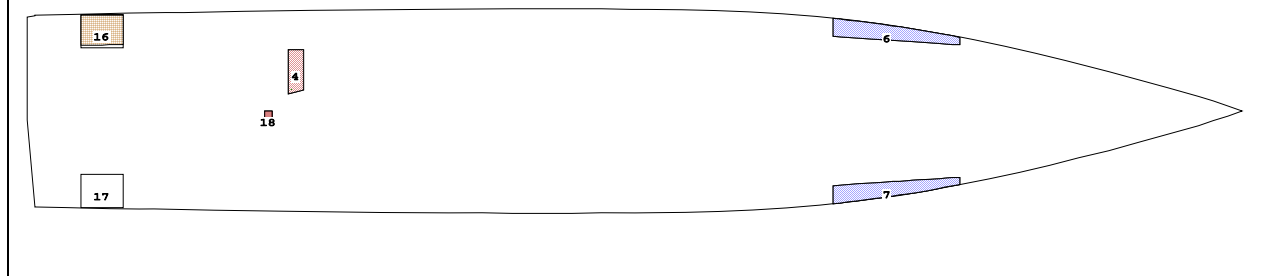


CG - Draft: 2.054 @ 38.850f, 2.343 @ 2.150f Heel: port 0.08 deg.

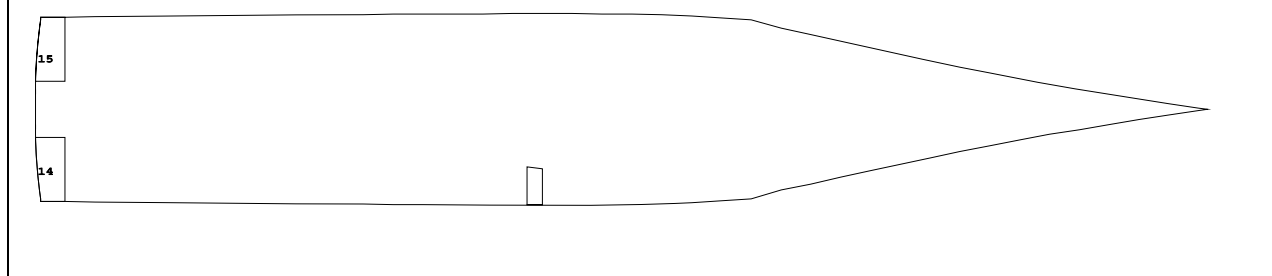
## Profile View @ 4.000s and beyond



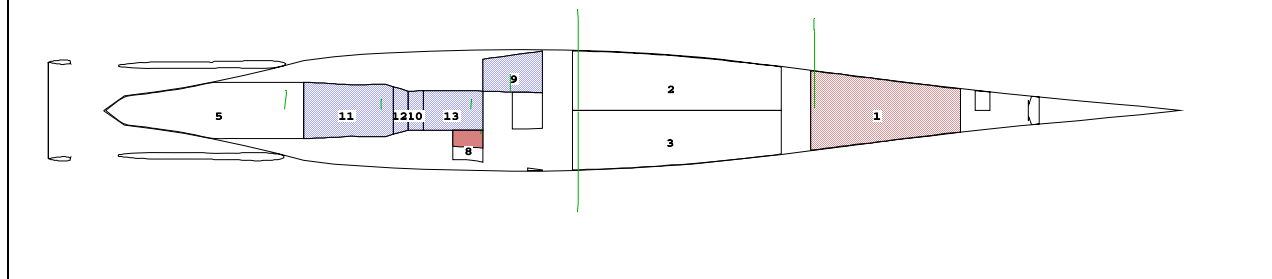
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	



## SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
2.56 MT of Misc. Weights	32.65 MT of Ice Accretion iaw S

## WEIGHT STATUS

BASELINE draft: 2.054 @ 38.85f, 2.343 @ 2.15f

Trim: Aft 0.288/36.700, Heel: Port 0.08 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 10%			0.15	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Ice Accretion iaw STAB 7			32.65	16.475f	0.000	5.618	
Total Fixed		>	255.52	16.184f	0.005s	3.475	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.570	0.840	4.23	28.236f	0.001p	0.604	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.746f	1.314p	2.026	0.10*
FW-TK11.P	0.100	1.000	0.32	28.532f	2.628p	2.962	0.08*
FW-TK12.S	0.100	1.000	0.32	28.534f	2.627s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.522f	0.854s	0.528	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.036f	1.152p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.000	0.724	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.001	0.834	1.37
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.000	0.759	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.015f	0.000	0.703	0.38*
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.875p	2.898	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.187s	2.685	0.00
Total Tanks		>	13.66	18.072f	0.171p	0.875	6.75
Total Weight		>	269.17	16.279f	0.004p	3.343	
Free Surface Adjustment		>				0.025	
Adjusted CG		>		16.279f	0.004p	3.368	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.288/36.700, Heel: Port 0.08 deg., VCG = 3.343

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.198	269.16	16.265f	1.512	2.14	16.508f	5.39	73.53	0.610
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.054 @ 38.85f, 2.921 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	2.054
Baseline Draft at Aft Draft Marks (FR 2.15)	2.343
Baseline Draft at Load Line Mark (FR 20.86)	2.195
Baseline Draft at AP (FR 1)	2.352
Baseline Draft at FP (FR 40.721)	2.039

## FREEBOARD STATUS

BASELINE draft: 2.054 @ 38.85f, 2.343 @ 2.15f

Trim: Aft 0.288/36.700, Heel: Port 0.08 deg.

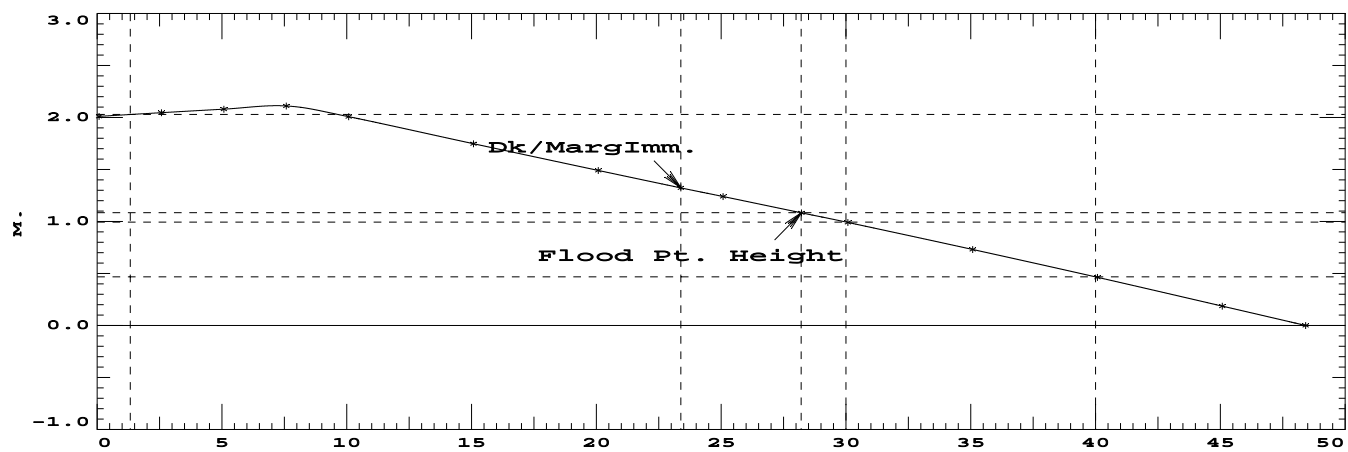
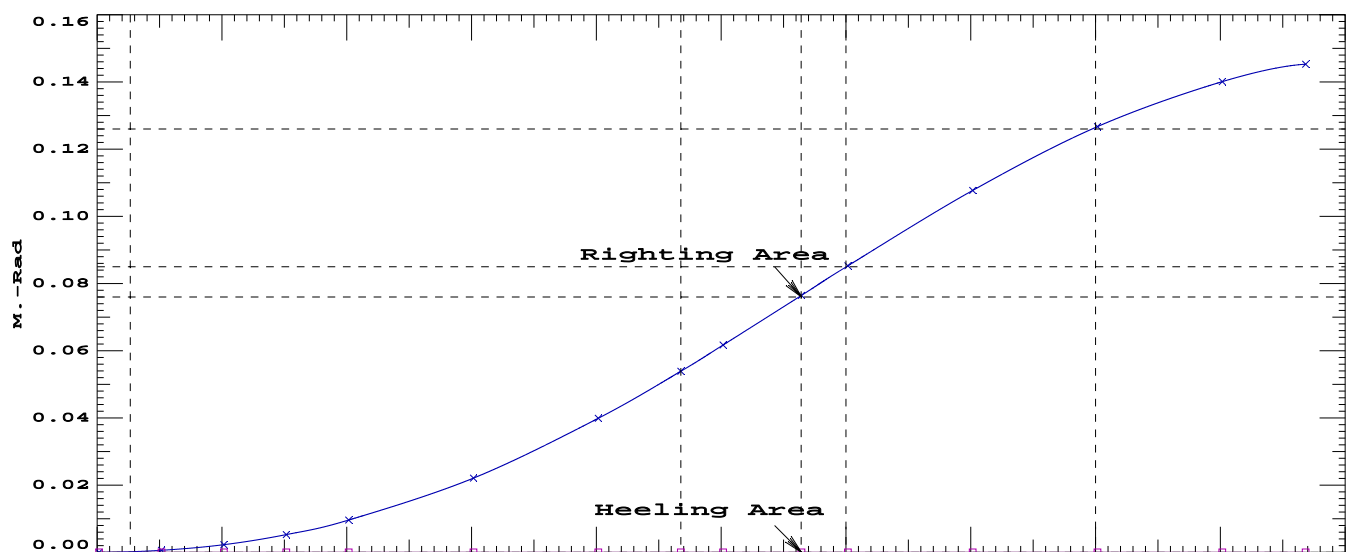
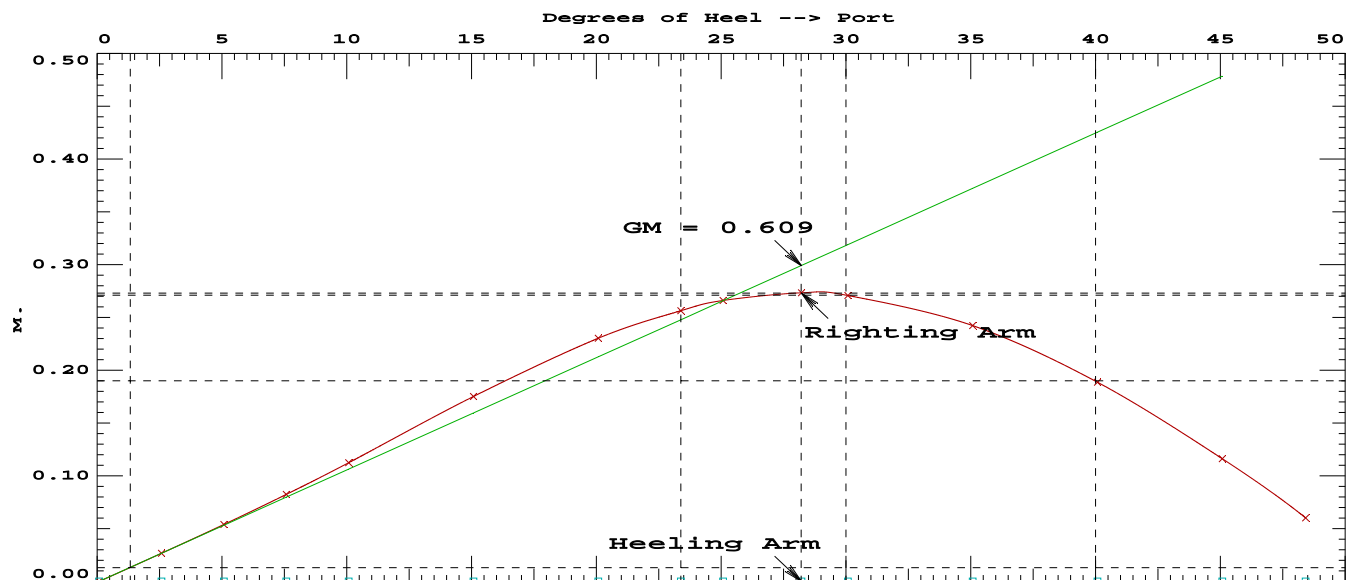
Least freeboard is 1.427 m. located at 0.500a

Least extra freeboard (to margin line) is 1.351 m. located at 0.500a

## RESIDUAL RIGHTING ARMS vs HEEL ANGLE

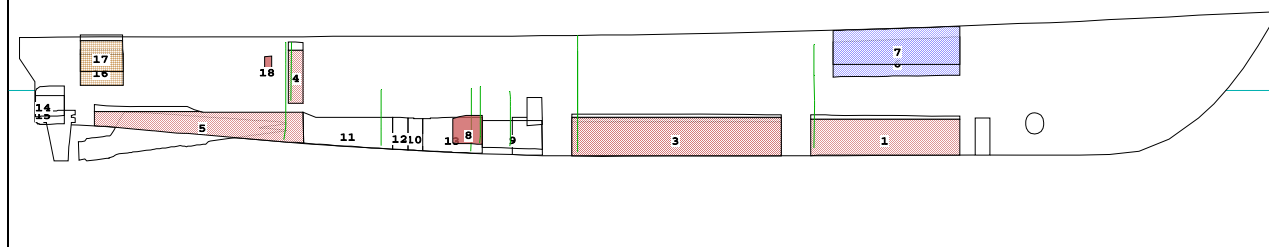
Fixed CG: LCG = 16.184f TCG = 0.005s VCG = 3.475

Origin	Degrees of		Displacement	Residual Arms			Flood Pt
Depth	Trim	Heel	Weight (MT)	in Trim	in Heel	> Area	Height
2.360	0.45a	0.08p	269.17	0.000	0.000	0.0000	2.010(24)
2.357	0.45a	2.58p	269.17	0.000	0.027	0.0006	2.047(24)
2.350	0.46a	5.08p	269.17	0.000	0.054	0.0023	2.080(24)
2.337	0.46a	7.58p	269.17	0.000	0.082	0.0053	2.110(24)
2.320	0.47a	10.08p	269.17	0.000	0.112	0.0096	2.007(16)
2.270	0.50a	15.08p	269.17	0.000	0.175	0.0221	1.748(16)
2.190	0.53a	20.08p	269.17	0.000	0.230	0.0398	1.490(16)
2.111	0.52a	23.38p	269.17	0.000	0.256	0.0539	Dk/MargImm.
2.062	0.51a	25.08p	269.17	0.000	0.266	0.0616	1.240(16)
1.964	0.49a	28.22p	269.17	0.000	0.273	0.0764	1.084(16)
1.906	0.48a	30.08p	269.17	0.000	0.271	0.0852	0.990(16)
1.748	0.49a	35.08p	269.17	0.000	0.242	0.1078	0.731(16)
1.589	0.52a	40.08p	269.17	0.000	0.189	0.1268	0.462(16)
1.426	0.55a	45.08p	269.17	0.000	0.116	0.1403	0.187(16)
1.314	0.58a	48.41p	269.17	0.000	0.060	0.1454	0.000(16)
Distances in METERS.			Specific Gravity = 1.025.			Area in m.-Rad.	
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh				FLOOD	18.533f	2.680p	4.717
(24) Emerg Generator Comp Exh				FLOOD	12.575f	0.863s	4.270
LIM	STAB 7 CRITERION				Min/Max		Attained
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.0852 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.1268 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0416 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.271 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	28.22 P
(6)	GM at 0 deg				>	0.150 m.	0.609 P
Relative angles measured from 0.076							

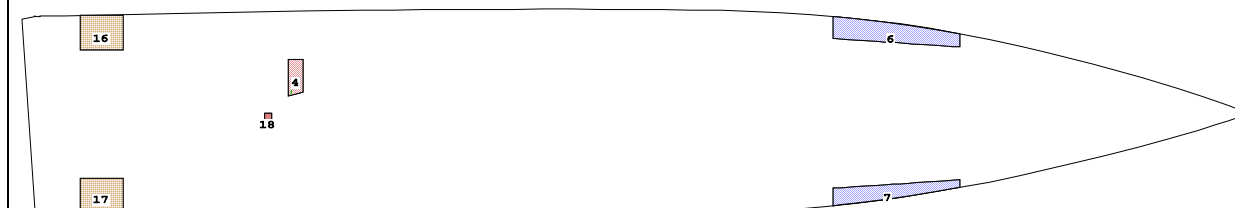


CG - Draft: 2.150 @ 38.850f, 2.238 @ 2.150f Heel: port 4.32 deg.

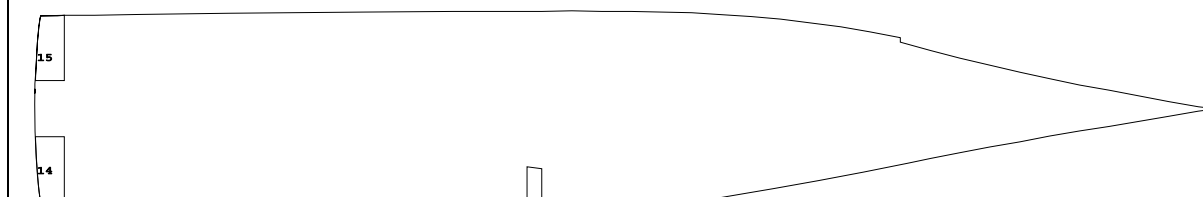
## Profile View @ 4.000s and beyond



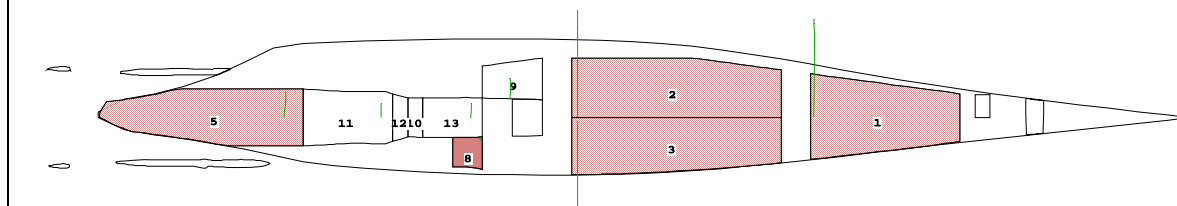
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

## SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
1.50 MT of Stores @ 100%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-0.00 MT of RHIB	-3.62 MT of Crane Inboard
3.62 MT of Crane Outboard	

## WEIGHT STATUS

BASELINE draft: 2.150 @ 38.85f, 2.238 @ 2.15f  
Trim: Aft 0.088/36.700, Heel: Port 4.32 deg.

Part	Weight(MT)	LCG	TCG	VCG			
LIGHT SHIP	220.30	16.069f	0.009s	3.145			
Stores @ 100%	1.50	15.500f	1.450p	4.900			
Crew & Equipment	1.80	24.800f	0.300p	4.270			
Emergency Gen FO @ 95%	0.31	15.580f	0.610s	5.600			
SAR Equipment - GFE	0.30	17.952f	0.150p	4.710			
RHIB (PS) Inboard	-2.46	4.655f	1.975p	5.750			
RHIB Payload Inboard	-0.50	24.800f	0.300p	4.270			
Crane Inboard	-3.62	7.700f	0.000	7.070			
RHIB (PS) Outboard	2.46	6.430f	5.950p	5.910			
RHIB Payload Outboard	0.50	6.430f	5.950p	5.910			
Crane Outboard	3.62	7.700f	2.230p	7.070			
Total Fixed	224.21	16.116f	0.095p	3.177			
Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM	
FO-TK1.C	0.950	0.840	7.05	28.266f	0.034p	0.787	4.33*
FO-TK2.P	0.950	0.840	8.19	21.350f	0.782p	0.790	3.41*
FO-TK3.S	0.950	0.840	8.19	21.366f	0.731s	0.790	3.41*
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.316p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.55	5.896f	0.018p	1.148	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.746p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.743s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks		39.83	19.929f	0.035p	1.456	13.36	
Total Weight		264.05	16.691f	0.086p	2.917		
Free Surface Adjustment					0.051		
Adjusted CG			16.691f	0.082p	2.968		
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.088/36.700, Heel: Port 4.32 deg., VCG = 2.917

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.194	264.05	16.688f	1.503	2.16	16.603f	5.50	76.48	1.065
Distances in METERS.		Specific Gravity = 1.025.					Moment in m.-MT.	
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.150 @ 38.85f, 2.816 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85) 2.150  
 Baseline Draft at Aft Draft Marks (FR 2.15) 2.238  
 Baseline Draft at Load Line Mark (FR 20.86) 2.193  
 Baseline Draft at AP (FR 1) 2.241  
 Baseline Draft at FP (FR 40.721) 2.145

## FREEBOARD STATUS

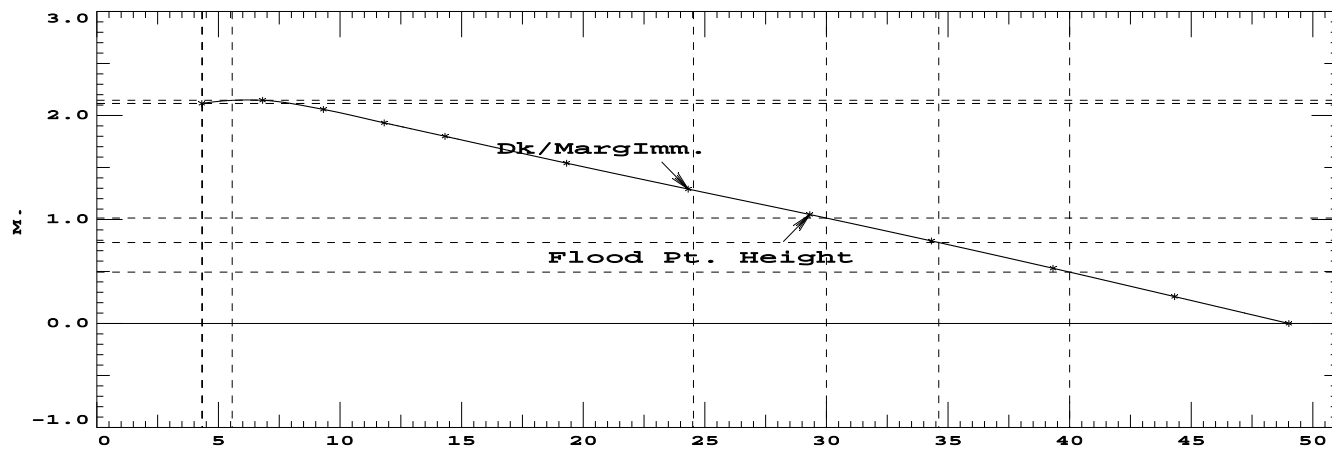
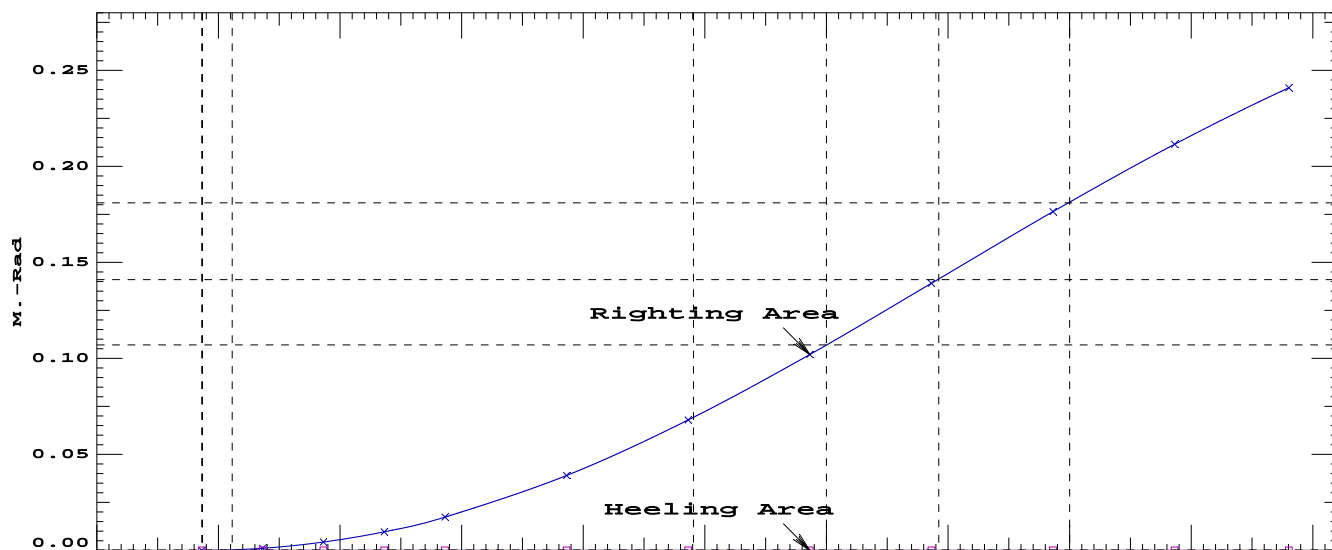
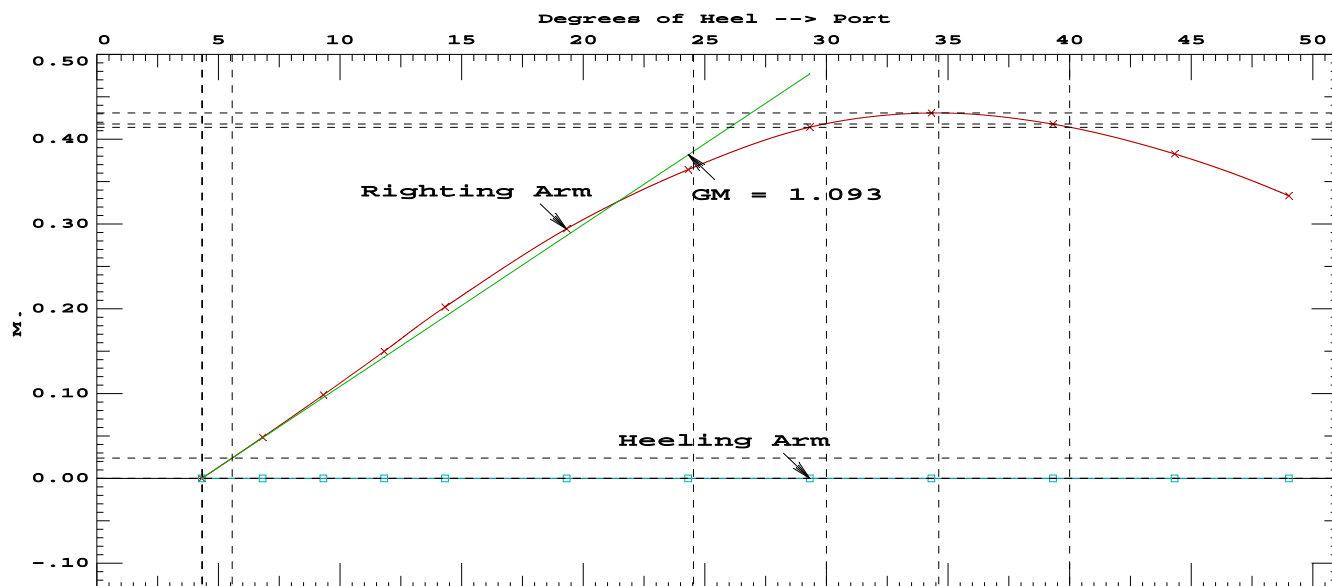
BASELINE draft: 2.150 @ 38.85f, 2.238 @ 2.15f  
 Trim: Aft 0.088/36.700, Heel: Port 4.32 deg.  
 Least freeboard is 1.296 m. located at 10.000f  
 Least extra freeboard (to margin line) is 1.220 m. located at 10.000f

## RESIDUAL RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 16.116f TCG = 0.095p VCG = 3.177

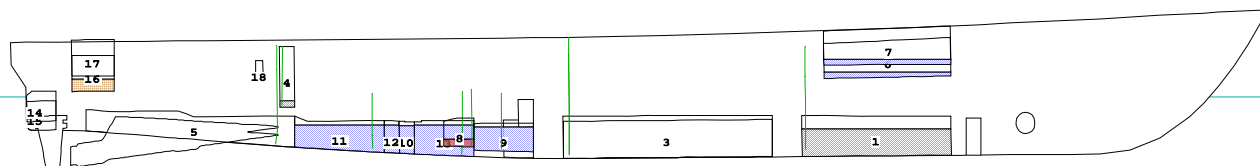
Origin	Degrees of		Displacement	Residual Arms		Flood Pt	
Depth	Trim	Heel	Weight (MT)	in Trim	in Heel	Area	Height
2.237	0.14a	4.32p	264.05	0.000	0.000	0.0000	2.116(24)
2.227	0.14a	6.82p	264.05	0.000	0.048	0.0011	2.147(24)
2.212	0.15a	9.32p	264.04	0.000	0.098	0.0043	2.058(16)
2.192	0.17a	11.82p	264.04	0.000	0.150	0.0097	1.930(16)
2.168	0.19a	14.32p	264.04	0.000	0.202	0.0173	1.800(16)
2.092	0.21a	19.32p	264.04	0.000	0.294	0.0390	1.542(16)
1.963	0.19a	24.32p	264.04	0.000	0.364	0.0679	1.293(16)
1.957	0.19a	24.53p	264.03	0.000	0.367	0.0693	Dk/MargImm.
1.799	0.14a	29.32p	264.04	0.000	0.414	0.1020	1.048(16)
1.632	0.13a	34.32p	264.04	0.000	0.431	0.1392	0.794(16)
1.627	0.13a	34.47p	264.04	0.000	0.431	0.1403	0.786(16)
1.464	0.13a	39.32p	264.04	0.000	0.418	0.1764	0.530(16)
1.293	0.15a	44.32p	264.04	0.000	0.383	0.2115	0.259(16)
1.127	0.17a	49.01p	264.04	0.000	0.333	0.2409	0.000(16)
Distances in METERS. Specific Gravity = 1.025. Area in m.-Rad.							
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh FLOOD				18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh FLOOD				12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION				Min/Max	Attained	
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1392 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2115 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0723 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.431 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	34.47 P
(6)	GM at 0 deg				>	0.150 m.	1.044 P
Relative angles measured from 4.319p							



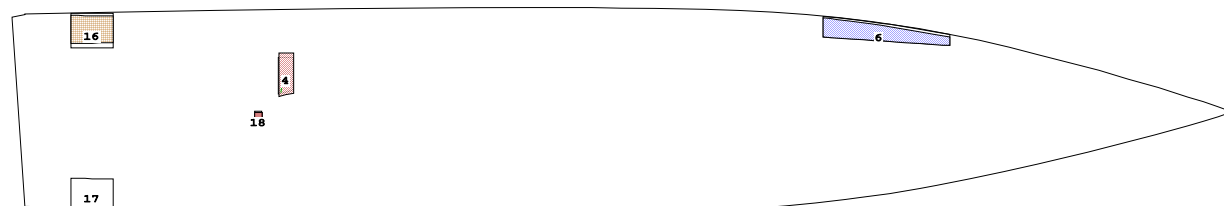


CG - Draft: 1.888 @ 38.850f, 2.193 @ 2.150f Heel: port 4.66 deg.

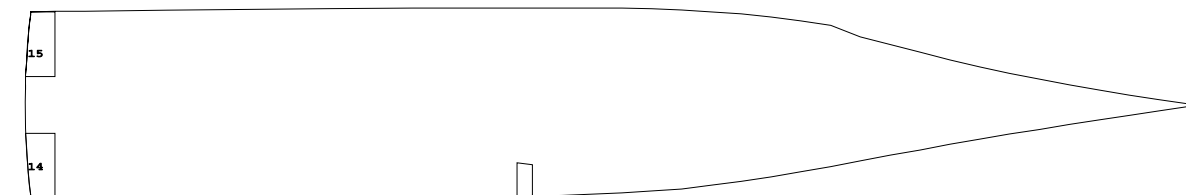
## Profile View @ 4.000s and beyond



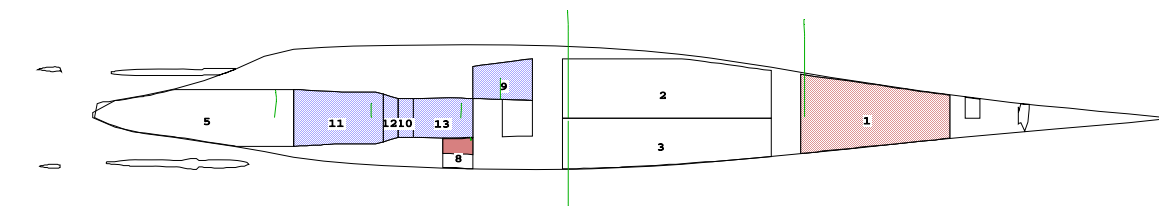
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
0.15 MT of Stores @ 10%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-0.00 MT of RHIB	-3.62 MT of Crane Inboard
3.62 MT of Crane Outboard	

WEIGHT STATUS

BASELINE draft: 1.888 @ 38.85f, 2.193 @ 2.15f  
Trim: Aft 0.303/36.700, Heel: Port 4.66 deg.

Part	Weight(MT)	LCG	TCG	VCG			
LIGHT SHIP	220.30	16.069f	0.009s	3.145			
Stores @ 10%	0.15	15.500f	1.450p	4.900			
Crew & Equipment	1.80	24.800f	0.300p	4.270			
Emergency Gen FO @ 95%	0.31	15.580f	0.610s	5.600			
SAR Equipment - GFE	0.30	17.952f	0.150p	4.710			
RHIB (PS) Inboard	-2.46	4.655f	1.975p	5.750			
RHIB Payload Inboard	-0.50	24.800f	0.300p	4.270			
Crane Inboard	-3.62	7.700f	0.000	7.070			
RHIB (PS) Outboard	2.46	6.430f	5.950p	5.910			
RHIB Payload Outboard	0.50	6.430f	5.950p	5.910			
Crane Outboard	3.62	7.700f	2.230p	7.070			
Total Fixed	222.86	16.119f	0.087p	3.166			
Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM	
FO-TK1.C	0.570	0.840	4.23	28.233f	0.077p	0.607	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.747f	1.387p	2.029	0.10*
FW-TK11.P	0.100	1.000	0.32	28.452f	2.648p	2.963	0.08*
FW-TK12.S	0.100	1.000	0.32	28.604f	2.609s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.521f	0.837s	0.529	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.038f	1.169p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.012p	0.725	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.031p	0.835	1.37*
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.018p	0.760	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.016f	0.013p	0.704	0.38*
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.907p	2.899	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.174s	2.685	0.00
Total Tanks			13.66	18.071f	0.210p	0.876	6.75
Total Weight			236.52	16.232f	0.094p	3.034	
Free Surface Adjustment						0.029	
Adjusted CG				16.232f	0.091p	3.062	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.303/36.700, Heel: Port 4.66 deg., VCG = 3.034

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.040	236.52	16.219f	1.433	2.11	16.298f	5.22	80.97	1.099
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.888 @ 38.85f, 2.771 @ 2.15f

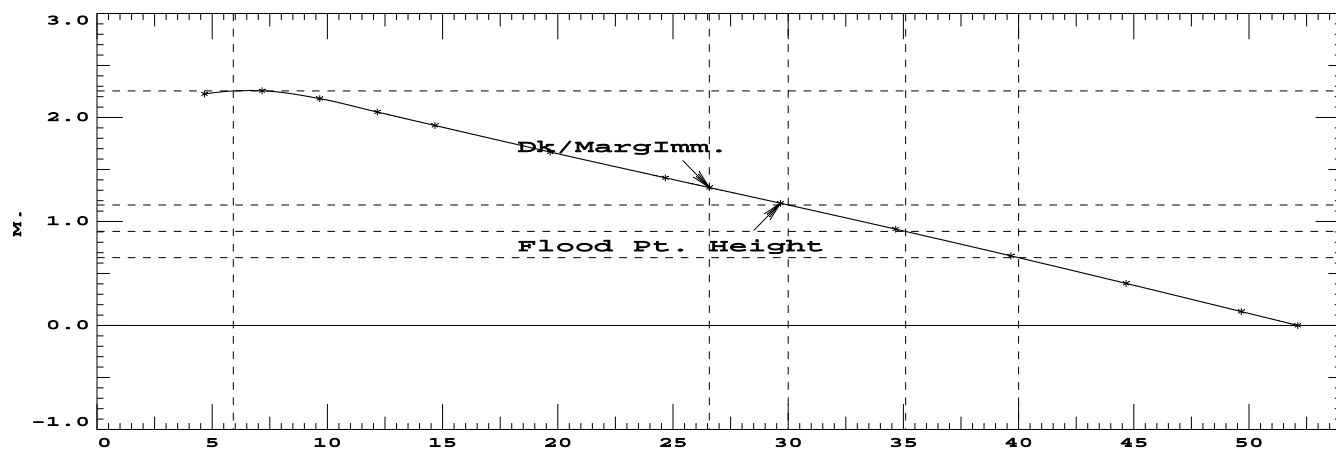
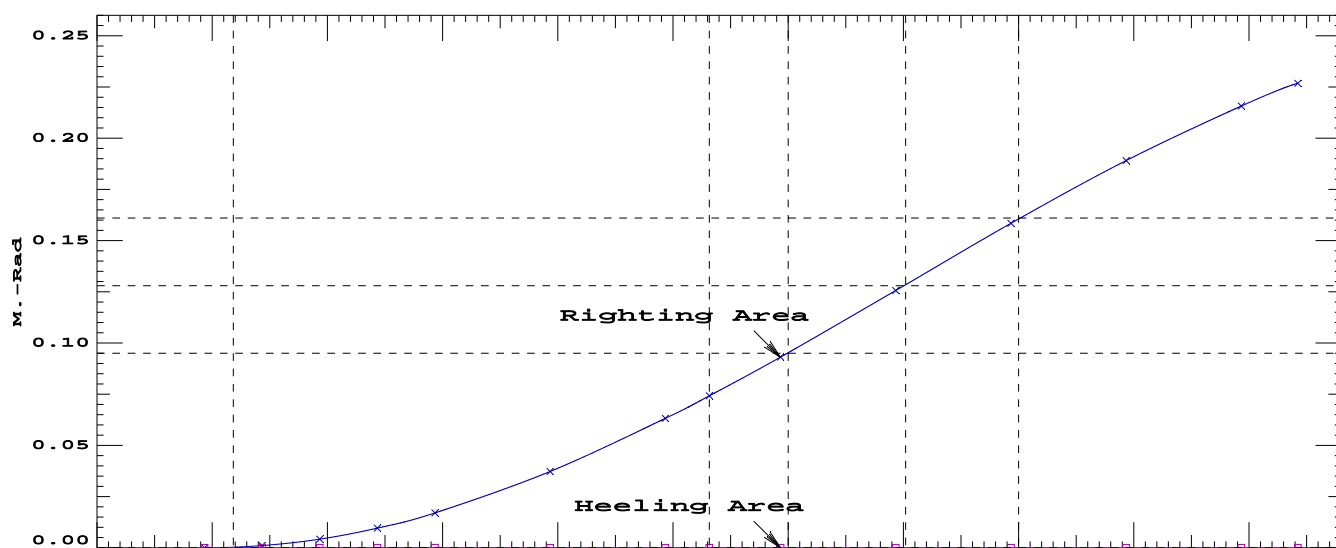
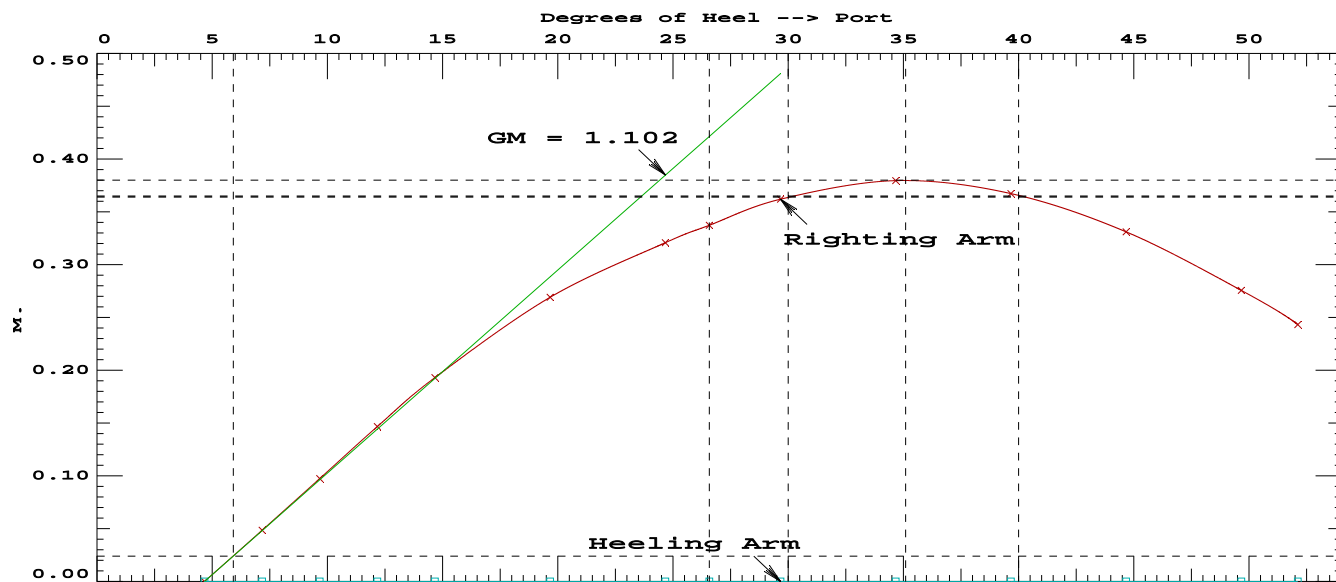
Baseline Draft at Fwd Draft Marks (FR 38.85) 1.888  
 Baseline Draft at Aft Draft Marks (FR 2.15) 2.193  
 Baseline Draft at Load Line Mark (FR 20.86) 2.038  
 Baseline Draft at AP (FR 1) 2.202  
 Baseline Draft at FP (FR 40.721) 1.873

## FREEBOARD STATUS

BASELINE draft: 1.888 @ 38.85f, 2.193 @ 2.15f  
 Trim: Aft 0.303/36.700, Heel: Port 4.66 deg.  
 Least freeboard is 1.311 m. located at 0.500a  
 Least extra freeboard (to margin line) is 1.235 m. located at 0.500a

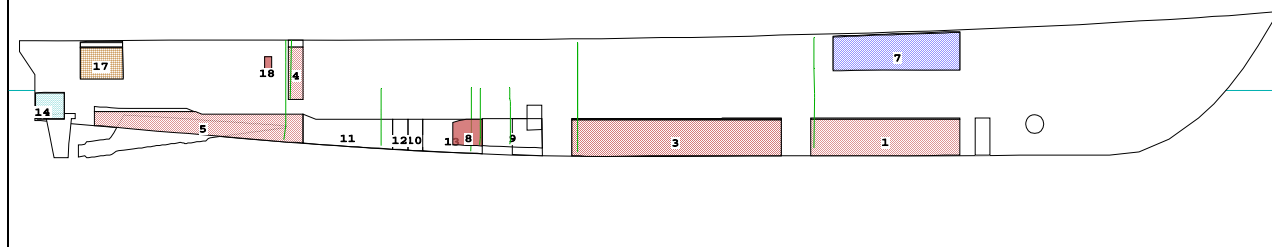
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.119f TCG = 0.087p VCG = 3.166

Origin	Degrees of		Displacement	Residual Arms			Flood Pt
Depth	Trim	Heel	Weight(MT)	in Trim	in Heel	> Area	Height
2.203	0.47a	4.66p	236.52	0.000	0.000	0.0000	2.227(24)
2.193	0.48a	7.16p	236.52	0.000	0.048	0.0011	2.257(24)
2.177	0.49a	9.66p	236.52	0.000	0.097	0.0042	2.182(16)
2.158	0.51a	12.16p	236.52	0.000	0.147	0.0096	2.053(16)
2.132	0.53a	14.66p	236.52	0.000	0.193	0.0170	1.924(16)
2.046	0.54a	19.66p	236.52	0.000	0.269	0.0372	1.668(16)
1.907	0.49a	24.66p	236.51	0.000	0.321	0.0632	1.420(16)
1.843	0.46a	26.58p	236.52	0.000	0.337	0.0741	Dk/MargImm.
1.732	0.42a	29.66p	236.51	0.000	0.362	0.0930	1.176(16)
1.550	0.38a	34.66p	236.52	0.000	0.380	0.1255	0.927(16)
1.542	0.38a	34.89p	236.52	0.000	0.380	0.1270	0.915(16)
1.368	0.36a	39.66p	236.52	0.000	0.367	0.1583	0.669(16)
1.183	0.36a	44.66p	236.52	0.000	0.331	0.1889	0.404(16)
0.991	0.35a	49.66p	236.52	0.000	0.276	0.2155	0.134(16)
0.894	0.35a	52.12p	236.52	0.000	0.243	0.2267	0.000(16)
Distances in METERS.			Specific Gravity = 1.025.			Area in m.-Rad.	
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh				FLOOD	18.533f	2.680p	4.717
(24) Emerg Generator Comp Exh				FLOOD	12.575f	0.863s	4.270
LIM	STAB 7 CRITERION				Min/Max		Attained
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1255 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.1889 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0634 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.380 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	34.89 P
(6)	GM at 0 deg				>	0.150 m.	1.073 P
Relative angles measured from 4.665p							

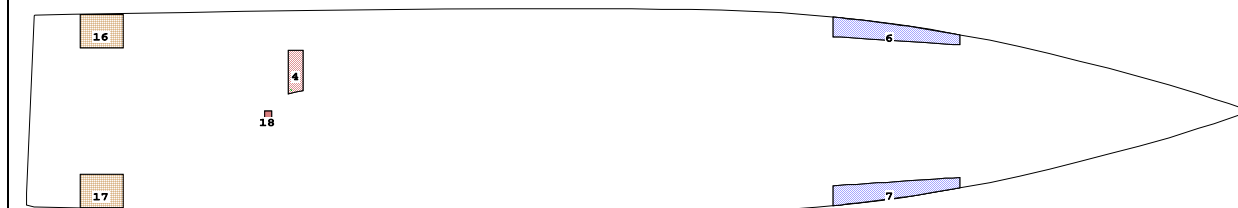


CG - Draft: 2.152 @ 38.850f, 2.228 @ 2.150f Heel: stbd 0.30 deg.

