

FOB TRIM

STABILITY INFORMATION

20 MAY 2009

INDEX

	Page
General Information	3
Description of calculations	4
Symbols, units & terms	6
Tank plan	7
Capacities & Centres of Gravity	8
Stability Criteria	10
Notes to the Master	11
Notes on use of Free Surface Moments	12
Maximum Permissible KG Diagram	13
Example on the use of the Maximum Permissible KG Principle	14
Summary of loading conditions	15
Loading Conditions: 1. Light Ship	16
2. Vessel with design load	19
3. Maximum load – 100% bunkers	22
4. Loaded as in cond. 3 – 10% bunkers	25
5. With passengers, no cargo - 100% bunkers	28
6. With passengers, no cargo - 10% bunkers	31
7. Cond. 2 with 50% full Anti-roll tank	34
8. Cond. 5 with 50% full Anti-roll tank	37
Sketch of freeboard - & draft marks	40
Light Ship Weight & C.G. after conversion May 2009	41
Inclining test report	42
Hydrostatic data	47
Form stability data	50
Stability limit tables	53
Tank Capacity Tables	57
Calculation Sheet - Simplified Stability Criteria	62

GENERAL INFORMATION

Ships Name	FOB TRIM	
Ships Type	Crew Trimaran	
Signal Letters	OU 9616	
Official Number	H 1521	
IMO Number		
Port of Registry	Fredericia	
Owner	Fredrik Odfjell Offshore Windservice Beddingsvej 2, 6960 Hvide Sande	
Builders	A/S Hvide Sande Skibs- og Bådebyggeri	
Yard no.	106	
Keel laid	July 2006	
Delivered	Feb. 2007	
Class (Hull only)	Lloyds Register ✕100 A1 SSC Cargo (A) Trimaran G2 Service Area	
Length overall	24.52	m.
Length b. p.	22.23	m.
Breadth moulded	7.40	m.
Depth mld. to Main deck	3.71	m.
Maximum Draught at midship (B.L.)	1.90	m.
Displacement at maximum draught	75	t.
Deadweight at maximum draught	31	t.
Gross Tonnage	GT	81.8
Net Tonnage	NT	24.5

DESCRIPTION OF CALCULATIONS

This booklet contains updated intact stability information for a special service aluminium trimaran, intended for transport of upto 12 persons, built as Yard No. 106 at Hvide Sande Skibs- og Bådebyggeri.

Calculations are updated after a conversion of the vessel carried out in May 2009 at Hvide Sande Skibs- og Bådebyggeri, where a new crane and resue net were fitted on the starboard side amidships. In addition a ballast tank, subdivided into a centre tank and 2 wing tanks, was built on the transom stern, thereby increasing the vessel's length by 0.80 metres. Calculations are carried out for the owners by P.K. Bagai from Jorgen Petersen Ltd., Consulting Naval Architects, Horsens, Denmark.

Stability calculations are carried out to comply with the regulations: Meddelelser fra Søfartsstyrelsen B (IMO Resolution A.749(18)).

For hydrostatic and form stability calculations, **Autohydro** is used, which is a Windows based software, developed by **Autoship Systems Corporation**, Canada. Hull geometry is transferred from the surface modelling program **Rhinocerus** to the program **Modelmaker**, where the internal geometry is defined. Loading conditions are calculated using Autohydro software by equilibrium calculations on the hull model and presented by software developed by Jorgen Petersen Ltd., Consulting Naval Architects, Horsens, Denmark. Drafts and stability data for the loading conditions are transferred to Excel from Autohydro direct stability calculations.

The hull model for calculations includes shell plating. A mean thickness of 6.0 mm is used.

BASIC DATA

The vessel is an aluminium trimaran hull with a deckhouse placed on the centre hull and extending over about $\frac{3}{4}$ of the length aft, and is partly recessed into the hull. Deckhouse contains accommodation for passengers in the after part with the wheelhouse positioned in the forward part. The engine room is situated amidships below the wheelhouse. The deckhouse is included as a bouyant part in the hull definition.

The following drawings have been used for the description of hull geometry and compartment definition:

- 1206-01-01 General Arrangement
- 1206-02-01 Lines plan
- 1206-02-11 Tankplan – included in this booklet

DOWN FLOODING POINTS

Wheelhouse windows, not provided with deadlights, are considered as downflooding openings:

Windows P & S 9.76f 1.85s/1.85p 5.10u

Windows aft in deckhouse in way of passenger seating area are to be provided with storm covers in accordance with Lloyds SSC rules part 3, chapter4, section 7.12.4 for each different size of window.

TRIM

Hydrostatic data, form stability data and tables of maximum permissible KG have been calculated for the vessel on even keel, and for the following trim values: 0.3 m aft and 0.3 m fwd.

All loading conditions in this booklet are a result of direct calculations on the hull model, i.e. on the actual waterline.

LOADING CONDITIONS

8 loading conditions, covering the most common loading cases, have been calculated. Loading condition no. 3 shows the vessel loaded with the maximum amount of deadweight including a future reserve of 14 t. All conditions fulfill the stability requirements with a reasonable margin. The least margin is in loading condition 3 having a VCG = 2.952 m against the maximum permissible value of 3.021 m.

Specific gravity 1.025 t/m^3 for seawater is used in the calculations.

ANTI-ROLL TANK

The vessel has a passive anti-roll tank in the afterpeak space. Loading conditions 7 & 8 show the effect of filling the tank to a level of 50% on stability compared to the corresponding conditions 2 & 5. The amount of water in the tank has to be adjusted optimize the level of damping in the prevailing conditions, having due regard to fulfilling the stability criteria. In the event of grounding, leakage, ice accretion or other factors, which might have effect on the vessels stability, the tank must be emptied immediately.

DRAFTS, DRAFT MARKS AND BASELINE

Draft Marks on the vessel are offset from the deepest points on the keel at the ends. A sketch of the draft marks (page 40) is included in this booklet showing the exact position of the marks with respect to the vessels Base Line as defined on the Lines Plan drawing. All drafts indicated in loading conditions in this booklet relate to the Base Line.

Base Line drafts calculated in the loading conditions can be converted to drafts above Bottom of Keel as follows:

$$\text{BOK draft forward} = \text{Baseline draft at FP} - 0.231 \text{ m}$$

$$\text{BOK draft aft} = \text{Baseline draft at AP} + 0.366 \text{ m}$$

For symbols, units and terms – refer to page 6.

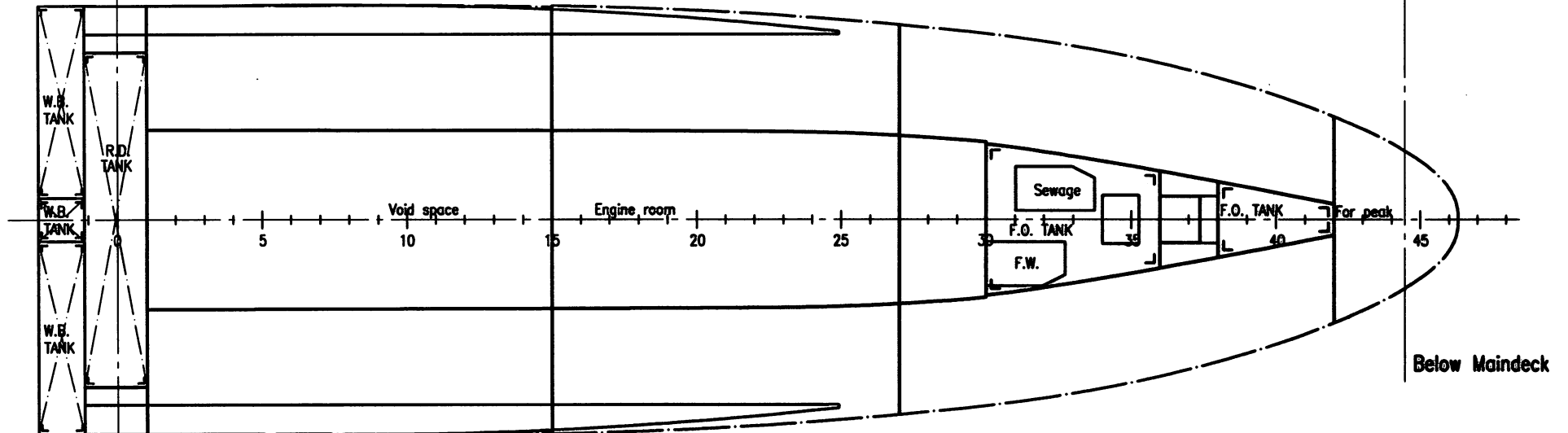
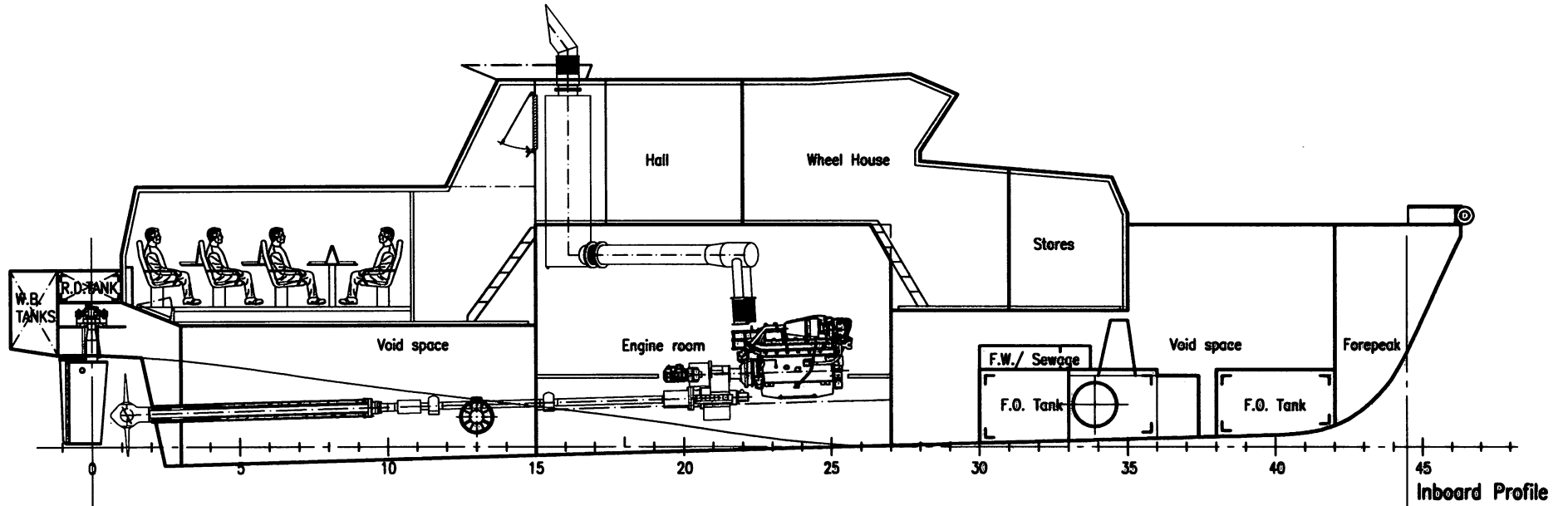
SYMBOLS, UNITS & TERMS

SYMBOL	UNIT	TERM
AP		: After perpendicular
FP		: Fore perpendicular
MP		: Mid between perpendiculars
BL		: Baseline
CL		: Centerline
BK		: Bottom of keel
X,Y,Z	[m]	: X or Y or Z coordinate with origin in AP,CL,BL
XG	[m]	: X-coordinate of centre of gravity
YG	[m]	: Y-coordinate of centre of gravity
ZG	[m]	: Z-coordinate of centre of gravity
KG	[m]	: Z-coordinate of centre of gravity for loaded vessel
KGc	[m]	: Free surface corrected Z-coordinate of centre of gravity
KGmax	[m]	: Max permissible Z-coordinate of centre of gravity according to stability criteria
GM	[m]	: Metacentric height = KMt - KG
GMc	[m]	: Free surface corrected Metacentric height
GMmin	[m]	: Min permissible metacentric height according to stability criteria
Lpp	[m]	: Length between perpendiculars (AP and FP) at design draft
Bmld	[m]	: Breadth moulded (excl. shell plating)
Tmld	[m]	: Draft at MP above BL
Tka	[m]	: Draft at AP above BK
Tkf	[m]	: Draft at FP above BK
Tkm	[m]	: Draft at MP above BK = $0.5 \times (Tka + Tkf)$
t	[m]	: Trim = Tkf - Tka => Negative for trim aft
DISV	[m ³]	: Displacement volume
DISM	[t]	: Displacement mass in saltwater
VCB	[m]	: Z-coordinate of centre of buoyancy
KMt	[m]	: Z-coordinate of transverse metacentre
TPC	[t/cm]	: Displacement mass per centimetre change of draft
MTC	[tm/cm]	: Moment to change trim one centimetre
XB	[m]	: X-coordinate of centre of buoyancy
XF	[m]	: X-coordinate of centre of flotation
Cb		: Block coefficient = $DISV / (Lpp \times Bmld \times Tmld)$
Cm		: Midship area coefficient = $Midship\ area / (Bmld \times Tmld)$
Theta Max	[deg]	: Angle at Max GZ
ϑ	[deg]	: Angle of Heel
Lk	[m]	: Value of stability crosscurve = $GZ + KG \times \sin(\vartheta)$
F.S. Mom	[tm]	: Free Surface moment = moment of inertia x spec. gravity

Project specific parameters:

Lpp	: 22.234 m
Bmld	: 7.400 m
Design trim	: 0.000 m
BL-BK	: 0.000 m, distance from BK to BL (positive for BK below BL)
Rho	: 1.025 , specific gravity of seawater

Main Dimensions: 22.23m LBP x 7.40 m BMLD x 3.71 m DMLD



Tank Plan

Scale 1:100

Drg. no. 1206-11-01C

PKB 19.05.09

CAPACITY TABLES

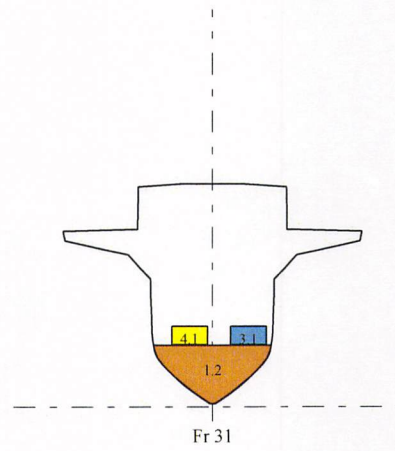
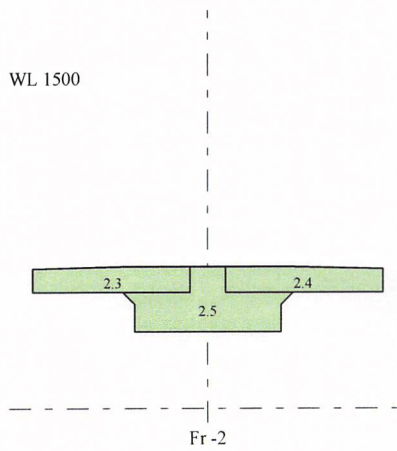
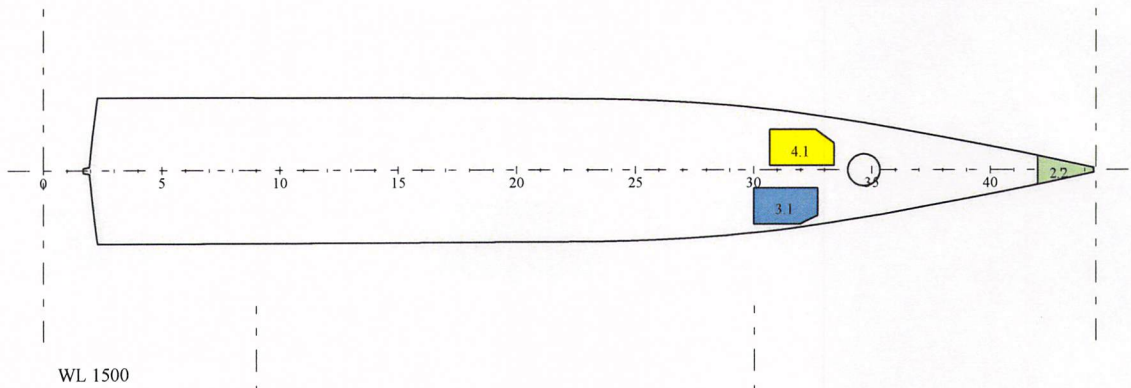
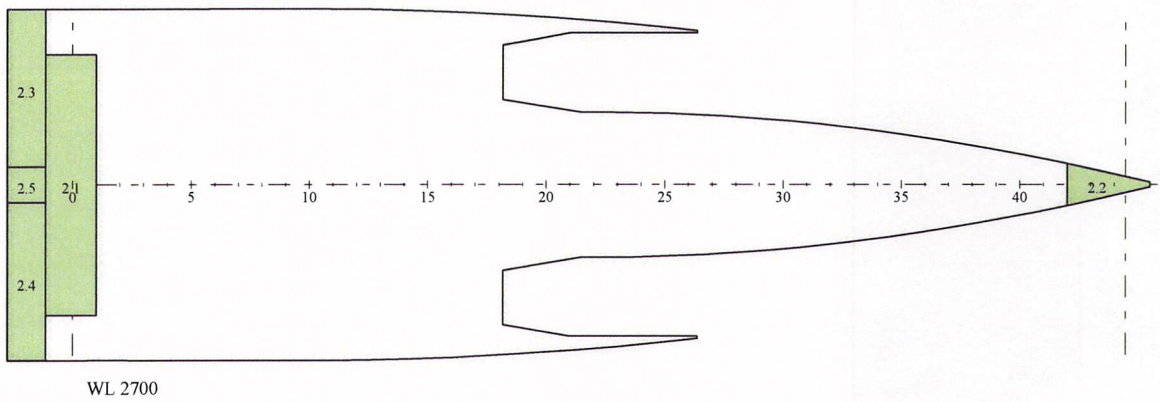
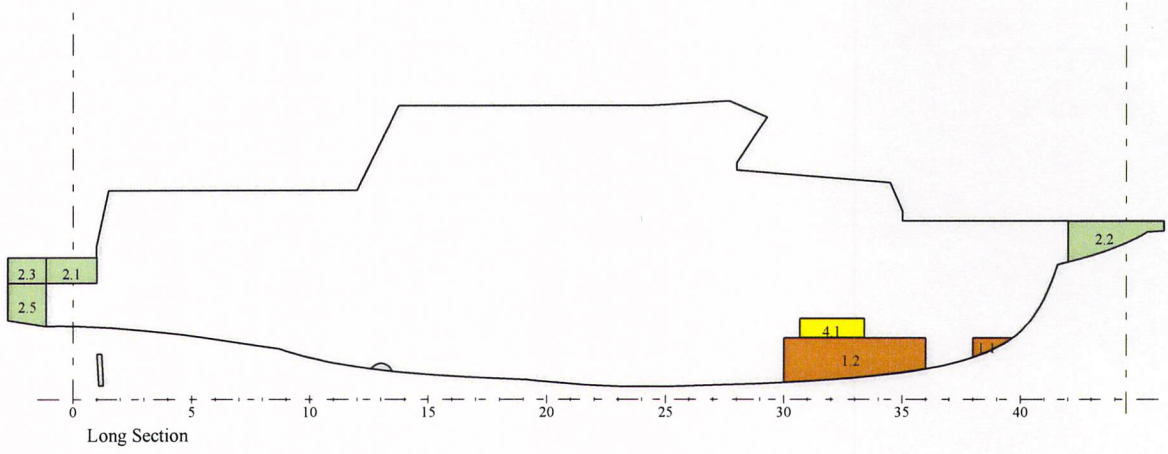
Fuel Oil	FRM NO.	S.G. [t/m3]	CONTENTS			XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
			100% [m3]	100% [t]	98% [t]				
1.1 Tank 1	38-42	0.850	1.19	1.01	0.99	19.84	0.00	0.89	0.1
1.2 Tank 2	30 - 36	0.850	3.48	2.96	2.90	16.03	0.00	0.88	2.2
TOTAL			4.67	3.97	3.89	17.00	0.00	0.88	

Water Ballast	FRM NO.	S.G. [t/m3]	CONTENTS			XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
			100% [m3]	100% [t]	98% [t]				
2.1 Anti-Roll Tank	Tr.- 1	1.025	3.07	3.15	3.08	-0.04	0.00	2.72	17.2
2.2 Forpeak Tank	42 - stem	1.025	3.56	3.65	3.58	21.71	0.00	3.00	3.4
2.3 W.B. Aft P	-3 - -1	1.025	1.38	1.41	1.39	-0.97	2.01	2.71	2.5
2.4 W.B. Aft S	-3 - -1	1.025	1.38	1.41	1.39	-0.97	-2.01	2.71	2.5
2.5 W.B. Aft C	-3 - -1	1.025	2.40	2.46	2.41	-0.96	0.00	2.13	3.1
TOTAL			11.79	12.08	11.84	6.12	0.00	2.68	

Fresh Water	FRM NO.	S.G. [t/m3]	CONTENTS			XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
			100% [m3]	100% [t]	98% [t]				
3.1 Fresh Water S	30 - 33	1.000	0.39	0.39	0.38	15.66	-0.75	1.51	0.0
TOTAL			0.39	0.39	0.38	15.66	-0.75	1.51	

Misc.	FRM NO.	S.G. [t/m3]	CONTENTS			XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
			100% [m3]	100% [t]	98% [t]				
4.1 Sewage Tank P	33 - 36	1.000	0.38	0.38	0.37	15.99	0.46	1.51	0.0
TOTAL			0.38	0.38	0.37	15.99	0.46	1.51	

CAPACITY PLAN



■ - Fresh Water
 ■ - Fuel oil
 ■ - Misc
 ■ - Water Ballast

INTACT STABILITY CRITERIA - IMO RES. A 749 (18), Ch 3.1.2

The vessels the stability must in any sailing condition comply with at least the following minimum criteria.

1. Area under the righting lever curve (GZ curve) should be:
 - a) At least 0,055 metre-radians up to an angle of heel of 30°.
 - b) At least 0,090 metre-radians up to an angle of heel of 40°, or the angle of flooding, if this angle is less than 40°. (Angle of flooding is the angle of heel at which openings in the hull, superstructures or deckhouses, which cannot be closed weathertight, immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.)
 - c) Additionally, the area under the righting lever curve (GZ curve) between the angles of 30° and 40° or between 30° and the angle of flooding, if this angle is less than 40°, should not be less than 0,03 metre-radians.
2. The righting lever GZ should be at least 0,20 m at an angle of heel equal to or greater than 30° but less than 40°, or the angle of flooding if this angle is less than 40°
3. The maximum righting arm should occur at an angle of heel not less than 25°.
4. The initial metacentric height GM should not be less than 0,15 m.

