PLAN HISTORY

REV. NO	DATED	DESCRIPTION	SIGN			
			DWN	CHK	APP	APP

PROJ. NO:	**85.3 m Passenger Vessel**	DATED:
APP.:	**TITLE**	SCALE: NONE
APP:	INTACT TRIM & STABILITY BOOKLET	KEY DWG: NONE
CHK:	(PRELIMINARY)	REF. DWG: NONE
DWN:		DWG No:

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APPENDICES

1. SHIP'S PARTICULARS

Vessels' Name	85.3M PASSENGER VESSEL
Yard Hull No.	
Type	Passenger
Length O.A.	85.20 m
Length B.P.	72.08 m
Breadth Mld.	14.00 m
Depth Mld.	8.00 m
Summer Draught	4.15 m
Passenger No	36 persons
Crew No	36 persons
Classification Society	DET NORSKE VERITAS

2. ABBREVIATIONS

BG : Trimming lever
DO : Diesel Oil
FO : Fuel Oil
LO : Lubricating Oil
FW : Fresh Water
FSM : Free Surface Moment
GM : Transverse Metacentric height
FSC : Correction of **GM** due to the free surface effects
GM_{COR} : Transverse Metacentric height corrected for free surface effects
GZ : Righting Arm
KM : Vertical distance of transverse metacenter above base line
LCB : Longitudinal Center of Buoyancy
LCG : Longitudinal Center of Gravity
LCF : Longitudinal Center of Flotation
VCG : Vertical Center of Gravity
KG_{COR} : VCG + FSC : Actual center of gravity abv Baseline corrected for free surface effects
OG : Distance between the center of gravity and the waterline
LOA : Length Overall
LBP : Length between Perpendiculars
Lwl : Length of Waterline
MCT : Moment to Change Trim
TPC : Tonnes per cm of immersion
TPI : Tonnes per inch of immersion
s.g. : Specific Gravity of Liquid in Tanks
Δ : Displacement
I : Moment of Inertia of Free Surface of Liquid in Tanks
θ : Angle of heel
θ_f : Angle of flooding[1]

[1] The angle of flooding is the angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. (Small openings through which progressive flooding cannot take place need not be considered as open).

Remarks :

1. LCG ,LCB and LCF are measured from midship.
" + " means forward
" - " means aft

2. VCG is measured from the base line, i.e. above keel plate.

3. UNITS CONVERSION TABLE – METRIC EQUIVALENTS

Unless otherwise stated, the metric system of units is used through the present booklet.

Multiply by	To convert from	To obtain	
0,0393700	millimeters	inches	25,4000000
0,0032810	millimeters	feet	304,8000000
0,3937000	centimeters	inches	2,5400000
0,0328100	centimeters	feet	30,4800000
39,3700000	meters	inches	0,0254000
3,2808000	meters	feet	0,3048000
10,7639000	square meters	square feet	0,0929000
35,3147000	cubic meters	cubic feet	0,0283200
2,2046000	kilograms	pounds	0,4535900
0,0009842	kilograms	tons	1016,0470000
0,9842000	metric tonnes	tons	1,0160000
2,4999800	metric tones per cm immersion	tons per inch immersion	0,4000000
8,2014000	moment to change trim 1 centimeter	moment to change trim 1 inch	0,1220000
187,9767000	meter - radians	feet - degrees	0,0053000
0,0278708	tonnes/cubic meters	tons / cubic feet	35,8795000
35,8795000	cubic meters/tonnes	cubic feet / tons	0,0278709
57,2957800	rad	deg	0,0174533
	To obtain	**To convert from**	**Multiply by above**

Relation between weight and volume

1000 mm^3	=	1 cm^3
1 cm^3 of fresh water (s.g.=1.000)	=	1 gram
1000 cm^3 of fresh water (s.g.=1.000)	=	1 kg (1000 grams)
1 m^3 of fresh water (s.g.=1.000)	=	1 tonne (1000 kilograms)
1 m^3 of salt water (s.g.=1.025)	=	1.025 tonnes
1 tonne of salt water (s.g.=1.025)	=	0.975 m^3

1 m^3	=	35.316 ft^3
1 ft^3	=	0.0283 m^3

4. GENERAL PROVISIONS AGAINST CAPSIZING AND INFORMATION FOR THE MASTER

In this manual the Master can find all necessary information for assessing the stability of the ship for any loading condition (other than those specified in this booklet) and to ensure that the stability criteria set by I.M.O. RES. A-749 (18) are complied with.

In the event loading conditions other than those specifically set forth in this booklet are contemplated, the Master should be guided by the arrangements and instructions contained in the above booklet and should satisfy himself, by use of the table of V.C.G. max and other information contained therein, that the vessel's metacentric height, angle of heel and stability at any stage in the voyage, fall within the limitations set forth in the afore mentioned regulations.

Compliance with the stability criteria does not ensure immunity against capsizing, regardless of the circumstances, or absolve the master from his responsibilities. The provision of adequate stability at all times remains the Master's responsibility. Masters should therefore exercise prudence and good seamanship having regard to the season of the year, weather forecast 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 cargo allocated to the ship 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 the ballast weight may be required. Before a voyage commences care should be taken to ensure that 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 stability criteria contained in this booklet set minimum values, but not maximum values are recommended. It is advisable to avoid excessive values of metacentric height, since might lead to acceleration forces which could be prejudicial to the ship, its complement, its equipment and to safe carriage of the cargo.

Masters should know that stability can be adversely affected by influences such as beam wind on ships with large windage area, icing on top-sides and deck cargo, water trapped on deck, rolling characteristics and following seas.

When it is intended to introduce or discharge water ballast during a voyage, this should be done by filling or emptying one tank at a time with the exception of tanks symmetrical about the ship's centerline which should be filled or emptied simultaneously.

The Master should ensure that the required stability criteria will be satisfied at all times.

5. OPERATIONAL PROCEDURES RELATED TO WEATHER CONDITIONS

All doorways and other openings through which water can enter into the hull or deckhouses, forecastle, etc., should be suitably closed in adverse weather conditions and accordingly all appliances for this purpose should be maintained on board and in good condition.

Weathertight and watertight hatches, doors, etc., should be kept closed during navigation, except when necessarily opened for the working of the ship 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. All portable deadlights should be maintained in good condition and securely closed in bad weather.

Any closing devices provided for vent pipes to fuel tanks should be secured in bad weather.

Reliance on automatic steering may be dangerous as this prevents ready changes to course which may be needed in bad weather.

In all conditions of loading necessary care should be taken to maintain a seaworthy freeboard.

In severe weather, the speed of the ship should be reduced if excessive rolling, propeller emergency, shipping of water on deck or heavy slamming occurs. Six heavy slammings or 25 propeller emergencies during 100 pitching motions should be considered dangerous.

Special attention should be paid when a ship is sailing in following or quartering seas because dangerous phenomena such as parametric resonance, broaching to, reduction of stability on the wave crest, and excessive rolling may occur singularly, in sequence or simultaneously in a multiple combination, creating a threat of capsize. Particularly dangerous is the situation when the wave length is of the order of 1.0 to 1.5 times the ship's length. A ship's speed and/or course should be altered appropriately to avoid the above mentioned phenomena.

Water trapping in deck wells should be avoided. If freeing ports are not sufficient for the drainage of the well, the speed of the ship should be reduced or course changed, or both. Freeing ports provided with closing appliances should always be capable of functioning and are not to be locked.

Master should be aware that steep or braking waves may occur in certain areas, or in certain wind and current combinations (river estuaries, shallow water areas, funnel shaped bays, etc.). These waves are particularly dangerous, especially for small ships.

Use of operational guidelines for avoiding dangerous situations in severe weather conditions or on board computer based system is recommended. The method should be simple to use.

6. INTACT STABILITY CRITERIA ACCORDING TO IMO RES A-749 (18)

In any service condition it must be ensured that the ship's stability complies with the following minimum criteria:

- The initial metacentric height shall be greater than 0.15m.
- The angle of heel where the maximum righting arm occurs shall preferably exceed 30 degrees but shall not be less than 25 degrees.
- The area under the righting arm curve (GZ curve) shall be greater than 0.055 meter-radians up to an angle of 30 degrees; not less than 0.090 meter-radians up to an angle of 40 degrees or the angle of flooding θ_f, (if this angle is less than 40 degrees). Additionally, the area under the righting arm curve (GZ curve) between the angles of heel of 30 and 40 degrees, or between 30 degrees and the flooding angle θ_f, (if this angle is less than 40 degrees), should not be less than 0.030 meter-radians.
- The righting arm GZ should be at least 0.20m at an angle of heel greater than or equal to 30 degrees.
- In addition for passenger ships, the angle of heel on account of crowding of passengers to one side of the ship should not exceed 10 deg.
- The angle of heel on account of turning should not exceed 10 deg. when calculated using the following formula:

$M_R = 0{,}02\ (V_0^2/L)\ D\ (KG_{COR} - d/2)$, where

M_R	:	heeling moment in [t x m]	D	:	displacement in [t]
V_0	:	service speed in [m/s]	d	:	mean draft in [m]
L	:	length of ship at waterline in [m]	KG_{COR}	:	height of center of gravity abv keel in [m]

The following "weather criterion" supplements the above stability criteria. This, together with the stringent of all above options should govern the minimum requirements for the ship.

7. SEVERE WIND AND ROLLING CRITERION (IMO RES.A- 749 (18))

1. Recommended weather criterion:

The ability of a ship to withstand the combined effects of beam wind and rolling should be demonstrated for each standard condition of loading with reference to the figure as follows:

a) the ship is subjected to a steady wind pressure acting perpendicular to the ship's centerline, which results in a steady wind heeling lever (lw1).
b) from the resultant angle of equilibrium (θ_0), the ship is assumed to roll owing to wave action to an angle of roll (θ_1) to windward. Attention should be paid to the effect of steady wind so that excessive resultant angles of heel are avoided [*];
c) the ship is then subjected to a gust wind pressure which results in a gust wind heeling lever (lw2);
d) under these circumstances, area "b" should be equal to or greater than area "a" ;
e) free surface effects should be accounted for in the standard conditions of loading ;

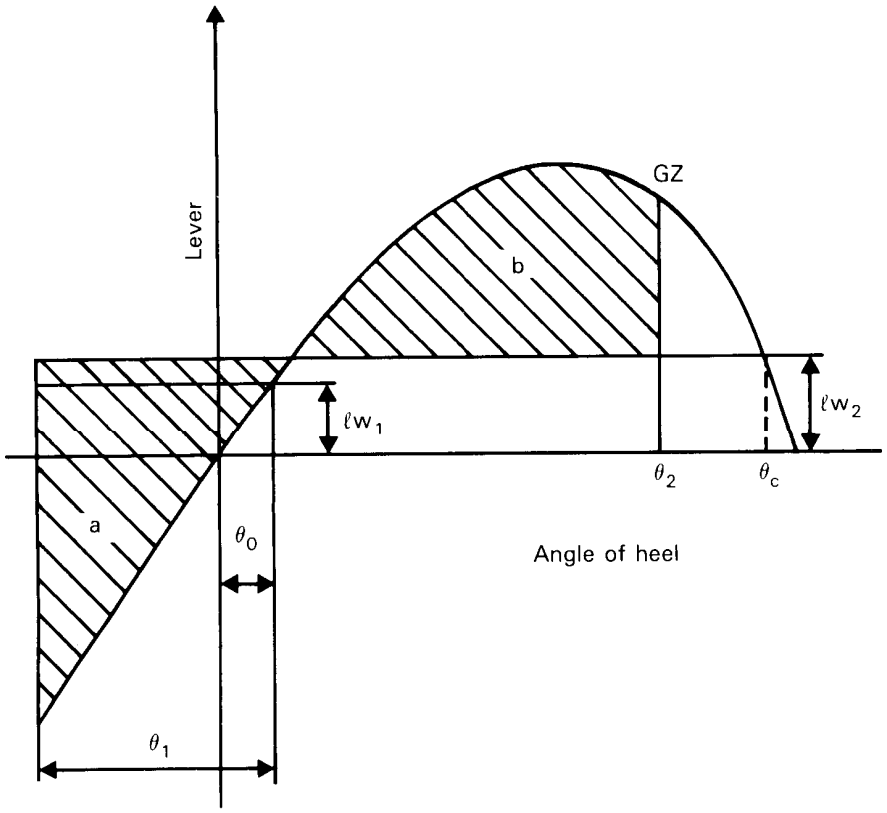

Figure - *Severe wind and rolling*

[*] *The angle of heel under action of steady wind (θ_0) should be limited to a certain angle to the satisfaction of the Administration. As a guide, 16° or 80% of the angle of deck edge immersion, whichever is less, is suggested.*

The angles in the above figure are defined as follows:

θ_0 = Angle of heel under action of steady wind (see par. 1b. and footnote).

θ_1 = Angle of roll to windward due to wave action.

θ_2 = Angle of downflooding (θ_f) or 50° or θ_c, whichever is less.

where:

(θ_f) = 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 and need not be considered as open.

(θ_c) = Angle of second intercept between wind heeling lever lw2 and GZ curves.

2. The wind heeling levers lw1and lw2 referred to in par. 1. and 3., are constant values at all angles of inclination and should be calculated as follows:

$$lw1 = \frac{PAZ}{1000g\Delta}(m) \; and \; lW_2 = 1.5\,lW_1\,(m)$$

where:

P = 504 N/m^2. The value of P used for ships in restricted service may be reduced subject to the approval of the Administration.

A = projected lateral area of the portion of the ship and deck cargo above the waterline (m^2).

Z = vertical distance from the center of A to the center of the underwater lateral area or approximately to a point at one half the mean draught (m).

Δ = Displacement (t)

g = 9.810 m/sec^2

3. The angle of roll (θ_1)* referred to par.2 should be calculated as follows:

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* The angle or roll (θ_1) for ships with anti – rolling devices should be determined without taking into account the operation of these devices.

θ_1 =109 k x1 x2 $\sqrt{rs}$ (degrees)

where:
x_1 = factor as shown in Table 1.

x_2 = factor as shown in Table 2.

k = factor as follows:

k = 1.0, for round-bilge ships having no bilge or bar keels
k = 0.7, for a ship having sharp bilges
k = as shown on Table 3, for a ship having bilge keels a bar keel or both

r =0.73 ± 0.6 OG/d.
where:

OG = distance between the center of gravity and the waterline (m) (+ if center of gravity is above the waterline, - if below).

d = mean moulded draught of the ship (m).

s = factor as shown in Table 4.

Table 1		**Table 2**		**Table 3**		**Table 4**	
Values of factor x_1		**Values of factor x_2**		**Values of factor k**		**Values of factor s**	
B/d	**X_1**	**C_B**	**X_2**	**100Ak/LB**	**k**	**T**	**S**
≤ 2.4	1.00	≤ 0.45	0.75	0.00	1.00	≤ 6	0.100
2.5	0.98	0.5	0.82	1.00	0.98	7	0.098
2.6	0.96	0.55	0.89	1.50	0.95	8	0.093
2.7	0.95	0.60	0.95	2.00	0.88	12	0.065
2.8	0.93	0.65	0.97	2.50	0.79	14	0.053
2.9	0.91	≥ 0.70	1.00	3.00	0.74	16	0.044
3.0	0.90			3.50	0.72	18	0.038
3.1	0.88			≥ 4.00	0.70	≥ 20	0.035
3.2	0.86						
3.3	0.84						
3.4	0.82						
≥ 3.5	0.80						

* *Intermediate values in tables 1-4 should be obtained by linear Interpolation.*

Rolling period: $T = \frac{2CB}{\sqrt{GM}} \text{seconds}$

where:

C = 0.373 + 0.023 (B/d) - 0.043(L/100).

The symbols in the above tables and formula for the rolling period are defined as follows:

L = waterline length of the ship (m).

B = moulded breadth of the ship (m).

d = mean moulded draught of the ship (m).

C_B = block coefficient.

A_k = Total overall area of bilge keels, or area of the lateral projection of the bar keel, or sum of these areas (sq.m.)

GM = transverse metacentric height corrected for free surface effect (m).

8. EFFECTS OF FREE SURFACES IN TANKS

With the provision that a tank is filled completely (full) with liquid, no movement of the liquid is possible and the effect on the ship's stability is the same as if the tank contained solid material. In case a quantity of liquid is withdrawn from the tank, the situation is changed completely, as the ship heels, the liquid in the tanks shifts so that its free surface remains horizontal and the ship's stability is affected adversely by what is known as the "free surface effect'. This movement corresponds to a movement of the center of grooving of the liquid and therefore of the center of grooving of the ship to the same direction.

The free surface correction should be the maximum value attainable between the filling limits envisaged for each tank, consistent with any operating instructions.

Tanks which are taken into consideration when determining the free surface correction, may be in one of two categories:

- Tanks with filling levels fixed (e.g. liquid cargo, water ballast). The free surface correction should be defined for the actual filling level to be used in each tank.
- Tanks with filling levels variable (e.g. consumable liquids such as fuel oil, diesel oil and fresh water, and also liquid cargo and water ballast during liquid transfer operations).

Where water ballast tanks, including anti – rolling tanks and anti-heeling tanks, are to be filled or discharged during the course of a voyage, the free surface effects should be calculated to take account of the most onerous transitory stage relating to such operations.

For ships engaged in liquid transfer operations, the free surface corrections at any stage of the liquid transfer operations may be determined in accordance with the filling level in each tank at that stage of the transfer operation.

The usual remainder of liquids in empty tanks need not be taken into account in calculating the corrections, provided that the total of such residual liquids does not constitute a free surface effect.

For all conditions the initial metacentric heights should be corrected for the effect of free liquid surfaces in accordance with the following assumptions:

- Tanks which are taken into consideration when determining the effect of liquids on the stability at all inclination angles should include single tanks or combination of tanks (including those of water ballast), which according to the service condition can have simultaneously free surfaces.
- For the purpose of determining the above correction to the initial GM, the tanks assumed slack, should be those which have the largest moments of inertia about an axis through the centroid and parallel to the ship's centerline, in any loading condition.

For each tank the adverse effect of free surface on the stability is referred to a "loss in GM" or as an "effective rise in VCG" and is calculated as follows:

$$\text{Loss in GM} = \frac{\Sigma(I.\gamma)}{\Delta}$$

Where:

I = moment of inertia of the free surface of the liquid in the tank [m^4]

γ = Specific gravity of liquid in tank [t/m^3]

Δ = Displacement of ship [t].

9. INFORMATION RELATED TO STABILITY CALCULATIONS

The master should:

1. Cease all loading operations if a list develops for which there is no satisfactory explanation and it would be imprudent to continue loading ;

2. Before proceeding to sea, the Master shall ensure that :

   - *the ship is upright ;*
   - *the ship has an adequate metacentric height; and*
   - *the ship's condition meets the required stability criteria.*

So long as the GM_{COR} is positive the vessel is stable, however, for the purpose of operating particularly in rough sea, it is desirable to maintain the GM_{COR} value up to the reasonable extent at any stage of the voyage. The extent of the GM_{COR} value depends on the judgment of master. On the other hand, excessive initial stability should be avoided, as it will result in rapid and violent motion in heavy seas.

10. TRIM & STABILITY CALCULATION PROCEDURE

In order to develop other acceptable loading conditions, different than the TYPICAL LOADING CONDITIONS included in this manual, the ship's master should follow the procedure described below:

SHIP'S CONDITION

1. Calculation of Displacement, LCG & VCG of the ship (use of the "loading form" on page 16).

a. Complete the ''WEIGHT'', the ''LCG'' and ''VCG'' columns with the weights, Longitudinal Centers of Gravity, and the vertical Centers of Gravity of all items.

b. Multiply the ''WEIGHT'' by ''LCG'' and ''VCG'' to find the Longitudinal Moment and the Vertical Moment respectively. Write these values in the corresponding Columns (i.e. ''Long. Mom'' and ''Vert. Mom'') of the table.

c. Enter the Free Surface Moment in column '' FREE SURFACE MOMENT ''
(see also FREE SURFACE EFFECT OF EACH TANK on page 11),

FREE SURFACE MOMENT (t x m) =
= MAX. MOMENT OF INERTIA (m^4) $\times$ SPECIFIC GRAVITY OF LIQUID (t/m^3)

d. Make the sum in each column ''WEIGHT'', ''L. MOMENT'', ''V. MOMENT'' and ''FREE SURFACE MOMENT'' respectively.

e. The sum of ''WEIGHT'' means the displacement.

f. Calculate the final, LCG, VCG and FSC i.e.:

$$\text{LCG} = \frac{(total\ Long.MOMENT)}{(displacement)}$$

$$\text{VCG} = \frac{(total\ Ver.MOMENT)}{(displacement)}$$

$$\text{FSC} = \frac{(\text{total FREE SURFACE MOMENT})}{(\text{displacement})}$$

2. MEAN DRAFT, LCB, MCT_{1cm} & KM.

From the HYDROSTATIC TABLES, using the displacement found above, find the corresponding DRAFT, LCB, MCT_{1cm} and KM.

3. TRIM

Deduct LCB from LCG and find the trim leverarm (BG) taking into consideration the following remarks:

- If the trim leverarm is (0) *zero* the ship floats as even keel.
- If the trim leverarm is (+) *positive*, the ship trims by the bow.
- If the trim leverarm is (-) *negative*, the ship trims by the stern.

The ship's trim is calculated from the following formula:

$$\text{TRIM} = \frac{(displacement)\times(BG)}{(MCT_{1cm})\times 100} \quad \text{in [m]}$$

4. DRAFT

The ship's Draft is obtained as follows:

$$\text{Draft FP} = \text{(corresponding draft)} + \frac{(L_{BP}/2)-LCF}{(L_{BP})}\times trim.$$

$$\text{Draft AP} = \text{(corresponding draft)} - \frac{(L_{BP}/2)+LCF}{(L_{BP})}\times trim$$

where LCF and trim are imported with their sign in the above formulas.

(LCF < 0, when LCF aft of Midship and LCF >0, when LCF forward of midship).
(trim <0 when the ship trims by the stern and trim >0 when the ship trims by the bow).

$$\text{Draft MS} = \frac{(\text{Fore draft})+(\text{Aft draft})}{2}$$

5. GM, GM_{COR} / VCG_{COR}

(a) Deduct VCG from KM, i.e.:
GM = (KM) – (VCG)
GM is the metacentric height.

(b) Deduct FSC from GM, i.e.:
GM_{COR} = GM – (FSC)
GM_{COR} is the metacentric height taking into account the free surface effects.

and/or

(c) Add FSC to VCG , i.e.

$VCG_{COR} = VCG + FSC$

$GM_{COR} = (KM) - (VCG_{COR})$

The Master should compare the corrected VCG to value of VCG maximum allowable at the specific displacement. If the actual value of VCG is less than the maximum permissible value of VCG, then the loading condition under consideration complies with all the above mentioned stability criteria. Also compare the corrected GM to value of GM minimum required to ensure that the loading condition satisfies damage stability criteria. Otherwise the Master should decide on an alternative loading condition, which must comply with the above mentioned stability criteria.

LOADING FORM

ITEMS	% FULL	WEIGHT to	V.C.G. m	Vert. Moment to x m	L.C.G. (-A,+F) m	Long. Moment to x m	FSM to x m
36 PASSENGERS							
PASSENGERS LUGGAGE							
CREW AND EFFECTS							
MISCELLANEOUS (GREY WATER-ETC)							
PROVISIONS							
SPA VESUVIUS (SUN DECK)							
SPA LOWER DECK (centre)							
2 SPAs LOWER DECK (P&S)							
AQUARIUM (LOWER DECK, FR68)							
D.B.-D.O. DRAIN [S] , No 18							
D.B.-D.O. OVERFLOW [C] , No 13							
D.B.-D.O.T. [P] , No 10							
D.B.-D.O.T. [S] , No 11							
D.B.-D.O.T. [P] , No 07							
D.B.-D.O.T. [S] , No 09							
D.B.-D.O.T. [C] , No 08							
D.B.-D.O.T. [P] , No 04							
D.B.-D.O.T. [S] , No 06							
D.B.-D.O.T. [C] , No 05							
D.B.-D.O.T. [P] , No 01							
D.B.-D.O.T. [S] , No 03							
D.B.-D.O.T. [C] , No 02							
TOTAL D.B. DIESEL OIL TANKS							
D.O. for emergency generator							
TOTAL D.O. daily							
L.O.T. [P], No 35							
D.B. Dirty D.O.T. [P], No 38							
TOTAL L.O.							
P.W.T. [P] FR11-19, No 23							
P.W.T. [S] FR11-19, No 24							
F.W.T. [P] FR17-21, No 21							
F.W.T. [S] FR17-21, No 22							
DB-FWT [C] FR93-101, No 20							
DB-FWT [C] FR101-108, No 19							
TOTAL F.W. TANKS							
BWT [P], No 33							
BWT [S], No 34							
D.B.-B.W.T. [C], No 50							
D.B.-B.W.T. [C], No 48							
D.B.-B.W.T. [P], No 47 (F.W)							
D.B.-B.W.T. [S], No 49 (F.W)							
D.B.-B.W.T. [P], No 12 (F.W)							
D.B.-B.W.T. [S], No 14 (F.W)							
D.B.-B.W.T. [P], No 31							
D.B.-B.W.T. [S], No 32							
D.B.-B.W.T. [P], No 29							
D.B.-B.W.T. [S], No 30							
D.B.-B.W.T. [P], No 27							
D.B.-B.W.T. [S], No 28							
B.W.T. [C], No 26							
B.W.T. [C], No 25 (F.W)							
S.W. Collecting Tank from Sea Chests, No 51							
TOTAL BALLAST WATER TANKS							
LIGHTSHIP							
TOTAL = SUM OF ALL SHADED SHELLS							

11. RIGHTING ARM CALCULATION PROCEDURE EXAMPLE SHOWING USE OF CROSS CURVES

The purpose of cross curves of stability (KN data) is to enable the statical stability curves to be drawn for the vessel in any loading condition, in order to verify whether the applicable stability criteria are satisfied.

After the calculation of the Vertical Center of Gravity (VCG) of the ship and the correction due to free surfaces (FSC), the righting arm GZ for each angle of inclination is obtained from the following formula:

$GZ = KN – KG_{COR} \times \sin\theta$, where

GZ = righting lever for actual center of gravity,

KN = righting lever (for KG =0) shown in cross curves,

KG_{COR} = KG + FSC = Actual center of gravity above Baseline corrected for free surface effects,

θ = inclination angle

After calculation of the righting arm GZ for several angles of inclination, it is possible to draw the statical stability curve.

Example Condition: Departure Condition

Righting lever at angle θ can be taken by the following formula:
$GZ = KN – (KG_{COR}) \times (\sin\theta) \Rightarrow GZ = KN – [(KG + FSC)] \times (\sin\theta)$

Where, KN = the righting lever at angle θ with center of gravity assumed at 0.0m from the baseline
KG = 6.0572 m
FSC = 0.073489 m
KG_{COR} = 6.131 m

1) Displacement at this loading condition: Δ = 2600,433 t

2) Enter the KN tables (Section 15) at the above load displacement and derive by linear interpolation the KN values for each angle of heel. These values are then inputted in the following table, where the righting arm GZ is calculated.

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,627	0,09387
10	0,17365	1,249	0,18643
15	0,25882	1,862	0,27875
20	0,34202	2,464	0,37085
25	0,42262	3,048	0,46247
30	0,50000	3,603	0,54397
35	0,57358	4,072	0,56183
40	0,64279	4,423	0,48958
45	0,70711	4,698	0,37093
50	0,76604	4,896	0,20847
55	0,81915	5,033	0,02071
60	0,86603	5,116	-0,18331

The GZ curve can now be plotted.

3) Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09363	4	0,37452
10	0,18632	2	0,37264
15	0,27813	4	1,11251
20	0,37001	2	0,74003
25	0,45988	4	1,83950
30	0,54045	1	0,54045
		Σ(GZ x SM)	4,97965

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4,97965 =
= 8,29942 m-deg
= **0.14485 m-rad**

4) Area calculation under GZ curve from 0 deg to 40 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09363	4	0,37452
10	0,18632	2	0,37264
15	0,27813	4	1,11251
20	0,37001	2	0,74003
25	0,45988	4	1,83950
30	0,54045	2	1,08090
35	0,55830	4	2,23320
40	0,49293	1	0,49293
		Σ(GZ x SM)	8,24623

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,24623 =
= 13,744 m-deg
= **0.23987 m-rad**

If the flooding angle θf is less than 40°, calculate the area under the GZ curve from θf to 40° and subtract this area from Area (0-40).

5) Area calculation under GZ curve from 30 deg to 40 deg (or θf)

Area (30°-40° or 30°-θf)) = Area (0°-40° or 0°-θf) – Area (0°-30°)
= 0,23987– 0.14485
= **0.0950 m-rad**

The above calculated values are compared with the corresponding minimum values defined in Section 6:

- Area (0°-30°) = 0.14485 m-rad > 0.055 m-rad O.K.
- Area (0°-40°) = 0,23987 m-rad > 0.090 m-rad O.K.
- Area (30°-40°) = 0.0950 m-rad > 0.030 m-rad O.K.

12. CAPACITY TABLES

DIESEL OIL TANKS

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m³)
									0,835
m⁴		to x m			m³	m	m	m	CAPACITIES (t)
8,643	D.O.daily	7,217	M/E D.O. Daily Tank [P], No 15	37-39	14,112	5,800	-13,640	-2,100	11,784
8,643	D.O. daily	7,217	M/E D.O. Daily Tank [S], No 16	37-39	14,112	5,800	-13,640	2,100	11,784
2,408	D.O. daily	2,011	D/G D.O. Daily Tank [S], No 17	37-39	9,160	5,803	-13,639	5,563	7,649
		16,445	**TOTAL D.O. Daily Tanks**		**37,384**	**5,801**	**-13,640**	**1,363**	**31,217**

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m³)
									0,835
m⁴		to x m			m³	m	m	m	CAPACITIES (t)
1,080	D.O.	0,902	D.B.-D.O.DRAIN [S], No 18	39-41	4,643	0,908	-12,240	1,016	3,877
25,931	D.O.	21,652	D.B.-D.O.OVERFLOW [C], No 13	41-47	27,174	0,897	-9,484	0,018	22,690
		22,6	**TOTAL D.O. Drain & Overflow**		**31,817**	**0,899**	**-9,886**	**0,164**	**26,567**

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m³)
									0,835
m⁴		to x m			m³	m	m	m	CAPACITIES (t)
1,441	D.O.	1,203	D.B.-D.O.T. [P], No 10	48-57	11,546	1,044	-3,490	-2,780	9,641
1,441	D.O.	1,203	D.B.-D.O.T. [S], No 11	48-57	11,546	1,044	-3,490	2,780	9,641
1,921	D.O.	1,604	D.B.-D.O.T. [P], No 07	58-70	15,349	1,046	4,554	-2,780	12,817
1,921	D.O.	1,604	D.B.-D.O.T. [S], No 09	58-70	15,349	1,046	4,554	2,780	12,817
51,861	D.O.	43,304	D.B.-D.O.T. [C], No 08	58-70	47,481	0,831	4,560	0,121	39,647
1,731	D.O.	1,445	D.B.-D.O.T. [P], No 04	70-82	13,773	1,072	12,660	-2,746	11,500
1,731	D.O.	1,445	D.B.-D.O.T. [S], No 06	70-82	13,773	1,072	12,660	2,746	11,500
51,861	D.O.	43,304	D.B.-D.O.T. [C], No 05	70-82	46,993	0,838	12,937	0,123	39,239
6,229	D.O.	5,201	D.B.-D.O.T. [P], No 01	83-91	8,071	1,277	20,302	-2,643	6,740
6,229	D.O.	5,201	D.B.-D.O.T. [S], No 03	83-91	8,071	1,277	20,302	2,643	6,740
22,787	D.O.	19,027	D.B.-D.O.T. [C], No 02	83-91	27,723	0,900	20,489	0,035	23,148
		124,5	**TOTAL D.B.-D.O.T.**		**219,675**	**0,957**	**9,688**	**0,057**	**183,430**

DIESEL OIL FOR EMERGENCY GENERATOR TANK				
	WEIGHT	V.C.G.	L.C.G (-A,+F)	F. S.M.
	to	m	m	to x m
D.O. for emergency Generator (Sun Deck)	1,900	16,900	4,595	1,656

LUBRICATION OIL TANKS

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m^3)
									0,900
m^4		to x m			m^3	m	m	m	CAPACITIES (t)
0,040	L.O	0,036	L.O.T. [P], No 35	37-39	2,352	5,800	-13,640	-4,550	2,117
1,080	L.O	0,972	D.B. Dirty D.O.T. [P], No 38	39-41	4,643	0,908	-12,240	-1,016	4,179
		1,008	**TOTAL L.O.**		**6,995**	**2,553**	**-12,711**	**-2,204**	**6,296**

FRESH WATER TANKS

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m^3)
									1,000
m^4		to x m			m^3	m	m	m	CAPACITIES IN t
6,860	F.W.	6,860	P.W.T. [P], No 23	11-19	25,200	5,800	-28,665	-2,100	25,200
6,860	F.W.	6,860	P.W.T. [S], No 24	11-19	25,200	5,800	-28,665	2,100	25,200
7,146	F.W.	7,146	F.W.T. [P], No 21	17-21	14,577	2,451	-26,511	-1,707	14,577
7,146	F.W.	7,146	F.W.T. [S], No 22	17-21	14,577	2,451	-26,511	1,707	14,577
28,033	F.W.	28,033	DB-FWT [C], No 20	93-101	17,651	0,996	26,537	0,039	17,651
5,786	F.W.	5,786	DB-FWT [C], No 19	101-108	9,494	0,960	30,290	0,001	9,494
		61,831	**TOTAL**		**106,699**	**3,660**	**-13,699**	**0,007**	**106,699**

MISCELLANEOUS TANKS

LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m^3) 1,000
	to x m			m^3	m	m	m	CAPACITIES (t)
	1,281	D.B.-SLUDGE TK [P-C], No 39	39-47	10,263	1,044	-10,140	-2,780	10,263
	1,281	D.B.-BILGE COLL. TK [S-C], No40	39-47	10,263	1,044	-10,140	2,780	10,263
	38,896	D.B.-GREY WATER TK [C], No 37	48-57	35,616	0,831	-3,490	0,121	35,616
	11,151	D.B.-LAUNDRYGR WATER TK [C], No 36	91-92	4,010	1,019	23,806	0,030	4,010
	52,609	**TOTAL**		**60,152**	**0,916**	**-3,940**	**0,074**	**60,152**

COFFERDAMS

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)
m^4		to x m			m^3	m	m	m
113,744			D.B.-C/F [C], No 45	47-48	9,708	1,018	-6,990	0,049
68,799			D.B.-C/F [C], No 44	57-58	8,488	0,956	0,010	0,057
52,422			D.B.-C/F [C], No43	82-83	6,747	1,024	17,507	0,071
6,583			D.B.-C/F [C], No 42	92-93	2,704	1,013	24,408	0,032
1517,693			Dry Tank, No 46	5-21	176,322	3,630	-29,349	0,000
			TOTAL		**203,969**	**3,274**	**-24,800**	**0,007**

BALLAST WATER TANKS

MAX MOMENT OF INERTIA	LIQUID	MAX FSM	TANKS	FR	CAPACITY 100%	V.C.G. ABOVE B.L.	L.C.G. FROM ⊗ (-A, +F)	T.C.G. FROM C.L. (-P, +S)	SPECIFIC GRAVITY (t/m^3) 1,000/1,025
m^4		to x m			m^3	m	m	m	CAPACITIES (t)
1,543	S.W.	1,582	BWT [P], No 33	9-13	5,334	2,855	-30,483	-1,007	5,469
1,543	S.W.	1,582	BWT [S], No 34	9-13	5,334	2,855	-30,483	1,007	5,469
11,587	S.W.	11,877	D.B.-B.W.T. [C], No 50	21-24	8,960	1,523	-24,355	0,000	9,186
36,145	S.W.	37,049	D.B.-B.W.T. [C], No 48	32-38	29,998	0,935	-15,736	0,000	30,754
8,237	F.W.	8,237	D.B.-B.W.T. [P], No 47	32-38	9,832	1,229	-15,715	-4,378	9,832
8,237	F.W.	8,237	D.B.-B.W.T. [S], No 49	32-38	9,832	1,229	-15,715	4,378	9,832
9,476	F.W.	9,476	D.B.-B.W.T. [P], No 12	39-47	12,488	1,230	-10,121	-4,573	12,488
9,476	F.W.	9,476	D.B.-B.W.T. [S], No 14	39-47	12,488	1,230	-10,121	4,573	12,488
11,261	S.W.	11,543	D.B.-B.W.T. [P], No 31	48-57	14,445	1,229	-3,486	-4,602	14,809
11,261	S.W.	11,543	D.B.-B.W.T. [S], No 32	48-57	14,445	1,229	-3,486	4,602	14,809
8,212	S.W.	8,417	D.B.-B.W.T. [P], No 29	58-70	14,548	1,181	4,940	-4,373	14,915
8,212	S.W.	8,417	D.B.-B.W.T. [S], No 30	58-70	14,548	1,181	4,940	4,373	14,915
7,820	S.W.	8,016	D.B.-B.W.T. [P], No 27	70-82	12,436	1,283	12,594	-4,235	12,749
7,820	S.W.	8,016	D.B.-B.W.T. [S], No 28	70-82	12,436	1,283	12,594	4,235	12,749
4,297	S.W.	4,404	B.W.T. [C], No 26	108-112	18,551	2,541	33,103	0,000	19,019
2,869	F.W.	2,869	B.W.T. [C], No 25	112-FE	20,380	2,231	36,264	0,000	20,380
18,764	S.W.	19,233	S.W. Collecting Tank from Sea Chests, No 5	38-39	7,129	0,955	-13,289	0,000	7,307
		169,975	**TOTAL**		**223,184**	**1,470**	**0,149**	**0,000**	**227,170**

IMPORTANT REMARKS

1) Permanent Solid Ballast has been placed in the following compartments:

SKEG:	67,564 t
FORE PEAK TANK No 25:	17,152 t
COFFERDAM No 43	28,780 t
COFFERDAM No 44	38,400 t
COFFERDAM No 45	40,000 t

2) Ballast Water Tanks No 47, No 49, No 12, No 14 and the Fore Peak Tank No 25 **SHOULD ALWAYS BE FULL WITH FRESH WATER.**

3) For the Fore Peak Tank No 25, which contains both permanent solid ballast as well as Fresh Water, the volume occupied by the solid ballast has been taken into account (deducted from the total volume of the tank) in the calculations of the volume, the weight and the center of gravity of the Fresh Water.