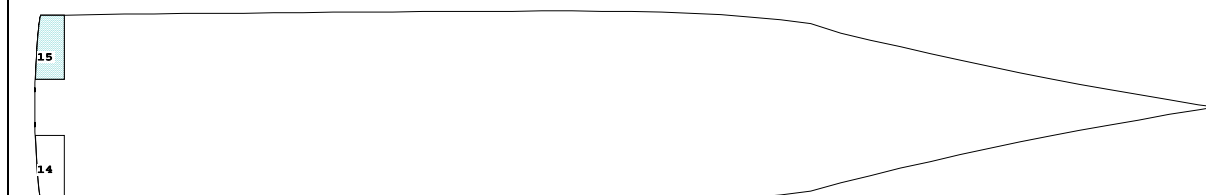
## Profile View @ 4.000s and beyond



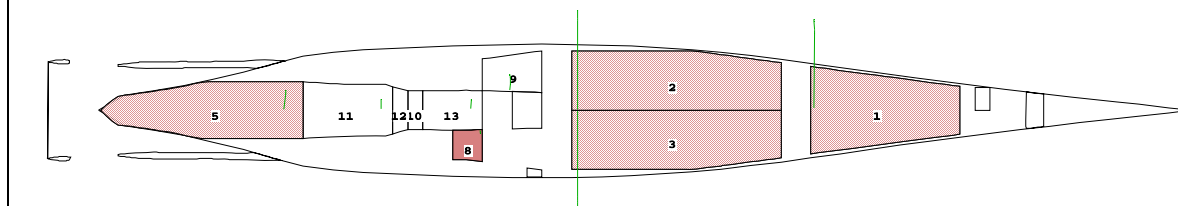
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....100% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
1.5 Cu.M. (50%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
1.50 MT of Stores @ 100%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-2.96 MT of RHIB	

WEIGHT STATUS

BASELINE draft: 2.152 @ 38.85f, 2.228 @ 2.15f  
Trim: Aft 0.076/36.700, Heel: Stbd 0.30 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 100%			1.50	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
RHIB (PS) Inboard			-2.46	4.655f	1.975p	5.750	
RHIB Payload Inboard			-0.50	24.800f	0.300p	4.270	
Total Fixed		>	221.25	16.246f	0.020s	3.140	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.950	0.840	7.05	28.259f	0.003s	0.786	4.33
FO-TK2.P	0.950	0.840	8.19	21.356f	0.755p	0.789	3.41
FO-TK3.S	0.950	0.840	8.19	21.354f	0.759s	0.789	3.41
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.312p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.54	5.898f	0.001s	1.147	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
WB-TK17.P	1.000	1.025	1.53	0.541f	2.005p	1.758	0.00
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.744p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.744s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks		>	41.36	19.208f	0.087p	1.466	13.36
Total Weight		>	262.61	16.712f	0.003s	2.876	
Free Surface Adjustment		>				0.051	
Adjusted CG		>		16.712f	0.003s	2.927	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.



# HYDROSTATIC PROPERTIES

Trim: Aft 0.076/36.700, Heel: Stbd 0.30 deg., VCG = 2.876

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.190	262.54	16.709f	1.492	2.15	16.603f	5.48	76.58	1.088
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.152 @ 38.85f, 2.806 @ 2.15f

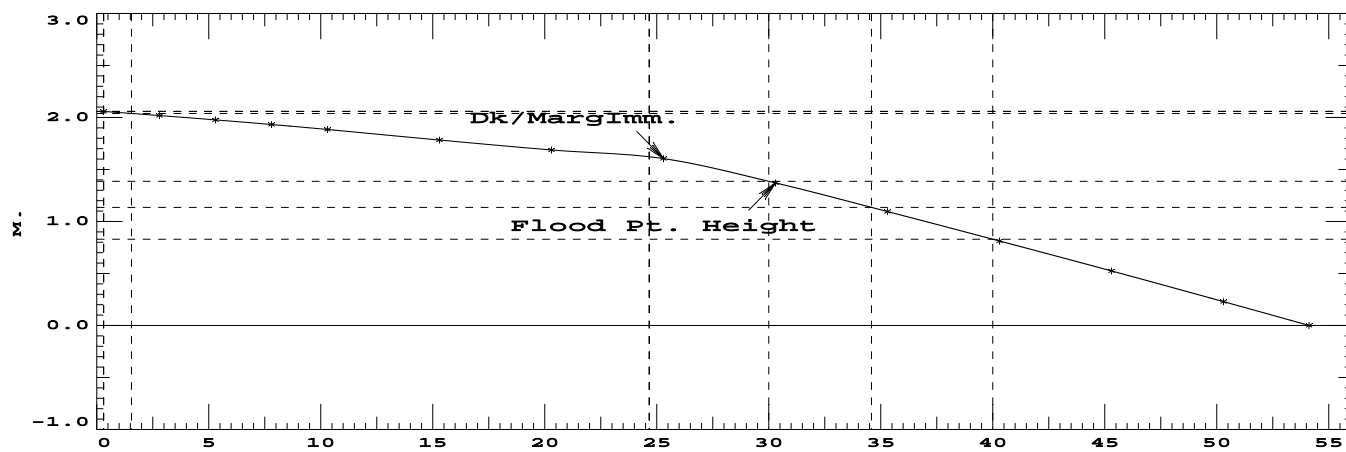
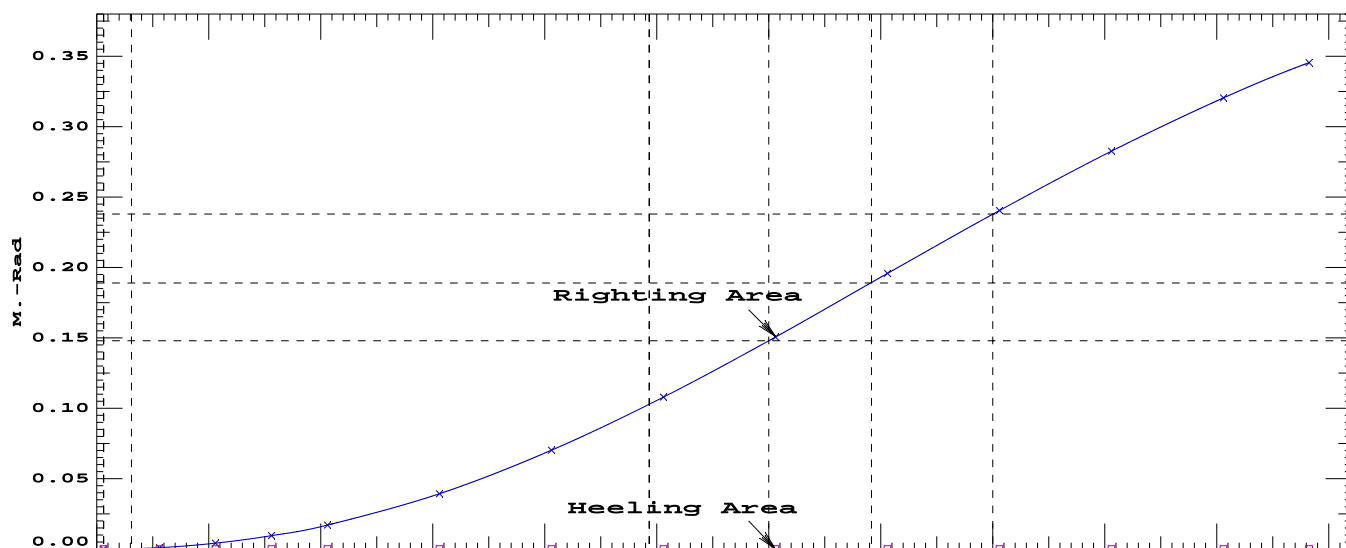
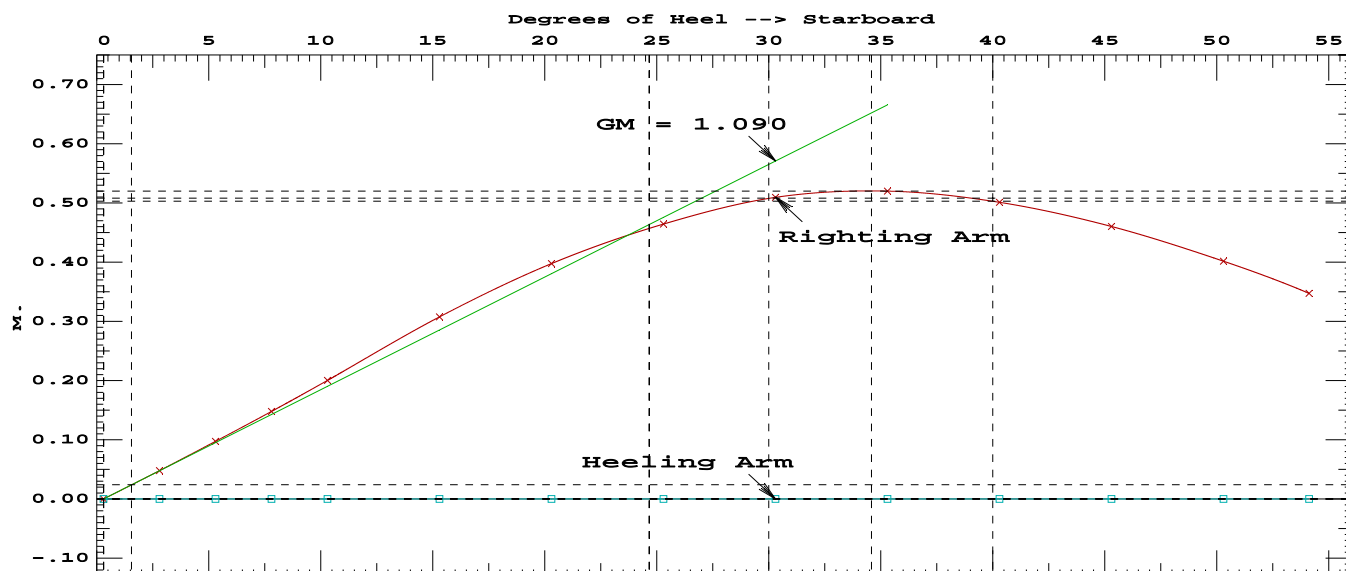
Baseline Draft at Fwd Draft Marks (FR 38.85)	2.152
Baseline Draft at Aft Draft Marks (FR 2.15)	2.228
Baseline Draft at Load Line Mark (FR 20.86)	2.190
Baseline Draft at AP (FR 1)	2.231
Baseline Draft at FP (FR 40.721)	2.149

## FREEBOARD STATUS

BASELINE draft: 2.152 @ 38.85f, 2.228 @ 2.15f  
Trim: Aft 0.076/36.700, Heel: Stbd 0.30 deg.  
Least freeboard is 1.544 m. located at 0.000  
Least extra freeboard (to margin line) is 1.468 m. located at 0.000

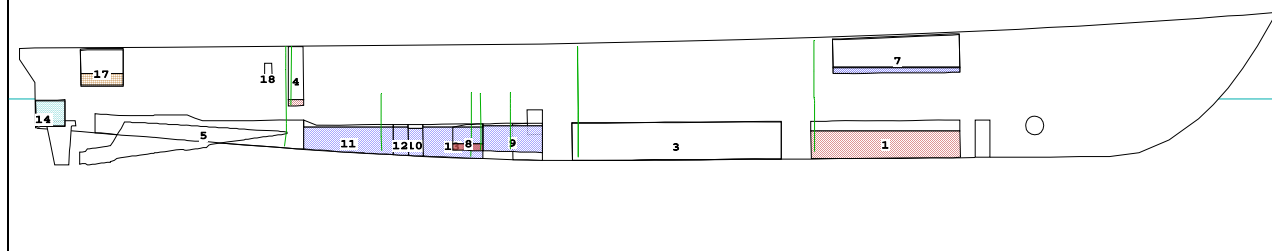
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.246f TCG = 0.020s VCG = 3.140

Origin	Degrees of	Displacement	Residual Arms	Flood Pt
Depth	Trim	Heel	Weight(MT)	in Trim in Heel → Area Height
2.233	0.12a	0.30s	262.61	0.000 0.000 0.0000 2.058(24)
2.230	0.12a	2.80s	262.61	0.000 0.048 0.0010 2.019(24)
2.223	0.12a	5.30s	262.61	0.000 0.097 0.0042 1.977(24)
2.210	0.13a	7.80s	262.61	0.000 0.148 0.0095 1.932(24)
2.194	0.14a	10.30s	262.61	0.000 0.200 0.0171 1.884(24)
2.146	0.18a	15.30s	262.61	0.000 0.307 0.0392 1.784(24)
2.061	0.20a	20.30s	262.61	0.000 0.398 0.0701 1.688(24)
1.942	0.17a	24.66s	262.61	0.000 0.457 0.1028 Dk/MargImm.
1.922	0.16a	25.30s	262.61	0.000 0.464 0.1079 1.605(24)
1.754	0.12a	30.30s	262.60	0.000 0.510 0.1506 1.370(4)
1.616	0.11a	34.42s	262.61	0.000 0.521 0.1878 1.144(4)
1.587	0.11a	35.30s	262.61	0.000 0.520 0.1957 1.095(4)
1.417	0.11a	40.30s	262.61	0.000 0.501 0.2405 0.813(4)
1.245	0.13a	45.30s	262.61	0.000 0.460 0.2826 0.524(4)
1.065	0.15a	50.30s	262.61	0.000 0.401 0.3203 0.229(4)
0.923	0.17a	54.12s	262.61	0.000 0.347 0.3453 0.000(4)
Distances in METERS. Specific Gravity = 1.025. Area in m.-Rad.				
Tank CG shifts included.				
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00				
Critical Points LCP TCP VCP				
(4) Bow Thruster Room Sup FLOOD 32.450f 2.666s 5.100				
(24) Emerg Generator Comp Exh FLOOD 12.575f 0.863s 4.270				
LIM	STAB 7 CRITERION			Min/Max Attained
(1) Area from 0 deg to 30	>			0.0550 m.-Rad 0.1506 P
(2) Area from 0 deg to 40 or Flood	>			0.0900 m.-Rad 0.2405 P
(3) Area from 30 deg to 40 or Flood	>			0.0300 m.-Rad 0.0899 P
(4) Righting Arm at 30 deg	>			0.200 m. 0.510 P
(5) Absolute Angle at MaxRA	>			25.00 deg 34.42 P
(6) GM at 0 deg	>			0.150 m. 1.092 P
Relative angles measured from 0.300s				

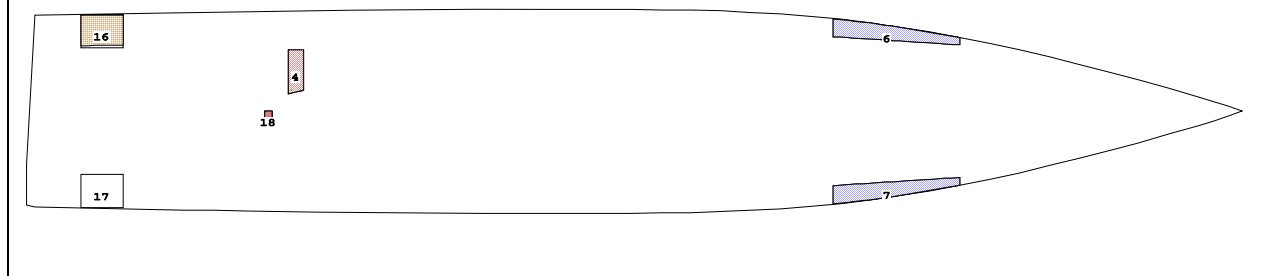


CG - Draft: 1.893 @ 38.850f, 2.183 @ 2.150f Heel: stbd 0.37 deg.

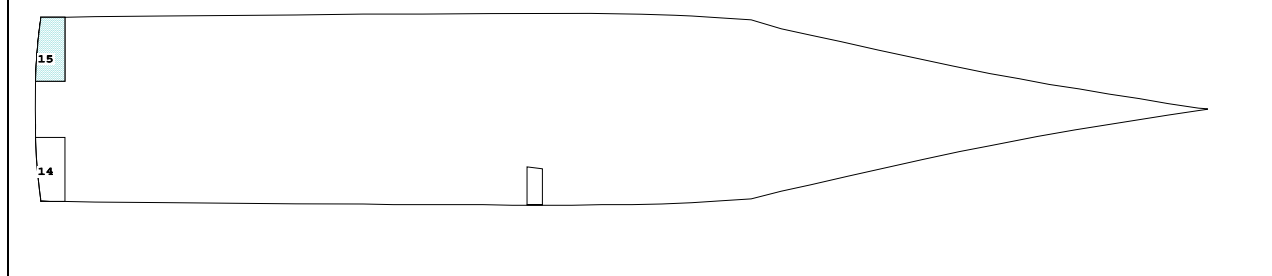
Profile View @ 4.000s and beyond



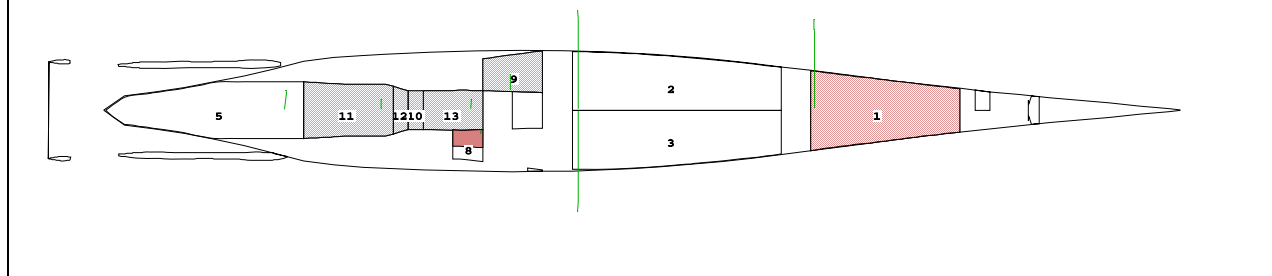
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....100% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
1.5 Cu.M. (50%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
0.15 MT of Stores @ 10%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-2.96 MT of RHIB	

WEIGHT STATUS

BASELINE draft: 1.893 @ 38.85f, 2.183 @ 2.15f  
Trim: Aft 0.290/36.700, Heel: Stbd 0.37 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 10%			0.15	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
RHIB (PS) Inboard			-2.46	4.655f	1.975p	5.750	
RHIB Payload Inboard			-0.50	24.800f	0.300p	4.270	
Total Fixed		>	219.90	16.250f	0.029s	3.129	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.570	0.840	4.23	28.236f	0.007s	0.604	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.746f	1.307p	2.026	0.10*
FW-TK11.P	0.100	1.000	0.32	28.538f	2.626p	2.962	0.08*
FW-TK12.S	0.100	1.000	0.32	28.526f	2.629s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.522f	0.855s	0.528	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.036f	1.151p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.001s	0.724	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.002s	0.834	1.37
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.001s	0.759	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.015f	0.001s	0.703	0.38*
WB-TK17.P	1.000	1.025	1.53	0.541f	2.005p	1.758	0.00
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.872p	2.898	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.189s	2.685	0.00
Total Tanks		>	15.19	16.303f	0.353p	0.964	6.75
Total Weight		>	235.09	16.253f	0.004s	2.989	
Free Surface Adjustment		>				0.029	
Adjusted CG		>		16.253f	0.004s	3.018	
Distances in METERS.						Moments in m.-MT.	

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

# HYDROSTATIC PROPERTIES

Trim: Aft 0.290/36.700, Heel: Stbd 0.37 deg., VCG = 2.989

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.038	235.09	16.241f	1.419	2.10	16.305f	5.20	81.25	1.128
Distances in METERS.		Specific Gravity = 1.025.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.893 @ 38.85f, 2.761 @ 2.15f

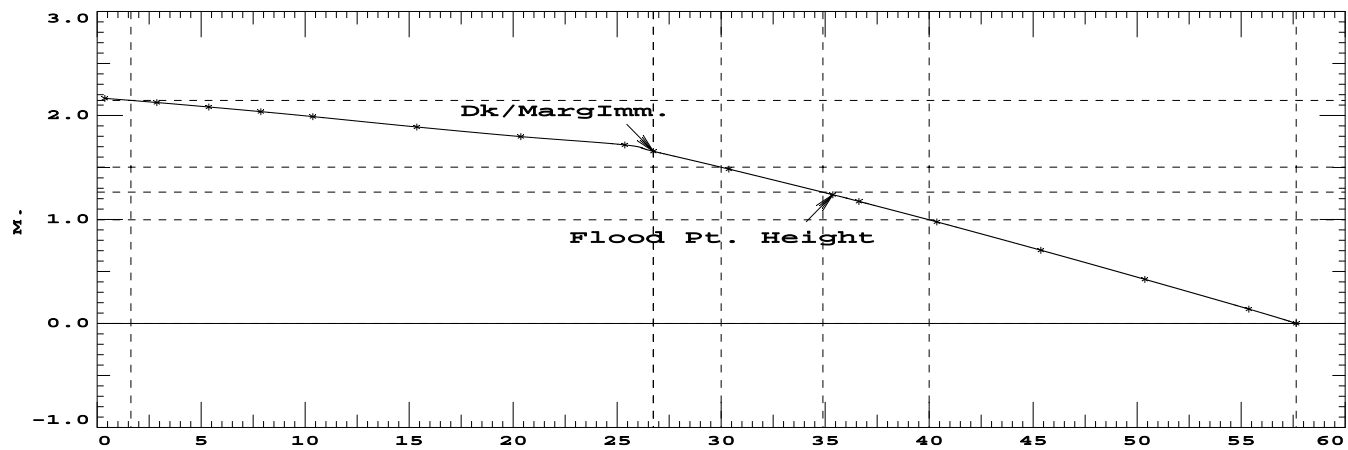
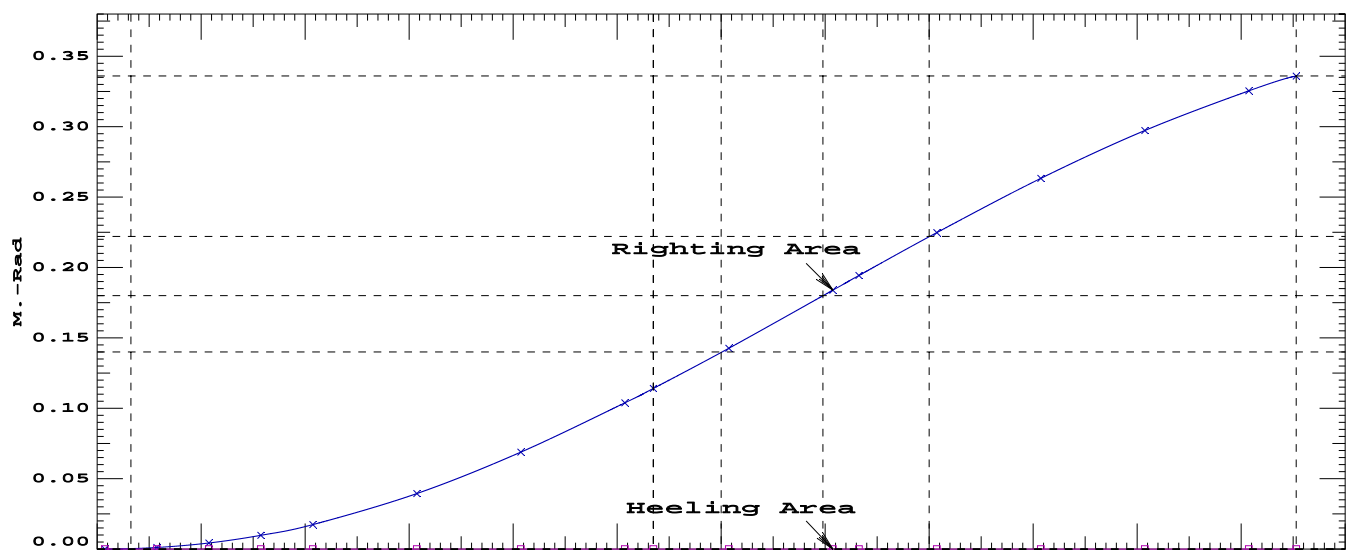
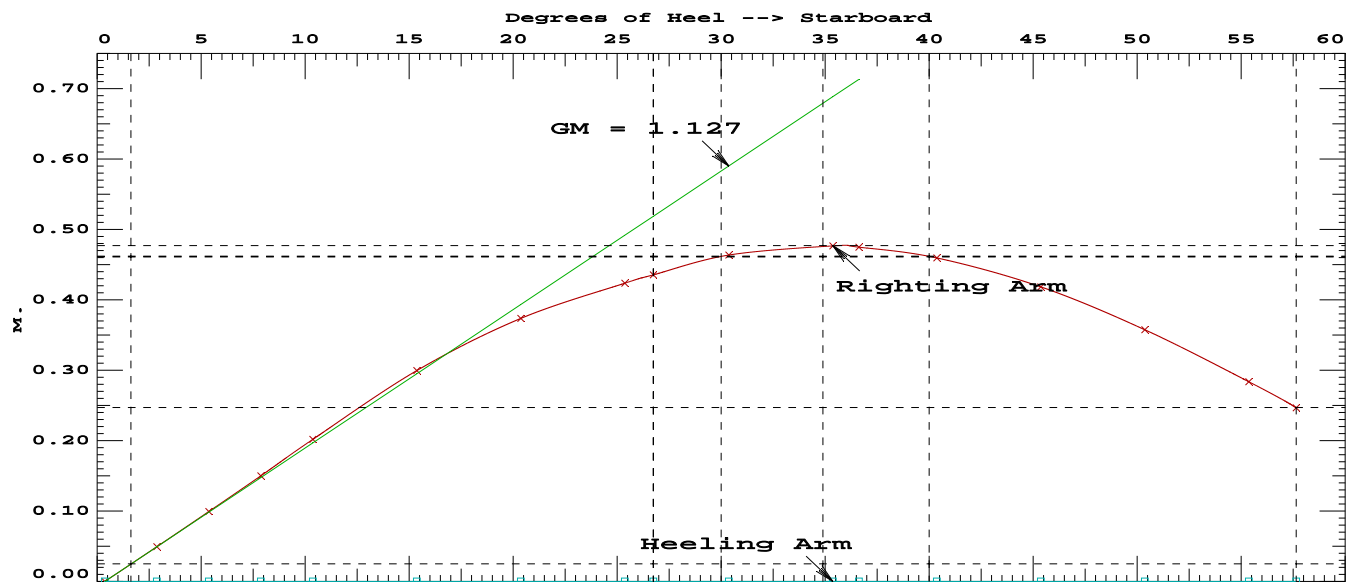
Baseline Draft at Fwd Draft Marks (FR 38.85)	1.893
Baseline Draft at Aft Draft Marks (FR 2.15)	2.183
Baseline Draft at Load Line Mark (FR 20.86)	2.035
Baseline Draft at AP (FR 1)	2.192
Baseline Draft at FP (FR 40.721)	1.878

## FREEBOARD STATUS

BASELINE draft: 1.893 @ 38.85f, 2.183 @ 2.15f  
Trim: Aft 0.290/36.700, Heel: Stbd 0.37 deg.  
Least freeboard is 1.570 m. located at 0.500a  
Least extra freeboard (to margin line) is 1.494 m. located at 0.500a

RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.250f TCG = 0.029s VCG = 3.129

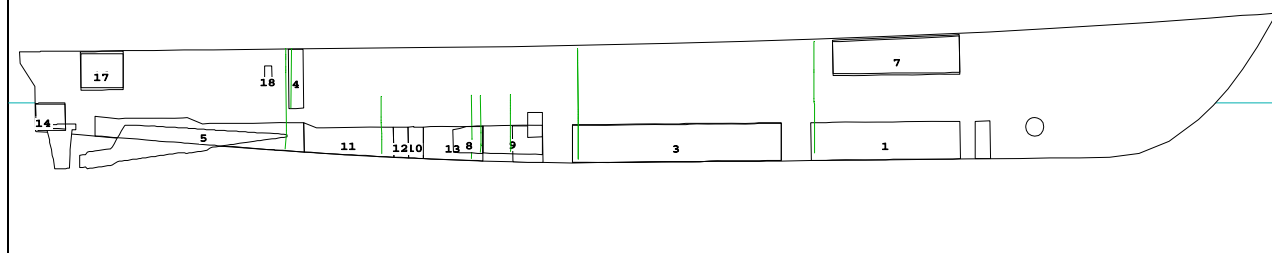
Origin	Degrees of	Displacement	Residual Arms	Flood Pt
Depth	Trim	Heel	Weight (MT)	in Trim in Heel → Area Height
2.199	0.45a	0.37s	235.09	0.000 0.000 0.0000 2.164(24)
2.197	0.45a	2.87s	235.09	0.000 0.049 0.0011 2.124(24)
2.189	0.46a	5.37s	235.09	0.000 0.099 0.0043 2.082(24)
2.178	0.47a	7.87s	235.09	0.000 0.150 0.0098 2.036(24)
2.162	0.48a	10.37s	235.09	0.000 0.202 0.0174 1.989(24)
2.112	0.52a	15.37s	235.09	0.000 0.300 0.0393 1.889(24)
2.019	0.52a	20.37s	235.09	0.000 0.374 0.0689 1.797(24)
1.873	0.46a	25.37s	235.08	0.000 0.424 0.1038 1.717(24)
1.826	0.44a	26.74s	235.08	0.000 0.435 0.1141 Dk/MargImm.
1.695	0.39a	30.37s	235.08	0.000 0.464 0.1426 1.485(29)
1.512	0.35a	35.37s	235.09	0.000 0.477 0.1838 1.238(29)
1.466	0.35a	36.62s	235.09	0.000 0.475 0.1942 1.175(29)
1.329	0.34a	40.37s	235.09	0.000 0.460 0.2248 0.977(29)
1.143	0.34a	45.37s	235.09	0.000 0.418 0.2633 0.704(29)
0.949	0.33a	50.37s	235.09	0.000 0.358 0.2973 0.425(29)
0.750	0.32a	55.37s	235.09	0.000 0.284 0.3254 0.138(4)
0.658	0.32a	57.65s	235.09	0.000 0.247 0.3359 -0.000(4)
Distances in METERS. Specific Gravity = 1.025. Area in m.-Rad.				
Tank CG shifts included.				
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00				
Critical Points LCP TCP VCP				
(4) Bow Thruster Room Sup FLOOD 32.450f 2.666s 5.100				
(24) Emerg Generator Comp Exh FLOOD 12.575f 0.863s 4.270				
(29) Aux Mach Room Sup Stbd FLOOD 11.148f 2.487s 5.055				
LIM	STAB 7 CRITERION			Min/Max Attained
(1) Area from 0 deg to 30	>			0.0550 m.-Rad 0.1426 P
(2) Area from 0 deg to 40 or Flood	>			0.0900 m.-Rad 0.2248 P
(3) Area from 30 deg to 40 or Flood	>			0.0300 m.-Rad 0.0822 P
(4) Righting Arm at 30 deg	>			0.200 m. 0.464 P
(5) Absolute Angle at MaxRA	>			25.00 deg 35.37 P
(6) GM at 0 deg	>			0.150 m. 1.127 P
Relative angles measured from 0.373s				



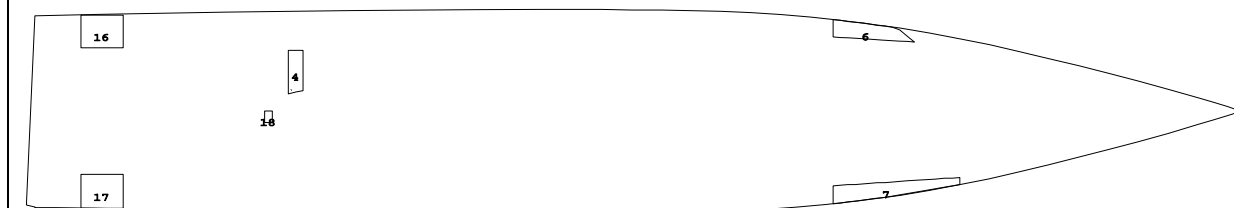


CG - Draft: 1.798 @ 38.850f, 2.170 @ 2.150f Heel: stbd 0.67 deg.

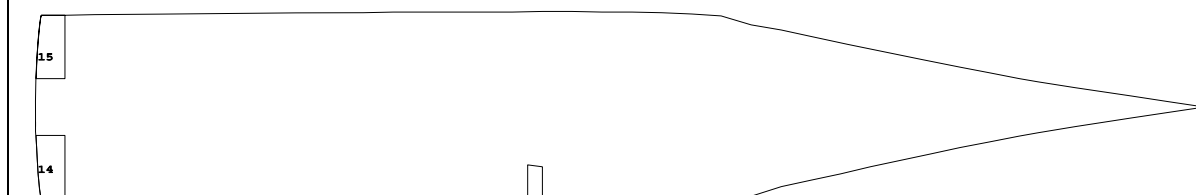
Profile View @ 4.000s and beyond



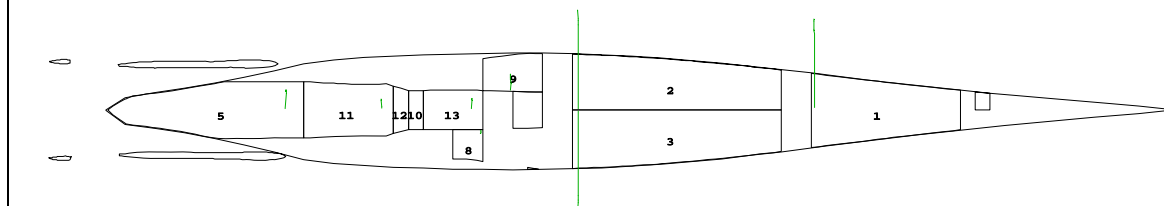
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....0% FUEL OIL	7 FW-TK12.S.....0% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....0% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....0% GASOLINE
4 FO-TK8A.P.....0% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....0% DG LO
6 FW-TK11.P.....0% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

WEIGHT STATUS						
Baseline draft: 1.798 @ 38.85f, 2.170 @ 2.15f						
Trim: Aft 0.371/36.700, Heel: Stbd 0.67 deg.						
Part	Weight(MT)	LCG	TCG	VCG	FSM	
WEIGHT	220.30	16.069f	0.009s	3.145		
Load	SpGr	Weight(MT)	LCG	TCG	VCG	
Total Tanks	>	0.00				0.00
Distances in METERS.				Moments in m.-MT.		

HYDROSTATIC PROPERTIES								
Trim: Aft 0.371/36.700, Heel: Stbd 0.67 deg., VCG = 3.145								
Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
1.984	220.32	16.051f	1.395	2.03	16.198f	4.98	82.94	1.055
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
Trim is per 36.70m.								
Draft is from Baseline.								

#### DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

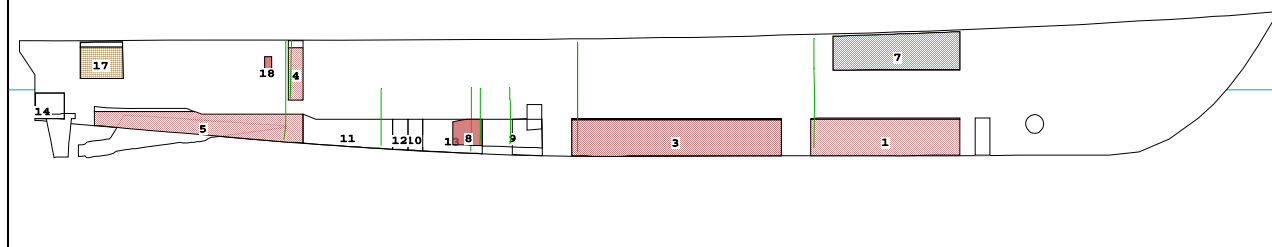
MARKS draft: 1.798 @ 38.85f, 2.748 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	1.798
Baseline Draft at Aft Draft Marks (FR 2.15)	2.170
Baseline Draft at Load Line Mark (FR 20.86)	1.980
Baseline Draft at AP (FR 1)	2.181
Baseline Draft at FP (FR 40.721)	1.779

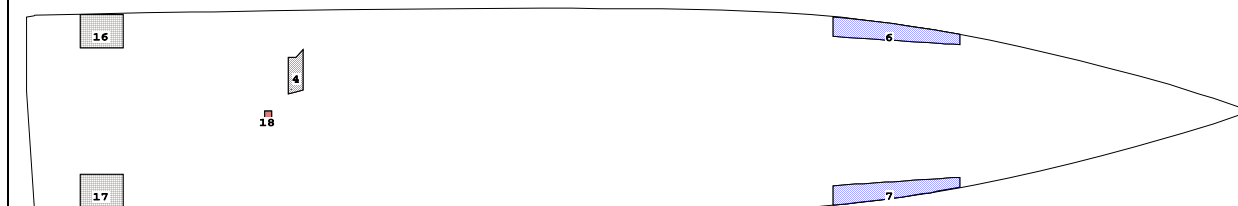
FREEBOARD STATUS	
BASELINE draft: 1.798 @ 38.85f, 2.170 @ 2.15f	
Trim: Aft 0.371/36.700, Heel: Stbd 0.67 deg.	
Least freeboard is 1.560 m. located at 0.500a	
Least extra freeboard (to margin line) is 1.485 m. located at 0.500a	

CG - Draft: 2.190 @ 38.850f, 2.266 @ 2.150f Heel: port 0.10 deg.

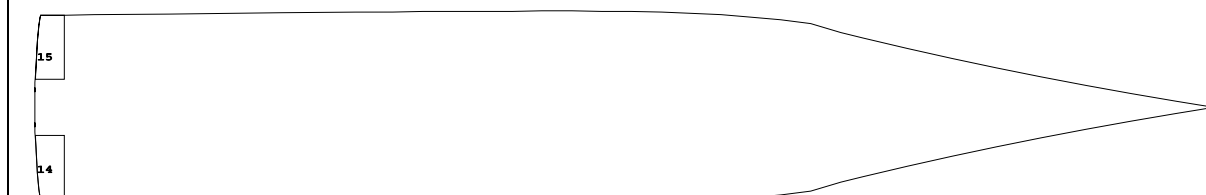
Profile View @ 4.000s and beyond



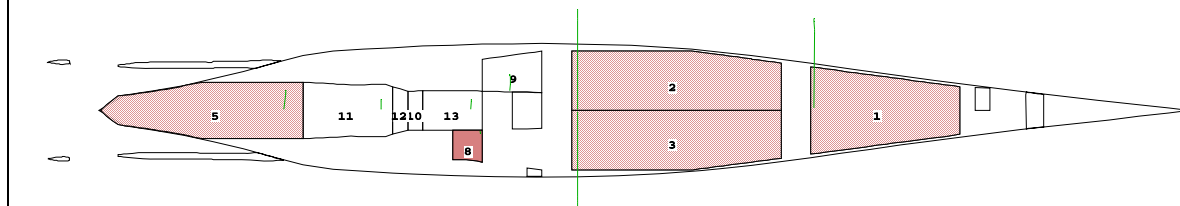
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
3.91 MT of Misc. Weights	

WEIGHT STATUS

BASELINE draft: 2.190 @ 38.85f, 2.266 @ 2.15f  
Trim: Aft 0.076/36.700, Heel: Port 0.10 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 100%			1.50	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Total Fixed		>	224.21	16.137f	0.003p	3.171	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.950	0.840	7.05	28.259f	0.001p	0.786	4.33
FO-TK2.P	0.950	0.840	8.19	21.355f	0.758p	0.789	3.41
FO-TK3.S	0.950	0.840	8.19	21.355f	0.756s	0.789	3.41
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.312p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.54	5.898f	0.000	1.147	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.744p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.744s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks		>	39.83	19.926f	0.016p	1.455	13.36
Total Weight		>	264.04	16.709f	0.005p	2.912	
Free Surface Adjustment		>				0.051	
Adjusted CG		>		16.709f	0.004p	2.963	
Distances in METERS.						Moments in m.-MT.	