NOTES TO THE MASTER

Compliance with the stability criteria does not ensure immunity against capsizing regardless of the circumstances or absolve the master from his responsibilities. The master 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 in such a way that compliance with the stability criteria can be achieved and if necessary the amount of cargo should be limited so as to allow any required ballast water to be taken.

Before a voyage commences care should be taken to ensure that the cargo and sizeable 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.

The number of tanks containing slack liquids should be kept to a minimum.

Hatches, doors, etc., which give access to the spaces below 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.

Ship owners bear the responsibility to ensure that adequate, accurate and up-to-date stability information for the master's use is provided.

It is of vital importance to ensure that all ballast tanks in any condition which are to be full, are in fact pressed full. Those tanks that are to be empty should be completely dry.

Doors and hatches etc. that provide access to exposed decks should be kept closed and secured at sea.

The vessel has a passive anti-roll tank in the afterpeak space. The amount of water in the tank has to be adjusted optimize the level of damping in the prevailing conditions, having due regard to fulfilling the stability criteria. In the event of grounding, leakage, ice accretion or other factors, which might have effect on the vessels stability, the tank must be emptied immediately.

Simplified stability Information is given as tables of maximum permitted values for the vessels vertical centre of gravity (KG). Corresponding minimum values of GM are also given. An example showing the use of the maximum permissible KG principle is included in this booklet.

Drafts in all loading conditions in this booklet refer to the draft above bottom of keel.

If the vessel is subjected to alterations that would affect the stability of the vessel, the information provided in this booklet must be corrected accordingly.

NOTES ON USE OF FREE SURFACE MOMENTS

Provided a tank is completely filled with liquid no movement of the liquid is possible and the effect on the ship's stability is precisely the same as if the tank contained solid material.

Immediately a quantity of liquid is withdrawn from the tank the situation changes completely and the stability of the ship is adversely affected by what is known as the "free surface effect". This adverse effect on the stability is referred to as a "loss in GM" or as a "virtual rise in KG" and is calculated as follows:

$$\text{Loss in GM} = \frac{\text{Free Surface Moment (tonnes metres)}}{\text{Displacement of the vessel in tonnes}}$$

Free surface moment of a tank is the transverse moment of inertia of the free surface multiplied by the specific gravity of the tank.

All free surface moments quoted in this booklet are at the specific gravity given on the "Capacities and Centres of Gravity" sheets for any particular Liquid/Tank combination.

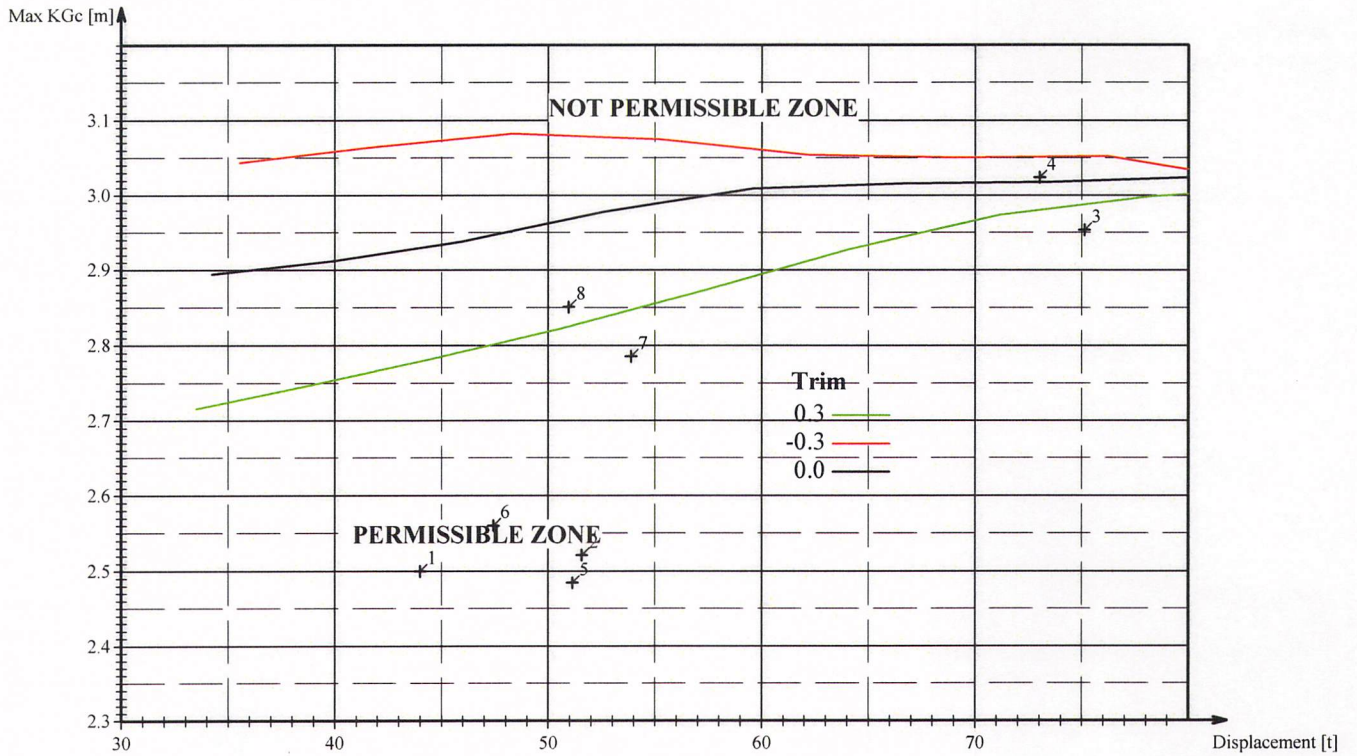
If it is required to ship for example, Fuel oil at an S.G. varying from the quoted 0,850, then the Free Surface Moment for any tank at this new S.G. is obtained by:

$$\text{F.S.M.} = \frac{\text{F.S.M. as stated}}{0,85} \times \text{New S.G.}$$

The "free surface effects" of all slack oil-fuel, fresh water, service and ballast tanks should be taken into account in both the Arrival and Departure Conditions.

Information on free surface moments for all tanks is shown in the Capacities & Centres of Gravity section.

MAX KGc DIAGRAM



No.	Identification	DISM	KGc
1	Light Ship	44.00	2.500
2	Vessel with design load	51.58	2.521
3	Maximum load - 100% Bkrs.	75.13	2.953
4	Loaded as in cond. 3 - 10% Bkrs.	73.02	3.024
5	With passengers, no cargo - 100% Bkrs	51.13	2.484
6	With passengers, no cargo - 10% Bkrs	47.43	2.560
7	Cond 2 with 50% full Anti-Roll tank	53.87	2.786
8	Cond 5 with 50% full Anti-Roll tank	50.96	2.851

EXAMPLE WITH CALCULATION OF STABILITY AND TRIM

(Based on loading condition no. 2)

	A	B	C	D = B · C	E	F = B · E	G
	Item	Weight [t]	XG [m]	Long.Mom. [tm]	ZG [m]	Vert.Mom. [tm]	F.S.Mom [tm]
1	Light ship						
2	Consumables						
3	Ballast						
4	Cargo						
5	Miscellaneous						

6	DISPLACEMENT	51.58	9.96	513.6	2.43	125.3	4.8
		= SUM(B1-B5)	= D6/B6	= SUM(D1-D5)	= F6/B6	= SUM(F1-F5)	= SUM(G1-G5)

$$\text{DISM} = \text{Displacement mass} = B6 = \underline{\underline{51.58 \text{ t}}}$$

Table with trim value = 0.000 is selected, the following values have been obtained:

$$\text{Tkm} = \underline{\underline{1.58 \text{ m}}}; \text{MTC} = \underline{\underline{1.01 \text{ tm/cm}}}; \text{XB} = \underline{\underline{10.06 \text{ m}}}; \text{XF} = \underline{\underline{8.50 \text{ m}}}$$

The following values are calculated:

$$t = \text{Trim} = \text{Table Trim} + [\text{DISM} \cdot (\text{XG} - \text{XB})] / (\text{MTC} \cdot 100) = \underline{\underline{-0.05 \text{ m}}}$$

$$\text{Tka} = \text{Draught at AP} = \text{Tkm} - (t / 2) + \text{Design trim} / 2 = \underline{\underline{1.61 \text{ m}}}$$

$$\text{Tkf} = \text{Draught at FP} = \text{Tkm} + (t / 2) - \text{Design trim} / 2 = \underline{\underline{1.56 \text{ m}}}$$

$$\text{KG of Displacement} = \text{Vertical moment} / \text{DISM} = E6 = \underline{\underline{2.43 \text{ m}}}$$

$$\text{FSmom} = \text{Free Surface Moment} = G6 = \underline{\underline{4.8 \text{ tm}}}$$

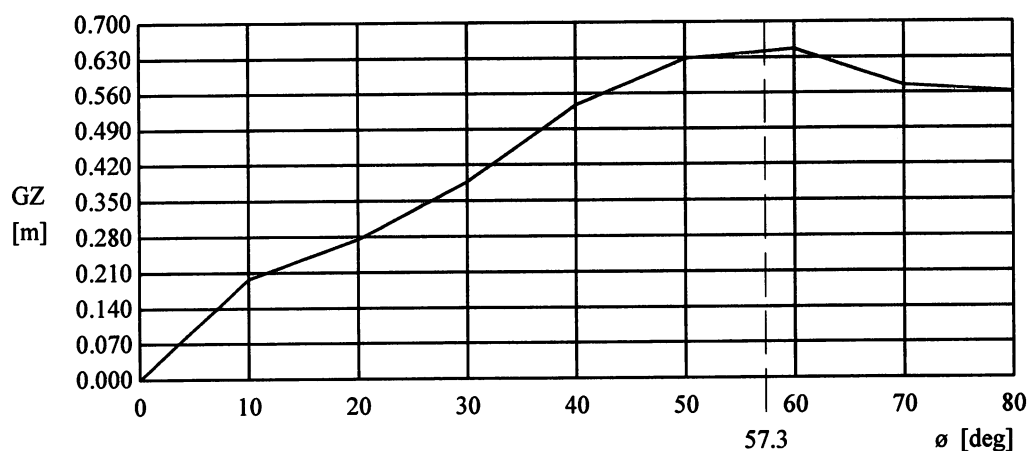
$$\text{KGc} = \text{KG} + \text{FSmom} / \text{DISM} = \underline{\underline{2.52 \text{ m}}}$$

$$\text{MAX PERMISSIBLE KGc from tables, interpolating for trim} = \underline{\underline{2.97 \text{ m}}}$$

KGc must be less than this value!

Form for calculation and plotting the righting lever curve (Lk taken from selected table):

ϑ [deg]	10	20	30	40	50	60	70	80
Lk [m]	0.64	1.14	1.65	2.16	2.56	2.83	2.94	3.04
KGc · sin(ϑ) [m]	0.44	0.86	1.26	1.62	1.93	2.18	2.37	2.48
GZ [m]	0.20	0.27	0.39	0.54	0.63	0.65	0.57	0.56
GZ = Lk - KGc · sin(ϑ); KM = <u>4.04 m</u> ; KGc = <u>2.52 m</u> ; GMc = KM - KGc = <u>1.52 m</u>								



SUMMARY OF LOADING CONDITIONS

No.	Loading condition	DISM	Tkm	t	KGc	KGmax	GMc	GMmin
		[t]	[m]	[m]	[m]	[m]	[m]	[m]
1	Light Ship	44.00	1.445	-0.233	2.500	2.950	1.817	1.367
2	Vessel with design load	51.58	1.578	-0.054	2.521	3.037	1.551	1.035
3	Maximum load - 100% Bkrs.	75.13	1.909	-0.105	2.952	3.021	0.522	0.453
4	Loaded as in cond. 3 - 10% Bkrs.	73.02	1.867	-0.201	3.024	3.214	0.487	0.297
5	With passengers, no cargo - 100% Bkrs	51.13	1.583	0.042	2.484	2.996	1.600	1.088
6	With passengers, no cargo - 10% Bkrs	47.43	1.487	-0.292	2.560	3.101	1.689	1.149
7	Cond 2 with 50% full Anti-Roll tank	53.87	1.615	-0.015	2.786	3.205	1.203	0.784
8	Cond 5 with 50% full Anti-Roll tank	50.96	1.559	-0.132	2.850	3.222	1.247	0.876

LOADING CONDITION NO. 1

Light Ship

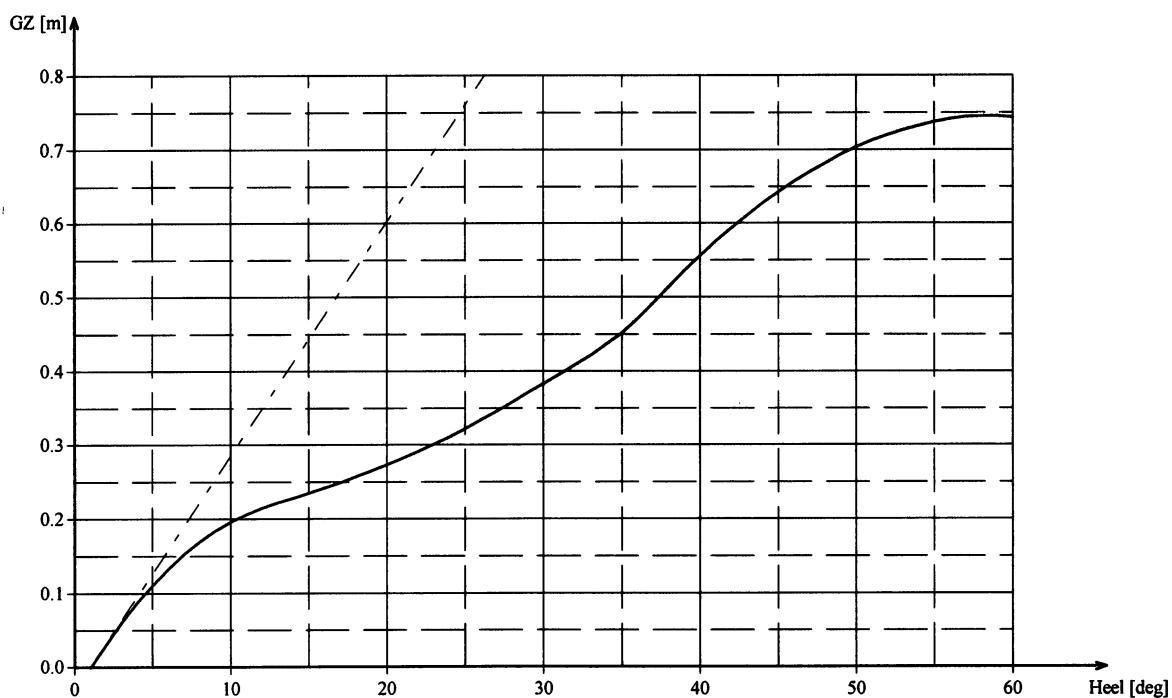
LOADING SUMMARY:

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage						
Deck cargo fwd.						
Deck cargo aft						
Total Cargo		0.00				
Fuel Oil:						
Tank 1	0					
Tank 2	0					
Total Fuel Oil		0.00				
Water Ballast						
Forepeak Tank	0					
W.B. Aft P						
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	0					
Total Water Ballast		0.00				
Fresh Water	0					
Sewage Tank	0					
Small Tanks						
Crew, Provision & Stores						
DEADWEIGHT		0.00	0.00	0.00	0.00	0.0
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		44.00	9.84	-0.04	2.50	0.0

LOADING CONDITION NO. 1**Light Ship****SAILING STATE:**

All drafts are from baseline

Displacement	44.000 [t]	Heel (positive port side)	-1.050 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	4.317 [m]
Distance from BL to BK	0.000 [m]	KG	2.500 [m]
Draft at XF	1.473 [m]	GM	1.817 [m]
Draft at AP	1.561 [m]	Free surface correction	0.000 [m]
Draft at FP	1.328 [m]	KGc	2.500 [m]
Mean draft at MP	1.445 [m]	GMc	1.817 [m]
Trim (negative aft)	-0.233 [m]	XB	9.824 [m]
Moment to Change Trim / cm	0.915 [tm]	XF	8.412 [m]

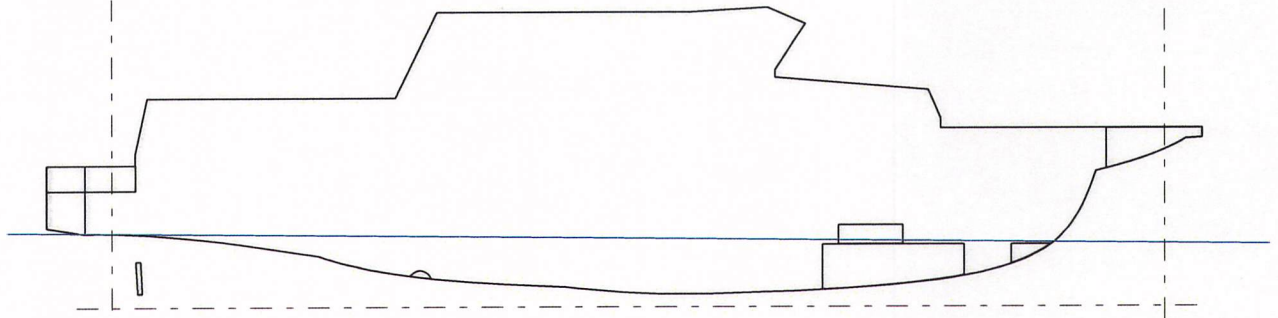
INTACT STABILITY:**Cargo / Passenger ship stability criteria**

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.115	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.196	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.081	0.030	[m.rad]	ok			
Max. GZ	0.746	0.200	[m]	ok	MAX. PERM. KGc:	2.950	[m]
Theta Max	58.000	25.000	[deg]	ok	Limiting criteria:		
GMc	1.817	0.150	[m]	ok	Area up to 30 deg		

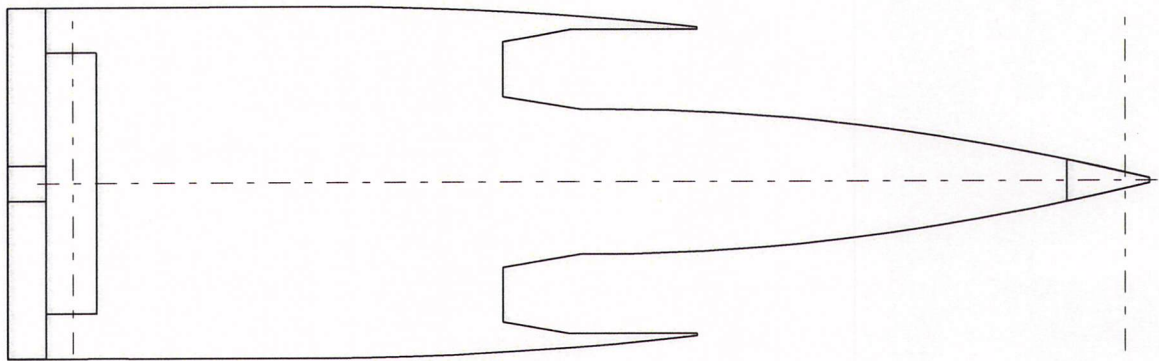
LOADING CONDITION NO. 1

Light Ship

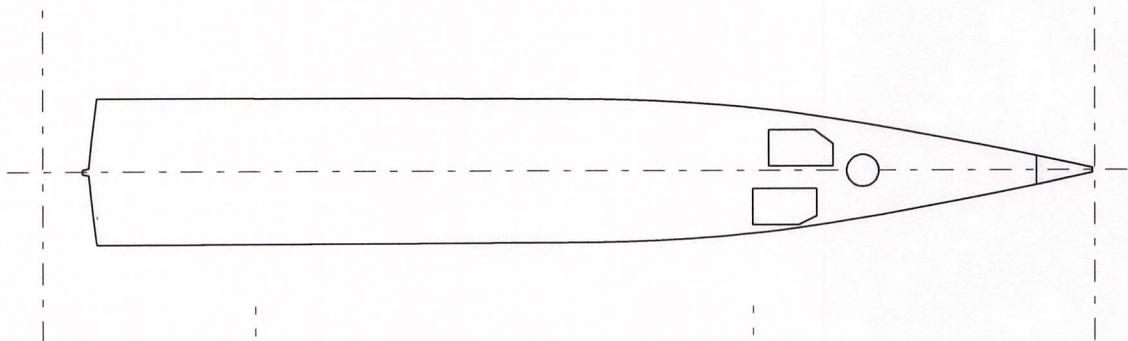
SHIP MODEL:



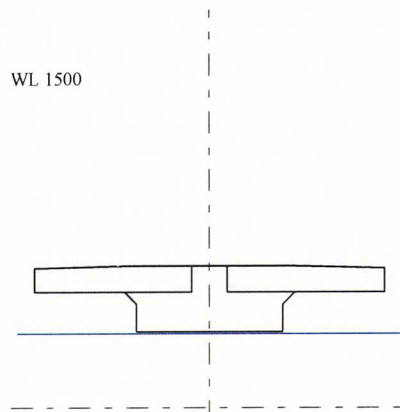
Long Section



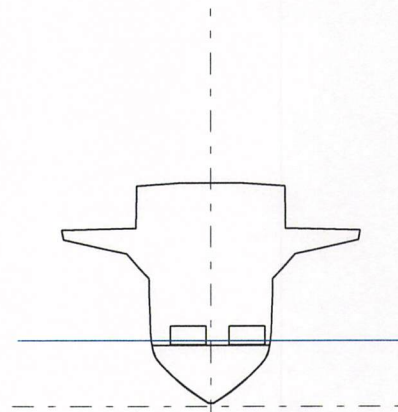
WL 2700



WL 1500



Fr-2



Fr 31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

LOADING CONDITION NO. 2

Vessel with design load

LOADING SUMMARY:

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.						
Deck cargo aft		1.00	4.00	0.00	3.80	0.0
Total Cargo		2.00				
Fuel Oil:						
Tank 1	50	0.51	19.83	0.00	0.66	0.1
Tank 2	98	2.90	16.03	0.00	0.88	2.1
Total Fuel Oil		3.41				
Water Ballast						
Forepeak Tank	0					
W.B. Aft P	50	0.71	-0.97	2.04	2.58	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	0					
Total Water Ballast		0.71				
Fresh Water	98	0.38	15.66	-0.75	1.51	0.0
Sewage Tank	20	0.08	15.99	0.46	1.35	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
DEADWEIGHT		7.58	10.64	0.16	2.02	4.8
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		51.58	9.96	-0.01	2.43	4.8

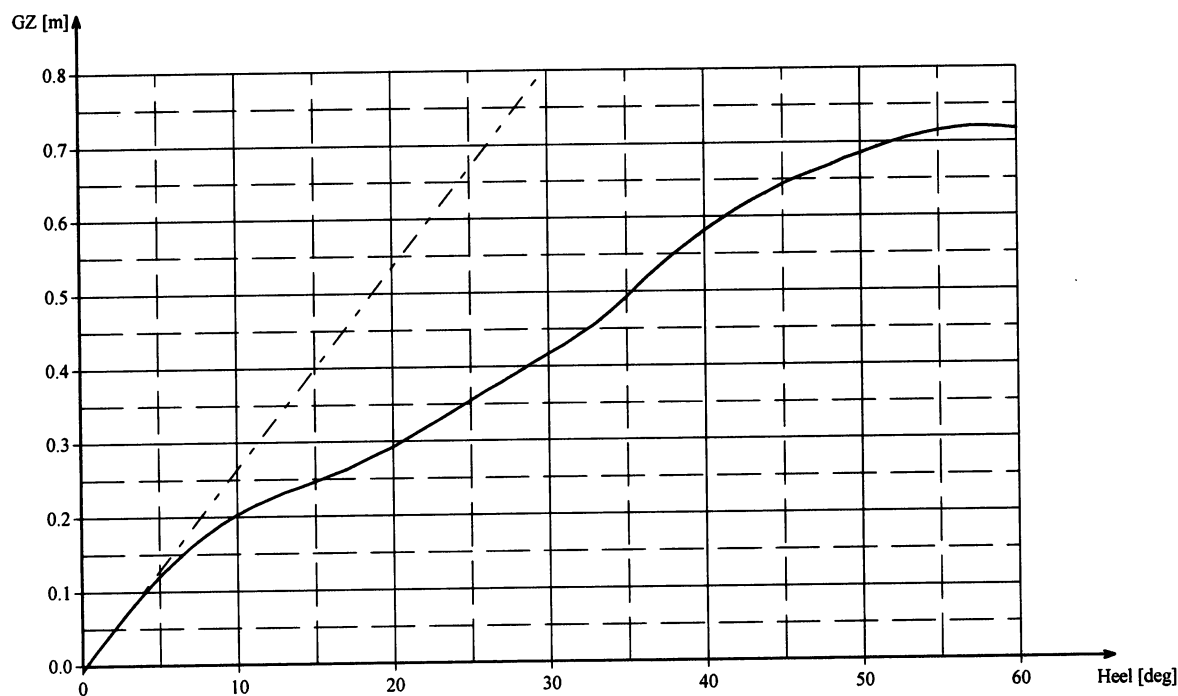
LOADING CONDITION NO. 2

Vessel with design load

SAILING STATE:

All drafts are from baseline

Displacement	51.576 [t]	Heel (positive port side)	-0.260 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	4.072 [m]
Distance from BL to BK	0.000 [m]	KG	2.429 [m]
Draft at XF	1.584 [m]	GM	1.643 [m]
Draft at AP	1.605 [m]	Free surface correction	0.092 [m]
Draft at FP	1.551 [m]	KGc	2.521 [m]
Mean draft at MP	1.578 [m]	GMc	1.551 [m]
Trim (negative aft)	-0.054 [m]	XB	9.953 [m]
Moment to Change Trim / cm	0.977 [tm]	XF	8.372 [m]

INTACT STABILITY:

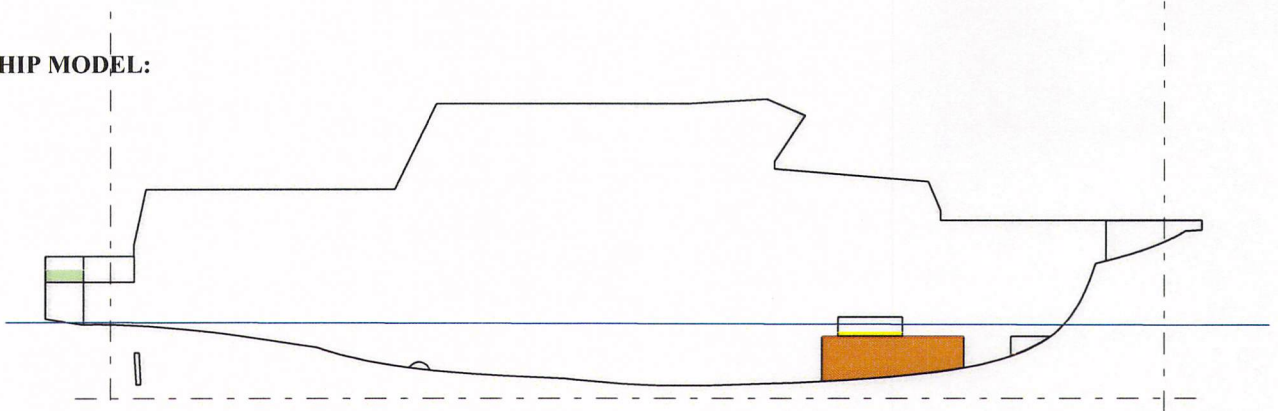
Cargo / Passenger ship stability criteria

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.125	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.211	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.086	0.030	[m.rad]	ok			
Max. GZ	0.720	0.200	[m]	ok	MAX. PERM. KGc:	3.037	[m]
Theta Max	57.000	25.000	[deg]	ok	Limiting criteria:		
GMc	1.551	0.150	[m]	ok	Area up to 40 deg		

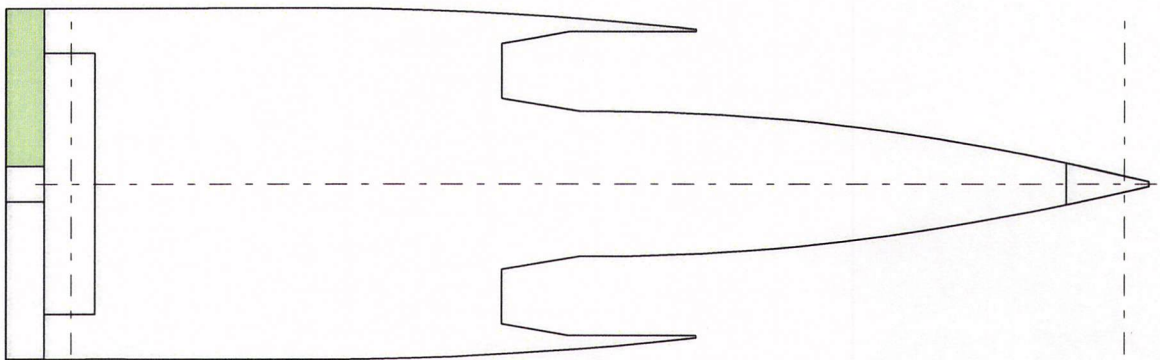
LOADING CONDITION NO. 2

Vessel with design load

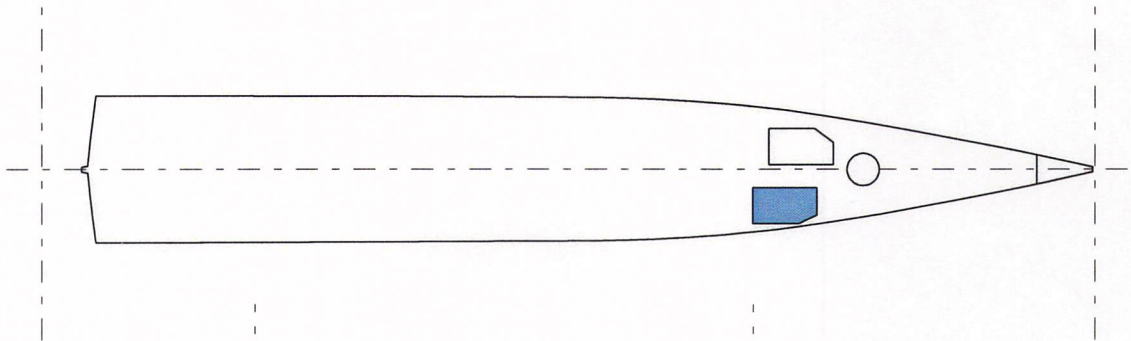
SHIP MODEL:



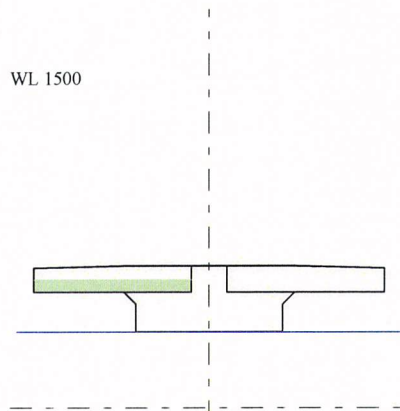
Long Section



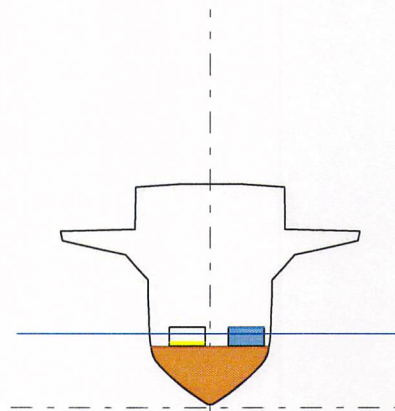
WL 2700



WL 1500



Fr-2



Fr 31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

LOADING CONDITION NO. 3

Maximum load - 100% Bkrs.

LOADING SUMMARY:

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.		3.50	16.00	0.00	3.50	0.0
Deck cargo aft		5.00	4.00	0.00	3.80	0.0
Total Cargo		9.50				
Fuel Oil:						
Tank 1	98	0.99	19.84	0.00	0.88	0.1
Tank 2	98	2.90	16.03	0.00	0.88	2.1
Total Fuel Oil		3.89				
Water Ballast						
Forepeak Tank	0					
W.B. Aft P	50	0.71	-0.97	2.04	2.58	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	50	1.57	-0.04	0.00	2.58	14.9
Total Water Ballast		2.28				
Fresh Water	98	0.38	15.66	-0.75	1.51	0.0
Sewage Tank	20	0.08	15.99	0.46	1.35	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
Deadweight Reserve		14.00	8.00	0.00	3.20	0.0
DEADWEIGHT		31.13	8.81	0.04	2.96	19.8
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		75.13	9.41	-0.00	2.69	19.8

LOADING CONDITION NO. 3

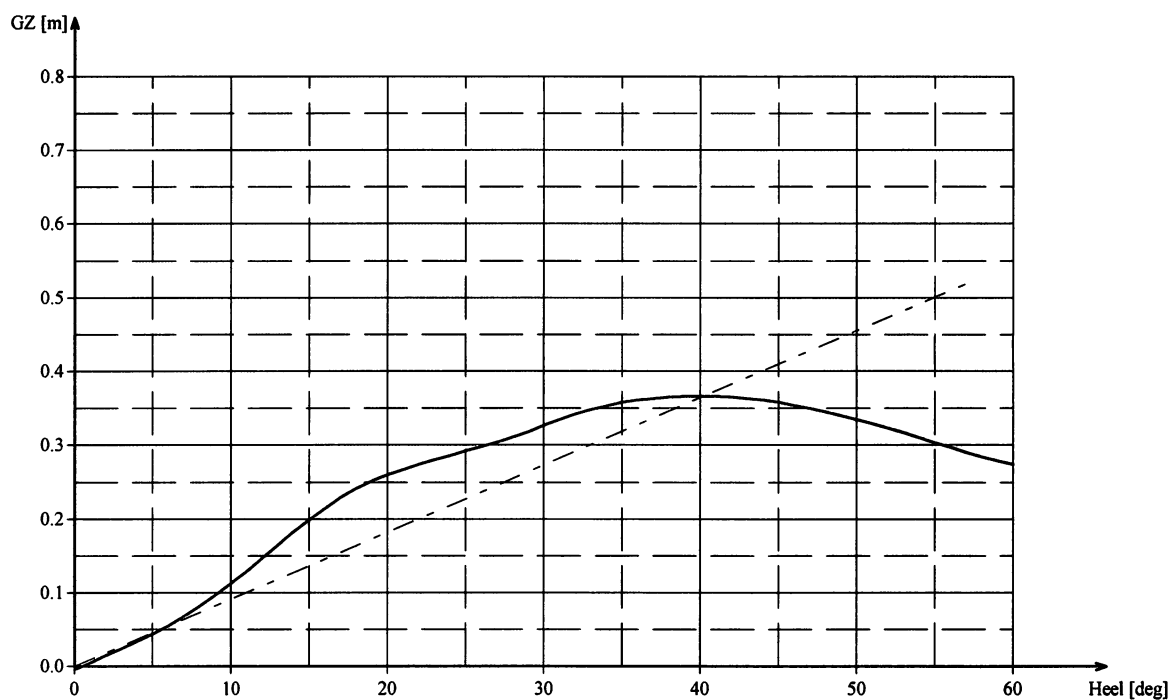
Maximum load - 100% Bkrs.

SAILING STATE:

All drafts are from baseline

Displacement	75.129 [t]	Heel (positive port side)	-0.470 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	3.474 [m]
Distance from BL to BK	0.000 [m]	KG	2.690 [m]
Draft at XF	1.921 [m]	GM	0.784 [m]
Draft at AP	1.961 [m]	Free surface correction	0.262 [m]
Draft at FP	1.856 [m]	KGc	2.952 [m]
Mean draft at MP	1.909 [m]	GMc	0.522 [m]
Trim (negative aft)	-0.105 [m]	XB	9.405 [m]
Moment to Change Trim / cm	1.000 [tm]	XF	8.475 [m]

INTACT STABILITY:



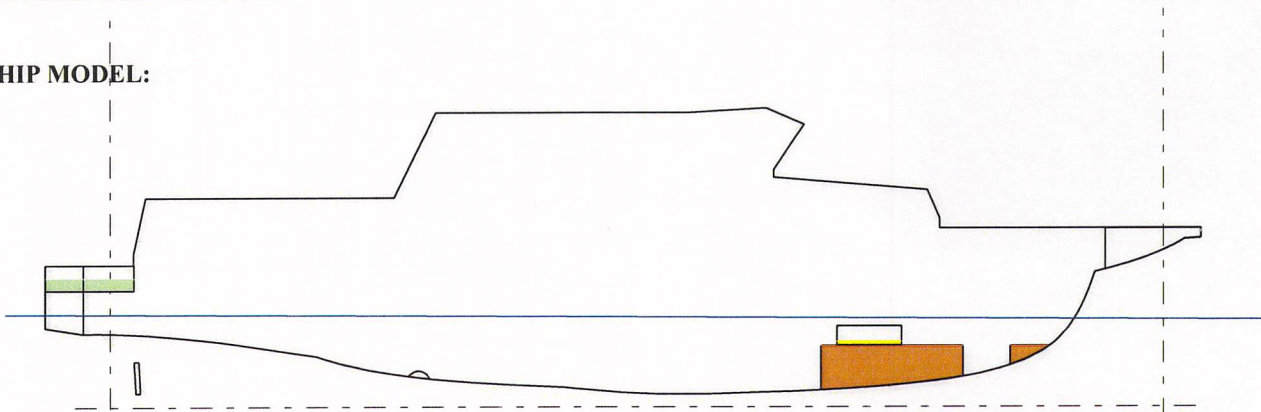
Cargo / Passenger ship stability criteria

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.093	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.155	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.062	0.030	[m.rad]	ok			
Max. GZ	0.366	0.200	[m]	ok	MAX. PERM. KGc:	3.021	[m]
Theta Max	39.000	25.000	[deg]	ok	Limiting criteria:		
GMc	0.522	0.150	[m]	ok	Nearest KGc found !		

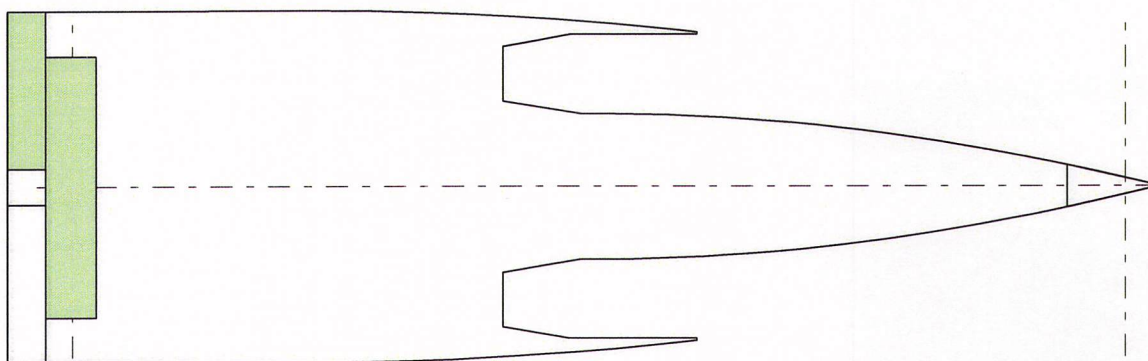
LOADING CONDITION NO. 3

Maximum load - 100% Bkrs.

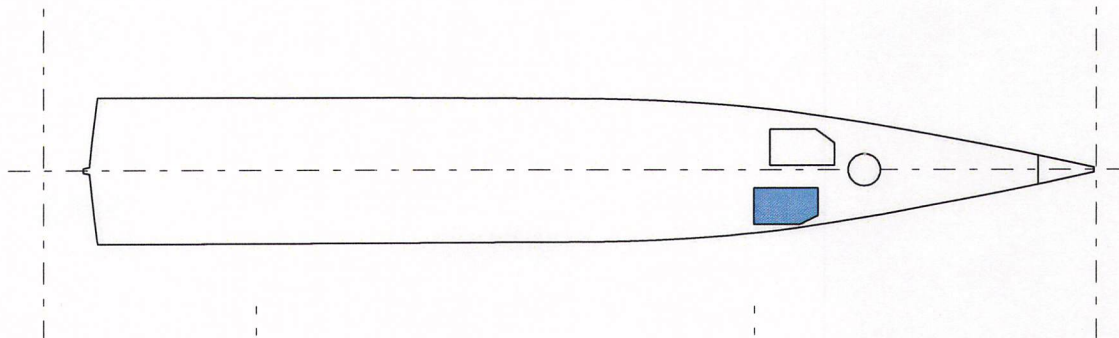
SHIP MODEL:



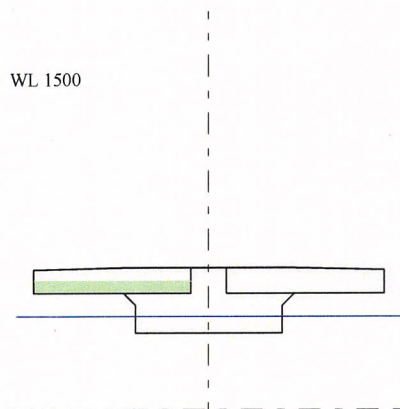
Long Section



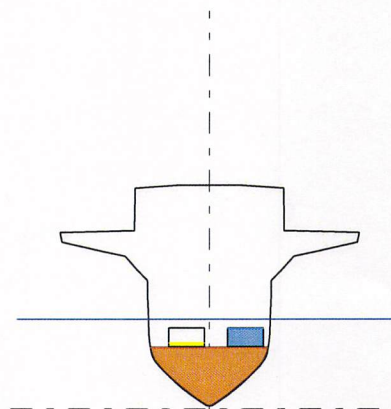
WL 2700



WL 1500



Fr-2



Fr-31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

LOADING CONDITION NO. 4

Loaded as in cond. 3 - 10% Bkrs.

LOADING SUMMARY:

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.		3.50	16.00	0.00	3.50	0.0
Deck cargo aft		5.00	4.00	0.00	3.80	0.0
Total Cargo		9.50				
Fuel Oil:						
Tank 1	0					
Tank 2	10	0.30	15.71	0.00	0.32	0.1
Total Fuel Oil		0.30				
Water Ballast						
Forepeak Tank	50	1.82	21.58	0.00	2.44	0.5
W.B. Aft P	50	0.71	-0.97	2.04	2.58	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	50	1.57	-0.04	0.00	2.58	14.9
Total Water Ballast		4.10				
Fresh Water	10	0.04	15.66	-0.75	1.33	0.0
Sewage Tank	20	0.08	15.99	0.46	1.35	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
Deadweight Reserve		14.00	8.00	0.00	3.20	0.0
DEADWEIGHT		29.02	8.50	0.05	3.20	18.1
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		73.02	9.31	-0.00	2.78	18.1

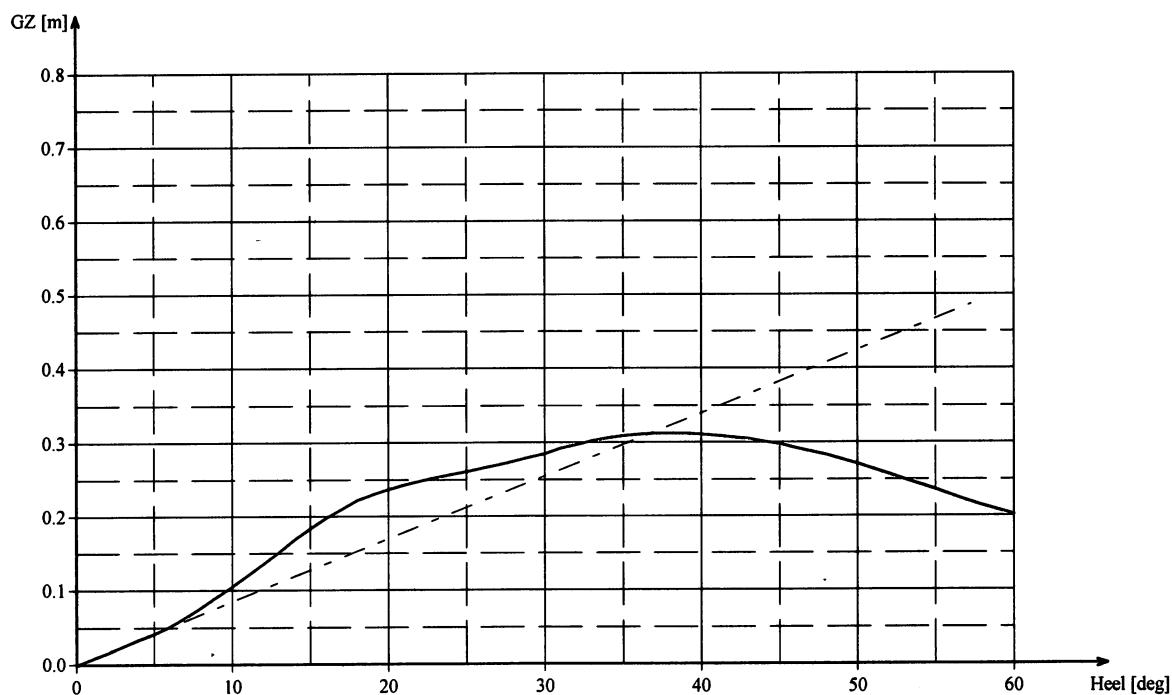
LOADING CONDITION NO. 4

Loaded as in cond. 3 - 10% Bkrs.