13. TANKS DATA FOR DEPARTURE AND ARRIVAL CONDITIONS

DIESEL OIL TANKS

DEPARTURE					TANKS' DATA					ARRIVAL				
%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.	ITEMS	FR	CAPACITIES 100%	CAPACITIES 98%	MAX F.S.M.	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.
	to	m	m	to x m			m^3	m^3	to x m		to	m	m	to x m
85%					**DIESEL OIL DAILY TANKS γ=0.835 to/m^3**					**85%**				
85	10,019	5,620	-13,640	7,181	M/E D.O. Daily Tank [P], No15	37-39	14,112	13,828	7,217	85	10,019	5,620	-13,640	7,181
85	10,019	5,620	-13,640	7,181	M/E D.O. Daily Tank [S], No 16	37-39	14,112	13,828	7,217	85	10,019	5,620	-13,640	7,181
85	6,504	5,623	-13,639	2,000	D/G D.O. Daily Tank [S], No 17	37-39	9,160	8,976	2,011	85	6,504	5,623	-13,639	2,000
	26,542	**5,621**	**-13,640**	**16,362**	**TOTAL D.O. Daily tanks**		37,384	36,632	16,445		**26,542**	**5,621**	**-13,640**	**16,362**
98%					**DIESEL OIL D.B. TANKS γ=0.835 to/m^3**					**10% REMAINING**				
					D.B.-D.O.DRAIN [S], No 18	39-41	4,643	4,550	0,902					0,902
					D.B.-D.O.OVERFLOW [C], No 13	41-47	27,174	26,628	21,652					21,652
98	9,447	1,031	-3,490	1,203	D.B.-D.O.T. [P], No 10	48-57	11,546	11,314	1,203					
98	9,447	1,031	-3,490	1,203	D.B.-D.O.T. [S], No 11	48-57	11,546	11,314	1,203					
98	12,559	1,033	4,553	1,604	D.B.-D.O.T. [P], No 07	58-70	15,349	15,041	1,604					
98	12,559	1,033	4,553	1,604	D.B.-D.O.T. [S], No 09	58-70	15,349	15,041	1,604					
98	38,853	0,814	4,560	34,483	D.B.-D.O.T. [C], No 08	58-70	47,481	46,531	43,304	45,323	17,974	0,419	4,599	43,304
98	11,269	1,060	12,659	1,445	D.B.-D.O.T. [P], No 04	70-82	13,773	13,496	1,445					
98	11,269	1,060	12,659	1,445	D.B.-D.O.T. [S], No 06	70-82	13,773	13,496	1,445					
98	38,453	0,820	12,937	34,483	D.B.-D.O.T. [C], No 05	70-82	46,993	46,052	43,304					
98	6,604	1,269	20,300	5,201	D.B.-D.O.T. [P], No 01	83-91	8,071	7,909	5,201					
98	6,604	1,269	20,300	5,201	D.B.-D.O.T. [S], No 03	83-91	8,071	7,909	5,201					
98	22,681	0,884	20,489	18,397	D.B.-D.O.T. [C], No 02	83-91	27,723	27,163	19,027					
98	**179,745**	**0,942**	**9,687**	**106,269**	**TOTAL D.B.-D.O.T.**		**251,492**	**246,444**	**147,095**		**17,974**	**0,4190**	**4,599**	**65,858**

In both Departure and Arrival Conditions:

DIESEL OIL FOR EMERGENCY GENERATOR TANK				
	WEIGHT	V.C.G.	L.C.G (-A,+F)	F. S.M.
	to	m	m	to x m
D.O. for emergency Generator (Sun Deck)	1,900	16,900	4,595	1,656

LUBRICATING OIL TANKS

DEPARTURE					TANKS' DATA					ARRIVAL				
%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.	ITEMS	FR	CAPACITIES 100%	CAPACITIES 98%	MAX F.S.M.	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.
	to	m	m	to x m			m^3	m^3	to x m		to	m	m	to x m
98%					**LUBRICATING OIL γ=0.900 to/m3**					98%				
98	2,074	5,776	-13,640	0,036	L.O.T. [P], No 35	37-39	2,352	2,305	0,036	98	2,074	5,776	-13,640	0,036
98	4,095	0,892	-12,240	0,972	D.B. Dirty D.O.T. [P], No 38	39-41	4,643	4,550	0,972	98	4,095	0,892	-12,240	0,972
	6,169	**2,534**	**-12,711**	**1,008**	**TOTAL L.O.**		**6,995**	**6,855**	**1,008**		**6,169**	**2,534**	**-12,711**	**1,008**

FRESH WATER TANKS

DEPARTURE					TANKS' DATA					ARRIVAL (10% REMAINING)				
%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.	ITEMS	FR	CAPACITIES 100%		MAX F.S.M.	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.
	to	m	m	to x m			m^3	m^3	to x m		to	m	m	to x m
100%					**FRESH WATER γ=1.000 to/m3**					10%				
100	25,200	5,800	-28,665	6,860	P.W.T. [P], No 23	11-19	25,200		6,860	10	2,520	4,720	-28,665	6,860
100	25,200	5,800	-28,665	6,860	P.W.T. [S], No 24	11-19	25,200		6,860	10	2,520	4,720	-28,665	6,860
100	14,577	2,451	-26,511	7,146	F.W.T. [P], No 21	17-21	14,577		7,146	10	1,456	1,452	-26,296	5,696
100	14,577	2,451	-26,511	7,146	F.W.T. [S], No 22	17-21	14,577		7,146	10	1,456	1,452	-26,296	5,696
100	17,651	0,996	26,537	28,033	DB-FWT [C], No 20	93-101	17,651		28,033	10	1,765	0,213	26,568	2,242
100	9,494	0,960	30,290	5,786	DB-FWT [C], No 19	101-108	9,494		5,786	10	0,949	0,193	30,297	0,658
	106,699	**3,660**	**-13,699**	**61,831**	**TOTAL F.W.**		**106,699**		**61,831**		**10,666**	**2,679**	**-13,632**	**28,012**

MISCELLANEOUS TANKS

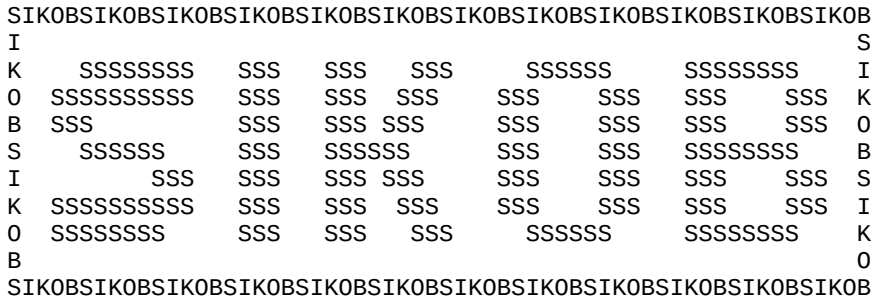
Miscellaneous Tanks at departure are empty

TANKS' DATA					ARRIVAL 70%				
ITEMS	FR	CAPACITIES 100%		MAX F.S.M.	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.
		m^3		to x m		to	m	m	to x m
MISCELLANEOUS γ=1.000 to/m3									
Laundry Grey Water Tank [C], No 36	91-92	4,010		11,151	70	2,805	0,802	23,806	7,550
Grey Water Tank [C], No 37	48-57	35,616		38,896	70	24,926	0,589	-3,490	31,448
Sludge Tank [P-C], No 39	39-47	10,263		1,281	70	7,186	0,847	-10,140	1,281
Bilge Coll. Tank [S-C], No 40	39-47	10,263		1,281	70	7,186	0,847	-10,140	1,281
TOTAL Miscellaneous		**60,152**		**52,609**	**70**	**42,103**	**0,691**	**-3,941**	**41,560**

BALLAST WATER TANKS

DEPARTURE					TANKS' DATA				ARRIVAL					
%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.	ITEMS	FR	CAPACITIES 100%	MAX F.S.M.	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	F. S.M.	
	to	m	m	to x m			m^3	to x m		to	m	m	to x m	
					S.W. :1.025t/m^3 or F.W. :1.000 t/m^3				100%					
					BWT [P], No 33	9-13	5,334	1,582	100	5,469	2,855	-30,483	0,000	
					BWT [S], No 34	9-13	5,334	1,582	100	5,469	2,855	-30,483	0,000	
					D.B.-B.W.T. [C], No 50	21-24	8,960	11,877	100	9,186	1,523	-24,355	0,000	
					D.B.-B.W.T. [C], No 48	32-38	29,998	37,049	100	30,754	0,935	-15,736	0,000	
100	9,832	1,229	-15,715	0,000	D.B.-B.W.T. [P], No 47 (F.W)	32-38	9,832	8,237	100	9,832	1,229	-15,715	0,000	
100	9,832	1,229	-15,715	0,000	D.B.-B.W.T. [S], No 49 (F.W)	32-38	9,832	8,237	100	9,832	1,229	-15,715	0,000	
100	12,488	1,230	-10,121	0,000	D.B.-B.W.T. [P], No 12 (F.W)	39-47	12,488	9,476	100	12,488	1,230	-10,121	0,000	
100	12,488	1,230	-10,121	0,000	D.B.-B.W.T. [S], No 14 (F.W)	39-47	12,488	9,476	100	12,488	1,230	-10,121	0,000	
					D.B.-B.W.T. [P], No 31	48-57	14,445	11,543	100	14,809	1,229	-3,486	0,000	
					D.B.-B.W.T. [S], No 32	48-57	14,445	11,543	100	14,809	1,229	-3,486	0,000	
					D.B.-B.W.T. [P], No 29	58-70	14,548	8,417	100	14,915	1,181	4,940	0,000	
					D.B.-B.W.T. [S], No 30	58-70	14,548	8,417	100	14,915	1,181	4,940	0,000	
					D.B.-B.W.T. [P], No 27	70-82	12,436	8,016	100	12,749	1,283	12,594	0,000	
					D.B.-B.W.T. [S], No 28	70-82	12,436	8,016	100	12,749	1,283	12,594	0,000	
					B.W.T. [C], No 26	108-112	18,551	4,404	100	19,019	2,541	33,103	0,000	
100	20,380	2,231	36,264	0,000	B.W.T. [C], No 25 (F.W)	112-FE	20,380	2,869	100	20,380	2,231	36,264	0,000	
100	7,307	0,955	-13,289	0,000	S.W. Collecting Tank from Sea Chests, No 51	38-39	7,129	19,233	100	7,307	0,955	-13,289	0,000	
	72,327	**1,484**	**1,108**	**0,000**	**TOTAL D.B.-D.O.T.**		223,184	**169,975**		**227,170**	**1,470**	**0,149**	**0,000**	

14. HYDROSTATIC TABLES (s.g.: 1.025t/m^3)



S I K O B HYDROSTATIC CALCULATION SYSTEM
MODULE : HYDR VERSION : 830401

EXECUTED 2004-03-29

0	3.000	3.100	3.200	3.300	3.400	3.500	3.600	3.700	0	DRAFT EXTREME	M
0	2.988	3.088	3.188	3.288	3.388	3.488	3.588	3.688	0	DRAFT MOULDED	M
										D I S P L A C E M E N T S	
1	1635.3	1714.5	1794.9	1876.5	1959.1	2042.9	2127.1	2212.7	1	TOTAL IN SALT WATER	TONNES
2	1595.4	1672.7	1751.1	1830.8	1911.3	1993.1	2075.2	2158.7	2	TOTAL IN FRESH WATER	TONNES
3	1585.6	1662.7	1741.0	1820.3	1900.6	1982.2	2064.2	2147.4	3	MOULDED VOLUME	M3
										I M M E R S I O N	
4	7.88	7.98	8.10	8.22	8.32	8.41	8.49	8.56	4	TONNES PER CM IMMERSION	
										C E N T R E S O F G R A V I T Y	
5	-2.360	-2.645	-3.034	-3.414	-3.785	-4.004	-4.178	-4.257	5	C.G. OF WATERPLANE FWD OF LPP/2	M
6	-.429	-.525	-.627	-.742	-.861	-.988	-1.109	-1.231	6	CENTRE OF BUOYANCY FWD OF LPP/2	M
7	1.801	1.858	1.915	1.973	2.030	2.089	2.145	2.204	7	CENTRE OF BUOYANCY ABOVE B.L.	M
										T R I M	
8	33.06	33.97	35.21	36.32	37.32	38.12	38.86	39.57	8	MOMENT TO ALTER TRIM 1 CM	TON-M
9	.495	.505	.510	.517	.525	.536	.547	.559	9	TRIM IN METRES PER METRE TRIM LEVER	M
										M E T A C E N T R E S	
10	7.944	7.846	7.757	7.683	7.619	7.558	7.502	7.445	10	TRANSVERSE METACENTRE ABOVE B.L.	M
11	147.527	144.671	143.327	141.474	139.330	136.577	133.826	131.121	11	LONGITUDINAL METACENTRE ABOVE B.L.	M
12	9799	10015	10229	10452	10681	10901	11118	11314	12	TRANSVERSE MOMENT OF INERTIA	M4
13	232487	238882	247631	255395	262421	268046	273270	278292	13	LONGITUDINAL MOMENT OF INERTIA	M4
										C O E F F I C I E N T S ON LPP & B.MLD	
14	.5259	.5336	.5412	.5486	.5559	.5632	.5701	.5770	14	BLOCK COEFFICIENT	
15	.6909	.6948	.6987	.7027	.7068	.7109	.7149	.7190	15	PRISMATIC COEFFICIENT	
16	.7598	.7696	.7811	.7921	.8027	.8111	.8189	.8257	16	WATERPLANE COEFFICIENT	
17	.7611	.7680	.7745	.7807	.7866	.7922	.7975	.8025	17	MIDSHIPSECTION COEFFICIENT	
										A R E A S	
18	766.7	776.6	788.3	799.4	810.0	818.5	826.4	833.3	18	WATERPLANE AREA MLD	M2
19	974.4	996.1	1020.4	1044.7	1069.1	1090.4	1110.7	1129.2	19	WETTED SURFACE	M2

TOTAL DISPLACEMENT IN S.W. TONNES

1	1658.3	1740.4	1823.7	1907.9	1992.6	2078.1	2163.9	2250.3	1	DISPL. TRIM = -.700
2	1654.5	1736.2	1819.2	1903.1	1987.6	2072.9	2158.5	2244.7	2	DISPL. TRIM = -.600
3	1650.8	1732.1	1814.8	1898.3	1982.6	2067.7	2153.1	2239.2	3	DISPL. TRIM = -.500
4	1647.2	1728.1	1810.4	1893.7	1977.7	2062.6	2147.7	2233.8	4	DISPL. TRIM = -.400
5	1644.1	1724.5	1806.4	1889.4	1973.0	2057.7	2142.6	2228.5	5	DISPL. TRIM = -.300
6	1641.2	1721.2	1802.6	1885.1	1968.4	2052.8	2137.4	2223.2	6	DISPL. TRIM = -.200
7	1638.2	1717.9	1798.8	1880.8	1963.7	2047.8	2132.3	2217.9	7	DISPL. TRIM = -.100
8	1635.3	1714.5	1794.9	1876.5	1959.1	2042.9	2127.1	2212.7	8	DISPL. TRIM = .000
9	1633.0	1711.9	1791.9	1873.1	1955.1	2038.6	2122.5	2207.9	9	DISPL. TRIM = .100
10	1630.6	1709.2	1788.9	1869.6	1951.1	2034.3	2117.9	2203.1	10	DISPL. TRIM = .200
11	1628.3	1706.6	1785.8	1866.1	1947.2	2030.0	2113.3	2198.3	11	DISPL. TRIM = .300
12	1626.0	1703.9	1782.8	1862.7	1943.4	2025.8	2108.8	2193.6	12	DISPL. TRIM = .400
13	1623.9	1701.6	1780.2	1859.8	1940.2	2022.2	2104.7	2189.3	13	DISPL. TRIM = .500
14	1622.0	1699.4	1777.7	1857.0	1937.1	2018.7	2100.8	2185.1	14	DISPL. TRIM = .600
15	1620.1	1697.2	1775.2	1854.2	1934.0	2015.2	2096.9	2181.0	15	DISPL. TRIM = .700

CENTRE OF BUOYANCY FWD OF LPP/2 M

1	-1.946	-2.025	-2.112	-2.198	-2.283	-2.369	-2.450	-2.534	1	L.C.B. TRIM = -.700
2	-1.723	-1.805	-1.895	-1.987	-2.078	-2.171	-2.259	-2.349	2	L.C.B. TRIM = -.600
3	-1.500	-1.584	-1.678	-1.775	-1.872	-1.972	-2.066	-2.162	3	L.C.B. TRIM = -.500
4	-1.276	-1.362	-1.460	-1.563	-1.665	-1.771	-1.872	-1.975	4	L.C.B. TRIM = -.400
5	-1.062	-1.150	-1.250	-1.356	-1.463	-1.575	-1.682	-1.789	5	L.C.B. TRIM = -.300
6	-.852	-.942	-1.043	-1.152	-1.264	-1.380	-1.492	-1.604	6	L.C.B. TRIM = -.200
7	-.641	-.734	-.836	-.947	-1.063	-1.184	-1.301	-1.418	7	L.C.B. TRIM = -.100
8	-.429	-.525	-.627	-.742	-.861	-.988	-1.109	-1.231	8	L.C.B. TRIM = .000
9	-.229	-.328	-.435	-.551	-.671	-.799	-.921	-1.046	9	L.C.B. TRIM = .100
10	-.028	-.132	-.242	-.359	-.479	-.609	-.733	-.862	10	L.C.B. TRIM = .200
11	.174	.066	-.048	-.167	-.287	-.418	-.544	-.676	11	L.C.B. TRIM = .300
12	.374	.261	.143	.022	-.098	-.230	-.357	-.491	12	L.C.B. TRIM = .400
13	.566	.448	.327	.204	.082	-.049	-.175	-.310	13	L.C.B. TRIM = .500
14	.758	.635	.510	.385	.262	.132	.007	-.128	14	L.C.B. TRIM = .600
15	.949	.822	.694	.566	.442	.313	.191	.054	15	L.C.B. TRIM = .700

										TRANSVERSE METACENTRE ABOVE B.L.		M
1	8.059	7.970	7.887	7.806	7.729	7.651	7.578	7.504	1	KMT	TRIM =	-.700
2	8.035	7.945	7.865	7.788	7.713	7.639	7.568	7.497	2	KMT	TRIM =	-.600
3	8.017	7.924	7.846	7.771	7.699	7.627	7.559	7.490	3	KMT	TRIM =	-.500
4	8.001	7.907	7.829	7.755	7.685	7.616	7.550	7.484	4	KMT	TRIM =	-.400
5	7.982	7.888	7.806	7.733	7.666	7.600	7.538	7.474	5	KMT	TRIM =	-.300
6	7.967	7.870	7.785	7.712	7.648	7.585	7.525	7.463	6	KMT	TRIM =	-.200
7	7.954	7.857	7.769	7.696	7.632	7.571	7.513	7.454	7	KMT	TRIM =	-.100
8	7.944	7.846	7.757	7.683	7.619	7.558	7.502	7.445	8	KMT	TRIM =	.000
9	7.927	7.830	7.741	7.663	7.596	7.537	7.484	7.430	9	KMT	TRIM =	.100
10	7.913	7.816	7.727	7.648	7.578	7.520	7.469	7.417	10	KMT	TRIM =	.200
11	7.901	7.804	7.716	7.636	7.564	7.506	7.455	7.405	11	KMT	TRIM =	.300
12	7.891	7.795	7.707	7.627	7.553	7.493	7.439	7.392	12	KMT	TRIM =	.400
13	7.879	7.782	7.695	7.614	7.540	7.477	7.420	7.375	13	KMT	TRIM =	.500
14	7.868	7.771	7.683	7.603	7.529	7.464	7.405	7.361	14	KMT	TRIM =	.600
15	7.858	7.761	7.674	7.594	7.520	7.454	7.394	7.349	15	KMT	TRIM =	.700

0	3.700	3.800	3.900	4.000	4.100	4.200	4.300	4.400	0	DRAFT EXTREME	M
0	3.688	3.788	3.888	3.988	4.088	4.188	4.288	4.388	0	DRAFT MOULDED	M
										D I S P L A C E M E N T S	
1	2212.7	2298.4	2385.2	2472.3	2560.1	2648.4	2737.1	2826.5	1	TOTAL IN SALT WATER	TONNES
2	2158.7	2242.4	2327.0	2412.0	2497.6	2583.8	2670.3	2757.5	2	TOTAL IN FRESH WATER	TONNES
3	2147.4	2230.9	2315.4	2400.2	2485.7	2571.6	2658.0	2745.1	3	MOULDED VOLUME	M3
										I M M E R S I O N	
4	8.56	8.63	8.69	8.75	8.80	8.85	8.90	8.95	4	TONNES PER CM IMMERSION	
										C E N T R E S O F G R A V I T Y	
5	-4.257	-4.324	-4.350	-4.358	-4.342	-4.310	-4.267	-4.210	5	C.G. OF WATERPLANE FWD OF LPP/2	M
6	-1.231	-1.344	-1.453	-1.556	-1.652	-1.741	-1.824	-1.900	6	CENTRE OF BUOYANCY FWD OF LPP/2	M
7	2.204	2.260	2.318	2.375	2.432	2.489	2.545	2.603	7	CENTRE OF BUOYANCY ABOVE B.L.	M
										T R I M	
8	39.57	40.28	40.93	41.56	42.18	42.79	43.40	43.99	8	MOMENT TO ALTER TRIM 1 CM	TON-M
9	.559	.571	.583	.595	.607	.619	.631	.643	9	TRIM IN METRES PER METRE TRIM LEVER	M
										M E T A C E N T R E S	
10	7.445	7.391	7.338	7.286	7.234	7.184	7.135	7.090	10	TRANSVERSE METACENTRE ABOVE B.L.	M
11	131.121	128.566	125.996	123.552	121.195	118.957	116.839	114.782	11	LONGITUDINAL METACENTRE ABOVE B.L.	M
12	11314	11506	11681	11845	11993	12128	12256	12372	12	TRANSVERSE MOMENT OF INERTIA	M4
13	278292	283227	287796	292278	296625	300928	305202	309338	13	LONGITUDINAL MOMENT OF INERTIA	M4
										C O E F F I C I E N T S ON LPP & B.MLD	
14	.5770	.5836	.5901	.5964	.6025	.6085	.6143	.6199	14	BLOCK COEFFICIENT	
15	.7190	.7229	.7268	.7306	.7343	.7380	.7416	.7451	15	PRISMATIC COEFFICIENT	
16	.8257	.8324	.8384	.8440	.8493	.8544	.8592	.8638	16	WATERPLANE COEFFICIENT	
17	.8025	.8073	.8119	.8163	.8205	.8245	.8283	.8320	17	MIDSHIPSECTION COEFFICIENT	
										A R E A S	
18	833.3	840.0	846.0	851.7	857.1	862.2	867.1	871.7	18	WATERPLANE AREA MLD	M2
19	1129.2	1147.6	1165.2	1182.7	1199.9	1216.9	1233.8	1250.6	19	WETTED SURFACE	M2

										TOTAL DISPLACEMENT IN S.W. TONNES
1	2250.3	2336.8	2423.9	2511.3	2599.1	2687.3	2775.8	2864.8	1	DISPL. TRIM = -.700
2	2244.7	2331.2	2418.2	2505.6	2593.4	2681.6	2770.1	2859.2	2	DISPL. TRIM = -.600
3	2239.2	2325.5	2412.5	2499.8	2587.6	2675.9	2764.4	2853.6	3	DISPL. TRIM = -.500
4	2233.8	2320.0	2406.9	2494.2	2582.0	2670.3	2758.8	2848.0	4	DISPL. TRIM = -.400
5	2228.5	2314.6	2401.5	2488.7	2576.5	2664.8	2753.4	2842.6	5	DISPL. TRIM = -.300
6	2223.2	2309.2	2396.0	2483.2	2571.0	2659.3	2748.0	2837.2	6	DISPL. TRIM = -.200
7	2217.9	2303.8	2390.6	2477.8	2565.5	2653.8	2742.5	2831.9	7	DISPL. TRIM = -.100
8	2212.7	2298.4	2385.2	2472.3	2560.1	2648.4	2737.1	2826.5	8	DISPL. TRIM = .000
9	2207.9	2293.5	2380.2	2467.2	2555.0	2643.3	2732.0	2821.4	9	DISPL. TRIM = .100
10	2203.1	2288.6	2375.1	2462.1	2549.9	2638.2	2726.9	2816.4	10	DISPL. TRIM = .200
11	2198.3	2283.6	2370.1	2457.1	2544.7	2633.1	2721.8	2811.3	11	DISPL. TRIM = .300
12	2193.6	2278.8	2365.2	2452.0	2539.7	2628.0	2716.8	2806.3	12	DISPL. TRIM = .400
13	2189.3	2274.3	2360.5	2447.3	2534.9	2623.2	2711.9	2801.5	13	DISPL. TRIM = .500
14	2185.1	2269.8	2356.0	2442.6	2530.2	2618.4	2707.2	2796.7	14	DISPL. TRIM = .600
15	2181.0	2265.4	2351.4	2438.0	2525.5	2613.7	2702.4	2792.0	15	DISPL. TRIM = .700

										CENTRE OF BUOYANCY FWD OF LPP/2 M
1	-2.534	-2.613	-2.689	-2.761	-2.828	-2.890	-2.947	-2.998	1	L.C.B. TRIM = -.700
2	-2.349	-2.433	-2.515	-2.591	-2.662	-2.728	-2.789	-2.844	2	L.C.B. TRIM = -.600
3	-2.162	-2.252	-2.339	-2.420	-2.495	-2.565	-2.630	-2.689	3	L.C.B. TRIM = -.500
4	-1.975	-2.070	-2.162	-2.248	-2.328	-2.402	-2.470	-2.532	4	L.C.B. TRIM = -.400
5	-1.789	-1.890	-1.986	-2.075	-2.159	-2.237	-2.310	-2.375	5	L.C.B. TRIM = -.300
6	-1.604	-1.709	-1.809	-1.903	-1.991	-2.072	-2.148	-2.217	6	L.C.B. TRIM = -.200
7	-1.418	-1.527	-1.632	-1.730	-1.822	-1.907	-1.986	-2.059	7	L.C.B. TRIM = -.100
8	-1.231	-1.344	-1.453	-1.556	-1.652	-1.741	-1.824	-1.900	8	L.C.B. TRIM = .000
9	-1.046	-1.163	-1.276	-1.382	-1.481	-1.574	-1.660	-1.739	9	L.C.B. TRIM = .100
10	-.862	-.982	-1.098	-1.207	-1.310	-1.406	-1.495	-1.578	10	L.C.B. TRIM = .200
11	-.676	-.799	-.919	-1.032	-1.138	-1.237	-1.330	-1.416	11	L.C.B. TRIM = .300
12	-.491	-.617	-.740	-.856	-.966	-1.068	-1.165	-1.254	12	L.C.B. TRIM = .400
13	-.310	-.437	-.563	-.681	-.794	-.899	-.999	-1.091	13	L.C.B. TRIM = .500
14	-.128	-.256	-.384	-.505	-.621	-.730	-.832	-.927	14	L.C.B. TRIM = .600
15	.054	-.075	-.205	-.329	-.447	-.559	-.664	-.762	15	L.C.B. TRIM = .700

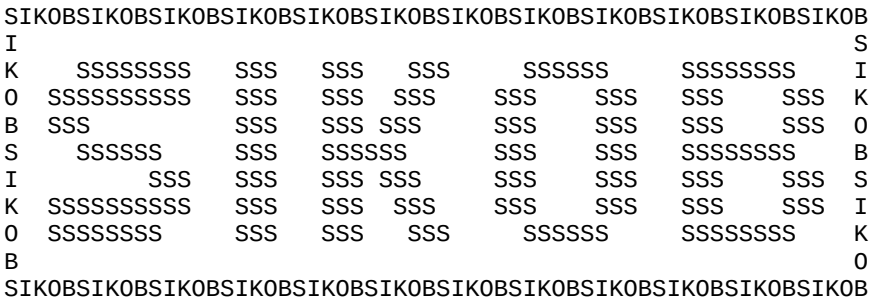
										TRANSVERSE METACENTRE ABOVE B.L.		M
1	7.504	7.434	7.367	7.304	7.243	7.185	7.129	7.077	1	KMT	TRIM =	-.700
2	7.497	7.430	7.364	7.302	7.243	7.185	7.131	7.079	2	KMT	TRIM =	-.600
3	7.490	7.425	7.362	7.301	7.242	7.186	7.132	7.082	3	KMT	TRIM =	-.500
4	7.484	7.421	7.359	7.300	7.242	7.187	7.134	7.084	4	KMT	TRIM =	-.400
5	7.474	7.414	7.354	7.296	7.240	7.186	7.134	7.086	5	KMT	TRIM =	-.300
6	7.463	7.406	7.348	7.293	7.238	7.185	7.134	7.087	6	KMT	TRIM =	-.200
7	7.454	7.398	7.343	7.289	7.236	7.184	7.135	7.088	7	KMT	TRIM =	-.100
8	7.445	7.391	7.338	7.286	7.234	7.184	7.135	7.090	8	KMT	TRIM =	.000
9	7.430	7.380	7.329	7.279	7.229	7.181	7.134	7.089	9	KMT	TRIM =	.100
10	7.417	7.368	7.320	7.273	7.225	7.178	7.132	7.089	10	KMT	TRIM =	.200
11	7.405	7.358	7.312	7.266	7.221	7.175	7.131	7.090	11	KMT	TRIM =	.300
12	7.392	7.347	7.303	7.260	7.216	7.172	7.130	7.089	12	KMT	TRIM =	.400
13	7.375	7.333	7.291	7.250	7.208	7.167	7.127	7.088	13	KMT	TRIM =	.500
14	7.361	7.320	7.280	7.240	7.201	7.162	7.124	7.086	14	KMT	TRIM =	.600
15	7.349	7.308	7.269	7.232	7.194	7.157	7.121	7.085	15	KMT	TRIM =	.700

0	4.400	4.500	4.600	4.700	4.800	4.900	5.000	5.000	0	DRAFT EXTREME	M
0	4.388	4.488	4.588	4.688	4.788	4.888	4.988	4.988	0	DRAFT MOULDED	M
										D I S P L A C E M E N T S	
1	2826.5	2916.1	3006.4	3097.0	3188.1	3279.5	3371.4	3371.4	1	TOTAL IN SALT WATER	TONNES
2	2757.5	2844.9	2933.1	3021.4	3110.3	3199.6	3289.2	3289.2	2	TOTAL IN FRESH WATER	TONNES
3	2745.1	2832.3	2920.3	3008.5	3097.2	3186.3	3275.7	3275.7	3	MOULDED VOLUME	M3
										I M M E R S I O N	
4	8.95	9.00	9.04	9.09	9.13	9.17	9.21	9.21	4	TONNES PER CM IMMERSION	
										C E N T R E S O F G R A V I T Y	
5	-4.210	-4.149	-4.069	-3.989	-3.905	-3.819	-3.731	-3.731	5	C.G. OF WATERPLANE FWD OF LPP/2	M
6	-1.900	-1.970	-2.034	-2.093	-2.145	-2.193	-2.237	-2.237	6	CENTRE OF BUOYANCY FWD OF LPP/2	M
7	2.603	2.658	2.716	2.771	2.828	2.884	2.940	2.940	7	CENTRE OF BUOYANCY ABOVE B.L.	M
										T R I M	
8	43.99	44.57	45.14	45.70	46.25	46.78	47.30	47.30	8	MOMENT TO ALTER TRIM 1 CM	TON-M
9	.643	.654	.666	.678	.689	.701	.713	.713	9	TRIM IN METRES PER METRE TRIM LEVER	M
										M E T A C E N T R E S	
10	7.090	7.047	7.006	6.968	6.935	6.903	6.875	6.875	10	TRANSVERSE METACENTRE ABOVE B.L.	M
11	114.782	112.833	110.939	109.142	107.394	105.709	104.070	104.070	11	LONGITUDINAL METACENTRE ABOVE B.L.	M
12	12372	12485	12584	12681	12772	12860	12944	12944	12	TRANSVERSE MOMENT OF INERTIA	M4
13	309338	313440	317431	321391	325236	328995	332636	332636	13	LONGITUDINAL MOMENT OF INERTIA	M4
										C O E F F I C I E N T S ON LPP & B.MLD	
14	.6199	.6254	.6308	.6359	.6410	.6460	.6508	.6508	14	BLOCK COEFFICIENT	
15	.7451	.7485	.7519	.7551	.7583	.7615	.7646	.7646	15	PRISMATIC COEFFICIENT	
16	.8638	.8683	.8725	.8767	.8807	.8846	.8884	.8884	16	WATERPLANE COEFFICIENT	
17	.8320	.8355	.8389	.8422	.8453	.8483	.8512	.8512	17	MIDSHIPSECTION COEFFICIENT	
										A R E A S	
18	871.7	876.2	880.5	884.7	888.7	892.7	896.5	896.5	18	WATERPLANE AREA MLD	M2
19	1250.6	1267.3	1284.0	1300.6	1317.2	1333.8	1350.4	1350.4	19	WETTED SURFACE	M2

										TOTAL DISPLACEMENT IN S.W. TONNES
1	2864.8	2954.0	3043.8	3133.8	3224.3	3315.1	3406.3	3406.3	1	DISPL. TRIM = -.700
2	2859.2	2948.4	3038.3	3128.4	3219.0	3309.9	3401.1	3401.1	2	DISPL. TRIM = -.600
3	2853.6	2942.9	3032.9	3123.0	3213.7	3304.7	3396.0	3396.0	3	DISPL. TRIM = -.500
4	2848.0	2937.4	3027.5	3117.7	3208.5	3299.5	3391.0	3391.0	4	DISPL. TRIM = -.400
5	2842.6	2932.0	3022.2	3112.5	3203.4	3294.5	3386.1	3386.1	5	DISPL. TRIM = -.300
6	2837.2	2926.7	3016.9	3107.3	3198.3	3289.5	3381.2	3381.2	6	DISPL. TRIM = -.200
7	2831.9	2921.4	3011.7	3102.1	3193.2	3284.5	3376.3	3376.3	7	DISPL. TRIM = -.100
8	2826.5	2916.1	3006.4	3097.0	3188.1	3279.5	3371.4	3371.4	8	DISPL. TRIM = .000
9	2821.4	2911.0	3001.5	3092.1	3183.3	3274.8	3366.8	3366.8	9	DISPL. TRIM = .100
10	2816.4	2906.0	2996.5	3087.2	3178.5	3270.1	3362.1	3362.1	10	DISPL. TRIM = .200
11	2811.3	2901.0	2991.6	3082.3	3173.7	3265.4	3357.5	3357.5	11	DISPL. TRIM = .300
12	2806.3	2896.0	2986.7	3077.5	3168.9	3260.7	3352.9	3352.9	12	DISPL. TRIM = .400
13	2801.5	2891.2	2981.9	3072.8	3164.3	3256.2	3348.5	3348.5	13	DISPL. TRIM = .500
14	2796.7	2886.5	2977.3	3068.2	3159.8	3251.7	3344.1	3344.1	14	DISPL. TRIM = .600
15	2792.0	2881.9	2972.6	3063.6	3155.3	3247.2	3339.7	3339.7	15	DISPL. TRIM = .700
										CENTRE OF BUOYANCY FWD OF LPP/2 M
1	-2.998	-3.046	-3.088	-3.126	-3.159	-3.188	-3.213	-3.213	1	L.C.B. TRIM = -.700
2	-2.844	-2.895	-2.940	-2.981	-3.017	-3.048	-3.076	-3.076	2	L.C.B. TRIM = -.600
3	-2.689	-2.743	-2.791	-2.835	-2.874	-2.908	-2.938	-2.938	3	L.C.B. TRIM = -.500
4	-2.532	-2.590	-2.641	-2.688	-2.730	-2.767	-2.799	-2.799	4	L.C.B. TRIM = -.400
5	-2.375	-2.436	-2.490	-2.540	-2.584	-2.624	-2.659	-2.659	5	L.C.B. TRIM = -.300
6	-2.217	-2.282	-2.339	-2.392	-2.438	-2.481	-2.519	-2.519	6	L.C.B. TRIM = -.200
7	-2.059	-2.126	-2.187	-2.242	-2.292	-2.337	-2.378	-2.378	7	L.C.B. TRIM = -.100
8	-1.900	-1.970	-2.034	-2.093	-2.145	-2.193	-2.237	-2.237	8	L.C.B. TRIM = .000
9	-1.739	-1.813	-1.879	-1.941	-1.997	-2.047	-2.093	-2.093	9	L.C.B. TRIM = .100
10	-1.578	-1.655	-1.724	-1.789	-1.847	-1.901	-1.949	-1.949	10	L.C.B. TRIM = .200
11	-1.416	-1.496	-1.569	-1.636	-1.698	-1.754	-1.805	-1.805	11	L.C.B. TRIM = .300
12	-1.254	-1.337	-1.413	-1.483	-1.548	-1.607	-1.661	-1.661	12	L.C.B. TRIM = .400
13	-1.091	-1.177	-1.256	-1.329	-1.396	-1.458	-1.515	-1.515	13	L.C.B. TRIM = .500
14	-.927	-1.016	-1.098	-1.174	-1.244	-1.309	-1.368	-1.368	14	L.C.B. TRIM = .600
15	-.762	-.854	-.939	-1.019	-1.092	-1.159	-1.221	-1.221	15	L.C.B. TRIM = .700

										TRANSVERSE METACENTRE ABOVE B.L.		M
1	7.077	7.029	6.986	6.945	6.909	6.876	6.846	6.846	1	KMT	TRIM =	-.700
2	7.079	7.032	6.989	6.949	6.913	6.880	6.850	6.850	2	KMT	TRIM =	-.600
3	7.082	7.034	6.992	6.952	6.916	6.884	6.854	6.854	3	KMT	TRIM =	-.500
4	7.084	7.037	6.995	6.956	6.921	6.888	6.858	6.858	4	KMT	TRIM =	-.400
5	7.086	7.039	6.998	6.959	6.924	6.892	6.863	6.863	5	KMT	TRIM =	-.300
6	7.087	7.042	7.000	6.962	6.927	6.896	6.867	6.867	6	KMT	TRIM =	-.200
7	7.088	7.044	7.003	6.965	6.931	6.900	6.871	6.871	7	KMT	TRIM =	-.100
8	7.090	7.047	7.006	6.968	6.935	6.903	6.875	6.875	8	KMT	TRIM =	.000
9	7.089	7.048	7.008	6.971	6.938	6.907	6.879	6.879	9	KMT	TRIM =	.100
10	7.089	7.049	7.010	6.975	6.941	6.911	6.883	6.883	10	KMT	TRIM =	.200
11	7.090	7.050	7.013	6.978	6.945	6.915	6.888	6.888	11	KMT	TRIM =	.300
12	7.089	7.051	7.015	6.981	6.949	6.919	6.892	6.892	12	KMT	TRIM =	.400
13	7.088	7.051	7.016	6.983	6.952	6.922	6.896	6.896	13	KMT	TRIM =	.500
14	7.086	7.051	7.017	6.985	6.954	6.926	6.900	6.900	14	KMT	TRIM =	.600
15	7.085	7.051	7.018	6.987	6.958	6.930	6.904	6.904	15	KMT	TRIM =	.700

15. CROSS CURVES OF STABILITY



STABILITY CALCULATION FOR INTACT SHIP

THE FREE TRIM DUE TO HEEL IS CORRECTED TO MAINTAIN CONSTANT LCB

UNITS ARE METRES AND TONNES
SALT WATER DENSITY = 1.02500

V ANGLE OF HEEL
DRAFT PERPENDICULAR DISTANCE TO THE WL AT AMIDSHIPS FROM
UNDERSIDE KEEL, KEELTHICKNESS = .012
TRIM DIFFERENCE IN DRAFT AT FP AND AP
TRIM FORWARD IS STATED POSITIVE
D DISPLACEMENT INCLUDING SHELLPLATE, MEANTHICKNESS = .010
KM TRANSVERSE METACENTRE FROM BL
GM TRANSVERSE METACENTRIC HEIGHT
KN DISPLACEMENT LEVER ABOUT BASE LINE AT CENTRE
MS DISPLACEMENT LEVER ABOUT M
GZ RIGHTING ARM
SKN THE INTEGRAL OF KN
SMS THE INTEGRAL OF MS
SGZ THE INTEGRAL OF GZ
COR CORRECTION OF GZ DUE TO FREE SURFACES
GZC RIGHTING ARM CORRECTED FOR FREE SURFACES

CALCULATION FORMULAS FOR GZ AND SGZ

WHEN KG IS GIVEN	WHEN GM IS GIVEN
GZ = KN-KG*SINV	GZ = MS+GM*SINV
SGZ= SKN-KG*(1-COSV)	SGZ= SMS+GM*(1-COSV)

N.B. FOLLOWING INCLUDED IN THE CALCULATION

Up To Main Deck (7.5/8.0/9.2 mm)