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

HYDROSTATIC PROPERTIES

Trim: Aft 0.076/36.700, Heel: Port 0.10 deg., VCG = 2.912

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.228	264.04	16.706f	1.514	2.11	16.647f	5.39	74.91	1.018
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.190 @ 38.85f, 2.844 @ 2.15f

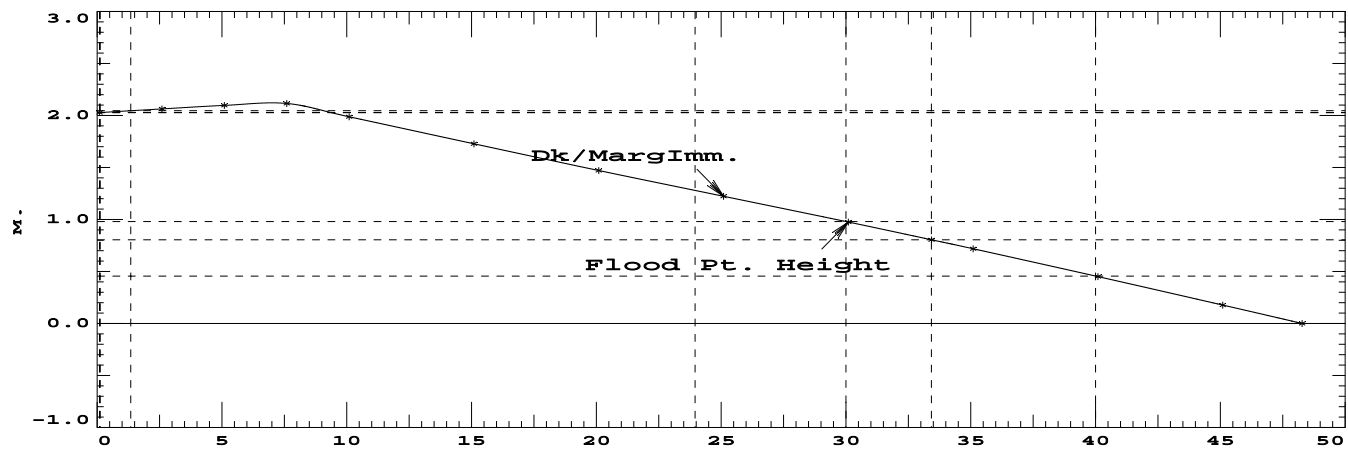
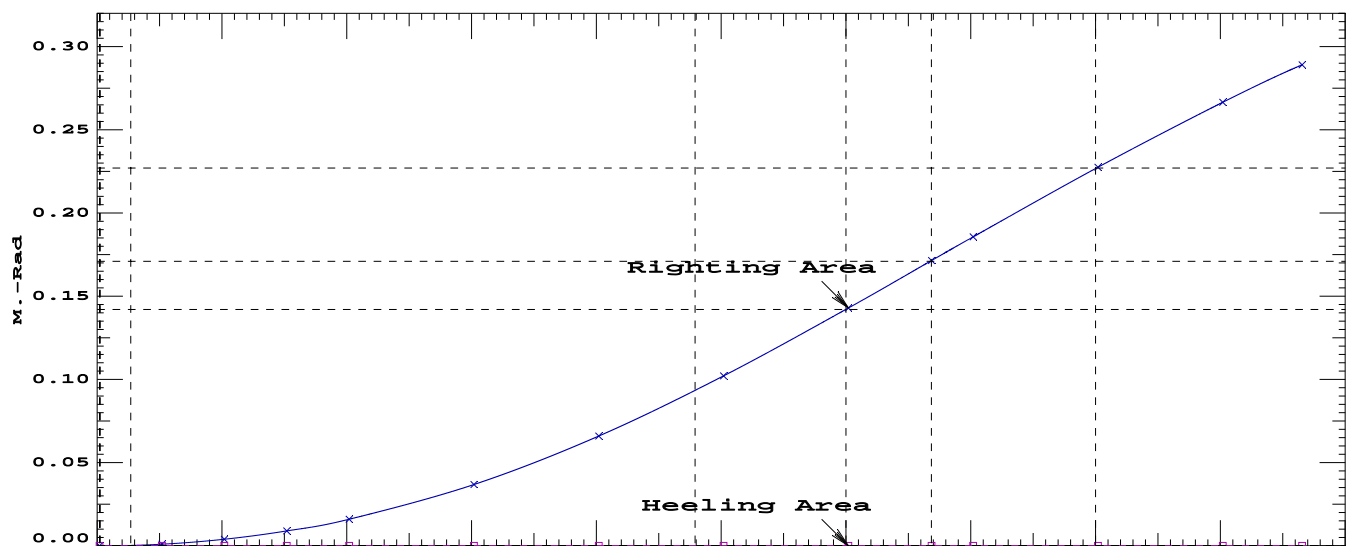
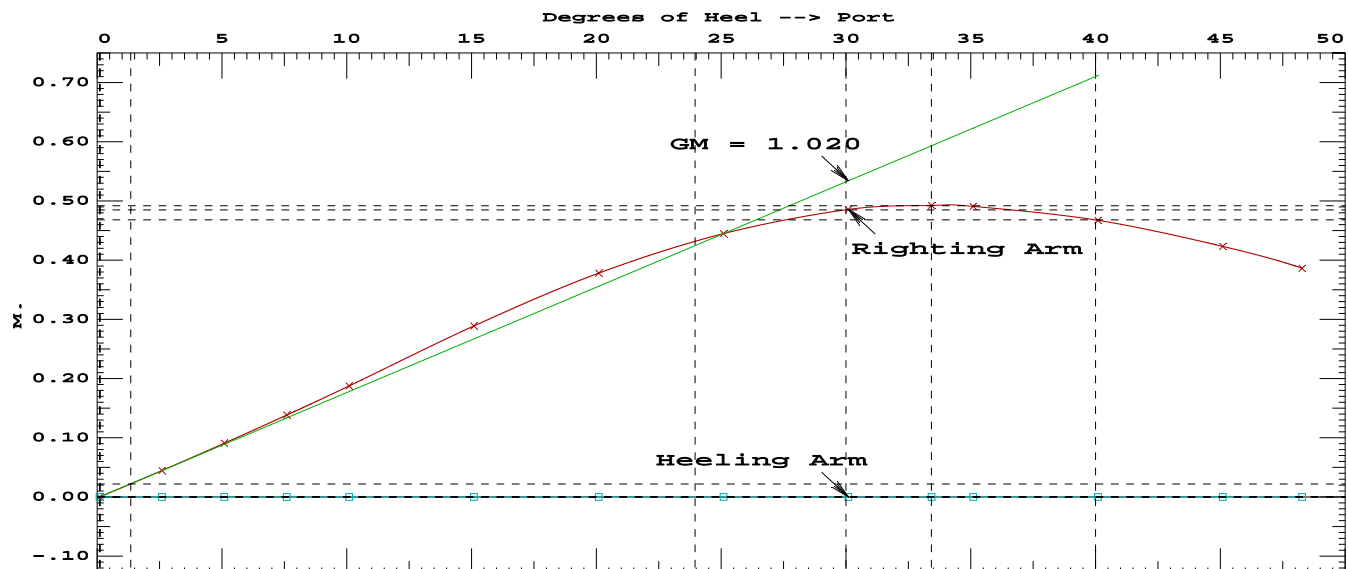
Baseline Draft at Fwd Draft Marks (FR 38.85)	2.190
Baseline Draft at Aft Draft Marks (FR 2.15)	2.266
Baseline Draft at Load Line Mark (FR 20.86)	2.227
Baseline Draft at AP (FR 1)	2.268
Baseline Draft at FP (FR 40.721)	2.186

FREEBOARD STATUS

BASELINE draft: 2.190 @ 38.85f, 2.266 @ 2.15f  
Trim: Aft 0.076/36.700, Heel: Port 0.10 deg.  
Least freeboard is 1.517 m. located at 0.000  
Least extra freeboard (to margin line) is 1.442 m. located at 0.000

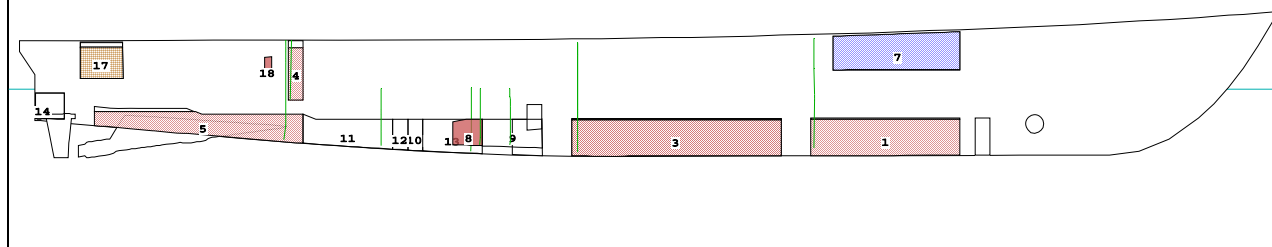
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.137f TCG = 0.003p VCG = 3.171

Origin	Degrees of	Displacement	Residual Arms	Flood Pt			
Depth	Trim	Heel	Weight(MT)	in Trim in Heel	Area	Height	
2.270	0.12a	0.10p	264.04	0.000	0.000	0.0000	2.027(24)
2.268	0.12a	2.60p	264.04	0.000	0.045	0.0010	2.063(24)
2.261	0.12a	5.10p	264.05	0.000	0.091	0.0039	2.096(24)
2.249	0.13a	7.60p	264.04	0.000	0.138	0.0089	2.115(16)
2.232	0.14a	10.10p	264.04	0.000	0.187	0.0160	1.988(16)
2.184	0.17a	15.10p	264.04	0.000	0.289	0.0368	1.728(16)
2.102	0.20a	20.10p	264.04	0.000	0.378	0.0660	1.471(16)
2.004	0.19a	23.95p	264.04	0.000	0.432	0.0933	Dk/MargImm.
1.969	0.18a	25.10p	264.04	0.000	0.445	0.1020	1.223(16)
1.807	0.14a	30.10p	264.04	0.000	0.486	0.1428	0.976(16)
1.699	0.14a	33.43p	264.04	0.000	0.492	0.1713	0.805(16)
1.645	0.14a	35.10p	264.04	0.000	0.491	0.1857	0.718(16)
1.481	0.15a	40.10p	264.04	0.000	0.467	0.2277	0.451(16)
1.313	0.18a	45.10p	264.04	0.000	0.423	0.2667	0.177(16)
1.204	0.20a	48.27p	264.04	0.000	0.386	0.2892	0.000(16)
Distances in METERS.			Specific Gravity = 1.000.		Area in m.-Rad.		
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points			LCP	TCP	VCP		
(16) Med Equip & SAR Lkr Exh			FLOOD	18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh			FLOOD	12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION			Min/Max	Attained		
(1)	Area from 0 deg to 30			>	0.0550	m.-Rad	0.1428 P
(2)	Area from 0 deg to 40 or Flood			>	0.0900	m.-Rad	0.2277 P
(3)	Area from 30 deg to 40 or Flood			>	0.0300	m.-Rad	0.0849 P
(4)	Righting Arm at 30 deg			>	0.200	m.	0.486 P
(5)	Absolute Angle at MaxRA			>	25.00	deg	33.43 P
(6)	GM at 0 deg			>	0.150	m.	1.020 P
Relative angles measured from 0.099							

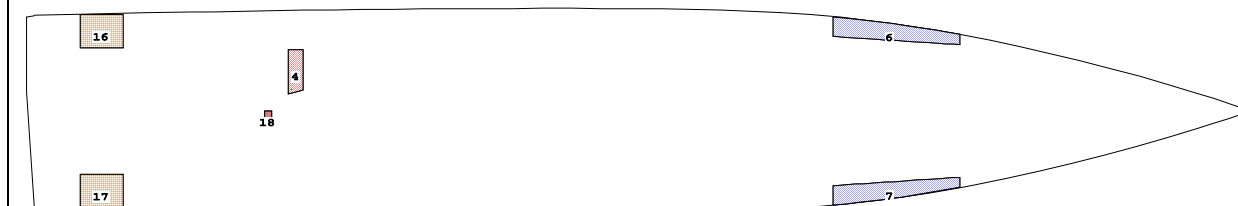


CG - Draft: 2.208 @ 38.850f, 2.289 @ 2.150f Heel: port 0.10 deg.

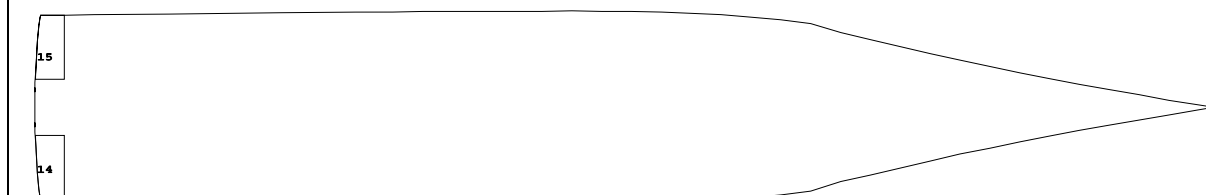
Profile View @ 4.000s and beyond



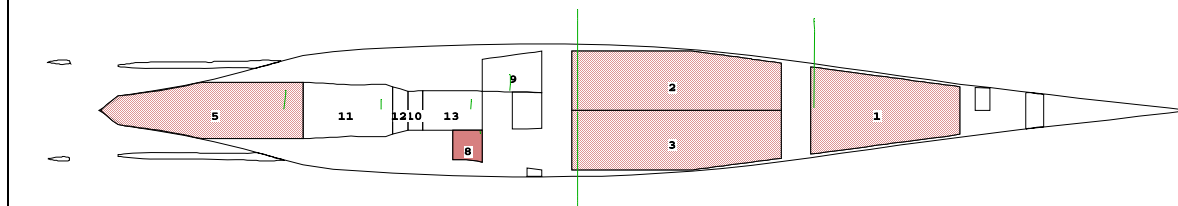
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	



SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
3.91 MT of Misc. Weights	4.50 MT of Additional Weight

WEIGHT STATUS

BASELINE draft: 2.208 @ 38.85f, 2.289 @ 2.15f  
Trim: Aft 0.081/36.700, Heel: Port 0.10 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 100%			1.50	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Additional Weight			4.50	16.069f	0.000	3.145	
Total Fixed			228.71	16.136f	0.003p	3.171	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.950	0.840	7.05	28.259f	0.001p	0.786	4.33
FO-TK2.P	0.950	0.840	8.19	21.354f	0.758p	0.789	3.41
FO-TK3.S	0.950	0.840	8.19	21.354f	0.756s	0.789	3.41
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.312p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.54	5.898f	0.000	1.147	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.744p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.744s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks			39.83	19.926f	0.016p	1.455	13.36
Total Weight			268.54	16.698f	0.005p	2.916	
Free Surface Adjustment						0.050	
Adjusted CG				16.698f	0.004p	2.966	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

HYDROSTATIC PROPERTIES

Trim: Aft 0.081/36.700, Heel: Port 0.10 deg., VCG = 2.916

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.249	268.54	16.695f	1.526	2.11	16.664f	5.41	73.93	0.995
Distances in METERS.		Specific Gravity = 1.000.					Moment in m.-MT.	
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.208 @ 38.85f, 2.867 @ 2.15f

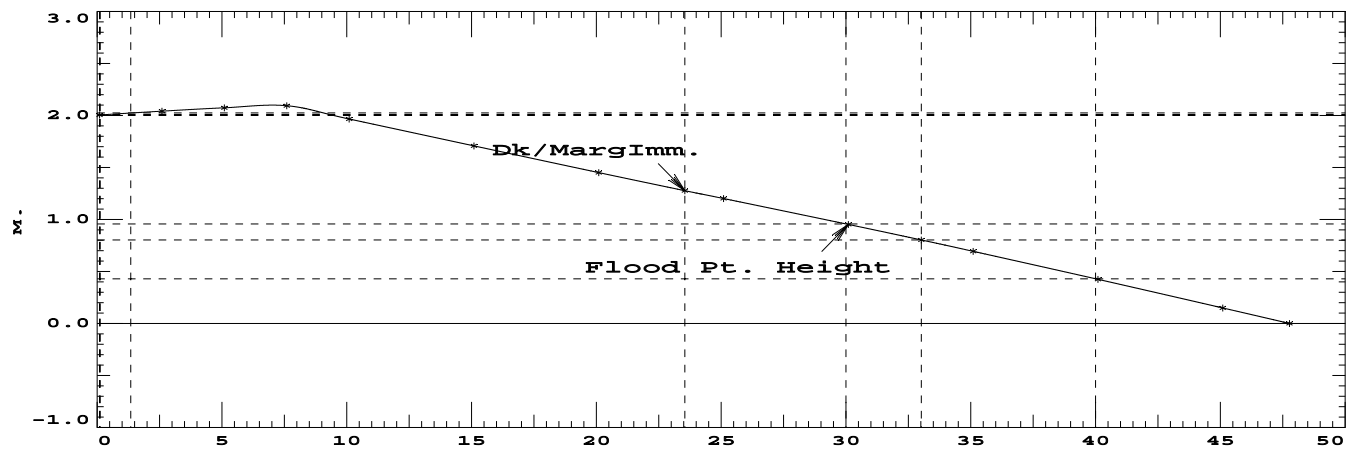
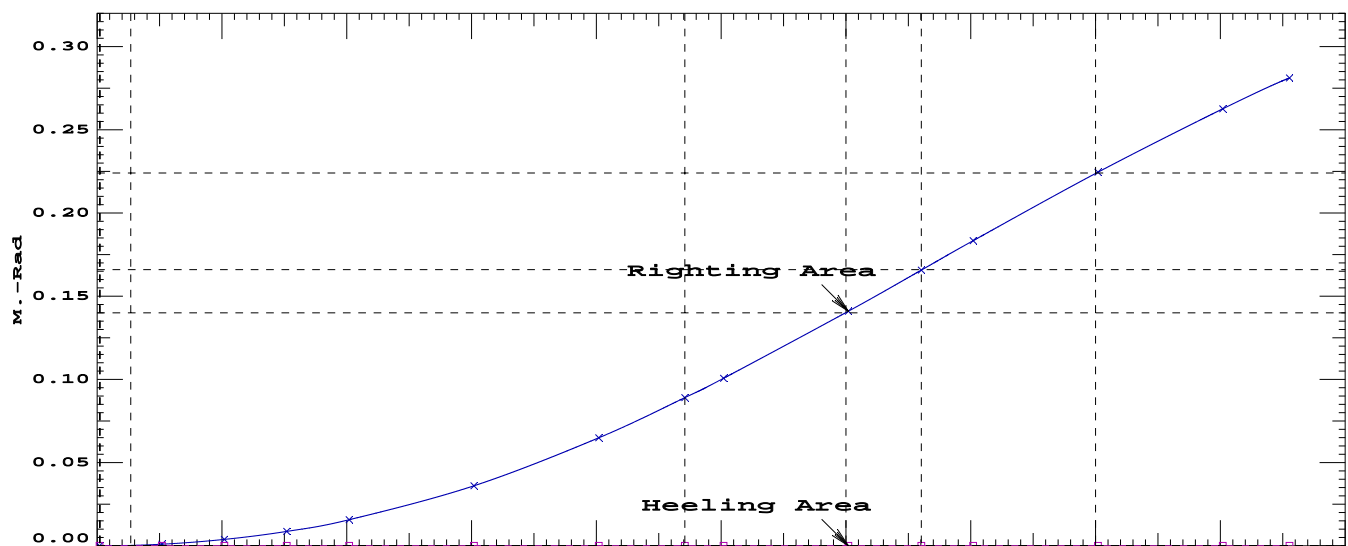
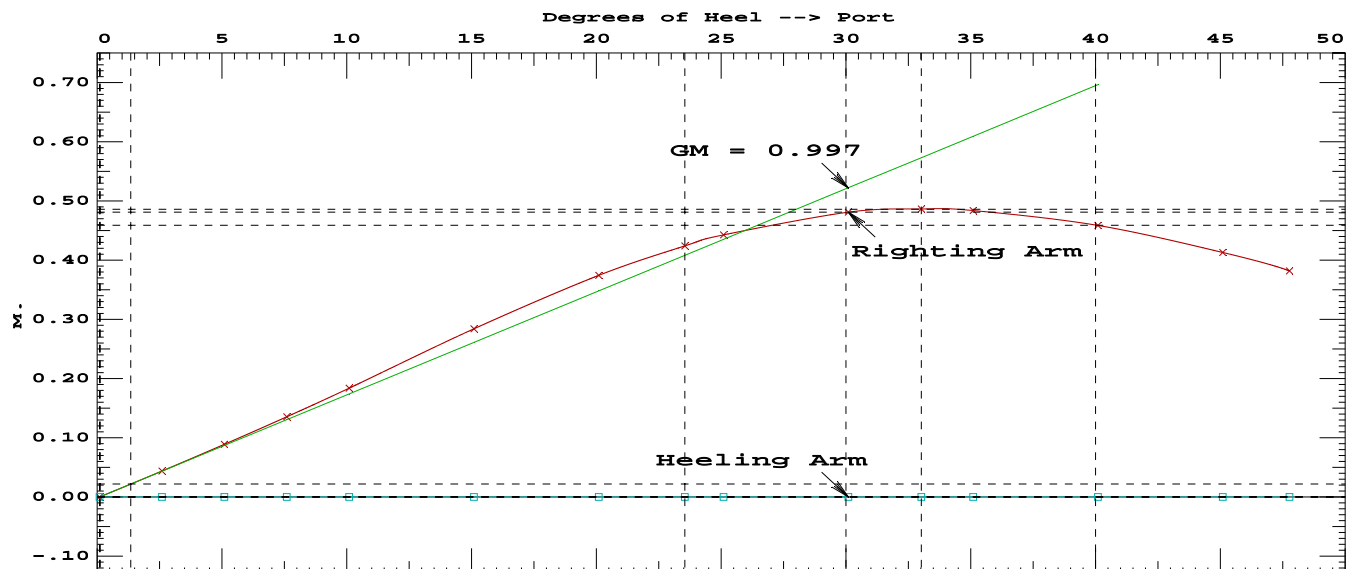
Baseline Draft at Fwd Draft Marks (FR 38.85)	2.208
Baseline Draft at Aft Draft Marks (FR 2.15)	2.289
Baseline Draft at Load Line Mark (FR 20.86)	2.248
Baseline Draft at AP (FR 1)	2.292
Baseline Draft at FP (FR 40.721)	2.204

FREEBOARD STATUS

BASELINE draft: 2.208 @ 38.85f, 2.289 @ 2.15f  
Trim: Aft 0.081/36.700, Heel: Port 0.10 deg.  
Least freeboard is 1.494 m. located at 0.000  
Least extra freeboard (to margin line) is 1.418 m. located at 0.000

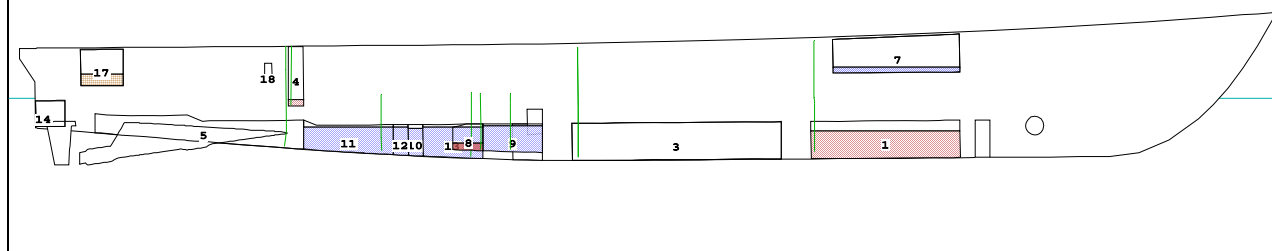
RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.136f TCG = 0.003p VCG = 3.171

Origin	Degrees of	Displacement	Residual Arms	Flood Pt			
Depth	Trim	Heel	Weight(MT)	in Trim in Heel	Area	Height	
2.294	0.13a	0.10p	268.54	0.000	0.000	0.0000	2.005(24)
2.291	0.13a	2.60p	268.54	0.000	0.044	0.0010	2.041(24)
2.284	0.13a	5.10p	268.55	0.000	0.089	0.0038	2.075(24)
2.272	0.14a	7.60p	268.54	0.000	0.136	0.0087	2.094(16)
2.255	0.15a	10.10p	268.54	0.000	0.184	0.0157	1.967(16)
2.207	0.18a	15.10p	268.54	0.000	0.284	0.0361	1.707(16)
2.126	0.21a	20.10p	268.54	0.000	0.374	0.0649	1.450(16)
2.042	0.20a	23.55p	268.54	0.000	0.424	0.0889	Dk/MargImm.
1.995	0.19a	25.10p	268.54	0.000	0.443	0.1007	1.201(16)
1.837	0.16a	30.10p	268.54	0.000	0.481	0.1412	0.952(16)
1.744	0.16a	33.02p	268.54	0.000	0.486	0.1659	0.803(16)
1.678	0.16a	35.10p	268.54	0.000	0.484	0.1835	0.693(16)
1.517	0.19a	40.10p	268.54	0.000	0.459	0.2248	0.425(16)
1.353	0.22a	45.10p	268.54	0.000	0.413	0.2630	0.149(16)
1.263	0.24a	47.77p	268.54	0.000	0.382	0.2815	0.000(16)
Distances in METERS.			Specific Gravity = 1.000.		Area in m.-Rad.		
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh				FLOOD	18.533f	2.680p	4.717
(24) Emerg Generator Comp Exh				FLOOD	12.575f	0.863s	4.270
LIM	STAB 7 CRITERION				Min/Max		Attained
(1)	Area from 0 deg to 30				>	0.0550	m.-Rad 0.1412 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900	m.-Rad 0.2248 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300	m.-Rad 0.0836 P
(4)	Righting Arm at 30 deg				>	0.200	m. 0.481 P
(5)	Absolute Angle at MaxRA				>	25.00	deg 33.02 P
(6)	GM at 0 deg				>	0.150	m. 0.997 P
Relative angles measured from 0.099							

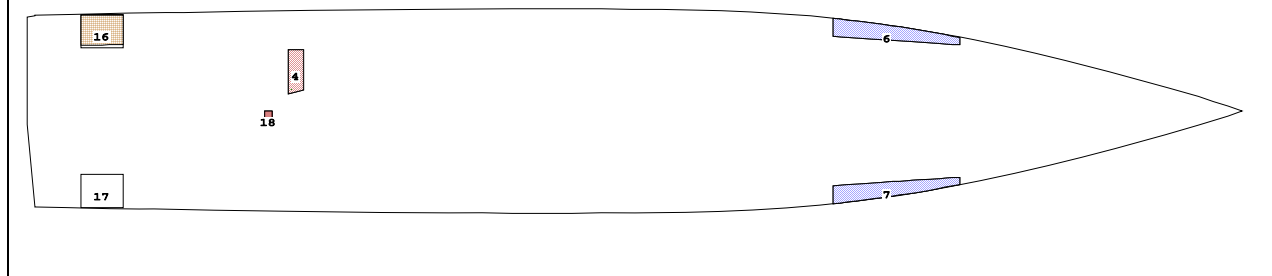


CG - Draft: 1.926 @ 38.850f, 2.218 @ 2.150f Heel: port 0.05 deg.

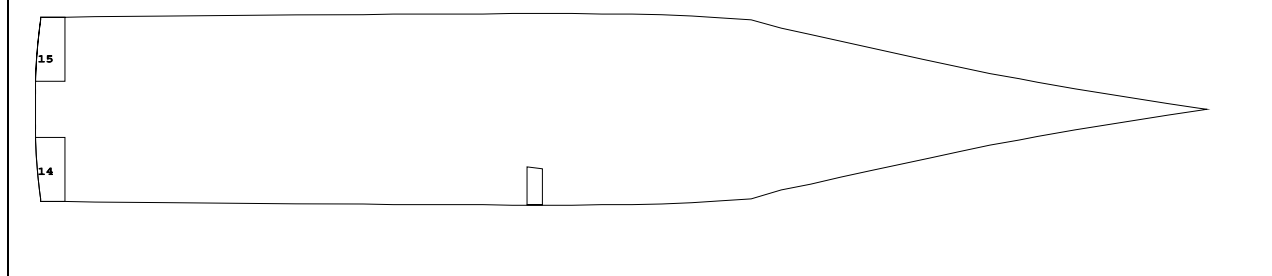
Profile View @ 4.000s and beyond



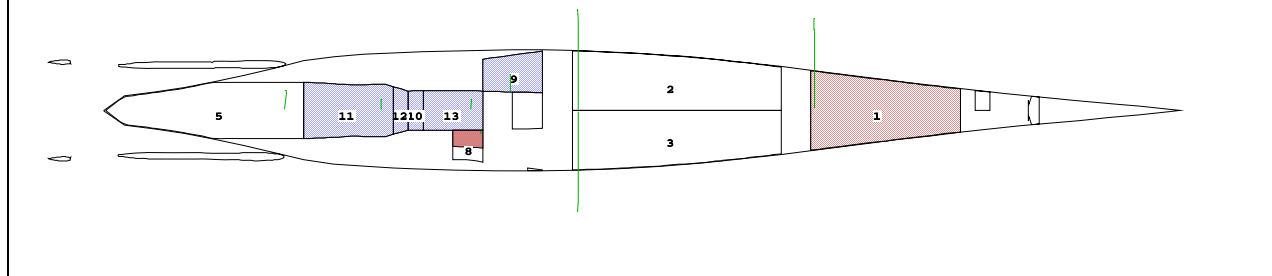
Plan View @ 3.200



Plan View @ 1.800



Plan View @ 1.050



Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
2.56 MT of Misc. Weights	

WEIGHT STATUS

BASELINE draft: 1.926 @ 38.85f, 2.218 @ 2.15f  
Trim: Aft 0.292/36.700, Heel: Port 0.05 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 10%			0.15	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Total Fixed		>	222.86	16.141f	0.006s	3.161	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.570	0.840	4.23	28.236f	0.001p	0.604	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.746f	1.314p	2.026	0.10*
FW-TK11.P	0.100	1.000	0.32	28.531f	2.628p	2.962	0.08*
FW-TK12.S	0.100	1.000	0.32	28.533f	2.627s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.522f	0.854s	0.528	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.036f	1.152p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.000	0.724	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.000	0.834	1.37
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.000	0.759	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.015f	0.000	0.703	0.38*
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.875p	2.898	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.187s	2.685	0.00
Total Tanks		>	13.66	18.071f	0.171p	0.875	6.75
Total Weight		>	236.52	16.252f	0.004p	3.029	
Free Surface Adjustment		>				0.029	
Adjusted CG		>		16.252f	0.004p	3.057	
Distances in METERS.						Moments in m.-MT.	

Distances in METERS.

Moments in m.-MT.

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

HYDROSTATIC PROPERTIES

Trim: Aft 0.292/36.700, Heel: Port 0.05 deg., VCG = 3.029

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.072	236.51	16.240f	1.440	2.06	16.351f	5.12	79.46	1.047
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.926 @ 38.85f, 2.796 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	1.926
Baseline Draft at Aft Draft Marks (FR 2.15)	2.218
Baseline Draft at Load Line Mark (FR 20.86)	2.069
Baseline Draft at AP (FR 1)	2.227
Baseline Draft at FP (FR 40.721)	1.911

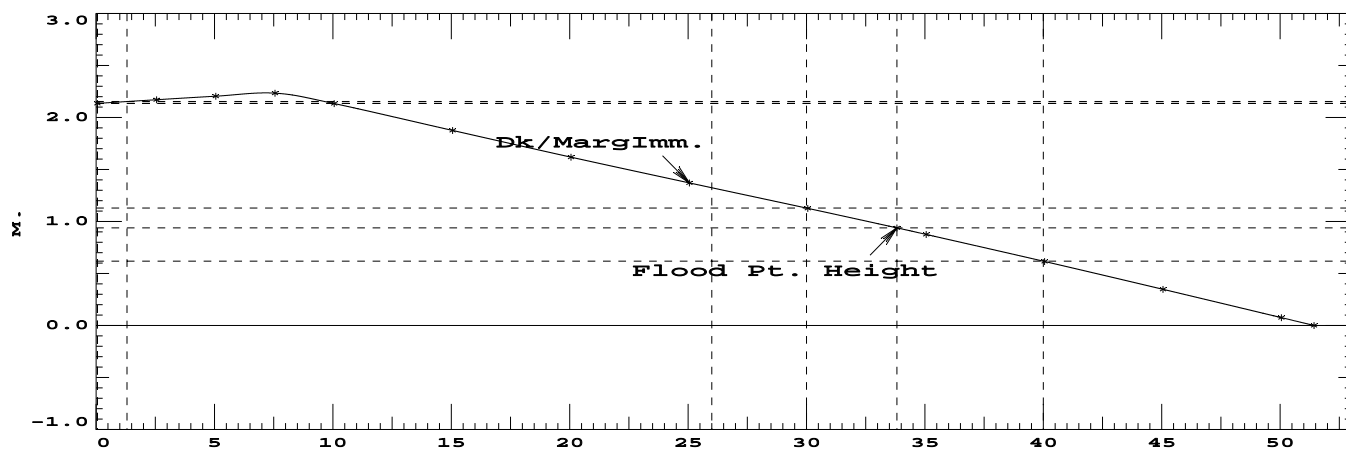
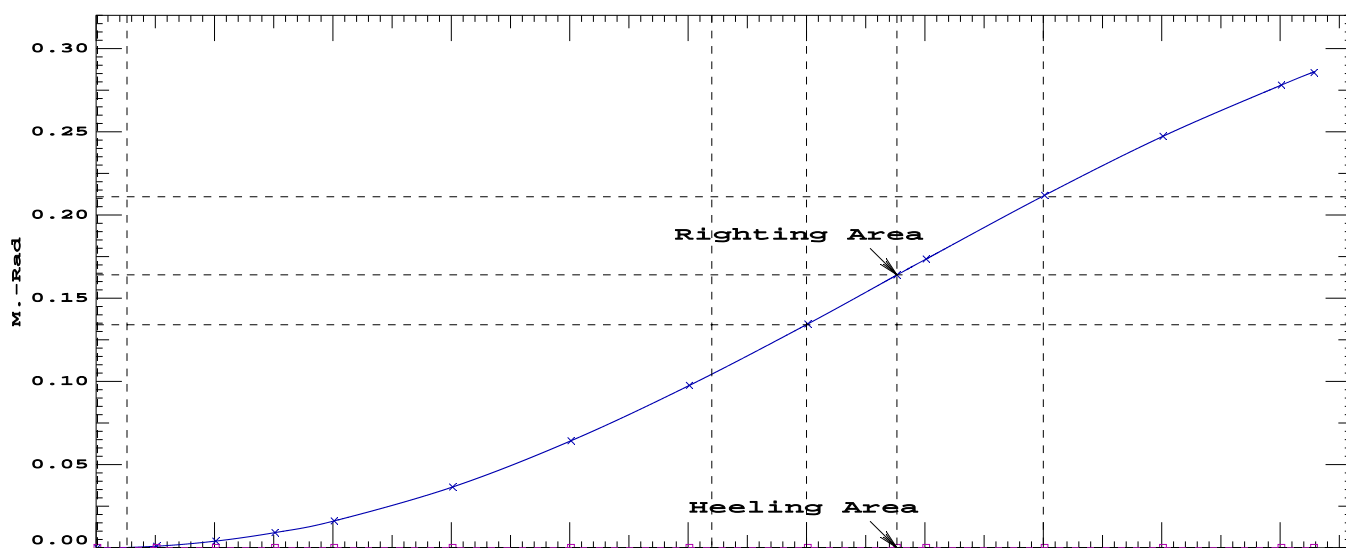
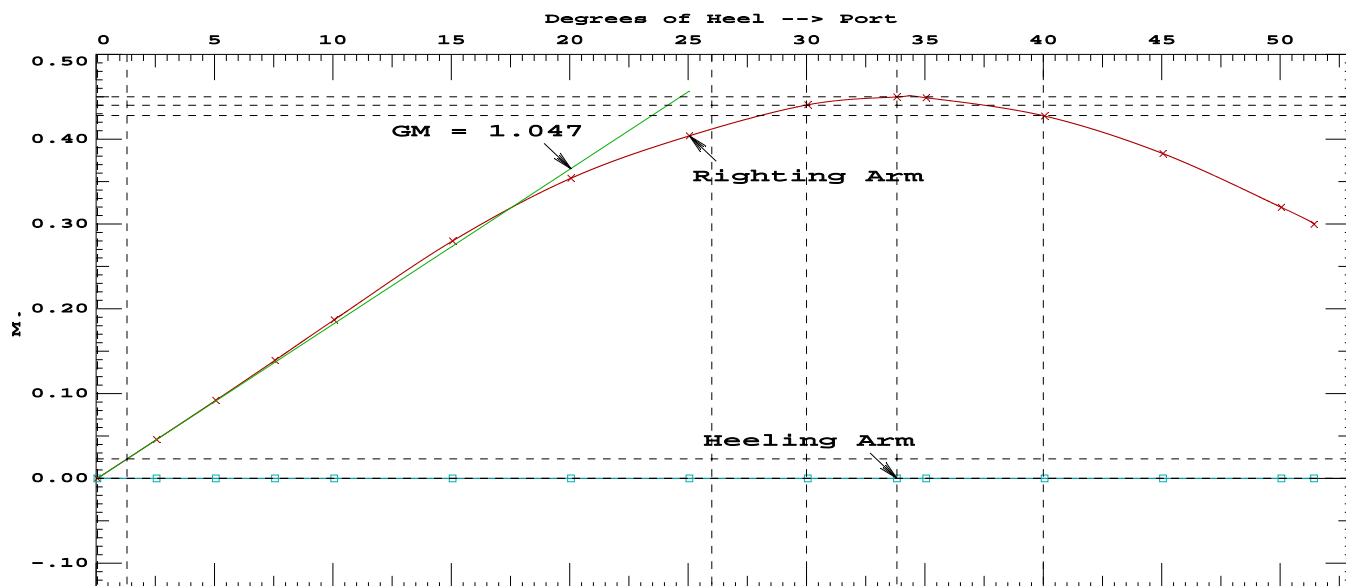
FREEBOARD STATUS

BASELINE draft: 1.926 @ 38.85f, 2.218 @ 2.15f  
Trim: Aft 0.292/36.700, Heel: Port 0.05 deg.  
Least freeboard is 1.552 m. located at 0.500a  
Least extra freeboard (to margin line) is 1.477 m. located at 0.500a

RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.141f TCG = 0.006s VCG = 3.161

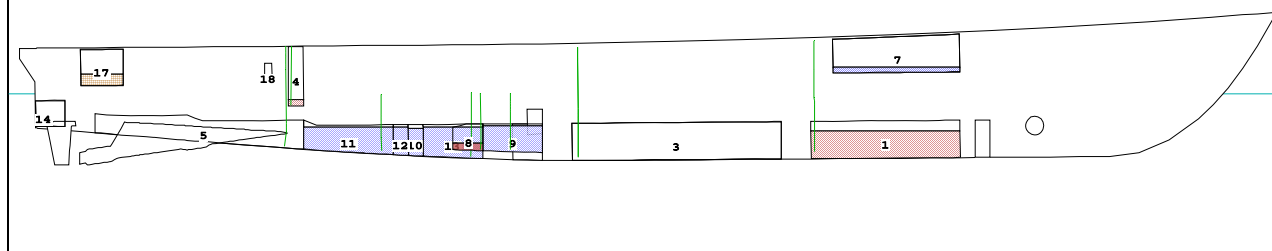
Origin	Degrees of		Displacement	Residual Arms		Flood Pt	
Depth	Trim	Heel	Weight(MT)	in Trim	in Heel	→ Area	Height
2.235	0.46a	0.05p	236.52	0.000	0.000	0.0000	2.135(24)
2.233	0.46a	2.55p	236.52	0.000	0.046	0.0010	2.172(24)
2.226	0.46a	5.05p	236.52	0.000	0.092	0.0040	2.205(24)
2.215	0.47a	7.55p	236.52	0.000	0.139	0.0091	2.234(24)
2.199	0.48a	10.05p	236.52	0.000	0.187	0.0162	2.133(16)
2.151	0.52a	15.05p	236.52	0.000	0.280	0.0365	1.875(16)
2.064	0.53a	20.05p	236.52	0.000	0.354	0.0643	1.619(16)
1.923	0.48a	25.05p	236.52	0.000	0.404	0.0976	1.371(16)
1.892	0.47a	26.00p	236.51	0.000	0.412	0.1043	Dk/MargImm.
1.749	0.42a	30.05p	236.51	0.000	0.441	0.1345	1.126(16)
1.615	0.39a	33.82p	236.52	0.000	0.450	0.1639	0.938(16)
1.571	0.39a	35.05p	236.52	0.000	0.449	0.1735	0.875(16)
1.393	0.38a	40.05p	236.52	0.000	0.427	0.2118	0.615(16)
1.212	0.38a	45.05p	236.52	0.000	0.383	0.2473	0.348(16)
1.023	0.39a	50.05p	236.52	0.000	0.320	0.2781	0.076(16)
0.970	0.39a	51.43p	236.52	0.000	0.300	0.2856	0.000(16)
Distances in METERS. Specific Gravity = 1.000. Area in m.-Rad.							
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh FLOOD				18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh FLOOD				12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION				Min/Max	Attained	
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1345 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2118 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0772 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.441 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	33.82 P
(6)	GM at 0 deg				>	0.150 m.	1.049 P
Relative angles measured from 0.054							



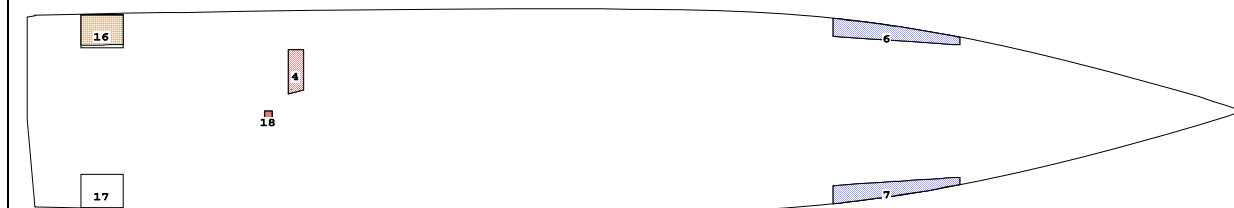


CG - Draft: 2.083 @ 38.850f, 2.375 @ 2.150f Heel: port 0.09 deg.