SAILING STATE:

All drafts are from baseline

Displacement	73.017 [t]	Heel (positive port side)	-0.100 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	3.511 [m]
Distance from BL to BK	0.000 [m]	KG	2.776 [m]
Draft at XF	1.891 [m]	GM	0.735 [m]
Draft at AP	1.968 [m]	Free surface correction	0.248 [m]
Draft at FP	1.766 [m]	KGc	3.024 [m]
Mean draft at MP	1.867 [m]	GMc	0.487 [m]
Trim (negative aft)	-0.201 [m]	XB	9.294 [m]
Moment to Change Trim / cm	0.991 [tm]	XF	8.451 [m]

INTACT STABILITY:

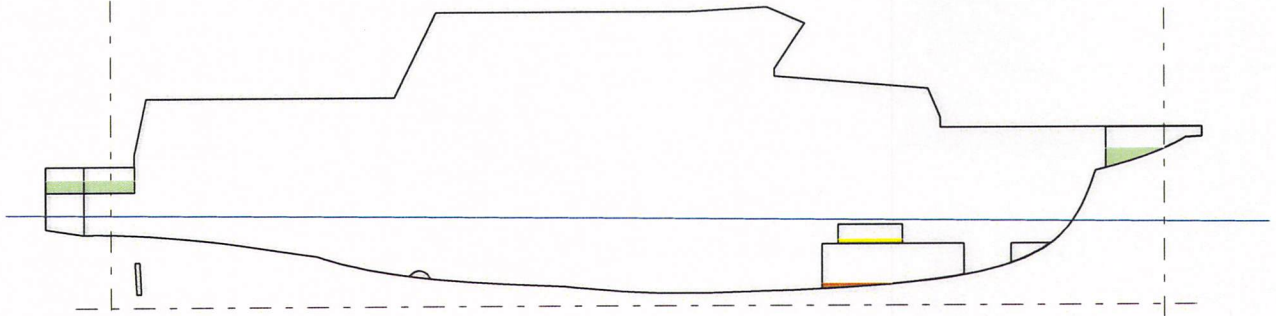
Cargo / Passenger ship stability criteria

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.085	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.138	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.053	0.030	[m.rad]	ok			
Max. GZ	0.312	0.200	[m]	ok	MAX. PERM. KGc:	3.214	[m]
Theta Max	37.000	25.000	[deg]	ok	Limiting criteria:		
GMc	0.487	0.150	[m]	ok	Nearest KGc found !		

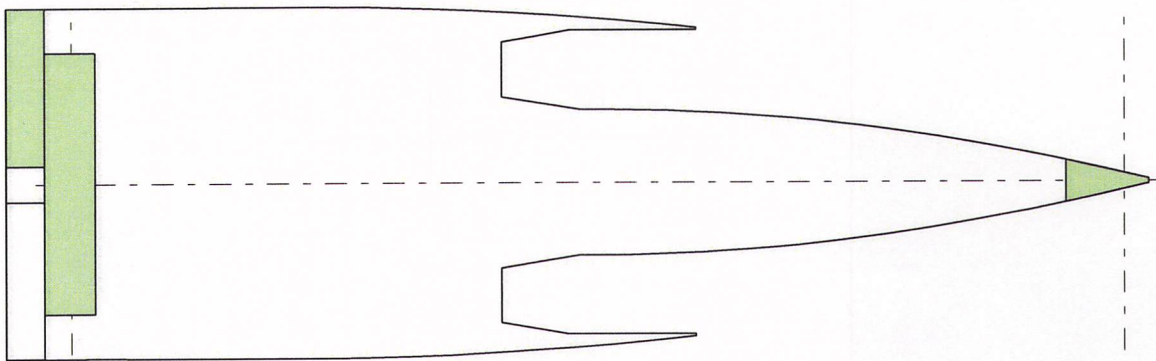
LOADING CONDITION NO. 4

Loaded as in cond. 3 - 10% Bkrs.

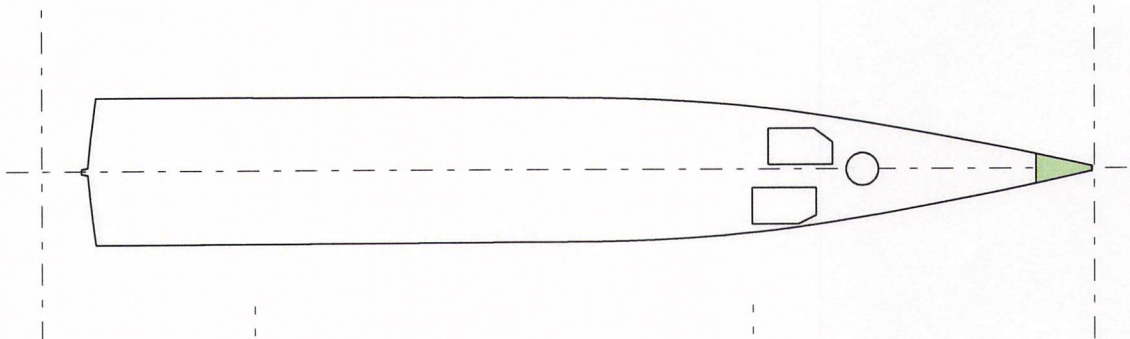
SHIP MODEL:



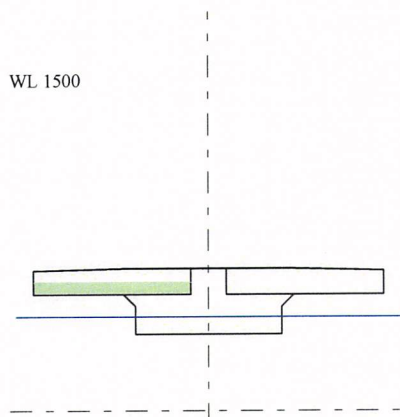
Long Section



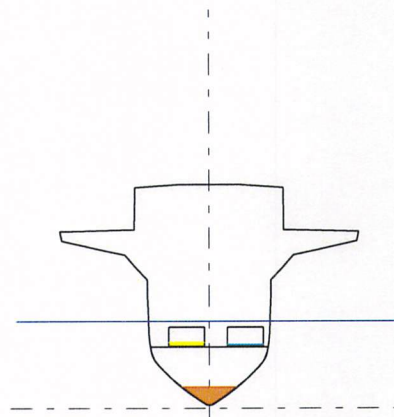
WL 2700



WL 1500



Fr-2



Fr 31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

LOADING CONDITION NO. 5

With passengers, no cargo - 100% Bkrs

LOADING SUMMARY:

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.						
Deck cargo aft						
Total Cargo		1.00				
Fuel Oil:						
Tank 1	98	0.99	19.84	0.00	0.88	0.1
Tank 2	98	2.90	16.03	0.00	0.88	2.1
Total Fuel Oil		3.89				
Water Ballast						
Forepeak Tank	0					
W.B. Aft P	55	0.78	-0.97	2.04	2.60	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	0					
Total Water Ballast		0.78				
Fresh Water	98	0.38	15.66	-0.75	1.51	0.0
Sewage Tank	20	0.08	15.99	0.46	1.35	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
DEADWEIGHT		7.13	12.08	0.19	1.71	4.8
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		51.13	10.15	-0.00	2.39	4.8

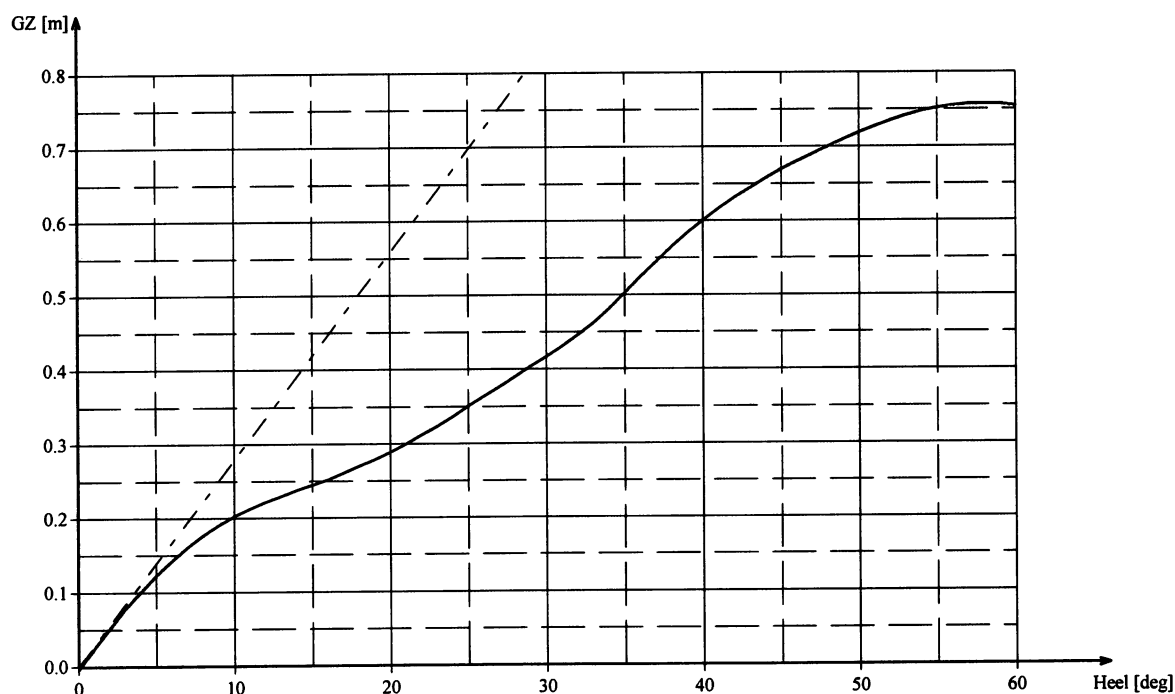
LOADING CONDITION NO. 5

With passengers, no cargo - 100% Bkrs

SAILING STATE:

All drafts are from baseline

Displacement	51.132 [t]	Heel (positive port side)	-0.130 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	4.084 [m]
Distance from BL to BK	0.000 [m]	KG	2.390 [m]
Draft at XF	1.578 [m]	GM	1.694 [m]
Draft at AP	1.562 [m]	Free surface correction	0.094 [m]
Draft at FP	1.604 [m]	KGc	2.484 [m]
Mean draft at MP	1.583 [m]	GMc	1.600 [m]
Trim (negative aft)	0.042 [m]	XB	10.156 [m]
Moment to Change Trim / cm	0.983 [tm]	XF	8.390 [m]

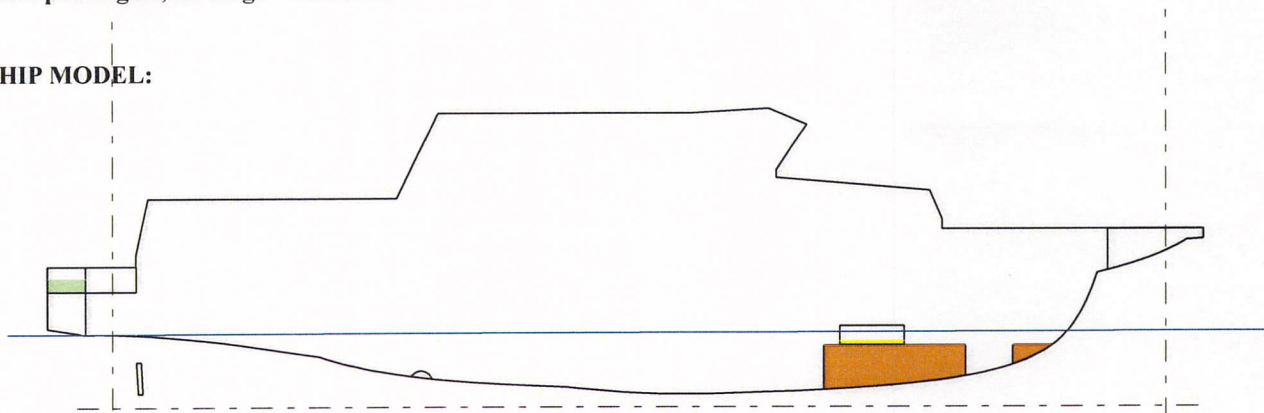
INTACT STABILITY:**Cargo / Passenger ship stability criteria**

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.124	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.212	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.088	0.030	[m.rad]	ok			
Max. GZ	0.757	0.200	[m]	ok	MAX. PERM. KGc:	2.996	[m]
Theta Max	57.000	25.000	[deg]	ok	Limiting criteria:		
GMc	1.600	0.150	[m]	ok	Area up to 30 deg		

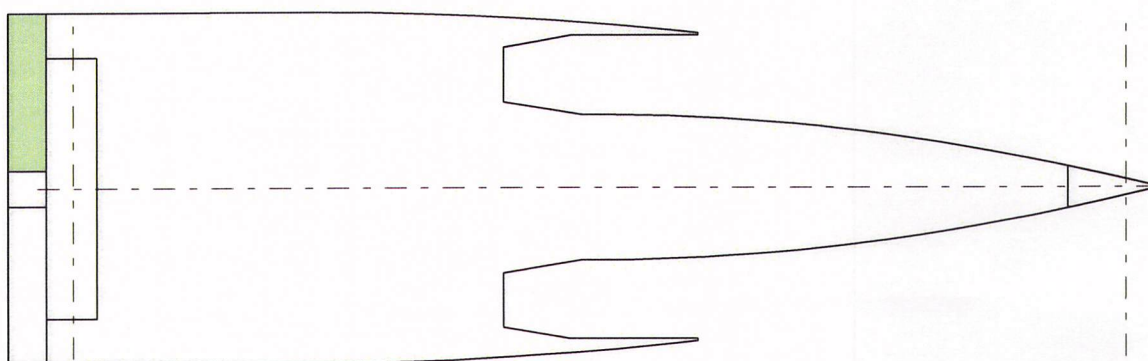
LOADING CONDITION NO. 5

With passengers, no cargo - 100% Bkrs

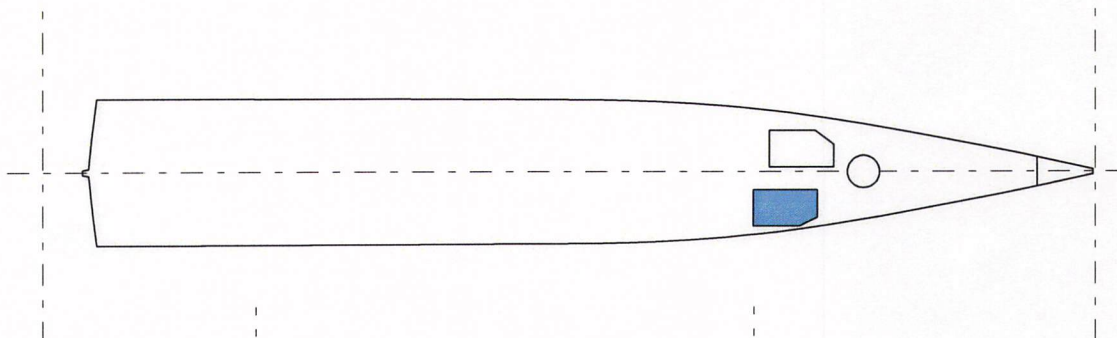
SHIP MODEL:



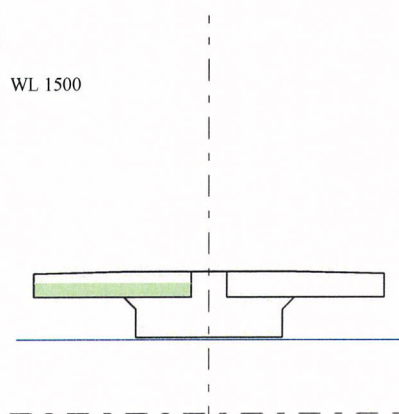
Long Section



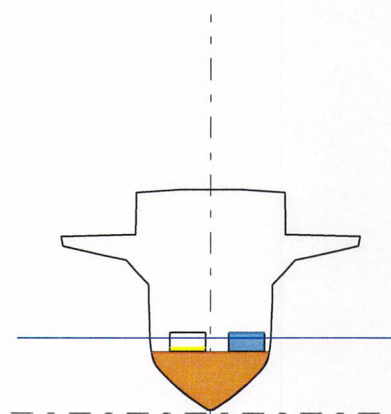
WL 2700



WL 1500



Fr-2



Fr 31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

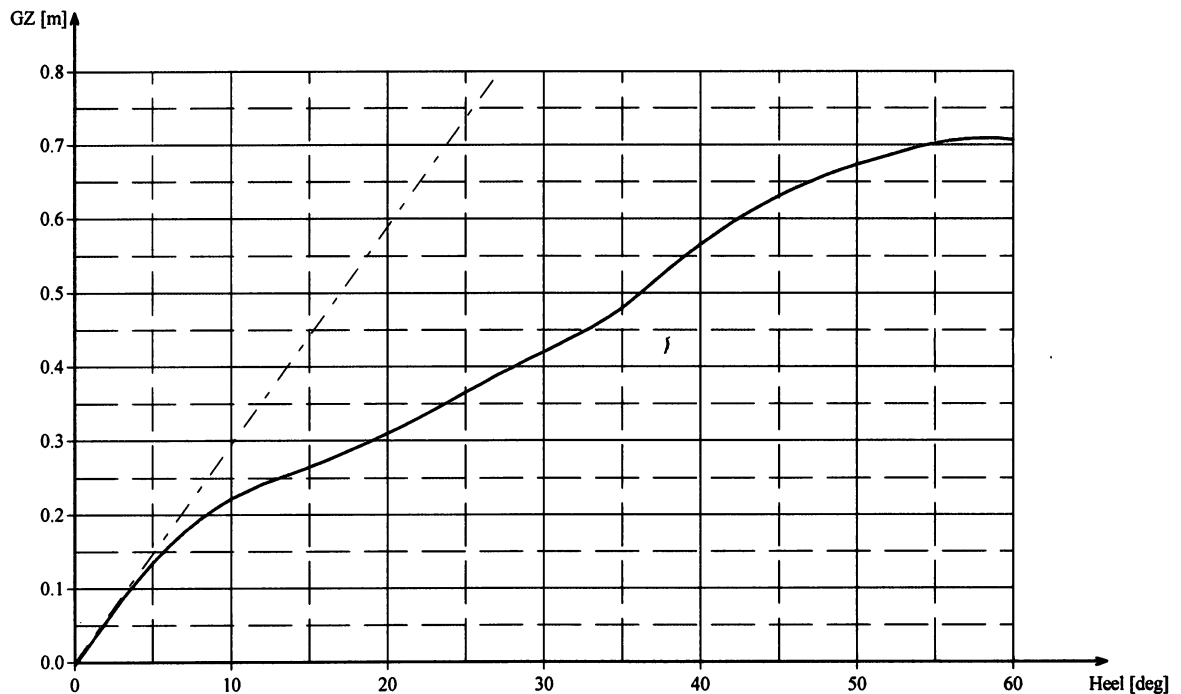
LOADING CONDITION NO. 6**With passengers, no cargo - 10% Bkrs****LOADING SUMMARY:**

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.						
Deck cargo aft						
Total Cargo		1.00				
Fuel Oil:						
Tank 1	0					
Tank 2	10	0.30	15.71	0.00	0.32	0.1
Total Fuel Oil		0.30				
Water Ballast						
Forepeak Tank	0					
W.B. Aft P	55	0.78	-0.97	2.04	2.60	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	0					
Total Water Ballast		0.78				
Fresh Water	10	0.04	15.66	-0.75	1.33	0.0
Sewage Tank	80	0.31	15.99	0.46	1.47	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
DEADWEIGHT		3.43	6.71	0.50	2.55	2.7
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		47.43	9.61	0.00	2.50	2.7

LOADING CONDITION NO. 6**With passengers, no cargo - 10% Bkrs****SAILING STATE:**

All drafts are from baseline

Displacement	47.426 [t]	Heel (positive port side)	0.130 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	4.250 [m]
Distance from BL to BK	0.000 [m]	KG	2.503 [m]
Draft at XF	1.525 [m]	GM	1.746 [m]
Draft at AP	1.633 [m]	Free surface correction	0.057 [m]
Draft at FP	1.341 [m]	KGc	2.560 [m]
Mean draft at MP	1.487 [m]	GMc	1.689 [m]
Trim (negative aft)	-0.292 [m]	XB	9.594 [m]
Moment to Change Trim / cm	0.952 [tm]	XF	8.289 [m]

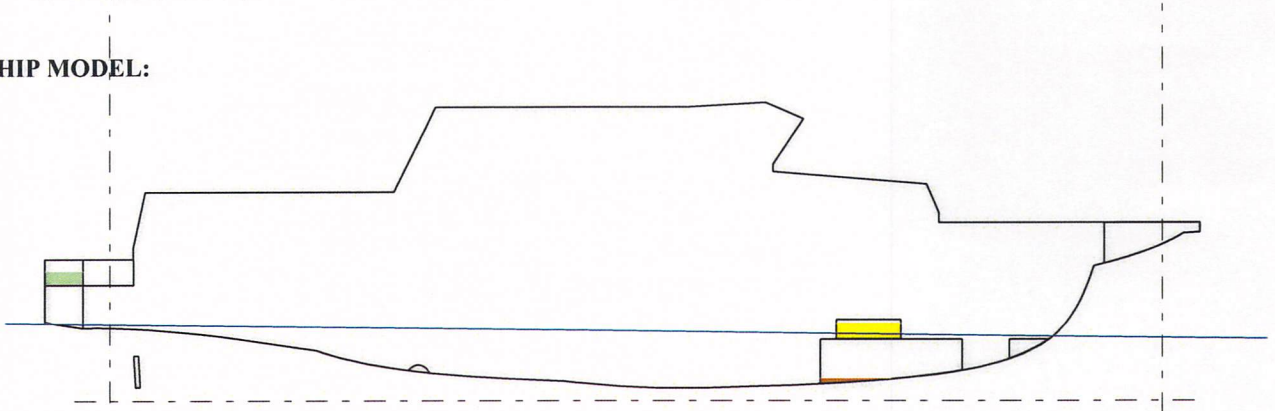
INTACT STABILITY:**Cargo / Passenger ship stability criteria**