15.1 KN CURVES for trim=0.0 m

TABLE OF KN VALUES
==========

THE TABLE APPLIES FOR TRIM= .000 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.708	1.405	2.073	2.692	3.246	3.733	4.174	4.584	4.964	5.262	5.455	5.570	5.578
1550	.014	.702	1.392	2.058	2.677	3.232	3.725	4.168	4.583	4.959	5.249	5.440	5.551	5.560
1600	.014	.696	1.382	2.044	2.663	3.222	3.717	4.165	4.582	4.953	5.236	5.423	5.532	5.541
1650	.014	.690	1.372	2.031	2.649	3.209	3.709	4.161	4.582	4.948	5.222	5.406	5.513	5.521
1700	.014	.685	1.362	2.018	2.636	3.199	3.702	4.158	4.580	4.941	5.207	5.390	5.493	5.502
1750	.014	.681	1.354	2.007	2.623	3.188	3.695	4.155	4.581	4.933	5.192	5.371	5.474	5.482
1800	.014	.676	1.345	1.995	2.612	3.178	3.689	4.153	4.578	4.924	5.176	5.353	5.455	5.462
1850	.013	.672	1.338	1.985	2.600	3.168	3.683	4.151	4.577	4.915	5.161	5.334	5.435	5.443
1900	.013	.668	1.330	1.974	2.588	3.159	3.677	4.149	4.573	4.904	5.145	5.313	5.415	5.423
1950	.013	.665	1.323	1.964	2.578	3.149	3.671	4.147	4.570	4.894	5.128	5.293	5.394	5.403
2000	.013	.661	1.316	1.955	2.567	3.141	3.666	4.146	4.565	4.882	5.112	5.273	5.373	5.383
2050	.013	.658	1.310	1.946	2.557	3.131	3.661	4.144	4.558	4.870	5.096	5.253	5.350	5.364
2100	.013	.655	1.304	1.937	2.548	3.123	3.655	4.142	4.552	4.858	5.079	5.234	5.329	5.344
2150	.013	.652	1.297	1.929	2.538	3.115	3.650	4.140	4.543	4.844	5.062	5.214	5.307	5.325
2200	.013	.649	1.292	1.920	2.529	3.107	3.646	4.135	4.534	4.830	5.045	5.194	5.284	5.305
2250	.013	.646	1.286	1.913	2.520	3.100	3.641	4.133	4.524	4.816	5.028	5.175	5.263	5.285
2300	.013	.644	1.280	1.905	2.512	3.092	3.636	4.126	4.513	4.801	5.010	5.155	5.242	5.264
2350	.013	.641	1.275	1.898	2.504	3.084	3.632	4.121	4.502	4.786	4.992	5.136	5.221	5.243
2400	.013	.638	1.270	1.891	2.496	3.077	3.627	4.113	4.489	4.770	4.975	5.116	5.201	5.221
2450	.013	.636	1.265	1.884	2.488	3.070	3.622	4.106	4.477	4.753	4.957	5.097	5.181	5.200
2500	.013	.633	1.261	1.878	2.481	3.064	3.617	4.097	4.463	4.737	4.938	5.078	5.160	5.179
2550	.013	.630	1.255	1.871	2.474	3.057	3.612	4.086	4.449	4.720	4.920	5.058	5.141	5.159
2600	.013	.628	1.251	1.865	2.467	3.051	3.606	4.075	4.434	4.703	4.901	5.039	5.121	5.140
2650	.013	.626	1.246	1.859	2.460	3.045	3.600	4.063	4.418	4.685	4.882	5.019	5.102	5.121
2700	.012	.623	1.242	1.853	2.454	3.039	3.592	4.050	4.402	4.667	4.864	5.000	5.083	5.103
2750	.012	.621	1.238	1.848	2.448	3.034	3.584	4.037	4.385	4.648	4.845	4.980	5.064	5.085
2800	.012	.619	1.234	1.843	2.442	3.029	3.576	4.023	4.367	4.629	4.825	4.961	5.045	5.067
2850	.012	.617	1.230	1.837	2.437	3.023	3.567	4.008	4.350	4.611	4.805	4.941	5.026	5.050
2900	.012	.615	1.227	1.833	2.431	3.019	3.556	3.993	4.332	4.591	4.786	4.922	5.007	5.034
2950	.012	.613	1.223	1.828	2.426	3.012	3.547	3.977	4.313	4.572	4.766	4.902	4.988	5.017
3000	.012	.611	1.220	1.823	2.421	3.008	3.534	3.961	4.294	4.552	4.745	4.882	4.969	5.001

15.2 FLOODING ANGLE CURVE

ANGLE OF HEEL AT WHICH STIPULATED POINTS BECOME IMMERSED
==========

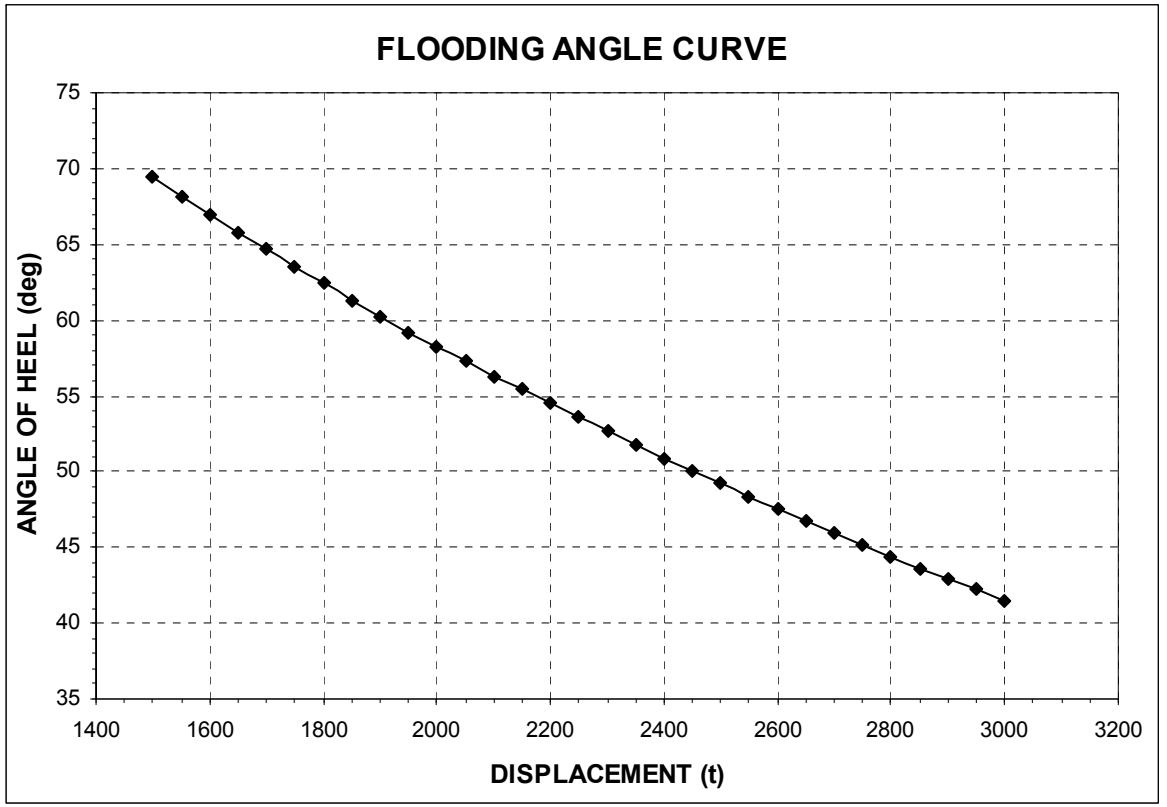
THE TABLE APPLIES FOR TRIM= .000 IN UPRIGHT CONDITION

COORDINATES FOR SPECIAL POINTS ON THE SHIP

POINT	FRAME	Y	Z	TYPE
1	22.500	5.452	9.120	1.000

*** INDICATES THAT THE POINT IS NOT FLOODED FOR CALC.RANGE OF ANGLES

	POINT NUMBER AS DEFINED IN ABOVE TABLE
DISPL	1
1500	69.49
1550	68.2
1600	67.0
1650	65.8
1700	64.7
1750	63.5
1800	62.4
1850	61.3
1900	60.2
1950	59.2
2000	58.2
2050	57.3
2100	56.3
2150	55.4
2200	54.5
2250	53.6
2300	52.7
2350	51.8
2400	50.9
2450	50.1
2500	49.2
2550	48.3
2600	47.5
2650	46.7
2700	45.9
2750	45.1
2800	44.4
2850	43.6
2900	42.9
2950	42.2
3000	41.5



15.3 CHANGE OF TRIM DUE TO HEEL

CHANGE OF TRIM DUE TO HEEL
==========

THE TABLE APPLIES FOR TRIM= .000 IN UPRIGHT CONDITION

	TRIM FOR FOLLOWING ANGLE OF HEEL													
DISPL	**.1**	**5.0**	**10.0**	**15.0**	**20.0**	**25.0**	**30.0**	**35.0**	**40.0**	**45.0**	**50.0**	**55.0**	**60.0**	**70.0**
1500	.000	.022	.090	.199	.354	.525	.708	.888	1.059	1.211	1.366	1.547	1.709	1.934
1550	.000	.023	.091	.207	.360	.528	.703	.880	1.040	1.191	1.339	1.503	1.658	1.879
1600	.000	.023	.086	.204	.352	.515	.688	.856	1.017	1.160	1.300	1.453	1.596	1.814
1650	.000	.024	.098	.212	.357	.517	.681	.846	.996	1.137	1.270	1.407	1.540	1.752
1700	.000	.024	.102	.215	.355	.509	.670	.828	.978	1.109	1.236	1.357	1.482	1.683
1750	.000	.027	.101	.210	.345	.497	.650	.803	.942	1.073	1.193	1.300	1.412	1.599
1800	.000	.027	.104	.212	.342	.486	.636	.784	.919	1.042	1.155	1.249	1.348	1.525
1850	.000	.026	.096	.201	.326	.467	.610	.751	.879	.997	1.104	1.186	1.271	1.432
1900	.000	.027	.103	.203	.324	.455	.593	.730	.852	.962	1.061	1.136	1.205	1.350
1950	.000	.029	.103	.199	.314	.442	.575	.703	.818	.921	1.014	1.080	1.135	1.265
2000	.000	.026	.096	.187	.295	.415	.544	.667	.776	.871	.956	1.015	1.058	1.167
2050	.000	.026	.094	.183	.286	.400	.520	.638	.739	.827	.903	.956	.993	1.077
2100	.000	.024	.083	.168	.265	.376	.491	.602	.692	.772	.842	.886	.914	.974
2150	.000	.024	.084	.164	.255	.357	.467	.571	.653	.725	.787	.826	.846	.881
2200	.000	.022	.079	.155	.242	.339	.439	.538	.610	.675	.729	.761	.778	.788
2250	.000	.020	.072	.140	.223	.313	.410	.498	.561	.617	.663	.688	.701	.689
2300	.000	.019	.068	.134	.210	.296	.387	.464	.516	.566	.602	.622	.630	.599
2350	.000	.011	.056	.119	.192	.271	.355	.422	.465	.506	.534	.547	.550	.510
2400	.000	.015	.056	.110	.179	.253	.332	.387	.419	.452	.472	.478	.476	.429
2450	.000	.014	.052	.105	.168	.236	.308	.350	.374	.398	.407	.408	.400	.348
2500	.000	.012	.041	.090	.149	.212	.278	.308	.321	.336	.337	.331	.319	.262
2550	.000	.011	.041	.085	.136	.196	.254	.271	.275	.280	.271	.259	.241	.182
2600	.000	.009	.036	.077	.126	.179	.229	.234	.229	.222	.205	.185	.161	.098
2650	.000	.008	.031	.063	.108	.158	.198	.191	.176	.158	.131	.105	.075	.008
2700	.000	.007	.027	.059	.095	.141	.171	.154	.130	.099	.064	.029	-.007	-.079
2750	.000	.005	.022	.051	.087	.125	.145	.116	.081	.042	-.002	-.046	-.089	-.166
2800	.000	.004	.018	.037	.070	.106	.112	.073	.029	-.022	-.077	-.127	-.178	-.262
2850	.000	.003	.014	.035	.058	.090	.084	.036	-.018	-.079	-.145	-.202	-.261	-.354
2900	.000	.002	.005	.022	.047	.069	.052	-.006	-.071	-.142	-.218	-.284	-.350	-.453
2950	.000	.001	.007	.020	.035	.056	.023	-.045	-.118	-.200	-.283	-.361	-.434	-.548
3000	.000	.000	.003	.013	.030	.040	-.004	-.081	-.165	-.256	-.349	-.435	-.518	-.642

15.4 CHANGE OF LCB DUE TO HEEL

CHANGE OF LCB DUE TO HEEL
==========

THE TABLE APPLIES FOR TRIM= .000 IN UPRIGHT CONDITION

	LCB FOR FOLLOWING ANGLE OF HEEL													
DISPL	**.1**	**5.0**	**10.0**	**15.0**	**20.0**	**25.0**	**30.0**	**35.0**	**40.0**	**45.0**	**50.0**	**55.0**	**60.0**	**70.0**
1500	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28	-.28
1550	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32	-.32
1600	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39	-.39
1650	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44	-.44
1700	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50	-.50
1750	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57	-.57
1800	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63	-.63
1850	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71	-.71
1900	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77	-.77
1950	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83	-.83
2000	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91	-.91
2050	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98	-.98
2100	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06	-1.06
2150	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12	-1.12
2200	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18
2250	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26	-1.26
2300	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31
2350	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38	-1.38
2400	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44	-1.44
2450	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49
2500	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55	-1.55
2550	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
2600	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65
2650	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
2700	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75	-1.75
2750	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79	-1.79
2800	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83	-1.83
2850	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87
2900	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91	-1.91
2950	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95
3000	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98	-1.98

15.5 CHANGE IN DRAFT DUE TO HEEL

CHANGE IN DRAFT DUE TO HEEL
==========

THE TABLE APPLIES FOR TRIM= .000 IN UPRIGHT CONDITION

THE DRAFTS INDICATED BELOW AGAINST ANGLES OF HEEL ARE MEASURED AMIDSHIPS
AND INDICATE THE PERPENDICULAR DISTANCE FROM THE UNDERSIDE OF KEEL AT
CENTRE LINE TO THE APPROPRIATE WATERLINE

	ANGLES OF HEEL													
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	2.826	2.804	2.738	2.625	2.461	2.242	1.969	1.645	1.274	.866	.444	.015	-.418	-1.290
1550	2.891	2.869	2.804	2.691	2.527	2.309	2.037	1.713	1.342	.935	.517	.093	-.336	-1.199
1600	2.954	2.932	2.868	2.755	2.592	2.376	2.104	1.781	1.409	1.003	.590	.171	-.255	-1.109
1650	3.018	2.997	2.931	2.819	2.657	2.442	2.172	1.848	1.475	1.072	.662	.248	-.173	-1.020
1700	3.082	3.060	2.994	2.882	2.721	2.507	2.237	1.914	1.541	1.140	.734	.325	-.092	-.931
1750	3.143	3.122	3.056	2.945	2.785	2.571	2.303	1.980	1.606	1.209	.807	.402	-.011	-.842
1800	3.206	3.184	3.118	3.007	2.847	2.635	2.367	2.044	1.671	1.277	.879	.478	.070	-.754
1850	3.266	3.244	3.179	3.068	2.910	2.698	2.431	2.108	1.736	1.345	.951	.554	.151	-.666
1900	3.328	3.306	3.240	3.130	2.971	2.761	2.494	2.171	1.800	1.414	1.023	.630	.232	-.579
1950	3.389	3.367	3.301	3.191	3.033	2.823	2.556	2.233	1.865	1.483	1.096	.705	.312	-.491
2000	3.448	3.426	3.361	3.251	3.094	2.884	2.618	2.295	1.929	1.551	1.169	.781	.391	-.404
2050	3.508	3.486	3.421	3.311	3.154	2.945	2.679	2.356	1.994	1.620	1.241	.856	.470	-.317
2100	3.567	3.545	3.480	3.371	3.214	3.005	2.740	2.417	2.058	1.689	1.314	.932	.549	-.230
2150	3.626	3.605	3.539	3.430	3.273	3.065	2.800	2.478	2.123	1.758	1.386	1.008	.627	-.143
2200	3.685	3.663	3.598	3.489	3.332	3.124	2.859	2.538	2.188	1.827	1.459	1.084	.706	-.056
2250	3.743	3.721	3.657	3.547	3.391	3.183	2.919	2.599	2.253	1.897	1.532	1.160	.784	.030
2300	3.801	3.780	3.715	3.606	3.449	3.242	2.977	2.659	2.318	1.966	1.605	1.236	.863	.114
2350	3.859	3.837	3.773	3.663	3.507	3.299	3.035	2.720	2.383	2.036	1.679	1.313	.942	.198
2400	3.917	3.895	3.831	3.721	3.565	3.357	3.093	2.780	2.449	2.106	1.752	1.389	1.021	.281
2450	3.974	3.953	3.888	3.779	3.622	3.414	3.150	2.841	2.514	2.176	1.826	1.466	1.100	.363
2500	4.031	4.010	3.945	3.835	3.679	3.471	3.207	2.902	2.580	2.246	1.900	1.543	1.180	.446
2550	4.088	4.067	4.002	3.892	3.735	3.527	3.264	2.963	2.646	2.317	1.974	1.621	1.260	.529
2600	4.145	4.124	4.059	3.949	3.792	3.583	3.321	3.024	2.712	2.387	2.048	1.699	1.341	.612
2650	4.202	4.180	4.115	4.005	3.848	3.639	3.377	3.085	2.779	2.458	2.123	1.777	1.422	.696
2700	4.258	4.237	4.171	4.061	3.903	3.694	3.434	3.146	2.845	2.529	2.198	1.855	1.503	.780
2750	4.314	4.293	4.227	4.117	3.959	3.749	3.490	3.208	2.912	2.600	2.273	1.934	1.584	.865
2800	4.370	4.349	4.283	4.172	4.014	3.804	3.547	3.269	2.978	2.671	2.348	2.013	1.666	.951
2850	4.426	4.404	4.339	4.228	4.068	3.858	3.604	3.331	3.045	2.742	2.423	2.092	1.748	1.037
2900	4.482	4.460	4.394	4.283	4.123	3.912	3.661	3.393	3.112	2.814	2.499	2.171	1.830	1.124
2950	4.537	4.516	4.449	4.338	4.178	3.966	3.718	3.455	3.179	2.885	2.575	2.250	1.913	1.211
3000	4.593	4.571	4.505	4.392	4.232	4.020	3.775	3.517	3.246	2.957	2.651	2.330	1.995	1.298

15.6 KN CURVES for trim = (-0.5)m – (+0.5)m

TABLE OF KN VALUES
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THE TABLE APPLIES FOR TRIM= -.500 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.717	1.421	2.097	2.720	3.276	3.765	4.205	4.613	4.991	5.288	5.485	5.594	5.586
1550	.014	.710	1.409	2.082	2.704	3.262	3.756	4.199	4.611	4.985	5.273	5.467	5.574	5.567
1600	.014	.704	1.399	2.067	2.689	3.250	3.746	4.194	4.608	4.977	5.258	5.447	5.554	5.548
1650	.014	.699	1.388	2.053	2.674	3.237	3.738	4.189	4.607	4.970	5.242	5.428	5.534	5.530
1700	.014	.694	1.379	2.040	2.661	3.226	3.730	4.186	4.607	4.962	5.226	5.409	5.513	5.510
1750	.014	.689	1.369	2.027	2.647	3.214	3.722	4.181	4.603	4.952	5.209	5.387	5.491	5.490
1800	.014	.685	1.361	2.015	2.634	3.202	3.715	4.177	4.599	4.942	5.193	5.366	5.470	5.470
1850	.014	.681	1.353	2.003	2.621	3.191	3.707	4.175	4.597	4.931	5.176	5.344	5.449	5.450
1900	.014	.677	1.344	1.992	2.608	3.181	3.700	4.171	4.591	4.919	5.158	5.323	5.425	5.430
1950	.013	.673	1.336	1.981	2.597	3.170	3.694	4.168	4.586	4.908	5.141	5.301	5.402	5.410
2000	.013	.669	1.329	1.971	2.585	3.160	3.686	4.165	4.579	4.895	5.123	5.280	5.378	5.389
2050	.013	.665	1.321	1.960	2.574	3.150	3.681	4.162	4.571	4.882	5.105	5.259	5.355	5.369
2100	.013	.662	1.315	1.951	2.563	3.140	3.675	4.158	4.563	4.868	5.087	5.239	5.331	5.348
2150	.013	.658	1.307	1.942	2.553	3.131	3.668	4.154	4.553	4.853	5.069	5.218	5.308	5.328
2200	.013	.655	1.301	1.932	2.543	3.122	3.661	4.147	4.542	4.838	5.051	5.198	5.286	5.306
2250	.013	.651	1.295	1.924	2.533	3.113	3.656	4.142	4.531	4.823	5.032	5.177	5.264	5.284
2300	.013	.648	1.288	1.915	2.524	3.105	3.650	4.134	4.519	4.806	5.014	5.157	5.242	5.261
2350	.013	.645	1.282	1.907	2.514	3.097	3.645	4.127	4.507	4.790	4.995	5.137	5.221	5.239
2400	.013	.642	1.276	1.900	2.505	3.089	3.638	4.117	4.492	4.773	4.976	5.117	5.200	5.217
2450	.013	.639	1.271	1.892	2.497	3.081	3.631	4.108	4.479	4.756	4.957	5.096	5.179	5.195
2500	.013	.636	1.266	1.885	2.489	3.073	3.625	4.097	4.464	4.738	4.938	5.076	5.158	5.174
2550	.013	.633	1.260	1.878	2.481	3.066	3.617	4.085	4.448	4.720	4.918	5.056	5.138	5.154
2600	.013	.630	1.255	1.871	2.474	3.059	3.609	4.073	4.432	4.701	4.899	5.036	5.118	5.135
2650	.013	.627	1.250	1.864	2.466	3.053	3.600	4.060	4.415	4.682	4.878	5.016	5.098	5.116
2700	.013	.625	1.245	1.858	2.460	3.046	3.591	4.045	4.398	4.662	4.859	4.996	5.078	5.098
2750	.012	.622	1.241	1.852	2.453	3.039	3.581	4.031	4.380	4.643	4.839	4.975	5.058	5.080
2800	.012	.620	1.236	1.846	2.446	3.034	3.571	4.016	4.361	4.622	4.818	4.955	5.039	5.063
2850	.012	.618	1.232	1.840	2.440	3.027	3.561	4.000	4.342	4.602	4.797	4.934	5.019	5.046
2900	.012	.615	1.228	1.835	2.434	3.021	3.549	3.984	4.323	4.582	4.776	4.914	4.999	5.029
2950	.012	.613	1.224	1.830	2.429	3.012	3.538	3.967	4.303	4.561	4.755	4.893	4.979	5.012
3000	.012	.611	1.220	1.825	2.424	3.006	3.524	3.950	4.283	4.540	4.734	4.873	4.960	4.995

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= -.400 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.715	1.418	2.092	2.715	3.270	3.759	4.198	4.607	4.986	5.282	5.480	5.590	5.585
1550	.014	.708	1.406	2.077	2.698	3.256	3.749	4.193	4.605	4.979	5.269	5.462	5.570	5.566
1600	.014	.703	1.396	2.063	2.685	3.244	3.741	4.187	4.603	4.973	5.254	5.443	5.550	5.547
1650	.014	.697	1.385	2.049	2.669	3.231	3.732	4.183	4.602	4.965	5.238	5.425	5.530	5.528
1700	.014	.692	1.375	2.035	2.656	3.220	3.724	4.180	4.599	4.957	5.222	5.403	5.509	5.509
1750	.014	.688	1.366	2.023	2.642	3.209	3.716	4.176	4.598	4.949	5.206	5.384	5.489	5.489
1800	.014	.683	1.358	2.011	2.629	3.197	3.709	4.172	4.596	4.939	5.189	5.364	5.467	5.469
1850	.014	.679	1.350	1.999	2.617	3.187	3.702	4.170	4.592	4.928	5.173	5.342	5.446	5.449
1900	.014	.675	1.341	1.989	2.604	3.176	3.695	4.166	4.587	4.917	5.156	5.321	5.424	5.429
1950	.013	.671	1.334	1.978	2.593	3.166	3.689	4.164	4.583	4.905	5.138	5.300	5.401	5.409
2000	.013	.667	1.326	1.968	2.581	3.155	3.682	4.161	4.576	4.892	5.121	5.279	5.377	5.389
2050	.013	.664	1.319	1.958	2.570	3.146	3.676	4.158	4.568	4.880	5.103	5.258	5.354	5.368
2100	.013	.661	1.312	1.948	2.560	3.137	3.670	4.155	4.561	4.866	5.085	5.238	5.331	5.348
2150	.013	.657	1.306	1.939	2.550	3.128	3.664	4.151	4.551	4.851	5.068	5.217	5.308	5.328
2200	.013	.654	1.299	1.930	2.540	3.119	3.659	4.145	4.541	4.837	5.049	5.197	5.285	5.306
2250	.013	.650	1.293	1.922	2.530	3.110	3.652	4.140	4.530	4.822	5.031	5.177	5.264	5.285
2300	.013	.647	1.287	1.913	2.521	3.102	3.647	4.134	4.518	4.806	5.013	5.156	5.242	5.262
2350	.013	.644	1.281	1.905	2.512	3.094	3.642	4.125	4.506	4.789	4.994	5.136	5.221	5.240
2400	.013	.641	1.275	1.898	2.503	3.086	3.636	4.117	4.493	4.772	4.976	5.116	5.200	5.218
2450	.013	.638	1.270	1.890	2.495	3.078	3.629	4.108	4.479	4.755	4.957	5.096	5.179	5.196
2500	.013	.635	1.265	1.883	2.487	3.071	3.624	4.097	4.464	4.738	4.938	5.077	5.159	5.175
2550	.013	.632	1.259	1.877	2.480	3.064	3.616	4.085	4.448	4.720	4.919	5.057	5.138	5.155
2600	.013	.630	1.254	1.870	2.472	3.057	3.608	4.074	4.433	4.701	4.899	5.037	5.118	5.136
2650	.013	.627	1.250	1.863	2.465	3.051	3.600	4.061	4.416	4.682	4.879	5.017	5.099	5.117
2700	.013	.625	1.245	1.857	2.458	3.044	3.592	4.047	4.399	4.663	4.860	4.996	5.079	5.099
2750	.012	.622	1.240	1.851	2.452	3.038	3.582	4.033	4.381	4.644	4.839	4.976	5.059	5.081
2800	.012	.620	1.236	1.846	2.445	3.033	3.573	4.018	4.362	4.625	4.819	4.956	5.040	5.064
2850	.012	.618	1.232	1.840	2.440	3.026	3.562	4.002	4.344	4.604	4.799	4.936	5.020	5.047
2900	.012	.615	1.228	1.835	2.434	3.020	3.551	3.986	4.325	4.584	4.778	4.915	5.001	5.030
2950	.012	.613	1.224	1.830	2.428	3.013	3.540	3.969	4.305	4.563	4.758	4.895	4.981	5.013
3000	.012	.611	1.220	1.825	2.423	3.007	3.528	3.952	4.285	4.542	4.737	4.874	4.962	4.996

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= -.300 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.713	1.414	2.087	2.708	3.263	3.753	4.192	4.601	4.980	5.277	5.474	5.585	5.584
1550	.014	.706	1.402	2.072	2.694	3.250	3.743	4.187	4.599	4.974	5.264	5.456	5.565	5.565
1600	.014	.701	1.392	2.058	2.678	3.238	3.735	4.181	4.598	4.969	5.248	5.438	5.546	5.545
1650	.014	.695	1.382	2.045	2.664	3.226	3.726	4.177	4.596	4.961	5.234	5.420	5.525	5.527
1700	.014	.690	1.372	2.031	2.650	3.214	3.718	4.173	4.595	4.952	5.219	5.400	5.505	5.507
1750	.014	.686	1.363	2.018	2.637	3.203	3.711	4.170	4.594	4.944	5.202	5.381	5.485	5.488
1800	.014	.681	1.354	2.007	2.625	3.192	3.703	4.168	4.591	4.935	5.186	5.361	5.464	5.468
1850	.014	.677	1.346	1.995	2.612	3.182	3.697	4.165	4.588	4.925	5.170	5.340	5.444	5.448
1900	.013	.673	1.339	1.985	2.601	3.171	3.690	4.162	4.584	4.914	5.153	5.319	5.421	5.427
1950	.013	.670	1.331	1.974	2.588	3.162	3.684	4.160	4.578	4.902	5.136	5.298	5.400	5.407
2000	.013	.666	1.324	1.964	2.578	3.152	3.678	4.157	4.573	4.890	5.119	5.278	5.377	5.387
2050	.013	.663	1.317	1.955	2.567	3.142	3.672	4.154	4.565	4.877	5.101	5.257	5.353	5.367
2100	.013	.659	1.310	1.945	2.557	3.134	3.666	4.152	4.558	4.864	5.084	5.237	5.330	5.347
2150	.013	.656	1.304	1.937	2.547	3.124	3.660	4.148	4.549	4.849	5.067	5.216	5.308	5.327
2200	.013	.653	1.297	1.928	2.538	3.116	3.655	4.143	4.540	4.835	5.048	5.197	5.285	5.306
2250	.013	.650	1.291	1.919	2.528	3.108	3.649	4.138	4.529	4.820	5.031	5.176	5.264	5.285
2300	.013	.646	1.285	1.911	2.519	3.100	3.644	4.132	4.517	4.805	5.012	5.156	5.242	5.263
2350	.013	.644	1.280	1.903	2.510	3.091	3.638	4.124	4.505	4.788	4.994	5.136	5.221	5.241
2400	.013	.641	1.274	1.896	2.501	3.084	3.634	4.116	4.492	4.772	4.976	5.116	5.200	5.219
2450	.013	.638	1.269	1.889	2.493	3.076	3.629	4.106	4.478	4.755	4.957	5.097	5.179	5.197
2500	.013	.635	1.264	1.882	2.486	3.069	3.622	4.097	4.464	4.737	4.938	5.077	5.159	5.176
2550	.013	.632	1.258	1.875	2.478	3.063	3.615	4.085	4.449	4.720	4.919	5.057	5.139	5.156
2600	.013	.629	1.254	1.868	2.471	3.056	3.607	4.074	4.433	4.702	4.900	5.037	5.119	5.137
2650	.013	.627	1.249	1.862	2.464	3.049	3.600	4.061	4.417	4.683	4.880	5.017	5.099	5.118
2700	.013	.624	1.244	1.856	2.457	3.043	3.592	4.048	4.400	4.664	4.861	4.997	5.080	5.100
2750	.012	.622	1.240	1.850	2.451	3.037	3.583	4.034	4.382	4.645	4.841	4.977	5.060	5.082
2800	.012	.620	1.236	1.845	2.444	3.032	3.574	4.019	4.364	4.626	4.821	4.957	5.041	5.065
2850	.012	.617	1.232	1.839	2.439	3.026	3.563	4.004	4.345	4.606	4.801	4.937	5.022	5.048
2900	.012	.615	1.228	1.834	2.433	3.020	3.553	3.988	4.326	4.585	4.780	4.917	5.002	5.031
2950	.012	.613	1.224	1.829	2.427	3.014	3.542	3.971	4.307	4.565	4.760	4.897	4.983	5.014
3000	.012	.611	1.220	1.825	2.422	3.007	3.530	3.955	4.288	4.545	4.739	4.876	4.963	4.998

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= -.200 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.711	1.411	2.082	2.703	3.257	3.745	4.185	4.595	4.974	5.272	5.468	5.579	5.582
1550	.014	.705	1.399	2.067	2.688	3.245	3.737	4.180	4.593	4.969	5.259	5.450	5.561	5.564
1600	.014	.699	1.388	2.053	2.673	3.232	3.728	4.176	4.593	4.962	5.244	5.434	5.541	5.544
1650	.014	.693	1.378	2.039	2.659	3.220	3.720	4.171	4.591	4.956	5.230	5.415	5.521	5.525
1700	.014	.689	1.369	2.027	2.645	3.209	3.712	4.168	4.591	4.948	5.214	5.397	5.501	5.506
1750	.014	.684	1.360	2.015	2.632	3.198	3.706	4.165	4.589	4.940	5.199	5.378	5.481	5.486
1800	.014	.679	1.351	2.003	2.620	3.187	3.698	4.163	4.587	4.931	5.183	5.358	5.461	5.466
1850	.014	.676	1.343	1.992	2.608	3.177	3.692	4.159	4.584	4.922	5.167	5.338	5.441	5.446
1900	.013	.672	1.336	1.981	2.596	3.167	3.685	4.158	4.581	4.911	5.150	5.318	5.419	5.426
1950	.013	.668	1.328	1.971	2.585	3.157	3.679	4.155	4.576	4.900	5.133	5.297	5.398	5.406
2000	.013	.665	1.322	1.961	2.574	3.148	3.674	4.153	4.571	4.888	5.116	5.276	5.375	5.386
2050	.013	.661	1.314	1.952	2.564	3.139	3.668	4.150	4.564	4.875	5.099	5.256	5.353	5.366
2100	.013	.658	1.308	1.942	2.553	3.130	3.662	4.149	4.556	4.862	5.082	5.236	5.330	5.346
2150	.013	.655	1.302	1.934	2.544	3.121	3.657	4.145	4.547	4.848	5.065	5.216	5.307	5.326
2200	.013	.652	1.295	1.925	2.534	3.113	3.652	4.141	4.538	4.834	5.047	5.195	5.285	5.306
2250	.013	.649	1.290	1.917	2.525	3.104	3.646	4.137	4.527	4.818	5.030	5.176	5.263	5.285
2300	.013	.646	1.284	1.910	2.517	3.097	3.642	4.130	4.516	4.803	5.011	5.156	5.242	5.263
2350	.013	.643	1.278	1.902	2.508	3.089	3.636	4.124	4.504	4.787	4.994	5.136	5.221	5.242
2400	.013	.640	1.273	1.894	2.499	3.081	3.631	4.116	4.491	4.771	4.975	5.116	5.200	5.220
2450	.013	.637	1.267	1.887	2.491	3.074	3.626	4.106	4.478	4.754	4.957	5.097	5.180	5.198
2500	.013	.634	1.262	1.880	2.484	3.068	3.620	4.097	4.464	4.737	4.938	5.077	5.160	5.177
2550	.013	.632	1.258	1.874	2.476	3.061	3.614	4.086	4.448	4.720	4.919	5.057	5.139	5.157
2600	.013	.629	1.253	1.867	2.470	3.054	3.608	4.074	4.433	4.701	4.900	5.038	5.120	5.138
2650	.013	.627	1.248	1.861	2.462	3.048	3.600	4.062	4.417	4.684	4.881	5.018	5.100	5.119
2700	.013	.624	1.244	1.855	2.456	3.042	3.592	4.049	4.400	4.665	4.862	4.998	5.081	5.101
2750	.012	.622	1.239	1.849	2.450	3.036	3.584	4.035	4.383	4.646	4.842	4.979	5.061	5.083
2800	.012	.620	1.235	1.844	2.443	3.031	3.575	4.020	4.365	4.627	4.822	4.958	5.042	5.066
2850	.012	.617	1.231	1.839	2.438	3.025	3.564	4.006	4.347	4.607	4.802	4.939	5.023	5.048
2900	.012	.615	1.227	1.834	2.432	3.019	3.554	3.990	4.328	4.588	4.782	4.919	5.004	5.032
2950	.012	.613	1.224	1.829	2.427	3.014	3.543	3.974	4.309	4.567	4.761	4.898	4.985	5.015
3000	.012	.611	1.220	1.824	2.422	3.007	3.531	3.957	4.289	4.547	4.741	4.878	4.965	4.999

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= -.100 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.710	1.407	2.077	2.697	3.250	3.739	4.179	4.589	4.969	5.267	5.460	5.574	5.581
1550	.014	.703	1.396	2.062	2.683	3.239	3.731	4.174	4.588	4.964	5.254	5.445	5.556	5.562
1600	.014	.697	1.385	2.049	2.668	3.226	3.722	4.170	4.588	4.957	5.241	5.429	5.536	5.543
1650	.014	.692	1.375	2.035	2.654	3.215	3.715	4.166	4.586	4.952	5.226	5.411	5.516	5.524
1700	.014	.687	1.366	2.023	2.641	3.204	3.708	4.163	4.587	4.945	5.211	5.394	5.498	5.504
1750	.014	.682	1.356	2.011	2.628	3.194	3.700	4.160	4.585	4.936	5.195	5.375	5.478	5.484
1800	.014	.678	1.348	1.999	2.616	3.183	3.694	4.158	4.583	4.927	5.180	5.355	5.458	5.464
1850	.013	.674	1.341	1.988	2.604	3.172	3.687	4.155	4.581	4.918	5.163	5.336	5.438	5.444
1900	.013	.670	1.333	1.978	2.592	3.163	3.681	4.153	4.577	4.907	5.147	5.315	5.417	5.425
1950	.013	.666	1.325	1.968	2.582	3.153	3.676	4.151	4.573	4.897	5.131	5.295	5.397	5.405
2000	.013	.663	1.319	1.958	2.571	3.144	3.670	4.150	4.568	4.885	5.114	5.275	5.374	5.385
2050	.013	.660	1.312	1.949	2.561	3.135	3.664	4.148	4.561	4.873	5.098	5.255	5.352	5.365
2100	.013	.657	1.305	1.940	2.550	3.126	3.659	4.145	4.554	4.860	5.080	5.235	5.329	5.345
2150	.013	.653	1.300	1.931	2.541	3.118	3.653	4.142	4.545	4.846	5.063	5.215	5.307	5.326
2200	.013	.650	1.293	1.923	2.532	3.110	3.648	4.139	4.535	4.832	5.046	5.195	5.285	5.306
2250	.013	.648	1.288	1.915	2.523	3.102	3.644	4.134	4.526	4.817	5.028	5.175	5.263	5.285
2300	.013	.645	1.282	1.907	2.514	3.094	3.639	4.128	4.515	4.802	5.011	5.155	5.242	5.264
2350	.013	.642	1.277	1.900	2.506	3.087	3.634	4.122	4.503	4.786	4.993	5.136	5.221	5.242
2400	.013	.639	1.272	1.893	2.498	3.079	3.629	4.115	4.490	4.771	4.975	5.116	5.200	5.221
2450	.013	.636	1.266	1.886	2.490	3.072	3.624	4.106	4.478	4.754	4.957	5.097	5.180	5.199
2500	.013	.634	1.261	1.879	2.482	3.066	3.619	4.097	4.464	4.737	4.938	5.077	5.160	5.178
2550	.013	.631	1.257	1.873	2.475	3.059	3.613	4.086	4.449	4.720	4.920	5.058	5.140	5.158
2600	.013	.629	1.252	1.866	2.468	3.053	3.607	4.075	4.434	4.702	4.901	5.038	5.121	5.139
2650	.013	.626	1.248	1.860	2.461	3.047	3.599	4.063	4.417	4.684	4.882	5.019	5.101	5.120
2700	.012	.624	1.243	1.855	2.455	3.041	3.592	4.049	4.401	4.667	4.863	4.999	5.082	5.102
2750	.012	.621	1.239	1.849	2.449	3.035	3.583	4.036	4.383	4.647	4.843	4.980	5.063	5.084
2800	.012	.619	1.235	1.843	2.443	3.029	3.575	4.021	4.367	4.628	4.824	4.960	5.044	5.066
2850	.012	.617	1.231	1.838	2.437	3.024	3.565	4.007	4.348	4.609	4.804	4.940	5.024	5.050
2900	.012	.615	1.227	1.833	2.432	3.018	3.556	3.991	4.330	4.590	4.784	4.920	5.006	5.033
2950	.012	.613	1.224	1.828	2.426	3.014	3.545	3.976	4.311	4.570	4.764	4.901	4.986	5.016
3000	.012	.611	1.220	1.824	2.421	3.007	3.533	3.959	4.292	4.550	4.743	4.881	4.967	5.000

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= .100 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.707	1.401	2.068	2.686	3.239	3.727	4.167	4.579	4.959	5.254	5.449	5.565	5.577
1550	.014	.700	1.389	2.053	2.671	3.227	3.719	4.164	4.578	4.954	5.243	5.434	5.546	5.558
1600	.014	.695	1.379	2.040	2.658	3.216	3.712	4.160	4.577	4.949	5.232	5.418	5.528	5.539
1650	.014	.689	1.368	2.027	2.644	3.204	3.704	4.156	4.577	4.943	5.217	5.403	5.509	5.519
1700	.014	.684	1.359	2.014	2.632	3.194	3.697	4.154	4.576	4.936	5.203	5.384	5.490	5.500
1750	.014	.679	1.350	2.003	2.619	3.183	3.691	4.151	4.576	4.929	5.188	5.368	5.471	5.480
1800	.014	.674	1.342	1.992	2.608	3.173	3.684	4.148	4.575	4.920	5.173	5.350	5.452	5.460
1850	.013	.671	1.335	1.981	2.596	3.164	3.678	4.147	4.573	4.911	5.158	5.331	5.432	5.441
1900	.013	.667	1.327	1.971	2.584	3.154	3.673	4.145	4.570	4.901	5.142	5.312	5.413	5.421
1950	.013	.663	1.320	1.961	2.574	3.146	3.667	4.144	4.566	4.890	5.126	5.292	5.392	5.401
2000	.013	.660	1.314	1.952	2.564	3.136	3.662	4.142	4.562	4.880	5.110	5.272	5.371	5.382
2050	.013	.657	1.307	1.943	2.554	3.128	3.657	4.141	4.555	4.868	5.093	5.252	5.349	5.363
2100	.013	.654	1.301	1.935	2.545	3.120	3.652	4.139	4.549	4.855	5.077	5.232	5.328	5.343
2150	.013	.651	1.295	1.926	2.535	3.112	3.647	4.137	4.541	4.842	5.061	5.213	5.307	5.324
2200	.013	.648	1.290	1.918	2.527	3.104	3.642	4.133	4.532	4.828	5.044	5.194	5.284	5.304
2250	.013	.645	1.284	1.911	2.518	3.097	3.638	4.131	4.523	4.814	5.027	5.174	5.263	5.285
2300	.013	.643	1.279	1.903	2.510	3.089	3.634	4.126	4.512	4.799	5.009	5.155	5.242	5.265
2350	.013	.640	1.274	1.896	2.502	3.082	3.630	4.119	4.501	4.784	4.992	5.135	5.221	5.244
2400	.013	.637	1.269	1.889	2.494	3.075	3.625	4.113	4.489	4.769	4.974	5.116	5.201	5.223
2450	.013	.635	1.264	1.882	2.486	3.068	3.620	4.105	4.476	4.753	4.956	5.097	5.181	5.201
2500	.013	.632	1.259	1.876	2.479	3.062	3.616	4.096	4.462	4.737	4.938	5.078	5.161	5.180
2550	.013	.630	1.254	1.870	2.472	3.056	3.611	4.085	4.449	4.720	4.921	5.058	5.142	5.160
2600	.013	.628	1.250	1.864	2.465	3.050	3.605	4.075	4.434	4.703	4.902	5.039	5.122	5.141
2650	.013	.625	1.246	1.858	2.459	3.044	3.599	4.064	4.418	4.686	4.883	5.020	5.103	5.122
2700	.012	.623	1.242	1.853	2.453	3.038	3.592	4.051	4.402	4.668	4.865	5.001	5.084	5.103
2750	.012	.621	1.238	1.847	2.447	3.033	3.585	4.038	4.386	4.650	4.845	4.982	5.065	5.086
2800	.012	.619	1.234	1.842	2.441	3.028	3.577	4.024	4.369	4.631	4.826	4.963	5.046	5.068
2850	.012	.617	1.230	1.837	2.436	3.023	3.568	4.010	4.351	4.612	4.807	4.943	5.027	5.051
2900	.012	.615	1.227	1.832	2.430	3.018	3.558	3.995	4.333	4.593	4.787	4.924	5.008	5.035
2950	.012	.613	1.223	1.828	2.425	3.013	3.548	3.978	4.315	4.574	4.767	4.904	4.989	5.019
3000	.012	.611	1.220	1.823	2.421	3.008	3.537	3.963	4.296	4.554	4.748	4.885	4.971	5.002