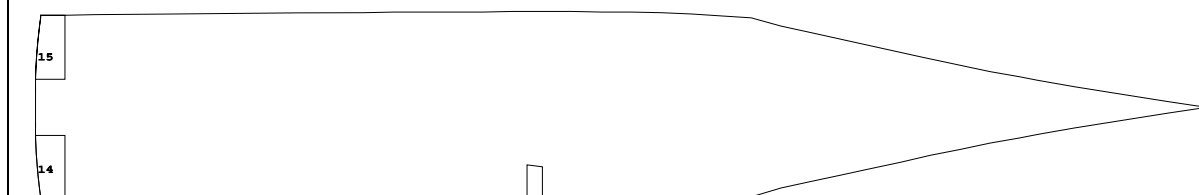
## Profile View @ 4.000s and beyond



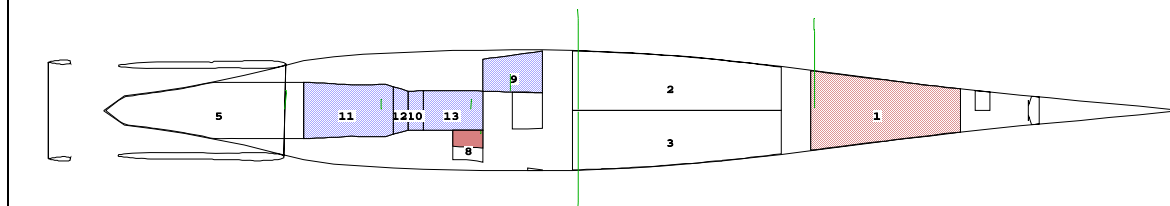
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
2.56 MT of Misc. Weights	32.65 MT of Ice Accretion iaw S

WEIGHT STATUS

BASELINE draft: 2.083 @ 38.85f, 2.375 @ 2.15f  
Trim: Aft 0.292/36.700, Heel: Port 0.09 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 10%			0.15	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
Ice Accretion iaw STAB 7			32.65	16.475f	0.000	5.618	
Total Fixed		>	255.52	16.184f	0.005s	3.475	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.570	0.840	4.23	28.236f	0.002p	0.604	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.746f	1.315p	2.026	0.10*
FW-TK11.P	0.100	1.000	0.32	28.531f	2.628p	2.962	0.08*
FW-TK12.S	0.100	1.000	0.32	28.533f	2.627s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.522f	0.853s	0.528	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.036f	1.152p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.000	0.724	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.001	0.834	1.37
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.000	0.759	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.015f	0.000	0.703	0.38*
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.875p	2.898	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.187s	2.685	0.00
Total Tanks		>	13.66	18.071f	0.171p	0.875	6.75
Total Weight		>	269.17	16.279f	0.004p	3.343	
Free Surface Adjustment		>				0.025	
Adjusted CG		>		16.279f	0.004p	3.368	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.292/36.700, Heel: Port 0.09 deg., VCG = 3.343

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.229	269.18	16.265f	1.530	2.10	16.536f	5.29	72.16	0.582
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.083 @ 38.85f, 2.953 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	2.083
Baseline Draft at Aft Draft Marks (FR 2.15)	2.375
Baseline Draft at Load Line Mark (FR 20.86)	2.227
Baseline Draft at AP (FR 1)	2.384
Baseline Draft at FP (FR 40.721)	2.069

## FREEBOARD STATUS

BASELINE draft: 2.083 @ 38.85f, 2.375 @ 2.15f

Trim: Aft 0.292/36.700, Heel: Port 0.09 deg.

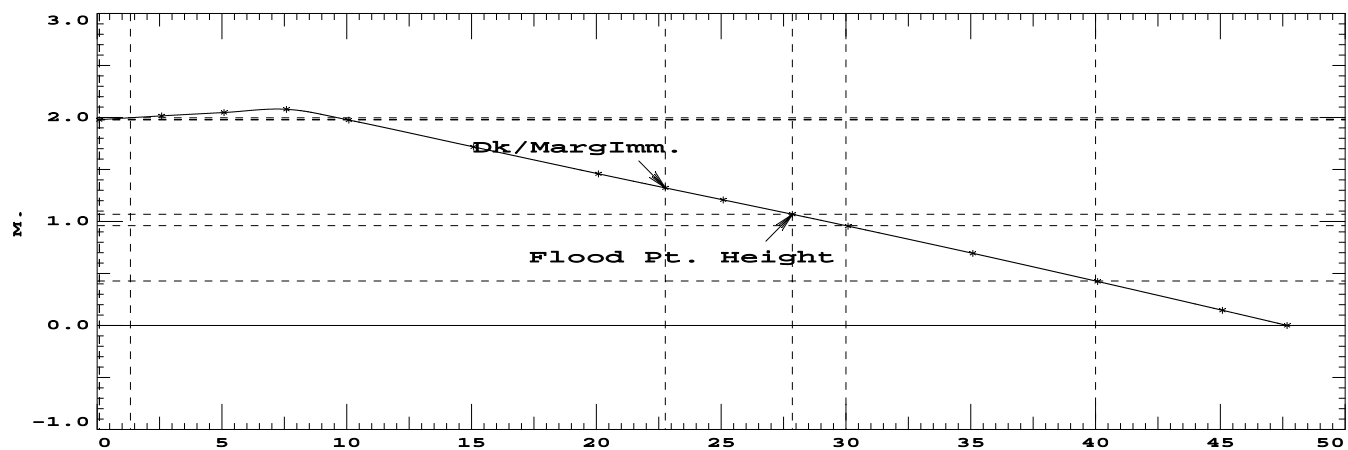
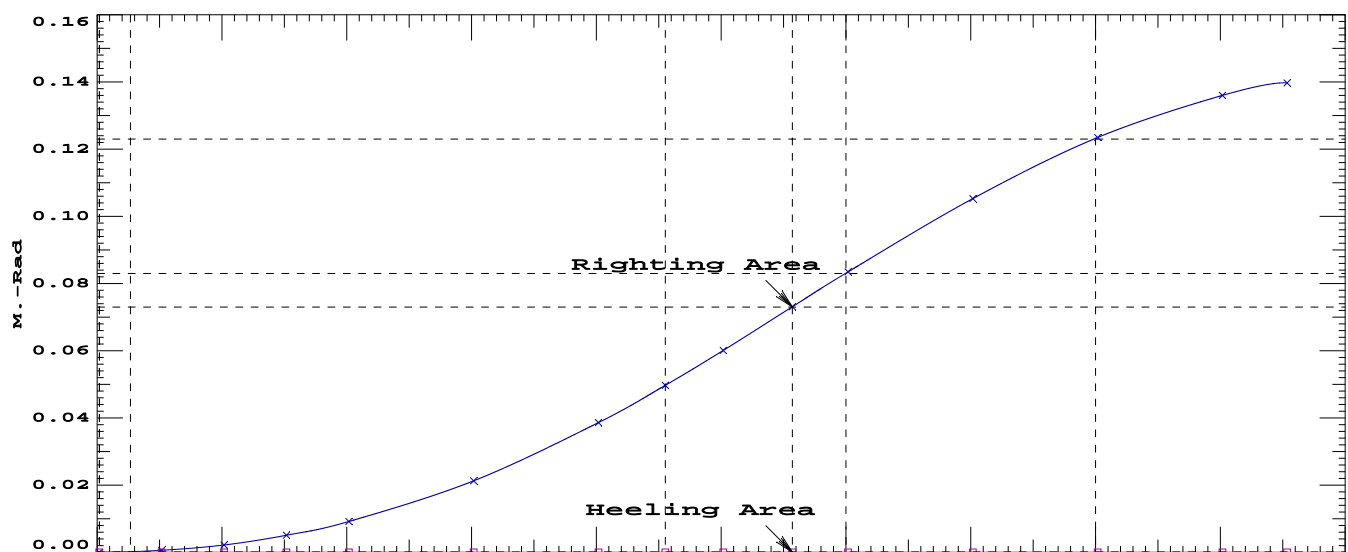
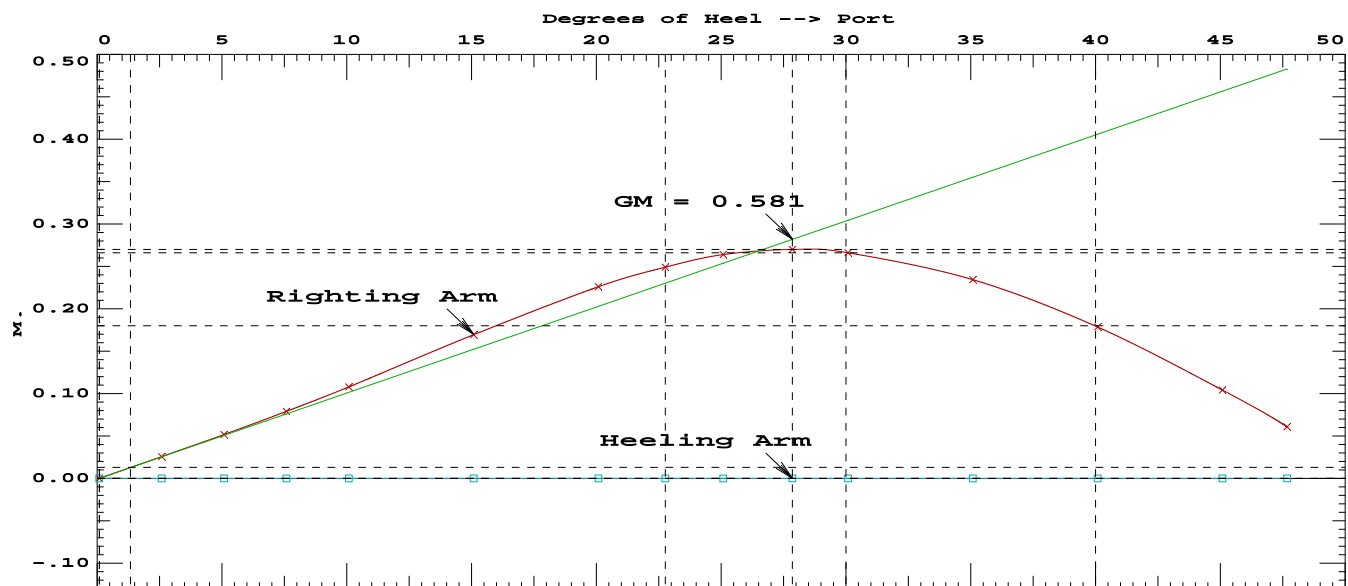
Least freeboard is 1.393 m. located at 0.500a

Least extra freeboard (to margin line) is 1.318 m. located at 0.500a

## RESIDUAL RIGHTING ARMS vs HEEL ANGLE

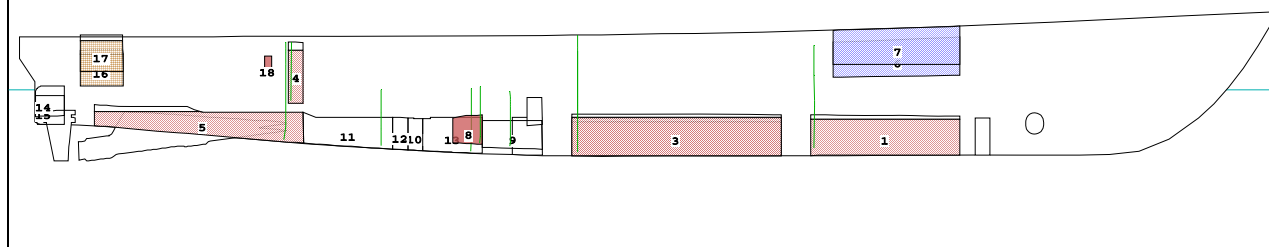
Fixed CG: LCG = 16.184f TCG = 0.005s VCG = 3.475

Origin	Degrees of	Displacement	Residual Arms	Flood Pt			
Depth	Trim	Heel	Weight(MT)	in Trim in Heel	Area	Height	
2.392	0.46a	0.09p	269.18	0.000	0.000	0.0000	1.979(24)
2.390	0.46a	2.59p	269.17	0.000	0.026	0.0006	2.015(24)
2.382	0.46a	5.09p	269.17	0.000	0.052	0.0022	2.048(24)
2.370	0.47a	7.59p	269.17	0.000	0.079	0.0051	2.079(24)
2.352	0.47a	10.09p	269.17	0.000	0.108	0.0092	1.976(16)
2.301	0.50a	15.09p	269.17	0.000	0.170	0.0212	1.717(16)
2.222	0.53a	20.09p	269.17	0.000	0.226	0.0385	1.459(16)
2.161	0.53a	22.76p	269.17	0.000	0.249	0.0497	Dk/MargImm.
2.098	0.52a	25.09p	269.17	0.000	0.264	0.0601	1.207(16)
2.015	0.51a	27.86p	269.17	0.000	0.270	0.0730	1.069(16)
1.947	0.51a	30.09p	269.17	0.000	0.266	0.0834	0.956(16)
1.795	0.53a	35.09p	269.17	0.000	0.234	0.1054	0.694(16)
1.641	0.56a	40.09p	269.17	0.000	0.178	0.1236	0.424(16)
1.482	0.60a	45.09p	269.17	0.000	0.104	0.1361	0.146(16)
1.398	0.63a	47.67p	269.17	0.000	0.061	0.1398	0.000(16)
Distances in METERS.			Specific Gravity = 1.000.		Area in m.-Rad.		
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT):							
Stbd heeling moment = 0.00							
Critical Points			LCP	TCP	VCP		
(16) Med Equip & SAR Lkr Exh			FLOOD	18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh			FLOOD	12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION			Min/Max		Attained	
(1)	Area from 0 deg to 30			>	0.0550	m.-Rad	0.0834 P
(2)	Area from 0 deg to 40 or Flood			>	0.0900	m.-Rad	0.1236 P
(3)	Area from 30 deg to 40 or Flood			>	0.0300	m.-Rad	0.0402 P
(4)	Righting Arm at 30 deg			>	0.200	m.	0.266 P
(5)	Absolute Angle at MaxRA			>	25.00	deg	27.86 P
(6)	GM at 0 deg			>	0.150	m.	0.581 P
Relative angles measured from 0.086							

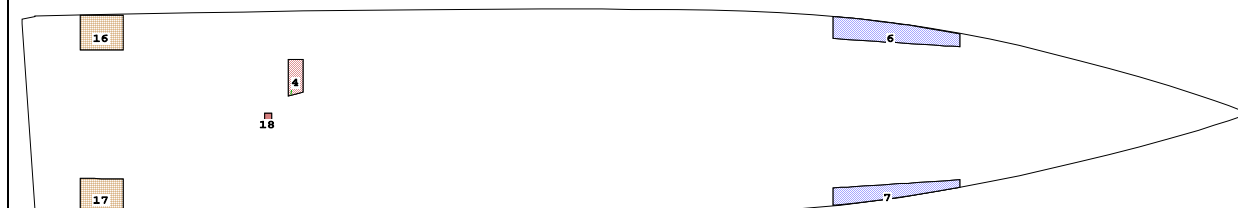


CG - Draft: 2.181 @ 38.850f, 2.269 @ 2.150f Heel: port 4.44 deg.

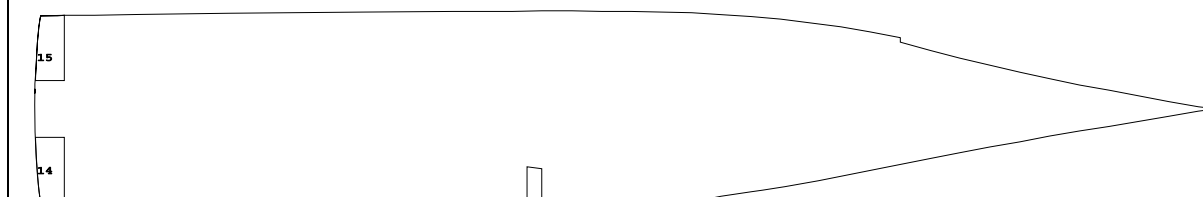
## Profile View @ 4.000s and beyond



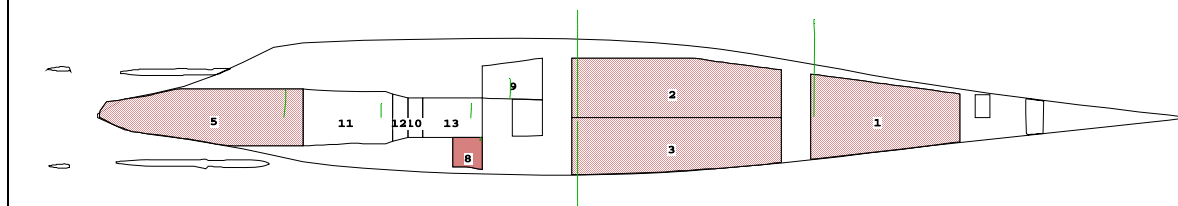
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
1.50 MT of Stores @ 100%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-0.00 MT of RHIB	-3.62 MT of Crane Inboard
3.62 MT of Crane Outboard	

WEIGHT STATUS

BASELINE draft: 2.181 @ 38.85f, 2.269 @ 2.15f  
Trim: Aft 0.087/36.700, Heel: Port 4.44 deg.

Part	Weight(MT)	LCG	TCG	VCG			
LIGHT SHIP	220.30	16.069f	0.009s	3.145			
Stores @ 100%	1.50	15.500f	1.450p	4.900			
Crew & Equipment	1.80	24.800f	0.300p	4.270			
Emergency Gen FO @ 95%	0.31	15.580f	0.610s	5.600			
SAR Equipment - GFE	0.30	17.952f	0.150p	4.710			
RHIB (PS) Inboard	-2.46	4.655f	1.975p	5.750			
RHIB Payload Inboard	-0.50	24.800f	0.300p	4.270			
Crane Inboard	-3.62	7.700f	0.000	7.070			
RHIB (PS) Outboard	2.46	6.430f	5.950p	5.910			
RHIB Payload Outboard	0.50	6.430f	5.950p	5.910			
Crane Outboard	3.62	7.700f	2.230p	7.070			
Total Fixed	224.21	16.116f	0.095p	3.177			
Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM	
FO-TK1.C	0.950	0.840	7.05	28.267f	0.034p	0.787	4.33*
FO-TK2.P	0.950	0.840	8.19	21.351f	0.783p	0.790	3.41*
FO-TK3.S	0.950	0.840	8.19	21.366f	0.731s	0.790	3.41*
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.316p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.55	5.896f	0.019p	1.148	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.746p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.743s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks			39.83	19.929f	0.035p	1.456	13.36
Total Weight			264.05	16.691f	0.086p	2.917	
Free Surface Adjustment						0.051	
Adjusted CG				16.691f	0.082p	2.968	
Distances in METERS.				Moments in m.-MT.			

Distances in METERS.

Moments in m.-MT.

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.



## HYDROSTATIC PROPERTIES

Trim: Aft 0.087/36.700, Heel: Port 4.44 deg., VCG = 2.917

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.225	264.05	16.688f	1.521	2.11	16.632f	5.40	75.09	1.037
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.181 @ 38.85f, 2.847 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85) 2.181  
 Baseline Draft at Aft Draft Marks (FR 2.15) 2.269  
 Baseline Draft at Load Line Mark (FR 20.86) 2.224  
 Baseline Draft at AP (FR 1) 2.271  
 Baseline Draft at FP (FR 40.721) 2.176

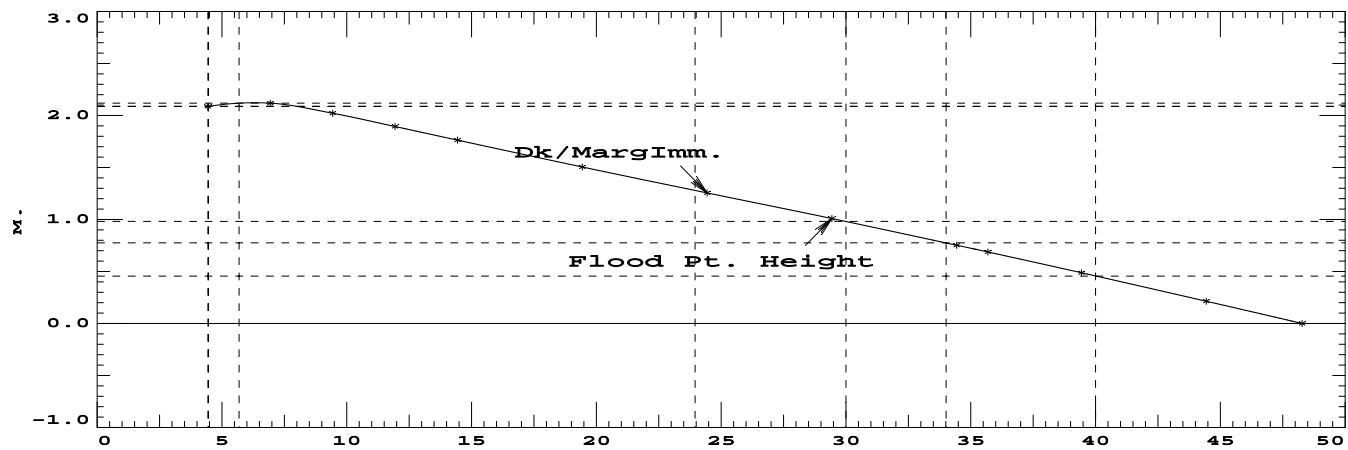
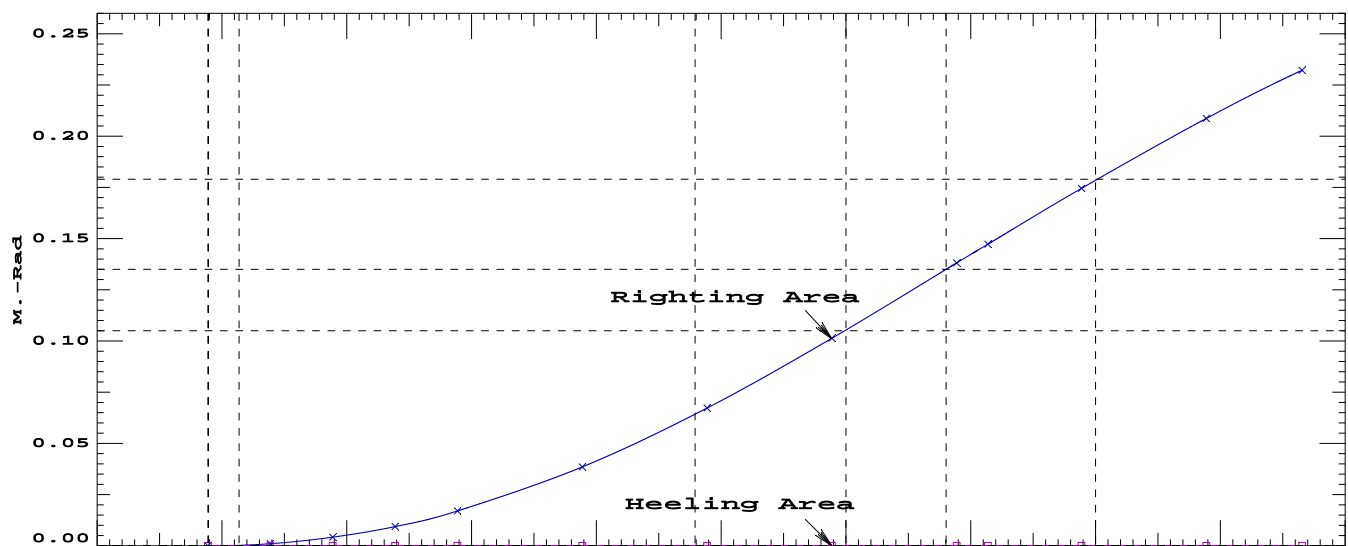
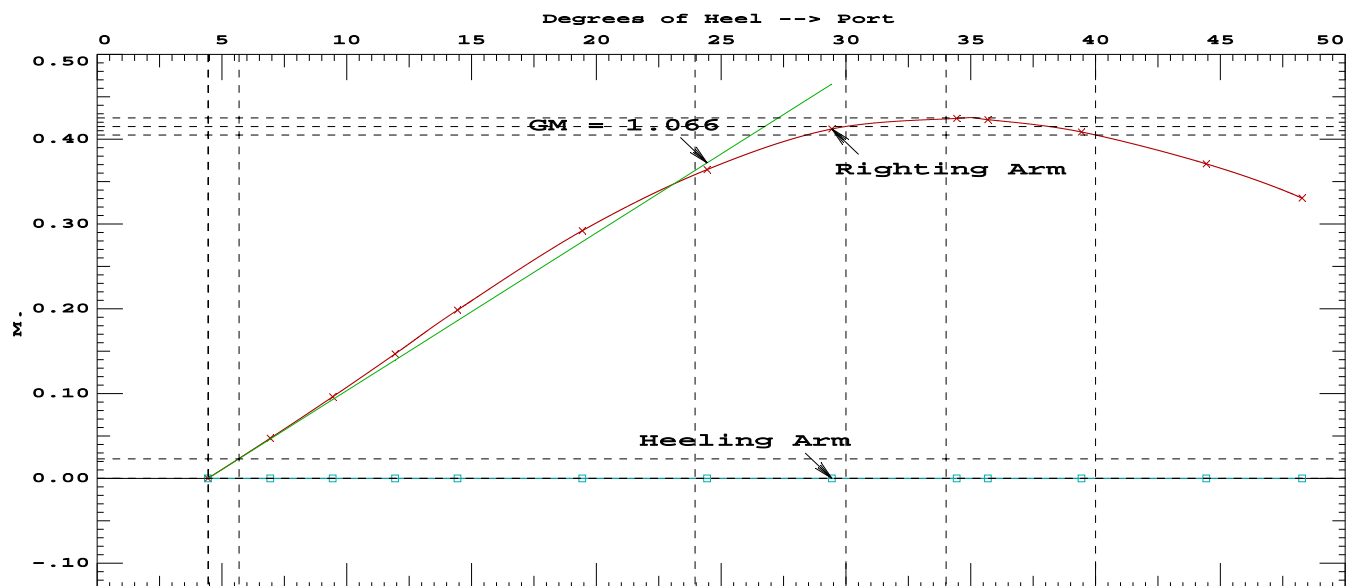
## FREEBOARD STATUS

BASELINE draft: 2.181 @ 38.85f, 2.269 @ 2.15f  
 Trim: Aft 0.087/36.700, Heel: Port 4.44 deg.  
 Least freeboard is 1.259 m. located at 10.000f  
 Least extra freeboard (to margin line) is 1.183 m. located at 10.000f

## RESIDUAL RIGHTING ARMS vs HEEL ANGLE

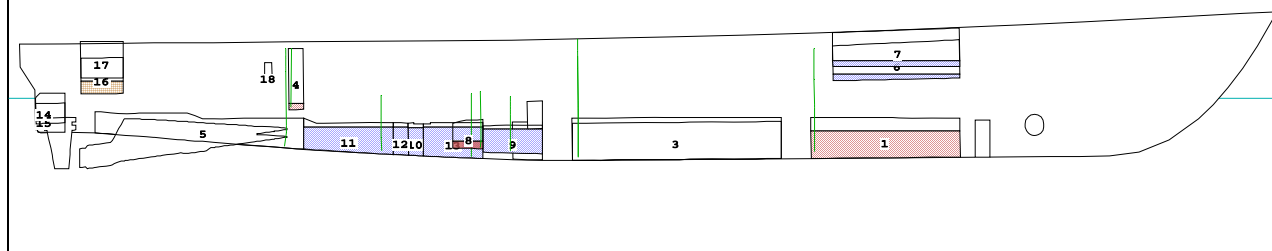
Fixed CG: LCG = 16.116f TCG = 0.095p VCG = 3.177

Origin	Degrees of	Displacement	Residual Arms	Flood Pt			
Depth	Trim	Heel	Weight(MT)	in Trim in Heel	Area	Height	
2.267	0.14a	4.44p	264.05	0.000	0.000	0.0000	2.087(24)
2.256	0.14a	6.94p	264.04	0.000	0.047	0.0010	2.118(24)
2.241	0.15a	9.44p	264.04	0.000	0.096	0.0042	2.022(16)
2.221	0.16a	11.94p	264.04	0.000	0.147	0.0094	1.893(16)
2.196	0.18a	14.44p	264.04	0.000	0.198	0.0170	1.763(16)
2.120	0.21a	19.44p	264.04	0.000	0.292	0.0384	1.505(16)
2.008	0.20a	23.96p	264.04	0.000	0.358	0.0642	Dk/MargImm.
1.994	0.20a	24.44p	264.04	0.000	0.364	0.0672	1.255(16)
1.833	0.16a	29.44p	264.04	0.000	0.412	0.1012	1.009(16)
1.671	0.15a	34.44p	264.04	0.000	0.425	0.1380	0.753(16)
1.630	0.15a	35.69p	264.04	0.000	0.423	0.1472	0.687(16)
1.508	0.17a	39.44p	264.04	0.000	0.408	0.1745	0.487(16)
1.341	0.19a	44.44p	264.04	0.000	0.371	0.2087	0.213(16)
1.209	0.22a	48.27p	264.04	0.000	0.331	0.2323	0.000(16)
Distances in METERS.				Specific Gravity = 1.000.		Area in m.-Rad.	
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(16) Med Equip & SAR Lkr Exh FLOOD				18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh FLOOD				12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION				Min/Max		Attained
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1380 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2087 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0707 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.425 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	34.44 P
(6)	GM at 0 deg				>	0.150 m.	1.015 P
Relative angles measured from 4.436p							

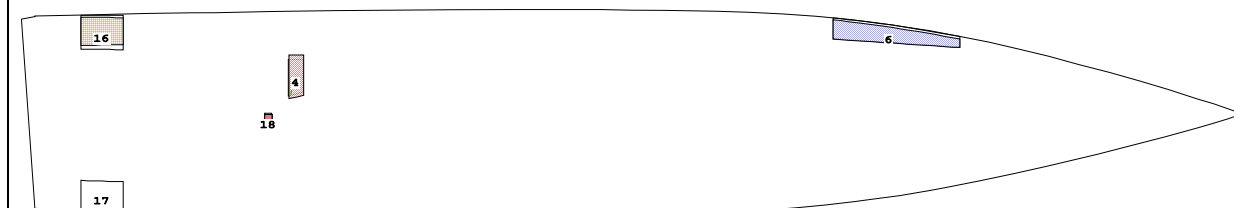


CG - Draft: 1.916 @ 38.850f, 2.221 @ 2.150f Heel: port 4.81 deg.

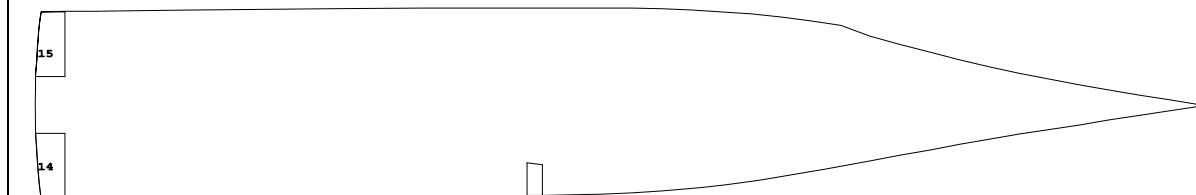
## Profile View @ 4.000s and beyond



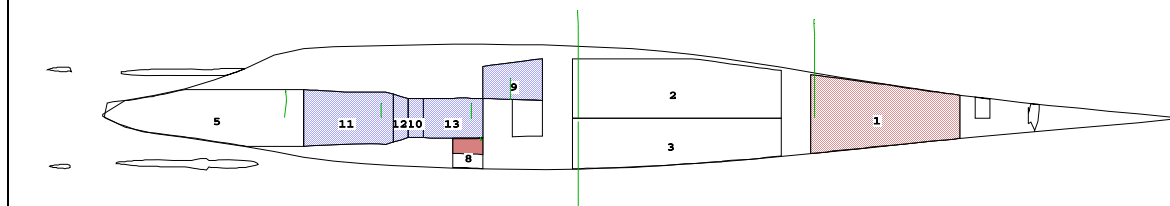
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....0% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C...90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
0.0 Cu.M. (0%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
0.15 MT of Stores @ 10%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-0.00 MT of RHIB	-3.62 MT of Crane Inboard
3.62 MT of Crane Outboard	

WEIGHT STATUS

BASELINE draft: 1.916 @ 38.85f, 2.221 @ 2.15f  
Trim: Aft 0.304/36.700, Heel: Port 4.81 deg.

Part	Weight(MT)	LCG	TCG	VCG			
LIGHT SHIP	220.30	16.069f	0.009s	3.145			
Stores @ 10%	0.15	15.500f	1.450p	4.900			
Crew & Equipment	1.80	24.800f	0.300p	4.270			
Emergency Gen FO @ 95%	0.31	15.580f	0.610s	5.600			
SAR Equipment - GFE	0.30	17.952f	0.150p	4.710			
RHIB (PS) Inboard	-2.46	4.655f	1.975p	5.750			
RHIB Payload Inboard	-0.50	24.800f	0.300p	4.270			
Crane Inboard	-3.62	7.700f	0.000	7.070			
RHIB (PS) Outboard	2.46	6.430f	5.950p	5.910			
RHIB Payload Outboard	0.50	6.430f	5.950p	5.910			
Crane Outboard	3.62	7.700f	2.230p	7.070			
Total Fixed	222.86	16.119f	0.087p	3.166			
Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM	
FO-TK1.C	0.570	0.840	4.23	28.232f	0.079p	0.607	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.747f	1.390p	2.029	0.10*
FW-TK11.P	0.100	1.000	0.32	28.449f	2.648p	2.964	0.08*
FW-TK12.S	0.100	1.000	0.32	28.606f	2.608s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.521f	0.837s	0.529	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.038f	1.170p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.013p	0.725	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.032p	0.835	1.37*
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.019p	0.760	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.016f	0.013p	0.704	0.38*
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.907p	2.899	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.173s	2.686	0.00
Total Tanks			13.66	18.071f	0.211p	0.876	6.75
Total Weight			236.52	16.232f	0.094p	3.034	
Free Surface Adjustment						0.029	
Adjusted CG				16.232f	0.091p	3.062	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.304/36.700, Heel: Port 4.81 deg., VCG = 3.034

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.068	236.52	16.219f	1.449	2.06	16.328f	5.12	79.50	1.066
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
					Trim is per 36.70m.			
Draft is from BASELINE.					Formal Free Surface included.			

Note: GMT includes the formal free surface moment 6.8 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.916 @ 38.85f, 2.799 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	1.916
Baseline Draft at Aft Draft Marks (FR 2.15)	2.221
Baseline Draft at Load Line Mark (FR 20.86)	2.065
Baseline Draft at AP (FR 1)	2.231
Baseline Draft at FP (FR 40.721)	1.900

## FREEBOARD STATUS

BASELINE draft: 1.916 @ 38.85f, 2.221 @ 2.15f

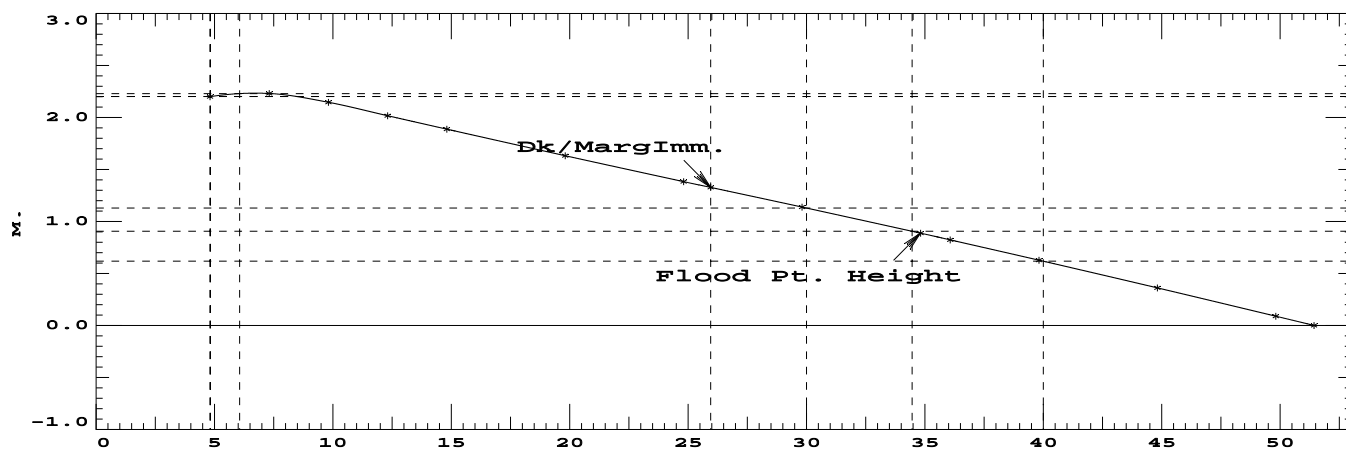
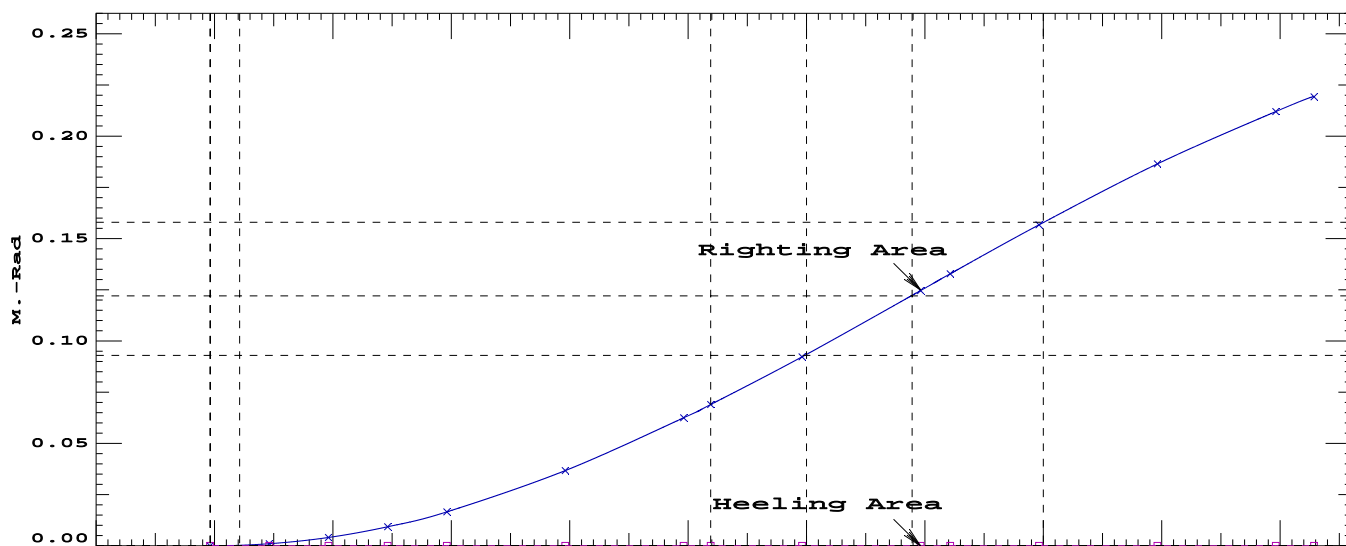
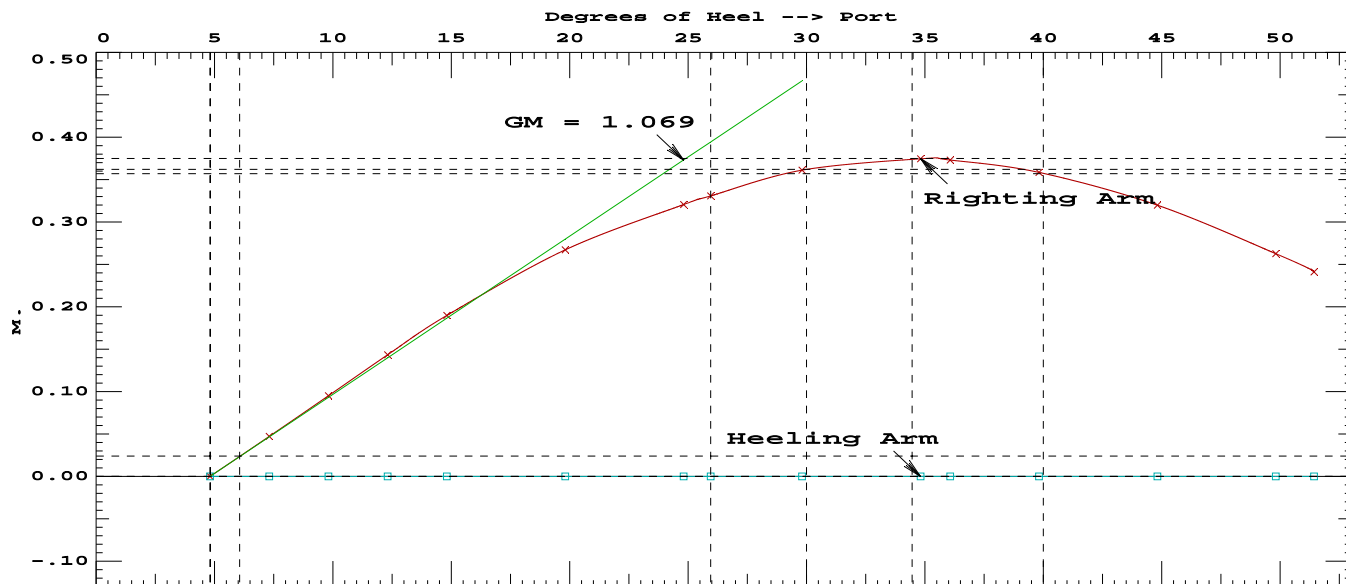
Trim: Aft 0.304/36.700, Heel: Port 4.81 deg.