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.132	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.217	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.085	0.030	[m.rad]	ok			
Max. GZ	0.709	0.200	[m]	ok	MAX. PERM. KGc:	3.101	[m]
Theta Max	58.000	25.000	[deg]	ok	Limiting criteria:		
GMc	1.689	0.150	[m]	ok	Area up to 40 deg		

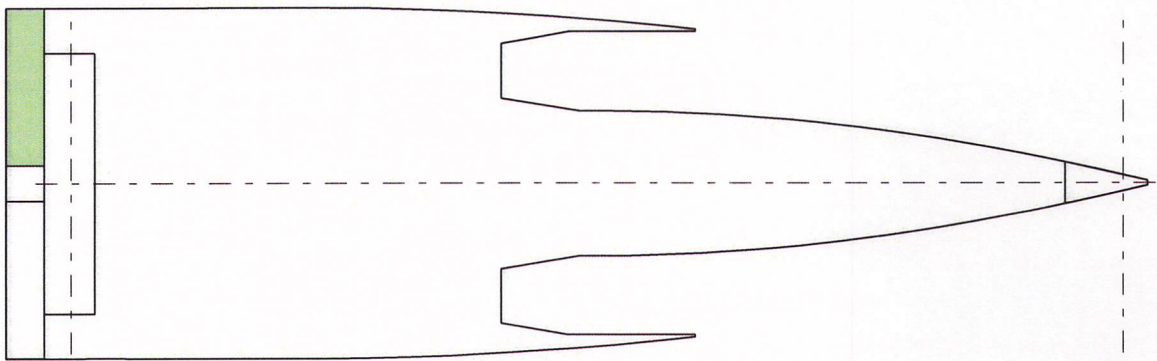
LOADING CONDITION NO. 6

With passengers, no cargo - 10% Bkrs

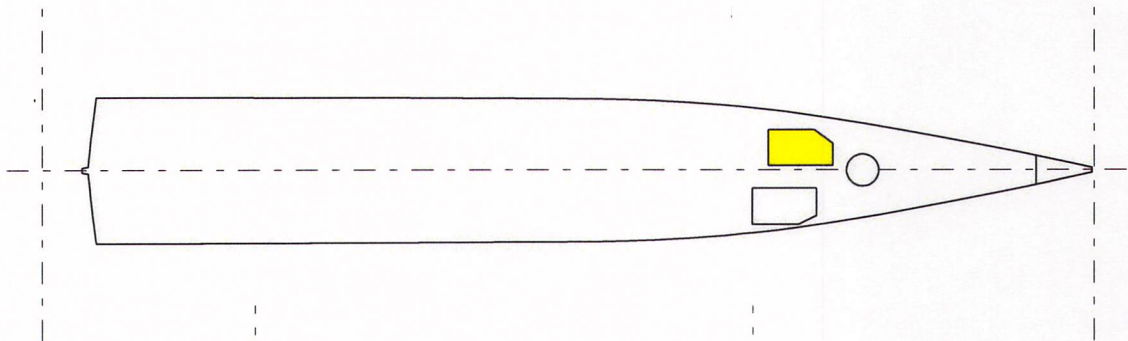
SHIP MODEL:



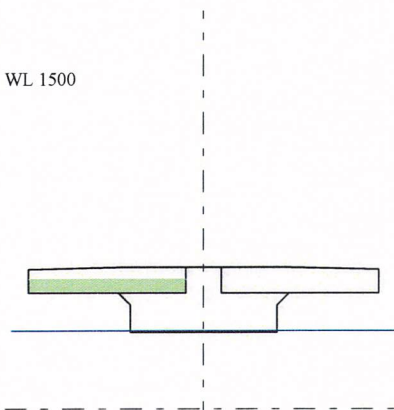
Long Section



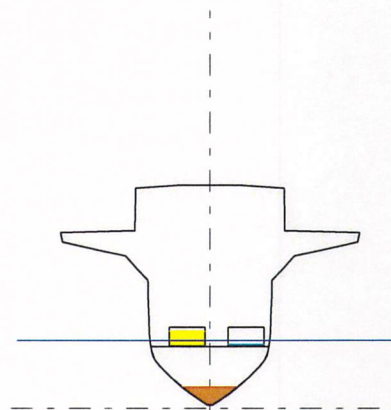
WL 2700



WL 1500



Fr-2



Fr-31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

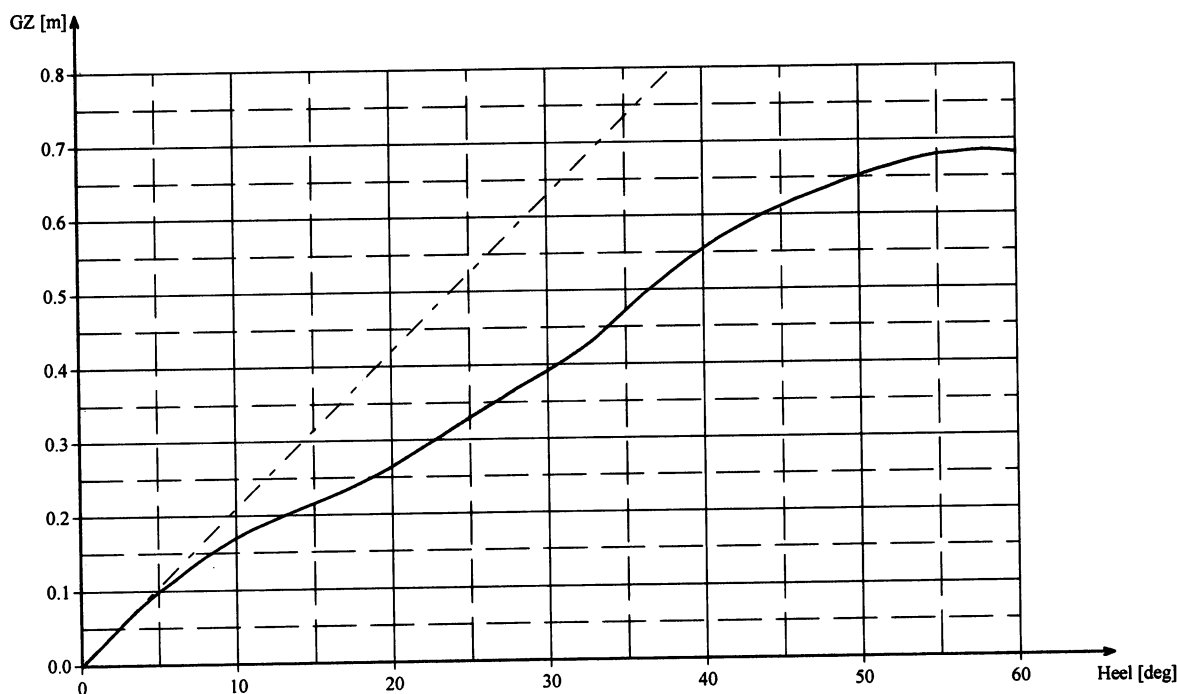
LOADING CONDITION NO. 7**Cond 2 with 50% full Anti-Roll tank****LOADING SUMMARY:**

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.		1.10	16.00	0.00	3.50	0.0
Deck cargo aft						
Total Cargo		2.10				
Fuel Oil:						
Tank 1	98	0.99	19.84	0.00	0.88	0.1
Tank 2	98	2.90	16.03	0.00	0.88	2.1
Total Fuel Oil		3.89				
Water Ballast						
Forepeak Tank	0					
W.B. Aft P	60	0.85	-0.97	2.04	2.61	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	50	1.57	-0.04	0.00	2.58	14.9
Total Water Ballast		2.42				
Fresh Water	98	0.38	15.66	-0.75	1.51	0.0
Sewage Tank	20	0.08	15.99	0.46	1.35	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
DEADWEIGHT		9.87	10.50	0.15	2.06	19.8
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		53.87	9.96	-0.00	2.42	19.8

LOADING CONDITION NO. 7**Cond 2 with 50% full Anti-Roll tank****SAILING STATE:**

All drafts are from baseline

Displacement	53.872 [t]	Heel (positive port side)	-0.070 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	3.989 [m]
Distance from BL to BK	0.000 [m]	KG	2.419 [m]
Draft at XF	1.618 [m]	GM	1.570 [m]
Draft at AP	1.623 [m]	Free surface correction	0.367 [m]
Draft at FP	1.608 [m]	KGc	2.786 [m]
Mean draft at MP	1.615 [m]	GMc	1.203 [m]
Trim (negative aft)	-0.015 [m]	XB	9.960 [m]
Moment to Change Trim / cm	0.983 [tm]	XF	8.392 [m]

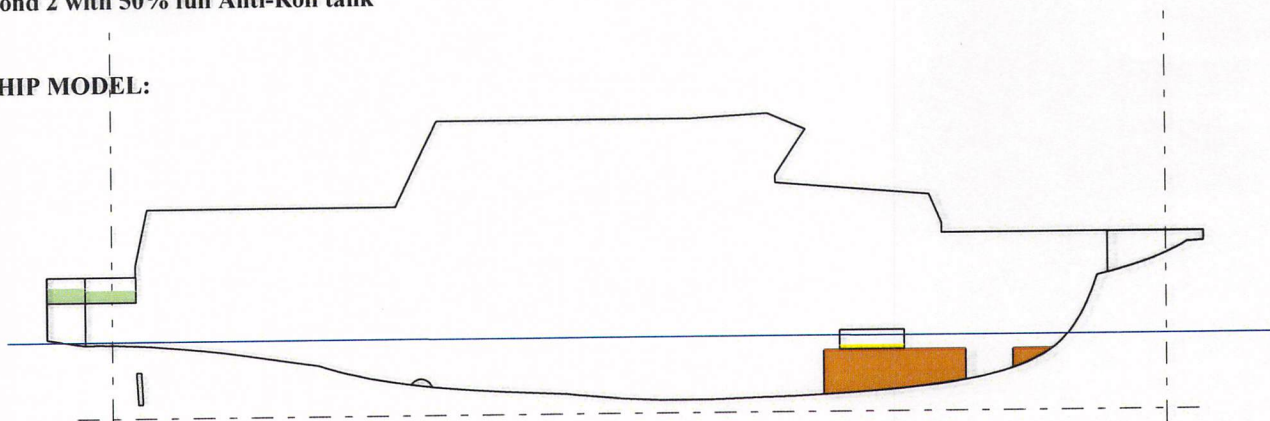
INTACT STABILITY:**Cargo / Passenger ship stability criteria**

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.112	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.194	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.082	0.030	[m.rad]	ok			
Max. GZ	0.685	0.200	[m]	ok	MAX. PERM. KGc:	3.205	[m]
Theta Max	58.000	25.000	[deg]	ok	Limiting criteria:		
GMc	1.203	0.150	[m]	ok	Area up to 30 deg		

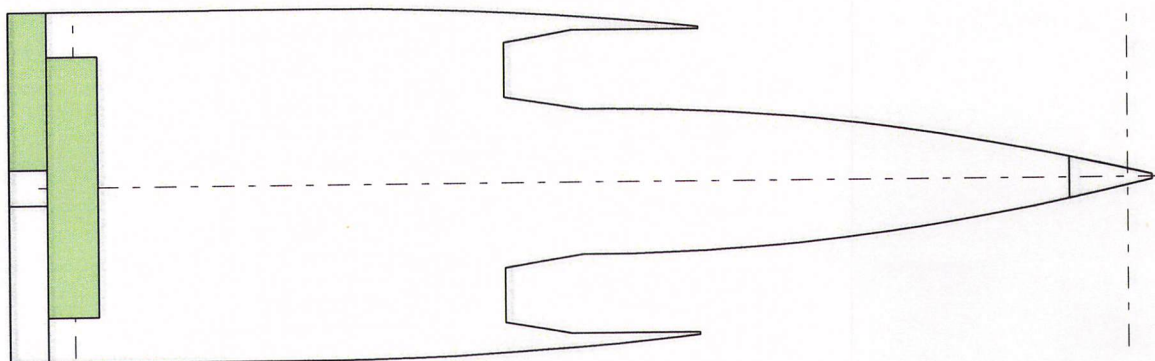
LOADING CONDITION NO. 7

Cond 2 with 50% full Anti-Roll tank

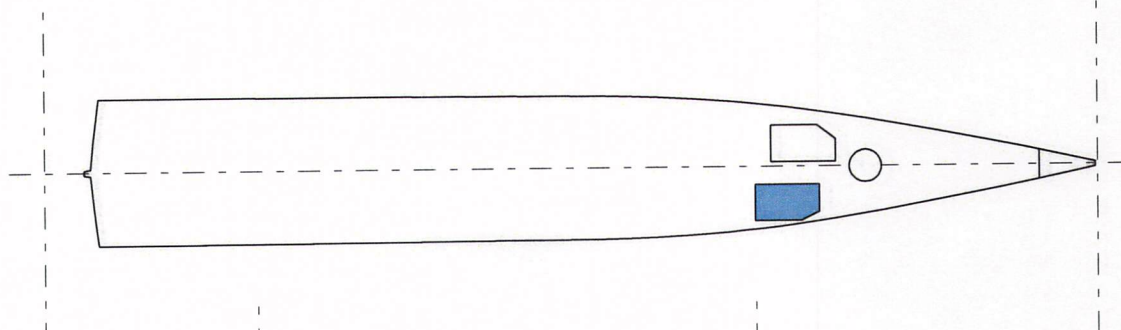
SHIP MODEL:



Long Section



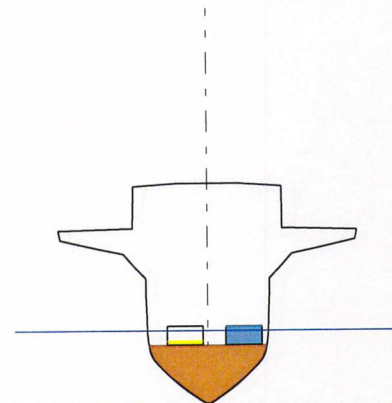
WL 2700



WL 1500



Fr-2



Fr 31

■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast

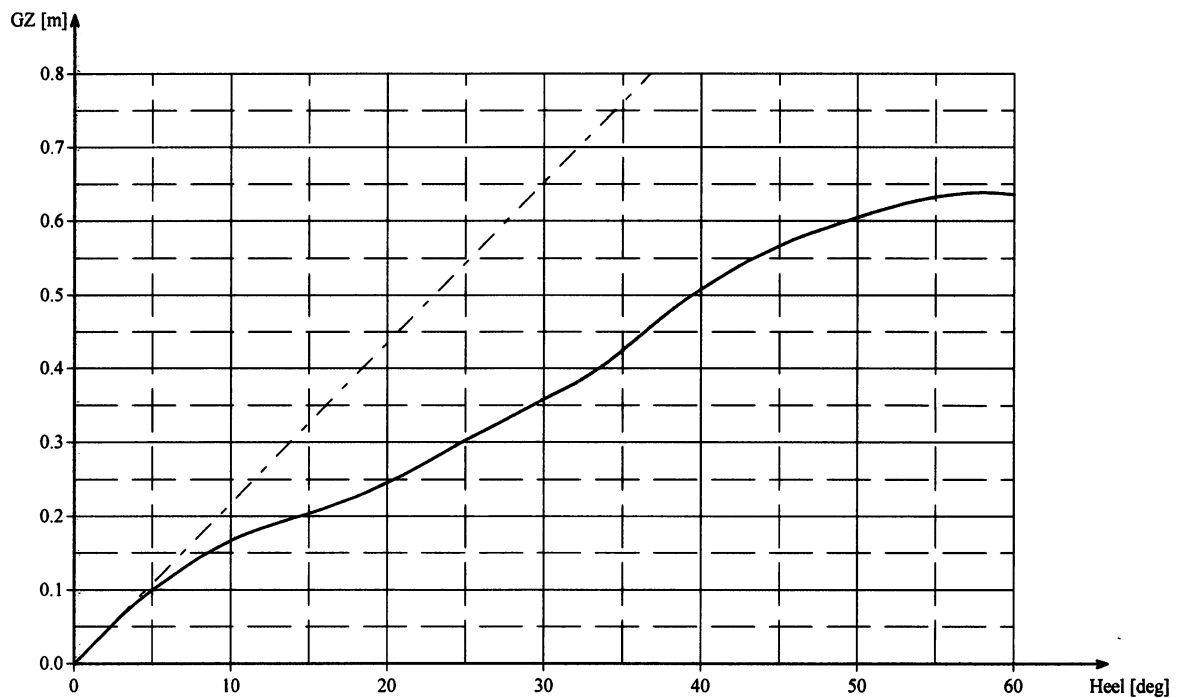
LOADING CONDITION NO. 8**Cond 5 with 50% full Anti-Roll tank****LOADING SUMMARY:**

ITEM	TANK LOAD [%]	WEIGHT [t]	XG FROM AP [m]	YG FROM CL [m]	ZG FROM BL [m]	F.S MOM [tm]
Cargo:						
Passengers incl. baggage		1.00	3.00	0.00	3.10	0.0
Deck cargo fwd.						
Deck cargo aft						
Total Cargo		1.00				
Fuel Oil:						
Tank 1	50	0.51	19.83	0.00	0.66	0.1
Tank 2	0					
Total Fuel Oil		0.51				
Water Ballast						
Forepeak Tank	50	1.82	21.58	0.00	2.44	0.5
W.B. Aft P	50	0.71	-0.97	2.04	2.58	2.5
W.B. Aft S						
W.B. Aft C						
Anti-Roll Tank	50	1.57	-0.04	0.00	2.58	14.9
Total Water Ballast		4.10				
Fresh Water	10	0.04	15.66	-0.75	1.33	0.0
Sewage Tank	80	0.31	15.99	0.46	1.47	0.0
Small Tanks		0.50	14.00	0.00	1.50	0.0
Crew, Provision & Stores		0.50	7.00	0.00	4.50	0.0
DEADWEIGHT		6.96	9.75	0.22	2.48	18.0
LIGHTWEIGHT		44.00	9.84	-0.04	2.50	
DISPLACEMENT		50.96	9.83	0.00	2.50	18.0

LOADING CONDITION NO. 8**Cond 5 with 50% full Anti-Roll tank****SAILING STATE:**

All drafts are from baseline

Displacement	50.960 [t]	Heel (positive port side)	0.000 [deg]
Water specific gravity	1.025 [t/m ³]	KMt	4.098 [m]
Distance from BL to BK	0.000 [m]	KG	2.497 [m]
Draft at XF	1.576 [m]	GM	1.600 [m]
Draft at AP	1.625 [m]	Free surface correction	0.353 [m]
Draft at FP	1.493 [m]	KGc	2.850 [m]
Mean draft at MP	1.559 [m]	GMc	1.247 [m]
Trim (negative aft)	-0.132 [m]	XB	9.817 [m]
Moment to Change Trim / cm	0.970 [tm]	XF	8.352 [m]

INTACT STABILITY:

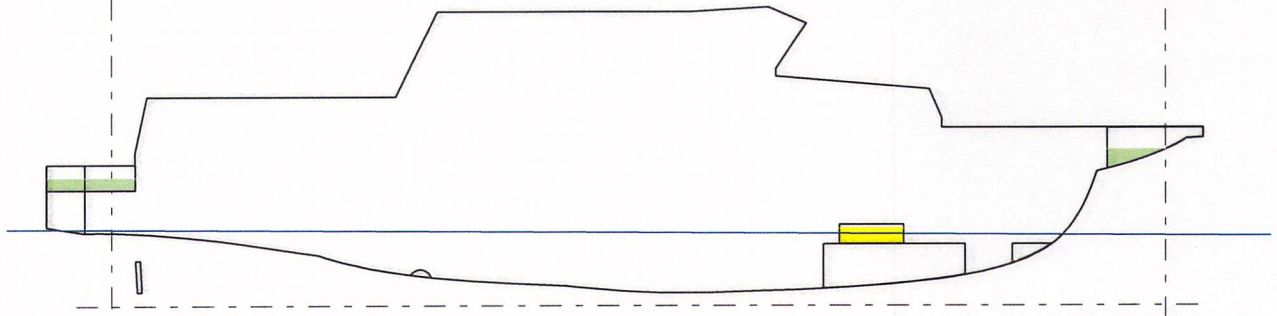
Cargo / Passenger ship stability criteria

LIMIT	ACTUAL	REQUIRED	UNIT	STATUS	ANGLE	VALUE	UNIT
Area up to 30 deg	0.105	0.055	[m.rad]	ok	Angle of flooding	60.000	[deg]
Area up to 40 deg	0.180	0.090	[m.rad]	ok			
Area between 30 and 40 deg	0.075	0.030	[m.rad]	ok			
Max. GZ	0.639	0.200	[m]	ok	MAX. PERM. KGc:	3.222	[m]
Theta Max	58.000	25.000	[deg]	ok	Limiting criteria:		
GMc	1.247	0.150	[m]	ok	Area up to 30 deg		