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= .200 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.705	1.398	2.063	2.680	3.233	3.721	4.161	4.574	4.954	5.248	5.444	5.560	5.575
1550	.014	.699	1.386	2.049	2.667	3.221	3.713	4.158	4.573	4.949	5.239	5.429	5.541	5.556
1600	.014	.693	1.376	2.035	2.652	3.210	3.706	4.154	4.573	4.944	5.225	5.413	5.523	5.536
1650	.014	.687	1.365	2.023	2.640	3.199	3.699	4.151	4.573	4.939	5.213	5.398	5.505	5.517
1700	.014	.682	1.356	2.010	2.626	3.189	3.692	4.148	4.572	4.932	5.200	5.381	5.486	5.497
1750	.014	.677	1.348	1.999	2.615	3.178	3.686	4.146	4.572	4.925	5.184	5.365	5.467	5.478
1800	.013	.673	1.339	1.988	2.602	3.169	3.680	4.144	4.571	4.917	5.169	5.347	5.448	5.458
1850	.013	.669	1.332	1.977	2.591	3.160	3.674	4.143	4.569	4.908	5.154	5.328	5.430	5.439
1900	.013	.665	1.324	1.968	2.581	3.150	3.668	4.141	4.567	4.898	5.139	5.310	5.410	5.419
1950	.013	.662	1.318	1.958	2.570	3.142	3.663	4.141	4.562	4.887	5.123	5.290	5.390	5.400
2000	.013	.658	1.311	1.949	2.561	3.133	3.658	4.139	4.558	4.877	5.108	5.271	5.370	5.380
2050	.013	.655	1.305	1.940	2.550	3.125	3.653	4.137	4.552	4.864	5.092	5.251	5.349	5.361
2100	.013	.652	1.299	1.932	2.542	3.117	3.649	4.136	4.546	4.853	5.076	5.231	5.327	5.342
2150	.013	.650	1.293	1.924	2.532	3.109	3.644	4.134	4.538	4.839	5.059	5.212	5.305	5.323
2200	.013	.647	1.288	1.916	2.524	3.102	3.640	4.132	4.530	4.827	5.042	5.193	5.284	5.304
2250	.013	.644	1.282	1.908	2.515	3.094	3.635	4.129	4.521	4.812	5.026	5.173	5.263	5.284
2300	.013	.642	1.277	1.901	2.507	3.087	3.632	4.124	4.511	4.798	5.009	5.154	5.242	5.264
2350	.013	.639	1.272	1.894	2.500	3.080	3.627	4.118	4.500	4.783	4.992	5.135	5.221	5.244
2400	.013	.637	1.267	1.888	2.492	3.074	3.623	4.112	4.488	4.768	4.974	5.116	5.201	5.223
2450	.013	.634	1.263	1.881	2.485	3.067	3.620	4.103	4.475	4.753	4.956	5.097	5.181	5.202
2500	.013	.632	1.258	1.875	2.477	3.060	3.615	4.095	4.462	4.736	4.939	5.078	5.162	5.182
2550	.013	.629	1.254	1.869	2.471	3.054	3.609	4.085	4.448	4.720	4.920	5.059	5.142	5.161
2600	.013	.627	1.249	1.863	2.464	3.048	3.605	4.075	4.433	4.704	4.902	5.040	5.123	5.142
2650	.013	.625	1.245	1.857	2.458	3.043	3.599	4.063	4.419	4.686	4.884	5.021	5.104	5.123
2700	.012	.623	1.241	1.852	2.452	3.037	3.592	4.051	4.403	4.668	4.865	5.002	5.085	5.104
2750	.012	.621	1.237	1.846	2.446	3.032	3.585	4.039	4.386	4.651	4.847	4.983	5.066	5.087
2800	.012	.619	1.233	1.841	2.440	3.027	3.578	4.025	4.370	4.633	4.828	4.963	5.047	5.069
2850	.012	.617	1.230	1.836	2.435	3.022	3.568	4.011	4.353	4.614	4.809	4.944	5.029	5.052
2900	.012	.615	1.226	1.832	2.430	3.017	3.559	3.996	4.335	4.595	4.789	4.925	5.010	5.036
2950	.012	.613	1.223	1.827	2.425	3.013	3.550	3.980	4.317	4.576	4.769	4.906	4.991	5.020
3000	.012	.611	1.220	1.823	2.420	3.008	3.538	3.965	4.298	4.556	4.750	4.887	4.973	5.004

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= .300 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.704	1.396	2.059	2.675	3.227	3.714	4.156	4.569	4.948	5.243	5.438	5.553	5.572
1550	.014	.698	1.384	2.045	2.662	3.216	3.708	4.153	4.568	4.944	5.233	5.423	5.537	5.553
1600	.014	.692	1.373	2.032	2.648	3.205	3.701	4.149	4.569	4.940	5.220	5.409	5.519	5.534
1650	.014	.686	1.363	2.018	2.635	3.194	3.694	4.147	4.568	4.934	5.209	5.394	5.500	5.514
1700	.014	.681	1.354	2.007	2.622	3.184	3.687	4.144	4.568	4.927	5.194	5.377	5.482	5.495
1750	.014	.676	1.345	1.995	2.610	3.174	3.681	4.142	4.568	4.921	5.181	5.361	5.464	5.475
1800	.013	.672	1.337	1.984	2.599	3.164	3.675	4.141	4.567	4.912	5.165	5.343	5.445	5.456
1850	.013	.667	1.329	1.975	2.588	3.155	3.670	4.139	4.566	4.904	5.152	5.326	5.427	5.437
1900	.013	.664	1.322	1.964	2.577	3.146	3.665	4.139	4.563	4.895	5.136	5.308	5.407	5.417
1950	.013	.660	1.315	1.955	2.567	3.138	3.660	4.136	4.559	4.885	5.121	5.288	5.387	5.398
2000	.013	.657	1.309	1.945	2.557	3.129	3.655	4.136	4.555	4.874	5.105	5.269	5.368	5.379
2050	.013	.654	1.302	1.937	2.548	3.121	3.650	4.134	4.550	4.862	5.090	5.250	5.347	5.360
2100	.013	.651	1.297	1.929	2.538	3.114	3.646	4.134	4.544	4.850	5.074	5.231	5.326	5.341
2150	.013	.648	1.291	1.922	2.530	3.106	3.641	4.132	4.536	4.838	5.058	5.211	5.305	5.322
2200	.013	.646	1.286	1.913	2.521	3.099	3.637	4.129	4.528	4.825	5.042	5.192	5.284	5.303
2250	.013	.643	1.281	1.906	2.513	3.091	3.633	4.126	4.519	4.810	5.024	5.173	5.263	5.283
2300	.013	.641	1.275	1.899	2.506	3.084	3.629	4.122	4.509	4.797	5.008	5.154	5.242	5.264
2350	.013	.638	1.270	1.892	2.497	3.078	3.625	4.117	4.499	4.782	4.991	5.135	5.222	5.244
2400	.013	.636	1.266	1.886	2.490	3.071	3.621	4.110	4.487	4.767	4.974	5.116	5.201	5.224
2450	.013	.633	1.261	1.879	2.483	3.065	3.618	4.103	4.474	4.752	4.956	5.097	5.182	5.203
2500	.013	.631	1.257	1.873	2.476	3.059	3.613	4.095	4.462	4.736	4.939	5.078	5.162	5.183
2550	.013	.629	1.252	1.867	2.469	3.053	3.609	4.085	4.448	4.720	4.921	5.059	5.143	5.162
2600	.013	.627	1.248	1.861	2.463	3.047	3.603	4.075	4.434	4.703	4.903	5.040	5.124	5.143
2650	.013	.625	1.244	1.856	2.456	3.042	3.598	4.064	4.418	4.687	4.885	5.021	5.105	5.124
2700	.012	.622	1.240	1.851	2.450	3.036	3.591	4.052	4.403	4.669	4.866	5.003	5.086	5.105
2750	.012	.620	1.236	1.845	2.445	3.031	3.585	4.039	4.387	4.652	4.848	4.984	5.067	5.088
2800	.012	.618	1.233	1.841	2.439	3.027	3.578	4.025	4.371	4.634	4.829	4.965	5.048	5.070
2850	.012	.617	1.229	1.836	2.435	3.022	3.569	4.012	4.354	4.615	4.810	4.946	5.030	5.053
2900	.012	.615	1.226	1.831	2.429	3.017	3.560	3.997	4.336	4.597	4.791	4.927	5.011	5.037
2950	.012	.613	1.223	1.827	2.424	3.013	3.550	3.982	4.318	4.578	4.771	4.908	4.993	5.021
3000	.012	.611	1.219	1.823	2.420	3.008	3.539	3.966	4.300	4.558	4.752	4.889	4.974	5.005

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= .400 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.703	1.393	2.055	2.670	3.221	3.709	4.150	4.565	4.944	5.238	5.433	5.549	5.569
1550	.014	.696	1.381	2.041	2.656	3.211	3.703	4.147	4.564	4.940	5.228	5.418	5.532	5.550
1600	.014	.691	1.371	2.028	2.643	3.199	3.695	4.144	4.565	4.935	5.216	5.404	5.514	5.531
1650	.014	.685	1.360	2.015	2.630	3.190	3.689	4.142	4.565	4.930	5.204	5.389	5.496	5.512
1700	.014	.680	1.351	2.003	2.618	3.179	3.682	4.140	4.565	4.923	5.190	5.374	5.478	5.492
1750	.014	.675	1.342	1.991	2.606	3.170	3.677	4.138	4.565	4.917	5.177	5.358	5.460	5.473
1800	.013	.670	1.334	1.981	2.595	3.160	3.672	4.137	4.564	4.909	5.164	5.340	5.442	5.454
1850	.013	.666	1.326	1.971	2.584	3.151	3.666	4.135	4.562	4.901	5.148	5.323	5.424	5.435
1900	.013	.662	1.319	1.961	2.574	3.143	3.662	4.135	4.560	4.891	5.133	5.304	5.405	5.416
1950	.013	.659	1.313	1.952	2.563	3.134	3.657	4.133	4.556	4.882	5.119	5.286	5.386	5.396
2000	.013	.655	1.306	1.943	2.554	3.126	3.651	4.133	4.552	4.871	5.103	5.268	5.366	5.377
2050	.013	.652	1.300	1.935	2.545	3.118	3.647	4.133	4.547	4.860	5.088	5.248	5.345	5.359
2100	.013	.650	1.294	1.927	2.536	3.110	3.643	4.131	4.541	4.848	5.072	5.229	5.326	5.339
2150	.013	.647	1.289	1.919	2.527	3.103	3.639	4.129	4.534	4.836	5.056	5.210	5.305	5.321
2200	.013	.644	1.284	1.911	2.519	3.096	3.635	4.127	4.525	4.823	5.040	5.191	5.284	5.302
2250	.013	.642	1.279	1.904	2.511	3.089	3.631	4.124	4.517	4.810	5.024	5.172	5.263	5.283
2300	.013	.639	1.274	1.897	2.503	3.082	3.627	4.119	4.507	4.795	5.007	5.153	5.242	5.264
2350	.013	.637	1.269	1.891	2.495	3.076	3.623	4.115	4.497	4.781	4.991	5.134	5.222	5.245
2400	.013	.635	1.264	1.884	2.488	3.069	3.619	4.109	4.485	4.767	4.973	5.116	5.202	5.224
2450	.013	.632	1.260	1.878	2.481	3.063	3.616	4.102	4.474	4.751	4.956	5.097	5.182	5.204
2500	.013	.630	1.256	1.872	2.474	3.057	3.612	4.094	4.461	4.736	4.939	5.078	5.163	5.184
2550	.013	.628	1.251	1.866	2.468	3.051	3.607	4.085	4.447	4.720	4.921	5.059	5.143	5.163
2600	.013	.626	1.247	1.860	2.461	3.046	3.602	4.074	4.434	4.704	4.903	5.041	5.124	5.144
2650	.012	.624	1.244	1.855	2.455	3.040	3.598	4.064	4.419	4.687	4.885	5.022	5.105	5.125
2700	.012	.622	1.239	1.850	2.450	3.035	3.592	4.051	4.404	4.670	4.867	5.004	5.086	5.107
2750	.012	.620	1.236	1.845	2.444	3.031	3.584	4.039	4.388	4.653	4.848	4.985	5.068	5.089
2800	.012	.618	1.232	1.840	2.439	3.026	3.578	4.026	4.372	4.634	4.830	4.966	5.049	5.071
2850	.012	.616	1.229	1.835	2.434	3.021	3.570	4.013	4.354	4.617	4.811	4.947	5.031	5.055
2900	.012	.615	1.226	1.831	2.429	3.016	3.561	3.998	4.338	4.598	4.792	4.929	5.013	5.038
2950	.012	.613	1.222	1.827	2.424	3.012	3.551	3.983	4.320	4.580	4.773	4.910	4.994	5.022
3000	.012	.611	1.219	1.822	2.420	3.008	3.541	3.968	4.302	4.560	4.754	4.891	4.976	5.006

TABLE OF KN VALUES

THE TABLE APPLIES FOR TRIM= .500 IN UPRIGHT CONDITION

	ANGLES OF HEEL												
DISPL	.1	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0
1500	.014	.702	1.391	2.051	2.665	3.215	3.704	4.146	4.559	4.939	5.232	5.425	5.544	5.566
1550	.014	.695	1.379	2.036	2.652	3.205	3.697	4.142	4.560	4.935	5.222	5.413	5.527	5.547
1600	.014	.689	1.368	2.024	2.638	3.196	3.690	4.140	4.561	4.930	5.212	5.400	5.509	5.528
1650	.014	.684	1.358	2.011	2.626	3.184	3.684	4.137	4.561	4.926	5.200	5.384	5.492	5.509
1700	.014	.679	1.349	1.999	2.614	3.175	3.678	4.136	4.562	4.920	5.187	5.370	5.474	5.490
1750	.013	.673	1.340	1.988	2.602	3.166	3.673	4.134	4.561	4.913	5.174	5.354	5.456	5.471
1800	.013	.669	1.331	1.977	2.591	3.156	3.668	4.133	4.560	4.905	5.160	5.338	5.439	5.451
1850	.013	.665	1.324	1.968	2.580	3.147	3.662	4.132	4.559	4.897	5.146	5.321	5.420	5.432
1900	.013	.661	1.316	1.958	2.570	3.139	3.658	4.131	4.556	4.887	5.132	5.302	5.402	5.414
1950	.013	.658	1.310	1.949	2.561	3.131	3.653	4.131	4.553	4.879	5.116	5.285	5.384	5.395
2000	.013	.654	1.304	1.940	2.551	3.123	3.648	4.130	4.549	4.868	5.101	5.265	5.364	5.376
2050	.013	.651	1.298	1.932	2.542	3.115	3.645	4.129	4.544	4.857	5.086	5.247	5.346	5.357
2100	.013	.648	1.292	1.924	2.533	3.108	3.640	4.129	4.539	4.846	5.070	5.229	5.325	5.338
2150	.013	.646	1.287	1.916	2.524	3.100	3.636	4.127	4.531	4.833	5.055	5.209	5.304	5.320
2200	.013	.643	1.282	1.909	2.516	3.093	3.633	4.125	4.524	4.821	5.039	5.191	5.284	5.301
2250	.013	.641	1.277	1.902	2.508	3.087	3.628	4.122	4.515	4.808	5.023	5.172	5.263	5.283
2300	.013	.638	1.272	1.895	2.501	3.080	3.625	4.117	4.505	4.794	5.006	5.153	5.242	5.264
2350	.013	.636	1.267	1.889	2.493	3.074	3.622	4.113	4.495	4.780	4.990	5.134	5.222	5.244
2400	.013	.634	1.263	1.882	2.486	3.067	3.618	4.107	4.483	4.765	4.973	5.115	5.202	5.224
2450	.013	.632	1.259	1.876	2.479	3.061	3.614	4.100	4.473	4.751	4.956	5.097	5.183	5.205
2500	.013	.629	1.254	1.871	2.473	3.056	3.610	4.093	4.460	4.736	4.939	5.079	5.163	5.185
2550	.013	.628	1.250	1.865	2.467	3.050	3.606	4.083	4.447	4.720	4.921	5.060	5.144	5.164
2600	.013	.625	1.247	1.859	2.460	3.045	3.602	4.074	4.433	4.704	4.904	5.041	5.125	5.145
2650	.012	.623	1.242	1.854	2.454	3.039	3.597	4.063	4.419	4.688	4.886	5.023	5.106	5.126
2700	.012	.622	1.239	1.849	2.449	3.034	3.591	4.052	4.404	4.671	4.868	5.004	5.088	5.108
2750	.012	.620	1.236	1.844	2.443	3.030	3.585	4.040	4.389	4.653	4.850	4.986	5.069	5.090
2800	.012	.618	1.232	1.839	2.438	3.025	3.578	4.027	4.372	4.636	4.831	4.968	5.051	5.073
2850	.012	.616	1.229	1.835	2.433	3.021	3.570	4.013	4.356	4.618	4.812	4.949	5.032	5.056
2900	.012	.614	1.225	1.831	2.428	3.017	3.561	3.999	4.338	4.599	4.794	4.930	5.014	5.039
2950	.012	.613	1.222	1.826	2.424	3.012	3.552	3.984	4.321	4.581	4.775	4.912	4.996	5.023
3000	.012	.611	1.219	1.822	2.419	3.008	3.541	3.969	4.303	4.562	4.756	4.893	4.978	5.007

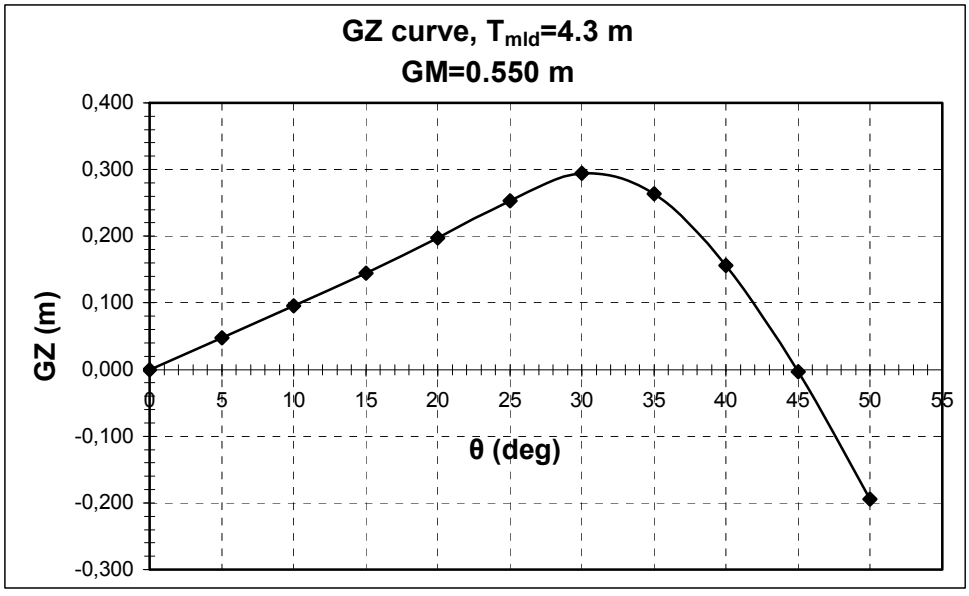
16. APPLICATION OF GENERAL INTACT STABILITY CRITERIA (PAR. 3.1 / IMO RES. A 749 (18) / 1993)

T_{mld} = 4.300 m

T_{mld} =	**4.300 m**
Δ =	2747.828 ton
KM_T =	7.130 m
L_{WL} =	74.599 m
GM =	**0.550 m**
KG =	**6.580 m**

GZ = KN – KGsinφ

θ (deg)	KN (m)	GZ (m)
5°	0.621	0.048
10°	1.238	0.095
15°	1.848	0.145
20°	2.448	0.198
25°	3.034	0.253
30°	3.584	0.294
35°	4.038	0.264
40°	4.386	0.156
45°	4.649	-0.004
50°	5.856	-0.195
55°	4.981	-0.409
60°	5.065	-0.633



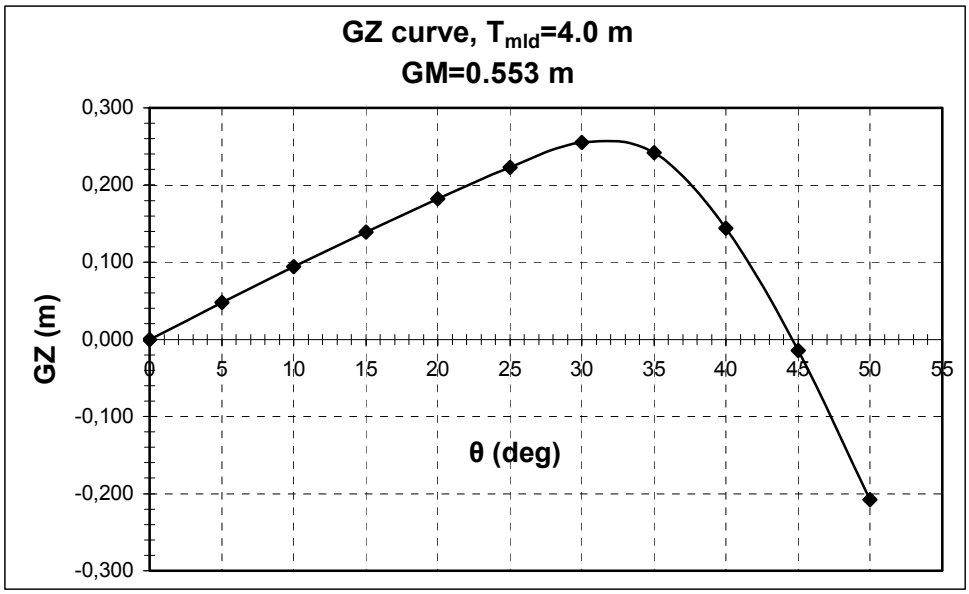
• **PAR. 3.1.2.1**	
A 0^0-30^0 [m x dg]	4.444
A 0^0-30^0 [m x rad]	0.0776 > 0.055
A 0^0- 40^0 [m x dg]	6.954
A 0^0- 40^0 [m x rad]	0.121 > 0.090
A 30^0- 40^0 [m x dg]	2.510
A 30^0- 40^0 [m x rad]	0.044 > 0.030
• **PAR. 3.1.2.2**	
GZ 30^0 [m]	0.294 > 0.200
• **PAR. 3.1.2.3**	
GZ_{max} at an angle	~ 30^0
• **PAR. 3.1.2.4**	
GM [m]	0.550 > 0.150
• **PAR. 3.1.2.5**	
N = 72 φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$	
Shift = ~ 6.5 [m]	
φ [dg]	1.330 < 10
• **PAR. 3.1.2.6**	
V_0 = 17 [knots] V_0 = 8.746 [m/sec] L = 74.599 [m] $M_R = 0.02 \frac{V_0^2}{L} \Delta$ (KG – d/2)	
M_R = [ton x m]	249.636
tanφ = M_R / ΔxGM	
φ [dg]	9.38 < 10

T_{mld} = 4.000 m

T_{mld} =	**4.000 m**
Δ =	2482.836 ton
KM_T =	7.280 m
L_{WL} =	74.111 m
GM =	**0.553 m**
KG =	**6.727 m**

GZ = KN – KGsinφ

θ (deg)	KN (m)	GZ (m)
5°	0.634	0.048
10°	1.262	0.094
15°	1.880	0.139
20°	2.483	0.182
25°	3.066	0.223
30°	3.619	0.255
35°	4.100	0.242
40°	4.468	0.144
45°	4.742	-0.015
50°	4.945	-0.208
55°	5.085	-0.425
60°	5.167	-0.659



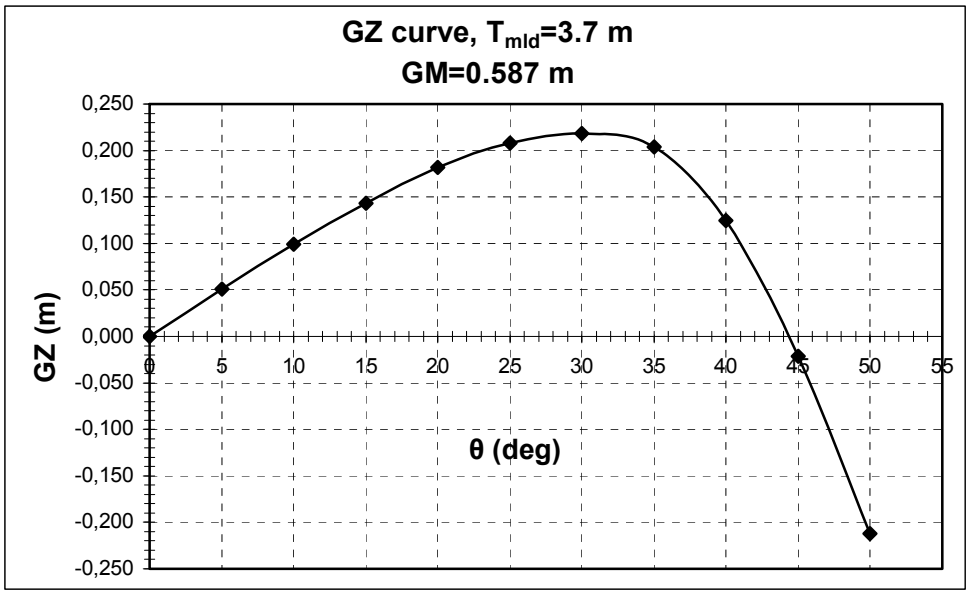
• **PAR. 3.1.2.1**	
A 0^0-30^0 [m x dg]	4.077
A 0^0-30^0 [m x rad]	0.071 > 0.055
A 0^0- 40^0 [m x dg]	6.353
A 0^0- 40^0 [m x rad]	0.111 > 0.090
A 30^0- 40^0 [m x dg]	2.276
A 30^0- 40^0 [m x rad]	0.040 > 0.030
• **PAR. 3.1.2.2**	
GZ 30^0 [m]	0.255 > 0.200
• **PAR. 3.1.2.3**	
GZ_{max} at an angle	~ 32^0
• **PAR. 3.1.2.4**	
GM [m]	0.553 > 0.150
• **PAR. 3.1.2.5**	
N = 72 φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$	
Shift = ~ 6.5 [m]	
φ [dg]	1.464 < 10
• **PAR. 3.1.2.6**	
V_0 = 17 [knots] V_0 = 8.746 [m/sec] L = [m] $M_R = 0.02 \frac{V_0^2}{L} \Delta$ (KG – d/2)	
M_R = [ton x m]	242.270
tanφ = M_R / ΔxGM	
φ [dg]	10 = 10

T_{mld} = 3.700 m

T_{mld} =	**3.700 m**
Δ =	2222.984 ton
KM_T =	7.439 m
L_{WL} =	73.896 m
GM =	**0.587 m**
KG =	**6.852 m**

GZ = KN – KGsinφ

θ (deg)	KN (m)	GZ (m)
5°	0.648	0.051
10°	1.289	0.099
15°	1.917	0.144
20°	2.525	0.181
25°	3.104	0.208
30°	3.644	0.218
35°	4.134	0.204
40°	4.529	0.125
45°	4.824	-0.021
50°	5.037	-0.212
55°	5.185	-0.428
60°	5.274	-0.660



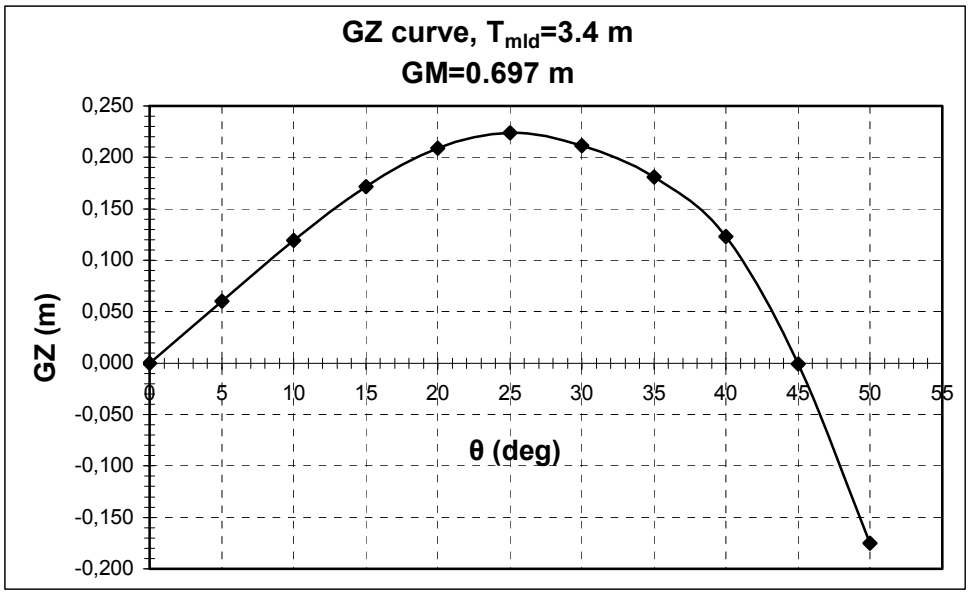
• **PAR. 3.1.2.1**	
A 0^0-30^0 [m x dg]	3.983
A 0^0-30^0 [m x rad]	0.070 > 0.055
A 0^0- 40^0 [m x dg]	5.913
A 0^0- 40^0 [m x rad]	0.103 > 0.090
A 30^0- 40^0 [m x dg]	1.930
A 30^0- 40^0 [m x rad]	0.034 > 0.030
• **PAR. 3.1.2.2**	
GZ 30^0 [m]	0.218 > 0.200
• **PAR. 3.1.2.3**	
GZ_{max} at an angle	~ 30^0
• **PAR. 3.1.2.4**	
GM [m]	0.587 > 0.150
• **PAR. 3.1.2.5**	
N = 72 φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$	
Shift = ~ 6.5 [m]	
φ [dg]	1.541 < 10
• **PAR. 3.1.2.6**	
V_0 = 17 [knots] V_0 = 8.746 [m/sec] L = [m] $M_R = 0.02 \frac{V_0^2}{L} \Delta$ (KG – d/2)	
M_R = [ton x m]	230.201
tanφ = M_R / ΔxGM	
φ [dg]	10 = 10

T_{mld} = 3.400 m

T_{mld} =	**3.400 m**
Δ =	1969.156 ton
KM_T =	7.612 m
L_{WL} =	75.1054 m
GM =	**0.697 m**
KG =	**6.915 m**

GZ = KN – KGsinφ

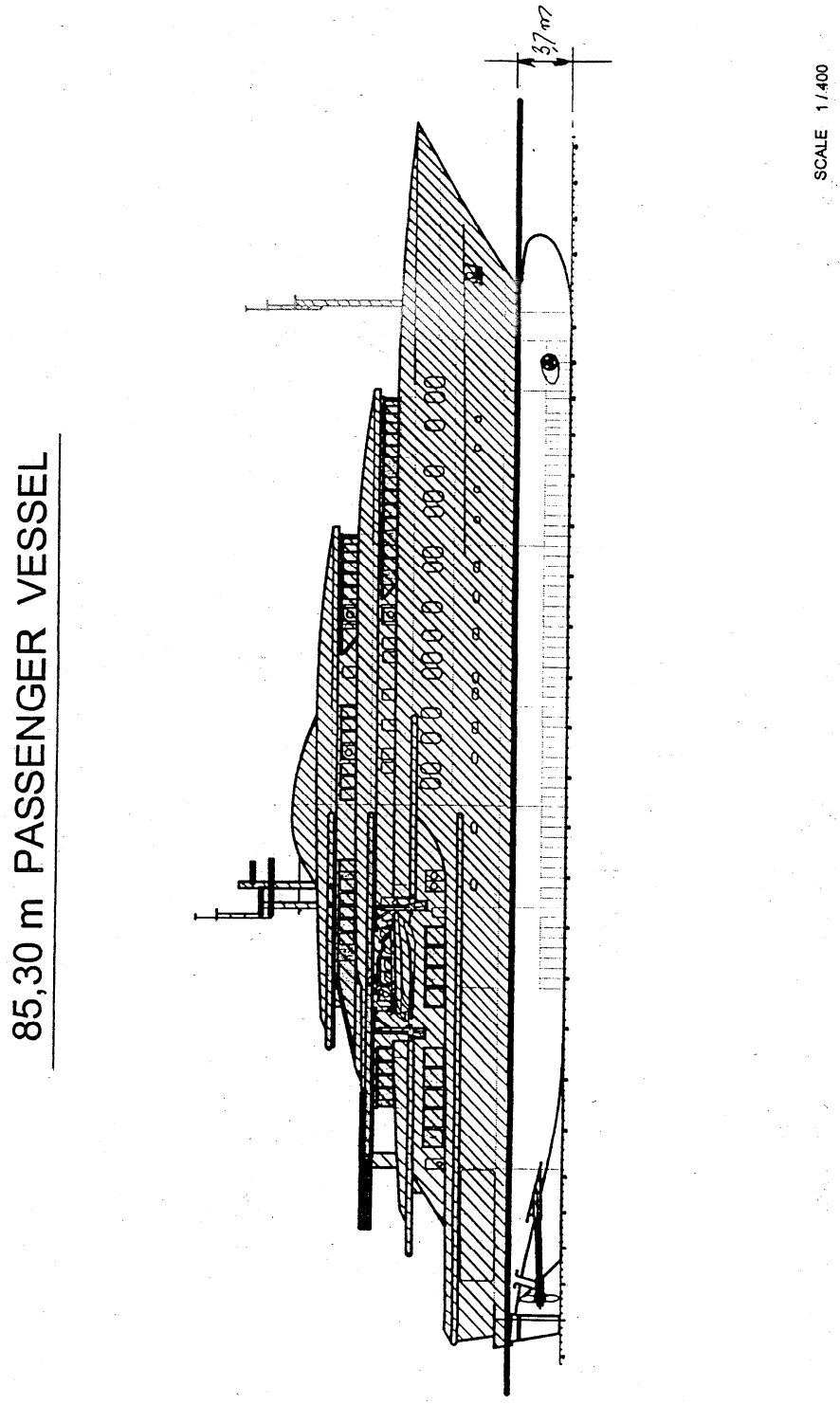
θ (deg)	KN (m)	GZ (m)
5°	0.663	0.060
10°	1.320	0.119
15°	1.961	0.171
20°	2.574	0.209
25°	3.146	0.224
30°	3.669	0.211
35°	4.147	0.181
40°	4.568	0.123
45°	4.889	-0.001
50°	5.122	-0.175
55°	5.285	-0.379
60°	5.386	-0.603



• **PAR. 3.1.2.1**	
A 0^0-30^0 [m x dg]	4.481
A 0^0-30^0 [m x rad]	0.078 > 0.055
A 0^0- 40^0 [m x dg]	6.243
A 0^0- 40^0 [m x rad]	0.109 > 0.090
A 30^0- 40^0 [m x dg]	1.762
A 30^0- 40^0 [m x rad]	0.031 > 0.030
• **PAR. 3.1.2.2**	
GZ 30^0 [m]	0.211 > 0.200
• **PAR. 3.1.2.3**	
GZ_{max} at an angle	25° - 30^0
• **PAR. 3.1.2.4**	
GM [m]	0.697 > 0.150
• **PAR. 3.1.2.5**	
N = 72 φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$	
Shift = ~ 6.5 [m]	
φ [dg]	1.465 < 10
• **PAR. 3.1.2.6**	
V_0 = 17 [knots] V_0 = 8.746 [m/sec] L = [m] $M_R = 0.02 \frac{V_0^2}{L} \Delta$ (KG – d/2)	
M_R = [ton x m]	209.176
tanφ = M_R / ΔxGM	
φ [dg]	8.665 < 10

17 APPLICATION OF SEVERE WIND AND ROLLING CRITERION (PAR. 3.2 / IMO RES. A 749 (18) / 1993)

17.1 Lateral Projected Area



17.2 Calculation Of Lateral Projected Area Above WL 3.7 m

FR0 x ⊙ [m]	≡ B.L. x ⊙ [m]	FR0 x ⊙ [m]	≡ B.L. x ⊙ [m]	FR0 x ⊙ [m]	≡ B.L. x ⊙ [m]
-1.820	≡3.700	32.025	≡18.600	64.700	≡11.950
-1.900	≡4.600	33.600	≡19.100	65.700	≡11.940
-1.150	≡4.600	35.000	≡19.160	66.700	≡11.900
-1.600	≡7.240	36.400	≡19.100	67.700	≡11.880
-1.800	≡7.440	37.800	≡18.870	68.700	≡11.860
-1.600	≡7.640	39.200	≡18.560	69.700	≡11.830
-0.700	≡8.140	40.600	≡18.130	70.500	≡11.800
6.500	≡8.140	42.000	≡17.460	70.500	≡19.360
14.700	≡11.740	43.400	≡17.450	70.900	≡19.360
14.700	≡13.230	44.800	≡17.430	70.900	≡11.770
11.480	≡13.230	46.200	≡17.370	71.700	≡11.700
11.480	≡11.550	47.600	≡17.270	72.700	≡11.700
10.500	≡11.470	49.000	≡17.200	73.700	≡11.640
10.500	≡13.280	50.400	≡17.040	74.700	≡11.560
6.200	≡13.280	51.800	≡16.930	75.700	≡11.500
6.200	≡14.100	53.200	≡16.700	76.700	≡11.430
15.750	≡14.100	55.090	≡16.440	77.700	≡11.340
15.750	≡14.050	55.090	≡16.040	78.700	≡11.260
16.450	≡14.050	54.670	≡16.040	79.700	≡11.160
17.500	≡14.470	54.670	≡15.760	80.700	≡11.060
21.700	≡15.450	54.530	≡15.760	81.700	≡10.950
21.700	≡16.030	54.530	≡14.640	83.300	≡10.800
18.970	≡16.030	56.000	≡14.580	81.700	≡9.870
18.970	≡16.160	57.400	≡14.500	80.700	≡9.330
18.725	≡16.360	58.800	≡14.400	79.700	≡8.750
18.970	≡16.560	60.200	≡14.240	78.700	≡8.140
19.950	≡16.560	61.200	≡14.140	77.700	≡7.560
28.525	≡17.270	62.200	≡14.020	76.700	≡6.950
28.525	≡21.460	63.200	≡13.840	75.700	≡6.340
28.980	≡21.460	64.700	≡13.630	74.700	≡5.680
28.980	≡17.300	64.700	≡13.230	73.700	≡5.040
29.925	≡17.330	64.200	≡13.230	72.700	≡4.300
29.925	≡22.860	64.200	≡12.960	72.080	≡3.700
30.380	≡22.860	64.050	≡12.960		
30.380	≡17.570	64.050	≡11.940		

A = 849.005 m^2
B.L. x ⊙ =9.720 m
FR0 x ⊙ =39.658 m

17.3 Heeling Levers Due to the Wind Effect

P = 0,0514-t/m^2, Wind Pressure.