Least freeboard is 1.274 m. located at 0.500a

Least extra freeboard (to margin line) is 1.198 m. located at 0.500a

RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.119f TCG = 0.087p VCG = 3.166

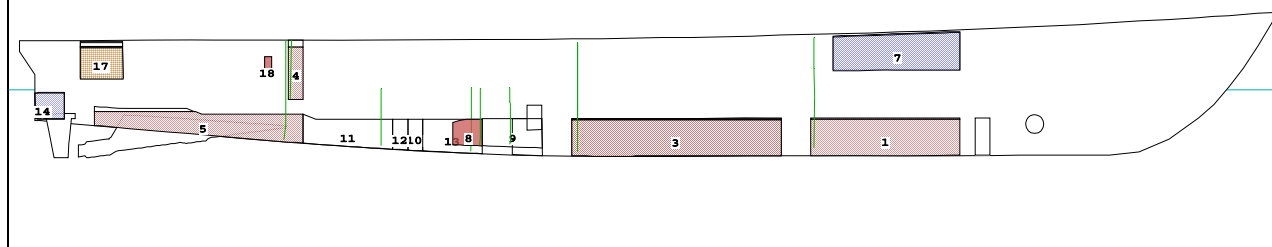
Origin	Degrees of	Displacement	Residual Arms	Flood Pt			
Depth	Trim	Heel	Weight(MT)	in Trim in Heel	Area	Height	
2.231	0.48a	4.81p	236.52	0.000	0.000	0.0000	2.201(24)
2.220	0.48a	7.31p	236.52	0.000	0.047	0.0010	2.231(24)
2.204	0.49a	9.81p	236.52	0.000	0.095	0.0041	2.146(16)
2.184	0.51a	12.31p	236.52	0.000	0.143	0.0093	2.017(16)
2.158	0.53a	14.81p	236.52	0.000	0.190	0.0166	1.888(16)
2.073	0.54a	19.81p	236.52	0.000	0.267	0.0366	1.632(16)
1.935	0.50a	24.81p	236.52	0.000	0.321	0.0624	1.383(16)
1.898	0.48a	25.95p	236.51	0.000	0.331	0.0689	Dk/MargImm.
1.762	0.43a	29.81p	236.51	0.000	0.361	0.0923	1.139(16)
1.585	0.40a	34.81p	236.52	0.000	0.375	0.1245	0.888(16)
1.540	0.40a	36.06p	236.52	0.000	0.373	0.1327	0.824(16)
1.407	0.39a	39.81p	236.52	0.000	0.359	0.1567	0.628(16)
1.226	0.40a	44.81p	236.52	0.000	0.320	0.1865	0.361(16)
1.038	0.40a	49.81p	236.52	0.000	0.263	0.2121	0.089(16)
0.975	0.40a	51.43p	236.52	0.000	0.241	0.2192	0.000(16)
Distances in METERS.			Specific Gravity = 1.000.		Area in m.-Rad.		
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points			LCP	TCP	VCP		
(16) Med Equip & SAR Lkr Exh			FLOOD	18.533f	2.680p	4.717	
(24) Emerg Generator Comp Exh			FLOOD	12.575f	0.863s	4.270	
LIM	STAB 7 CRITERION			Min/Max	Attained		
(1)	Area from 0 deg to 30			>	0.0550	m.-Rad	0.1245 P
(2)	Area from 0 deg to 40 or Flood			>	0.0900	m.-Rad	0.1865 P
(3)	Area from 30 deg to 40 or Flood			>	0.0300	m.-Rad	0.0620 P
(4)	Righting Arm at 30 deg			>	0.200	m.	0.375 P
(5)	Absolute Angle at MaxRA			>	25.00	deg	34.81 P
(6)	GM at 0 deg			>	0.150	m.	1.039 P
Relative angles measured from 4.814p							



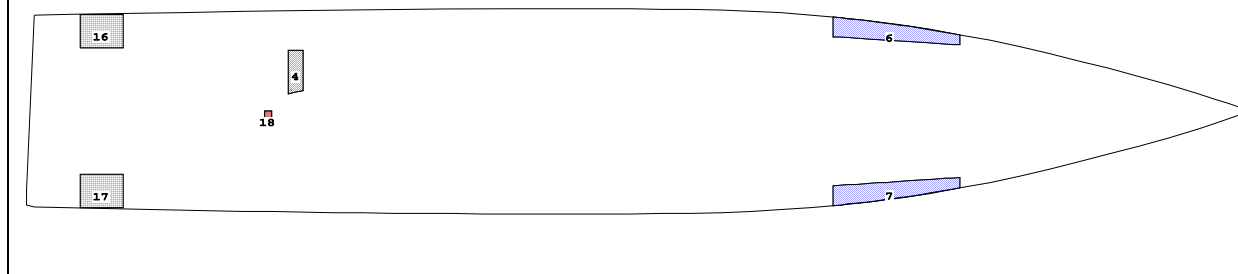


CG - Draft: 2.184 @ 38.850f, 2.258 @ 2.150f Heel: stbd 0.32 deg.

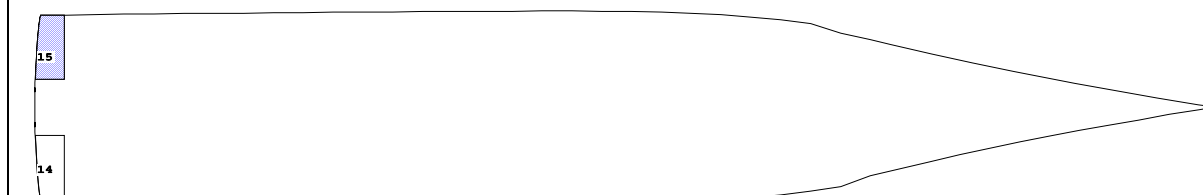
## Profile View @ 4.000s and beyond



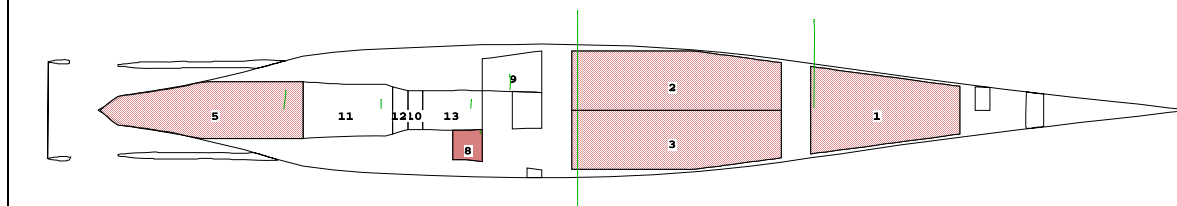
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....95% FUEL OIL	7 FW-TK12.S.....100% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....95% FUEL OIL	8 LO-TK5.S.....100% LUBE OIL	15 WB-TK17.P.....100% BALLAST
3 FO-TK3.S.....95% FUEL OIL	9 BILGE_W-TK4.P....0% BILGE WATER	16 GAS-TK13.P.....95% GASOLINE
4 FO-TK8A.P.....90% FUEL OIL	10 SEWAGE-TK6.C.....0% SLUDGE	17 GAS-TK14.S.....95% GASOLINE
5 FO-TK9.C.....92% FUEL OIL	11 GW-TK7A.C.....0% GREY WATER	18 DG_LO_TK.S.....100% DG LO
6 FW-TK11.P.....100% FRESH WATER	12 BW-TK7B.C.....0% BLACK WATER	
	13 DIRTY_O-TK15.C...0% DIRTY OIL	

## SUMMARY OF LOADING

36.8 Cu.M. (94%) FUEL OIL	6.4 Cu.M. (100%) FRESH WATER
0.6 Cu.M. (100%) LUBE OIL	0.0 Cu.M. (0%) BILGE WATER
0.0 Cu.M. (0%) SLUDGE	0.0 Cu.M. (0%) GREY WATER
0.0 Cu.M. (0%) BLACK WATER	0.0 Cu.M. (0%) DIRTY OIL
1.5 Cu.M. (50%) BALLAST	2.5 Cu.M. (95%) GASOLINE
0.1 Cu.M. (100%) DG LO	
1.50 MT of Stores @ 100%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-2.96 MT of RHIB	

## WEIGHT STATUS

BASELINE draft: 2.184 @ 38.85f, 2.258 @ 2.15f

Trim: Aft 0.074/36.700, Heel: Stbd 0.32 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 100%			1.50	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
RHIB (PS) Inboard			-2.46	4.655f	1.975p	5.750	
RHIB Payload Inboard			-0.50	24.800f	0.300p	4.270	
Total Fixed		>	221.25	16.246f	0.020s	3.140	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.950	0.840	7.05	28.260f	0.003s	0.786	4.33
FO-TK2.P	0.950	0.840	8.19	21.356f	0.755p	0.789	3.41
FO-TK3.S	0.950	0.840	8.19	21.355f	0.759s	0.789	3.41
FO-TK8A.P	0.900	0.840	0.95	8.746f	1.312p	2.767	0.05*
FO-TK9.C	0.918	0.840	6.54	5.898f	0.001s	1.147	1.58*
FW-TK11.P	1.000	1.000	3.21	28.798f	2.710p	3.531	0.24*
FW-TK12.S	1.000	1.000	3.21	28.798f	2.710s	3.531	0.24*
LO-TK5.S	1.000	0.900	0.57	14.522f	1.115s	0.894	0.08*
WB-TK17.P	1.000	1.000	1.50	0.541f	2.005p	1.758	0.00
GAS-TK13.P	0.950	0.735	0.93	2.250f	2.744p	3.251	0.01*
GAS-TK14.S	0.950	0.735	0.93	2.250f	2.744s	3.251	0.01*
DG_LO_TK.S	1.000	0.900	0.06	7.825f	0.187s	3.000	0.00
Total Tanks		>	41.32	19.225f	0.085p	1.466	13.36
Total Weight		>	262.57	16.714f	0.003s	2.877	
Free Surface Adjustment		>				0.051	
Adjusted CG		>		16.714f	0.003s	2.928	
Distances in METERS.				Moments in m.-MT.			

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.074/36.700, Heel: Stbd 0.32 deg., VCG = 2.877

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.221	262.57	16.712f	1.510	2.11	16.642f	5.39	75.28	1.060
Distances in METERS.		Specific Gravity = 1.000.				Moment in m.-MT.		
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 13.4 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 2.184 @ 38.85f, 2.836 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85) 2.184  
 Baseline Draft at Aft Draft Marks (FR 2.15) 2.258  
 Baseline Draft at Load Line Mark (FR 20.86) 2.220  
 Baseline Draft at AP (FR 1) 2.260  
 Baseline Draft at FP (FR 40.721) 2.181

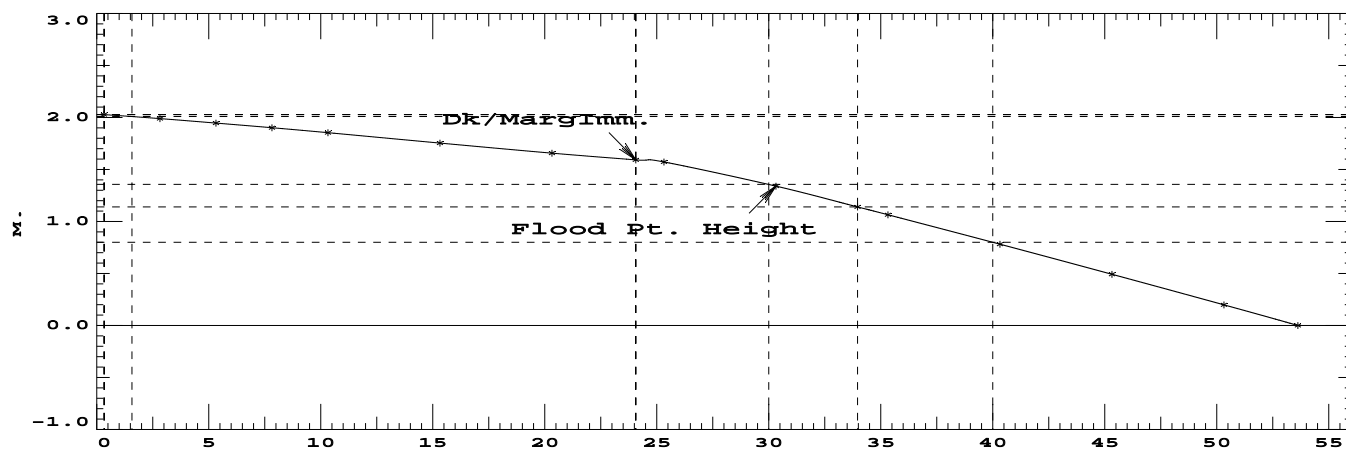
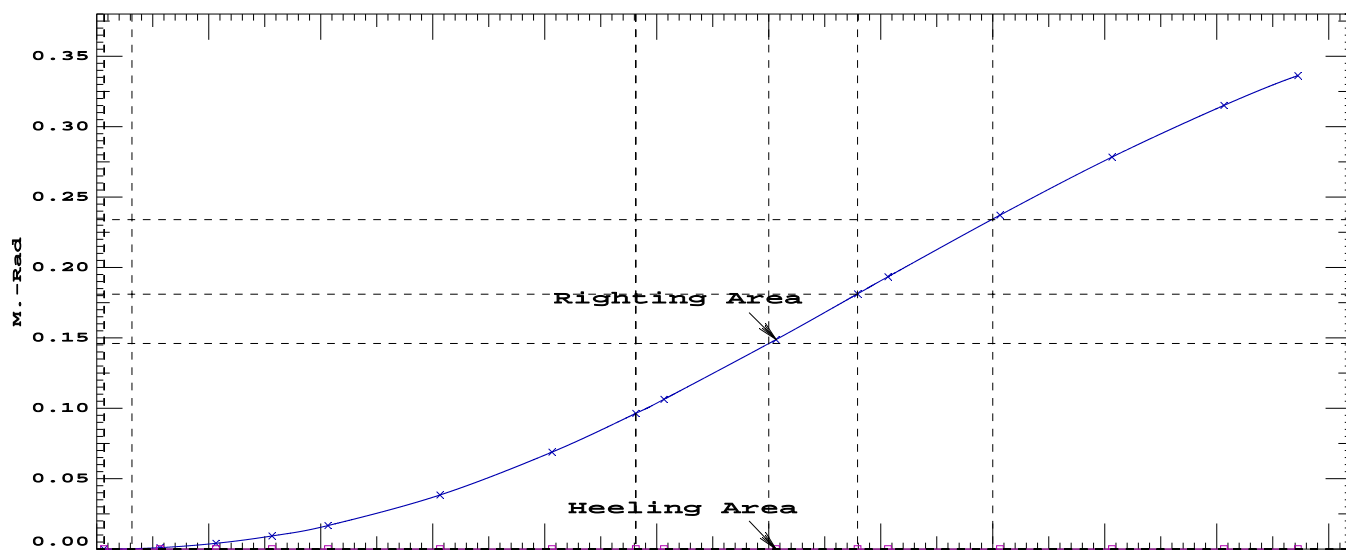
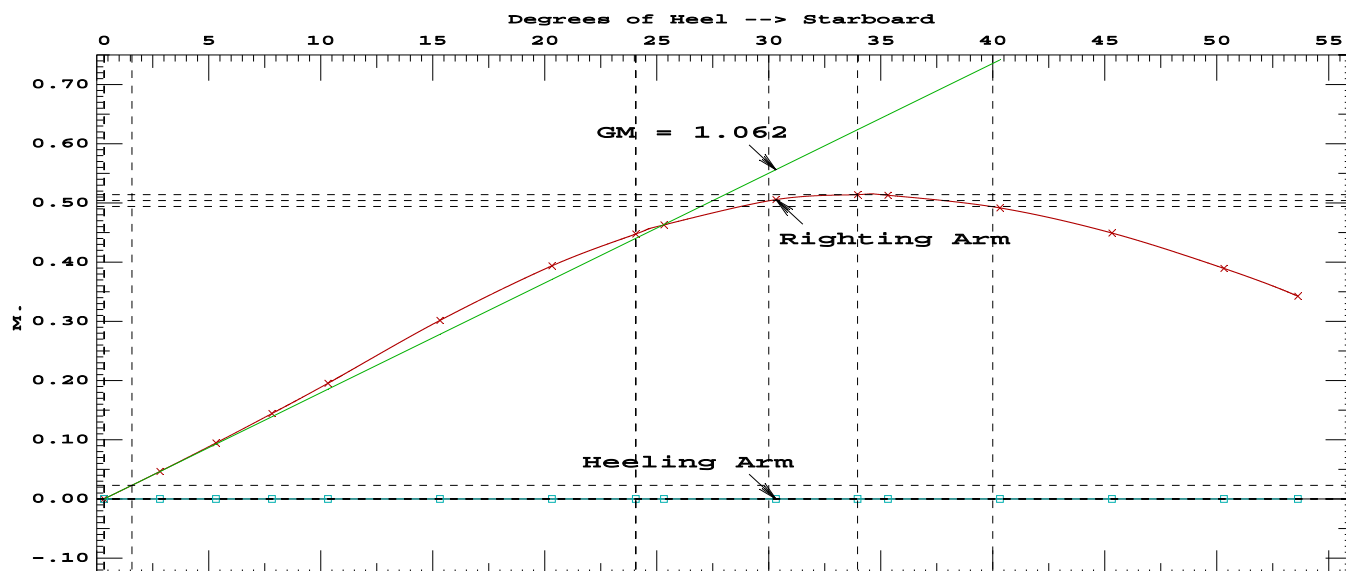
## FREEBOARD STATUS

BASELINE draft: 2.184 @ 38.85f, 2.258 @ 2.15f  
 Trim: Aft 0.074/36.700, Heel: Stbd 0.32 deg.  
 Least freeboard is 1.513 m. located at 0.000  
 Least extra freeboard (to margin line) is 1.437 m. located at 0.000

## RESIDUAL RIGHTING ARMS vs HEEL ANGLE

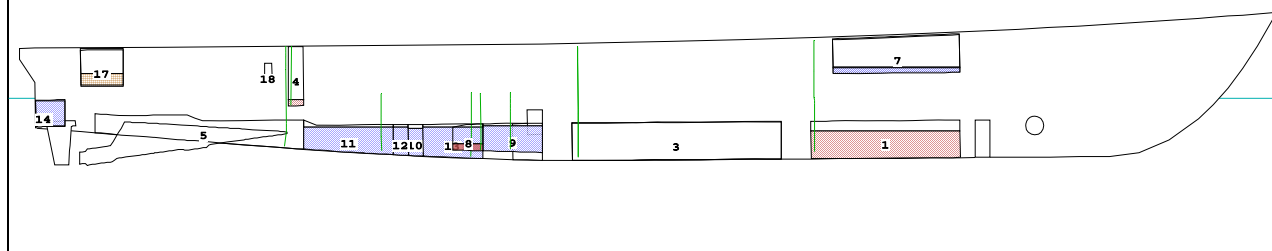
Fixed CG: LCG = 16.246f TCG = 0.020s VCG = 3.140

Origin	Degrees of		Displacement	Residual Arms		Flood Pt	
Depth	Trim	Heel	Weight(MT)	in Trim	in Heel	Area	Height
2.262	0.11a	0.32s	262.57	0.000	0.000	0.0000	2.028(24)
2.259	0.12a	2.82s	262.57	0.000	0.047	0.0010	1.989(24)
2.252	0.12a	5.32s	262.58	0.000	0.095	0.0041	1.946(24)
2.239	0.13a	7.82s	262.57	0.000	0.144	0.0093	1.902(24)
2.222	0.14a	10.32s	262.57	0.000	0.195	0.0167	1.854(24)
2.174	0.17a	15.32s	262.57	0.000	0.302	0.0384	1.754(24)
2.090	0.20a	20.32s	262.57	0.000	0.394	0.0688	1.657(24)
1.993	0.18a	24.07s	262.57	0.000	0.448	0.0964	Dk/MargImm.
1.955	0.17a	25.32s	262.57	0.000	0.463	0.1064	1.573(24)
1.791	0.13a	30.32s	262.57	0.000	0.506	0.1488	1.340(4)
1.672	0.13a	33.97s	262.57	0.000	0.514	0.1814	1.140(4)
1.628	0.13a	35.32s	262.57	0.000	0.513	0.1935	1.064(4)
1.463	0.14a	40.32s	262.57	0.000	0.492	0.2376	0.782(4)
1.295	0.17a	45.32s	262.57	0.000	0.449	0.2788	0.493(4)
1.120	0.20a	50.32s	262.57	0.000	0.389	0.3155	0.198(4)
1.000	0.21a	53.62s	262.57	0.000	0.342	0.3366	0.000(4)
Distances in METERS. Specific Gravity = 1.000. Area in m.-Rad.							
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(4) Bow Thruster Room Sup				FLOOD	32.450f	2.666s	5.100
(24) Emerg Generator Comp Exh				FLOOD	12.575f	0.863s	4.270
LIM	STAB 7 CRITERION				Min/Max		Attained
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1488 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2376 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0887 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.506 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	33.97 P
(6)	GM at 0 deg				>	0.150 m.	1.062 P
Relative angles measured from 0.319s							

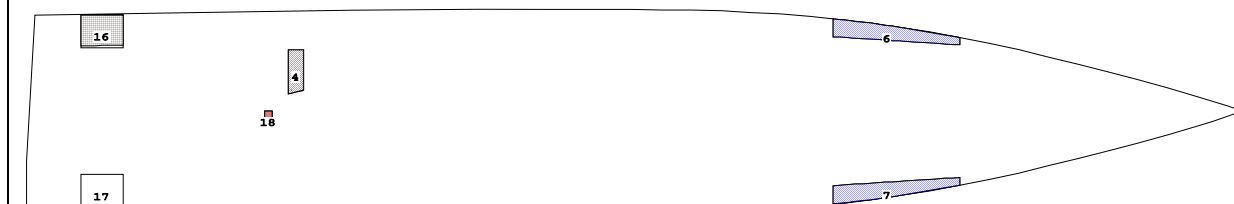


CG - Draft: 1.920 @ 38.850f, 2.210 @ 2.150f Heel: stbd 0.40 deg.

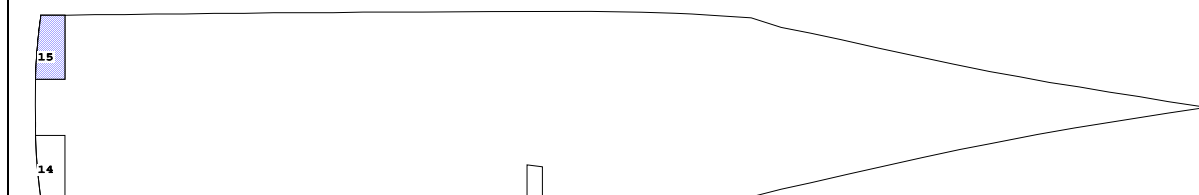
## Profile View @ 4.000s and beyond



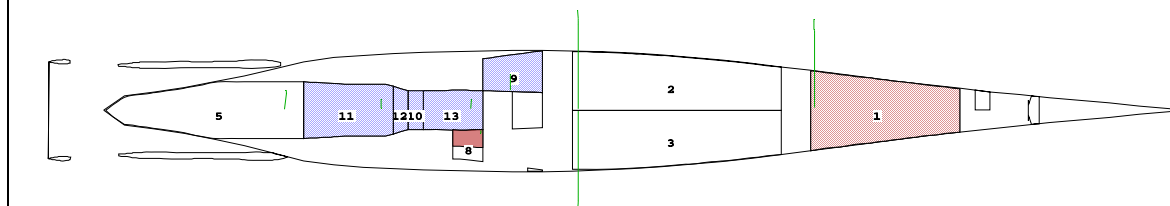
## Plan View @ 3.200



## Plan View @ 1.800



## Plan View @ 1.050



## Tanks

1 FO-TK1.C.....57% FUEL OIL	7 FW-TK12.S.....10% FRESH WATER	14 WB-TK16.S.....0% BALLAST
2 FO-TK2.P.....0% FUEL OIL	8 LO-TK5.S.....10% LUBE OIL	15 WB-TK17.P.....100% BALLAST
3 FO-TK3.S.....0% FUEL OIL	9 BILGE_W-TK4.P...90% BILGE WATER	16 GAS-TK13.P.....20% GASOLINE
4 FO-TK8A.P.....10% FUEL OIL	10 SEWAGE-TK6.C....90% SLUDGE	17 GAS-TK14.S.....0% GASOLINE
5 FO-TK9.C.....0% FUEL OIL	11 GW-TK7A.C.....90% GREY WATER	18 DG_LO_TK.S.....10% DG LO
6 FW-TK11.P.....10% FRESH WATER	12 BW-TK7B.C.....90% BLACK WATER	
	13 DIRTY_O-TK15.C..90% DIRTY OIL	

SUMMARY OF LOADING

5.2 Cu.M. (13%) FUEL OIL	0.6 Cu.M. (10%) FRESH WATER
0.1 Cu.M. (10%) LUBE OIL	1.5 Cu.M. (90%) BILGE WATER
0.5 Cu.M. (90%) SLUDGE	3.6 Cu.M. (90%) GREY WATER
0.6 Cu.M. (90%) BLACK WATER	2.3 Cu.M. (90%) DIRTY OIL
1.5 Cu.M. (50%) BALLAST	0.3 Cu.M. (10%) GASOLINE
0.0 Cu.M. (10%) DG LO	
0.15 MT of Stores @ 10%	1.80 MT of Crew & Equipment
0.31 MT of Emergency Gen FO @	0.30 MT of SAR Equipment - GFE
-2.96 MT of RHIB	

WEIGHT STATUS

BASELINE draft: 1.920 @ 38.85f, 2.210 @ 2.15f  
Trim: Aft 0.290/36.700, Heel: Stbd 0.40 deg.

Part			Weight (MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Stores @ 10%			0.15	15.500f	1.450p	4.900	
Crew & Equipment			1.80	24.800f	0.300p	4.270	
Emergency Gen FO @ 95%			0.31	15.580f	0.610s	5.600	
SAR Equipment - GFE			0.30	17.952f	0.150p	4.710	
RHIB (PS) Inboard			-2.46	4.655f	1.975p	5.750	
RHIB Payload Inboard			-0.50	24.800f	0.300p	4.270	
Total Fixed		>	219.90	16.250f	0.029s	3.129	
	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FO-TK1.C	0.570	0.840	4.23	28.236f	0.007s	0.604	4.11*
FO-TK8A.P	0.100	0.840	0.11	8.746f	1.307p	2.026	0.10*
FW-TK11.P	0.100	1.000	0.32	28.539f	2.626p	2.962	0.08*
FW-TK12.S	0.100	1.000	0.32	28.526f	2.629s	2.962	0.08*
LO-TK5.S	0.100	0.900	0.06	14.522f	0.855s	0.528	0.01*
BILGE_W-TK4.P	0.900	1.000	1.46	16.036f	1.151p	0.861	0.31*
SEWAGE-TK6.C	0.900	1.000	0.52	12.751f	0.001s	0.724	0.09*
GW-TK7A.C	0.900	1.000	3.59	10.538f	0.003s	0.834	1.37
BW-TK7B.C	0.900	1.000	0.57	12.244f	0.002s	0.759	0.13*
DIRTY_O-TK15.C	0.900	1.000	2.29	14.015f	0.001s	0.703	0.38*
WB-TK17.P	1.000	1.000	1.50	0.541f	2.005p	1.758	0.00
GAS-TK13.P	0.200	0.735	0.20	2.243f	2.872p	2.898	0.09*
DG_LO_TK.S	0.100	0.900	0.01	7.824f	0.189s	2.685	0.00
Total Tanks		>	15.15	16.342f	0.348p	0.962	6.75
Total Weight		>	235.05	16.256f	0.005s	2.990	
Free Surface Adjustment		>				0.029	
Adjusted CG		>		16.256f	0.005s	3.018	
Distances in METERS.						Moments in m.-MT.	

\* Note: FSM values marked with the asterisk are formal values which are not the same as the true values in the present condition.

## HYDROSTATIC PROPERTIES

Trim: Aft 0.290/36.700, Heel: Stbd 0.40 deg., VCG = 2.990

Draft@	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
20.500f	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
2.065	235.05	16.244f	1.436	2.06	16.344f	5.12	79.88	1.095
Distances in METERS.		Specific Gravity = 1.000.					Moment in m.-MT.	
				Trim is per 36.70m.				
Draft is from BASELINE.				Formal Free Surface included.				

Note: GMT includes the formal free surface moment 6.8 m.-MT

## DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.920 @ 38.85f, 2.788 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85) 1.920  
 Baseline Draft at Aft Draft Marks (FR 2.15) 2.210  
 Baseline Draft at Load Line Mark (FR 20.86) 2.063  
 Baseline Draft at AP (FR 1) 2.219  
 Baseline Draft at FP (FR 40.721) 1.906

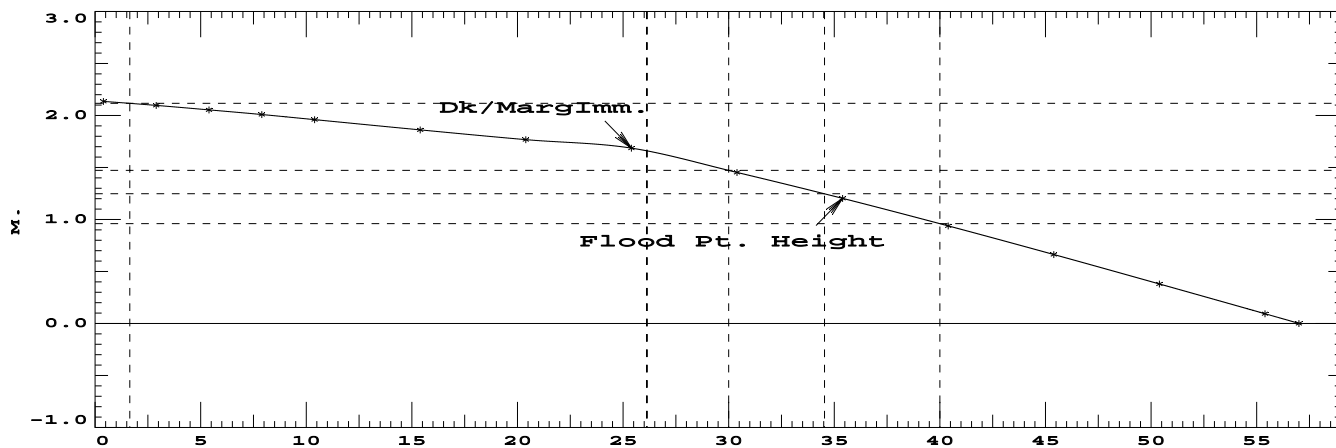
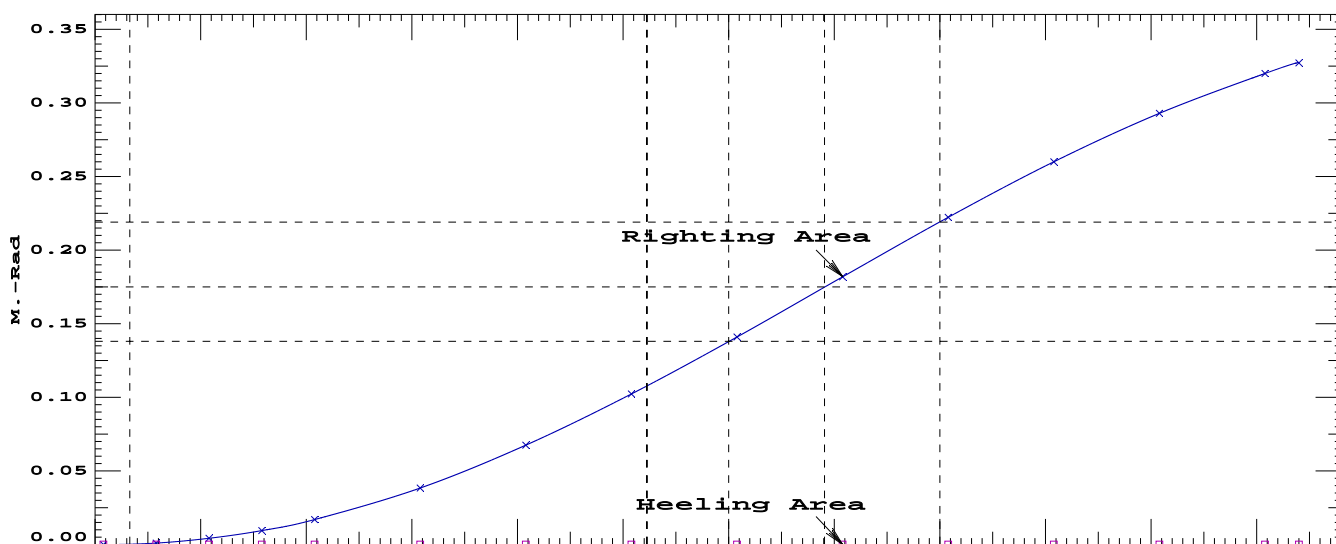
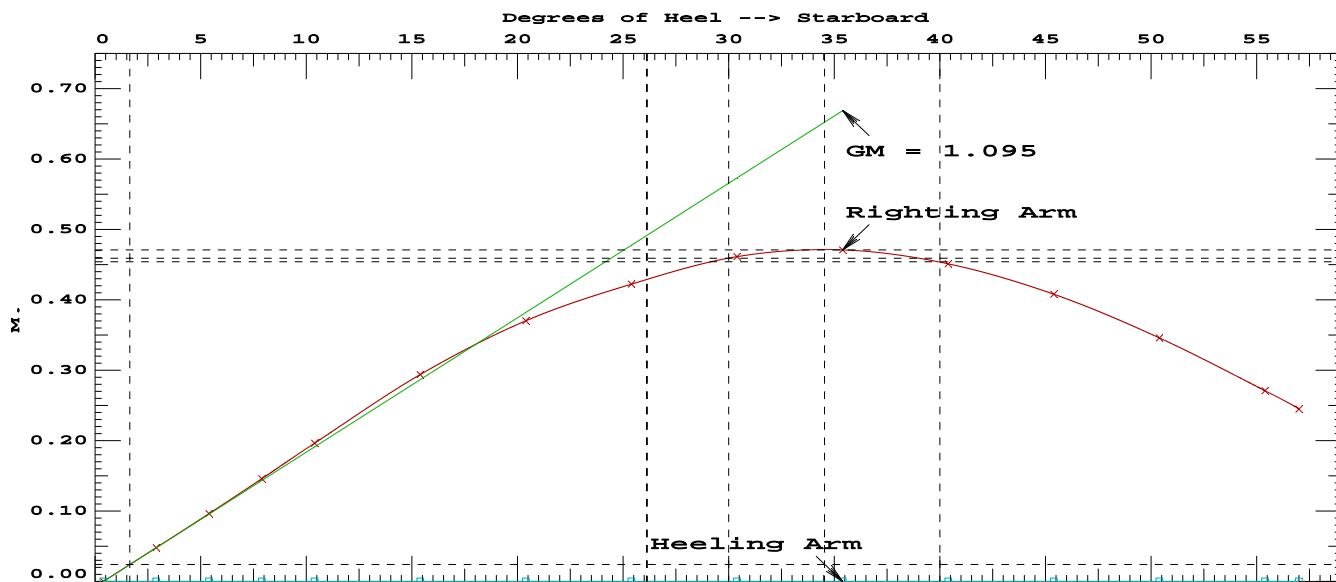
## FREEBOARD STATUS

BASELINE draft: 1.920 @ 38.85f, 2.210 @ 2.15f  
 Trim: Aft 0.290/36.700, Heel: Stbd 0.40 deg.  
 Least freeboard is 1.541 m. located at 0.500a  
 Least extra freeboard (to margin line) is 1.465 m. located at 0.500a



RESIDUAL RIGHTING ARMS vs HEEL ANGLE  
Fixed CG: LCG = 16.250f TCG = 0.029s VCG = 3.129

Origin	Degrees of		Displacement	Residual Arms			Flood Pt
Depth	Trim	Heel	Weight(MT)	in Trim	in Heel	→ Area	Height
2.227	0.45a	0.40s	235.05	0.000	0.000	0.0000	2.136(24)
2.224	0.45a	2.90s	235.05	0.000	0.048	0.0010	2.096(24)
2.217	0.46a	5.40s	235.05	0.000	0.096	0.0042	2.054(24)
2.205	0.47a	7.90s	235.05	0.000	0.146	0.0095	2.008(24)
2.188	0.48a	10.40s	235.05	0.000	0.196	0.0169	1.961(24)
2.139	0.51a	15.40s	235.05	0.000	0.294	0.0383	1.861(24)
2.049	0.52a	20.40s	235.05	0.000	0.370	0.0675	1.768(24)
1.904	0.47a	25.40s	235.04	0.000	0.422	0.1022	1.686(24)
1.880	0.46a	26.13s	235.04	0.000	0.429	0.1076	Dk/MargImm.
1.728	0.41a	30.40s	235.04	0.000	0.461	0.1409	1.452(29)
1.587	0.38a	34.38s	235.05	0.000	0.472	0.1734	1.255(29)
1.550	0.38a	35.40s	235.05	0.000	0.471	0.1817	1.203(29)
1.371	0.37a	40.40s	235.05	0.000	0.451	0.2220	0.939(29)
1.189	0.38a	45.40s	235.05	0.000	0.408	0.2596	0.663(29)
0.999	0.38a	50.40s	235.05	0.000	0.346	0.2927	0.381(29)
0.804	0.38a	55.40s	235.05	0.000	0.271	0.3197	0.093(29)
0.740	0.38a	57.00s	235.05	0.000	0.245	0.3269	0.000(29)
Distances in METERS.			Specific Gravity = 1.000.			Area in m.-Rad.	
Tank CG shifts included.							
Note: The Residual Righting Arms shown above are in excess of the overturning arms derived from these moments (in m.-MT): Stbd heeling moment = 0.00							
Critical Points				LCP	TCP	VCP	
(24) Emerg Generator Comp Exh				FLOOD	12.575f	0.863s	4.270
(29) Aux Mach Room Sup Stbd				FLOOD	11.148f	2.487s	5.055
LIM	STAB 7 CRITERION				Min/Max	Attained	
(1)	Area from 0 deg to 30				>	0.0550 m.-Rad	0.1409 P
(2)	Area from 0 deg to 40 or Flood				>	0.0900 m.-Rad	0.2220 P
(3)	Area from 30 deg to 40 or Flood				>	0.0300 m.-Rad	0.0811 P
(4)	Righting Arm at 30 deg				>	0.200 m.	0.461 P
(5)	Absolute Angle at MaxRA				>	25.00 deg	34.38 P
(6)	GM at 0 deg				>	0.150 m.	1.092 P
Relative angles measured from 0.397s							



## Section 12. TANK PLAN AND CHARACTERISTICS

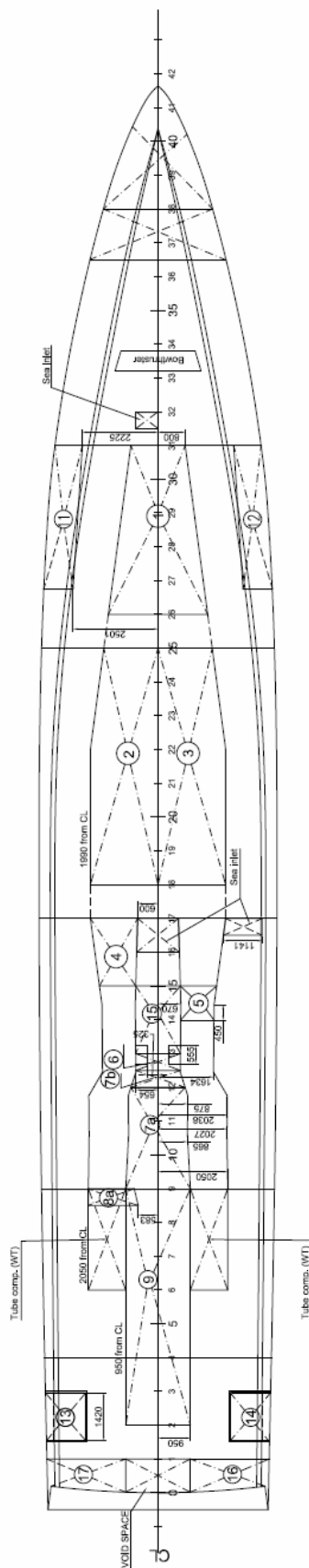
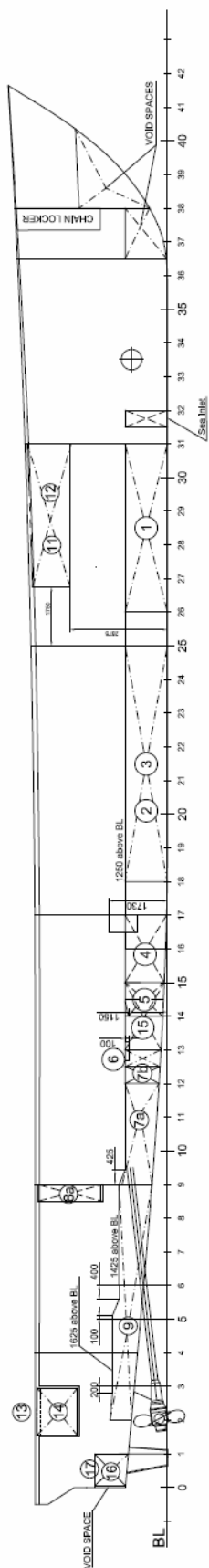
This section provides a tank plan for the vessel on the following page as well tank characteristics for each tank. The specific gravity of the fluids has been taken as follows:

Fuel Oil	0.840
Fresh Water	1.000
Lube Oil	0.900
Bilge Water	1.000
Sewage Sludge	1.000
Grey Water	1.000
Black Water	1.000
Dirty Oil Sludge	1.000
Water Ballast	1.025
Gasoline	0.735

Capacity tables are provided for every tank based on the level of loading, which appears as the second column in each table (i.e. Load of 0.200 equals 20%). In addition the first column of each capacity table shows the fluid height (mm) above the lowest point in each tank (reference point) which is defined at the bottom of each table.

Sounding tables are provided for each tank that is fitted with a sounding tube. Sounding increments are 50mm. The second column of each sounding table shows the level of loading associated with the indicated sounding.