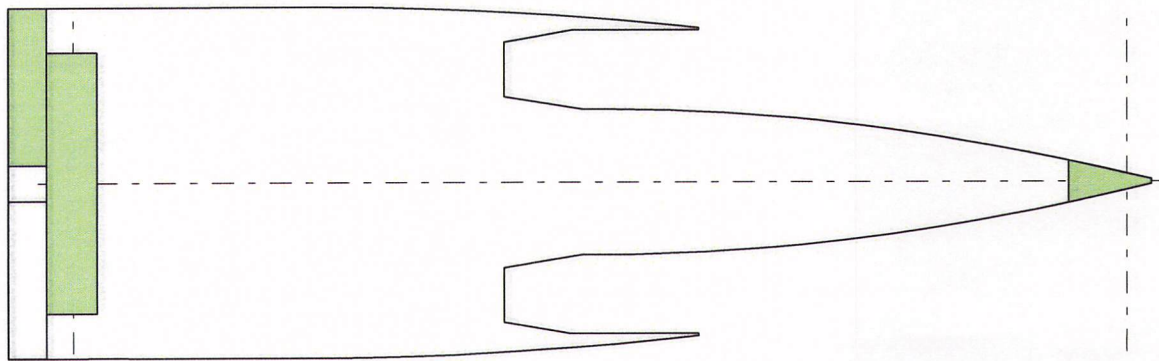
LOADING CONDITION NO. 8

Cond 5 with 50% full Anti-Roll tank

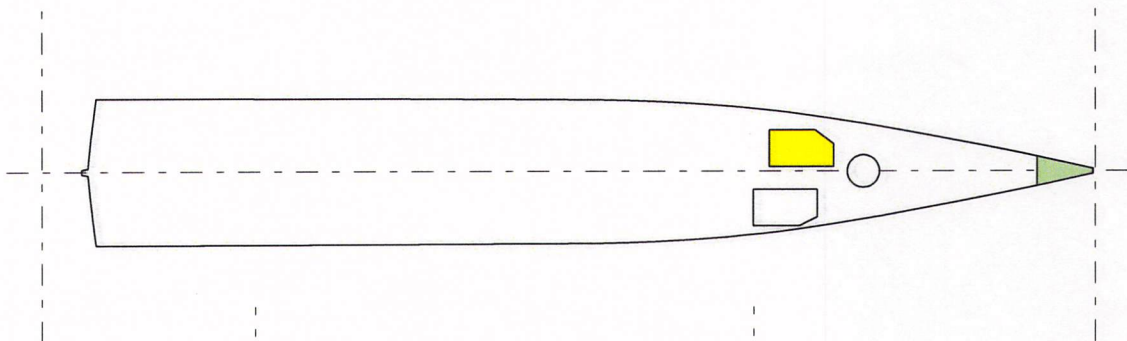
SHIP MODEL:



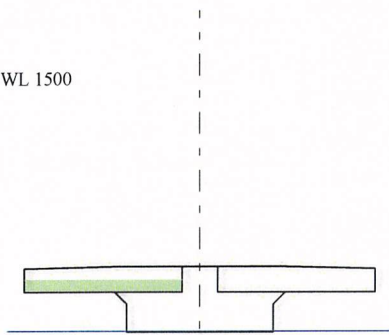
Long Section



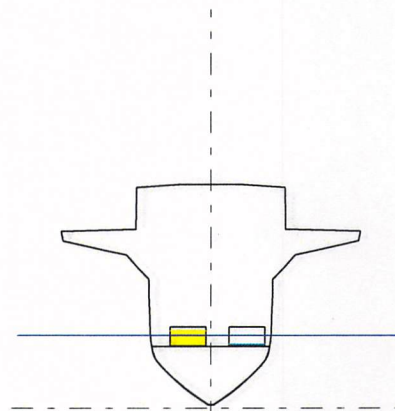
WL 2700



WL 1500

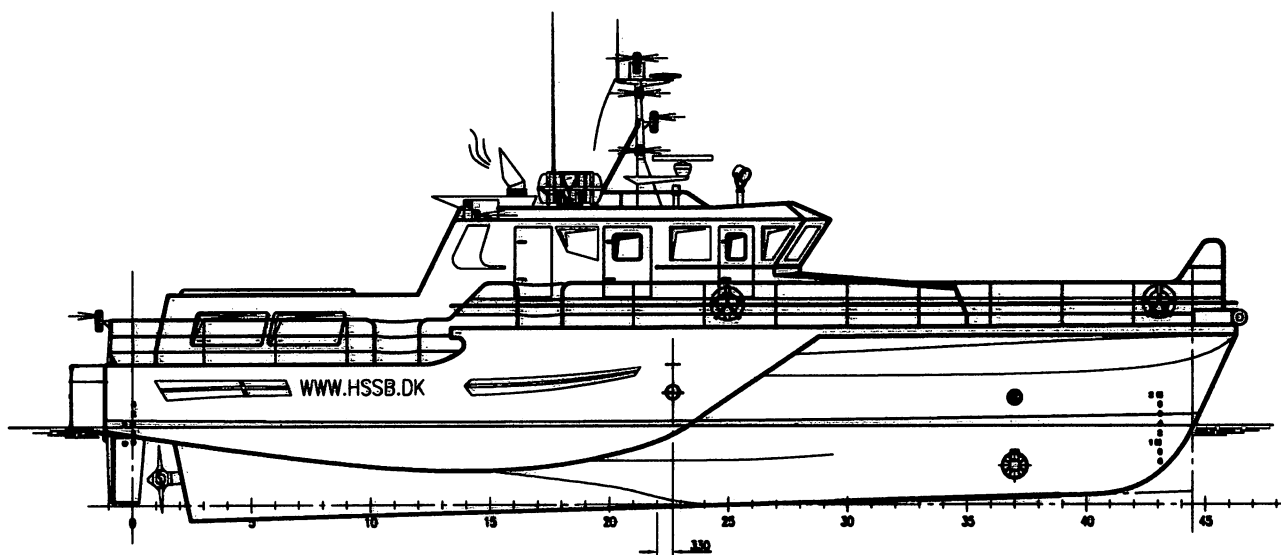


Fr-2

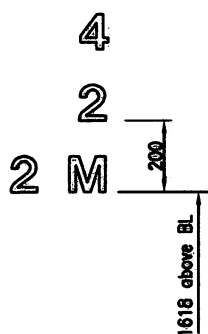


Fr 31

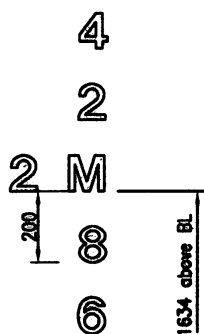
■ - Fresh Water ■ - Fuel oil ■ - Misc ■ - Water Ballast



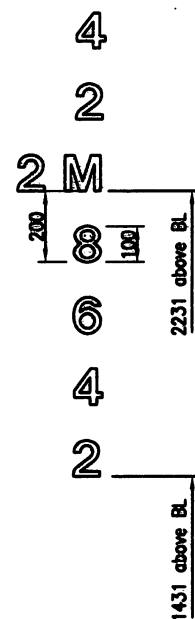
Transom



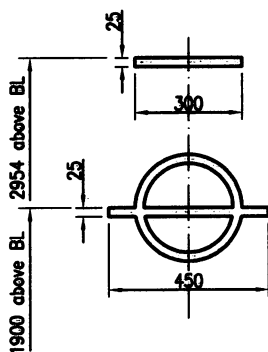
Frame 0



Frame 43



Freeboard Mark



**M/S "FOB TRIM" - CONVERSION - MAY 2009
LIGHT SHIP WEIGHT & C.G. CALCULATION**

ITEM	WEIGHT	CENTRE OF GRAVITY	
		above B.L. m	fwd. of A.P. m
Light ship weight & CG - inclining test 14.11.2007	42.94	2.48	10.02
New Ballast tank - aluminium weight	0.50	2.50	-1.05
Pipes and valves	0.10	2.20	0.20
New crane	0.40	4.30	7.30
Resue Net	0.10	5.50	3.30
Removed material	-0.05	3.50	7.20
Light Ship	43.99	2.50	9.84

SØFARTSSTYRELSEN

KRÆNGNINGSFORSØG

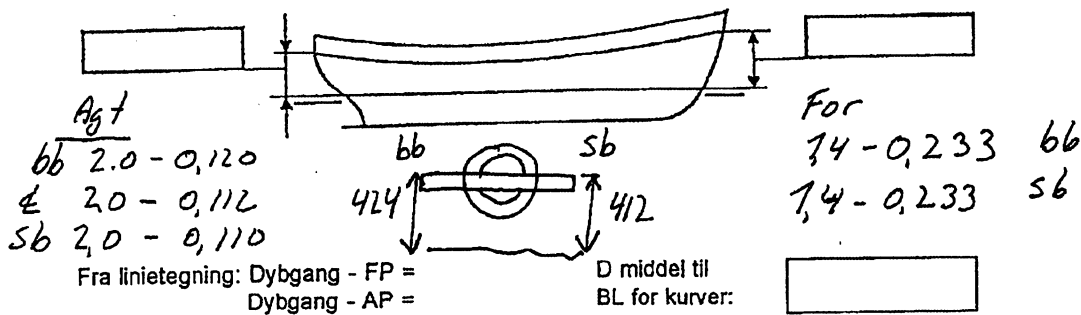
Att Bayai

Skib: <i>Fob Trim</i>	Kontrolnr.: <i>H 1521</i>
Forsøgt afholdt i: <i>Hvide Sande</i>	Dato: <i>14.11.2007</i>
Længde p-p:	Vandets vægtfylde: <i>1,010</i>
Bredde muld.:	Vind og sø <i>Nordlig vind, ingen sø</i>
Dybde mould.:	Bemærkninger:
Uk.k. køl-BL for kurver:	
Konstr. trim (styrplastigh.):	

Dybgange under forsøget

For	Ved amn. u. k. køl.	SB		Ved FP u.k. køl		D. midd. u.k. køl	D midd. BL	Trim ex styl.
Agter	Ved amn. u.k. køl	BB		Ved AP u.k. køl				
Fribord ved ø		SB =						
Fribord ved ø		BB =						

Hvis ingen arningsmærker måles fribord for og agter og linietegning vedlægges rapport:



Krængningsvægte (w)

Vægt nr.	Vægt t	ø over dæk	ø fra AP
1	0412	0,175	0,30
2			
3			

Penduler (min. 2)

Pendul Nr. 1	L = 2170	m
Pendul Nr. 2	L = 2095	m

Krængninger (min.4)

Flytn. (a) OBS: tg ø > 0,025 < 0,040

Kræng. nr.	Flytn.ret. SB-BB	Vægt Ton	Afst. Meter	Pendul 1			Pendul 2		
				udsl. mm	midd.	tg ø	udsl. mm	midd.	tg ø
1	sb-bb	0412	6.705	76 1/2	77	0,03548	76	76	0,03628
2	bb-sb	-	-	77			76		
3	sb-bb	-	-	77			76		
4	bb-sb	-	-	77 1/2			76		

tg ø middel = 0,03588

Underskrift _____
 Søfartsstyrelsen

dato: *14/11-2007*

Underskrift _____
 Udførende

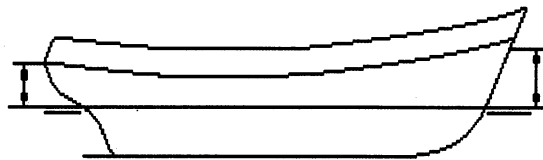
OC Consult Aps
 w/ Skibingenør Ole Christensen
 Mamrelundsg. 6960 Hvide Sande
 Tlf. 97 31 32 36 · Fax 97 31 32 35

INCLINING EXPERIMENT

Ship	M/S "FOB TRIM"	Type:	Crew Trimaran	Official No	H - 1521
Place	Hvide Sande			Date:	14.11.2007
Length B.P.	22.23 m	Density of water	1.010 t/m ³		
Breadth mld.	7.40 m	Wind & Sea :	Light wind from North		
Depth mld.	3.71 m				
U.S. Keel - B.L. for curves	0.01 m	Remarks :	Vessel free of quay		
Design Trim	0.618 m				

Draughts during test

Fwd.	At marks	SB= 1.167	1.167	At FP		Mean dr.	Mean dr.	Trim
	U.S. Keel	BB= 1.167		U.S. Keel		U.S. Keel	BL	
Aft	At marks	SB=1.89	1.885	At AP				0.129
	U.S. Keel	BB=1.88		U.S. Keel			1.455	
Freeboard amidships	Fb mark to WL	SB= 0.412	0.418	Corrected mean draft = 1.47 m above B.L.				
		BB= 0.424						



From Lines Plan:	Draft - A.P. (B.L.)=	1.519	Mea Draft	
	Draft - F.P. (B.L.) =	1.390	above B.L.	1.455

Inclining Weights (w)

Pendulums (min. 2)

Weight no	Weight t	C.G. above B.L.	C.G, from A.P.	Transverse Shift
1	0.412	3.18	0.30	6.705
2				
Total	0.412	3.18	0.30	6.705

Pendulum - 1, L =	2170
Pendulum - 2, L =	2095

Shifting of Weights

obs. $.025 < \text{tg } \emptyset < .040$

Shift No.	Direction P - S	Shifting moment		Pendulum 1		Pendulum 2			
		Weight	Dist.	Deflection	mean	tg \emptyset	Deflection	mean	tg \emptyset
1	BB-SB	0.412	6.705	76.5	77.0	0.03548	76.0	76.0	0.036277
2	SB-BB	0.412	6.705	77.0					
3	BB-SB	0.412	6.705	77.0					
4	SB-BB	0.412	6.705	77.5					

tg \emptyset mean = 0.03588

Surveyor:	Person in Charge: Ole Christensen, O.C. Consult
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Displacement:

Displacement from hydr. curves	=		* - Positive hvis flydecenter er på samme side af midtskib som skibet trimmer
Corr. for density of water	=		
Corr. for trim	=		
Displ. in inclining condition (w)	=		

Note: If trim (corrected for design trim) during the test is more than 1,5% of LBP, the Displ. and BM shall be calculated for the actual trimmed waterline.

Displacement in inclining condition (attached calculation) = 44.8

GM = $w \times L / (\text{Displ.} \times \text{tg } \theta)$	=	1.720
KM (from curves)	=	
KM (attached calculation)	=	4.200
KG uncorrected	=	2.480
Correction for free surfaces	=	0.001
KG in inclining condition	=	2.479

L.C.G. in inclining condition

Trim arm = Trim x mct/cm / Displ	=	
LCB (calculated)	=	10.01
Trim Corr. = Trim/Lbp*(KG-KB)	=	
LCG - AP (attached calculation)	=	10.02

Light Ship

	Weight t	VCG	Mom BL	LCG	Mom AP	TCG
Ship as inclined	44.77	2.48	111.0	10.02	448.6	
Weights to be Deducted	-2.12	3.11	-6.6	9.94	-21.1	
Weights to be Added	0.29	6.74	2.0	9.70	2.8	
Light Ship	42.94	2.48	106.4	10.02	430.4	

Remarks:

Weights to be Deducted

Item	Weight	VCG	Mom. ab BL	LCG	Mom. ab AP	TCG fr CL	F.S. mom.
	t	m	t*m	m	t*m	m	t*m
Inclining Weights	0.41	3.18	1.31	0.30	0.12	0.00	
Surplus weights	0.21	3.18	0.66	0.30	0.1	0.00	
Tanks							
Fresh Water	0.38	1.51	0.6	15.66	6.0	-0.75	0.05
2 persons - fwd deck	0.17	4.75	0.8	17.00	2.9	0.00	
1 person at pendulums	0.09	2.90	0.3	16.50	1.5	0.00	
2 Liferrafts on deck	0.29	3.45	1.0	3.70	1.1	0.00	
1 Argonite bottle	0.10	3.75	0.4	6.26	0.6	-2.10	
Welding equipment	0.32	4.25	1.4	19.00	6.1	-1.40	
Tools	0.02	1.40	0.0	18.00	0.4	0.00	
Lifting beam	0.05	1.80	0.1	18.50	0.9	0.00	
Welding equipment	0.08	1.75	0.1	18.00	1.5	0.00	
SUM	2.12	3.11	6.6	9.94	21.1	-0.44	0.05

Weights to be Added

Item	Weight	VCG	Mom. ab BL	LCG	Mom. ab AP	TCG fr CL	F.S. mom.
	t	m	t*m	m	t*m	m	t*m
2 nos. Life rafts	0.29	6.74	2.0	9.70	2.8	0.0	
SUM	0.29	6.74	2.0	9.70	2.8	0.0	0.0

Floating Status

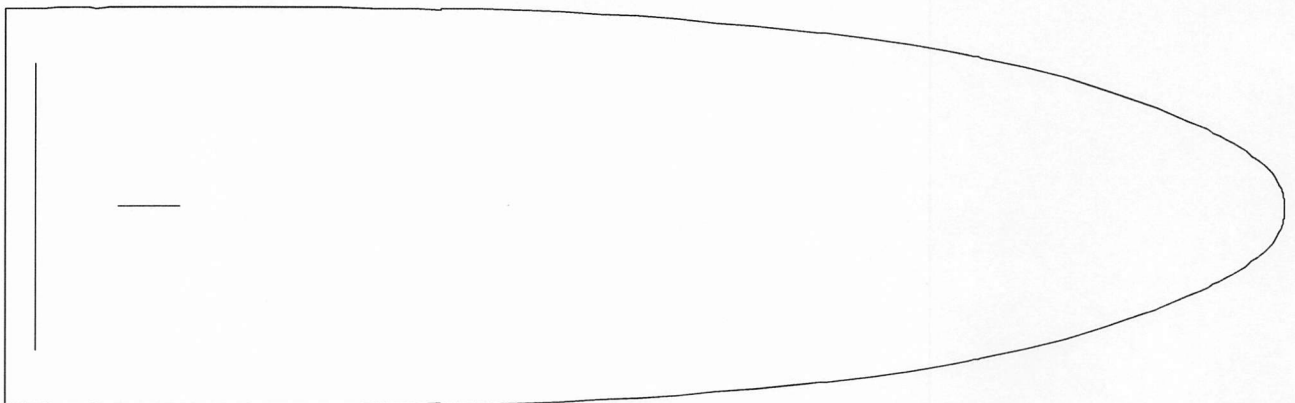
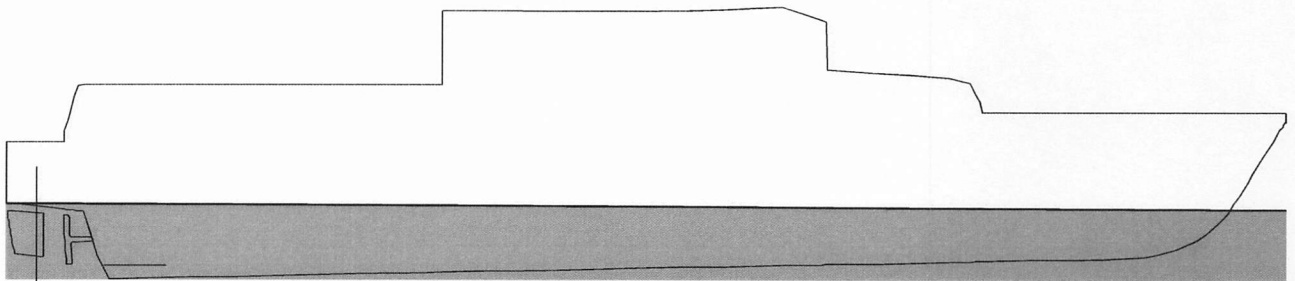
Draft FP	1.406 m	Heel	stbd 0.09 deg.	GM(Solid)	1.720 m
Draft MS	1.470 m	Equil	No	F/S Corr.	0.000 m
Draft AP	1.535 m	Wind	Off	GM(Fluid)	1.720 m
Trim	aft 0.129/22.234	Wave	No	KMt	4.200 m
LCG	10.022f m	VCG	2.480 m	TPcm	0.64
Displacement	44.77 MT	WaterSpgr	1.010		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	44.77	10.022f	0.000	2.480
Displacement	44.77	10.022f	0.000	2.480

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.010	44.77	10.013f	0.007s	0.991	1.000
SubTotals:			44.77	10.013f	0.007s	0.991	



HYDROSTATIC DATA - TRIM = 0.000 m

Tkm [m]	DISV [m ³]	DISM [t]	VCB [m]	KMt [m]	TPC [t/cm]	MTC [tm/cm]	XB [m]	XF [m]	Cb
1.300	33.41	34.24	0.864	4.022	0.54	0.59	10.478	9.593	0.156
1.320	34.51	35.38	0.878	4.031	0.55	0.62	10.456	9.578	0.159
1.340	35.62	36.51	0.892	4.041	0.56	0.64	10.433	9.563	0.161
1.360	36.72	37.64	0.905	4.050	0.57	0.67	10.411	9.548	0.164
1.380	37.83	38.78	0.919	4.060	0.58	0.69	10.388	9.533	0.166
1.400	38.94	39.91	0.933	4.069	0.58	0.71	10.366	9.518	0.169
1.420	40.12	41.12	0.947	4.070	0.59	0.74	10.338	9.425	0.172
1.440	41.30	42.33	0.961	4.071	0.60	0.77	10.311	9.333	0.174
1.460	42.48	43.54	0.974	4.073	0.61	0.79	10.283	9.240	0.177
1.480	43.66	44.75	0.988	4.074	0.62	0.82	10.256	9.148	0.179
1.500	44.84	45.97	1.002	4.075	0.63	0.84	10.228	9.055	0.182
1.520	46.15	47.30	1.016	4.066	0.64	0.88	10.187	8.922	0.185
1.540	47.45	48.64	1.030	4.057	0.66	0.92	10.147	8.789	0.187
1.560	48.76	49.98	1.044	4.049	0.67	0.96	10.106	8.656	0.190
1.580	50.06	51.32	1.058	4.040	0.68	1.00	10.066	8.523	0.192
1.600	51.37	52.65	1.072	4.031	0.69	1.04	10.025	8.390	0.195
1.620	52.73	54.04	1.085	3.984	0.69	1.05	9.984	8.396	0.198
1.640	54.08	55.43	1.099	3.939	0.69	1.05	9.945	8.403	0.200
1.660	55.44	56.83	1.112	3.895	0.70	1.05	9.906	8.409	0.203
1.680	56.80	58.22	1.126	3.853	0.70	1.06	9.870	8.416	0.205
1.700	58.15	59.61	1.139	3.813	0.70	1.06	9.836	8.422	0.208
1.720	59.52	61.01	1.152	3.776	0.70	1.06	9.804	8.428	0.210
1.740	60.89	62.41	1.165	3.741	0.70	1.07	9.774	8.435	0.212
1.760	62.25	63.81	1.177	3.706	0.70	1.07	9.745	8.441	0.215
1.780	63.62	65.21	1.190	3.673	0.70	1.07	9.717	8.448	0.217
1.800	64.98	66.61	1.203	3.640	0.70	1.08	9.689	8.454	0.219
1.820	66.36	68.02	1.215	3.612	0.70	1.08	9.666	8.460	0.221
1.840	67.73	69.43	1.228	3.584	0.70	1.08	9.642	8.466	0.223
1.860	69.11	70.84	1.240	3.556	0.70	1.09	9.619	8.473	0.226
1.880	70.48	72.25	1.253	3.528	0.71	1.09	9.595	8.479	0.228
1.900	71.86	73.65	1.265	3.500	0.71	1.09	9.572	8.485	0.230
1.920	73.24	75.07	1.277	3.480	0.71	1.10	9.553	8.492	0.232
1.940	74.62	76.49	1.289	3.460	0.71	1.10	9.534	8.498	0.234
1.960	76.01	77.91	1.301	3.441	0.71	1.10	9.516	8.505	0.235
1.980	77.39	79.32	1.313	3.421	0.71	1.11	9.497	8.511	0.237
2.000	78.77	80.74	1.325	3.401	0.71	1.11	9.478	8.518	0.239
2.020	80.16	82.17	1.337	3.383	0.71	1.11	9.463	8.524	0.241
2.040	81.55	83.59	1.349	3.366	0.71	1.12	9.448	8.530	0.243
2.060	82.94	85.02	1.360	3.348	0.71	1.12	9.432	8.535	0.244
2.080	84.34	86.44	1.372	3.331	0.71	1.12	9.417	8.541	0.246