A (m^2), Projected lateral area of the portion of the ship and deck cargo above Waterline.

VCA (m), Vertical coordinate of the centre of A.

Z (m), Vertical distance from the centre of A to the centre of the underwater lateral area or approximately to a point at one half the draught (Z=VCA-(T_{mld}/2)).

T_{mld} (m), Moulded Draught

Δ (t), Displacement

T_{mld} (m)	Δ (t)	Lwl (m)	δA (m^2)	Vc (δA) (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4.300	2747.828	74.5992	7.452	4.250	804.500	10.037	7.887	0.119	0.178
4.200	2659.044	74.4427	7.436	4.150	811.952	9.984	7.884	0.124	0.186
4.100	2570.696	74.2862	7.420	4.050	819.388	9.931	7.881	0.129	0.194
4.000	2482.836	74.1106	7.406	3.950	826.808	9.878	7.878	0.135	0.202
3.900	2395.652	74.0138	7.398	3.850	834.214	9.825	7.875	0.141	0.211
3.800	2308.816	73.9547	7.393	3.750	841.812	9.772	7.872	0.148	0.221
3.700	2222.984	73.8955	7.392	3.650	849.005	9.720	7.870	0.154	0.232
3.600	2137.372	73.9467	7.397	3.550	856.397	9.668	7.868	0.162	0.243
3.500	2053.004	73.9978	7.455	3.450	863.794	9.615	7.865	0.170	0.255
3.400	1969.156	75.1054			871.249	9.562	7.862	0.179	0.268

Where,

lw_1 = P*A*Z/Δ (m)

lw_2 = 1.5*lw_1 (m)

δA = ΔT_{mld} *(Lwl_1+Lwl_2)/2 (m^2)

Vc (δA) = T_{mld2} +((T_{mld1}- T_{mld2})/2) (m)

17.4 Angle Of Roll

$\theta_1=109*k*x_1*x_2*(r*s)^{1/2}$, deg, Angle of roll to windward due to wave action

$C=0.373+0.023*(B/T_{mld})-0.043*(Lwl/100)$

$T=2*C*B/(GM)^{(1/2)}$, sec, Rolling Period

$r=0.73\pm0.6*(OG/d)$

T_{mld} = 4.300 m

T_{mld} =	**4.300 m**
B_{wl} =	13.8390 m
Cb =	0.6010
Lwl =	74.5992 m
KMt =	7.1300 m
GM_{wind} =	**0.850 m**

Calculation of parameters

i) k = 1.0

ii) x_1
B/d = 3.2184 Linear interpolation from Table 1 on page 9:
x_1 = 0.85632

iii) x_2
Cb = 0.6010 Linear interpolation from Table 2 on page 9:
x_2 = 0.9504

iv) s
B/d =3.2184
Lwl/100 = 0.7460
C = 0.4149
T = 12.457 Linear interpolation from Table 2 on page 9:
s = 0.062258

v) r

T_{mld} (m)	KM (m)	GM (m)	KG (m)	OG (m)	r
4.300	7.130	0.850	6.280	1.980	**1.006279**

Calculation of angle of roll, θ1

T_{mld} (m)	GM (m)	k	x_1	x_2	r	s	θ_1 (deg)
4.300	**0.850**	1.000	0.85632	0.9504	1.006279	0.062258	**22.20372**

T_{mld} = 4.000 m

T_{mld}	**4.000 m**
B_{wl}	13.88260 m
Cb	0.5881
Lwl	74.111 m
KMt	7.2800 m
GM_{wind} =	**0.962 m**

Calculation of parameters

i) k = 1.0

ii) x_1
B/d = 3.4565 Linear interpolation from Table 1 on page 9:
x_1 = 0.8087

iii) x_2
Cb = 0.5881 Linear interpolation from Table 2 on page 9:
x_2 = 0.93572

iv) s
B/d =3.4565
Lwl/100 = 0.7411
C = 0.4206
T = 11.859 Linear interpolation from Table 2 on page 9:
s = 0.065987

v) r

T_{mld} (m)	KM (m)	GM (m)	KG (m)	OG (m)	r
4.000	7.280	0.9620	6.318	2.318	**1.00777**

Calculation of angle of roll, θ1

T_{mld} (m)	GM (m)	k	x_1	x_2	r	s	θ_1 (deg)
4.000	**0.962**	1.000	0.8087	0.93572	1.00777	0.065987	**21.99571**

T_{mld} = 3.700 m

T_{mld}	**3.700 m**
B_{wl}	13.7876 m
Cb	0.5723
Lwl	73.8955 m
KMt	7.4390 m
GM_{wind} =	**1.177 m**

Calculation of parameters

i) k = 1.0

ii) x_1
B/d = 3.7264 Linear interpolation from Table 1 on page 9:
x_1 = 0.8000

iii) x_2
Cb = 0.5723 Linear interpolation from Table 2 on page 9:
x_2 = 0.91676

iv) s
B/d =3.7264
Lwl/100 = 0.7390
C = 0.4269
T = 10.851 Linear interpolation from Table 2 on page 9:
s = 0.073043

v) r

T_{mld} (m)	KM (m)	GM (m)	KG (m)	OG (m)	r
3.700	7.439	1.177	6.262	2.562	**1.145459**

Calculation of angle of roll, θ1

T_{mld} (m)	GM (m)	k	x_1	x_2	r	s	θ_1 (deg)
3.700	**1.177**	1.000	0.8000	0.91676	1.145459	0.073043	**23.12337**

T_{mld} = 3.400 m

T_{mld}	**3.400 m**
B_{wl}	13.7316 m
Cb	0.5463
Lwl	75.1054 m
KMt	7.612 m
GM_{wind} =	**1.452 m**

Calculation of parameters

i) k = 1.0

ii) x_1
B/d = 4.0387 Linear interpolation from Table 1 on page 9:
x_1 = 0.8000

iii) x_2
Cb = 0.5463 Linear interpolation from Table 2 on page 9:
x_2 = 0.88482

iv) s
B/d =4.0387
Lwl/100 = 0.7511
C = 0.4336
T = 9.882 Linear interpolation from Table 2 on page 9:
s = 0.079826

v) r

T_{mld} (m)	KM (m)	GM (m)	KG (m)	OG (m)	r
3.400	7.612	1.452	6.160	2.760	**1.217059**

Calculation of angle of roll, θ1

T_{mld} (m)	GM (m)	k	x_1	x_2	r	s	θ_1 (deg)
3.400	**1.452**	1.000	0.8000	0.88482	1.217059	0.079826	**24.04913**

17.5 GM_{min} Required Due to the Wind Effect

T_{mld} = 4.300 m

Tmld	4,300	m
Bmld	14,000	m
Δ	2747,828	t
LW1	0,119	m
LW2	0,178	m
KMt	7,130	m
Hdeckedge	7,506	m

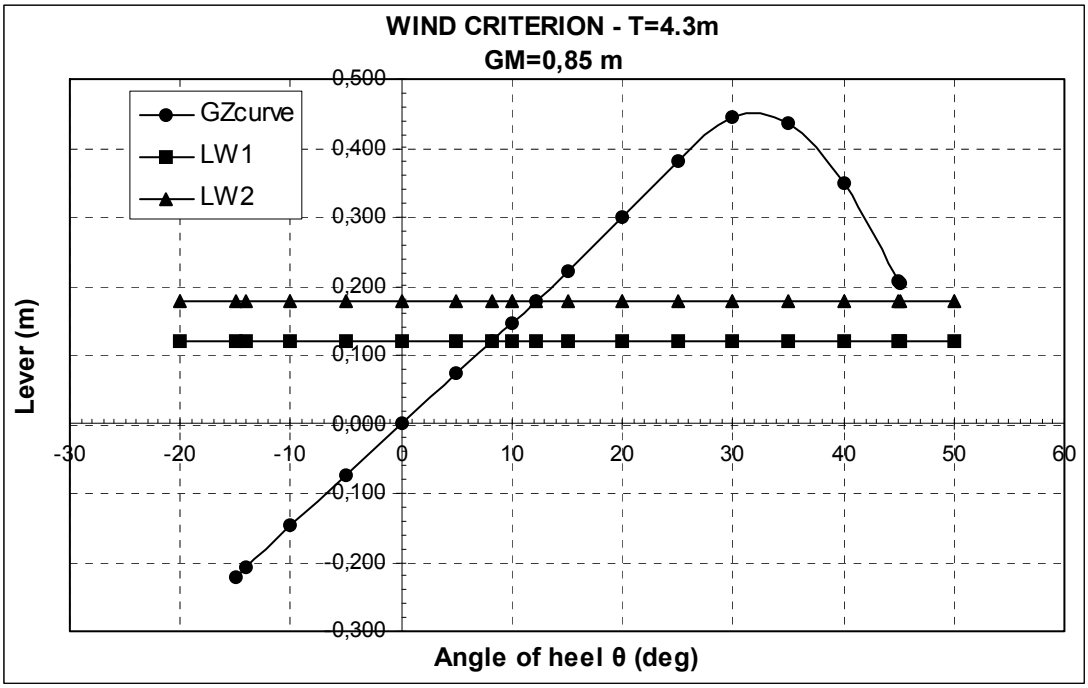
(Hdeckedge-dmld)/(Bmld/2)	0,458	rad
atan((Hdeckedge-dmld)/(Bmld/2))	0,42949	rad
atan((Hdeckedge-dmld)/(Bmld/2))	24,6078	deg

80%atan((Hdeckedge-dmld)/(Bmld/2))	19,6862	deg	>16 deg

GM (m) =	0,850	
KG (m) =	6,280	
θ0 (deg) =	8,15	The angle for which GZ=LW1
θ1 (deg) =	22,20372	Angle of Roll
θ0-θ1 (deg) =	-14,0537	
θab (deg) =	12,147	The angle for which GZ=LW2

θf (deg) =	45,135	flooding angle
θc (deg) =	45,867	second intersection of GZ and LW2

θ (deg)	θ (rad)	sinθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202			0,119	0,178	
-15	-0,26180	-0,25882		-0,223	0,119	0,178	
-14,0537	-0,24528	-0,24283		-0,208	0,119	0,178	-0,38640
-10	-0,17453	-0,17365		-0,147	0,119	0,178	-0,32549
-5	-0,08727	-0,08716		-0,074	0,119	0,178	-0,25166
0	0,00000	0,00000	0,000	0,000	0,119	0,178	-0,17800
5	0,08727	0,08716	0,621	0,074	0,119	0,178	-0,10434
8,150	0,14224	0,14177	1,010	0,119	0,119	0,178	-0,05858
10	0,17453	0,17365	1,238	0,147	0,119	0,178	-0,03051
12,147	0,21201	0,21042	1,500	0,178	0,119	0,178	0,00049
15	0,26180	0,25882	1,848	0,223	0,119	0,178	0,04462
20	0,34907	0,34202	2,448	0,300	0,119	0,178	0,12211
25	0,43633	0,42262	3,034	0,380	0,119	0,178	0,20196
30	0,52360	0,50000	3,584	0,444	0,119	0,178	0,26600
35	0,61087	0,57358	4,038	0,436	0,119	0,178	0,25794
40	0,69813	0,64279	4,386	0,349	0,119	0,178	0,17129
45	0,78540	0,70711	4,649	0,208	0,119	0,178	0,03037
45,135	0,78775	0,70877	4,654	0,203	0,119	0,178	0,02524



a=area between GZ curve and LW2 curve between θ0 - θ1= -14.0537° and θab = 12.147°
b=area between GZ curve and LW2 curve between θab = 12.147° and θf=45.135°

a = 5.035 m x deg
b = 5.455 m x deg
b-a = 0.420 m x deg

T_{mld} = 4.000 m

Tmld	4,000	m
Bmld	14,000	m
Δ	2482,836	t
LW1	0,135	m
LW2	0,202	m
KMt	7,280	m
Hdeckedge	7,506	m

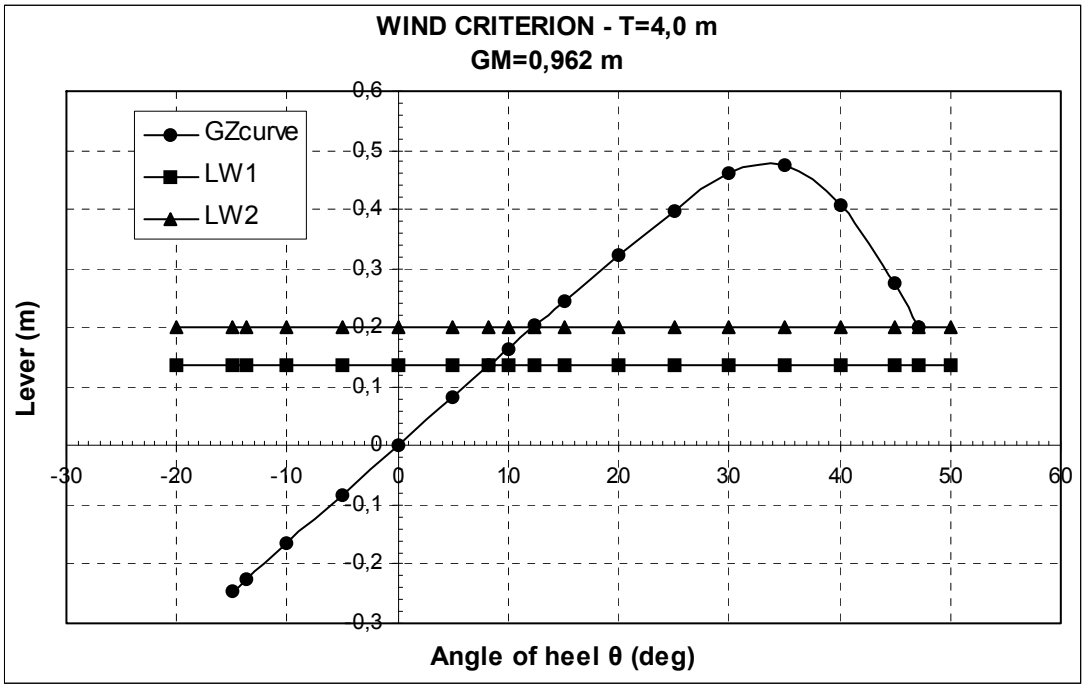
(Hdeckedge-dmld)/(Bmld/2)	0,50085714	rad
atan((Hdeckedge-dmld)/(Bmld/2))	0,46433309	rad
atan((Hdeckedge-dmld)/(Bmld/2))	26,6043262	deg

80%atan((Hdeckedge-dmld)/(Bmld/2))	21,283461	deg	>16 deg

GM (m)	0,962	
KG (m)	6,318	
θ0	8,242	The angle for which GZ=LW1
θ1	21,996	Angle of Roll
θ0-θ1	-13,75371	
θab	12,435	The angle for which GZ=LW2

θf (deg) =	49,509	flooding angle
θc (deg) =	47,130	second intersection of GZ and LW2

θ (deg)	θ (rad)	sinθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,349066	-0,342020			0,135	0,202	
-15	-0,261799	-0,258819		-0,245	0,135	0,202	
-13,754	-0,240048	-0,237749		-0,225	0,135	0,202	-0,426868
-10	-0,174533	-0,173648		-0,165	0,135	0,202	-0,366891
-5	-0,087266	-0,087156		-0,083	0,135	0,202	-0,285350
0	0,000000	0,000000	0	0,000	0,135	0,202	-0,202000
5	0,087266	0,087156	0,634	0,083	0,135	0,202	-0,118650
8,242	0,143850	0,143354	1,041	0,135	0,135	0,202	-0,066518
10	0,174533	0,173648	1,262	0,165	0,135	0,202	-0,037109
12,435	0,217032	0,215332	1,563	0,202	0,135	0,202	0,000499
15	0,261799	0,258819	1,88	0,245	0,135	0,202	0,042781
20	0,349066	0,342020	2,483	0,322	0,135	0,202	0,120117
25	0,436332	0,422618	3,066	0,396	0,135	0,202	0,193898
30	0,523599	0,500000	3,619	0,460	0,135	0,202	0,258000
35	0,610865	0,573576	4,100	0,476	0,135	0,202	0,274144
40	0,698132	0,642788	4,468	0,407	0,135	0,202	0,204868
45	0,785398	0,707107	4,742	0,274	0,135	0,202	0,072499
47,130	0,822574	0,732899	4,966	0,287	0,135	0,202	0,085492



a=area between GZ curve and LW2 curve between θ0 - θ1= -13.7537° and θab = 12.435°
b=area between GZ curve and LW2 curve between θab = 12.435° and θc=46.130°
a = 5.574 m x deg
b = 5.772 m x deg
b-a = 0.198 m x deg

T_{mld} = 3.700 m

Tmld	3,700	m
Bmld	14,000	m
Δ	2222,984	t
LW1	0,154	m
LW2	0,232	m
KMt	7,439	m
Hdeckedge	7,506	m

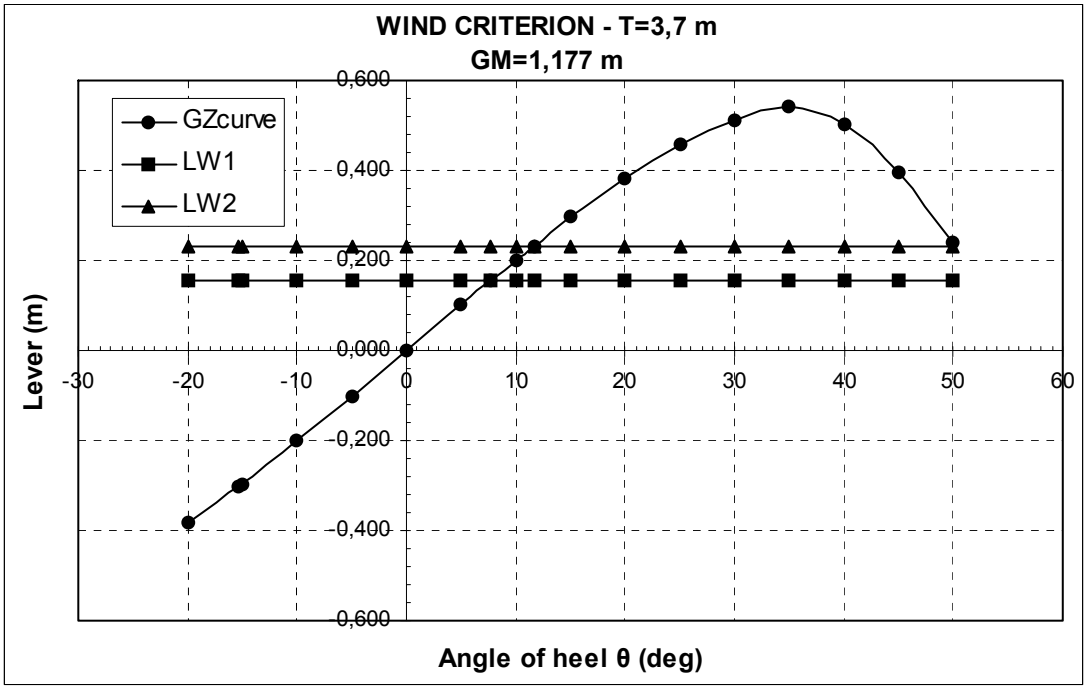
(Hdeckedge-dmld)/(Bmld/2)		0,54371429	rad
atan((Hdeckedge-dmld)/(Bmld/2))		0,49800452	rad
atan((Hdeckedge-dmld)/(Bmld/2))		28,5335572	deg

80%atan((Hdeckedge-dmld)/(Bmld/2))	22,8268458	deg	>16 deg

GM (m)	1,177	
KG (m)	6,262	
θ0	7,668	The angle for which GZ=LW1
θ1	23,088	Angle of Roll
θ0-θ1	-15,41957	
θab	11,691	The angle for which GZ=LW2

θf (deg) =	54,086	flooding angle
θc (deg)	>50	second intersection of GZ and LW2

θ (deg)	θ (rad)	sinθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,349066	-0,342020		-0,383	0,154	0,232	
-15,420	-0,269122	-0,265885		-0,304	0,154	0,232	-0,535575
-15	-0,261799	-0,258819		-0,296	0,154	0,232	-0,528275
-10	-0,174533	-0,173648		-0,202	0,154	0,232	-0,433615
-5	-0,087266	-0,087156		-0,102	0,154	0,232	-0,334231
0	0,000000	0,000000	0	0,000	0,154	0,232	-0,232000
5	0,087266	0,087156	0,648	0,102	0,154	0,232	-0,129769
7,668	0,133832	0,133433	0,990	0,154	0,154	0,232	-0,077518
10	0,174533	0,173648	1,289	0,202	0,154	0,232	-0,030385
11,691	0,204046	0,202633	1,501	0,232	0,154	0,232	0,000499
15	0,261799	0,258819	1,917	0,296	0,154	0,232	0,064275
20	0,349066	0,342020	2,525	0,383	0,154	0,232	0,151270
25	0,436332	0,422618	3,104	0,458	0,154	0,232	0,225564
30	0,523599	0,500000	3,644	0,513	0,154	0,232	0,281000
35	0,610865	0,573576	4,134	0,542	0,154	0,232	0,310264
40	0,698132	0,642788	4,529	0,504	0,154	0,232	0,271864
45	0,785398	0,707107	4,824	0,396	0,154	0,232	0,164097
50	0,872665	0,766044	5,037	0,240	0,154	0,232	0,008030



a=area between GZ curve and LW2 curve between θ0 - θ1= -15.420° and θab = 11.691°
b=area between GZ curve and LW2 curve between θab = 11.691° and 50°

a = 7.293 m x deg
b = 7.421 m x deg
b-a = 0.128 m x deg

T_{mld} = 3.400 m

Tmld	3,400	m
Bmld	14,000	m
Δ	1969,156	t
LW1	0,179	m
LW2	0,268	m
KMt	7,612	m
Hdeckedge	7,506	m

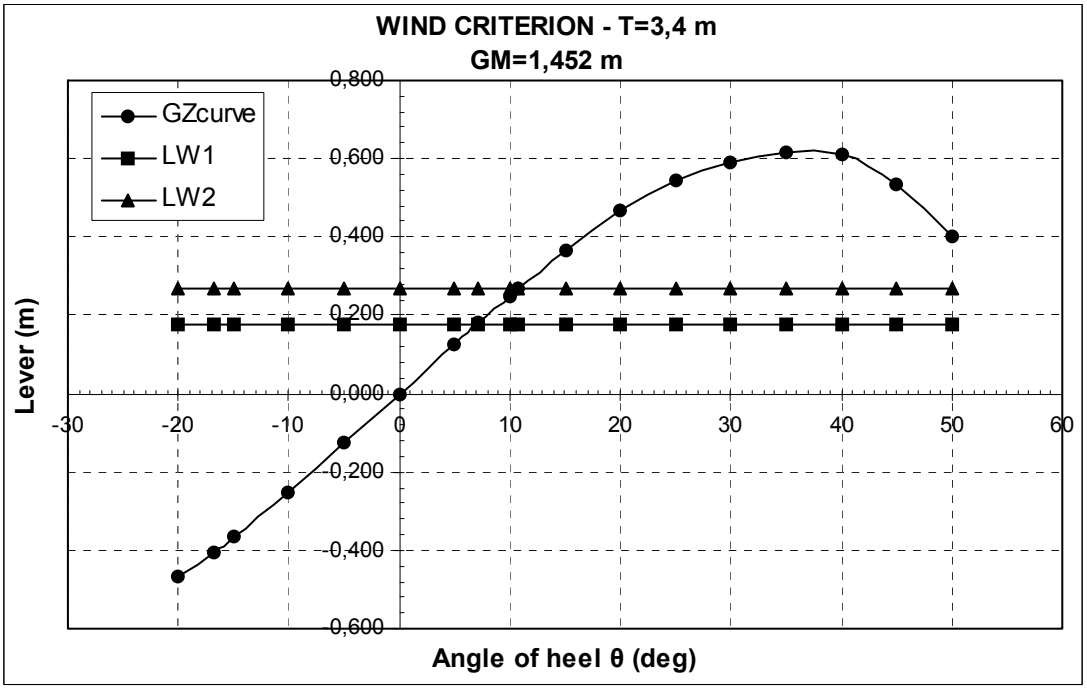
(Hdeckedge-dmld)/(Bmld/2)	0,58657143	rad
atan((Hdeckedge-dmld)/(Bmld/2))	0,53048703	rad
atan((Hdeckedge-dmld)/(Bmld/2))	30,394668	deg

80%atan((Hdeckedge-dmld)/(Bmld/2))	24,3157344	deg	>16 deg

GM (m)	1,452	
KG (m)	6,160	
θ0	7,178	The angle for which GZ=LW1
θ1	24,0491	Angle of Roll
θ0-θ1	-16,87113	
θab	10,809	The angle for which GZ=LW2

θf (deg) =	58,817	flooding angle
θc (deg)	>50	second intersection of GZ and LW2

θ (deg)	θ (rad)	sinθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,349066	-0,342020		-0,467	0,179	0,268	
-16,8711	-0,294457	-0,290220		-0,404	0,179	0,268	-0,660000
-15	-0,261799	-0,258819		-0,367	0,179	0,268	-0,634675
-10	-0,174533	-0,173648		-0,250	0,179	0,268	-0,518327
-5	-0,087266	-0,087156		-0,126	0,179	0,268	-0,394121
0	0,000000	0,000000	0,000	0,000	0,179	0,268	-0,268000
5	0,087266	0,087156	0,663	0,126	0,179	0,268	-0,141879
7,178	0,125280	0,124952	0,949	0,179	0,179	0,268	-0,089000
10	0,174533	0,173648	1,320	0,250	0,179	0,268	-0,017673
10,809	0,188653	0,187536	1,424	0,268	0,179	0,268	0,000494
15	0,261799	0,258819	1,961	0,367	0,179	0,268	0,098675
20	0,349066	0,342020	2,574	0,467	0,179	0,268	0,199156
25	0,436332	0,422618	3,146	0,543	0,179	0,268	0,274671
30	0,523599	0,500000	3,669	0,589	0,179	0,268	0,321000
35	0,610865	0,573576	4,147	0,614	0,179	0,268	0,345769
40	0,698132	0,642788	4,568	0,608	0,179	0,268	0,340428
45	0,785398	0,707107	4,889	0,533	0,179	0,268	0,265222
50	0,872665	0,766044	5,122	0,403	0,179	0,268	0,135166

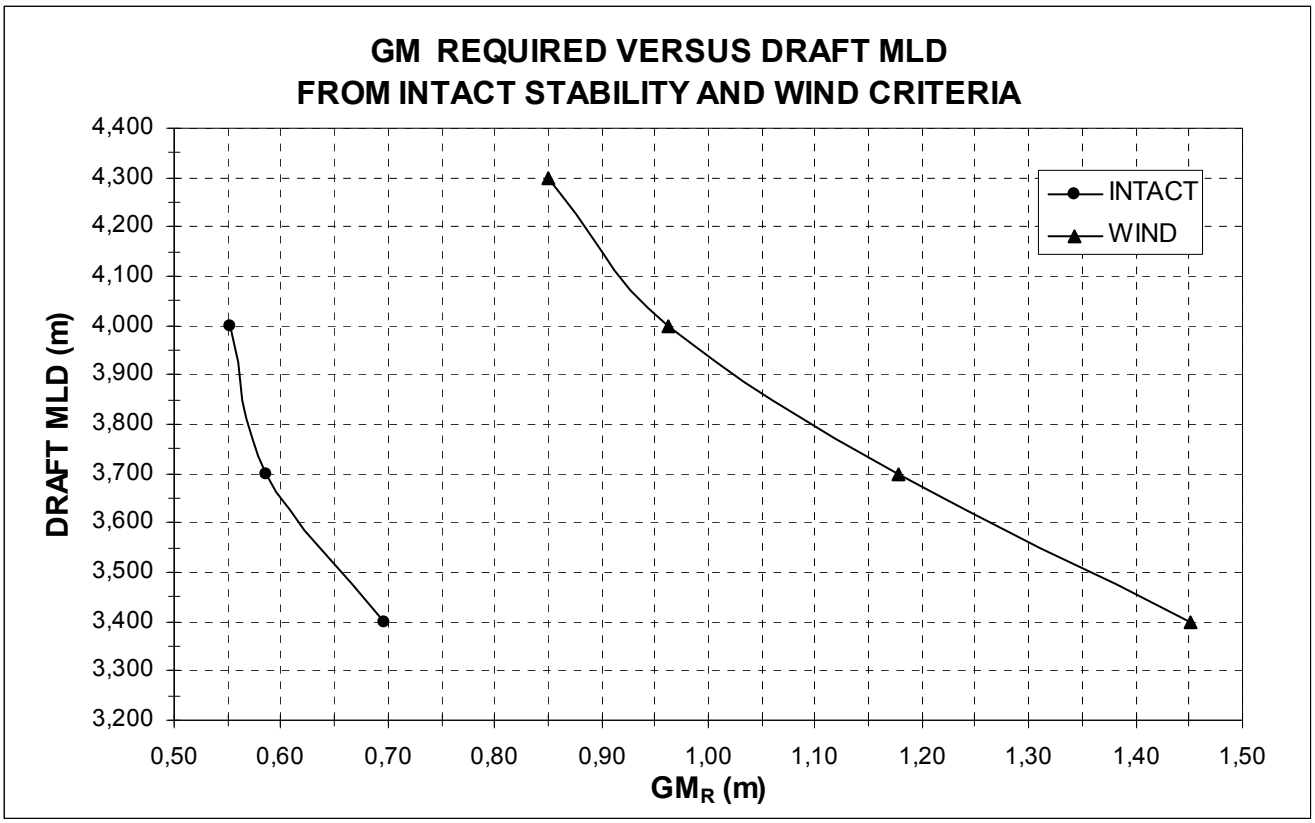


a=area between GZ curve and LW2 curve between θ0 - θ1= -16.8711° and θab = 10.809°
b=area between GZ curve and LW2 curve between θab = 10.809° and 50°

a = 9.460 m x deg
b = 9.619 m x deg
b-a = 0.159 m x deg

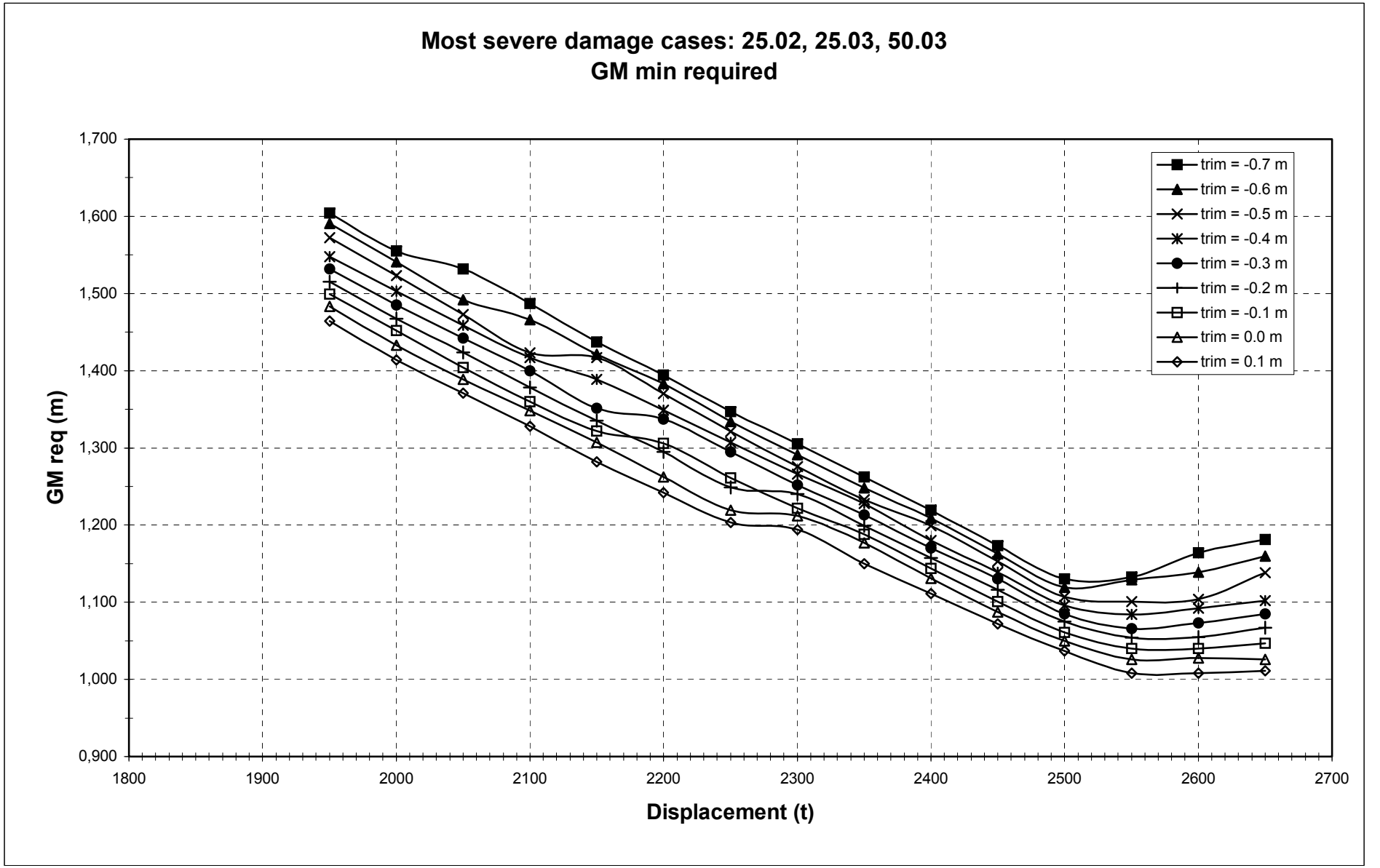
18. INTACT STABILITY & WIND:CURVES OF GM_{min} REQUIRED Versus T_{mld}

Tmld	GM_R Intact	GM_R Wind
4,300	0,550	0,850
4,000	0,553	0,962
3,700	0,587	1,177
3,400	0,697	1,452



19. DAMAGE STABILITY: GM_{min} REQUIRED AND/OR KG_{max} ALLOWABLE VERSUS DISPLACEMENT (PARAMETER: trim)

		FROM DAMAGE STABILITY, F=1								
		TRIM IN [m] (+F, -A)								
EVEN KEEL		-0,700	-0,600	-0,500	-0,400	-0,300	-0,200	-0,100	0,000	0,100
Δ	Tmld	GM min REQUIRED / KG max ALLOWABLE								
		DAMAGE CASE								
[t]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
1950	3,374	1,604 / 6,173	1,591 / 6,168	1,572 / 6,167	1,548 / 6,164	1,532 / 6,161	1,515 / 6,159	1,499 / 6,155	1,483 / 6,154	1,464 / 6,151
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2000	3,435	1,555 / 6,177	1,541 / 6,171	1,523 / 6,170	1,503 / 6,169	1,485 / 6,167	1,467 / 6,166	1,452 / 6,161	1,433 / 6,160	1,414 / 6,159
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2050	3,495	1,532 / 6,154	1,492 / 6,176	1,473 / 6,175	1,459 / 6,173	1,442 / 6,172	1,424 / 6,171	1,404 / 6,171	1,389 / 6,170	1,371 / 6,170
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2100	3,554	1,487 / 6,157	1,466 / 6,159	1,423 / 6,182	1,417 / 6,180	1,400 / 6,179	1,378 / 6,182	1,360 / 6,180	1,348 / 6,181	1,328 / 6,182
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2150	3,612	1,437 / 6,164	1,421 / 6,161	1,417 / 6,161	1,389 / 6,161	1,351 / 6,188	1,335 / 6,191	1,322 / 6,188	1,307 / 6,190	1,282 / 6,191
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2200	3,671	1,394 / 6,166	1,383 / 6,165	1,370 / 6,165	1,349 / 6,166	1,337 / 6,167	1,295 / 6,196	1,306 / 6,169	1,262 / 6,199	1,242 / 6,200
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2250	3,730	1,347 / 6,171	1,334 / 6,171	1,321 / 6,172	1,307 / 6,173	1,295 / 6,173	1,249 / 6,206	1,261 / 6,180	1,219 / 6,209	1,203 / 6,210
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2300	3,788	1,305 / 6,173	1,291 / 6,175	1,276 / 6,178	1,266 / 6,180	1,252 / 6,183	1,240 / 6,183	1,222 / 6,186	1,212 / 6,189	1,194 / 6,193
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2350	3,845	1,262 / 6,178	1,248 / 6,180	1,233 / 6,183	1,228 / 6,186	1,213 / 6,189	1,199 / 6,191	1,188 / 6,194	1,177 / 6,198	1,150 / 6,202
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2400	3,902	1,219 / 6,184	1,209 / 6,187	1,199 / 6,190	1,180 / 6,193	1,170 / 6,197	1,157 / 6,202	1,144 / 6,206	1,131 / 6,210	1,111 / 6,214
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2450	3,960	1,173 / 6,193	1,163 / 6,195	1,153 / 6,198	1,139 / 6,201	1,130 / 6,204	1,116 / 6,210	1,101 / 6,215	1,087 / 6,221	1,072 / 6,226
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2500	4,017	1,130 / 6,197	1,119 / 6,202	1,107 / 6,207	1,096 / 6,212	1,085 / 6,217	1,075 / 6,220	1,061 / 6,225	1,050 / 6,230	1,037 / 6,235
		50.03	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*	*50.03*
2550	4,076	1,133 / 6,161	1,129 / 6,158	1,101 / 6,179	1,084 / 6,194	1,066 / 6,206	1,054 / 6,211	1,040 / 6,216	1,026 / 6,228	1,008 / 6,238
		25.02	*25.03*	*25.02*	*25.02*	*25.03*	*25.02*	*25.02*	*25.02*	*25.03*
2600	4,133	1,164 / 6,096	1,139 / 6,115	1,104 / 6,142	1,092 / 6,151	1,073 / 6,167	1,055 / 6,181	1,040 / 6,192	1,028 / 6,191	1,008 / 6,207
		25.03	*25.03*	*25.02*	*25.02*	*25.02*	*25.03*	*25.03*	*25.02*	*25.03*
2650	4,190	1,181 / 6,046	1,160 / 6,064	1,138 / 6,082	1,102 / 6,111	1,085 / 6,124	1,067 / 6,137	1,047 / 6,154	1,026 / 6,167	1,011 / 6,177
		25.03	*25.03*	*25.03*	*25.02*	*25.02*	*25.02*	*25.03*	*25.03*	*25.03*


Most severe damage cases: 25.02, 25.03, 50.03
GM min required
GM req (m)
Displacement (t)
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
0,900
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
trim = -0.7 m
trim = -0.6 m
trim = -0.5 m
trim = -0.4 m
trim = -0.3 m
trim = -0.2 m
trim = -0.1 m
trim = 0.0 m
trim = 0.1 m

20. LOADING CONDITIONS

20.1 MAX DRAFT CONDITION

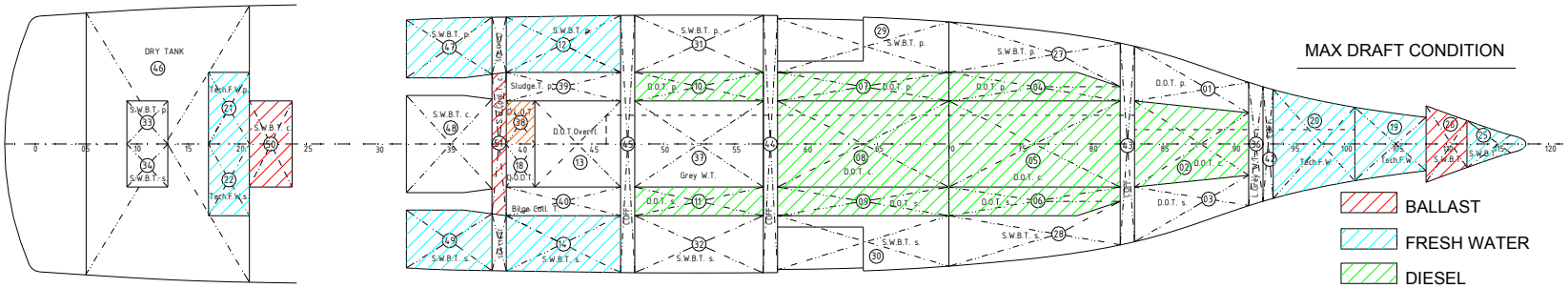
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)					
PROVISIONS	99	14,841	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					
D.B.-D.O. OVERFLOW [C] **No 13**					
D.B.-D.O.T. [P], **No 10**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [S], **No 11**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [P], **No 07**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [S], **No 09**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [C], **No 08**	98	38,853	0,814	4,560	34,483
D.B.-D.O.T. [P], **No 04**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [S], **No 06**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [C], **No 05**	98	38,453	0,820	12,937	34,483
D.B.-D.O.T. [P], **No 01**	emptying				5,201
D.B.-D.O.T. [S], **No 03**	emptying				5,201
D.B.-D.O.T. [C], **No 02**	98	22,681	0,884	20,489	18,397
TOTAL D.B. DIESEL OIL TANKS	92,65	**166,537**	**0,916**	**8,845**	**106,269**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	100	25,200	5,800	-28,665	6,860
P.W.T. [S], **No 24**	100	25,200	5,800	-28,665	6,860
F.W.T. [P], **No 21**	100	14,577	2,451	-26,511	7,146
F.W.T. [S], **No 22**	100	14,577	2,451	-26,511	7,146
DB-FWT [C], **No 20**	82,15	14,500	0,996	26,537	28,033
DB-FWT [C], **No 19**	100	9,494	0,960	30,290	5,786
TOTAL F.W. TANKS		**103,548**	**3,741**	**-14,923**	**61,831**