Tank	Cap Tab Page	Snd Tab Page	Tank	Cap Tab Page	Snd Tab Page
1: Fuel Oil	150	151	6: Sewage Sludge	168	N/A
2: Fuel Oil (P)	152	153	7A: Grey Water	169	170
3: Fuel Oil (S)	155	156	7B: Black Water	171	N/A
8A: Fuel Oil (P)	158	159	15: Dirty Oil Sludge	172	173
9: Fuel Oil	160	161	16: Water Ballast (S)	174	N/A
11: Fresh Water (P)	162	N/A	17: Water Ballast (P)	175	N/A
12: Fresh Water (S)	163	N/A	13: Gasoline (P)	176	N/A
5: Main Engine Lube Oil (S)	164	165	14: Gasoline (S)	177	N/A
4: Bilge Water (P)	166	167	DG Lube Oil (S)	178	N/A



TANK CHARACTERISTICS  
No Trim, No Heel  
Tank: FO-TK1.C, Contents: FUEL OIL at 0.840 Specific Gravity  
FO STORAGE

Ref	Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
			LITERS	METRIC	TON		LCG	TCG	VCG	
-266		.050	442		0.37		28.275f	0.000	0.178	0.11
-377		.100	884		0.74		28.275f	0.000	0.252	0.31
-462		.150	1325		1.11		28.274f	0.000	0.308	0.58
-535		.200	1767		1.48		28.274f	0.000	0.356	0.88
-598		.250	2209		1.86		28.273f	0.000	0.399	1.23
-656		.300	2651		2.23		28.273f	0.000	0.437	1.61
-709		.350	3092		2.60		28.272f	0.000	0.472	2.03
-758		.400	3534		2.97		28.272f	0.000	0.505	2.48
-805		.450	3976		3.34		28.272f	0.000	0.536	2.95
-849		.500	4418		3.71		28.271f	0.000	0.565	3.45
-890		.550	4859		4.08		28.271f	0.000	0.593	3.97
-931		.600	5301		4.45		28.271f	0.000	0.619	4.33
-970		.650	5743		4.82		28.269f	0.000	0.645	4.33
-1010		.700	6185		5.20		28.268f	0.000	0.670	4.33
-1050		.750	6626		5.57		28.268f	0.000	0.694	4.33
-1090		.800	7068		5.94		28.267f	0.000	0.717	4.33
-1130		.850	7510		6.31		28.266f	0.000	0.740	4.33
-1169		.900	7952		6.68		28.265f	0.000	0.763	4.33
-1209		.950	8394		7.05		28.265f	0.000	0.786	4.33
-1233		.980	8659		7.27		28.265f	0.000	0.799	4.33
		1.000	8835		7.42		28.264f	0.000	0.808	
Distances in METERS.										
FO-TK1.C Reference Point: Long.= 28.500f Trans.= 0.000 Vert.= 0.001										

TANK CHARACTERISTICS  
No Trim, No Heel  
Tank: FO-TK1.C, Contents: FUEL OIL at 0.840 Specific Gravity  
FO STORAGE

Snding	Load	Volume	Weight	Center of Gravity			FSM
		LITERS	METRIC TON	LCG	TCG	VCG	m. -MT
0	.044	388	0.33	28.275f	0.000	0.166	0.09
50	.054	476	0.40	28.275f	0.000	0.184	0.13
100	.065	573	0.48	28.275f	0.000	0.202	0.17
150	.077	678	0.57	28.275f	0.000	0.220	0.21
200	.090	793	0.67	28.275f	0.000	0.238	0.27
250	.104	916	0.77	28.275f	0.000	0.256	0.33
300	.119	1048	0.88	28.275f	0.000	0.274	0.41
350	.135	1189	1.00	28.274f	0.000	0.292	0.49
400	.152	1339	1.13	28.274f	0.000	0.310	0.59
450	.170	1498	1.26	28.274f	0.000	0.328	0.69
500	.189	1665	1.40	28.274f	0.000	0.346	0.81
550	.208	1842	1.55	28.274f	0.000	0.364	0.94
600	.229	2027	1.70	28.274f	0.000	0.382	1.08
650	.251	2220	1.86	28.273f	0.000	0.400	1.24
700	.274	2423	2.03	28.273f	0.000	0.418	1.41
750	.298	2634	2.21	28.273f	0.000	0.436	1.60
800	.323	2853	2.40	28.273f	0.000	0.454	1.80
850	.349	3082	2.59	28.272f	0.000	0.471	2.02
900	.376	3319	2.79	28.272f	0.000	0.489	2.26
950	.404	3565	2.99	28.272f	0.000	0.507	2.51
1000	.432	3820	3.21	28.272f	0.000	0.525	2.78
1050	.462	4084	3.43	28.272f	0.000	0.543	3.07
1100	.493	4356	3.66	28.271f	0.000	0.561	3.38
1150	.525	4637	3.89	28.271f	0.000	0.579	3.71
1200	.558	4926	4.14	28.271f	0.000	0.597	4.05
1250	.591	5224	4.39	28.271f	0.000	0.615	4.33
1300	.625	5523	4.64	28.270f	0.000	0.632	4.33
1350	.659	5822	4.89	28.269f	0.000	0.649	4.33
1400	.693	6122	5.14	28.269f	0.000	0.666	4.33
1450	.727	6421	5.39	28.268f	0.000	0.683	4.33
1500	.761	6721	5.65	28.267f	0.000	0.699	4.33
1550	.795	7020	5.90	28.267f	0.000	0.715	4.33
1600	.828	7320	6.15	28.266f	0.000	0.731	4.33
1650	.862	7619	6.40	28.266f	0.000	0.746	4.33
1700	.896	7919	6.65	28.266f	0.000	0.762	4.33
1750	.930	8218	6.90	28.265f	0.000	0.777	4.33
1800	.964	8518	7.15	28.265f	0.000	0.792	4.33
1850	.998	8817	7.41	28.264f	0.000	0.807	4.33
1900	1.000	8835	7.42	28.264f	0.000	0.808	

Soundings in mm. — Other distances in METERS.

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK2.P, Contents: FUEL OIL at 0.840 Specific Gravity  
FO SERVICE PORT

Ref Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
-269	.050	513	0.43	21.353f	0.187p	0.179	0.09
-380	.100	1027	0.86	21.349f	0.264p	0.254	0.24
-466	.150	1540	1.29	21.347f	0.323p	0.311	0.44
-538	.200	2053	1.72	21.347f	0.372p	0.359	0.68
-602	.250	2566	2.16	21.347f	0.416p	0.401	0.94
-660	.300	3080	2.59	21.347f	0.455p	0.440	1.23
-713	.350	3593	3.02	21.348f	0.491p	0.475	1.54
-762	.400	4106	3.45	21.348f	0.525p	0.508	1.88
-809	.450	4619	3.88	21.349f	0.556p	0.539	2.23
-853	.500	5133	4.31	21.350f	0.586p	0.568	2.59
-895	.550	5646	4.74	21.350f	0.614p	0.596	2.98
-936	.600	6159	5.17	21.352f	0.640p	0.623	3.28
-975	.650	6672	5.60	21.354f	0.664p	0.648	3.40
-1014	.700	7186	6.04	21.357f	0.685p	0.673	3.41
-1054	.750	7699	6.47	21.359f	0.703p	0.697	3.41
-1093	.800	8212	6.90	21.361f	0.719p	0.721	3.41
-1132	.850	8725	7.33	21.363f	0.733p	0.744	3.41
-1171	.900	9239	7.76	21.365f	0.746p	0.766	3.41
-1210	.950	9752	8.19	21.366f	0.757p	0.789	3.41
-1234	.980	10060	8.45	21.367f	0.763p	0.802	3.41
	1.000	10265	8.62	21.367f	0.767p	0.811	
Distances in METERS.							
FO-TK2.P Reference Point: Long.= 21.500f Trans.= 0.995p Vert.= 0.000							

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK2.P, Contents: FUEL OIL at 0.840 Specific Gravity  
FO SERVICE PORT

		Volume	Weight	Center of Gravity			FSM	
Snding	Load	LITERS	METRIC	TON	LCG	TCG	VCG	m.-MT
0	.010	99		0.08	21.369f	0.082p	0.079	0.01
50	.013	138		0.12	21.365f	0.097p	0.093	0.01
100	.018	183		0.15	21.361f	0.112p	0.107	0.02
150	.023	235		0.20	21.359f	0.126p	0.121	0.03
200	.029	294		0.25	21.357f	0.141p	0.136	0.04
250	.035	359		0.30	21.355f	0.156p	0.150	0.05
300	.042	430		0.36	21.354f	0.171p	0.164	0.07
350	.049	508		0.43	21.353f	0.186p	0.178	0.08
400	.058	592		0.50	21.352f	0.201p	0.193	0.11
450	.067	683		0.57	21.351f	0.215p	0.207	0.13
500	.076	780		0.66	21.350f	0.230p	0.221	0.16
550	.086	884		0.74	21.349f	0.245p	0.235	0.19
600	.097	994		0.84	21.349f	0.260p	0.250	0.23
650	.108	1111		0.93	21.348f	0.274p	0.264	0.27
700	.120	1234		1.04	21.348f	0.289p	0.278	0.32
750	.133	1363		1.14	21.348f	0.304p	0.292	0.37
800	.146	1499		1.26	21.347f	0.319p	0.306	0.42
850	.160	1641		1.38	21.347f	0.333p	0.321	0.49
900	.174	1790		1.50	21.347f	0.348p	0.335	0.55
950	.189	1944		1.63	21.347f	0.363p	0.349	0.62
1000	.205	2106		1.77	21.347f	0.377p	0.363	0.70
1050	.221	2273		1.91	21.347f	0.392p	0.378	0.79
1100	.238	2447		2.06	21.347f	0.406p	0.392	0.88
1150	.256	2628		2.21	21.347f	0.421p	0.406	0.97
1200	.274	2814		2.36	21.347f	0.435p	0.420	1.08
1250	.293	3007		2.53	21.347f	0.450p	0.434	1.19
1300	.312	3206		2.69	21.348f	0.464p	0.448	1.30
1350	.332	3411		2.87	21.348f	0.479p	0.463	1.43
1400	.353	3623		3.04	21.348f	0.493p	0.477	1.56
1450	.374	3841		3.23	21.348f	0.508p	0.491	1.70
1500	.396	4065		3.41	21.348f	0.522p	0.505	1.85
1550	.418	4295		3.61	21.349f	0.537p	0.519	2.00
1600	.442	4532		3.81	21.349f	0.551p	0.534	2.17
1650	.465	4775		4.01	21.349f	0.565p	0.548	2.34
1700	.489	5024		4.22	21.350f	0.580p	0.562	2.51
1750	.514	5279		4.43	21.350f	0.594p	0.576	2.70
1800	.540	5540		4.65	21.350f	0.608p	0.590	2.90
1850	.566	5807		4.88	21.351f	0.622p	0.604	3.10
1900	.592	6080		5.11	21.351f	0.636p	0.619	3.25
1950	.619	6356		5.34	21.353f	0.650p	0.633	3.35
2000	.646	6635		5.57	21.354f	0.663p	0.646	3.40
2050	.674	6915		5.81	21.356f	0.674p	0.660	3.41

Soundings in mm. Other distances in METERS.



## TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: FO-TK2.P, Contents: FUEL OIL at 0.840 Specific Gravity  
FO SERVICE PORT

		Volume	Weight	Center of Gravity			FSM
Snding	Load	LITERS	METRIC TON	LCG	TCG	VCG	m.-MT
2100	.701	7194	6.04	21.357f	0.685p	0.673	3.41
2150	.728	7474	6.28	21.358f	0.696p	0.687	3.41
2200	.755	7753	6.51	21.359f	0.705p	0.700	3.41
2250	.783	8033	6.75	21.361f	0.714p	0.712	3.41
2300	.810	8312	6.98	21.362f	0.722p	0.725	3.41
2350	.837	8592	7.22	21.363f	0.730p	0.738	3.41
2400	.864	8871	7.45	21.363f	0.737p	0.750	3.41
2450	.891	9151	7.69	21.364f	0.744p	0.762	3.41
2500	.919	9431	7.92	21.365f	0.750p	0.775	3.41
2550	.946	9710	8.16	21.366f	0.756p	0.787	3.41
2600	.973	9990	8.39	21.367f	0.762p	0.799	3.41
2650	1.000	10265	8.62	21.367f	0.767p	0.811	
Soundings in mm.		Other distances in METERS.					

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK3.S, Contents: FUEL OIL at 0.840 Specific Gravity  
FO SERVICE STBD

Ref Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
-269	.050	513	0.43	21.353f	0.187s	0.179	0.09
-380	.100	1027	0.86	21.349f	0.264s	0.254	0.24
-466	.150	1540	1.29	21.347f	0.323s	0.311	0.44
-538	.200	2053	1.72	21.347f	0.372s	0.359	0.68
-602	.250	2566	2.16	21.347f	0.416s	0.401	0.94
-660	.300	3080	2.59	21.347f	0.455s	0.440	1.23
-713	.350	3593	3.02	21.348f	0.491s	0.475	1.54
-762	.400	4106	3.45	21.348f	0.525s	0.508	1.88
-809	.450	4619	3.88	21.349f	0.556s	0.539	2.23
-853	.500	5133	4.31	21.350f	0.586s	0.568	2.59
-895	.550	5646	4.74	21.350f	0.614s	0.596	2.98
-936	.600	6159	5.17	21.352f	0.640s	0.623	3.28
-975	.650	6672	5.60	21.354f	0.664s	0.648	3.40
-1014	.700	7186	6.04	21.357f	0.685s	0.673	3.41
-1054	.750	7699	6.47	21.359f	0.703s	0.697	3.41
-1093	.800	8212	6.90	21.361f	0.719s	0.721	3.41
-1132	.850	8725	7.33	21.363f	0.733s	0.744	3.41
-1171	.900	9239	7.76	21.365f	0.746s	0.766	3.41
-1210	.950	9752	8.19	21.366f	0.757s	0.789	3.41
-1234	.980	10060	8.45	21.367f	0.763s	0.802	3.41
	1.000	10265	8.62	21.367f	0.767s	0.811	
Distances in METERS.							
FO-TK3.S Reference Point: Long.= 21.500f Trans.= 0.995s Vert.= 0.000							

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK3.S, Contents: FUEL OIL at 0.840 Specific Gravity  
FO SERVICE STBD

Snding	Load	Volume	Weight	Center of Gravity			FSM	
		LITERS	METRIC	TON	LCG	TCG	VCG	m. -MT
0	.012	127		0.11	21.365f	0.093s	0.089	0.01
50	.017	171		0.14	21.362f	0.108s	0.104	0.02
100	.022	221		0.19	21.360f	0.122s	0.118	0.02
150	.027	277		0.23	21.357f	0.137s	0.132	0.03
200	.033	339		0.29	21.356f	0.152s	0.146	0.05
250	.040	408		0.34	21.354f	0.167s	0.160	0.06
300	.047	484		0.41	21.353f	0.181s	0.174	0.08
350	.055	565		0.47	21.352f	0.196s	0.188	0.10
400	.064	653		0.55	21.351f	0.211s	0.202	0.12
450	.073	747		0.63	21.350f	0.225s	0.216	0.15
500	.083	848		0.71	21.350f	0.240s	0.230	0.18
550	.093	955		0.80	21.349f	0.255s	0.245	0.22
600	.104	1068		0.90	21.349f	0.269s	0.259	0.26
650	.116	1187		1.00	21.348f	0.284s	0.273	0.30
700	.128	1313		1.10	21.348f	0.298s	0.287	0.35
750	.141	1445		1.21	21.348f	0.313s	0.301	0.40
800	.154	1583		1.33	21.347f	0.327s	0.315	0.46
850	.168	1728		1.45	21.347f	0.342s	0.329	0.52
900	.183	1878		1.58	21.347f	0.356s	0.343	0.59
950	.198	2035		1.71	21.347f	0.371s	0.357	0.67
1000	.214	2199		1.85	21.347f	0.385s	0.371	0.75
1050	.231	2368		1.99	21.347f	0.400s	0.385	0.83
1100	.248	2544		2.14	21.347f	0.414s	0.399	0.93
1150	.265	2725		2.29	21.347f	0.429s	0.413	1.03
1200	.284	2913		2.45	21.347f	0.443s	0.427	1.13
1250	.303	3107		2.61	21.347f	0.457s	0.442	1.24
1300	.322	3308		2.78	21.348f	0.472s	0.456	1.36
1350	.342	3514		2.95	21.348f	0.486s	0.470	1.49
1400	.363	3726		3.13	21.348f	0.500s	0.484	1.63
1450	.384	3945		3.31	21.348f	0.515s	0.498	1.77
1500	.406	4170		3.50	21.348f	0.529s	0.512	1.92
1550	.429	4401		3.70	21.349f	0.543s	0.526	2.08
1600	.452	4638		3.90	21.349f	0.557s	0.540	2.24
1650	.475	4881		4.10	21.349f	0.571s	0.554	2.41
1700	.500	5130		4.31	21.350f	0.586s	0.568	2.59
1750	.525	5385		4.52	21.350f	0.600s	0.582	2.78
1800	.550	5646		4.74	21.350f	0.614s	0.596	2.98
1850	.576	5913		4.97	21.351f	0.628s	0.610	3.16
1900	.602	6184		5.19	21.352f	0.641s	0.624	3.29
1950	.629	6459		5.43	21.353f	0.655s	0.638	3.37
2000	.656	6736		5.66	21.355f	0.667s	0.651	3.41
2050	.683	7013		5.89	21.356f	0.678s	0.665	3.41

Soundings in mm. — Other distances in METERS.

## TANK CHARACTERISTICS, continued

No Trim, No Heel

Tank: FO-TK3.S, Contents: FUEL OIL at 0.840 Specific Gravity  
FO SERVICE STBD

		Volume	Weight	Center of Gravity			FSM
Snding	Load	LITERS	METRIC TON	LCG	TCG	VCG	m.-MT
2100	.710	7289	6.12	21.357f	0.689s	0.678	3.41
2150	.737	7566	6.36	21.359f	0.699s	0.691	3.41
2200	.764	7843	6.59	21.360f	0.708s	0.704	3.41
2250	.791	8120	6.82	21.361f	0.717s	0.716	3.41
2300	.818	8396	7.05	21.362f	0.724s	0.729	3.41
2350	.845	8673	7.29	21.363f	0.732s	0.741	3.41
2400	.872	8950	7.52	21.364f	0.739s	0.754	3.41
2450	.899	9227	7.75	21.364f	0.745s	0.766	3.41
2500	.926	9504	7.98	21.365f	0.752s	0.778	3.41
2550	.953	9780	8.22	21.366f	0.757s	0.790	3.41
2600	.980	10057	8.45	21.367f	0.763s	0.802	3.41
2638	1.000	10265	8.62	21.367f	0.767s	0.811	
Soundings in mm.		Other distances in METERS.					

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK8A.P, Contents: FUEL OIL at 0.840 Specific Gravity  
FO DAY

Ref Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
-116	.050	63	0.05	8.747f	1.281p	1.979	0.10
-208	.100	126	0.11	8.747f	1.313p	2.026	0.10
-299	.150	189	0.16	8.747f	1.324p	2.072	0.10
-390	.200	252	0.21	8.747f	1.329p	2.117	0.10
-482	.250	315	0.26	8.747f	1.333p	2.163	0.10
-573	.300	378	0.32	8.747f	1.335p	2.209	0.10
-664	.350	441	0.37	8.747f	1.336p	2.254	0.10
-756	.400	505	0.42	8.747f	1.337p	2.300	0.10
-847	.450	568	0.48	8.747f	1.338p	2.346	0.10
-938	.500	631	0.53	8.747f	1.339p	2.391	0.10
-1030	.550	694	0.58	8.747f	1.340p	2.437	0.10
-1121	.600	757	0.64	8.747f	1.340p	2.483	0.10
-1213	.650	820	0.69	8.747f	1.341p	2.529	0.10
-1310	.700	883	0.74	8.747f	1.338p	2.574	0.05
-1421	.750	946	0.79	8.747f	1.330p	2.621	0.05
-1532	.800	1009	0.85	8.746f	1.323p	2.669	0.05
-1643	.850	1072	0.90	8.746f	1.317p	2.718	0.05
-1754	.900	1135	0.95	8.746f	1.312p	2.767	0.05
-1866	.950	1198	1.01	8.746f	1.307p	2.817	0.05
-1932	.980	1236	1.04	8.746f	1.304p	2.848	0.05
	1.000	1261	1.06	8.746f	1.301p	2.868	
Distances in METERS.							
FO-TK8A.P Reference Point: Long.= 8.750f Trans.= 1.317p Vert.= 1.910							

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK8A.P, Contents: FUEL OIL at 0.840 Specific Gravity  
FO DAY

Snding	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON		LCG	TCG	VCG	
0	.002	3		0.00		8.747f	0.830p	1.923	0.01
50	.025	31		0.03		8.747f	1.215p	1.955	0.10
100	.052	66		0.06		8.747f	1.284p	1.981	0.10
150	.079	100		0.08		8.747f	1.305p	2.007	0.10
200	.107	135		0.11		8.747f	1.315p	2.032	0.10
250	.134	169		0.14		8.747f	1.321p	2.057	0.10
300	.162	204		0.17		8.747f	1.326p	2.082	0.10
350	.189	238		0.20		8.747f	1.328p	2.107	0.10
400	.216	273		0.23		8.747f	1.331p	2.132	0.10
450	.244	307		0.26		8.747f	1.332p	2.157	0.10
500	.271	342		0.29		8.747f	1.334p	2.182	0.10
550	.298	376		0.32		8.747f	1.335p	2.207	0.10
600	.326	411		0.35		8.747f	1.336p	2.232	0.10
650	.353	445		0.37		8.747f	1.336p	2.257	0.10
700	.380	480		0.40		8.747f	1.337p	2.282	0.10
750	.408	514		0.43		8.747f	1.338p	2.307	0.10
800	.435	549		0.46		8.747f	1.338p	2.332	0.10
850	.463	583		0.49		8.747f	1.339p	2.357	0.10
900	.490	618		0.52		8.747f	1.339p	2.382	0.10
950	.517	652		0.55		8.747f	1.339p	2.407	0.10
1000	.545	687		0.58		8.747f	1.340p	2.432	0.10
1050	.572	721		0.61		8.747f	1.340p	2.457	0.10
1100	.599	756		0.64		8.747f	1.340p	2.482	0.10
1150	.627	790		0.66		8.747f	1.340p	2.507	0.10
1200	.654	825		0.69		8.747f	1.341p	2.532	0.10
1250	.681	860		0.72		8.747f	1.341p	2.557	0.10
1300	.704	889		0.75		8.747f	1.337p	2.578	0.05
1350	.727	917		0.77		8.747f	1.334p	2.599	0.05
1400	.749	945		0.79		8.747f	1.330p	2.621	0.05
1450	.772	974		0.82		8.746f	1.327p	2.642	0.05
1500	.794	1002		0.84		8.746f	1.324p	2.664	0.05
1550	.817	1030		0.87		8.746f	1.321p	2.685	0.05
1600	.839	1059		0.89		8.746f	1.318p	2.707	0.05
1650	.862	1087		0.91		8.746f	1.316p	2.729	0.05
1700	.884	1116		0.94		8.746f	1.313p	2.752	0.05
1750	.907	1144		0.96		8.746f	1.311p	2.774	0.05
1800	.929	1172		0.98		8.746f	1.309p	2.797	0.05
1850	.952	1201		1.01		8.746f	1.307p	2.819	0.05
1900	.974	1229		1.03		8.746f	1.305p	2.842	0.05
1950	.996	1256		1.06		8.746f	1.303p	2.864	0.02
1985	1.000	1261		1.06		8.746f	1.301p	2.868	

Soundings in mm. — Other distances in METERS.

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK9.C, Contents: FUEL OIL at 0.840 Specific Gravity  
FO STORAGE/OVERFLOW

Ref Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON		LCG	TCG	VCG	
-311	.050	424		0.36		7.991f	0.000	0.688	0.55
-396	.100	849		0.71		7.706f	0.000	0.750	1.07
-459	.150	1273		1.07		7.480f	0.000	0.795	1.44
-512	.200	1698		1.43		7.284f	0.000	0.831	1.75
-558	.250	2122		1.78		7.109f	0.000	0.863	2.02
-599	.300	2546		2.14		6.949f	0.000	0.892	2.26
-637	.350	2971		2.50		6.802f	0.000	0.918	2.49
-673	.400	3395		2.85		6.674f	0.000	0.942	2.68
-708	.450	3820		3.21		6.565f	0.000	0.965	2.85
-743	.500	4244		3.57		6.472f	0.000	0.986	3.00
-776	.550	4669		3.92		6.391f	0.000	1.007	3.13
-809	.600	5093		4.28		6.320f	0.000	1.027	3.23
-842	.650	5517		4.63		6.258f	0.000	1.047	3.29
-874	.700	5942		4.99		6.204f	0.000	1.066	3.29
-907	.750	6366		5.35		6.157f	0.000	1.084	3.29
-939	.800	6791		5.70		6.116f	0.000	1.103	3.29
-974	.850	7215		6.06		6.073f	0.000	1.121	1.69
-1039	.900	7639		6.42		5.944f	0.000	1.140	1.61
-1107	.950	8064		6.77		5.824f	0.000	1.160	1.53
-1150	.980	8318		6.99		5.756f	0.000	1.173	1.48
	1.000	8488		7.13		5.704f	0.000	1.182	
Distances in METERS.									
FO-TK9.C Reference Point: Long.= 5.500f Trans.= 0.000 Vert.= 0.455									

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FO-TK9.C, Contents: FUEL OIL at 0.840 Specific Gravity  
FO STORAGE/OVERFLOW

Snding	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON		LCG	TCG	VCG	
0	.002	20		0.02		8.638f	0.000	0.538	0.01
50	.005	44		0.04		8.529f	0.000	0.564	0.03
100	.010	83		0.07		8.420f	0.000	0.590	0.07
150	.016	139		0.12		8.310f	0.000	0.615	0.14
200	.025	216		0.18		8.199f	0.000	0.640	0.24
250	.037	316		0.27		8.089f	0.000	0.666	0.38
300	.052	442		0.37		7.978f	0.000	0.691	0.58
350	.070	595		0.50		7.865f	0.000	0.716	0.78
400	.091	777		0.65		7.749f	0.000	0.741	0.99
450	.116	985		0.83		7.629f	0.000	0.765	1.20
500	.144	1221		1.03		7.506f	0.000	0.790	1.40
550	.175	1483		1.25		7.380f	0.000	0.814	1.60
600	.209	1773		1.49		7.252f	0.000	0.837	1.80
650	.246	2089		1.76		7.122f	0.000	0.861	2.00
700	.287	2433		2.04		6.991f	0.000	0.884	2.20
750	.338	2872		2.41		6.835f	0.000	0.912	2.44
800	.395	3356		2.82		6.685f	0.000	0.940	2.66
850	.455	3859		3.24		6.556f	0.000	0.967	2.87
900	.525	4454		3.74		6.431f	0.000	0.997	3.07
950	.599	5083		4.27		6.322f	0.000	1.027	3.23
1000	.674	5720		4.80		6.231f	0.000	1.056	3.29
1050	.750	6369		5.35		6.157f	0.000	1.084	3.29
1100	.827	7020		5.90		6.096f	0.000	1.113	3.29
1150	.876	7432		6.24		6.005f	0.000	1.130	1.65
1200	.913	7753		6.51		5.911f	0.000	1.145	1.59
1250	.950	8062		6.77		5.825f	0.000	1.160	1.53
1300	.985	8359		7.02		5.745f	0.000	1.175	1.47
1350	.998	8474		7.12		5.710f	0.000	1.181	0.19
1388	1.000	8488		7.13		5.704f	0.000	1.182	

Soundings in mm. Other distances in METERS.



## GHS 11.00 TANK NO 11 (FRESH WATER: FR 26.75-31, PORT) CAPACITY TABLE

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FW-TK11.P, Contents: FRESH WATER at 1.000 Specific Gravity  
FW PORT

Ref	Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
			LITERS	METRIC TON	LCG	TCG	VCG	
-88	.050		160	0.16	28.586f	2.613p	2.919	0.07
-169	.100		321	0.32	28.603f	2.620p	2.962	0.08
-245	.150		481	0.48	28.617f	2.627p	3.002	0.09
-317	.200		641	0.64	28.629f	2.633p	3.041	0.10
-385	.250		801	0.80	28.640f	2.639p	3.078	0.11
-451	.300		962	0.96	28.650f	2.645p	3.114	0.12
-513	.350		1122	1.12	28.660f	2.651p	3.148	0.13
-573	.400		1282	1.28	28.668f	2.657p	3.182	0.14
-631	.450		1443	1.44	28.676f	2.663p	3.215	0.15
-687	.500		1603	1.60	28.683f	2.669p	3.247	0.16
-741	.550		1763	1.76	28.690f	2.674p	3.278	0.17
-794	.600		1924	1.92	28.696f	2.680p	3.308	0.18
-845	.650		2084	2.08	28.702f	2.685p	3.338	0.20
-894	.700		2244	2.24	28.708f	2.690p	3.367	0.21
-943	.750		2404	2.40	28.713f	2.695p	3.395	0.22
-990	.800		2565	2.56	28.718f	2.701p	3.423	0.23
-1036	.850		2725	2.72	28.723f	2.705p	3.451	0.24
-1082	.900		2885	2.89	28.729f	2.710p	3.478	0.24
-1131	.950		3046	3.05	28.743f	2.713p	3.504	0.14
-1175	.980		3142	3.14	28.769f	2.712p	3.520	0.09
	1.000		3206	3.21	28.798f	2.710p	3.531	
Distances in METERS.								
FW-TK11.P Reference Point: Long.= 28.875f Trans.= 2.799p Vert.= 2.875								

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: FW-TK12.S, Contents: FRESH WATER at 1.000 Specific Gravity  
FW STBD

Ref	Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
			LITERS	METRIC	TON		LCG	TCG	VCG	
-88		.050	160		0.16		28.586f	2.613s	2.919	0.07
-169		.100	321		0.32		28.603f	2.620s	2.962	0.08
-245		.150	481		0.48		28.617f	2.627s	3.002	0.09
-317		.200	641		0.64		28.629f	2.633s	3.041	0.10
-385		.250	801		0.80		28.640f	2.639s	3.078	0.11
-451		.300	962		0.96		28.650f	2.645s	3.114	0.12
-513		.350	1122		1.12		28.660f	2.651s	3.148	0.13
-573		.400	1282		1.28		28.668f	2.657s	3.182	0.14
-631		.450	1443		1.44		28.676f	2.663s	3.215	0.15
-687		.500	1603		1.60		28.683f	2.669s	3.247	0.16
-741		.550	1763		1.76		28.690f	2.674s	3.278	0.17
-794		.600	1924		1.92		28.696f	2.680s	3.308	0.18
-845		.650	2084		2.08		28.702f	2.685s	3.338	0.20
-894		.700	2244		2.24		28.708f	2.690s	3.367	0.21
-943		.750	2404		2.40		28.713f	2.695s	3.395	0.22
-990		.800	2565		2.56		28.718f	2.701s	3.423	0.23
-1036		.850	2725		2.72		28.723f	2.705s	3.451	0.24
-1082		.900	2885		2.89		28.729f	2.710s	3.478	0.24
-1131		.950	3046		3.05		28.743f	2.713s	3.504	0.14
-1175		.980	3142		3.14		28.769f	2.712s	3.520	0.09
		1.000	3206		3.21		28.798f	2.710s	3.531	
Distances in METERS.										
FW-TK12.S Reference Point: Long.= 28.875f Trans.= 2.799s Vert.= 2.875										

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: LO-TK5.S, Contents: LUBE OIL at 0.900 Specific Gravity  
LO MAIN ENGINE

Ref Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
-184	.050	32	0.03	14.541f	0.799s	0.483	0.00
-252	.100	64	0.06	14.528f	0.854s	0.528	0.01
-304	.150	96	0.09	14.522f	0.896s	0.563	0.02
-348	.200	128	0.11	14.519f	0.931s	0.592	0.04
-386	.250	160	0.14	14.516f	0.962s	0.618	0.05
-422	.300	192	0.17	14.515f	0.990s	0.641	0.07
-454	.350	223	0.20	14.514f	1.014s	0.662	0.08
-487	.400	255	0.23	14.513f	1.034s	0.683	0.08
-519	.450	287	0.26	14.512f	1.049s	0.702	0.08
-551	.500	319	0.29	14.512f	1.061s	0.721	0.08
-584	.550	351	0.32	14.511f	1.071s	0.739	0.08
-616	.600	383	0.34	14.511f	1.079s	0.757	0.08
-648	.650	415	0.37	14.511f	1.086s	0.774	0.08
-681	.700	447	0.40	14.511f	1.092s	0.792	0.08
-713	.750	479	0.43	14.510f	1.097s	0.809	0.08
-745	.800	511	0.46	14.510f	1.101s	0.826	0.08
-778	.850	543	0.49	14.510f	1.105s	0.843	0.08
-810	.900	575	0.52	14.510f	1.109s	0.860	0.07
-848	.950	607	0.55	14.514f	1.112s	0.877	0.06
-875	.980	626	0.56	14.518f	1.114s	0.887	0.05
	1.000	638	0.57	14.522f	1.115s	0.894	
Distances in METERS.							
LO-TK5.S Reference Point: Long.= 14.500f Trans.= 1.191s Vert.= 0.353							

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: LO-TK5.S, Contents: LUBE OIL at 0.900 Specific Gravity  
LO MAIN ENGINE

		Volume	Weight	Center of Gravity			FSM
Snding	Load	LITERS	METRIC TON	LCG	TCG	VCG	m.-MT
0	.001	0	0.00	14.831f	0.681s	0.378	0.00
50	.007	5	0.00	14.609f	0.718s	0.415	0.00
100	.024	15	0.01	14.560f	0.758s	0.449	0.00
150	.049	31	0.03	14.541f	0.798s	0.482	0.00
200	.084	54	0.05	14.531f	0.838s	0.515	0.01
250	.128	82	0.07	14.524f	0.879s	0.548	0.02
300	.181	116	0.10	14.520f	0.918s	0.581	0.03
350	.243	155	0.14	14.517f	0.958s	0.614	0.05
400	.313	200	0.18	14.514f	0.997s	0.647	0.07
450	.389	249	0.22	14.513f	1.030s	0.678	0.08
500	.465	297	0.27	14.512f	1.053s	0.708	0.08
550	.542	346	0.31	14.511f	1.069s	0.736	0.08
600	.618	394	0.35	14.511f	1.081s	0.763	0.08
650	.694	443	0.40	14.511f	1.091s	0.789	0.08
700	.771	492	0.44	14.510f	1.099s	0.816	0.08
750	.848	541	0.49	14.510f	1.105s	0.842	0.08
800	.922	589	0.53	14.511f	1.110s	0.867	0.07
850	.981	626	0.56	14.518f	1.114s	0.887	0.05
873	1.000	638	0.57	14.522f	1.115s	0.894	
Soundings in mm. — Other distances in METERS.							

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: BILGE\_W-TK4.P, Contents: BILGE WATER at 1.000 Specific Gravity  
BILGE WATER

Ref	Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
			LITERS	METRIC TON	LCG	TCG	VCG	
-221	.050		81	0.08	16.121f	0.774p	0.437	0.01
-299	.100		162	0.16	16.083f	0.834p	0.489	0.04
-359	.150		243	0.24	16.066f	0.881p	0.529	0.07
-409	.200		324	0.32	16.056f	0.919p	0.563	0.11
-454	.250		405	0.40	16.049f	0.953p	0.593	0.15
-495	.300		486	0.49	16.044f	0.984p	0.620	0.20
-532	.350		567	0.57	16.040f	1.012p	0.644	0.25
-567	.400		648	0.65	16.038f	1.038p	0.667	0.28
-601	.450		729	0.73	16.038f	1.060p	0.689	0.31
-635	.500		810	0.81	16.038f	1.078p	0.710	0.31
-668	.550		891	0.89	16.039f	1.093p	0.730	0.31
-702	.600		972	0.97	16.039f	1.106p	0.750	0.31
-736	.650		1052	1.05	16.039f	1.117p	0.769	0.31
-769	.700		1133	1.13	16.040f	1.126p	0.788	0.31
-803	.750		1214	1.21	16.040f	1.134p	0.806	0.31
-836	.800		1295	1.30	16.040f	1.141p	0.824	0.31
-870	.850		1376	1.38	16.040f	1.147p	0.843	0.31
-903	.900		1457	1.46	16.040f	1.152p	0.861	0.31
-937	.950		1538	1.54	16.040f	1.157p	0.878	0.31
-957	.980		1587	1.59	16.041f	1.160p	0.889	0.31
	1.000		1619	1.62	16.041f	1.162p	0.896	
Distances in METERS.								
BILGE_W-TK4.P Reference Point: Long.= 16.000f Trans.= 1.295p Vert.= 0.280								

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: BILGE\_W-TK4.P, Contents: BILGE WATER at 1.000 Specific Gravity  
BILGE WATER

Snding	Load	Volume	Weight	Center of Gravity			FSM
		LITERS	METRIC	TON	LCG	TCG	VCG
0	.010	16	0.02	16.270f	0.692p	0.365	0.00
50	.017	28	0.03	16.208f	0.713p	0.384	0.00
100	.027	43	0.04	16.168f	0.733p	0.402	0.01
150	.038	61	0.06	16.140f	0.754p	0.420	0.01
200	.051	83	0.08	16.120f	0.775p	0.438	0.01
250	.067	108	0.11	16.104f	0.797p	0.456	0.02
300	.089	143	0.14	16.089f	0.822p	0.478	0.03
350	.113	183	0.18	16.078f	0.848p	0.500	0.05
400	.141	228	0.23	16.069f	0.873p	0.522	0.07
450	.172	278	0.28	16.061f	0.898p	0.544	0.09
500	.219	355	0.35	16.053f	0.933p	0.575	0.12
550	.275	446	0.45	16.047f	0.969p	0.606	0.17
600	.338	547	0.55	16.041f	1.005p	0.638	0.23
650	.406	657	0.66	16.038f	1.040p	0.670	0.29
700	.478	774	0.77	16.038f	1.070p	0.701	0.31
750	.552	895	0.89	16.039f	1.094p	0.731	0.31
800	.627	1015	1.02	16.039f	1.112p	0.760	0.31
850	.701	1136	1.14	16.040f	1.126p	0.788	0.31
900	.776	1256	1.26	16.040f	1.137p	0.816	0.31
950	.850	1377	1.38	16.040f	1.147p	0.843	0.31
1000	.925	1497	1.50	16.040f	1.155p	0.869	0.31
1050	.999	1618	1.62	16.041f	1.161p	0.896	0.31
1100	1.000	1619	1.62	16.041f	1.162p	0.896	
Soundings in mm. — Other distances in METERS.							

Soundings in mm. — Other distances in METERS.

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: SEWAGE-TK6.C, Contents: SLUDGE at 1.000 Specific Gravity  
SEWAGE SLUDGE

Ref	Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
			LITERS	METRIC	TON		LCG	TCG	VCG	
-161	.050		29		0.03		12.765f	0.000	0.301	0.02
-222	.100		58		0.06		12.761f	0.000	0.342	0.06
-269	.150		86		0.09		12.758f	0.000	0.374	0.09
-314	.200		115		0.12		12.756f	0.000	0.401	0.09
-358	.250		144		0.14		12.755f	0.000	0.426	0.09
-403	.300		173		0.17		12.754f	0.000	0.450	0.09
-448	.350		201		0.20		12.754f	0.000	0.474	0.09
-493	.400		230		0.23		12.753f	0.000	0.497	0.09
-537	.450		259		0.26		12.753f	0.000	0.520	0.09
-582	.500		288		0.29		12.753f	0.000	0.543	0.09
-627	.550		316		0.32		12.752f	0.000	0.566	0.09
-671	.600		345		0.35		12.752f	0.000	0.589	0.09
-716	.650		374		0.37		12.752f	0.000	0.611	0.09
-761	.700		403		0.40		12.752f	0.000	0.634	0.09
-805	.750		431		0.43		12.752f	0.000	0.657	0.09
-850	.800		460		0.46		12.752f	0.000	0.679	0.09
-895	.850		489		0.49		12.752f	0.000	0.702	0.09
-940	.900		518		0.52		12.752f	0.000	0.724	0.09
-995	.950		546		0.55		12.750f	0.000	0.747	0.04
-1034	.980		564		0.56		12.749f	0.000	0.761	0.04
	1.000		575		0.58		12.748f	0.000	0.771	
Distances in METERS.										
SEWAGE-TK6.C Reference Point: Long.= 12.750f Trans.= 0.000 Vert.= 0.190										

TANK CHARACTERISTICS								
No Trim, No Heel								
Tank: GW-TK7A.C, Contents: GREY WATER at 1.000 Specific Gravity GREY WATER								
Ref	Ht	Load	Volume LITERS	Weight METRIC TON	Center of Gravity			FSM m.-MT
					LCG	TCG	VCG	
-239	.050		200	0.20	11.096f	0.000	0.427	0.20
-305	.100		399	0.40	10.928f	0.000	0.475	0.52
-355	.150		599	0.60	10.843f	0.000	0.510	0.86
-398	.200		799	0.80	10.782f	0.000	0.539	1.09
-439	.250		999	1.00	10.733f	0.000	0.565	1.24
-478	.300		1198	1.20	10.693f	0.000	0.589	1.34
-516	.350		1398	1.40	10.662f	0.000	0.611	1.37
-555	.400		1598	1.60	10.639f	0.000	0.633	1.37
-593	.450		1797	1.80	10.620f	0.000	0.654	1.37
-631	.500		1997	2.00	10.606f	0.000	0.675	1.37
-670	.550		2197	2.20	10.594f	0.000	0.695	1.37
-708	.600		2397	2.40	10.584f	0.000	0.715	1.37
-746	.650		2596	2.60	10.575f	0.000	0.735	1.37
-784	.700		2796	2.80	10.568f	0.000	0.755	1.37
-823	.750		2996	3.00	10.562f	0.000	0.775	1.37
-861	.800		3195	3.20	10.556f	0.000	0.795	1.37
-899	.850		3395	3.40	10.551f	0.000	0.814	1.37
-938	.900		3595	3.59	10.547f	0.000	0.834	1.37
-976	.950		3795	3.79	10.543f	0.000	0.854	1.37
-999	.980		3914	3.91	10.541f	0.000	0.865	1.37
	1.000		3994	3.99	10.517f	0.000	0.874	
Distances in METERS.								
GW-TK7A.C Reference Point: Long.= 10.500f Trans.= 0.000 Vert.= 0.249								



TANK CHARACTERISTICS

No Trim, No Heel

Tank: GW-TK7A.C, Contents: GREY WATER at 1.000 Specific Gravity  
GREY WATER

Snding	Load	Volume	Weight	Center of Gravity			FSM
		LITERS	METRIC TON	LCG	TCG	VCG	m. -MT
0	.008	30	0.03	11.512f	0.000	0.341	0.01
50	.020	80	0.08	11.324f	0.000	0.379	0.06
100	.042	168	0.17	11.142f	0.000	0.417	0.16
150	.075	299	0.30	10.995f	0.000	0.453	0.35
200	.119	475	0.47	10.891f	0.000	0.489	0.66
250	.172	688	0.69	10.814f	0.000	0.523	0.97
300	.232	928	0.93	10.749f	0.000	0.556	1.20
350	.296	1182	1.18	10.696f	0.000	0.587	1.34
400	.361	1442	1.44	10.657f	0.000	0.616	1.37
450	.426	1703	1.70	10.629f	0.000	0.644	1.37
500	.491	1962	1.96	10.608f	0.000	0.671	1.37
550	.556	2221	2.22	10.592f	0.000	0.697	1.37
600	.618	2468	2.47	10.580f	0.000	0.722	1.37
650	.678	2708	2.71	10.571f	0.000	0.747	1.37
700	.736	2940	2.94	10.563f	0.000	0.770	1.37
750	.793	3166	3.17	10.557f	0.000	0.792	1.37
800	.849	3392	3.39	10.551f	0.000	0.814	1.37
850	.906	3618	3.62	10.546f	0.000	0.836	1.37
900	.962	3844	3.84	10.542f	0.000	0.858	1.37
950	.988	3945	3.95	10.534f	0.000	0.868	0.19
1000	.994	3970	3.97	10.525f	0.000	0.871	0.14
1050	.998	3986	3.99	10.520f	0.000	0.873	0.02
1100	1.000	3994	3.99	10.517f	0.000	0.874	0.01
Soundings in mm. — Other distances in METERS.							