HYDROSTATIC DATA - TRIM = -0.300 m

Tkm [m]	DISV [m3]	DISM [t]	VCB [m]	KMt [m]	TPC [t/cm]	MTC [tm/cm]	XB [m]	XF [m]
1.300	34.67	35.54	0.884	4.374	0.57	0.66	9.929	9.098
1.320	35.84	36.74	0.898	4.398	0.59	0.71	9.896	8.965
1.340	37.01	37.94	0.913	4.421	0.60	0.76	9.863	8.831
1.360	38.19	39.14	0.927	4.445	0.62	0.82	9.829	8.697
1.380	39.36	40.34	0.942	4.468	0.64	0.87	9.796	8.563
1.400	40.53	41.55	0.956	4.492	0.66	0.93	9.763	8.429
1.420	41.86	42.91	0.971	4.436	0.66	0.94	9.721	8.402
1.440	43.19	44.27	0.986	4.379	0.67	0.96	9.679	8.375
1.460	44.51	45.63	1.001	4.323	0.67	0.97	9.637	8.348
1.480	45.84	46.99	1.016	4.266	0.68	0.99	9.595	8.321
1.500	47.17	48.35	1.031	4.210	0.69	1.01	9.553	8.294
1.520	48.51	49.72	1.045	4.159	0.69	1.01	9.522	8.303
1.540	49.85	51.10	1.059	4.107	0.69	1.02	9.491	8.312
1.560	51.19	52.47	1.073	4.056	0.69	1.02	9.461	8.321
1.580	52.54	53.85	1.087	4.004	0.69	1.03	9.430	8.330
1.600	53.88	55.23	1.101	3.953	0.69	1.03	9.399	8.339
1.620	55.23	56.61	1.114	3.909	0.69	1.03	9.374	8.347
1.640	56.59	58.00	1.127	3.867	0.69	1.04	9.350	8.355
1.660	57.94	59.39	1.140	3.825	0.69	1.04	9.326	8.364
1.680	59.29	60.77	1.153	3.786	0.70	1.05	9.304	8.372
1.700	60.65	62.16	1.166	3.749	0.70	1.05	9.283	8.380
1.720	62.01	63.56	1.179	3.714	0.70	1.05	9.264	8.388
1.740	63.37	64.96	1.191	3.681	0.70	1.06	9.245	8.396
1.760	64.74	66.35	1.204	3.649	0.70	1.06	9.228	8.403
1.780	66.10	67.75	1.216	3.618	0.70	1.06	9.211	8.411
1.800	67.46	69.15	1.229	3.587	0.70	1.07	9.194	8.419
1.820	68.83	70.56	1.241	3.561	0.70	1.07	9.180	8.425
1.840	70.21	71.96	1.253	3.535	0.70	1.07	9.166	8.432
1.860	71.58	73.37	1.266	3.509	0.70	1.08	9.152	8.438
1.880	72.95	74.77	1.278	3.483	0.70	1.08	9.138	8.445
1.900	74.32	76.18	1.290	3.457	0.70	1.09	9.124	8.451
1.920	75.70	77.59	1.302	3.439	0.71	1.09	9.113	8.458
1.940	77.08	79.01	1.314	3.420	0.71	1.09	9.102	8.465
1.960	78.46	80.42	1.325	3.402	0.71	1.10	9.090	8.473
1.980	79.84	81.83	1.337	3.383	0.71	1.10	9.079	8.480
2.000	81.22	83.25	1.349	3.365	0.71	1.10	9.068	8.487
2.020	82.64	84.70	1.361	3.360	0.72	1.13	9.055	8.416
2.040	84.06	86.16	1.373	3.356	0.72	1.16	9.043	8.345
2.060	85.48	87.62	1.384	3.351	0.73	1.18	9.030	8.275
2.080	86.90	89.07	1.396	3.347	0.74	1.21	9.018	8.204

HYDROSTATIC DATA - TRIM = 0.300 m

Tkm [m]	DISV [m3]	DISM [t]	VCB [m]	KMt [m]	TPC [t/cm]	MTC [tm/cm]	XB [m]	XF [m]
1.300	32.68	33.49	0.858	3.510	0.52	0.56	11.008	10.333
1.320	33.73	34.57	0.871	3.528	0.53	0.58	10.985	10.276
1.340	34.78	35.65	0.884	3.547	0.53	0.59	10.961	10.220
1.360	35.83	36.72	0.898	3.565	0.54	0.61	10.938	10.163
1.380	36.88	37.80	0.911	3.584	0.55	0.62	10.914	10.107
1.400	37.93	38.88	0.924	3.602	0.55	0.63	10.891	10.050
1.420	39.04	40.02	0.937	3.639	0.56	0.65	10.865	9.974
1.440	40.16	41.16	0.950	3.676	0.57	0.67	10.839	9.898
1.460	41.27	42.30	0.964	3.714	0.57	0.69	10.812	9.823
1.480	42.38	43.44	0.977	3.751	0.58	0.71	10.786	9.747
1.500	43.49	44.58	0.990	3.788	0.59	0.73	10.760	9.671
1.520	44.67	45.79	1.003	3.781	0.60	0.75	10.731	9.612
1.540	45.85	47.00	1.016	3.773	0.60	0.76	10.701	9.553
1.560	47.03	48.21	1.028	3.766	0.61	0.78	10.672	9.494
1.580	48.21	49.42	1.041	3.758	0.61	0.80	10.642	9.435
1.600	49.39	50.63	1.054	3.751	0.62	0.82	10.613	9.376
1.620	50.65	51.92	1.067	3.754	0.63	0.85	10.580	9.249
1.640	51.92	53.21	1.080	3.756	0.64	0.88	10.546	9.130
1.660	53.18	54.51	1.093	3.758	0.65	0.91	10.511	9.022
1.680	54.44	55.80	1.106	3.757	0.66	0.94	10.476	8.925
1.700	55.70	57.10	1.119	3.754	0.67	0.97	10.439	8.838
1.720	57.07	58.50	1.132	3.748	0.68	0.99	10.400	8.761
1.740	58.44	59.90	1.145	3.739	0.68	1.02	10.359	8.690
1.760	59.80	61.30	1.158	3.727	0.69	1.04	10.316	8.622
1.780	61.17	62.70	1.171	3.713	0.70	1.06	10.272	8.557
1.800	62.53	64.10	1.184	3.698	0.70	1.09	10.227	8.492
1.820	63.91	65.51	1.197	3.668	0.70	1.09	10.193	8.497
1.840	65.29	66.92	1.209	3.638	0.71	1.09	10.159	8.502
1.860	66.67	68.33	1.222	3.609	0.71	1.10	10.124	8.508
1.880	68.04	69.74	1.234	3.579	0.71	1.10	10.090	8.513
1.900	69.42	71.16	1.247	3.549	0.71	1.10	10.056	8.518
1.920	70.81	72.58	1.259	3.528	0.71	1.11	10.028	8.524
1.940	72.19	74.00	1.271	3.507	0.71	1.11	10.001	8.530
1.960	73.58	75.42	1.283	3.485	0.71	1.11	9.973	8.536
1.980	74.96	76.84	1.295	3.464	0.71	1.12	9.946	8.542
2.000	76.35	78.26	1.307	3.443	0.71	1.12	9.918	8.548
2.020	77.74	79.69	1.319	3.424	0.71	1.12	9.895	8.555
2.040	79.14	81.11	1.331	3.405	0.71	1.13	9.873	8.561
2.060	80.53	82.54	1.342	3.386	0.72	1.13	9.850	8.568
2.080	81.93	83.97	1.354	3.367	0.72	1.13	9.828	8.574

FORM STABILITY DATA Lk - TRIM = 0.000 m

Tkm [m]	DISM [t]	KMt [m]	Lk for Angle of Heel in degrees							
			10	20	30	40	50	60	70	80
1.300	34.24	4.022	0.623	1.112	1.598	2.166	2.716	3.006	3.101	3.072
1.320	35.38	4.031	0.625	1.113	1.600	2.166	2.705	2.995	3.090	3.069
1.340	36.51	4.041	0.626	1.113	1.602	2.166	2.695	2.983	3.079	3.066
1.360	37.64	4.050	0.628	1.114	1.604	2.166	2.684	2.972	3.069	3.064
1.380	38.78	4.060	0.629	1.114	1.606	2.166	2.674	2.960	3.058	3.061
1.400	39.91	4.069	0.631	1.115	1.608	2.166	2.663	2.949	3.047	3.058
1.420	41.12	4.070	0.632	1.117	1.611	2.165	2.651	2.937	3.036	3.056
1.440	42.33	4.071	0.633	1.118	1.615	2.165	2.640	2.924	3.025	3.054
1.460	43.54	4.073	0.633	1.120	1.618	2.164	2.628	2.912	3.013	3.052
1.480	44.75	4.074	0.634	1.121	1.622	2.164	2.617	2.899	3.002	3.050
1.500	45.97	4.075	0.635	1.123	1.625	2.163	2.605	2.887	2.991	3.048
1.520	47.30	4.066	0.635	1.126	1.630	2.162	2.594	2.873	2.980	3.047
1.540	48.64	4.057	0.635	1.130	1.635	2.161	2.583	2.860	2.969	3.046
1.560	49.98	4.049	0.636	1.133	1.641	2.159	2.573	2.846	2.957	3.046
1.580	51.32	4.040	0.636	1.137	1.646	2.158	2.562	2.833	2.946	3.045
1.600	52.65	4.031	0.636	1.140	1.651	2.157	2.551	2.819	2.935	3.044
1.620	54.04	3.984	0.635	1.145	1.655	2.155	2.542	2.805	2.925	3.045
1.640	55.43	3.939	0.634	1.149	1.660	2.154	2.533	2.790	2.916	3.046
1.660	56.83	3.895	0.633	1.154	1.664	2.152	2.524	2.776	2.907	3.047
1.680	58.22	3.853	0.631	1.158	1.668	2.151	2.515	2.762	2.899	3.048
1.700	59.61	3.813	0.630	1.163	1.672	2.149	2.506	2.749	2.891	3.049
1.720	61.01	3.776	0.628	1.168	1.676	2.147	2.498	2.736	2.884	3.051
1.740	62.41	3.741	0.626	1.173	1.679	2.145	2.490	2.723	2.878	3.052
1.760	63.81	3.706	0.624	1.177	1.682	2.143	2.482	2.711	2.872	3.054
1.780	65.21	3.673	0.622	1.182	1.685	2.141	2.474	2.698	2.866	3.056
1.800	66.61	3.640	0.620	1.187	1.688	2.139	2.466	2.686	2.861	3.058
1.820	68.02	3.612	0.619	1.191	1.691	2.137	2.459	2.676	2.857	3.060
1.840	69.43	3.584	0.617	1.195	1.694	2.135	2.452	2.666	2.853	3.062
1.860	70.84	3.556	0.616	1.199	1.696	2.133	2.445	2.656	2.850	3.063
1.880	72.25	3.528	0.614	1.203	1.699	2.131	2.438	2.646	2.846	3.065
1.900	73.65	3.500	0.613	1.207	1.702	2.129	2.431	2.636	2.842	3.067
1.920	75.07	3.480	0.613	1.210	1.704	2.127	2.425	2.629	2.839	3.068
1.940	76.49	3.460	0.612	1.213	1.706	2.125	2.419	2.622	2.836	3.069
1.960	77.91	3.441	0.612	1.216	1.708	2.123	2.412	2.614	2.834	3.071
1.980	79.32	3.421	0.611	1.219	1.710	2.121	2.406	2.607	2.831	3.072
2.000	80.74	3.401	0.611	1.222	1.712	2.119	2.400	2.600	2.828	3.073
2.020	82.17	3.383	0.613	1.224	1.713	2.116	2.395	2.595	2.825	3.074
2.040	83.59	3.366	0.615	1.226	1.714	2.114	2.390	2.590	2.822	3.075
2.060	85.02	3.348	0.616	1.229	1.714	2.111	2.385	2.586	2.820	3.075
2.080	86.44	3.331	0.618	1.231	1.715	2.109	2.380	2.581	2.817	3.076

FORM STABILITY DATA Lk - TRIM = -0.300 m

Tkm [m]	DISM [t]	KMt [m]	Lk for Angle of Heel in degrees							
			10	20	30	40	50	60	70	80
1.300	35.54	4.374	0.671	1.165	1.665	2.216	2.747	3.031	3.125	3.100
1.320	36.74	4.398	0.672	1.167	1.668	2.215	2.733	3.017	3.112	3.096
1.340	37.94	4.421	0.672	1.169	1.671	2.213	2.719	3.003	3.099	3.092
1.360	39.14	4.445	0.673	1.170	1.675	2.212	2.704	2.988	3.085	3.087
1.380	40.34	4.468	0.673	1.172	1.678	2.210	2.690	2.974	3.072	3.083
1.400	41.55	4.492	0.674	1.174	1.681	2.209	2.676	2.960	3.059	3.079
1.420	42.91	4.436	0.673	1.177	1.685	2.206	2.661	2.944	3.045	3.076
1.440	44.27	4.379	0.672	1.181	1.689	2.204	2.646	2.928	3.031	3.073
1.460	45.63	4.323	0.671	1.184	1.694	2.201	2.631	2.913	3.016	3.069
1.480	46.99	4.266	0.670	1.188	1.698	2.199	2.616	2.897	3.002	3.066
1.500	48.35	4.210	0.669	1.191	1.702	2.196	2.601	2.881	2.988	3.063
1.520	49.72	4.159	0.666	1.194	1.704	2.193	2.589	2.865	2.977	3.063
1.540	51.10	4.107	0.664	1.197	1.706	2.190	2.577	2.849	2.965	3.062
1.560	52.47	4.056	0.661	1.201	1.709	2.186	2.566	2.832	2.954	3.062
1.580	53.85	4.004	0.659	1.204	1.711	2.183	2.554	2.816	2.942	3.061
1.600	55.23	3.953	0.656	1.207	1.713	2.180	2.542	2.800	2.931	3.061
1.620	56.61	3.909	0.653	1.211	1.714	2.177	2.533	2.784	2.923	3.062
1.640	58.00	3.867	0.650	1.214	1.716	2.174	2.523	2.768	2.915	3.063
1.660	59.39	3.825	0.647	1.218	1.717	2.171	2.514	2.753	2.907	3.064
1.680	60.77	3.786	0.644	1.221	1.719	2.168	2.505	2.739	2.900	3.066
1.700	62.16	3.749	0.641	1.224	1.720	2.165	2.496	2.725	2.893	3.067
1.720	63.56	3.714	0.639	1.227	1.721	2.162	2.488	2.712	2.887	3.069
1.740	64.96	3.681	0.636	1.229	1.722	2.159	2.479	2.700	2.882	3.070
1.760	66.35	3.649	0.634	1.232	1.724	2.156	2.472	2.688	2.876	3.072
1.780	67.75	3.618	0.632	1.234	1.725	2.153	2.464	2.677	2.872	3.074
1.800	69.15	3.587	0.630	1.236	1.726	2.150	2.456	2.666	2.867	3.076
1.820	70.56	3.561	0.629	1.238	1.727	2.147	2.449	2.657	2.863	3.077
1.840	71.96	3.535	0.628	1.240	1.727	2.144	2.442	2.649	2.859	3.078
1.860	73.37	3.509	0.628	1.241	1.728	2.141	2.436	2.640	2.856	3.080
1.880	74.77	3.483	0.627	1.243	1.728	2.138	2.429	2.632	2.852	3.081
1.900	76.18	3.457	0.626	1.245	1.729	2.135	2.422	2.623	2.848	3.082
1.920	77.59	3.439	0.627	1.246	1.729	2.132	2.416	2.617	2.844	3.083
1.940	79.01	3.420	0.628	1.247	1.729	2.129	2.410	2.611	2.840	3.084
1.960	80.42	3.402	0.630	1.249	1.728	2.126	2.405	2.605	2.837	3.085
1.980	81.83	3.383	0.631	1.250	1.728	2.123	2.399	2.599	2.833	3.086
2.000	83.25	3.365	0.632	1.251	1.728	2.120	2.393	2.593	2.829	3.087
2.020	84.70	3.360	0.635	1.252	1.727	2.117	2.388	2.589	2.826	3.088
2.040	86.16	3.356	0.638	1.252	1.726	2.114	2.384	2.585	2.822	3.088
2.060	87.62	3.351	0.640	1.253	1.724	2.110	2.379	2.581	2.819	3.089
2.080	89.07	3.347	0.643	1.253	1.723	2.107	2.375	2.577	2.815	3.089

FORM STABILITY DATA Lk - TRIM = 0.300 m

Tkm [m]	DISM [t]	K Mt [m]	Lk for Angle of Heel in degrees							
			10	20	30	40	50	60	70	80
1.300	33.49	3.510	0.575	1.059	1.538	2.114	2.671	2.972	3.069	3.038
1.320	34.57	3.528	0.578	1.060	1.540	2.116	2.664	2.963	3.061	3.036
1.340	35.65	3.547	0.581	1.061	1.541	2.118	2.657	2.954	3.052	3.034
1.360	36.72	3.565	0.583	1.063	1.543	2.119	2.650	2.946	3.044	3.031
1.380	37.80	3.584	0.586	1.064	1.544	2.121	2.643	2.937	3.035	3.029
1.400	38.88	3.602	0.589	1.065	1.546	2.123	2.636	2.928	3.027	3.027
1.420	40.02	3.639	0.591	1.066	1.549	2.124	2.628	2.918	3.018	3.026
1.440	41.16	3.676	0.593	1.068	1.552	2.125	2.620	2.908	3.009	3.025
1.460	42.30	3.714	0.595	1.069	1.556	2.127	2.613	2.899	3.001	3.024
1.480	43.44	3.751	0.597	1.071	1.559	2.128	2.605	2.889	2.992	3.023
1.500	44.58	3.788	0.599	1.072	1.562	2.129	2.597	2.879	2.983	3.022
1.520	45.79	3.781	0.600	1.074	1.567	2.129	2.589	2.868	2.974	3.022
1.540	47.00	3.773	0.602	1.076	1.571	2.129	2.581	2.857	2.965	3.021
1.560	48.21	3.766	0.603	1.079	1.576	2.130	2.572	2.847	2.955	3.021
1.580	49.42	3.758	0.605	1.081	1.580	2.130	2.564	2.836	2.946	3.020
1.600	50.63	3.751	0.606	1.083	1.585	2.130	2.556	2.825	2.937	3.020
1.620	51.92	3.754	0.607	1.086	1.590	2.130	2.548	2.813	2.928	3.020
1.640	53.21	3.756	0.608	1.089	1.596	2.129	2.540	2.802	2.919	3.021
1.660	54.51	3.758	0.608	1.092	1.601	2.129	2.531	2.790	2.910	3.021
1.680	55.80	3.757	0.609	1.096	1.606	2.128	2.523	2.779	2.902	3.022
1.700	57.10	3.754	0.609	1.100	1.612	2.128	2.515	2.767	2.894	3.023
1.720	58.50	3.748	0.609	1.105	1.618	2.127	2.507	2.755	2.887	3.025
1.740	59.90	3.739	0.609	1.110	1.624	2.127	2.499	2.743	2.880	3.027
1.760	61.30	3.727	0.609	1.116	1.630	2.126	2.492	2.731	2.873	3.029
1.780	62.70	3.713	0.608	1.123	1.636	2.126	2.484	2.719	2.866	3.031
1.800	64.10	3.698	0.608	1.129	1.642	2.125	2.476	2.707	2.860	3.034
1.820	65.51	3.668	0.607	1.135	1.647	2.124	2.469	2.696	2.855	3.036
1.840	66.92	3.638	0.606	1.141	1.653	2.123	2.462	2.685	2.851	3.038
1.860	68.33	3.609	0.606	1.146	1.658	2.123	2.455	2.675	2.846	3.040
1.880	69.74	3.579	0.605	1.152	1.664	2.122	2.448	2.664	2.842	3.042
1.900	71.16	3.549	0.604	1.158	1.669	2.121	2.441	2.653	2.837	3.044
1.920	72.58	3.528	0.603	1.163	1.673	2.120	2.435	2.645	2.834	3.046
1.940	74.00	3.507	0.602	1.168	1.677	2.119	2.428	2.636	2.831	3.048
1.960	75.42	3.485	0.601	1.174	1.681	2.118	2.422	2.628	2.828	3.049
1.980	76.84	3.464	0.600	1.179	1.685	2.117	2.415	2.619	2.825	3.051
2.000	78.26	3.443	0.599	1.184	1.689	2.116	2.409	2.611	2.822	3.053
2.020	79.69	3.424	0.599	1.188	1.692	2.114	2.403	2.605	2.820	3.054
2.040	81.11	3.405	0.600	1.192	1.695	2.112	2.398	2.599	2.818	3.055
2.060	82.54	3.386	0.600	1.196	1.697	2.111	2.392	2.594	2.815	3.056
2.080	83.97	3.367	0.601	1.200	1.700	2.109	2.387	2.588	2.813	3.057

-
- (1) The area under the righting lever curve (GZ curve) is not to be less than 0.055 metre-radians up to 30° angle of heel
 - (2) The area under the righting lever curve is not to be less than 0.090 metre-radians up to 40° angle of heel or angle of flooding if this angle is less than 40°
 - (3) The area under the righting lever curve between the angles of heel of 30° and 40° or between 30° and angle of flooding, if this angle is less than 40°, is not to be less than 0.03 metre-radians
 - (4) The righting lever (GZ) is to be at least 0.20 m at an angle of heel equal to or greater than 30°
 - (5) The maximum righting lever should occur at an angle of heel preferably exceeding 30° but not less than 25°
 - (6) The initial metacentric height, GM corr. is not to be less than 0.15 m