Cont. on next page

ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**					
BWT [S], **No 34**					
D.B.-B.W.T. [C], **No 50**	filling	9,186	1,541	-24,439	11,877
D.B.-B.W.T. [C], **No 48**					
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**					
D.B.-B.W.T. [S], **No 32**					
D.B.-B.W.T. [P], **No 29**					
D.B.-B.W.T. [S], **No 30**					
D.B.-B.W.T. [P], **No 27**					
D.B.-B.W.T. [S], **No 28**					
B.W.T. [C], No **26**	filling	19,019	2,541	33,103	4,404
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**100,532**	**1,689**	**4,827**	**16,281**
DEAD WEIGHT		435,888	2,647	-0,264	207,383
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2612,120**	**6,0461**	**-1,627**	**207,383**

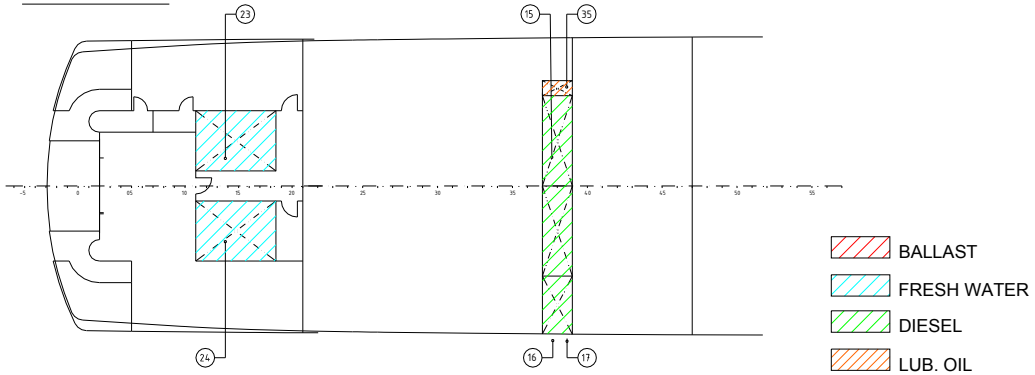
				EXTREME DRAFTS			
LCB (-A,+F)	-1,7044 m	**LCF (-A,+F)=**	-4,323 m	$T_{corresp.}$ =	4,159 m	**FSC =**	0,079393 m
TRIM =	0,0475 m	**$MCT1_{cm}$ =**	42,539 txm/cm	T_{AP} =	4,138 m	**KG_{COR} =**	6,126 m
Trim.lever =	0,0774 m	**TPcm =**	8,829 t/cm	T_{FP} =	4,186 m	**GM_{ACT} =**	1,077 m
KM_T =	7,2030 m	**$T_{\otimes\ mld}$=**	4,150 m	$T_{\otimes}$ =	4,162 m		

TANK PLAN



MAX DRAFT CONDITION

LOWER DECK

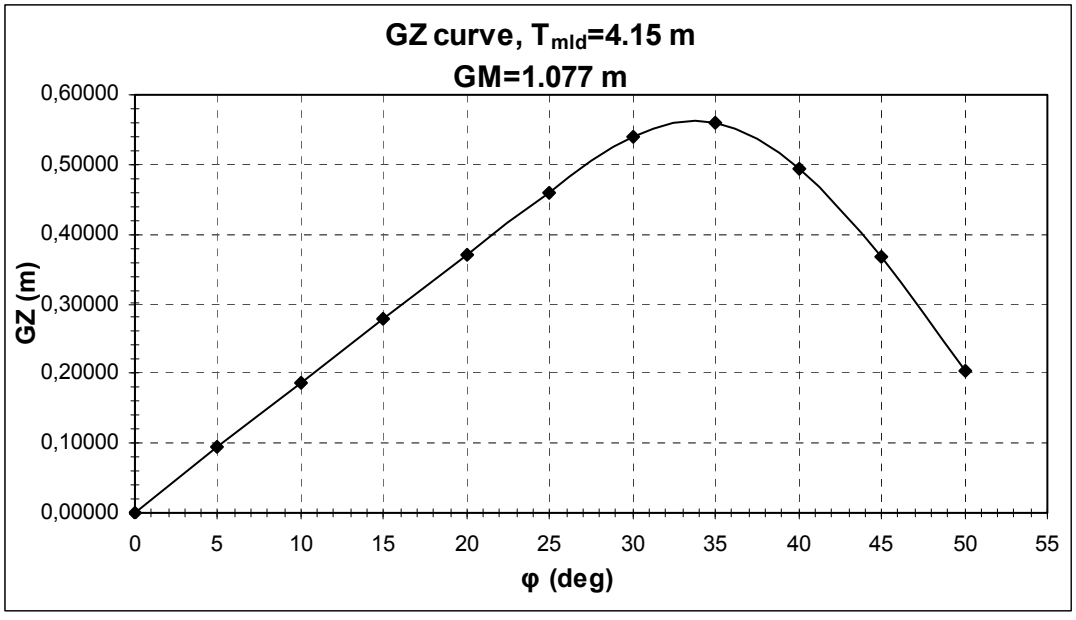


20.1.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

Tmld =	4,150	m
Δ =	2612,120	t
KM =	7,203	m
GM_{COR} =	1,077	m
KG_{COR} =	6,126	m

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,627	0,09348
10	0,17365	1,249	0,18566
15	0,25882	1,863	0,27755
20	0,34202	2,464	0,36925
25	0,42262	3,049	0,46011
30	0,50000	3,604	0,54107
35	0,57358	4,072	0,55848
40	0,64279	4,430	0,49240
45	0,70711	4,699	0,36702
50	0,76604	4,897	0,20408
55	0,81915	5,034	0,01614
60	0,86603	5,117	-0,18840



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09348	4	0,37394
10	0,18566	2	0,37132
15	0,27755	4	1,11018
20	0,36925	2	0,73851
25	0,46011	4	1,84044
30	0,54107	1	0,54107
		Σ(GZ x SM)	4,97546

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4,97546 =
= 8,292 m-deg
= **0.14473 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09348	4	0,37394
10	0,18566	2	0,37132
15	0,27755	4	1,11018
20	0,36925	2	0,73851
25	0,46011	4	1,84044
30	0,54107	2	1,08214
35	0,55848	4	2,23391
40	0,49240	1	0,49240
		Σ(GZ x SM)	8,242839

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,242839 =
= 13,73806 m-deg
= **0.2398 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,44606 m-deg =
0.0951 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.541m > 0.2 m

3. maximum GZ
GZ_{max} at ~34°

4. Initial GM

GM = 1.077 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2612.120 \times 1.077}$ = ATAN 0.012477

$\rightarrow$ **φ = 0.715° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.364 m
$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.364}$ 2612.120 (6.126-(4.15 / 2)) $\rightarrow$
$\rightarrow$ M_R = 217.692 t x m

tanφ = M_R / ΔxGM_{COR} = 217.692 / (2612.120 x 1.077) = 0.07738

$\rightarrow$ $\rightarrow$ **φ = 4.425° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in Section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Max Draft Condition** are given below:

Tmld	4,15	m	Draught
B	13,8360	m	Breadth at draught d
Cb	0,5945		Block coefficient
Lwl	74,3640	m	Waterline Length
KMt	7,2030	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,150	2612,120	74,364	815,670	9,957	7,882	0,127	0,190

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,077	6,126	1,000	0,83320	0,94340	1,01569	11,138	0,07103	**23,01388**

Deck edge immersion

Bmld	14,000	m
Tmld	4,150	m
Δ	2612,120	t
LW1	0,127	m
LW2	0,190	m
KMt	7,203	m
Hdeckedge	7,506	m

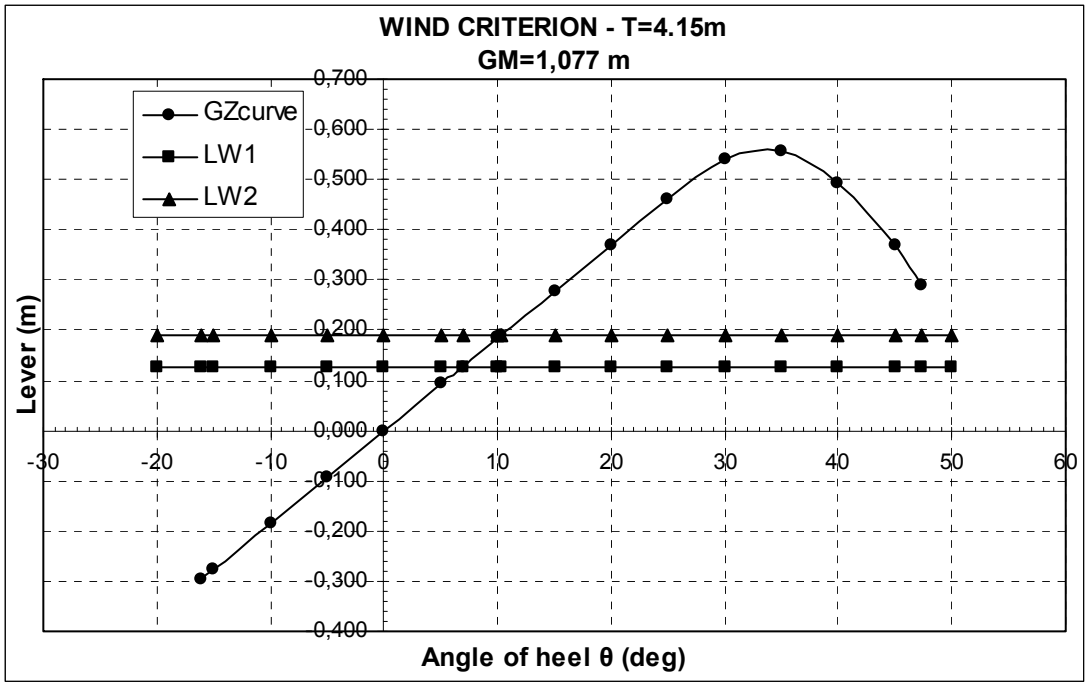
$(Hdeckedge-T_{mld})/(B_{mld}/2)$	0,479428571	rad
$atan((Hdeckedge-T_{mld})/(B_{mld}/2))$	0,447055447	rad
$atan((Hdeckedge-T_{mld})/(B_{mld}/2))$	25,6143903	deg

$80\%atan((Hdeckedge-T_{mld})/(B_{mld}/2))$	20,49151224	deg	>16 deg

GM (m)	1,077	
KG (m)	6,126	
θ0 (deg)	6,905	The angle for which GZ=LW1
θ1 (deg)	23,01388	Angle of Roll
θ0-θ1 (deg)	-16,10888	
θab (deg)	10,300	The angle for which GZ=LW2

θf (deg)	47,306	flooding angle
θc (deg)	> 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,369	0,127	0,190	
-16,10888	-0,28115	-0,27746		-0,298	0,127	0,190	-0,488
-15	-0,26180	-0,25882		-0,277	0,127	0,190	-0,467
-10	-0,17453	-0,17365		-0,185	0,127	0,190	-0,375
-5	-0,08727	-0,08716		-0,093	0,127	0,190	-0,283
0	0,00000	0,00000	0	0,000	0,127	0,190	-0,19
5	0,08727	0,08716	0,627	0,093	0,127	0,190	-0,097
6,905	0,12051	0,12022	0,864	0,127	0,127	0,190	-0,063
10	0,17453	0,17365	1,249	0,185	0,127	0,190	-0,005
10,300	0,17977	0,17880	1,286	0,190	0,127	0,190	0,000
15	0,26180	0,25882	1,863	0,277	0,127	0,190	0,087
20	0,34907	0,34202	2,464	0,369	0,127	0,190	0,179
25	0,43633	0,42262	3,049	0,460	0,127	0,190	0,270
30	0,52360	0,50000	3,604	0,541	0,127	0,190	0,351
35	0,61087	0,57358	4,072	0,558	0,127	0,190	0,368
40	0,69813	0,64279	4,43	0,492	0,127	0,190	0,302
45	0,78540	0,70711	4,699	0,367	0,127	0,190	0,177
47,306	0,82565	0,73499	4,790	0,288	0,127	0,190	0,098
50	0,87266	0,76604	4,897	0,204	0,127	0,190	0,014



a=area between GZ curve and LW2 curve between θ0 - θ1= -16.10888° and θab = 10.300°

b=area between GZ curve and LW2 curve between θab = 10.300° and θf=47.306°
By applying Simpson's method, we get:
a = 6.436 m x deg
b = 8.640 m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Max Draft Condition:**
Δ = 2612,120 t and **trim = 0,0475 m** by bow,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,018 m for Damage Case 25.03 (See Damage Stability Booklet).

GM_{actual} = 1,077m > GM_{min} (damage)

20.2 DEPARTURE CONDITION

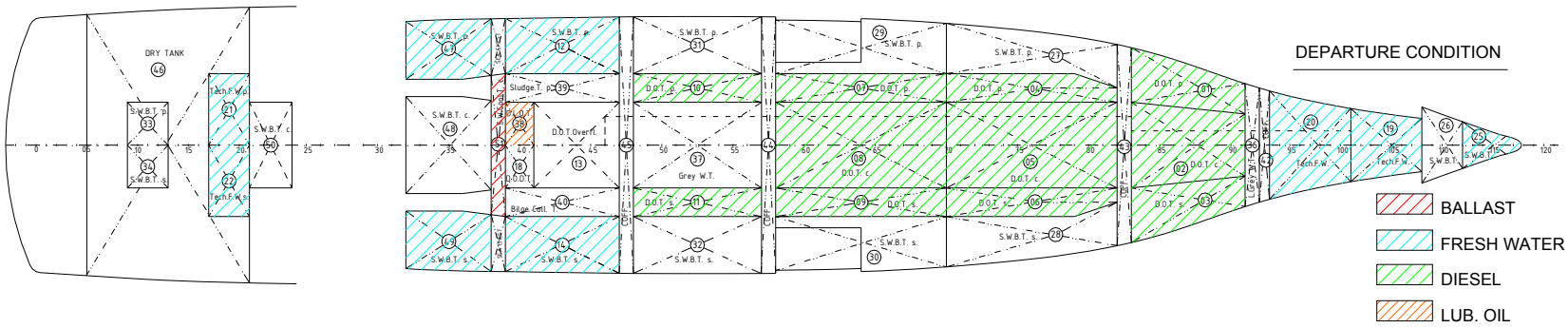
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)					
PROVISIONS	100	15,000	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					
D.B.-D.O. OVERFLOW [C] **No 13**					
D.B.-D.O.T. [P], **No 10**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [S], **No 11**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [P], **No 07**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [S], **No 09**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [C], **No 08**	98	38,853	0,814	4,560	34,483
D.B.-D.O.T. [P], **No 04**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [S], **No 06**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [C], **No 05**	98	38,453	0,820	12,937	34,483
D.B.-D.O.T. [P], **No 01**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [S], **No 03**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [C], **No 02**	98	22,681	0,884	20,489	18,397
TOTAL D.B. DIESEL OIL TANKS	98	**179,745**	**0,942**	**9,687**	**106,269**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	100	25,200	5,800	-28,665	6,860
P.W.T. [S], **No 24**	100	25,200	5,800	-28,665	6,860
F.W.T. [P], **No 21**	100	14,577	2,451	-26,511	7,146
F.W.T. [S], **No 22**	100	14,577	2,451	-26,511	7,146
DB-FWT [C], **No 20**	100	17,651	0,996	26,537	28,033
DB-FWT [C], **No 19**	100	9,494	0,960	30,290	5,786
TOTAL F.W. TANKS	100	**106,699**	**3,660**	**-13,699**	**61,831**

Cont. on next page

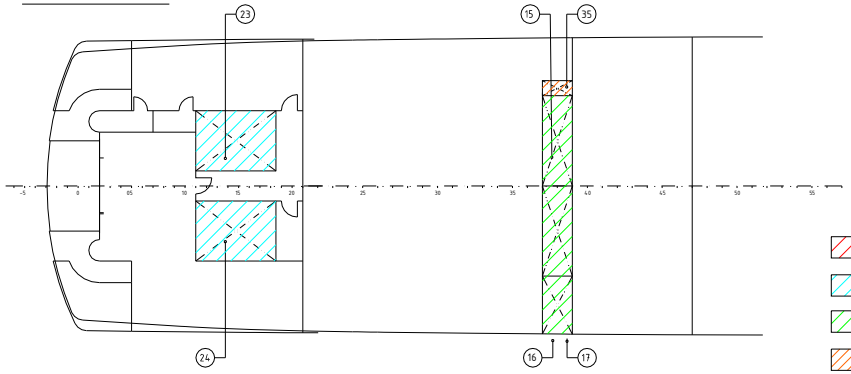
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**					
BWT [S], **No 34**					
D.B.-B.W.T. [C], **No 50**					
D.B.-B.W.T. [C], **No 48**					
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**					
D.B.-B.W.T. [S], **No 32**					
D.B.-B.W.T. [P], **No 29**					
D.B.-B.W.T. [S], **No 30**					
D.B.-B.W.T. [P], **No 27**					
D.B.-B.W.T. [S], **No 28**					
B.W.T. [C], No **26**					
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**72,327**	**1,484**	**1,108**	**0,000**
DEAD WEIGHT		424,201	2,622	-0,401	191,102
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2600,433**	**6,0572**	**-1,655**	**191,102**

				EXTREME DRAFTS			
LCB (-A,+F)	-1,6927 m	**LCF (-A,+F)=**	-4,327 m	$T_{corresp.}$ =	4,146 m	**FSC =**	0,073489 m
TRIM =	0,0228 m	**$MCT1_{cm}$ =**	42,459 txm/cm	T_{AP} =	4,136 m	**KG_{COR} =**	6,131 m
Trim.lever =	0,0372 m	**TPcm =**	8,823 t/cm	T_{FP} =	4,158 m	**GM_{ACT} =**	1,079 m
KM_T =	7,2100 m	**$T_{\otimes\ mld}$=**	4,135 m	$T_{\otimes}$ =	4,147 m		

TANK PLAN



LOWER DECK

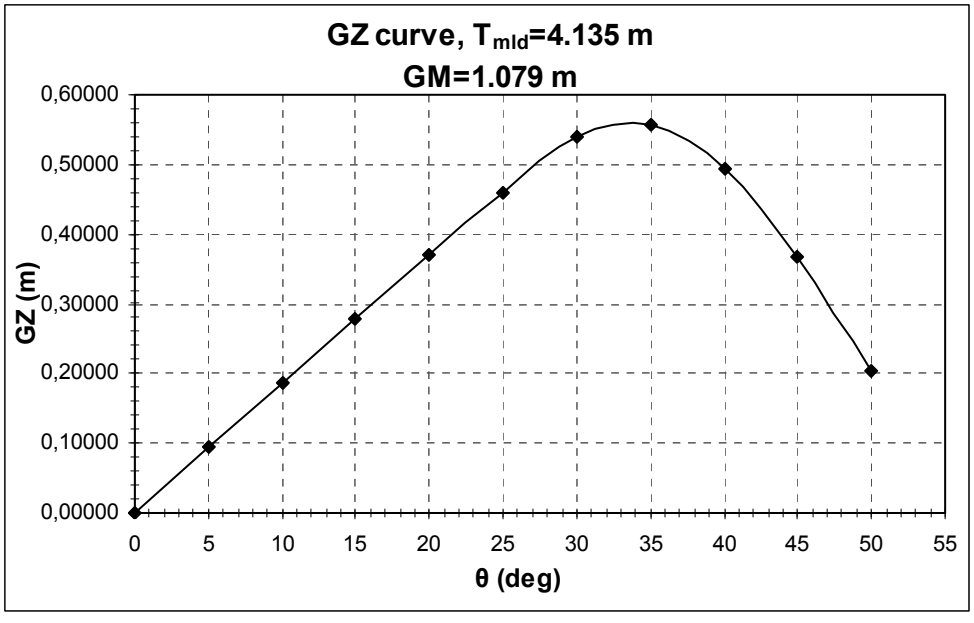


20.2.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

Tmld=	4,135	m
Δ=	2600,433	t
KM=	7,210	m
GM_{COR} =	1,079	m
KG_{COR} =	6,131	m

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,628	0,09363
10	0,17365	1,251	0,18632
15	0,25882	1,865	0,27813
20	0,34202	2,467	0,37001
25	0,42262	3,051	0,45988
30	0,50000	3,606	0,54045
35	0,57358	4,075	0,55830
40	0,64279	4,434	0,49293
45	0,70711	4,703	0,36757
50	0,76604	4,901	0,20422
55	0,81915	5,039	0,01661
60	0,86603	5,121	-0,18877



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09363	4	0,37452
10	0,18632	2	0,37264
15	0,27813	4	1,11251
20	0,37001	2	0,74003
25	0,45988	4	1,83950
30	0,54045	1	0,54045
		Σ(GZ x SM)	4,97965

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4,97965 =
= 8,29942 m-deg
= **0.14485 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09363	4	0,37452
10	0,18632	2	0,37264
15	0,27813	4	1,11251
20	0,37001	2	0,74003
25	0,45988	4	1,83950
30	0,54045	2	1,08090
35	0,55830	4	2,23320
40	0,49293	1	0,49293
		Σ(GZ x SM)	8,24623

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,24623 =
= 13,744 m-deg
= **0.23987 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,44458 m-deg =
0.0950 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.54045m > 0.2 m

3. maximum GZ
GZ_{max} at ~33.5°

4. Initial GM

GM = 1.079 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2600.433 \times 1.079}$ = ATAN 0.0125

$\rightarrow$ **φ = 0.717° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.339 m

$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.339}$ 2600.433 (6.131-(4.135 / 2)) $\rightarrow$

$\rightarrow$ M_R = 217.459 t x m

tanφ = M_R / ΔxGM_{COR} = 217.459 / (2600.433 x 1.079) = 0.0775

$\rightarrow$ $\rightarrow$ **φ = 4.432° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in Section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Departure Condition** are given below:

T_{mld}	4,135	m	Moulded Draft
B	13,8350	m	Breadth at T_{mld}
Cb	0,5938		Block coefficient
Lwl	74,3390	m	Waterline Length
KMt	7,2100	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,135	2600,433	74,339	816,785	9,949	7,882	0,127	0,191

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,079	6,131	1,000	0,830834	0,94256	1,01962515	11,134	0,07106	**22,97644**

Deck edge immersion

Bmld	14,00	m
Tmld	4,135	m
Δ	2600,433	t
LW1	0,127	m
LW2	0,191	m
KMt	7,210	m
Hdeckedge	7,506	m

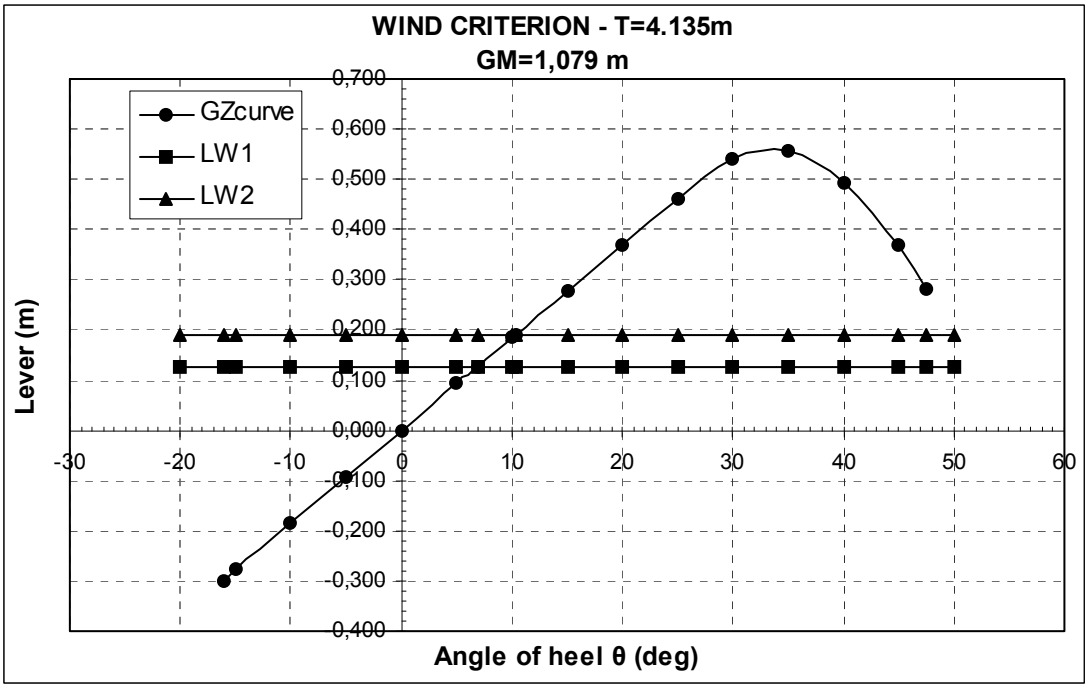
(Hdeckedge-T_{mld})/(B_{mld}/2)	0,481571429	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	0,448796361	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	25,71413734	deg

80%atan((Hdeckedge-T_{mld})/(B_{mld}/2))	20,57130987	deg	>16 deg

GM (m)	1,079	
KG (m)	6,131	
θ0 (deg)	6,862	The angle for which GZ=LW1
θ1 (deg)	22,97644	Angle of Roll
θ0-θ1 (deg)	-16,11444	
θab (deg)	10,294	The angle for which GZ=LW2

θf (deg)	47,493	flooding angle
θc (deg)	> 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,370	0,127	0,191	
-16,11444	-0,28125	-0,27756		-0,299	0,127	0,191	-0,490
-15	-0,26180	-0,25882		-0,278	0,127	0,191	-0,469
-10	-0,17453	-0,17365		-0,186	0,127	0,191	-0,377
-5	-0,08727	-0,08716		-0,094	0,127	0,191	-0,285
0	0,00000	0,00000	0	0,000	0,127	0,191	-0,191
5	0,08727	0,08716	0,628	0,094	0,127	0,191	-0,097
6,862	0,11976	0,11948	0,860	0,127	0,127	0,191	-0,064
10	0,17453	0,17365	1,251	0,186	0,127	0,191	-0,005
10,294	0,17966	0,17870	1,287	0,191	0,127	0,191	0,000
15	0,26180	0,25882	1,865	0,278	0,127	0,191	0,087
20	0,34907	0,34202	2,467	0,370	0,127	0,191	0,179
25	0,43633	0,42262	3,051	0,460	0,127	0,191	0,269
30	0,52360	0,50000	3,606	0,540	0,127	0,191	0,349
35	0,61087	0,57358	4,075	0,558	0,127	0,191	0,367
40	0,69813	0,64279	4,434	0,493	0,127	0,191	0,302
45	0,78540	0,70711	4,703	0,368	0,127	0,191	0,177
47,493	0,82891	0,73719	4,802	0,282	0,127	0,191	0,091
50	0,87266	0,76604	4,901	0,204	0,127	0,191	0,013



a=area between GZ curve and LW2 curve between θ0 - θ1= -16.11444° and θab = 10.294°
b=area between GZ curve and LW2 curve between θab = 10.294° and θf=47.493°
By applying Simpson's method, we get:
a = 6.470 m x deg
b = 8.639m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Departure Condition:**
Δ = 2600,433 t and **trim = 0,0228 m** by bow,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,023 m for Damage Case 25.03 (See Damage Stability Booklet).

GM_{actual} = 1,079m > GM_{min} (damage)

20.3 INTERMEDIATE CONDITION 1

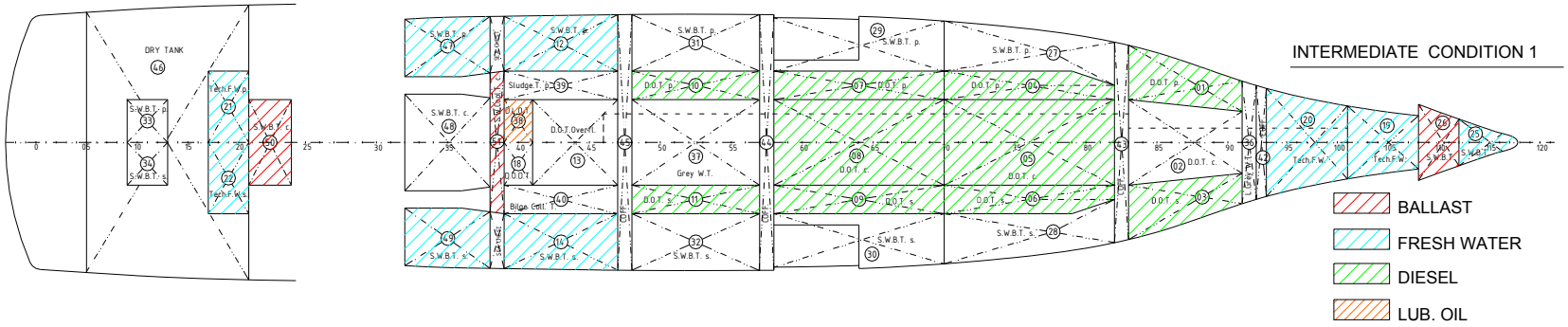
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)					
PROVISIONS	87,4	13,110	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					
D.B.-D.O. OVERFLOW [C] **No 13**					
D.B.-D.O.T. [P], **No 10**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [S], **No 11**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [P], **No 07**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [S], **No 09**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [C], **No 08**	98	38,853	0,814	4,560	34,483
D.B.-D.O.T. [P], **No 04**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [S], **No 06**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [C], **No 05**	98	38,453	0,820	12,937	34,483
D.B.-D.O.T. [P], **No 01**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [S], **No 03**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [C], **No 02**	emptying				19,027
TOTAL D.B. DIESEL OIL TANKS	87,4	**157,064**	**0,950**	**8,127**	**106,899**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	87,4	22,025	5,800	-28,665	6,860
P.W.T. [S], **No 24**	87,4	22,025	5,800	-28,665	6,860
F.W.T. [P], **No 21**	87,4	12,740	2,451	-26,511	7,146
F.W.T. [S], **No 22**	87,4	12,740	2,451	-26,511	7,146
DB-FWT [C], **No 20**	87,4	15,427	0,996	26,537	28,033
DB-FWT [C], **No 19**	87,4	8,298	0,960	30,290	5,786
TOTAL F.W. TANKS	87,4	**93,255**	**3,660**	**-13,699**	**61,831**

Cont. on next page

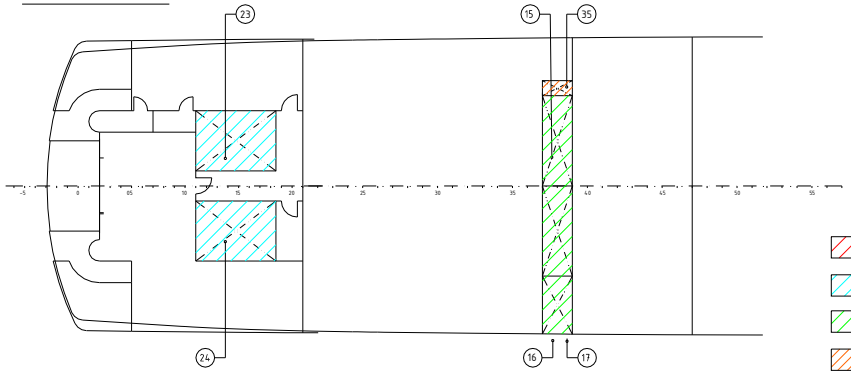
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**					
BWT [S], **No 34**					
D.B.-B.W.T. [C], **No 50**	filling	9,186	1,523	-24,355	11,877
D.B.-B.W.T. [C], **No 48**					
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**					
D.B.-B.W.T. [S], **No 32**					
D.B.-B.W.T. [P], **No 29**					
D.B.-B.W.T. [S], **No 30**					
D.B.-B.W.T. [P], **No 27**					
D.B.-B.W.T. [S], **No 28**					
B.W.T. [C], No **26**	filling	19,019	2,541	33,103	4,404
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**100,532**	**1,688**	**4,834**	**16,281**
DEAD WEIGHT		414,391	2,644	-0,062	208,013
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2590,623**	**6,0738**	**-1,606**	**208,013**

				EXTREME DRAFTS			
LCB (-A,+F)=	-1,6828 m	**LCF (-A,+F)=**	-4,331 m	$T_{corresp.}$ =	4,135 m	**FSC =**	0,080295 m
TRIM =	0,0469 m	$MCT1_{cm}$ =	42,391 txm/cm	T_{AP} =	4,114 m	KG_{COR} =	6,154 m
Trim.lever =	0,0768 m	**TPcm =**	8,817 t/cm	T_{FP} =	4,161 m	GM_{ACT} =	1,061 m
KM_T =	7,2150 m	$T_{\otimes\ mld}$=	4,125 m	$T_{\otimes}$ =	4,137 m		

TANK PLAN



LOWER DECK

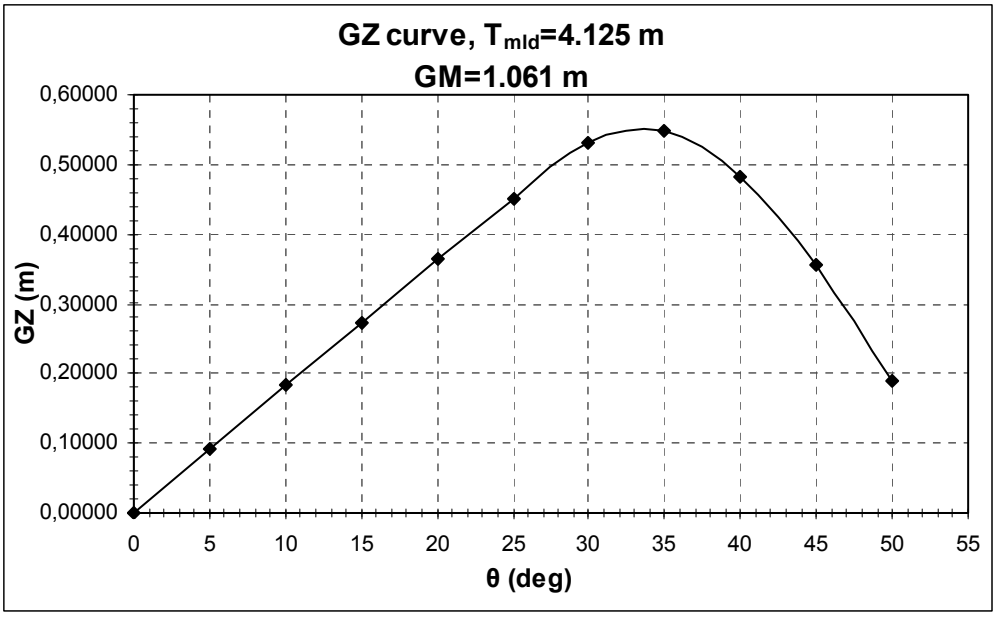


20.3.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

Tmld=	4,125
Δ=	2590,623
KM=	7,215
GM_{COR} =	1,061
KG_{COR} =	6,154

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,628	0,09202
10	0,17365	1,252	0,18312
15	0,25882	1,866	0,27335
20	0,34202	2,468	0,36352
25	0,42262	3,052	0,45133
30	0,50000	3,607	0,53013
35	0,57358	4,077	0,54727
40	0,64279	4,437	0,48110
45	0,70711	4,706	0,35465
50	0,76604	4,905	0,19033
55	0,81915	5,043	0,00150
60	0,86603	5,125	-0,20477



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09202	4	0,36807
10	0,18312	2	0,36624
15	0,27335	4	1,09341
20	0,36352	2	0,72704
25	0,45133	4	1,80533
30	0,53013	1	0,53013
		Σ(GZ x SM)	4,89022

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4,89022 =
= 8,15037 m-deg
= **0.14225 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09202	4	0,36807
10	0,18312	2	0,36624
15	0,27335	4	1,09341
20	0,36352	2	0,72704
25	0,45133	4	1,80533
30	0,53013	2	1,06025
35	0,54727	4	2,18909
40	0,48110	1	0,48110
		Σ(GZ x SM)	8.09054

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,09054 =
= 13,48423 m-deg
= **0.23534 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,33386 m-deg =
0.09309 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.53013 m > 0.2 m

3. maximum GZ
GZ_{max} at ~34.0°

4. Initial GM

GM = 1.061 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2590.623 \times 1.061}$ = ATAN 0.01277

$\rightarrow$ **φ = 0.7316° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.325 m

$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.325}$ 2590.623 (6.154-(4.125 / 2)) $\rightarrow$

$\rightarrow$ M_R = 218.173 t x m

tanφ = M_R / ΔxGM_{COR} = 218.173 / (2590.623 x 1.061) = 0.0794

$\rightarrow$ $\rightarrow$ **φ = 4.538° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in Section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Intermediate Condition 1** are given below:

T_{mld}	4,125	m	Moulded Draft
B	13,8342	m	Breadth at T_{mld}
Cb	0,5934		Block coefficient
Lwl	74,3250	m	Waterline Length
KMt	7,2150	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,125	2590,623	74,325	817,529	9,944	7,882	0,128	0,192

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,061	6,154	1,000	0,829251	0,94208	1,02512727	11,233	0,070371	**22,87101**

Deck edge immersion

BmId	14,00	m
TmId	4,125	m
Δ	2590,623	t
LW1	0,128	m
LW2	0,192	m
KMt	7,215	m
Hdeckedge	7,506	m

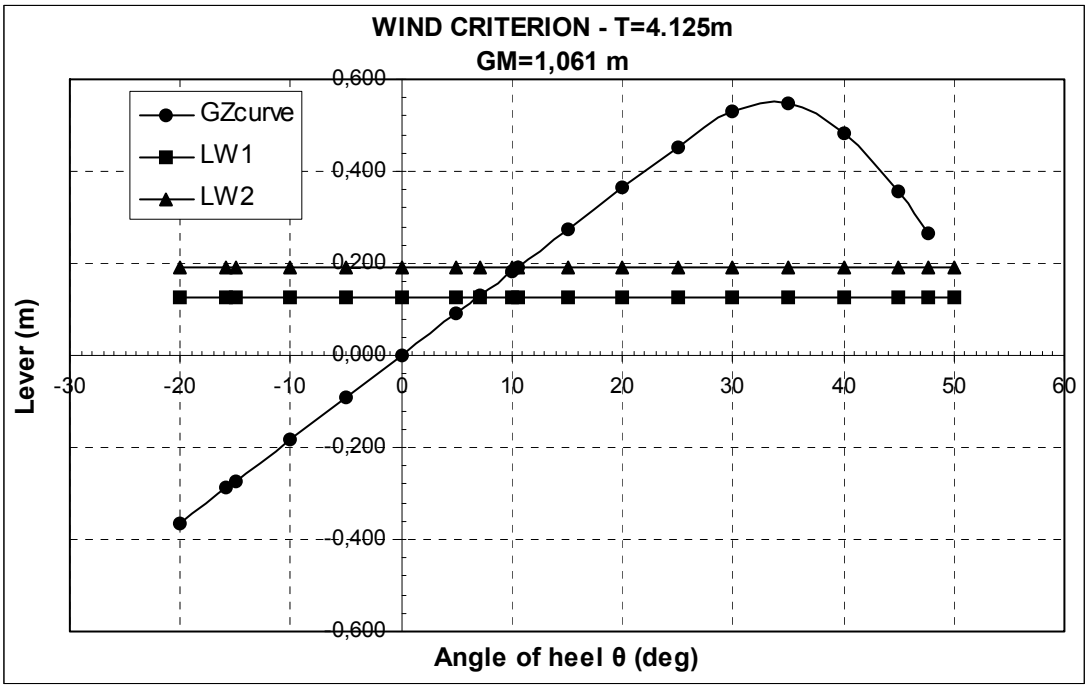
(Hdeckedge-T_{mld})/(B_{mld}/2)	0,483	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	0,449955352	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	25,78054261	deg

80%atan((Hdeckedge-T_{mld})/(B_{mld}/2))	20,62443409	deg	>16 deg

GM (m)	1,061	
KG (m)	6,154	
θ0 (deg)	7,040	The angle for which GZ=LW1
θ1 (deg)	22,87101	Angle of Roll
θ0-θ1 (deg)	-15,83101	
θab (deg)	10,533	The angle for which GZ=LW2

θf (deg)	47,650	flooding angle
θc (deg)	~ 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,363	0,128	0,192	
-15,83101	-0,27630	-0,27280		-0,288	0,128	0,192	-0,480
-15	-0,26180	-0,25882		-0,273	0,128	0,192	-0,465
-10	-0,17453	-0,17365		-0,183	0,128	0,192	-0,375
-5	-0,08727	-0,08716		-0,092	0,128	0,192	-0,284
0	0,00000	0,00000	0	0,000	0,128	0,192	-0,192
5	0,08727	0,08716	0,628	0,092	0,128	0,192	-0,100
7,040	0,12287	0,12256	0,883	0,128	0,128	0,192	-0,064
10	0,17453	0,17365	1,252	0,183	0,128	0,192	-0,009
10,533	0,18384	0,18280	1,317	0,192	0,128	0,192	0,000
15	0,26180	0,25882	1,866	0,273	0,128	0,192	0,081
20	0,34907	0,34202	2,468	0,363	0,128	0,192	0,171
25	0,43633	0,42262	3,052	0,451	0,128	0,192	0,259
30	0,52360	0,50000	3,607	0,530	0,128	0,192	0,338
35	0,61087	0,57358	4,077	0,547	0,128	0,192	0,355
40	0,69813	0,64279	4,437	0,481	0,128	0,192	0,289
45	0,78540	0,70711	4,706	0,354	0,128	0,192	0,162
47,650	0,83165	0,73904	4,811	0,263	0,128	0,192	0,071
50	0,87266	0,76604	4,905	0,191	0,128	0,192	-0,001



a=area between GZ curve and LW2 curve between θ0 - θ1= -15.83101° and θab = 10.533°
b=area between GZ curve and LW2 curve between θab = 10.533° and θf=47.650°
By applying Simpson's method, we get:
a = 6.336 m x deg
b = 8.270 m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Intermediate Condition 1:**
Δ = 2590,623 t and **trim = 0,0469 m** by bow,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,018 m for Damage Case 25.03 (See Damage Stability Booklet).