Soundings in mm. Other distances in METERS.

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: BW-TK7B.C, Contents: BLACK WATER at 1.000 Specific Gravity  
BLACK WATER

Ref Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON		LCG	TCG	VCG	
-164	.050	31		0.03		12.264f	0.000	0.332	0.02
-228	.100	63		0.06		12.260f	0.000	0.375	0.07
-277	.150	94		0.09		12.257f	0.000	0.408	0.11
-322	.200	126		0.13		12.254f	0.000	0.436	0.13
-366	.250	157		0.16		12.251f	0.000	0.461	0.13
-411	.300	189		0.19		12.250f	0.000	0.486	0.13
-455	.350	220		0.22		12.249f	0.000	0.510	0.13
-499	.400	251		0.25		12.248f	0.000	0.533	0.13
-543	.450	283		0.28		12.247f	0.000	0.556	0.13
-588	.500	314		0.31		12.247f	0.000	0.579	0.13
-632	.550	346		0.35		12.246f	0.000	0.602	0.13
-676	.600	377		0.38		12.246f	0.000	0.624	0.13
-720	.650	409		0.41		12.245f	0.000	0.647	0.13
-765	.700	440		0.44		12.245f	0.000	0.669	0.13
-809	.750	471		0.47		12.245f	0.000	0.692	0.13
-853	.800	503		0.50		12.245f	0.000	0.714	0.13
-897	.850	534		0.53		12.245f	0.000	0.737	0.13
-942	.900	566		0.57		12.244f	0.000	0.759	0.13
-986	.950	597		0.60		12.244f	0.000	0.781	0.13
-1013	.980	616		0.62		12.244f	0.000	0.795	0.13
	1.000	629		0.63		12.244f	0.000	0.804	
Distances in METERS.									
BW-TK7B.C Reference Point: Long.= 12.250f Trans.= 0.000 Vert.= 0.220									

## GHS 11.00 TANK NO 15 (DIRTY OIL &amp; SLUDGE: FR 13-15) CAPACITY TABLE

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: DIRTY\_O-TK15.C, Contents: DIRTY OIL at 1.000 Specific Gravity  
DIRTY OIL SLUDGE

Ref	Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
			LITERS	METRIC	TON		LCG	TCG	VCG	
-203	.050		127		0.13		14.192f	0.000	0.240	0.09
-269	.100		254		0.25		14.134f	0.000	0.285	0.25
-321	.150		381		0.38		14.102f	0.000	0.319	0.37
-370	.200		508		0.51		14.077f	0.000	0.349	0.38
-419	.250		635		0.64		14.062f	0.000	0.376	0.38
-468	.300		762		0.76		14.052f	0.000	0.403	0.38
-516	.350		889		0.89		14.044f	0.000	0.429	0.38
-565	.400		1016		1.02		14.039f	0.000	0.454	0.38
-614	.450		1143		1.14		14.035f	0.000	0.480	0.38
-663	.500		1270		1.27		14.031f	0.000	0.505	0.38
-712	.550		1397		1.40		14.029f	0.000	0.530	0.38
-761	.600		1524		1.52		14.026f	0.000	0.555	0.38
-810	.650		1651		1.65		14.024f	0.000	0.580	0.38
-858	.700		1778		1.78		14.023f	0.000	0.604	0.38
-907	.750		1905		1.91		14.021f	0.000	0.629	0.38
-956	.800		2032		2.03		14.020f	0.000	0.654	0.38
-1005	.850		2159		2.16		14.019f	0.000	0.678	0.38
-1054	.900		2287		2.29		14.018f	0.000	0.703	0.38
-1106	.950		2414		2.41		14.020f	0.000	0.728	0.34
-1137	.980		2490		2.49		14.021f	0.000	0.743	0.34
	1.000		2541		2.54		14.022f	0.000	0.752	
Distances in METERS.										
DIRTY_O-TK15.C Reference Point: Long.= 14.000f Trans.= 0.000 Vert.= 0.092										

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: DIRTY\_O-TK15.C, Contents: DIRTY OIL at 1.000 Specific Gravity  
DIRTY OIL SLUDGE

Snding	Load	Volume	Weight	Center of Gravity			FSM
		LITERS	METRIC TON	LCG	TCG	VCG	m. -MT
0	.003	8	0.01	14.590f	0.000	0.148	0.00
50	.011	29	0.03	14.388f	0.000	0.179	0.01
100	.027	69	0.07	14.261f	0.000	0.210	0.04
150	.050	128	0.13	14.192f	0.000	0.240	0.09
200	.081	205	0.20	14.150f	0.000	0.269	0.19
250	.118	301	0.30	14.122f	0.000	0.298	0.31
300	.161	409	0.41	14.095f	0.000	0.326	0.38
350	.205	521	0.52	14.075f	0.000	0.352	0.38
400	.249	633	0.63	14.062f	0.000	0.376	0.38
450	.293	745	0.74	14.053f	0.000	0.399	0.38
500	.337	857	0.86	14.046f	0.000	0.422	0.38
550	.381	969	0.97	14.041f	0.000	0.445	0.38
600	.428	1087	1.09	14.036f	0.000	0.469	0.38
650	.475	1207	1.21	14.033f	0.000	0.492	0.38
700	.525	1334	1.33	14.030f	0.000	0.517	0.38
750	.576	1463	1.46	14.027f	0.000	0.543	0.38
800	.627	1592	1.59	14.025f	0.000	0.568	0.38
850	.678	1722	1.72	14.023f	0.000	0.593	0.38
900	.729	1852	1.85	14.022f	0.000	0.619	0.38
950	.780	1982	1.98	14.020f	0.000	0.644	0.38
1000	.832	2113	2.11	14.019f	0.000	0.669	0.38
1050	.883	2243	2.24	14.018f	0.000	0.694	0.38
1100	.932	2368	2.37	14.019f	0.000	0.719	0.34
1150	.980	2490	2.49	14.021f	0.000	0.743	0.34
1173	1.000	2541	2.54	14.022f	0.000	0.752	
Soundings in mm. — Other distances in METERS.							

Soundings in mm. — Other distances in METERS.

## GHS 11.00 TANK NO 16 (WATER BALLAST: FR AE-1, STBD) CAPACITY TABLE

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: WB-TK16.S, Contents: BALLAST at 1.025 Specific Gravity  
WATER BALLAST STBD

Ref Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
-109	.050	75	0.08	0.535f	2.285s	1.358	0.48
-160	.100	150	0.15	0.530f	2.188s	1.389	0.68
-200	.150	224	0.23	0.533f	2.117s	1.415	0.71
-240	.200	299	0.31	0.535f	2.080s	1.437	0.71
-279	.250	374	0.38	0.537f	2.059s	1.459	0.71
-319	.300	449	0.46	0.538f	2.045s	1.479	0.72
-358	.350	523	0.54	0.538f	2.035s	1.500	0.72
-398	.400	598	0.61	0.539f	2.028s	1.520	0.73
-437	.450	673	0.69	0.539f	2.023s	1.541	0.73
-476	.500	748	0.77	0.540f	2.019s	1.561	0.73
-515	.550	822	0.84	0.540f	2.016s	1.581	0.74
-555	.600	897	0.92	0.540f	2.013s	1.601	0.74
-594	.650	972	1.00	0.540f	2.011s	1.620	0.74
-633	.700	1047	1.07	0.541f	2.010s	1.640	0.75
-672	.750	1121	1.15	0.541f	2.008s	1.660	0.75
-710	.800	1196	1.23	0.541f	2.007s	1.680	0.76
-749	.850	1271	1.30	0.541f	2.007s	1.699	0.76
-788	.900	1346	1.38	0.541f	2.006s	1.719	0.76
-827	.950	1420	1.46	0.541f	2.006s	1.739	0.77
-850	.980	1465	1.50	0.541f	2.006s	1.750	0.77
	1.000	1495	1.53	0.541f	2.005s	1.758	
Distances in METERS.							
WB-TK16.S Reference Point: Long.= 0.510f Trans.= 2.038s Vert.= 1.285							

## GHS 11.00 TANK NO 17 (WATER BALLAST: FR AE-1, PORT) CAPACITY TABLE

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: WB-TK17.P, Contents: BALLAST at 1.025 Specific Gravity  
WATER BALLAST PORT

Ref	Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
			LITERS	METRIC TON	LCG	TCG	VCG	
-109	.050		75	0.08	0.535f	2.285p	1.358	0.48
-160	.100		150	0.15	0.530f	2.188p	1.389	0.68
-200	.150		224	0.23	0.533f	2.117p	1.415	0.71
-240	.200		299	0.31	0.535f	2.080p	1.437	0.71
-279	.250		374	0.38	0.537f	2.059p	1.459	0.71
-319	.300		449	0.46	0.538f	2.045p	1.479	0.72
-358	.350		523	0.54	0.538f	2.035p	1.500	0.72
-398	.400		598	0.61	0.539f	2.028p	1.520	0.73
-437	.450		673	0.69	0.539f	2.023p	1.541	0.73
-476	.500		748	0.77	0.540f	2.019p	1.561	0.73
-515	.550		822	0.84	0.540f	2.016p	1.581	0.74
-555	.600		897	0.92	0.540f	2.013p	1.601	0.74
-594	.650		972	1.00	0.540f	2.011p	1.620	0.74
-633	.700		1047	1.07	0.541f	2.010p	1.640	0.75
-672	.750		1121	1.15	0.541f	2.008p	1.660	0.75
-710	.800		1196	1.23	0.541f	2.007p	1.680	0.76
-749	.850		1271	1.30	0.541f	2.007p	1.699	0.76
-788	.900		1346	1.38	0.541f	2.006p	1.719	0.76
-827	.950		1420	1.46	0.541f	2.006p	1.739	0.77
-850	.980		1465	1.50	0.541f	2.006p	1.750	0.77
	1.000		1495	1.53	0.541f	2.005p	1.758	
Distances in METERS.								
WB-TK17.P Reference Point: Long.= 0.510f Trans.= 2.038p Vert.= 1.285								

## GHS 11.00 TANK NO 13 (GASOLINE: FR 1.54-2.96, PORT) CAPACITY TABLE

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: GAS-TK13.P, Contents: GASOLINE at 0.735 Specific Gravity  
GASOLINE PORT

Ref Ht	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
-190	.050	66	0.05	2.250f	3.029p	2.771	0.01
-268	.100	133	0.10	2.250f	2.965p	2.824	0.03
-328	.150	199	0.15	2.250f	2.916p	2.864	0.06
-379	.200	266	0.20	2.250f	2.875p	2.898	0.09
-424	.250	332	0.24	2.250f	2.839p	2.927	0.11
-467	.300	398	0.29	2.250f	2.812p	2.955	0.12
-510	.350	465	0.34	2.250f	2.793p	2.980	0.12
-553	.400	531	0.39	2.250f	2.779p	3.005	0.12
-595	.450	598	0.44	2.250f	2.769p	3.029	0.12
-638	.500	664	0.49	2.250f	2.761p	3.052	0.12
-680	.550	730	0.54	2.250f	2.754p	3.075	0.12
-722	.600	797	0.59	2.250f	2.749p	3.097	0.12
-764	.650	863	0.63	2.250f	2.745p	3.120	0.13
-806	.700	929	0.68	2.250f	2.741p	3.142	0.13
-847	.750	996	0.73	2.250f	2.738p	3.164	0.13
-889	.800	1062	0.78	2.250f	2.736p	3.186	0.13
-930	.850	1129	0.83	2.250f	2.734p	3.207	0.13
-976	.900	1195	0.88	2.250f	2.735p	3.229	0.06
-1041	.950	1261	0.93	2.250f	2.744p	3.251	0.01
-1126	.980	1301	0.96	2.250f	2.755p	3.266	0.00
	1.000	1328	0.98	2.250f	2.763p	3.277	
Distances in METERS.							
GAS-TK13.P Reference Point: Long.= 2.250f Trans.= 2.703p Vert.= 2.645							

## GHS 11.00 TANK NO 14 (GASOLINE: FR 1.54-2.96, STBD) CAPACITY TABLE

## TANK CHARACTERISTICS

No Trim, No Heel

Tank: GAS-TK14.S, Contents: GASOLINE at 0.735 Specific Gravity  
GASOLINE STBD

Ref	Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
			LITERS	METRIC	TON		LCG	TCG	VCG	
-190		.050	66		0.05		2.250f	3.029s	2.771	0.01
-268		.100	133		0.10		2.250f	2.965s	2.824	0.03
-328		.150	199		0.15		2.250f	2.916s	2.864	0.06
-379		.200	266		0.20		2.250f	2.875s	2.898	0.09
-424		.250	332		0.24		2.250f	2.839s	2.927	0.11
-467		.300	398		0.29		2.250f	2.812s	2.955	0.12
-510		.350	465		0.34		2.250f	2.793s	2.980	0.12
-553		.400	531		0.39		2.250f	2.779s	3.005	0.12
-595		.450	598		0.44		2.250f	2.769s	3.029	0.12
-638		.500	664		0.49		2.250f	2.761s	3.052	0.12
-680		.550	730		0.54		2.250f	2.754s	3.075	0.12
-722		.600	797		0.59		2.250f	2.749s	3.097	0.12
-764		.650	863		0.63		2.250f	2.745s	3.120	0.13
-806		.700	929		0.68		2.250f	2.741s	3.142	0.13
-847		.750	996		0.73		2.250f	2.738s	3.164	0.13
-889		.800	1062		0.78		2.250f	2.736s	3.186	0.13
-930		.850	1129		0.83		2.250f	2.734s	3.207	0.13
-976		.900	1195		0.88		2.250f	2.735s	3.229	0.06
-1041		.950	1261		0.93		2.250f	2.744s	3.251	0.01
-1126		.980	1301		0.96		2.250f	2.755s	3.266	0.00
		1.000	1328		0.98		2.250f	2.763s	3.277	
Distances in METERS.										
GAS-TK14.S Reference Point: Long.= 2.250f Trans.= 2.703s Vert.= 2.645										



## TANK CHARACTERISTICS

No Trim, No Heel

Tank: DG\_LO\_TK.S, Contents: DG LO at 0.900 Specific Gravity  
 DG LUBE OIL RESEVOIR

Ref Ht	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON		LCG	TCG	VCG	
-35	.050	3		0.00		7.825f	0.187s	2.667	0.00
-70	.100	6		0.01		7.825f	0.187s	2.685	0.00
-105	.150	9		0.01		7.825f	0.187s	2.702	0.00
-140	.200	13		0.01		7.825f	0.187s	2.720	0.00
-175	.250	16		0.01		7.825f	0.187s	2.737	0.00
-210	.300	19		0.02		7.825f	0.187s	2.755	0.00
-245	.350	22		0.02		7.825f	0.187s	2.772	0.00
-280	.400	25		0.02		7.825f	0.187s	2.790	0.00
-315	.450	28		0.03		7.825f	0.187s	2.807	0.00
-350	.500	32		0.03		7.825f	0.187s	2.825	0.00
-385	.550	35		0.03		7.825f	0.187s	2.842	0.00
-420	.600	38		0.03		7.825f	0.187s	2.860	0.00
-455	.650	41		0.04		7.825f	0.187s	2.877	0.00
-490	.700	44		0.04		7.825f	0.187s	2.895	0.00
-525	.750	47		0.04		7.825f	0.187s	2.912	0.00
-560	.800	50		0.05		7.825f	0.187s	2.930	0.00
-595	.850	54		0.05		7.825f	0.187s	2.947	0.00
-630	.900	57		0.05		7.825f	0.187s	2.965	0.00
-665	.950	60		0.05		7.825f	0.187s	2.982	0.00
-686	.980	62		0.06		7.825f	0.187s	2.993	0.00
	1.000	63		0.06		7.825f	0.187s	3.000	
Distances in METERS.									
DG_LO_TK.S Reference Point: Long.= 7.825f Trans.= 0.187s Vert.= 2.650									

### Section 13. INDEPENDENT ESTIMATION OF STABILITY BY MASTER

To enable the Master to calculate the vessel's stability for loading conditions other than those presented in this manual, Stability Worksheets No.1, 2, 3 and 4 have been provided. Instructions on the use of the worksheets are provided on the bottoms of Worksheet No.1 and 4.

The following fixed loads are used in the conditions contained in this manual:

Item	Weight (tonne)	LCG (m) (+ aft FR 0)	VCG (m) (ABL)	TCG (m) (+ stbd)
Crew & Equipment (All Cases)	1.80	-24.80	4.27	-0.30
Stores (Departure)	1.50	-15.50	4.90	-1.45
Stores (Arrival)	0.15	-15.50	4.90	-1.45
Emergency Gen FO @ 95% (All Cases)	0.31	-15.58	5.60	0.61
SAR Equipment – GFE (All Cases)	0.304	-17.93	4.71	-0.15

To demonstrate the use of these worksheets, a worked example based on Case S4 (contained in Section 11), has been included. The notes below discuss various aspects of the calculation.

**Note:**

Stability Worksheet No. 1: Tank Loads

1. Tank weight, centre of gravity and FSM were taken from the Tables in Section 12 for the appropriate loading level. These tables present information for a No trim and No heel situation.

Stability Worksheet No. 2: Fixed Loads and Vessel Total Load

2. The worksheet does not contain weights or centers for any fixed loads other than Lightship. These should be entered by the Master, as appropriate, using the information presented in the table above as guidance. If necessary, room has been provided for other types of fixed loads to be added.

**Note cont:****Stability Worksheet No. 3: Trim, Drafts, GM and VCG (fluid)**

3. Hydrostatic properties are taken from the No trim, No heel table contained on page 23 in Section 7. The values are interpolated from the displacements of 220.29 and 241.47 tonne to the calculated displacement of 236.54 tonne. As an example the mean draft is interpolated as follows:  $\text{Interpolated draft} = 2.00 + (2.20 - 2.10) * (236.54 - 220.29) / (241.47 - 220.29) = 2.077 \text{ m}$ . LCF is negative as it is forward of frame 0 (i.e. “16.416f” for a displacement of 220.29 tonne. Similarly for LCB.
4. Trim aft is considered positive.
5. The calculated VCG (fluid) is 3.06m. Using the Maximum VCG curves from Section 6 it can be seen that the upper limit of VCG (fluid) for a displacement of 236.54 tonne and a trim of 0.277m aft is about 3.53m. Therefore, the calculated loading condition will meet all of the required stability criteria.
6. If it is required to calculate the actual stability characteristics continue on to Worksheet No. 4.

**Stability Worksheet No. 4: Stability Criteria**

7. Calculate the product of VCG (fluid) \* Sin (Heel Angle) and record on the worksheet.
8. KN values are taken from the 0.25m aft trim table (trim closest to actual trim of 0.277m aft) contained on page 42 of Section 8. The values are interpolated from the displacements of 235 and 240 tonne to the calculated displacement of 236.54 tonne and recorded for the appropriate angles of heel.
9. Calculate the resulting GZ values and then plot the values of GZ vs. Heel Angle.
10. Determine the righting energy (i.e. Area from 0 to 30 degrees, Area from 0 to 40 degrees and Area from 30 to 40 degrees using the appropriate GZ values and carrying out the indicated calculations. Compare to the required values to ensure that the criteria have been satisfied.
11. Fill in the values of GZ at 30 degrees and the angle of maximum GZ and compare to the required values to ensure that the criteria have been satisfied.

**MSPV**

**STABILITY WORKSHEET No. 1**

PREPARED BY:						CHKD:		DATE:		
CONDITION: Case S4: Arrival (Salt Water)										
			( 1 )	( 2 )	( 3 )	( 4 )	( 5 )	( 6 )	( 7 )	( 8 )
TANK DESCRIPTION	FRAMES	LOAD	WEIGHT	VCG	V. Mmt. ( 1 ) x ( 2 )	LCG (+aft FR 0)	L. Mmt ( 1 ) x ( 4 )	TCG (+ stbd)	T. Mmt ( 1 ) x ( 6 )	F.S.M.
		[ % ]	[ Tonne ]	[ metres ]	[ Tonne-metres ]	[ metres ]	[ Tonne-metres ]	[ metres ]	[ Tonne-metres ]	[ Tonne-metres ]
1: Fuel Oil	26 to 31	57	4.23	0.60	2.538	-28.27	-119.591	0.00	0.000	4.11
2: Fuel Oil (P)	18 to 25									
3: Fuel Oil (S)	18 to 25									
8A: Fuel Oil	8.5 to 9	10	0.11	2.026	0.223	-8.747	-0.962	-1.313	-0.144	0.10
9: Fuel Oil	2 to 9									
11: Fresh Water (P)	26.75 to 31	10	0.32	2.962	0.948	-28.603	-9.153	-2.620	-0.838	0.08
12: Fresh Water (S)	26.75 to 31	10	0.32	2.962	0.948	-28.603	-9.153	2.620	0.838	0.08
5: Main Engine Lube Oil	14 to 15	10	0.06	0.528	0.032	-14.528	-0.872	0.854	0.051	0.01
4: Bilge Water	15 to 17	90	1.46	0.861	1.257	-16.040	-23.418	-1.152	-1.682	0.31
6: Sewage Sludge	12.5 to 13	90	0.52	0.724	0.376	-12.752	-6.631	0.000	0.000	0.09
7A: Grey Water	9 to 12	90	3.59	0.834	2.994	-10.547	-37.864	0.000	0.000	1.37
7B: Black Water	12 to 12.5	90	0.57	0.759	0.433	-12.244	-6.979	0.000	0.000	0.13
15: Dirty Oil Sludge	13 to 15	90	2.29	0.703	1.610	-14.018	-32.101	0.000	0.000	0.38
16: Water Ballast (P)	0.176 to 1									
17: Water Ballast (S)	0.176 to 1									
13: Gasoline (P)	1.54 to 2.96	20	0.20	2.898	0.580	-2.250	-0.450	-2.875	-0.575	0.09
14: Gasoline (S)	1.54 to 2.96									
DG Lube Oil		10	0.01	2.685	0.016	-7.825	-0.047	0.187	0.001	0.00
<b>TANK TOTAL</b>			13.68	0.874	11.954	-18.077	-247.221	-0.172	-2.349	6.75
			SUM(1)	SUM(3) SUM(1)	SUM(3)	SUM(5) SUM(1)	SUM(5)	SUM(7) SUM(1)	SUM(7)	SUM(8)

Instructions for use of Stability Worksheets No. 1, 2 and 3

Stability Worksheet No. 1

1. Determine loading for all tanks.
2. Use the tank tables contained in Section 12 to determine the weight, VCG, LCG, TCG and FSM for each tank, based on the load level recorded, and then enter the values on the worksheet.
3. Follow directions on the worksheet to determine the total weight and centre and FSM for the tanks.

Stability Worksheet No.2

1. Enter the Tank Total from Worksheet No.1.
2. Enter the estimated weight and centre for all listed weight items as well as any additional items not specifically listed.
3. Follow directions on the worksheet to determine the total weight and centre and FSM for the Vessel.

Stability Worksheet No. 3

1. From the Vessel Total Weight determined on Worksheet No. 2 use the Table of Hydrostatic Properties at Level Trim, contained in Section 7, to enter the required hydrostatic properties.
2. Enter LCG, VCG, SUM(8) and SUM(1) from Worksheet No. 2 in the appropriate places.
3. Follow the directions on the worksheet to determine the Vessel trim, marks drafts and VCG (fluid).
4. Compare the calculated VCG (fluid) and Vessel trim with the curves of Maximum Allowable VCG (fluid), contained in Section 6, to determine if the Vessel will be operating within the Safe Stability Range.



**MSPV**

**STABILITY WORKSHEET No. 3**

CONDITION: Case S4: Arrival (Salt Water)

**HYDROSTATICS AND SHIP PARTICULARS**

LBM: 36.7 m	MEAN DRAFT T <sub>M</sub> : 2.077	
LCF: -16.742	KM <sub>T</sub> : 4.160	
LCB: -16.905	MCT: 5.577	
<p>BASELINE TRIM:</p> $T_T = \frac{[(LCG) - (LCB)] \times SUM(1)}{MCT \times 100}$ $T_T = \frac{[(-16.253) - (-16.905)] \times (236.54)}{(5.577) \times 100}$ <p align="center">= 0.277 m aft</p>		
<p>TRIM CHANGE AFT:</p> $T_A = \frac{[(-2.15) - (LCF)] \times T_T}{LBM}$ $T_A = \frac{[(-2.15) - (-16.742)] \times (0.277)}{36.70}$ <p align="center">= 0.110 m</p>		
<p>TRIM CHANGE FORWARD:</p> $T_F = \frac{[(-38.85) - (LCF)] \times T_T}{LBM}$ $T_F = \frac{[(-38.85) - (-16.742)] \times (0.277)}{36.70}$ <p align="center">= - 0.167m</p>		

DRAFT AT AFT MARKS = T <sub>M</sub> + T <sub>A</sub> + 0.578 = 2.077 + 0.110 + 0.578 = 2.765 m		
DRAFT AT FWD MARKS = T <sub>M</sub> + T <sub>F</sub> = 2.077 + - 0.167 = 1.910 m		
GM <sub>S</sub>	= KM <sub>T</sub> - VCG = 4.160 - 3.03 = 1.130 m	
F.S.C.	= Σ(8) / Σ(1) = 6.75 / 236.54 = 0.029 m	
GM <sub>F</sub>	= GM <sub>S</sub> - (F.S.C.) = 1.130 - 0.029 Requirement is ≥ 0.150m = 1.101 m	
VCG (Fluid)	= VCG + (F.S.C.) = 3.03 + 0.029 = 3.06 m	

**MSPV**

**STABILITY WORKSHEET No. 4**

PREPARED BY:					CHKD:			DATE:	
CONDITION: Case S4: Arrival (Salt Water)									
HEEL ANGLE (Degrees)	0	10	20	30	40	50	60	70	FLOOD 52.10
Heel Angle (Radians)	0.000	0.175	0.349	0.524	0.698	0.873	1.047	1.222	0.909
Sin (Heel Angle)	0.000	0.174	0.342	0.500	0.643	0.766	0.866	0.940	0.789
VCG (Fluid) * Sin (Heel Angle)	0.000	0.531	1.047	1.530	1.967	2.344	2.650	2.875	2.415
KN (from Section 8)		0.726	1.403	1.968	2.394	2.663	2.806	2.846	2.703
GZ = KN - [VCG (Fluid) * Sin (Heel Angle)]	0.000	0.195	0.356	0.438	0.427	0.319	0.156	-0.029	0.288

**GZ (m)**

**Heel Angle (Degrees)**

(1)	(2)	(3)	(4)
Heel Angle	GZ	Multiplier	(2) * (3)
0	0	0	0
10	0.195	0.1963	0.038
20	0.356	0.1963	0.070
30	0.438	0.0654	0.029

**Area (0 to 30) [m-rad]** 0.137 Requirement is ≥ 0.055 m-rad

SUM (4) (0 to 30)

30	0.438	0.0873	0.038
40	0.427	0.0873	0.037

**Area (30 to 40) [m-rad]** 0.076 Requirement is ≥ 0.030 m-rad

SUM (4) (30 to 40)

**Area (0 to 40) [m-rad]** =Area (0 to 30) + Area (30 to 40) 0.212 Requirement is ≥ 0.090 m-rad

**GZ (30) [m]** 0.438 Requirement is ≥ 0.200 m

**Angle of Maximum GZ [deg]** 30 Requirement is ≥ 25 deg

Instructions for use of this Stability Worksheet

1. Multiply the VCG (Fluid) by the listed Sin (Heel Angle).
2. Enter the KN Values from Section 8 at the trim closest to the actual trim determined on Worksheet No. 3 corresponding to the actual displacement determined on Worksheet No.2.
3. Plot GZ (righting arms) vs. the Heel Angle including the limiting Flood value.
4. Calculate the righting energy and compare to the required values.
5. Compare GZ at 30 degrees and the angle of maximum GZ with the required values.

MSPV

STABILITY WORKSHEET No. 1

PREPARED BY:				CHKD:				DATE:		
CONDITION:										
			( 1 )	( 2 )	( 3 )	( 4 )	( 5 )	( 6 )	( 7 )	( 8 )
TANK DESCRIPTION	FRAMES	LOAD	WEIGHT	VCG	V. Mmt. ( 1 ) x ( 2 )	LCG (+aft FR 0)	L. Mmt ( 1 ) x ( 4 )	TCG (+ stbd)	T. Mmt ( 1 ) x ( 6 )	F.S.M.
		[%]	[ Tonne ]	[ metres ]	[ Tonne-metres ]	[ metres ]	[ Tonne-metres ]	[ metres ]	[ Tonne-metres ]	[ Tonne-metres ]
1: Fuel Oil	26 to 31									
2: Fuel Oil (P)	18 to 25									
3: Fuel Oil (S)	18 to 25									
8A: Fuel Oil	8.5 to 9									
9: Fuel Oil	2 to 9									
11: Fresh Water (P)	26.75 to 31									
12: Fresh Water (S)	26.75 to 31									
5: Main Engine Lube Oil	14 to 15									
4: Bilge Water	15 to 17									
6: Sewage Sludge	12.5 to 13									
7A: Grey Water	9 to 12									
7B: Black Water	12 to 12.5									
15: Dirty Oil Sludge	13 to 15									
16: Water Ballast (P)	0.176 to 1									
17: Water Ballast (S)	0.176 to 1									
13: Gasoline (P)	1.54 to 2.96									
14: Gasoline (S)	1.54 to 2.96									
DG Lube Oil										
<b>TANK TOTAL</b>										
			SUM(1)	SUM(3) SUM(1)	SUM(3)	SUM(5) SUM(1)	SUM(5)	SUM(7) SUM(1)	SUM(7)	SUM(8)

Instructions for use of Stability Worksheets No. 1, 2 and 3

Stability Worksheet No. 1

1. Determine loading for all tanks.
2. Use the tank tables contained in Section 12 to determine the weight, VCG, LCG, TCG and FSM for each tank, based on the load level recorded, and then enter the values on the worksheet.
3. Follow directions on the worksheet to determine the total weight and centre and FSM for the tanks.

Stability Worksheet No.2

1. Enter the Tank Total from Worksheet No.1.
2. Enter the estimated weight and centre for all listed weight items as well as any additional items not specifically listed.
3. Follow directions on the worksheet to determine the total weight and centre and FSM for the Vessel.

Stability Worksheet No. 3

1. From the Vessel Total Weight determined on Worksheet No. 2 use the Table of Hydrostatic Properties at Level Trim, contained in Section 7, to enter the required hydrostatic properties.
2. Enter LCG, VCG, SUM(8) and SUM(1) from Worksheet No. 2 in the appropriate places.
3. Follow the directions on the worksheet to determine the Vessel trim, marks drafts and VCG (fluid).
4. Compare the calculated VCG (fluid) and Vessel trim with the curves of Maximum Allowable VCG (fluid), contained in Section 6, to determine if the Vessel will be operating within the Safe Stability Range.



## STABILITY WORKSHEET No. 2

MSPV MS Variant  
Private Robertson V.C. Hull 6094  
CA-024-000-EQ-WB-009

# MSPV

## STABILITY WORKSHEET No. 3

CONDITION:

### HYDROSTATICS AND SHIP PARTICULARS

LBM: 36.7 m	MEAN DRAFT T <sub>M</sub> :	
LCF:	KM <sub>T</sub> :	
LCB:	MCT:	
<p>BASELINE TRIM:</p> $T_T = \frac{[(LCG) - (LCB)] \times SUM(1)}{MCT \times 100}$ $T_T = \frac{[(\quad) - (\quad)] \times (\quad)}{(\quad) \times 100}$ <p style="text-align: center;">=</p>		
<p>TRIM CHANGE AFT:</p> $T_A = \frac{[(-2.15) - (LCF)] \times T_T}{LBM}$ $T_A = \frac{[(-2.15) - (\quad)] \times (\quad)}{36.70}$ <p style="text-align: center;">=</p>		
<p>TRIM CHANGE FORWARD:</p> $T_F = \frac{[(-38.85) - (LCF)] \times T_T}{LBM}$ $T_F = \frac{[(-38.85) - (\quad)] \times (\quad)}{36.70}$ <p style="text-align: center;">=</p>		

DRAFT AT AFT MARKS = T <sub>M</sub> + T <sub>A</sub> + 0.578 = _____ + _____ + 0.578 = _____	
DRAFT AT FWD MARKS = T <sub>M</sub> + T <sub>F</sub> = _____ + _____ = _____	
GM <sub>S</sub>	= KM <sub>T</sub> - VCG = _____ - _____ =
F.S.C.	= Σ(8) / Σ(1) = _____ / _____ =
GM <sub>F</sub>	= GM <sub>S</sub> - (F.S.C.) = _____ - _____ Requirement is ≥ 0.150m =
VCG (Fluid)	= VCG + (F.S.C.) = _____ + _____ =

**MSPV**

**STABILITY WORKSHEET No. 4**

PREPARED BY:					CHKD:			DATE:	
CONDITION:									
HEEL ANGLE (Degrees)	0	10	20	30	40	50	60	70	FLOOD
Heel Angle (Radians)	0.000	0.175	0.349	0.524	0.698	0.873	1.047	1.222	
Sin (Heel Angle)	0.000	0.174	0.342	0.500	0.643	0.766	0.866	0.940	
VCG (Fluid) * Sin (Heel Angle)									
KN (from Section 8)									
GZ = KN - [VCG (Fluid) * Sin (Heel Angle)]									

GZ (m)

0.90							
0.80							
0.70							
0.60							
0.50							
0.40							
0.30							
0.20							
0.10							
0.00							

Heel Angle (Degrees)

( 1 )	( 2 )	( 3 )	( 4 )
Heel Angle	GZ	Multiplier	(2) * (3)
0		0	
10		0.1963	
20		0.1963	
30		0.0654	

Area (0 to 30) [m-rad] SUM (4) (0 to 30) Requirement is  $\geq 0.055$  m-rad

30		0.0873	
40		0.0873	

Area (30 to 40) [m-rad] SUM (4) (30 to 40) Requirement is  $\geq 0.030$  m-rad

Area (0 to 40) [m-rad] = Area (0 to 30) + Area (30 to 40) Requirement is  $\geq 0.090$  m-rad

GZ (30) [m] Requirement is  $\geq 0.200$  m

Angle of Maximum GZ [deg] Requirement is  $\geq 25$  deg

Instructions for use of this Stability Worksheet

1. Multiply the VCG (Fluid) by the listed Sin (Heel Angle).
2. Enter the KN Values from Section 8 at the trim closest to the actual trim determined on Worksheet No. 3 corresponding to the actual displacement determined on Worksheet No.2.
3. Plot GZ (righting arms) vs. the Heel Angle including the limiting Flood value.
4. Calculate the righting energy and compare to the required values.
5. Compare GZ at 30 degrees and the angle of maximum GZ with the required values.

## ANNEX A: INCLINING EXPERIMENT REPORT, HULL 6094

**HALIFAX SHIPYARD**

**H-6094: Mid-Shore Patrol Vessel**

**PRIVATE ROBERTSON V.C.**

**(vessel name)**

**Report of  
Trial Agenda: 835A  
Inclining Experiment  
Dock Trial**

Prepared by: Ray Creaser

Revision No.: 0

Date of Report: 13 June, 2012

Approvals: LR

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### Inclining Experiment Test Sign-Off Sheet

Verification Method: Technical Acceptance Trial
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Applicable To:	<u>Mid-Shore Patrol Vessel</u>	Ship No.	<u>6094</u>
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Trial Agenda #	<u>835A</u>	Date of Trial	<u>10 June, 2012</u>
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<b>Witnessed</b> by the undersigned that the Trial has been conducted using the procedures, and taking the required measurements, as detailed in this Trial Agenda.

1. Conducting Authority

Ray Creaser	T&T
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2.	Co-ordinating Authority:

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HS QA

3.	Witnessing Authority

\_\_\_\_\_  
 Franjo Prpic (EYE) PWGSC / IA

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Daniel Bell
LR

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Rob Sampson
CCG/ TA

### **SUMMARY OF RESULTS**

Lightship Weight:	220.30 Tonne
Vertical Centre of Gravity (VCG):	3.145 m above Base Line
Longitudinal Centre of Gravity (LCG):	16.069 m forward of Frame 0
Transverse Centre of Gravity (TCG):	0.009 m to Starboard
Height of Metacentre (GMT):	1.09 m
Fwd Marks Draft:	1.77 m
Fwd Base Line Draft:	1.77 m
Aft Marks Draft:	2.72 m
Aft Base Line Draft:	2.14 m
Marks Trim:	0.95 m
Base Line Trim:	0.37 m

- References:
- Dwg. No. 6094-89940-01 (General Arrangement)
  - Dwg. No. 6094-89940-02 (Tank Arrangement Capacity Plan)
  - Dwg. No. 6094-89940-08 (Draft Marks and Load Line Marks Plan)
- Equipment:
- Hydrometer (S.G. 1.000 to 1.030).
  - Container to suit hydrometer.
  - Thermometer (0 – 35 C).
  - Four hand held radios.
  - Small boat.
  - Tank sounding tape with water finding paste and powder cleanser for fuel oil tanks.
  - Measuring tape.
  - Pendulum (2 off) made up from piano wire. Top shall be free to pivot and pivot point shall be clearly defined. Bottom shall consist of cruciform plumb-bob. Pendulums shall be of sufficient length to ensure that the deflection is at least 150mm to each side of the initial position when the maximum heeling moment is applied.
  - Damping troughs, filled with oil and/or water and equipped with battens and paper.
  - Four in number inclining weights, with a combined weight of approximately 4.5 tonne. Weights shall be weighed on a suitable calibrated scale.
  - Dunnage, as required, for inclining weights.
  - Crane of suitable capacity.
  - Righting weights as required. Weights shall be weighed on a suitable calibrated scale.



- Prerequisites:
- Vessel as near complete as possible. Missing weights should not exceed 2% of the lightship weight.
  - Vessel upright (maximum heel approximately one half degree).
  - $GM > 0.20m$ .
  - All bilges and void spaces dry.
  - Tanks should in principle be either empty or full. As few tanks as possible shall be partly filled. Any slack tanks should be sounded manually. Full tanks are to be pressed to the air pipes and empty tanks are to be open for visual inspection.
  - Foreign weights (tank contents not included) should not exceed 4% of the lightship weight.
  - All systems at operating level.
  - All shipyard equipment and dunnage not required for this experiment removed.
  - Favourable weather conditions, i.e. winds  $< 10$  knots.
  - Vessel sheltered from wave action.
  - Gangways landed ashore.

Procedure:

1. Survey all compartments, tanks, voids, and bilges for weights on/off to calculate Lightship.
2. Install pendula and inclining weights. Record weights and centres of all items installed.
3. Record environmental conditions, wind, water condition, specific gravity of water. Make sketch of site showing location and heading of ship and showing wind direction.
4. Ensure ship floating freely and unrestrained.
5. Take and record drafts forward and aft (P & S).
6. Close up inclining stations:
  - i) Take zero pendulum reading.
  - ii) Shift weight #1, Port to Starboard. Take first pendulum reading and measure distance of shift.
  - iii) Shift weight #3, Port to Starboard. Take second pendulum reading and measure distance of shift.
  - iv) Shift weight #1 to Port. Replace in original position. Take third pendulum reading and measure distance of shaft.
  - v) Shift weight #3 to Port. Replace in original position. Take fourth pendulum reading and measure distance of shift.
  - vi) Shift weight #2, Starboard to Port. Take fifth pendulum reading and measure distance of shift.
  - vii) Shift weight #4, Starboard to Port. Take sixth pendulum reading and measure distance of shift.
  - viii) Shift weight #2 to Starboard. Replace in original position. Take seventh pendulum reading and measure distance of shift.
  - ix) Shift weight #4 to Starboard. Replace in original position. Take eighth (final) pendulum reading and measure distance of shift.

*Note: Results shall be plotted as weights are shifted. Any sign of hysteresis should be cause to stop experiment and find the problem. Experiment must then be restarted.*

7. Verify draft readings to ensure that no significant change in the vessels condition has occurred during the test.

**Pre-inclining Inspections**  
**Condition of Bilges**

Compartment	Dry		Bilge Water Location	Average Draft of Bilge Water	Estimated Weight
	Yes	No			
Bow Thruster Compt	Yes				
MMR	Yes				
AMR	Yes				
Steering Gear Compt	Yes				

**Condition Of Machinery And Systems**

Machinery/System	Charged with Operating Fluid (working level)		State of cross-connections (if any)
	Yes	No	
All systems operational with exception of: <ul style="list-style-type: none"> <li>- hydraulic system piping;</li> <li>- grey water collection tanks; and</li> <li>- grease trap.</li> </ul> Refer to list of weights on and off for details.			