MAX PERMISSIBLE KGc - TRIM = 0.000 m

Tkm [m]	DISM [t]	KMt [m]	KGmax [m]	GMmin [m]	Limit Crit.
1.300	34.24	4.022	2.894	1.128	2
1.320	35.38	4.031	2.898	1.134	2
1.340	36.51	4.041	2.901	1.140	2
1.360	37.64	4.050	2.905	1.145	2
1.380	38.78	4.060	2.908	1.151	2
1.400	39.91	4.069	2.912	1.157	2
1.420	41.12	4.070	2.917	1.153	2
1.440	42.33	4.071	2.922	1.149	2
1.460	43.54	4.073	2.928	1.145	2
1.480	44.75	4.074	2.933	1.141	2
1.500	45.97	4.075	2.938	1.137	2
1.520	47.30	4.066	2.946	1.120	2
1.540	48.64	4.057	2.954	1.103	2
1.560	49.98	4.049	2.962	1.087	2
1.580	51.32	4.040	2.970	1.070	2
1.600	52.65	4.031	2.978	1.053	2
1.620	54.04	3.984	2.985	0.999	2
1.640	55.43	3.939	2.993	0.946	2
1.660	56.83	3.895	2.999	0.896	2
1.680	58.22	3.853	3.005	0.848	2
1.700	59.61	3.813	3.009	0.804	2
1.720	61.01	3.776	3.012	0.764	2
1.740	62.41	3.741	3.014	0.727	2
1.760	63.81	3.706	3.015	0.691	4
1.780	65.21	3.673	3.016	0.657	4
1.800	66.61	3.640	3.016	0.624	4
1.820	68.02	3.612	3.016	0.596	4
1.840	69.43	3.584	3.017	0.567	4
1.860	70.84	3.556	3.017	0.539	4
1.880	72.25	3.528	3.018	0.510	4
1.900	73.65	3.500	3.018	0.482	4
1.920	75.07	3.480	3.019	0.461	4
1.940	76.49	3.460	3.021	0.440	4
1.960	77.91	3.441	3.022	0.418	4
1.980	79.32	3.421	3.024	0.397	4
2.000	80.74	3.401	3.025	0.376	4
2.020	82.17	3.383	3.026	0.357	4
2.040	83.59	3.366	3.027	0.339	4
2.060	85.02	3.348	3.028	0.320	4
2.080	86.44	3.331	3.029	0.302	4

MAX PERMISSIBLE KGc - TRIM = -0.300 m

Tkm [m]	DISM [t]	KMt [m]	KGmax [m]	GMmin [m]	Limit Crit.
1.300	35.54	4.374	3.044	1.330	2
1.320	36.74	4.398	3.048	1.350	2
1.340	37.94	4.421	3.052	1.369	2
1.360	39.14	4.445	3.056	1.389	3
1.380	40.34	4.468	3.060	1.408	3
1.400	41.55	4.492	3.064	1.428	3
1.420	42.91	4.436	3.068	1.368	3
1.440	44.27	4.379	3.072	1.308	3
1.460	45.63	4.323	3.075	1.247	3
1.480	46.99	4.266	3.079	1.187	3
1.500	48.35	4.210	3.083	1.127	3
1.520	49.72	4.159	3.081	1.077	3
1.540	51.10	4.107	3.080	1.027	3
1.560	52.47	4.056	3.078	0.978	4
1.580	53.85	4.004	3.077	0.928	4
1.600	55.23	3.953	3.075	0.878	4
1.620	56.61	3.909	3.070	0.839	4
1.640	58.00	3.867	3.066	0.801	4
1.660	59.39	3.825	3.061	0.764	4
1.680	60.77	3.786	3.058	0.728	4
1.700	62.16	3.749	3.055	0.694	4
1.720	63.56	3.714	3.053	0.661	4
1.740	64.96	3.681	3.052	0.629	4
1.760	66.35	3.649	3.051	0.598	4
1.780	67.75	3.618	3.051	0.567	4
1.800	69.15	3.587	3.051	0.536	4
1.820	70.56	3.561	3.051	0.510	4
1.840	71.96	3.535	3.052	0.483	4
1.860	73.37	3.509	3.052	0.457	4
1.880	74.77	3.483	3.053	0.430	4
1.900	76.18	3.457	3.053	0.404	4
1.920	77.59	3.439	3.046	0.392	4
1.940	79.01	3.420	3.040	0.380	4
1.960	80.42	3.402	3.033	0.369	5
1.980	81.83	3.383	3.027	0.357	5
2.000	83.25	3.365	3.020	0.345	5
2.020	84.70	3.360	3.010	0.350	5
2.040	86.16	3.356	3.000	0.355	5
2.060	87.62	3.351	2.991	0.361	5
2.080	89.07	3.347	2.981	0.366	5

MAX PERMISSIBLE KGc - TRIM = 0.300 m

Tkm [m]	DISM [t]	KMt [m]	KGmax [m]	GMmin [m]	Limit Crit.
1.300	33.49	3.510	2.716	0.794	1
1.320	34.57	3.528	2.722	0.806	1
1.340	35.65	3.547	2.729	0.818	1
1.360	36.72	3.565	2.735	0.830	1
1.380	37.80	3.584	2.742	0.842	1
1.400	38.88	3.602	2.748	0.854	1
1.420	40.02	3.639	2.755	0.884	1
1.440	41.16	3.676	2.762	0.914	1
1.460	42.30	3.714	2.769	0.945	1
1.480	43.44	3.751	2.776	0.975	1
1.500	44.58	3.788	2.783	1.005	1
1.520	45.79	3.781	2.791	0.990	1
1.540	47.00	3.773	2.799	0.974	1
1.560	48.21	3.766	2.807	0.959	1
1.580	49.42	3.758	2.815	0.943	1
1.600	50.63	3.751	2.823	0.928	1
1.620	51.92	3.754	2.832	0.922	1
1.640	53.21	3.756	2.841	0.915	1
1.660	54.51	3.758	2.851	0.907	1
1.680	55.80	3.757	2.861	0.896	1
1.700	57.10	3.754	2.871	0.883	1
1.720	58.50	3.748	2.882	0.866	1
1.740	59.90	3.739	2.893	0.846	1
1.760	61.30	3.727	2.904	0.823	1
1.780	62.70	3.713	2.916	0.797	1
1.800	64.10	3.698	2.928	0.770	1
1.820	65.51	3.668	2.937	0.731	1
1.840	66.92	3.638	2.946	0.692	1
1.860	68.33	3.609	2.956	0.653	1
1.880	69.74	3.579	2.965	0.614	1
1.900	71.16	3.549	2.974	0.575	1
1.920	72.58	3.528	2.979	0.549	1
1.940	74.00	3.507	2.984	0.523	1
1.960	75.42	3.485	2.989	0.496	4
1.980	76.84	3.464	2.994	0.470	4
2.000	78.26	3.443	2.999	0.444	4
2.020	79.69	3.424	3.001	0.423	4
2.040	81.11	3.405	3.004	0.401	4
2.060	82.54	3.386	3.006	0.380	4
2.080	83.97	3.367	3.009	0.358	4

Tank Capacities for FOREPEAK.C containing WATER BALLAST (1.025)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
1.38	5.00%	0.18	0.18	21.347f	0.000	1.061	0.01	0.03
1.78	10.00%	0.35	0.36	21.407f	0.000	1.328	0.01	0.06
2.35	20.00%	0.71	0.72	21.476f	0.000	1.705	0.02	0.12
2.79	30.00%	1.06	1.09	21.524f	0.000	1.996	0.03	0.19
3.11	40.00%	1.41	1.45	21.555f	0.000	2.240	0.17	0.33
3.30	50.00%	1.77	1.81	21.580f	0.000	2.435	0.47	0.55
3.44	60.00%	2.12	2.17	21.607f	0.000	2.591	0.84	0.80
3.54	70.00%	2.47	2.54	21.632f	0.000	2.720	2.73	1.34
3.61	80.00%	2.83	2.90	21.662f	0.000	2.827	3.35	1.71
3.68	90.00%	3.18	3.26	21.686f	0.000	2.917	3.35	1.71
3.71	95.00%	3.36	3.44	21.696f	0.000	2.958	3.35	1.71
3.73	98.00%	3.46	3.55	21.701f	0.000	2.982	3.35	1.71
	100.00%	3.54	3.62	21.706f	0.000	2.997		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
FOREPEAK.C	0.000	0.000	0.000

Tank Capacities for FUEL_1.C containing FUEL OIL (0.850)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.38	5.00%	0.06	0.05	19.745f	0.000	0.306	0.00	0.13
0.48	10.00%	0.12	0.10	19.786f	0.000	0.369	0.01	0.18
0.63	20.00%	0.24	0.20	19.809f	0.000	0.463	0.02	0.24
0.74	30.00%	0.36	0.30	19.819f	0.000	0.537	0.03	0.29
0.84	40.00%	0.48	0.40	19.825f	0.000	0.601	0.05	0.33
0.93	50.00%	0.59	0.50	19.829f	0.000	0.658	0.06	0.36
1.01	60.00%	0.71	0.61	19.832f	0.000	0.711	0.07	0.39
1.09	70.00%	0.83	0.71	19.835f	0.000	0.760	0.09	0.42
1.16	80.00%	0.95	0.81	19.837f	0.000	0.806	0.10	0.44
1.23	90.00%	1.07	0.91	19.839f	0.000	0.850	0.12	0.47
1.27	95.00%	1.13	0.96	19.840f	0.000	0.871	0.12	0.47
1.29	98.00%	1.16	0.99	19.841f	0.000	0.883	0.13	0.48
	100.00%	1.19	1.01	19.841f	0.000	0.891		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
FUEL_1.C	0.000	0.000	0.000

Tank Capacities for FUEL_2.C containing FUEL OIL (0.850)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.32	5.00%	0.16	0.14	15.699f	0.000	0.234	0.05	0.18
0.44	10.00%	0.32	0.27	15.709f	0.000	0.310	0.14	0.26
0.60	20.00%	0.64	0.55	15.755f	0.000	0.419	0.40	0.81
0.72	30.00%	0.97	0.82	15.821f	0.000	0.500	0.68	1.32
0.81	40.00%	1.29	1.09	15.872f	0.000	0.567	0.94	1.67
0.90	50.00%	1.61	1.37	15.910f	0.000	0.625	1.21	1.94
0.98	60.00%	1.93	1.64	15.941f	0.000	0.677	1.44	2.14
1.07	70.00%	2.25	1.92	15.967f	0.000	0.727	1.70	2.37
1.15	80.00%	2.58	2.19	15.990f	0.000	0.774	1.88	2.53
1.22	90.00%	2.90	2.46	16.010f	0.000	0.820	2.02	2.64
1.26	95.00%	3.06	2.60	16.019f	0.000	0.842	2.07	2.68
1.29	98.00%	3.15	2.68	16.024f	0.000	0.855	2.10	2.70
	100.00%	3.22	2.74	16.027f	0.000	0.864		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
FUEL_2.C	0.000	0.000	0.000

Tank Capacities for ROLLDAMP.C containing WATER BALLAST (1.025)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
2.48	5.00%	0.15	0.16	0.035a	0.000	2.467	17.06	0.59
2.51	10.00%	0.30	0.31	0.035a	0.000	2.480	16.82	0.59
2.56	20.00%	0.61	0.62	0.035a	0.000	2.505	16.35	0.58
2.61	30.00%	0.91	0.94	0.035a	0.000	2.531	15.88	0.58
2.66	40.00%	1.22	1.25	0.035a	0.000	2.557	15.41	0.57
2.71	50.00%	1.52	1.56	0.035a	0.000	2.582	14.95	0.56
2.76	60.00%	1.83	1.87	0.035a	0.000	2.608	14.50	0.56
2.82	70.00%	2.13	2.18	0.035a	0.000	2.635	14.05	0.55
2.87	80.00%	2.43	2.50	0.035a	0.000	2.661	13.60	0.55
2.93	90.00%	2.74	2.81	0.035a	0.000	2.687	13.16	0.54
2.95	95.00%	2.89	2.96	0.035a	0.000	2.701	12.95	0.54
2.97	98.00%	2.98	3.06	0.035a	0.000	2.709	6.36	0.42
	100.00%	3.04	3.12	0.035a	0.000	2.714		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
ROLLDAMP.C	0.000	0.000	0.000

Tank Capacities for FW.S containing FRESH WATER (1.000)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
1.33	5.00%	0.02	0.02	15.660f	0.753s	1.320	0.04	0.14
1.35	10.00%	0.04	0.04	15.660f	0.753s	1.330	0.04	0.14
1.39	20.00%	0.08	0.08	15.660f	0.753s	1.350	0.04	0.14
1.43	30.00%	0.12	0.12	15.660f	0.753s	1.370	0.04	0.14
1.47	40.00%	0.16	0.16	15.660f	0.753s	1.390	0.04	0.14
1.51	50.00%	0.20	0.20	15.660f	0.753s	1.410	0.04	0.14
1.55	60.00%	0.23	0.23	15.660f	0.753s	1.430	0.04	0.14
1.59	70.00%	0.27	0.27	15.660f	0.753s	1.450	0.04	0.14
1.63	80.00%	0.31	0.31	15.660f	0.753s	1.470	0.04	0.14
1.67	90.00%	0.35	0.35	15.660f	0.753s	1.490	0.04	0.14
1.69	95.00%	0.37	0.37	15.660f	0.753s	1.500	0.04	0.14
1.70	98.00%	0.38	0.38	15.660f	0.753s	1.506	0.04	0.14
	100.00%	0.39	0.39	15.660f	0.753s	1.510		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
FW.S	0.000	0.000	0.000

Tank Capacities for SEWAGE.P containing MISC (1.000)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
1.33	5.00%	0.02	0.02	15.988f	0.462p	1.320	0.04	0.14
1.35	10.00%	0.04	0.04	15.988f	0.462p	1.330	0.04	0.14
1.39	20.00%	0.08	0.08	15.988f	0.462p	1.350	0.04	0.14
1.43	30.00%	0.11	0.11	15.988f	0.462p	1.370	0.04	0.14
1.47	40.00%	0.15	0.15	15.988f	0.462p	1.390	0.04	0.14
1.51	50.00%	0.19	0.19	15.988f	0.462p	1.410	0.04	0.14
1.55	60.00%	0.23	0.23	15.988f	0.462p	1.430	0.04	0.14
1.59	70.00%	0.27	0.27	15.988f	0.462p	1.450	0.04	0.14
1.63	80.00%	0.31	0.31	15.988f	0.462p	1.470	0.04	0.14
1.67	90.00%	0.34	0.34	15.988f	0.462p	1.490	0.04	0.14
1.69	95.00%	0.36	0.36	15.988f	0.462p	1.500	0.04	0.14
1.70	98.00%	0.38	0.38	15.988f	0.462p	1.506	0.04	0.14
	100.00%	0.38	0.38	15.988f	0.462p	1.510		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
SEWAGE.P	0.000	0.000	0.000

Tank Capacities for WB_AFT_P containing WATER BALLAST (1.025)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
2.48	5.00%	0.07	0.07	0.970a	2.037p	2.463	2.46	0.14
2.50	10.00%	0.14	0.14	0.970a	2.037p	2.476	2.46	0.14
2.56	20.00%	0.28	0.28	0.970a	2.037p	2.503	2.46	0.14
2.61	30.00%	0.41	0.42	0.970a	2.037p	2.529	2.46	0.14
2.66	40.00%	0.55	0.56	0.970a	2.037p	2.556	2.46	0.14
2.71	50.00%	0.69	0.71	0.970a	2.037p	2.582	2.46	0.14
2.77	60.00%	0.83	0.85	0.970a	2.037p	2.608	2.46	0.14
2.82	70.00%	0.96	0.99	0.970a	2.037p	2.635	2.46	0.14
2.87	80.00%	1.10	1.13	0.970a	2.037p	2.661	2.46	0.14
2.93	90.00%	1.24	1.27	0.970a	2.037p	2.688	2.46	0.14
2.95	95.00%	1.31	1.34	0.970a	2.037p	2.701	2.07	0.13
2.97	98.00%	1.35	1.38	0.970a	2.028p	2.709	0.81	0.10
	100.00%	1.38	1.41	0.970a	2.014p	2.714		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
WB_AFT_P	0.000	0.000	0.000

Tank Capacities for WB_AFT_S containing WATER BALLAST (1.025)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
2.48	5.00%	0.07	0.07	0.970a	2.037s	2.463	2.46	0.14
2.50	10.00%	0.14	0.14	0.970a	2.037s	2.476	2.46	0.14
2.56	20.00%	0.28	0.28	0.970a	2.037s	2.503	2.46	0.14
2.61	30.00%	0.41	0.42	0.970a	2.037s	2.529	2.46	0.14
2.66	40.00%	0.55	0.56	0.970a	2.037s	2.556	2.46	0.14
2.71	50.00%	0.69	0.71	0.970a	2.037s	2.582	2.46	0.14
2.77	60.00%	0.83	0.85	0.970a	2.037s	2.608	2.46	0.14
2.82	70.00%	0.96	0.99	0.970a	2.037s	2.635	2.46	0.14
2.87	80.00%	1.10	1.13	0.970a	2.037s	2.661	2.46	0.14
2.93	90.00%	1.24	1.27	0.970a	2.037s	2.688	2.46	0.14
2.95	95.00%	1.31	1.34	0.970a	2.037s	2.701	2.07	0.13
2.97	98.00%	1.35	1.38	0.970a	2.028s	2.709	0.81	0.10
	100.00%	1.38	1.41	0.970a	2.014s	2.714		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
WB_AFT_S	0.000	0.000	0.000

Tank Capacities for WB_AFT_C containing WATER BALLAST (1.025)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
1.66	5.00%	0.12	0.12	0.806a	0.000	1.625	1.76	0.09
1.71	10.00%	0.24	0.25	0.885a	0.000	1.656	1.99	0.13
1.81	20.00%	0.48	0.49	0.927a	0.000	1.709	1.99	0.13
1.91	30.00%	0.72	0.74	0.942a	0.000	1.759	1.99	0.13
2.01	40.00%	0.96	0.98	0.949a	0.000	1.809	1.99	0.13
2.11	50.00%	1.20	1.23	0.953a	0.000	1.859	1.99	0.13
2.21	60.00%	1.44	1.47	0.956a	0.000	1.909	2.02	0.13
2.30	70.00%	1.68	1.72	0.958a	0.000	1.958	2.41	0.14
2.39	80.00%	1.92	1.97	0.959a	0.000	2.007	2.83	0.15
2.58	90.00%	2.16	2.21	0.961a	0.000	2.056	0.03	0.03
2.79	95.00%	2.28	2.34	0.961a	0.000	2.089	0.03	0.03
2.91	98.00%	2.35	2.41	0.961a	0.000	2.112	0.03	0.03
	100.00%	2.40	2.46	0.961a	0.000	2.129		

Reference Point

Part	Long.(m)	Trans.(m)	Vert.(m)
WB_AFT_C	0.000	0.000	0.000

MANUAL CALCULATION OF STABILITY AND TRIM

	A	B	C	D = B · C	E	F = B · E	G
	Item	Weight [t]	XG [m]	Long.Mom. [tm]	ZG [m]	Vert.Mom. [tm]	F.S.Mom [tm]
1	Light ship	44.00	9.84	433.0	2.50	110.0	-
2	Consumables						
3	Ballast						
4	Cargo						
5	Miscellaneous						
6	DISPLACEMENT						
		= SUM(B1-B5)	= D6/B6	= SUM(D1-D5)	= F6/B6	= SUM(F1-F5)	= SUM(G1-G5)

DISM = Displacement mass = B6 = _____ m

With calculated DISM, obtain XB from hydrostatic tables, for all trim values.

Select the table with trim, where the distance between XG and XB is minimum, and obtain the following values:

Tkm = _____ m; MTC = _____ tm/cm; XB = _____ m; XF = _____ m

Calculate the following values:

t = Trim = [DISM · (XG - XB)] / (MTC · 100) = _____ m

Tka = Draught at AP = Tkm - (t · XF / Lpp) = _____ m

Tkf = Draught at FP = Tkm - [t · (XF - Lpp) / Lpp] = _____ m

KG of Displacement = Vertical moment / DISM = C6 = _____ m

FSmom = Free Surface Moment = G6 = _____ tm

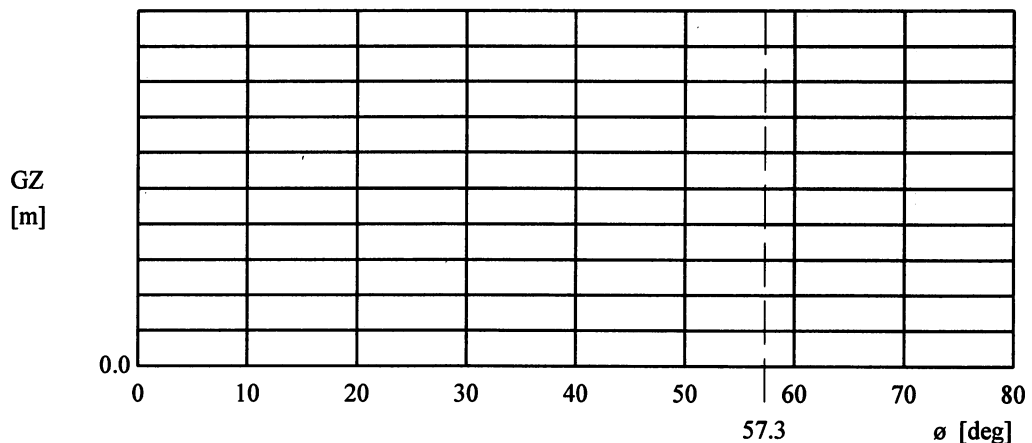
KGc = KG + FSmom / DISM = _____ m

MAX PERMISSIBLE KGc from tables, interpolating for trim = _____ m

KGc must be less than this value!

Forms for calculation and plotting the righting lever curve:

ø [deg]	10	20	30	40	50	60	70	80
Lk [m]								
KGc · sin(ø) [m]								
GZ [m]								
GZ = Lk - KGc · sin(ø); KM = _____ m; KGc = _____ m; GMc = KM - KGc = _____ m								



MANUAL CALCULATION OF WEIGHT AND C.G. FOR _____

	A	B	C	D	E	F	G
	Item	Weight [t]	XG [m]	= B · C Long.Mom. [tm]	ZG [m]	= B · E Vert.Mom. [tm]	F.S.Mom [tm]
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
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35							
36							
37							
38							
39							

40	TOTAL						
		= SUM(B1-B39)	= D40/B40	= SUM(D1-D39)	= F40/B40	= SUM(F1-F39)	= SUM(G1-G39)