GM_{actual} = 1,061m > GM_{min} (damage)

20.4 INTERMEDIATE CONDITION 2

INTERMEDIATE CONDITION 2

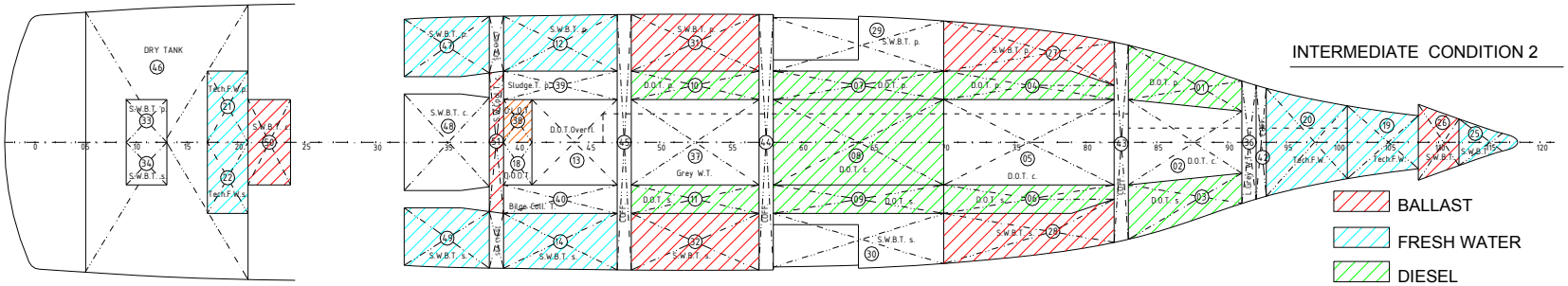
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)					
PROVISIONS	66	9,900	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					
D.B.-D.O. OVERFLOW [C] **No 13**					
D.B.-D.O.T. [P], **No 10**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [S], **No 11**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [P], **No 07**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [S], **No 09**	98	12,559	1,033	4,553	1,604
D.B.-D.O.T. [C], **No 08**	98	38,853	0,814	4,560	34,483
D.B.-D.O.T. [P], **No 04**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [S], **No 06**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [C], **No 05**	emtying				43,304
D.B.-D.O.T. [P], **No 01**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [S], **No 03**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [C], **No 02**					
TOTAL D.B. DIESEL OIL TANKS	66	**118,611**	**0,992**	**6,568**	**96,693**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	66	16,632	5,800	-28,665	6,860
P.W.T. [S], **No 24**	66	16,632	5,800	-28,665	6,860
F.W.T. [P], **No 21**	66	9,621	2,451	-26,511	7,146
F.W.T. [S], **No 22**	66	9,621	2,451	-26,511	7,146
DB-FWT [C], **No 20**	66	11,650	0,996	26,537	28,033
DB-FWT [C], **No 19**	66	6,266	0,960	30,290	5,786
TOTAL F.W. TANKS	66	**70,422**	**3,660**	**-13,699**	**61,831**

Cont. on next page

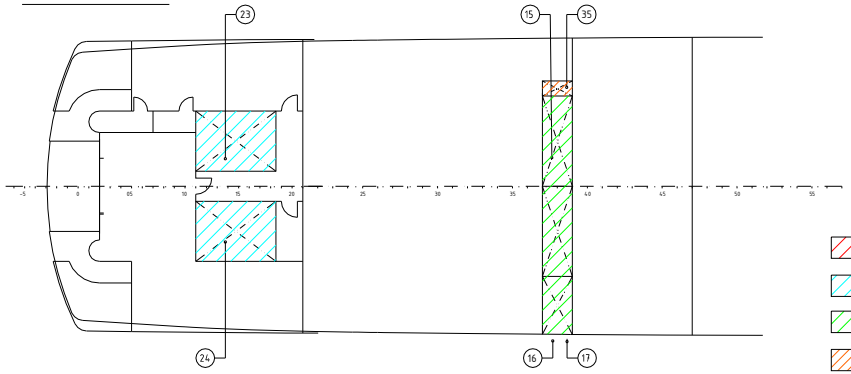
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**					
BWT [S], **No 34**					
D.B.-B.W.T. [C], **No 50**	100	9,186	1,523	-24,355	0,000
D.B.-B.W.T. [C], **No 48**					
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**	filling	14,809	1,229	-3,486	11,543
D.B.-B.W.T. [S], **No 32**	filling	14,809	1,229	-3,486	11,543
D.B.-B.W.T. [P], **No 29**					
D.B.-B.W.T. [S], **No 30**					
D.B.-B.W.T. [P], **No 27**	filling	12,749	1,283	12,594	8,016
D.B.-B.W.T. [S], **No 28**	filling	12,749	1,283	12,594	8,016
B.W.T. [C], No **26**	100	19,019	2,541	33,103	0,000
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**155,648**	**1,534**	**4,522**	**39,118**
DEAD WEIGHT		405,011	2,552	0,099	220,644
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2581,243**	**6,0719**	**-1,586**	**220,644**

				EXTREME DRAFTS			
LCB (-A,+F)=	-1,6733 m	**LCF (-A,+F)=**	-4,334 m	**$T_{corresp.}$ =**	4,124 m	**FSC =**	0,085480 m
TRIM =	0,0530 m	**$MCT1_{cm}$ =**	42,326 txm/cm	**T_{AP} =**	4,101 m	**KG_{COR} =**	6,157 m
Trim.lever =	0,0870 m	**TPcm =**	8,812 t/cm	**T_{FP} =**	4,154 m	**GM_{ACT} =**	1,063 m
KM_T =	7,2200 m	**$T_{\otimes\ mld}$=**	4,115 m	**$T_{\otimes}$ =**	4,127 m		

TANK PLAN



LOWER DECK

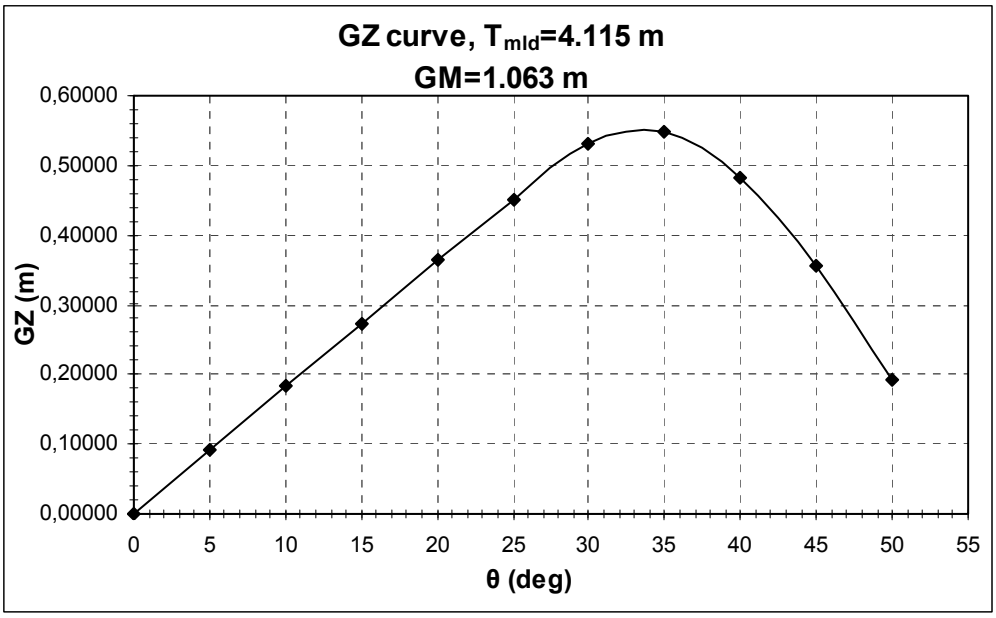


20.4.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

Tmld=	4,115	m
Δ=	2581,243	t
KM=	7,220	m
GM_{COR} =	1,063	m
KG_{COR} =	6,157	m

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,629	0,09213
10	0,17365	1,253	0,18335
15	0,25882	1,867	0,27370
20	0,34202	2,470	0,36381
25	0,42262	3,053	0,45119
30	0,50000	3,608	0,52975
35	0,57358	4,079	0,54762
40	0,64279	4,440	0,48198
45	0,70711	4,709	0,35572
50	0,76604	4,908	0,19159
55	0,81915	5,046	0,00261
60	0,86603	5,129	-0,20362



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09213	4	0,36853
10	0,18335	2	0,36670
15	0,27370	4	1,09481
20	0,36381	2	0,72762
25	0,45119	4	1,80476
30	0,52975	1	0,52975
		Σ(GZ x SM)	4,89216

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4,89216 =
= 8,15361 m-deg
= **0.14231 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09213	4	0,36853
10	0,18335	2	0,36670
15	0,27370	4	1,09481
20	0,36381	2	0,72762
25	0,45119	4	1,80476
30	0,52975	2	1,05950
35	0,54762	4	2,19047
40	0,48198	1	0,48198
		Σ(GZ x SM)	8,09436

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,09436 =
= 13,49061 m-deg
= **0.23546 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,337 m-deg =
0.09315 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.52975 m > 0.2 m

3. maximum GZ
GZ_{max} at ~34.0°

4. Initial GM

GM = 1.063 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2581.243 \times 1.063}$ = ATAN 0.01279

$\rightarrow$ **φ = 0.7329° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.310 m
$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.310}$ 2581.243 (6.157-(4.115 / 2)) $\rightarrow$
$\rightarrow$ M_R = 217.852 t x m

tanφ = M_R / ΔxGM_{COR} = 217.852 / (2581.243 x 1.063) = 0.07939

$\rightarrow$ $\rightarrow$ **φ = 4.540° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Intermediate Condition 2** are given below:

T_{mld}	4,115	m	Moulded Draft
B	13,8420	m	Breadth at T_{mld}
Cb	0,5925		Block coefficient
Lwl	74,3100	m	Waterline Length
KMt	7,2200	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,112	2581,242	74,305	818,495	9,931	7,875	0,128	0,193

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,063	6,157	1,000	0,827242	0,941	1,02773998	11,235	0,070356	**22,81605**

Deck edge immersion

BmId	14,00	m
TmId	4,115	m
Δ	2581,243	t
LW1	0,128	m
LW2	0,193	m
KMt	7,220	m
Hdeckedge	7,506	m

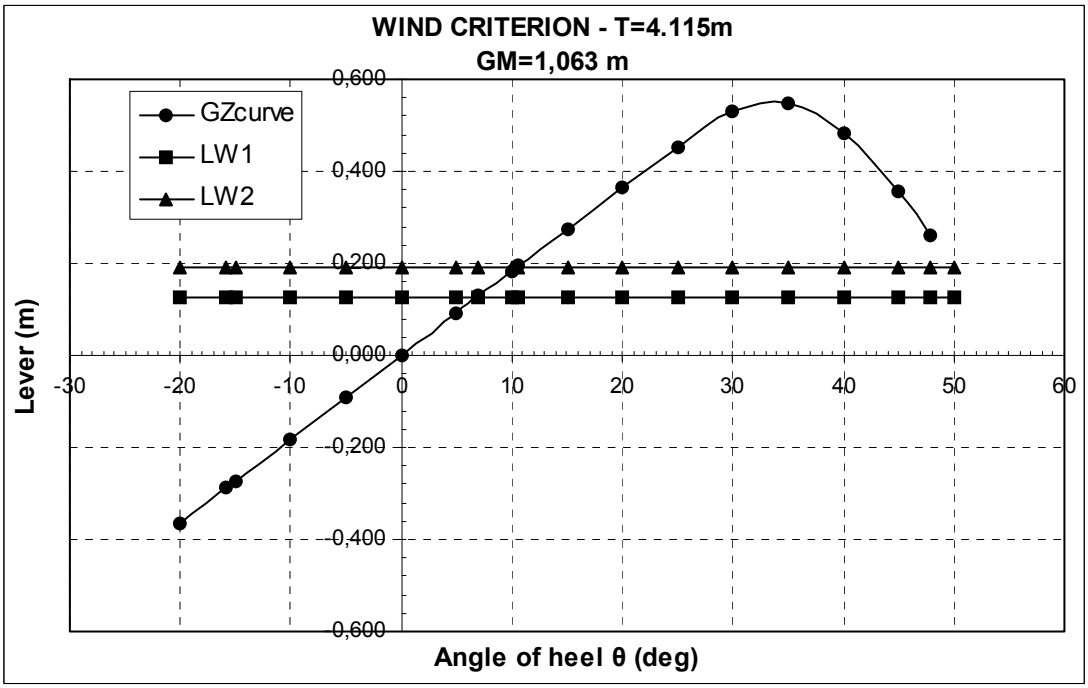
(Hdeckedge-T_{mld})/(B_{mld}/2)	0,484428571	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	0,451113046	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	25,84687363	deg

80%atan((Hdeckedge-T_{mld})/(B_{mld}/2))	20,6774989	deg	>16 deg

GM (m)	1,063	
KG (m)	6,157	
θ0 (deg)	7,013	The angle for which GZ=LW1
θ1 (deg)	22,81605	Angle of Roll
θ0-θ1 (deg)	-15,80305	
θab (deg)	10,565	The angle for which GZ=LW2

θf (deg)	47,800	flooding angle
θc (deg)	~ 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,364	0,128	0,193	
-15,80305	-0,27582	-0,27233		-0,288	0,128	0,193	-0,481
-15	-0,26180	-0,25882		-0,273	0,128	0,193	-0,466
-10	-0,17453	-0,17365		-0,184	0,128	0,193	-0,377
-5	-0,08727	-0,08716		-0,092	0,128	0,193	-0,285
0	0,00000	0,00000	0	0,000	0,128	0,193	-0,193
5	0,08727	0,08716	0,629	0,092	0,128	0,193	-0,101
7,013	0,12240	0,12209	0,880	0,128	0,128	0,193	-0,065
10	0,17453	0,17365	1,253	0,184	0,128	0,193	-0,009
10,565	0,18439	0,18335	1,322	0,193	0,128	0,193	0,000
15	0,26180	0,25882	1,867	0,273	0,128	0,193	0,080
20	0,34907	0,34202	2,470	0,364	0,128	0,193	0,171
25	0,43633	0,42262	3,053	0,451	0,128	0,193	0,258
30	0,52360	0,50000	3,608	0,529	0,128	0,193	0,336
35	0,61087	0,57358	4,079	0,547	0,128	0,193	0,354
40	0,69813	0,64279	4,440	0,482	0,128	0,193	0,289
45	0,78540	0,70711	4,709	0,355	0,128	0,193	0,162
47,800	0,83427	0,74080	4,820	0,259	0,128	0,193	0,066
50	0,87266	0,76604	4,908	0,191	0,128	0,193	-0,002



a=area between GZ curve and LW2 curve between θ0 - θ1= -15.80305° and θab = 10.565°
b=area between GZ curve and LW2 curve between θab = 10.565° and θf=47.800°
By applying Simpson's method, we get:
a = 6.350 m x deg
b = 8.259 m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Intermediate Condition 2:**
Δ = 2581,243 t and **trim = 0,0530 m** by bow,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,017 m for Damage Case 25.03 (See Damage Stability Booklet).

GM_{actual} = 1,063 m > GM_{min} (damage)

20.5 INTERMEDIATE CONDITION 3

INTERMEDIATE CONDITION 3

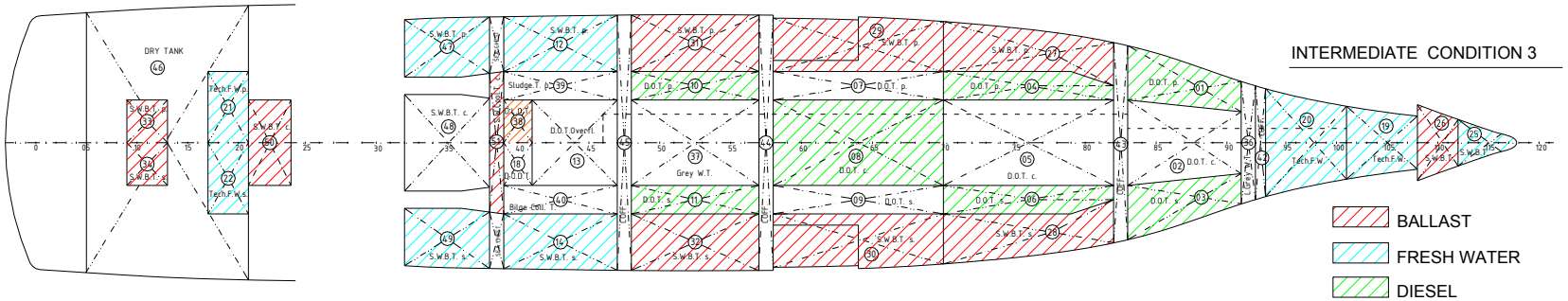
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)					
PROVISIONS	52	7,800	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					
D.B.-D.O. OVERFLOW [C] **No 13**					
D.B.-D.O.T. [P], **No 10**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [S], **No 11**	98	9,447	1,031	-3,490	1,203
D.B.-D.O.T. [P], **No 07**	emptying		1,033	4,553	1,604
D.B.-D.O.T. [S], **No 09**	emptying		1,033	4,553	1,604
D.B.-D.O.T. [C], **No 08**	98	38,853	0,814	4,560	34,483
D.B.-D.O.T. [P], **No 04**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [S], **No 06**	98	11,269	1,060	12,659	1,445
D.B.-D.O.T. [C], **No 05**					
D.B.-D.O.T. [P], **No 01**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [S], **No 03**	98	6,604	1,269	20,300	5,201
D.B.-D.O.T. [C], **No 02**					
TOTAL D.B. DIESEL OIL TANKS	52	**93,493**	**0,981**	**7,109**	**53,389**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	52	13,104	5,800	-28,665	6,860
P.W.T. [S], **No 24**	52	13,104	5,800	-28,665	6,860
F.W.T. [P], **No 21**	52	7,580	2,451	-26,511	7,146
F.W.T. [S], **No 22**	52	7,580	2,451	-26,511	7,146
DB-FWT [C], **No 20**	52	9,179	0,996	26,537	28,033
DB-FWT [C], **No 19**	52	4,937	0,960	30,290	5,786
TOTAL F.W. TANKS	52	**55,484**	**3,660**	**-13,698**	**61,831**

Cont. on next page

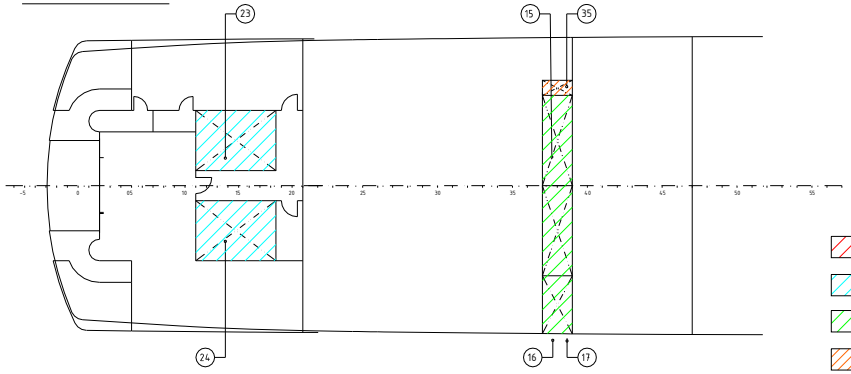
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**	filling	5,469	2,855	-30,483	1,582
BWT [S], **No 34**	filling	5,469	2,855	-30,483	1,582
D.B.-B.W.T. [C], **No 50**	100	9,186	1,523	-24,355	0,000
D.B.-B.W.T. [C], **No 48**					
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**	100	14,809	1,229	-3,486	0,000
D.B.-B.W.T. [S], **No 32**	100	14,809	1,229	-3,486	0,000
D.B.-B.W.T. [P], **No 29**	filling	14,915	1,181	4,940	8,417
D.B.-B.W.T. [S], **No 30**	filling	14,915	1,181	4,940	8,417
D.B.-B.W.T. [P], **No 27**	100	12,749	1,283	12,594	0,000
D.B.-B.W.T. [S], **No 28**	100	12,749	1,283	12,594	0,000
B.W.T. [C], No **26**	100	19,019	2,541	33,103	0,000
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**196,416**	**1,554**	**2,636**	**19,998**
DEAD WEIGHT		403,623	2,500	-0,085	158,220
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2579,855**	**6,0656**	**-1,616**	**158,220**

				EXTREME DRAFTS			
LCB (-A,+F)=	-1,6719 m	**LCF (-A,+F)=**	-4,335 m	**$T_{corresp.}$ =**	4,122 m	**FSC =**	0,061329 m
TRIM =	0,0340 m	**$MCT1_{cm}$ =**	42,316 txm/cm	**T_{AP} =**	4,107 m	**KG_{COR} =**	6,127 m
Trim.lever =	0,0558 m	**TPcm =**	8,811 t/cm	**T_{FP} =**	4,141 m	**GM_{ACT} =**	1,094 m
KM_T =	7,2210 m	**$T_{\otimes\ mld}$=**	4,112 m	**$T_{\otimes}$ =**	4,124 m		

TANK PLAN



LOWER DECK

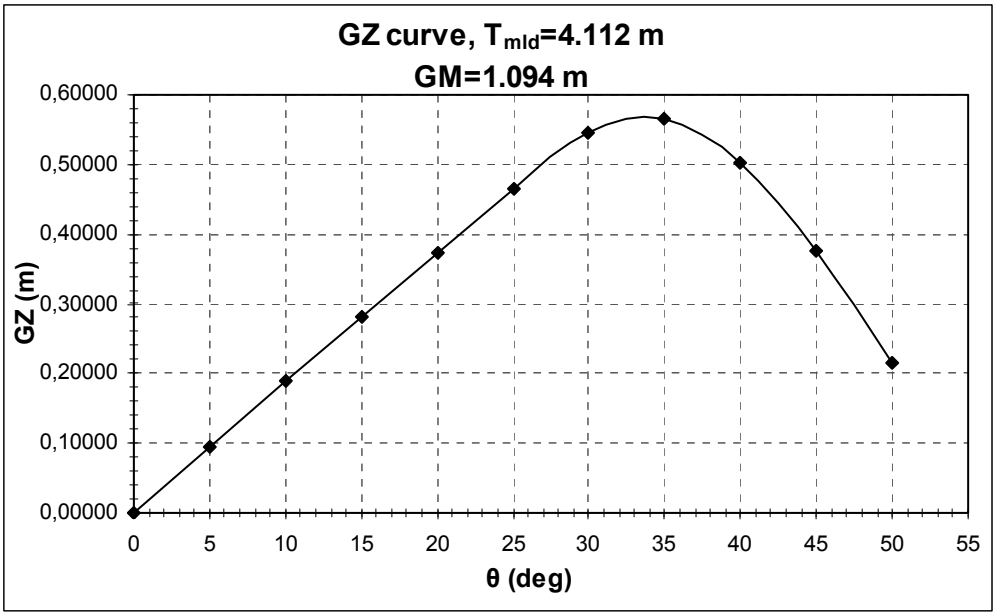


20.5.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

TmId=	4,112	m
Δ=	2579,855	t
KM=	7,221	m
GM_{COR} =	1,094	m
KG_{COR} =	6,127	m

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,629	0,09480
10	0,17365	1,253	0,18867
15	0,25882	1,867	0,28163
20	0,34202	2,470	0,37426
25	0,42262	3,053	0,46404
30	0,50000	3,608	0,54492
35	0,57358	4,079	0,56513
40	0,64279	4,440	0,50168
45	0,70711	4,710	0,37741
50	0,76604	4,909	0,21510
55	0,81915	5,047	0,02771
60	0,86603	5,129	-0,17708



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09480	4	0,37921
10	0,18867	2	0,37734
15	0,28163	4	1,12653
20	0,37426	2	0,74853
25	0,46404	4	1,85614
30	0,54492	1	0,54492
		Σ(GZ x SM)	5,03267

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 5,03267 =
= 8,38778 m-deg
= **0.14639 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09480	4	0,37921
10	0,18867	2	0,37734
15	0,28163	4	1,12653
20	0,37426	2	0,74853
25	0,46404	4	1,85614
30	0,54492	2	1,08983
35	0,56513	4	2,26052
40	0,50168	1	0,50168
		Σ(GZ x SM)	8,33978

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,33978 =
= 13,89964 m-deg
= **0.24259 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,5119 m-deg =
0.09620 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.54492 m > 0.2 m

3. maximum GZ
GZ_{max} at ~34.0°

4. Initial GM

GM = 1.094 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2579.855 \times 1.094}$ = ATAN 0.012436

$\rightarrow$ **φ = 0.7125° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.309 m

$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.309}$ 2579.855 (6.127-(4.112 / 2)) $\rightarrow$

$\rightarrow$ M_R = 216.224 t x m

$\tan\varphi = M_R / \Delta x GM_{COR}$ = 216.224 / (2579.855 x 1.094) = 0.07661

$\rightarrow$ $\rightarrow$ **φ = 4.381° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in Section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Intermediate Condition 3** are given below:

T_{mld}	4,112	m	Moulded Draft
B	13,8420	m	Breadth at T_{mld}
Cb	0,5924		Block coefficient
Lwl	74,3090	m	Waterline Length
KMt	7,2210	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,112	2579,855	74,309	818,496	9,937	7,881	0,129	0,193

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,094	6,127	1,000	0,826751	0,94088	1,02401751	11,076	0,071468	**22,93737**

Deck edge immersion

Bmld	14,00	m
Tmld	4,112	m
Δ	2579,855	t
LW1	0,129	m
LW2	0,193	m
KMt	7,221	m
Hdeckedge	7,506	m

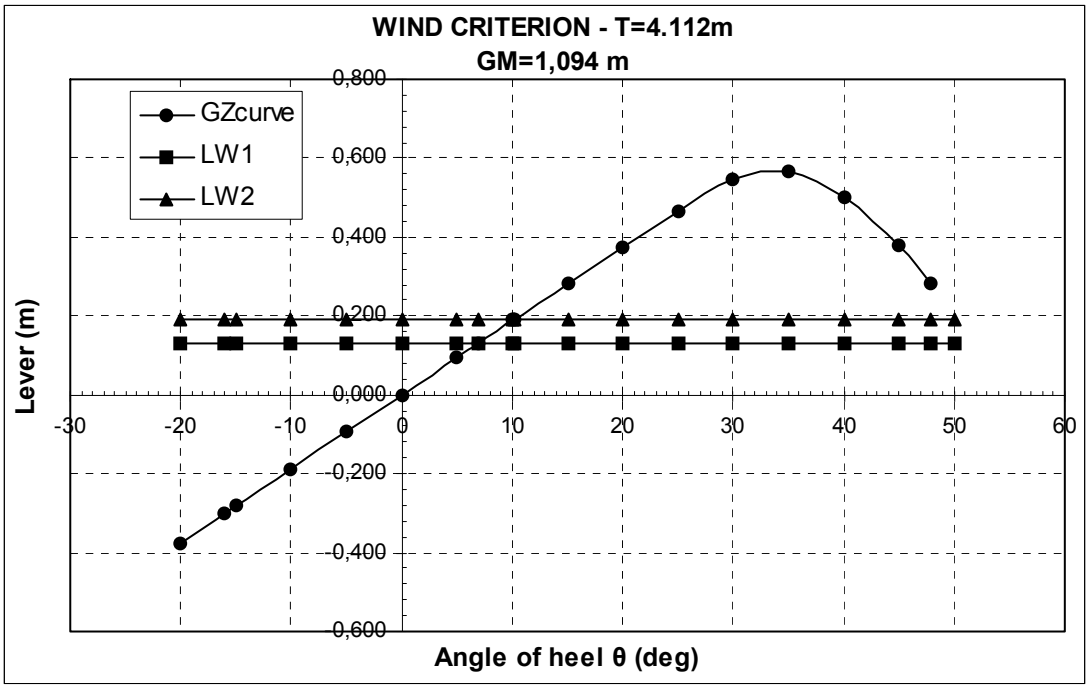
(Hdeckedge-T_{mld})/(B_{mld}/2)	0,484857143	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	0,451460102	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	25,86675844	deg

80%atan((Hdeckedge-T_{mld})/(B_{mld}/2))	20,69340675	deg	>16 deg

GM (m)	1,094	
KG (m)	6,127	
θ0 (deg)	6,870	The angle for which GZ=LW1
θ1 (deg)	22,93737	Angle of Roll
θ0-θ1 (deg)	-16,06737	
θab (deg)	10,253	The angle for which GZ=LW2

θf (deg)	47,822	flooding angle
θc (deg)	> 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,374	0,129	0,193	
-16,06737	-0,28043	-0,27677		-0,301	0,129	0,193	-0,494
-15	-0,26180	-0,25882		-0,281	0,129	0,193	-0,474
-10	-0,17453	-0,17365		-0,189	0,129	0,193	-0,382
-5	-0,08727	-0,08716		-0,095	0,129	0,193	-0,288
0	0,00000	0,00000	0	0,000	0,129	0,193	-0,193
5	0,08727	0,08716	0,629	0,095	0,129	0,193	-0,098
6,870	0,11990	0,11962	0,862	0,129	0,129	0,193	-0,064
10	0,17453	0,17365	1,253	0,189	0,129	0,193	-0,004
10,253	0,17895	0,17800	1,284	0,193	0,129	0,193	0,000
15	0,26180	0,25882	1,867	0,281	0,129	0,193	0,088
20	0,34907	0,34202	2,470	0,374	0,129	0,193	0,181
25	0,43633	0,42262	3,053	0,464	0,129	0,193	0,271
30	0,52360	0,50000	3,608	0,544	0,129	0,193	0,351
35	0,61087	0,57358	4,079	0,565	0,129	0,193	0,372
40	0,69813	0,64279	4,440	0,502	0,129	0,193	0,309
45	0,78540	0,70711	4,71	0,378	0,129	0,193	0,185
47,822	0,83465	0,74106	4,822	0,282	0,129	0,193	0,089
50	0,87266	0,76604	4,909	0,215	0,129	0,193	0,022



a=area between GZ curve and LW2 curve between θ0 - θ1= -16.067° and θab = 10.253°
b=area between GZ curve and LW2 curve between θab = 10.253° and θf=47.822°
By applying Simpson's method, we get:
a = 6.517 m x deg
b = 8.803 m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Intermediate Condition 3:**
Δ = 2579,855 t and **trim = 0,0340 m** by bow,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,020 m for Damage Case 25.03 (See Damage Stability Booklet).

GM_{actual} = 1,094 m > GM_{min} (damage)

20.6 INTERMEDIATE CONDITION 4

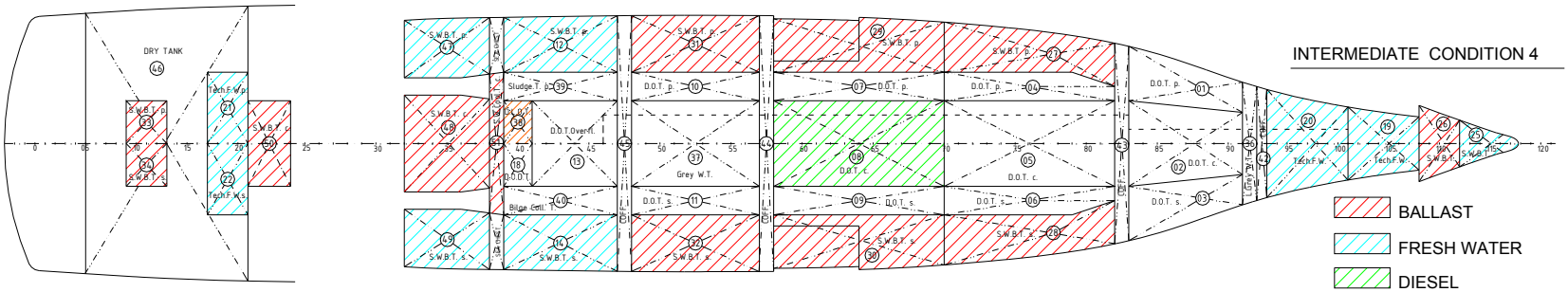
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)	50	30,075	0,554	-3,941	46,420
PROVISIONS	22	3,300	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					
D.B.-D.O. OVERFLOW [C] **No 13**					
D.B.-D.O.T. [P], **No 10**	emptying		1,031	-3,490	1,203
D.B.-D.O.T. [S], **No 11**	emptying		1,031	-3,490	1,203
D.B.-D.O.T. [P], **No 07**					
D.B.-D.O.T. [S], **No 09**					
D.B.-D.O.T. [C], **No 08**	98	38,853	0,814	4,560	34,483
D.B.-D.O.T. [P], **No 04**	emptying		1,060	12,659	1,445
D.B.-D.O.T. [S], **No 06**	emptying		1,060	12,659	1,445
D.B.-D.O.T. [C], **No 05**					
D.B.-D.O.T. [P], **No 01**	emptying		1,269	20,300	5,201
D.B.-D.O.T. [S], **No 03**	emptying		1,269	20,300	5,201
D.B.-D.O.T. [C], **No 02**					
TOTAL D.B. DIESEL OIL TANKS	22	**38,853**	**0,814**	**4,560**	**50,181**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	22	5,544	5,800	-28,665	6,860
P.W.T. [S], **No 24**	22	5,544	5,800	-28,665	6,860
F.W.T. [P], **No 21**	22	3,207	2,451	-26,511	7,146
F.W.T. [S], **No 22**	22	3,207	2,451	-26,511	7,146
DB-FWT [C], **No 20**	22	3,883	0,996	26,537	28,033
DB-FWT [C], **No 19**	22	2,089	0,960	30,290	5,786
TOTAL F.W. TANKS	22	**23,474**	**3,660**	**-13,699**	**61,831**

Cont. on next page

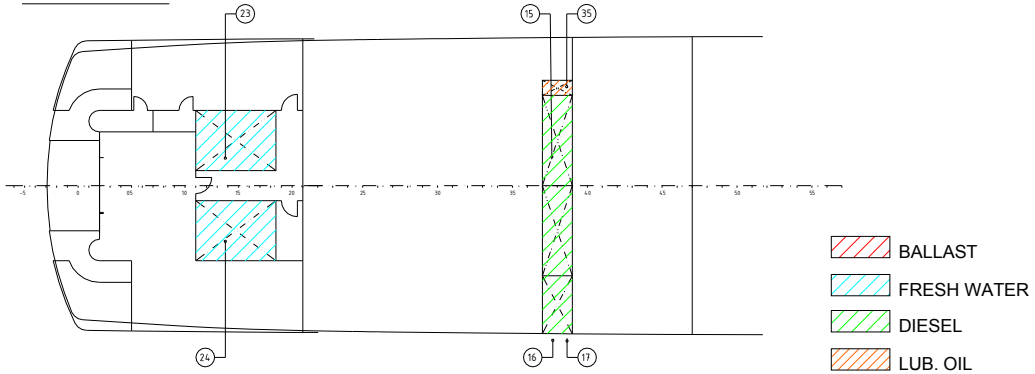
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**	100	5,469	2,855	-30,483	0,000
BWT [S], **No 34**	100	5,469	2,855	-30,483	0,000
D.B.-B.W.T. [C], **No 50**	100	9,186	1,523	-24,355	0,000
D.B.-B.W.T. [C], **No 48**	filling	30,754	0,935	-15,736	37,049
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**	100	14,809	1,229	-3,486	0,000
D.B.-B.W.T. [S], **No 32**	100	14,809	1,229	-3,486	0,000
D.B.-B.W.T. [P], **No 29**	100	14,915	1,181	4,940	0,000
D.B.-B.W.T. [S], **No 30**	100	14,915	1,181	4,940	0,000
D.B.-B.W.T. [P], **No 27**	100	12,749	1,283	12,594	0,000
D.B.-B.W.T. [S], **No 28**	100	12,749	1,283	12,594	0,000
B.W.T. [C], No **26**	100	19,019	2,541	33,103	0,000
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**227,170**	**1,470**	**0,149**	**37,049**
DEAD WEIGHT		373,302	2,289	-1,715	218,483
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2549,534**	**6,0772**	**-1,873**	**218,483**

				EXTREME DRAFTS			
LCB (-A,+F)=	-1,6371 m	**LCF (-A,+F)=**	-4,337 m	**$T_{corresp.}$ =**	4,088 m	**FSC =**	0,085695 m
TRIM =	-0,1428 m	**$MCT1_{cm}$ =**	42,099 txm/cm	**T_{AP} =**	4,151 m	**KG_{COR} =**	6,163 m
Trim.lever =	-0,2358 m	**TPcm =**	8,794 t/cm	**T_{FP} =**	4,008 m	**GM_{ACT} =**	1,080 m
KM_T =	7,2430 m	**$T_{\otimes\ mld}$=**	4,067 m	**$T_{\otimes}$ =**	4,079 m		