**Ship's Tanks**

Tank No.	Tank	Frames	Uncorrected Sounding	Measured S.G.	Sighted Dry		Remarks
					Yes	No	
1	Fuel Oil Storage	26-31			Yes		Sounded
2	Fuel Oil Service, PS	18-25			Yes		Sounded
3	Fuel Oil Service, SB	18-25			Yes		Sounded
4	Bilge Water, PS	15-17			Yes		Sounded
5	Lube Oil, SB	14-15			Yes		Sounded
6	Sewage Sludge	12.5-13			Yes		Visual via removal of Hamann sensor flange
7a	Grey Water	9-12			Yes		Sounded
7b	Black Water	12-12.5			Yes		Visual via removal of Hamann sensor flange
8a	Fuel Oil Day, PS	8.5-9	0.80m			No	Sounded
9	Fuel Oil	2-9			Yes		Sounded
11	Fresh Water, PS	26.75-31			Yes		Opened tank drain in bow thruster compartment
12	Fresh Water, SB	26.75-31			Yes		Opened tank drain in bow thruster compartment
13	Gasoline, PS	1.54-2.96			Yes		Visual, via removal of vent head
14	Gasoline, SB	1.54-2.96			Yes		Visual, via removal of vent head
15	Dirty Oil and Sludge	13-15			Yes		Sounded
16	Ballast, SB	AE-1			Yes		Visual, via removal of manhole
17	Ballast, PS	AE-1			Yes		Visual, via removal of manhole
	Void	17-18			Yes		Visual, via removal of manhole
	Void	25-26			Yes		Visual, via removal of manhole

**Details of Permanent Ballast (If any)**

No.	Weight	L.C.G.	V.C.G.	T.C.G.	Remarks
<b>NONE FITTED</b>					

**Details of Righting/Trimming Weights (If Any)**

No.	Weight	L.C.G.	V.C.G.	T.C.G.	Remarks
<b>NONE USED</b>					

Item	Weight On (kg)	Weight Off (kg)	VCG ABL (m)	LCG FR #	TCG + Stbd (m)	Remarks
Inclining Trough - Fwd		40	1.81	33.50	0.40	
Inclining Trough - Aft		40	1.85	3.50	0.30	
Pendulum Support - Fwd		10	4.81	33.50	0.40	
Pendulum Support - Aft		10	4.66	3.50	0.30	
<b>Bridge Top</b>						
AVOS	24		9.50	14.50	1.50	GFE
EPIRB	4		9.60	13.75	-0.50	
<b>Bridge</b>						
Bridge Ceiling	147		8.45	20.75	0.00	17.27m <sup>2</sup> @ 5.5kg/m <sup>2</sup>
Bridge Deck Covering	50		6.35	19.95	-0.20	10.33m <sup>2</sup> @ 4.8kg/m <sup>2</sup>
SART's	1		6.50	20.50	0.00	
Misc Outfit - Bridge	69		7.80	20.00	0.00	GFE
Misc Outfit - Bridge	42		7.50	20.50	0.00	ISI
UHF Communications	15		8.10	22.20	0.50	GFE
House Front Window Trim	20		8.00	23.00	0.00	
Laser Fax Printer (Item 53)	25		8.05	19.70	0.00	
Marine Radio Transceiver (Item 47)	27		7.95	19.70	-0.60	
15" ECS Display (Item 35)	18		8.25	19.70	-1.00	
Echo sounder Display (Item 39)	15		8.25	19.70	-0.50	
Excess cable		20	7.90	19.70	-1.25	
Bookshelf (Item 109)	6		8.15	18.25	-1.40	
SAR Equipment Cabinet (Item 116)	16		7.10	18.50	-1.00	
Medical Locker (Item 119)	3		7.30	19.00	1.80	
Flag Locker (Item 117)	6		7.95	18.35	1.60	
<b>Bridge Wings</b>						
Bearing Repeater Compass (port)	11		7.15	19.70	-3.00	
Bearing Repeater Fdns (port & stbd)	15		7.15	19.70	0.00	
<b>Command Center</b>						
Desktop Computer - Command Ctr	14		7.70	16.50	0.00	GFE
Laptops - Command Ctr	10		6.75	16.50	-0.90	GFE
Special Communications	43		7.20	17.50	1.50	GFE
Lockable Cabinet (Item 69)	34		6.85	15.50	-1.40	
Book Cases (2 off, Item 70)	13		6.85	16.25	0.50	
Table (Item 65)	28		7.35	16.50	-1.10	
Whiteboard (Item 68)	21		7.70	17.75	-1.25	
Ceiling- partial	10		8.45	17.75	-0.40	1.8m <sup>2</sup> @ 5.5kg/m <sup>2</sup>
<b>Bridge Deck Exterior</b>						
Rocket Parachute Flares (12 off)	4		7.60	14.60	-1.34	ISI Supply
Rescue Boat Gasoline (50l)	36		7.20	10.75	2.50	
Jack Staff / Ensign Staff		13	7.00	12.50	-2.60	Relocate
Fire Hose Locker - Hose & Nozzle	9		7.00	12.00	0.80	near davit power pack
Spare Fire Extinguishers (4 off)	56		6.70	23.00	1.50	
CCG Crest	2		6.70	24.00	0.00	
Life Ring	5		6.75	20.50	3.30	stbd rail
<b>Main Deck Exterior</b>						
Mooring Lines		64	4.75	39.00	0.50	
Mooring Lines		45	4.40	33.00	2.00	
Mooring Lines		27	4.60	35.00	-1.50	

Item	Weight On (kg)	Weight Off (kg)	VCG ABL (m)	LCG FR #	TCG + Stbd (m)	Remarks
Mooring Lines		68	4.00	0.50	0.00	
Jack Staff	5		6.72	42.18	0.00	
Ensign Staff	8		4.89	-0.37	0.00	
Fire Hose Locker - Hose & Nozzle	9		5.00	35.00	-2.10	Fwd port side
Ship's Bell	8		5.70	33.00	-0.93	
Jacobs Ladders (2 off)	20		2.55	9.70	0.00	ISI Supply
Towing Rope	18		4.28	2.50	-0.82	1/2" Dia x 180m
RHIB Gasoline (port & stbd @ 321l ea)	465		5.33	4.80	0.00	
RHIB Lifting Plate and Hook (stbd)	130		6.60	4.42	1.98	
RHIB Lashing (port & stbd)	75		4.85	4.68	0.00	
Gasoline Suction Hose & Containers	25		4.20	5.00	-1.95	
Deck Crane Remote Control	13		5.75	9.00	0.00	
Deck Crane Haul Ball & Hook	30		6.75	4.50	0.00	
Life Ring	5		4.50	0.00	-3.00	aft port rail
Gangway Safety Net / Spreader Bars	30		4.10	13.00	-3.30	
Temp Railing at Port Gas Tank		14	4.60	2.20	-3.20	
Temp Railing at Stbd Gas Tank		5	4.60	2.20	3.20	
<b>Ammo Locker</b>						
Ammunition for Fire Arms	35		4.85	32.60	0.00	GFE
<b>Deck Equipment Locker</b>						
Portable Fenders (5 of 6)	60		5.00	31.00	1.75	
<b>Main Deck Cabins</b>						
Laptops - Captains & Chiefs	5		4.90	29.50	0.26	GFE
<b>Electronic Equipment Room</b>						
Motorola XTL5000 (EER Aft Rack)	8		5.60	23.50	1.75	
VHF DC-DC Converters (EER Aft Rack)	2		4.75	23.50	1.75	
TV/Radio Dist Sys (EER Aft Rack)	5		4.50	23.50	1.75	
CCTV Controller (EER Aft Rack)	15		4.35	23.50	1.75	
Tools / Excess cable		20	5.50	23.50	1.75	
<b>Mess</b>						
Mess Items	57		4.10	20.30	-1.00	GFE
Plywood Protection on Sofa		49	4.50	22.00	1.70	
Plywood Protection Fwd		41	4.30	24.50	-1.10	
Table Tops	20		4.70	23.00	-1.63	
Desk	4		4.40	22.75	0.75	
<b>Paint Locker</b>						
Paint Locker Items	45		4.50	20.50	2.20	GFE
<b>Galley</b>						
Galley Items	58		4.70	17.50	-1.40	GFE
<b>Main Deck Passageway (16-20)</b>						
Ceiling	25		5.95	18.75	0.25	4.55m^2 @ 5.5kg/m^2
<b>Main Deck Passageway (12-17)</b>						
Fire Hose Box and Contents	17		5.00	16.30	-0.60	
Fire Arms	34		4.85	13.25	-1.00	GFE
<b>Emergency Generator Comp</b>						
Lube Oil Reservoir Emerg Genset (20l)	17		5.10	12.87	1.32	tank was empty
Emergency Generator Fuel Oil		72	5.39	15.58	0.61	73cm down from top
<b>Wet Gear Stores</b>						
Floater Suits (8 off)	15		2.50	26.00	0.00	GFE

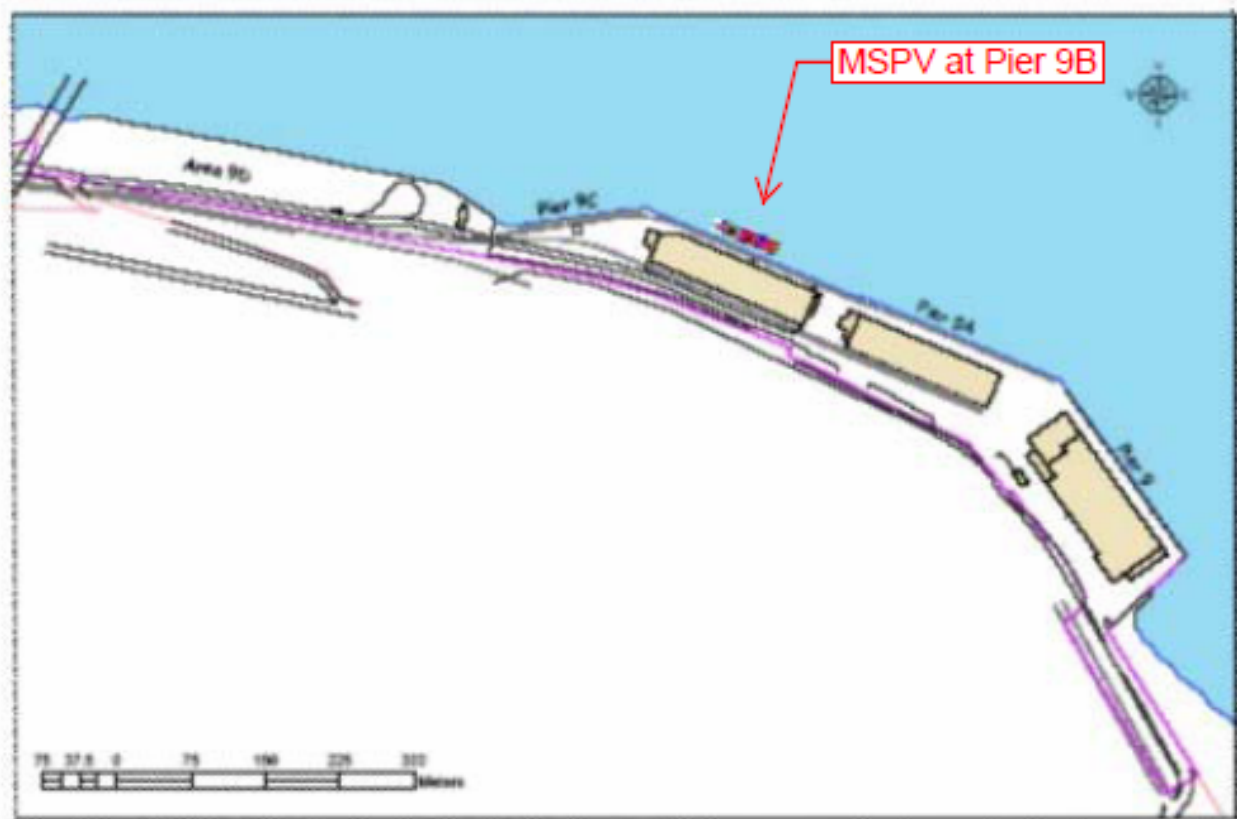
Item	Weight On (kg)	Weight Off (kg)	VCG ABL (m)	LCG FR #	TCG + Stbd (m)	Remarks
<b>Fore Peak Store</b>						
Mooring Rope (3 off)	20		3.20	39.10	0.00	Fwd - 3/8" Dia x 110m
<b>Bow Thruster Comp</b>						
Tools - Bow Thruster Comp	344		2.00	33.40	-1.50	GFE
Fire Hose Locker - Hose & Nozzle	9		3.00	31.25	-1.00	
<b>Cleaning Gear &amp; Stewards Locker</b>						
Cleaning Gear & Stewards Lkr Items	83		2.50	30.50	-1.50	GFE
<b>2nd Engineers Cabin</b>						
Test & Trials Toolbox		30	1.50	21.00	-1.00	
<b>Laundry / Central Stores</b>						
Central Storeroom Items	35		2.50	19.50	1.50	GFE
Linen Locker Items	56		2.50	19.00	2.50	GFE
Flat Iron	2		2.35	19.00	2.50	GFE
<b>Medical Equip and SAR Locker</b>						
First Aid Kits	5		2.35	19.00	-1.15	GFE
<b>MCR</b>						
Laptop - MCR	3		1.95	17.40	-1.15	GFE
Rubber Matting	19		1.30	18.20	-1.10	
<b>Lower Deck Lobby (18-19)</b>						
Ceiling	10		3.60	17.75	0.25	1.9m^2 @ 5.5kg/m^2
Deck Covering	9		1.35	17.75	0.25	1.9m^2 @ 4.8kg/m^2
<b>Main Machinery Room</b>						
Chain Block ( 2off)	20		3.00	13.00	0.00	ISI
Fire Hose Box and Contents	17		2.40	16.75	-0.50	
Main Engine Air Filters	20		3.00	13.75	0.00	
Exhaust Lagging at Engines	50		3.00	12.00	0.00	
Tools - MMR	100		2.50	16.00	2.75	
<b>Auxiliary Machinery Room</b>						
Tools - AMR	100		2.50	4.50	0.00	GFE
Fire Hose Box and Contents	17		2.95	8.75	1.95	
<b>Steering Gear Compartment</b>						
Mooring Rope (3 off)	20		2.00	3.40	0.96	Aft - 3/8" Dia x 110m
<b>General</b>						
Lifejackets (18 off)	8		3.44	23.63	-0.34	ISI
Immersion Suits (18 off)	113		3.44	27.63	0.71	GFE
EEBD (18 off)	27		3.44	23.63	-0.34	GFE
AFFF Fire Extinguishers - Contents	95		2.59	16.94	-0.37	10 @ 9.5kg ea
Cabin Linens	55		3.60	25.00	0.00	GFE
Class Spare Pumps	231		2.41	7.81	-0.12	
<b>System Fluids</b>						
Grease Trap Contents	38		2.89	19.35	-3.08	
Grey Water Collection Tank Contents	96		1.33	19.24	0.64	6 off @ 16l ea
Hydraulic Oil System, 110-5	1		3.68	36.70	-0.25	Tribon wt & ctr
Hydraulic Oil System, 110-3	38		3.37	24.42	0.91	Tribon wt & ctr
Hydraulic Oil System, 110-1	3		3.61	3.16	-0.96	Tribon wt & ctr
Hydraulic Oil System, 110-2	57		3.07	10.93	-0.58	Tribon wt & ctr
Hydraulic Oil System, 110-4	22		3.10	33.50	-0.65	Tribon wt & ctr



Item	Weight On (kg)	Weight Off (kg)	VCG ABL (m)	LCG FR #	TCG + Stbd (m)	Remarks
Inclining Weight # 1		1495	4.14	10.00	-2.92	9 persons
Inclining Weight # 2		1504	4.14	16.00	2.92	
Inclining Weight # 3		750	4.14	14.35	-2.92	
Inclining Weight # 4		760	4.16	17.70	2.92	
Inclining Personnel		810	5.44	13.44	0.00	
<b>TOTAL WEIGHT ON</b>	<b>3785</b>		<b>4.48</b>	<b>17.03</b>	<b>0.00</b>	
<b>TOTAL WEIGHT OFF</b>		<b>5887</b>	<b>4.33</b>	<b>14.58</b>	<b>0.03</b>	

**THE EXPERIMENT**  
**Environmental Conditions**

Time:	Weight shifts from 1936 to 2105
Wind Direction:	Not Applicable
Wind Speed:	Calm
Tide:	Falling
Time of High/Low Water:	Low at 2049
Weather:	Sunny, 15C
Side to Jetty:	Port
Ship's Head:	North West



Sketch of Ship Location:

### **Conducting Officer's Comments**

- Inclining weight certification at 1415
- Tank survey from 1430 to 1600
- Lightship survey from 1610 to 1830
- Pendulums measured at 1830
- Draft marks recorded at 1900
- Specific gravity measured at 1925
- Gangway was removed
- Shore power cable was disconnected and removed
- Mooring lines were slack throughout weight shifts
- First zero recorded at 1936
- Second zero recorded at 2020
- Third zero recorded at 2105
- The mean draft aft was 2.745m. The breadth of the hull at this height at location of aft marks is 6.294m. The difference between the port and starboard aft draft readings was 0.06m. The corresponding As-Inclined heel angle is therefore:  $\tan^{-1} (0.06/6.294) = 0.55$  deg to starboard.
- The SAR equipment portion of the GFE weight budget has not been included in the derivation of lightship weight. The total weight for this equipment is 304kg and will be added to each loading condition in the final stability book for each vessel as a separate load item.
- The derivation of lightship weight does not include any allowance for 50 cal machine guns and the associated ammunition.
- Fuel for the Emergency generator has not been included in the derivation of lightship weight and will be added to each loading condition in the final stability book for each vessel as a separate load item.

**Drafts, Specific Gravity, and Reference Origins**

Item	Forward	Aft
Position of Draft Marks	150 aft FR 39	150 fwd FR 2
Draft Port (Marks)	1.765	2.715
Draft Starboard (Marks)	1.765	2.775
Draft Mean (Marks)	1.765	2.745
Baseline Draft Correction	- 0.000 m	- 0.578 m
Draft Mean (Baseline)	1.765	2.167
Specific Gravity and Temperature	1.025, 10C	

Deepest Appendage Projection below Line of Keel:      Propellers, 578mm below baseline

Least Depth of Water Surrounding Ship:      8.5m (low tide)

Sign conventions:    V.C.G.      + above origin (baseline)  
                              L.C.G.      + fwd of origin (FR 0)  
                              T.C.G.      + stbd, - port

**Statement of Inclining Team  
(and Personnel on board at time of Experiment)**

<b>Name &amp; Title</b>	<b>Location</b>	<b>Weight</b>	<b>V.C.G.</b>	<b>L.C.G.</b>	<b>T.C.G.</b>
Ray Creaser, ISI	Command Center	90kg	7.35	16.5	0
Ben Trask, ISI	Fwd Pendulum	90kg	2.25	33.5	0
Michael Walker, ISI	Aft Pendulum	90kg	2.62	3.5	0
Rob Sampson (CCG / TA)	Command Center	90kg	7.35	16.5	0
Daniel Bell, LRS	Command Center	90kg	7.35	16.5	0
Franjo Prpic (EYE / IA)	Command Center	90kg	7.35	16.5	0
Lou Lanceleve, ISI	Main Deck - Aft	90kg	4.91	6.0	0
Mike Briggs, ISI	Main Deck - Aft	90kg	4.91	6.0	0
Kevin, ISI	Main Deck - Aft	90kg	4.91	6.0	0
<b>TOTALS</b>		<b>810kg</b>	<b>5.44</b>	<b>13.44</b>	<b>0</b>

### Particulars of Inclining Ballast

BALLAST GROUP	CERTIFIED WEIGHT (Kg)	V.C.G. m	V.MOM kg.m	L.C.G. m	L.MOM kg.m	T.C.G. m	T. MOM kg.m
# 1	1495	4.14		FR 10.0		2.92 p	
# 2	1504	4.14		FR 16.0		2.92 s	
# 3	750	4.14		FR 14.3		2.92 p	
# 4	760	4.16		FR 17.7		2.92 s	
TOTAL	4509	4.14		FR 14.0		0.01 s	

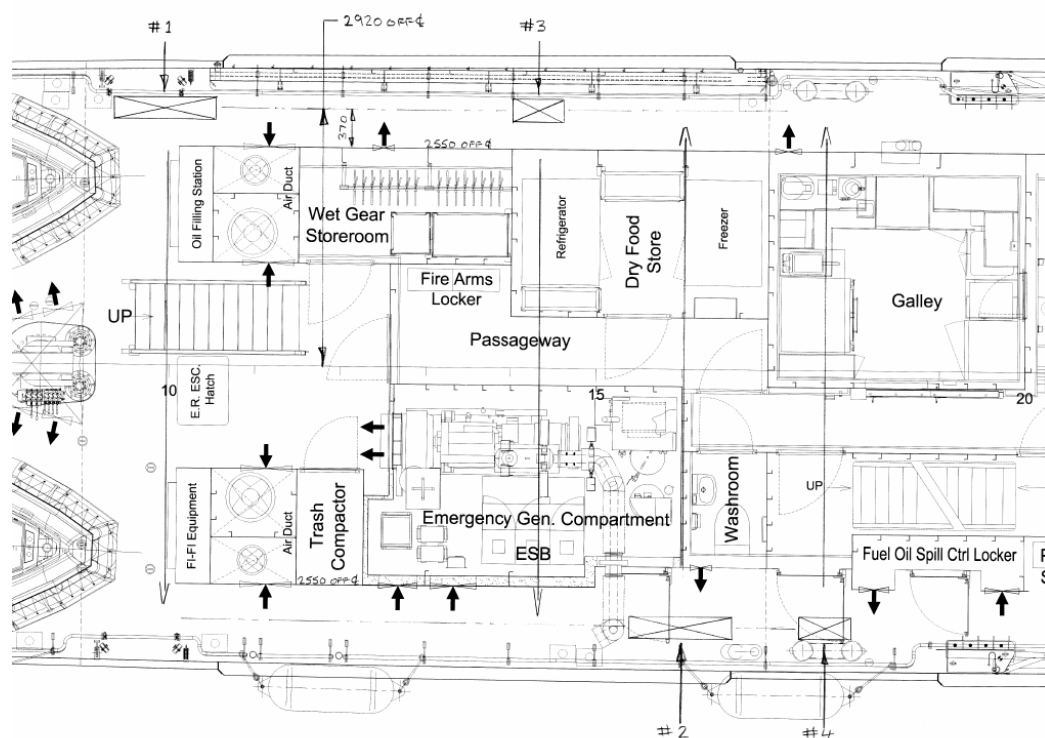
Average Weight = 1127kg

### DIAGRAM OF POSITION OF BALLAST GROUPS

Weight Dimensions (# 1 and # 2): 1220mm long x 260mm wide x 605mm high

Weight Dimensions (# 3 and # 4): 610mm long x 260mm wide x 605mm high

Weights were positioned on 25mm plywood.



Details of weight certification:

Dillon Dynamometer, Model ED-2000-10, Serial No. D40194, Range 0 to 10,000 kg

Calibrated December 6, 2011 by Pylon Atlantic, Calibration due December 6, 2012

Certificate at end of report.

Fwd Pendulum Location: Bow Thruster Compt Escape Hatch, FR 33.5  
Aft Pendulum Location: Steering Gear Compt Escape Hatch, FR 3.5  
Fwd Pendulum Length = 3500 mm  
Aft Pendulum Length = 3392 mm

$\Delta = 222.86$  tonne

NOTE 1: STBD WEIGHT MOVEMENT GIVES POSITIVE PENDULUM DEFLECTION & POSITIVE MOMENT  
NOTE 2: PORT WEIGHT MOVEMENT GIVES NEGATIVE PENDULUM DEFLECTION & NEGATIVE MOMENT

LEAST SQUARES FIT TO DATA

					"Y"		"X <sub>F</sub> "				"X <sub>A</sub> "			
					SINGLE INCLINING WEIGHT MOM. (t m)	[M] TOTAL INCLINING WEIGHT MOM. (t m)	Forward Pendulum				Aft Pendulum			
Shift	Weight No.	Weight (tonnes)	Shift Dist. (m)	Shift Dir.			Fwd Pendulum Single Deflection (mm)	Fwd Pendulum Total Deflection (mm)	TOTAL Tan Θ <sub>F</sub>	Approx GM <sub>F</sub> [Fwd Pend.] (m)	Aft Pendulum Single Deflection (mm)	Aft Pendulum Total Deflection (mm)	TOTAL Tan Θ <sub>A</sub>	Approx GM <sub>A</sub> [Aft Pend.] (m)
1	1	1.495	5.84	P-S	8.731	<b>8.731</b>	133.0	133.0	<b>0.0380</b>	1.031	124.0	124.0	<b>0.0366</b>	1.072
2	3	0.750	5.84	P-S	4.380	<b>13.111</b>	63.0	196.0	<b>0.0560</b>	1.092	61.5	185.5	<b>0.0547</b>	1.084
3	1	1.495	-5.84	S-P	-8.731	<b>4.380</b>	-131.0	65.0	<b>0.0186</b>	1.047	-123.0	62.5	<b>0.0184</b>	1.080
4	3	0.750	-5.84	S-P	-4.380	<b>0.000</b>	-61.5	3.5	<b>0.0010</b>	1.118	-60.0	2.5	<b>0.0007</b>	1.111
5	2	1.504	-5.84	S-P	-8.783	<b>-8.783</b>	-133.0	-129.5	<b>-0.0370</b>	1.037	-128.5	-126.0	<b>-0.0371</b>	1.040
6	4	0.760	-5.84	S-P	-4.438	<b>-13.222</b>	-65.0	-194.5	<b>-0.0556</b>	1.072	-61.5	-187.5	<b>-0.0553</b>	1.098
7	2	1.504	5.84	P-S	8.783	<b>-4.438</b>	130.0	-64.5	<b>-0.0184</b>	1.061	124.5	-63.0	<b>-0.0186</b>	1.074
8	4	0.760	5.84	P-S	4.438	<b>0.000</b>	63.5	-1.0	<b>-0.0003</b>	1.098	63.0	0.0	<b>0.0000</b>	1.072

SUMMARY OUTPUT (FWD PENDULUM)

SLOPE<sub>F</sub>: 235.433  
Y\_INTERCEP: -0.095  
FORMULA: **Y<sub>F</sub> = 235.433 X<sub>F</sub> - 0.095**  
235.433\*( 0.0560) - 0.095 = 13.09  
235.433\*(-0.0556) - 0.095 = -13.18  
ΣTanθ<sub>F</sub> = 0.1116      ΣM= 26.27

SLOPE = ΣM / ΣTanθ<sub>F</sub> = 26.27 / 0.1116 = 235.43

GM<sub>F</sub> = SLOPE / Δ = 235.43 / 222.86 = 1.056 m  
(Fwd Pendulum)

GM = (GM<sub>F</sub> + GM<sub>A</sub>) / 2 = (1.056 + 1.072) / 2 = 1.064 m

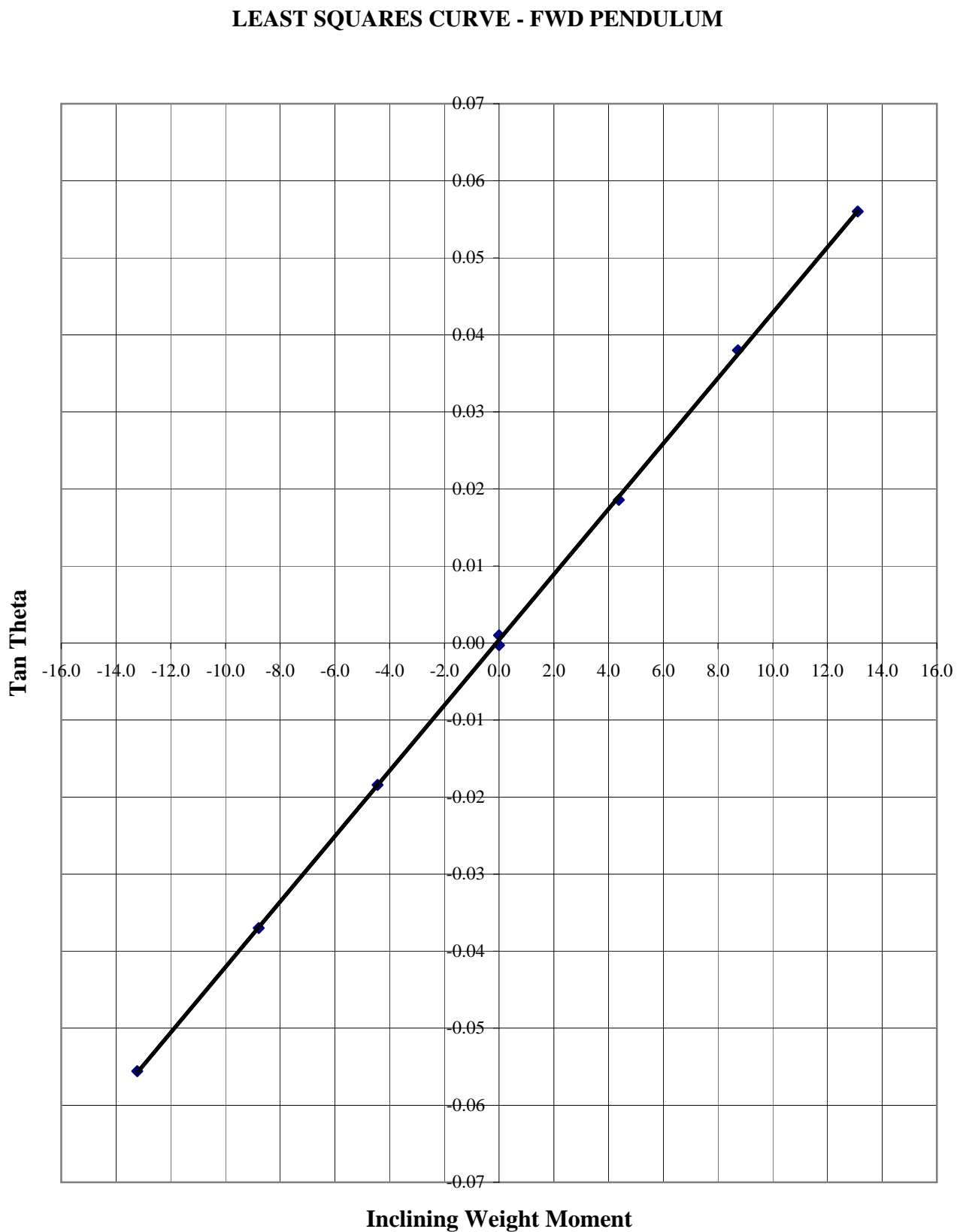
KMT = 4.217 m  
KGf = KMT - GM = 4.217 - 1.064 = 3.153 m  
FS = 0.10 / 222.86 = 0.000 m  
KGs = KGf - FS = 3.152 m

SUMMARY OUTPUT (AFT PENDULUM)

SLOPE<sub>A</sub>: 238.838  
Y\_INTERCEPT: -0.010  
FORMULA: **Y<sub>A</sub> = 238.838 X<sub>A</sub> - 0.010**  
238.838\*( 0.0547) - 0.010 = 13.05  
238.838\*(-0.0553) - 0.010 = -13.21  
ΣTanθ<sub>F</sub> = 0.1100      ΣM= 26.26

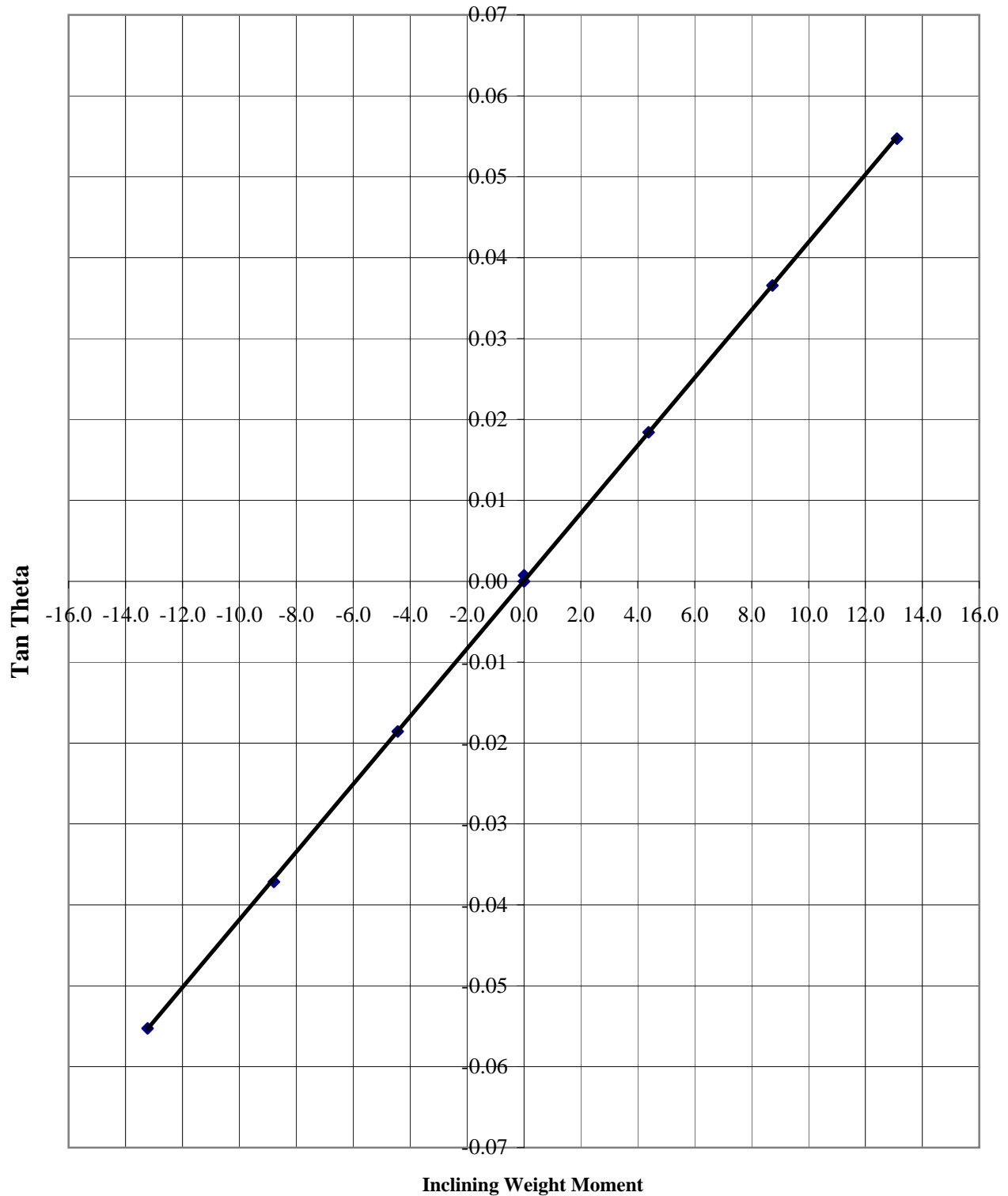
SLOPE = ΣM / ΣTanθ<sub>F</sub> = 26.26 / 0.1100 = 238.84

GM<sub>F</sub> = SLOPE / Δ = 238.84 / 222.86 = 1.072 m  
(Aft Pendulum)





LEAST SQUARES CURVE - AFT PENDULUM



DISPLACEMENT STATUS						
Baseline draft: 1.765 @ 38.85f, 2.167 @ 2.15f						
Trim: Aft 0.402/36.700, Heel: Stbd 0.55 deg.						
Part	SpGr	Displ(MT)	LCB	TCB	VCB	RefHt
HULL	1.025	222.86	15.979f	0.024s	1.388	-2.190
Distances in METERS.						

HYDROSTATIC PROPERTIES								
Trim: Aft 0.402/36.700,			Heel: Stbd 0.55 deg.,			VCG = 0.000		
Draft@ 20.500f	Displacement Weight(MT)	Buoyancy-Ctr. LCB	VCB	Weight/ cm	LCF	Moment/ cm trim	GML	GMT
1.966	222.86	15.979f	1.388	2.08	16.153f	5.26	86.54	4.217
Distances in METERS.			Specific Gravity = 1.025.			Moment in m.-MT.		
Draft is from Baseline.			Trim is per 36.70m.					

GMT is equivalent to KMT as VCG has been set to zero

#### DRAFT STATUS

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.765 @ 38.85f, 2.745 @ 2.15f
--

Baseline Draft at Fwd Draft Marks (FR 38.85)	1.765
Baseline Draft at Aft Draft Marks (FR 2.15)	2.167
Baseline Draft at Load Line Mark (FR 20.86)	1.962
Baseline Draft at AP (FR 1)	2.180
Baseline Draft at FP (FR 40.721)	1.745

## WEIGHTS ON AND OFF

WEIGHT STATUS							
Trim: Aft 0.402/36.700,				Heel: Stbd 0.55 deg.			
Part			Weight(MT)	LCG	TCG	VCG	
LIGHT SHIP			220.30	16.069f	0.009s	3.145	
Total Weights Off			5.89	14.580f	0.030s	4.330	
Total Weights On			-3.79	17.030f	0.000	4.480	
<b>Total Fixed</b>			<b>222.40</b>	<b>16.013f</b>	<b>0.010s</b>	<b>3.154</b>	
	Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM
FO-TK8A.P	0.431	0.840	0.46	8.746f	1.336p	2.328	0.10
<b>Total Weight</b>			<b>222.86</b>	<b>15.998f</b>	<b>0.007s</b>	<b>3.152</b>	
<b>Free Surface Adjustment</b>						<b>0.000</b>	
<b>Adjusted CG</b>				<b>15.998f</b>	<b>0.007s</b>	<b>3.153</b>	
Distances in METERS.						Moments in m.-MT.	

DISPLACEMENT STATUS						
BASELINE draft: 1.765 @ 38.85f, 2.167 @ 2.15f						
Trim: Aft 0.402/36.700, Heel: Stbd 0.55 deg.						
Part	SpGr	Displ(MT)	LCB	TCB	VCB	RefHt
HULL	1.025	222.86	15.979f	0.024s	1.388	-2.190
Distances in METERS.						

## LIGHTSHIP CONDITION

**WEIGHT STATUS**

BASELINE draft: 1.772 @ 38.85f, 2.143 @ 2.15f

Trim: Aft 0.370/36.700, Heel: Stbd 0.65 deg.

Part	Weight(MT)	LCG	TCG	VCG
WEIGHT	220.30	16.069f	0.009s	3.145

Distances in METERS.

**HYDROSTATIC PROPERTIES**

Trim: Aft 0.370/36.700, Heel: Stbd 0.65 deg., VCG = 3.145

Draft@ 20.500f	Displacement Weight(MT)	Buoyancy-Ctr. LCB VCB		Weight/ cm	LCF	Moment/ cm trim	GML	GMT
1.957	220.30	16.051f	1.380	2.08	16.158f	5.07	84.38	1.091
Distances in METERS.			Specific Gravity = 1.025.				Moment in m.-MT.	
Draft is from BASELINE.			Trim is per 36.70m.					

**DRAFT STATUS**

MARKS draft refers to the line:

0.000 above baseline @ 38.850f and 0.578 below baseline @ 2.150f

MARKS draft: 1.772 @ 38.85f, 2.721 @ 2.15f

Baseline Draft at Fwd Draft Marks (FR 38.85)	1.772
Baseline Draft at Aft Draft Marks (FR 2.15)	2.143
Baseline Draft at Load Line Mark (FR 20.86)	1.954
Baseline Draft at AP (FR 1)	2.154
Baseline Draft at FP (FR 40.721)	1.753

**Pylon Atlantic**

31 Trider Crescent,  
Dartmouth, N.S., B3B

Page 1 of 1

## CERTIFICATE OF CALIBRATION

<b>Description</b>	LOAD CELL 20000LB	<b>Work Order</b>	E23640
<b>Model Number</b>	ED-2000-10	<b>Serial Number</b>	D40194
<b>Instrument Id</b>	T008349	<b>Cal Procedure</b>	33K6-4-874-1
<b>Manufacturer</b>	DILLON	<b>Cal Date</b>	6 Dec 2011
<b>Customer Name</b>	HSL	<b>Recall Cycle</b>	52 Weeks
<b>Purchase Order</b>	215515 OH	<b>Next Cal Date</b>	6 Dec 2012

**Calibration Environment:** Temperature 20 +/-0.5°C Relative Humidity 44 +/- 5%

**Received Condition:** Within Tolerance

**Completed Condition:** Within Tolerance

### Standards Used to Establish Traceability

<u>Instrument Type</u>	<u>Model</u>	<u>Asset #</u>
LOAD CELL	1110DDF-5K	21277
LOAD CELL	1620CCX	21275
DIGITAL PROCESS MONITOR	9840	21273
LOAD CELL	10K	21274

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined in the calibration procedure(s) and/or specification(s) referenced on the Test Data Sheet(s) (TDS), unless otherwise indicated. The received and final conditions specified above and the TDS specifications are based on the procedure(s) and/or specification(s) referenced on the TDS unless otherwise indicated.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through National Research Council of Canada (NRC), the National Institute of Standards and Technology (NIST) and/or other recognised international standards. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

Pylon's Electrical and Physical Properties Laboratories meet the recommendations of NRC's Recommended Practices of Calibration Laboratories - June 2003 for ambient temperature, relative humidity and cleanliness. Pylon's quality system is registered to ISO 9001:2008. The quality system meets the requirements of ISO/IEC 17025:2005. This compliance has not been independently verified.

This report consists of 2 parts with separate page numbering schemes; the Certificate of Calibration and the Test Data Sheet(s) (TDS). Copyright of this report is owned by the issuing laboratory and may not be reproduced, other than in full, except with the prior written permission of the issuing laboratory.

Metrologist : 109

Quality Assurance: S007

Date of Issue: 6 Dec 2011

F083 Rev 13

HALIFAX

MONTREAL

OTTAWA

TORONTO

pylcert1



## Calibration Test Data

Description: **LOAD CELL 20000LB**

**Model No.: ED-2000-10**

**Customer ID.: T008349**

Manufacturer: **DILLON**

Customer: HSL

Work order: **E23640**

Serial No.: **D40194**

Procedure: 33K6-4-874-1

Proc. Rev.: 30-Aug-2007

Cal Date: 06-Dec-2011

Rev:25Jan2007

 $AF=0$ 
$$F=0$$

110TTTDSIPP TL Temp 008

Appr 012

TEST REFERENCE	TEST DESCRIPTION	APPLIED*	RESULTS			
			MINIMUM	AS FOUND	FINAL	MAXIMUM
	Tension					
		0	-20	0		20
		4000	3980	4000		4020
		8000	7980	8005		8020
		12000	11980	12010		12020
		16000	15980	16010		16020
		20000	19980	20015		20020
NOTE: ALL UNITS ARE IN Lbs UNLESS INDICATED OTHERWISE.						