TANK PLAN



LOWER DECK

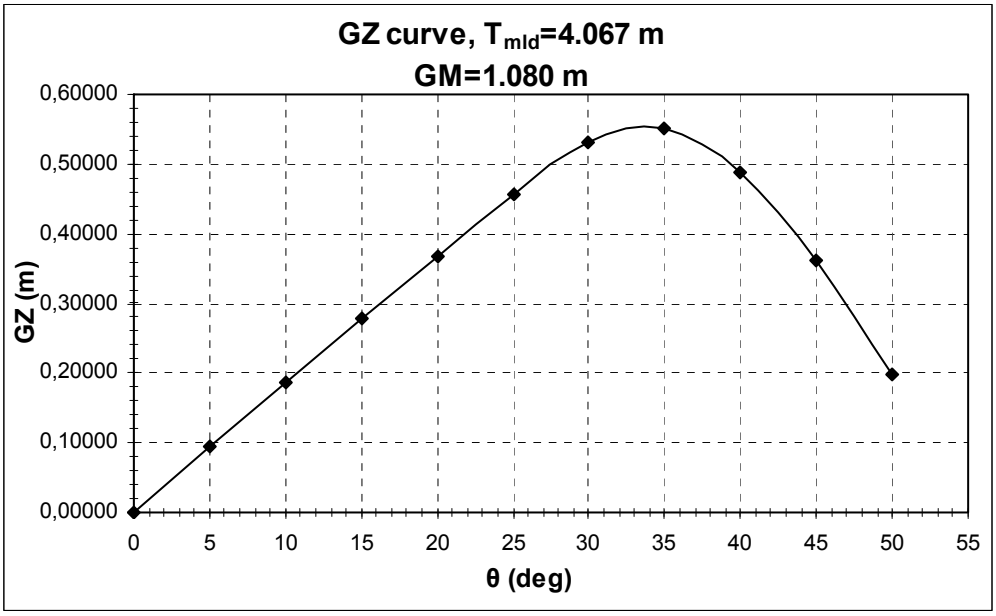


20.6.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

Tmld=	4,067	m
Δ=	2549,534	t
KM=	7,243	m
GM_{COR} =	1,080	m
KG_{COR} =	6,163	m

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,631	0,09431
10	0,17365	1,257	0,18727
15	0,25882	1,873	0,27838
20	0,34202	2,475	0,36763
25	0,42262	3,060	0,45532
30	0,50000	3,613	0,53198
35	0,57358	4,086	0,55115
40	0,64279	4,449	0,48722
45	0,70711	4,720	0,36226
50	0,76604	4,920	0,19861
55	0,81915	5,058	0,00932
60	0,86603	5,140	-0,19755



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09431	4	0,37724
10	0,18727	2	0,37454
15	0,27838	4	1,11353
20	0,36763	2	0,73525
25	0,45532	4	1,82130
30	0,53198	1	0,53198
		Σ(GZ x SM)	4,95385

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4.95385 =
= 8,256428 m-deg
= **0.14410 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09431	4	0,37724
10	0,18727	2	0,37454
15	0,27838	4	1,11353
20	0,36763	2	0,73525
25	0,45532	4	1,82130
30	0,53198	2	1,06397
35	0,55115	4	2,20460
40	0,48722	1	0,48722
		Σ(GZ x SM)	8,17766

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,17766 =
= 13,62943 m-deg
= **0.23788 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,373 m-deg =
0.09378 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.53198 m > 0.2 m

3. maximum GZ
GZ_{max} at ~34.0°

4. Initial GM

GM = 1.080 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2549.534 \times 1.080}$ = ATAN 0.012747

$\rightarrow$ **φ = 0.7303° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.235 m

$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.235}$ 2549.534 (6.163-(4.067 / 2)) $\rightarrow$

$\rightarrow M_R$ = 216.969 t x m

$\tan\varphi = M_R / \Delta x GM_{COR}$ = 216.969 / (2549.534 x 1.080) = 0.0788

$\rightarrow$ $\rightarrow$ **φ = 4.505° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in Section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Intermediate Condition 4** are given below:

T_{mld}	4,067	m	Moulded Draft
B	13,8259	m	Breadth at T_{mld}
Cb	0,5916		Block coefficient
Lwl	74,2350	m	Waterline Length
KMt	7,2430	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,067	2549,534	74,235	821,837	9,913	7,880	0,131	0,196

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,080	6,163	1,000	0,820093	0,93992	1,03922056	11,156	0,070909	**22,80788**

Deck edge immersion

Bmld	14,00	m
Tmld	4,067	m
Δ	2549,534	t
LW1	0,131	m
LW2	0,196	m
KMt	7,243	m
Hdeckedge	7,506	m

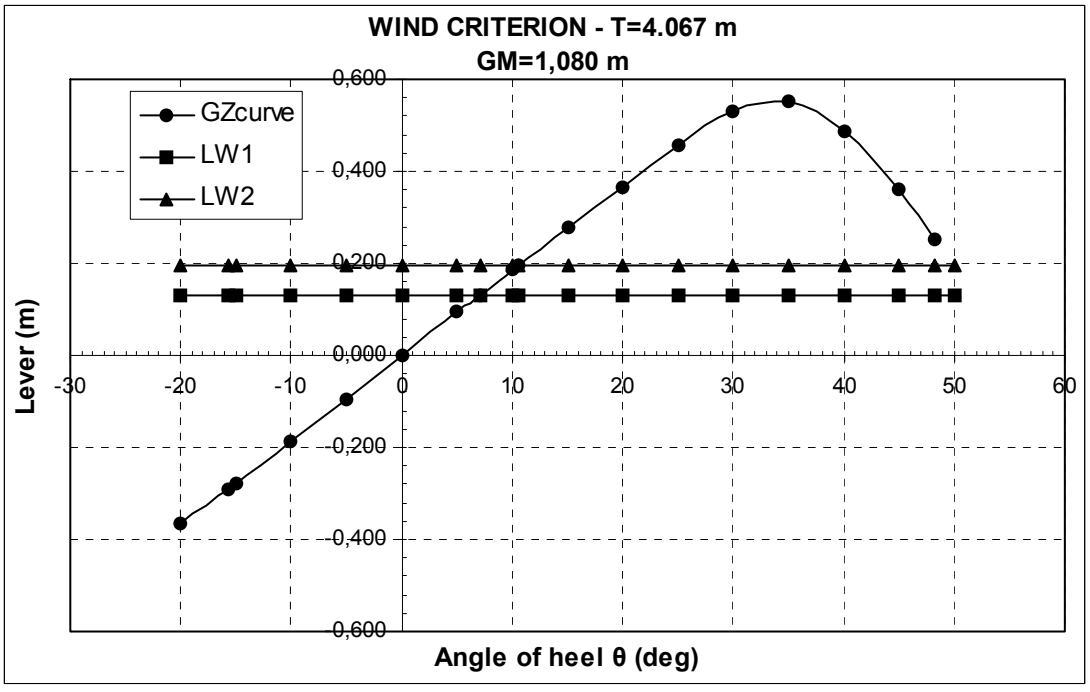
(Hdeckedge-T_{mld})/(B_{mld}/2)	0,491285714	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	0,456651909	rad
atan((Hdeckedge-T_{mld})/(B_{mld}/2))	26,1642271	deg

80%atan((Hdeckedge-T_{mld})/(B_{mld}/2))	20,93138168	deg	>16 deg

GM (m)	1,080	
KG (m)	6,163	
θ0 (deg)	7,060	The angle for which GZ=LW1
θ1 (deg)	22,80788	Angle of Roll
θ0-θ1 (deg)	-15,74788	
θab (deg)	10,558	The angle for which GZ=LW2

θf (deg)	48,308	flooding angle
θc (deg)	~ 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,367	0,131	0,196	
-15,74788	-0,27485	-0,27140		-0,291	0,131	0,196	-0,487
-15	-0,26180	-0,25882		-0,278	0,131	0,196	-0,474
-10	-0,17453	-0,17365		-0,187	0,131	0,196	-0,383
-5	-0,08727	-0,08716		-0,094	0,131	0,196	-0,290
0	0,00000	0,00000	0	0,000	0,131	0,196	-0,196
5	0,08727	0,08716	0,631	0,094	0,131	0,196	-0,102
7,060	0,12322	0,12291	0,889	0,131	0,131	0,196	-0,065
10	0,17453	0,17365	1,257	0,187	0,131	0,196	-0,009
10,558	0,18427	0,18323	1,326	0,196	0,131	0,196	0,000
15	0,26180	0,25882	1,873	0,278	0,131	0,196	0,082
20	0,34907	0,34202	2,475	0,367	0,131	0,196	0,171
25	0,43633	0,42262	3,060	0,455	0,131	0,196	0,259
30	0,52360	0,50000	3,613	0,531	0,131	0,196	0,335
35	0,61087	0,57358	4,086	0,551	0,131	0,196	0,355
40	0,69813	0,64279	4,449	0,487	0,131	0,196	0,291
45	0,78540	0,70711	4,720	0,362	0,131	0,196	0,166
48,308	0,84313	0,74673	4,852	0,250	0,131	0,196	0,054
50	0,87266	0,76604	4,920	0,199	0,131	0,196	0,003



a=area between GZ curve and LW2 curve between θ0 - θ1= -15.748° and θab = 10.558°
b=area between GZ curve and LW2 curve between θab = 10.558° and θf=48.308°
By applying Simpson's method, we get:
a = 6.423 m x deg
b = 8.330 m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Intermediate Condition 4:**
Δ = 2549,534 t and **trim = -0,1428 m** by stern,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,046 m for Damage Case 25.02 (See Damage Stability Booklet).

GM_{actual} = 1,080 m > GM_{min} (damage)

20.7 ARRIVAL CONDITION

ARRIVAL CONDITION

ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
36 PASSENGERS		2,700	16,400	0,000	
PASSENGERS LUGGAGE		0,700	9,500	0,000	
CREW AND EFFECTS		4,320	8,000	0,000	
MISCELLANEOUS (GREY WATER-ETC)	70	42,103	0,691	-3,941	41,560
PROVISIONS	10	1,500	5,000	-10,140	
SPA VESUVIUS (SUN DECK)		3,400	17,800	7,930	1,610
SPA LOWER DECK (centre)		1,400	5,500	4,210	0,8669
2 SPAs LOWER DECK (P&S)		1,800	5,500	5,610	0,7552
AQUARIUM (LOWER DECK, FR68)		1,500	6,300	7,320	0,670
D.B.-D.O. DRAIN [S], **No 18**					0,902
D.B.-D.O. OVERFLOW [C] **No 13**					21,652
D.B.-D.O.T. [P], **No 10**					
D.B.-D.O.T. [S], **No 11**					
D.B.-D.O.T. [P], **No 07**					
D.B.-D.O.T. [S], **No 09**					
D.B.-D.O.T. [C], **No 08**	45,323	17,974	0,419	4,599	43,304
D.B.-D.O.T. [P], **No 04**					
D.B.-D.O.T. [S], **No 06**					
D.B.-D.O.T. [C], **No 05**					
D.B.-D.O.T. [P], **No 01**					
D.B.-D.O.T. [S], **No 03**					
D.B.-D.O.T. [C], **No 02**					
TOTAL D.B. DIESEL OIL TANKS	10	**17,974**	**0,419**	**4,599**	**65,858**
D.O. for emergency generator		**1,900**	**16,900**	**4,595**	**1,656**
TOTAL D.O. daily	85	**26,541**	**5,621**	**-13,640**	**16,436**
L.O.T. [P], **No 35**	98	2,074	5,776	-13,640	0,036
D.B. Dirty D.O.T. [P], **No 38**	98	4,095	0,892	-12,240	0,972
TOTAL L.O.	98	**6,169**	**2,534**	**-12,711**	**1,008**
P.W.T. [P], **No 23**	10	2,520	4,720	-28,665	6,860
P.W.T. [S], **No 24**	10	2,520	4,720	-28,665	6,860
F.W.T. [P], **No 21**	10	1,456	1,452	-26,296	5,696
F.W.T. [S], **No 22**	10	1,456	1,452	-26,296	5,696
DB-FWT [C], **No 20**	10	1,765	0,213	26,568	2,242
DB-FWT [C], **No 19**	10	0,949	0,193	30,297	0,658
TOTAL F.W. TANKS	10	**10,666**	**2,679**	**-13,632**	**28,012**

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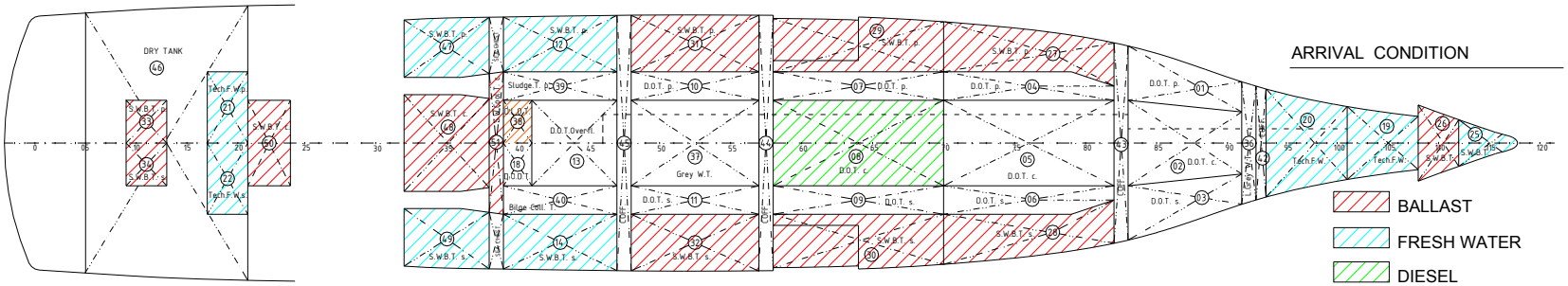
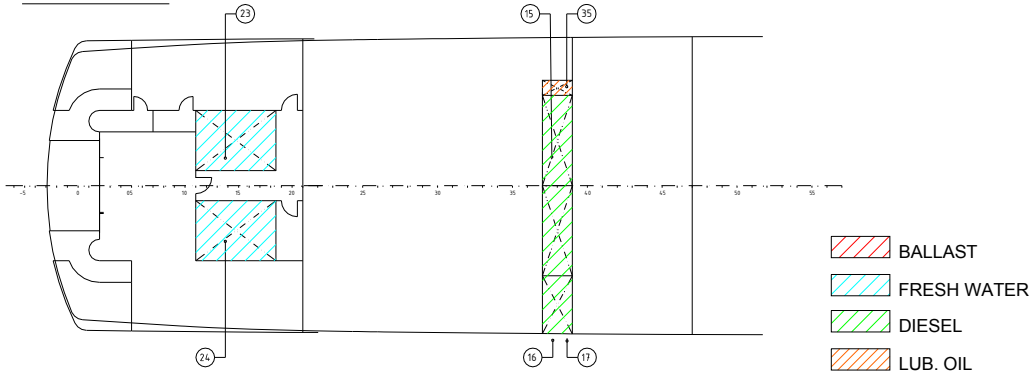
ITEMS	%	WEIGHT	V.C.G.	L.C.G. (-A,+F)	FSM
		to	m	m	to x m
BWT [P], **No 33**	100	5,469	2,855	-30,483	0,000
BWT [S], **No 34**	100	5,469	2,855	-30,483	0,000
D.B.-B.W.T. [C], **No 50**	100	9,186	1,523	-24,355	0,000
D.B.-B.W.T. [C], **No 48**	100	30,754	0,935	-15,736	0,000
D.B.-B.W.T. [P], **No 47** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [S], **No 49** (F.W)	100	9,832	1,229	-15,715	0,000
D.B.-B.W.T. [P], **No 12** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [S], **No 14** (F.W)	100	12,488	1,230	-10,121	0,000
D.B.-B.W.T. [P], **No 31**	100	14,809	1,229	-3,486	0,000
D.B.-B.W.T. [S], **No 32**	100	14,809	1,229	-3,486	0,000
D.B.-B.W.T. [P], **No 29**	100	14,915	1,181	4,940	0,000
D.B.-B.W.T. [S], **No 30**	100	14,915	1,181	4,940	0,000
D.B.-B.W.T. [P], **No 27**	100	12,749	1,283	12,594	0,000
D.B.-B.W.T. [S], **No 28**	100	12,749	1,283	12,594	0,000
B.W.T. [C], No **26**	100	19,019	2,541	33,103	0,000
B.W.T. [C], **No 25** (F.W)	100	20,380	2,231	36,264	0,000
S.W. Collecting Tank from Sea Chests, **No 51**	100	7,307	0,955	-13,289	0,000
TOTAL BALLAST WATER TANKS		**227,170**	**1,470**	**0,149**	**0,000**
DEAD WEIGHT		349,843	2,220	-1,680	158,432
LIGHTSHIP		2176,232	6,727	-1,900	
DISPLACEMENT		**2526,075**	**6,1027**	**-1,870**	**158,432**

				EXTREME DRAFTS			
LCB (-A,+F)=	-1,6148 m	**LCF (-A,+F)=**	-4,348 m	**$T_{corresp.}$ =**	4,061 m	**FSC =**	0,062719 m
TRIM =	-0,1534 m	**$MCT1_{cm}$ =**	41,940 txm/cm	**T_{AP} =**	4,129 m	**KG_{COR} =**	6,165 m
Trim.lever =	-0,2547 m	**TPcm =**	8,781 t/cm	**T_{FP} =**	3,975 m	**GM_{ACT} =**	1,093 m
KM_T =	7,2580 m	**$T_{\otimes\ mld}$=**	4,040 m	**$T_{\otimes}$ =**	4,052 m		

TANK PLAN



LOWER DECK

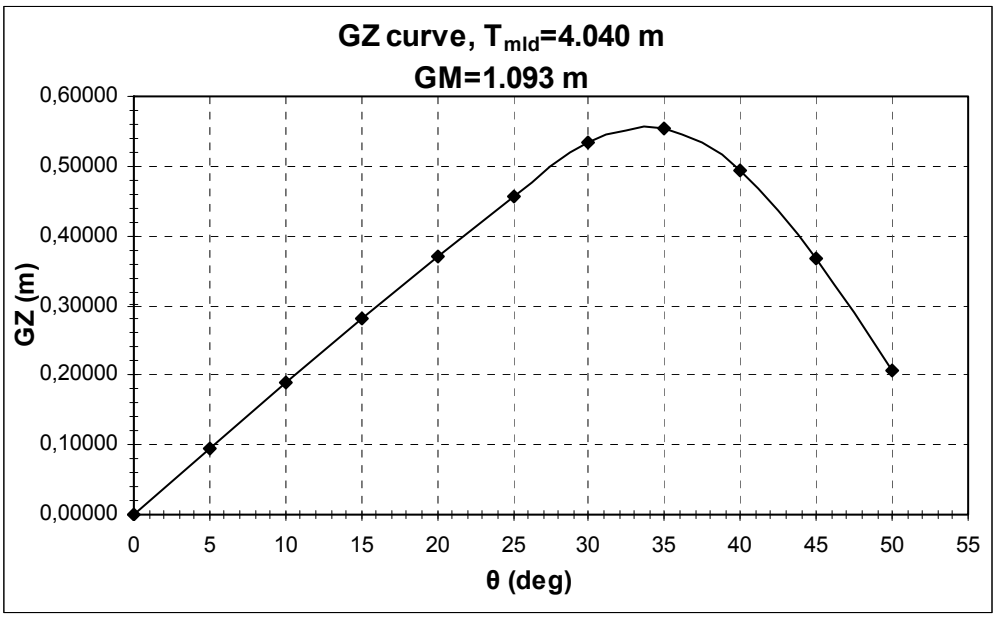


20.7.1 STABILITY CHECK

A. INTACT STABILITY CRITERIA

Tmld=	4,040	m
Δ=	2526,075	t
KM=	7,258	m
GM_{COR} =	1,093	m
KG_{COR} =	6,165	m

θ (deg)	sinθ	KN	GZ=KN-KG_{COR}*sinθ
0	0,00000	0,000	0,00000
5	0,08716	0,633	0,09534
10	0,17365	1,259	0,18880
15	0,25882	1,876	0,28068
20	0,34202	2,479	0,37043
25	0,42262	3,063	0,45776
30	0,50000	3,616	0,53380
35	0,57358	4,091	0,55516
40	0,64279	4,456	0,49317
45	0,70711	4,728	0,36882
50	0,76604	4,928	0,20573
55	0,81915	5,067	0,01680
60	0,86603	5,149	-0,18970



1a. Area calculation under GZ curve from 0 deg to 30 deg

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09534	4	0,38137
10	0,18880	2	0,37760
15	0,28068	4	1,12272
20	0,37043	2	0,74086
25	0,45776	4	1,83105
30	0,53380	1	0,53380
		Σ(GZ x SM)	4,98740

Area (0° - 30°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 4.98740 =
= 8,31234 m-deg
= **0.14508 m-rad > 0.055 m-rad**

1b. Area calculation under GZ curve from 0 deg to 40 deg or to θ_f

$\theta_f > 40°$

θ (deg)	GZ (m)	SM	GZ x SM
0	0,00000	1	0,00000
5	0,09534	4	0,38137
10	0,18880	2	0,37760
15	0,28068	4	1,12272
20	0,37043	2	0,74086
25	0,45776	4	1,83105
30	0,53380	2	1,06760
35	0,55516	4	2,22066
40	0,49317	1	0,49317
		Σ(GZ x SM)	8,23503

Area (0° - 40°) = 1/3 x 5 x Σ(GZ x SM) = 1/3 x 5 x 8,23503 =
= 13,72505 m-deg
= **0.23955 m-rad > 0.09 m-rad**

1c. Area calculation under GZ curve from 30 deg to 40 deg or to θ_f

Area (30° - 40°) = Area (0° - 40°) - Area (0° - 30°) = 5,4127 m-deg =
0.09447 m-rad > 0.03 m-rad

2. GZ at 30°
$GZ_{(30°)}$ = 0.5338 m > 0.2 m

3. maximum GZ
GZ_{max} at ~34.5°

4. Initial GM

GM = 1.093 > 0.15 m

5. *Crowding of Passengers*

N = 72 passengers

Shift = ~ 6.5 [m]

φ = ATAN $\frac{N \times 0.075 \times shift}{\Delta \times GM}$ = ATAN $\frac{72 \times 0.075 \times 6.5}{2526.075 \times 1.093}$ = ATAN 0.012713

$\rightarrow$ **φ = 0.7283° < 10°**

6. *Turning*

V_0 = 17 knots
V_0 = 8.746 m/sec
L = 74.192 m
$M_R = 0.02 \frac{V_0^2}{L} \Delta (KG_{COR} - T_{mld}/2) = 0{,}02 \frac{8.746^2}{74.192}$ 2526.075 (6.165-(4.040 / 2)) $\rightarrow$
$\rightarrow$ M_R = 215.905 t x m

$\tan\varphi = M_R / \Delta x GM_{COR}$ = 215.905 / (2526.075 x 1.093) = 0.078198

$\rightarrow$ $\rightarrow$ **φ = 4.471° < 10°**

B. SEVERE WIND AND ROLLING CRITERION

Following the procedure described in Section 7 of this booklet, the calculations regarding the severe wind and rolling criterion for the **Arrival Condition** are given below:

T_{mld}	4,040	m	Moulded Draft
B	13,8270	m	Breadth at T_{mld}
Cb	0,5903		Block coefficient
Lwl	74,1920	m	Waterline Length
KMt	7,2580	m	Transverse Metacentre above B.L.

T_{mld} (m)	Δ (t)	Lwl (m)	A (m^2)	VCA (m)	Z (m)	LW1 (m)	LW2 (m)
4,040	2526,075	74,192	823,840	9,899	7,879	0,132	0,198

Angle of Roll

GM (m)	KG (m)	k	x1	x2	r	T (sec)	s	**θ1**
1,093	6,165	1,000	0,815495	0,938384	1,04559406	11,105	0,071267	**22,76957**

Deck edge immersion

Bmld	14,00	m
Tmld	4,040	m
Δ	2526,075	t
LW1	0,132	m
LW2	0,198	m
KMt	7,258	m
Hdeckedge	7,506	m

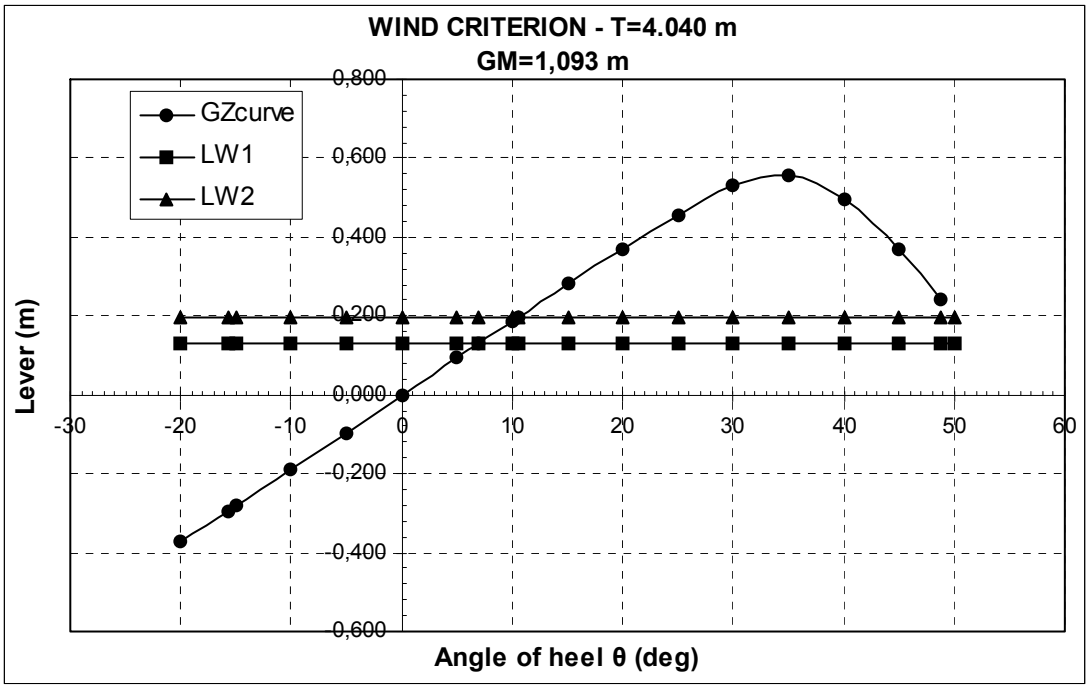
$(Hdeckedge-d_{mld})/(B_{mld}/2)$	0,495142857	rad
$atan((Hdeckedge-d_{mld})/(B_{mld}/2))$	0,45975435	rad
$atan((Hdeckedge-d_{mld})/(B_{mld}/2))$	26,34198389	deg

$80\%atan((Hdeckedge-d_{mld})/(B_{mld}/2))$	21,07358711	deg	>16 deg

GM (m)	1,093	
KG (m)	6,165	
θ0 (deg)	7,020	The angle for which GZ=LW1
θ1 (deg)	22,76957	Angle of Roll
θ0-θ1 (deg)	-15,74957	
θab (deg)	10,572	The angle for which GZ=LW2

θf (deg)	48,731	flooding angle
θc (deg)	> 50°	second intersection of GZ and LW2

θ (deg)	θ (rad)	ηµθ	KN (m)	GZ (m)	LW1 (m)	LW2 (m)	GZ-LW2 (m)
-20	-0,34907	-0,34202		-0,370	0,132	0,198	
-15,74957	-0,27488	-0,27143		-0,294	0,132	0,198	-0,492
-15	-0,26180	-0,25882		-0,280	0,132	0,198	-0,478
-10	-0,17453	-0,17365		-0,188	0,132	0,198	-0,386
-5	-0,08727	-0,08716		-0,096	0,132	0,198	-0,294
0	0,00000	0,00000	0	0,000	0,132	0,198	-0,198
5	0,08727	0,08716	0,633	0,096	0,132	0,198	-0,102
7,020	0,12252	0,12222	0,886	0,132	0,132	0,198	-0,066
10	0,17453	0,17365	1,259	0,188	0,132	0,198	-0,010
10,572	0,18452	0,18347	1,330	0,198	0,132	0,198	0,000
15	0,26180	0,25882	1,876	0,280	0,132	0,198	0,082
20	0,34907	0,34202	2,479	0,370	0,132	0,198	0,172
25	0,43633	0,42262	3,063	0,458	0,132	0,198	0,260
30	0,52360	0,50000	3,616	0,533	0,132	0,198	0,335
35	0,61087	0,57358	4,091	0,555	0,132	0,198	0,357
40	0,69813	0,64279	4,456	0,493	0,132	0,198	0,295
45	0,78540	0,70711	4,728	0,369	0,132	0,198	0,171
48,731	0,85052	0,75162	4,877	0,243	0,132	0,198	0,045
50	0,87266	0,76604	4,928	0,205	0,132	0,198	0,007



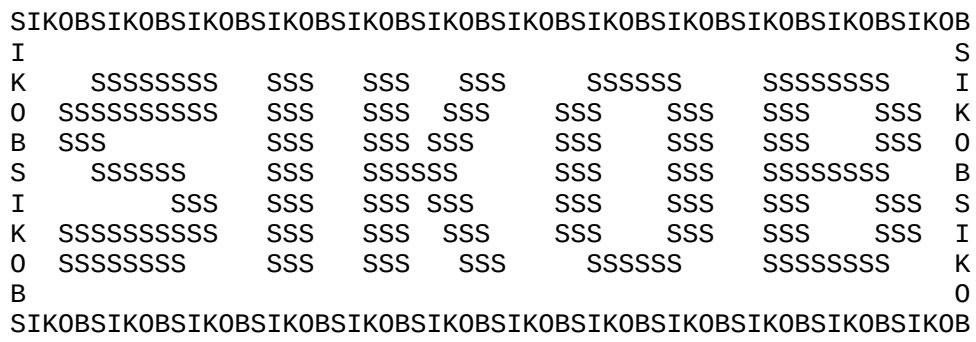
a=area between GZ curve and LW2 curve between θ0 - θ1= -15.74957° and θab = 10.572°
b=area between GZ curve and LW2 curve between θab = 10.572° and θf=48.731°
By applying Simpson's method, we get:
a = 6.487 m x deg
b = 8.418 m x deg
b >a, O.K.

C. DAMAGE STABILITY CRITERIA

For the floating status of the **Arrival Condition:**
Δ = 2526,075 t and **trim = -0,1534 m** by stern,
the minimum GM required from the damage stability according to Table and curves on pages 80 and 81 respectively is GM_{min} (damage) = 1,048 m for Damage Case 50.03 (See Damage Stability Booklet).

GM_{actual} = 1,093 m > GM_{min} (damage)

I. HULL OFFSETS TABLE



INPUT DATA FOR DESCRIPTION OF HULLFORM
SHIP NO 434

MULT	LPP	BMOULD	DMOULD	FRO-LPP/2	MAXYZ	KEELPL	SHELLPL
1.00000	72.080	14.000	7.500	36.040	15.000	.012	.010

FRAME NO 21. 92.
SPACING .500 .700 .500

LONGITUDINAL COORD FROM LPP/2 FOR FRAME

-23	-22	-21	-20	-19	-18	-17	-16
-47.540	-47.040	-46.540	-46.040	-45.540	-45.040	-44.540	-44.040
-15	-14	-13	-12	-11	-10	-9	-8
-43.540	-43.040	-42.540	-42.040	-41.540	-41.040	-40.540	-40.040
-7	-6	-5	-4	-3	-2	-1	0
-39.540	-39.040	-38.540	-38.040	-37.540	-37.040	-36.540	-36.040
1	2	3	4	5	6	7	8
-35.540	-35.040	-34.540	-34.040	-33.540	-33.040	-32.540	-32.040
9	10	11	12	13	14	15	16
-31.540	-31.040	-30.540	-30.040	-29.540	-29.040	-28.540	-28.040
17	18	19	20	21	22	23	24
-27.540	-27.040	-26.540	-26.040	-25.540	-24.840	-24.140	-23.440
25	26	27	28	29	30	31	32
-22.740	-22.040	-21.340	-20.640	-19.940	-19.240	-18.540	-17.840
33	34	35	36	37	38	39	40
-17.140	-16.440	-15.740	-15.040	-14.340	-13.640	-12.940	-12.240
41	42	43	44	45	46	47	48
-11.540	-10.840	-10.140	-9.440	-8.740	-8.040	-7.340	-6.640
49	50	51	52	53	54	55	56
-5.940	-5.240	-4.540	-3.840	-3.140	-2.440	-1.740	-1.040
57	58	59	60	61	62	63	64
-.340	.360	1.060	1.760	2.460	3.160	3.860	4.560
65	66	67	68	69	70	71	72
5.260	5.960	6.660	7.360	8.060	8.760	9.460	10.160
73	74	75	76	77	78	79	80
10.860	11.560	12.260	12.960	13.660	14.360	15.060	15.760
81	82	83	84	85	86	87	88
16.460	17.160	17.860	18.560	19.260	19.960	20.660	21.360
89	90	91	92	93	94	95	96
22.060	22.760	23.460	24.160	24.660	25.160	25.660	26.160
97	98	99	100	101	102	103	104
26.660	27.160	27.660	28.160	28.660	29.160	29.660	30.160
105	106	107	108	109	110	111	112
30.660	31.160	31.660	32.160	32.660	33.160	33.660	34.160
113	114	115	116	117	118	119	120
34.660	35.160	35.660	36.160	36.660	37.160	37.660	38.160
121	122	123	124	125	126	127	128
38.660	39.160	39.660	40.160	40.660	41.160	41.660	42.160
129	130	131	132	133	134	135	136
42.660	43.160	43.660	44.160	44.660	45.160	45.660	46.160
137	138	139	140	141	142	143	144
46.660	47.160	47.660	48.160	48.660	49.160	49.660	50.160

SHIPCONTOUR ON CL

	FR.NO	DX	TYP	FRAME-CONTOUR B0 Z0	R1 Z	B1 Y	Z	Y	Z	Y
STERN	.00	-1.600	2	10.800						
	.00	-1.600	2	7.500						
	.00	-1.900	2	7.000						
	.00	-1.500	2	4.350						
	.00	-1.900	2	4.350						
	.00	-1.770	2	3.350						
	.00	-.500	2	3.250						
	.00	1.200	2	3.000						
	.00	4.200	2	.000						
KEEL	.00	4.200	2	.000						
	.00	69.200	2	.000						
STEM	110.00	.000	2	.000						
	113.00	.000	2	.030						
	115.00	.000	2	.150						
	117.00	.000	2	.333						
	119.00	.000	2	.643						
	121.00	.000	2	1.113						
	122.00	.000	2	1.517						
	122.00	.300	2	2.320						
	122.00	.000	2	2.960						
	121.00	.000	2	3.205						
	119.00	.000	2	3.353						
	117.00	.000	2	3.435						
	116.00	.000	2	3.513						
	115.00	.380	2	3.700						
	116.00	.000	2	3.960						
	119.00	.000	2	5.030						
	122.00	.000	2	6.030						
	125.00	.000	2	6.973						
	127.00	.000	2	7.575						
	132.00	.300	2	9.200						

SEQUENCE OF LINES (CODE= 1.)

INPUT DATA DESCRIBING DECK-CORNER
NO= NUMBER OF DECK
RAD=RADIUS OF DECKCORNER
INTERP.FACTOR REFERS ALWAYS TO THE PRECEDING INTERVAL
CAMBER NO REFERS TO CAMBER-DATA

LINE	NO	FR.NO	DX	Y	Z	INTERP	RADIE	CAMBER
1.	3.0	.000	-1.600	.000	7.500	.000	.000	1.000
2.	3.0	-3.000	.000	1.910	7.500	1.000	.000	1.000
3.	3.0	-2.000	.000	4.292	7.500	1.000	.000	1.000
4.	3.0	-1.000	.000	5.697	7.500	1.000	.000	1.000
5.	3.0	.000	.000	6.735	7.500	1.000	.000	1.000
6.	3.0	1.000	.000	6.742	7.500	2.000	.000	1.000
7.	3.0	5.000	.000	6.766	7.500	3.000	.000	1.000
8.	3.0	9.000	.000	6.788	7.500	3.000	.000	1.000
9.	3.0	13.000	.000	6.806	7.500	3.000	.000	1.000
10.	3.0	17.000	.000	6.821	7.500	3.000	.000	1.000
11.	3.0	21.000	.000	6.835	7.500	3.000	.000	1.000
12.	3.0	27.000	.000	6.867	7.500	3.000	.000	1.000
13.	3.0	33.000	.000	6.909	7.500	3.000	.000	1.000
14.	3.0	39.000	.000	6.951	7.500	3.000	.000	1.000
15.	3.0	45.000	.000	6.983	7.500	3.000	.000	1.000
16.	3.0	51.000	.000	6.996	7.500	3.000	.000	1.000
17.	3.0	57.000	.000	6.997	7.500	-2.000	.000	1.000
18.	3.0	57.000	.000	6.998	8.000	1.000	.000	1.000
19.	3.0	64.000	.000	6.984	8.000	2.000	.000	1.000
20.	3.0	70.000	.000	6.967	8.000	3.000	.000	1.000
21.	3.0	76.000	.000	6.946	8.000	3.000	.000	1.000
22.	3.0	82.000	.000	6.895	8.000	3.000	.000	1.000
23.	3.0	88.000	.000	6.758	8.000	3.000	.000	1.000
24.	3.0	94.000	.000	6.511	8.000	3.000	.000	1.000
25.	3.0	100.000	.000	6.144	8.000	3.000	.000	1.000
26.	3.0	106.000	.000	5.550	8.000	3.000	.000	1.000
27.	3.0	112.000	.000	4.703	8.000	-2.000	.000	1.000
28.	3.0	112.000	.000	5.310	9.200	1.000	.000	1.000
29.	3.0	118.000	.000	4.410	9.200	2.000	.000	1.000
30.	3.0	122.000	.000	3.743	9.200	3.000	.000	1.000
31.	3.0	126.000	.000	2.979	9.200	3.000	.000	1.000
32.	3.0	130.000	.000	1.939	9.200	3.000	.000	1.000
33.	3.0	132.000	.300	.000	9.200	-2.000	.000	1.000
34.	4.0	.000	-1.600	6.895	10.800	.000	.000	2.000
35.	4.0	1.000	.000	6.896	10.800	2.000	.000	2.000
36.	4.0	5.000	.000	6.898	10.800	3.000	.000	2.000
37.	4.0	9.000	.000	6.900	10.800	3.000	.000	2.000
38.	4.0	13.000	.000	6.903	10.800	3.000	.000	2.000
39.	4.0	17.000	.000	6.907	10.800	3.000	.000	2.000
40.	4.0	21.000	.000	6.912	10.800	3.000	.000	2.000
41.	4.0	27.000	.000	6.927	10.800	3.000	.000	2.000
42.	4.0	33.000	.000	6.951	10.800	3.000	.000	2.000
43.	4.0	39.000	.000	6.977	10.800	3.000	.000	2.000
44.	4.0	45.000	.000	6.994	10.800	3.000	.000	2.000
45.	4.0	51.000	.000	7.000	10.800	3.000	.000	2.000

INPUT DATA DESCRIBING DECK-CORNER
NO= NUMBER OF DECK
RAD=RADIUS OF DECKCORNER
INTERP.FACTOR REFERS ALWAYS TO THE PRECEDING INTERVAL
CAMBER NO REFERS TO CAMBER-DATA

LINE	NO	FR.NO	DX	Y	Z	INTERP	RADIE	CAMBER
46.	4.0	57.000	.000	7.000	10.800	3.000	.000	2.000
47.	4.0	64.000	.000	7.000	10.800	3.000	.000	2.000
48.	4.0	70.000	.000	7.000	10.800	3.000	.000	2.000
49.	4.0	76.000	.000	7.000	10.800	3.000	.000	2.000
50.	4.0	82.000	.000	7.000	10.800	3.000	.000	2.000
51.	4.0	88.000	.000	6.963	10.800	3.000	.000	2.000
52.	4.0	94.000	.000	6.892	10.800	3.000	.000	2.000
53.	4.0	100.000	.000	6.761	10.800	3.000	.000	2.000
54.	4.0	106.000	.000	6.474	10.800	3.000	.000	2.000
55.	4.0	112.000	.000	5.993	10.800	-2.000	.000	2.000
56.	4.0	112.000	.000	5.310	9.200	1.000	.000	2.000
57.	4.0	118.000	.000	4.410	9.200	2.000	.000	2.000
58.	4.0	122.000	.000	3.743	9.200	3.000	.000	2.000
59.	4.0	126.000	.000	2.979	9.200	3.000	.000	2.000
60.	4.0	130.000	.000	1.039	9.200	3.000	.000	2.000
61.	4.0	132.000	.300	.000	9.200	-2.000	.000	2.000

INPUTDATA DESCRIBING KNUCKLE-LINES
NO= NUMBER OF KNUCKLELINE
INTERP.FACTOR REFERS ALWAYS TO THE PRECEDING INTERVAL

LINE NO	FR NO	DX	Y	Z	INTERP
62.10.2	2.000	.200	.319	3.000	.000
63.10.2	3.000	.000	.295	2.700	1.000
64.10.2	4.000	.000	.255	2.200	1.000
65.10.2	5.000	.000	.215	1.700	1.000
66.10.2	6.000	.000	.175	1.200	1.000
67.10.2	7.000	.000	.135	.700	1.000
68.10.2	8.000	.000	.095	.200	1.000
69.10.2	8.000	.200	.079	.000	1.000
70.10.2	9.000	.000	.110	.000	1.000
71.10.2	10.000	.000	.165	.000	1.000
72.10.2	11.000	.000	.212	.000	1.000
73.10.2	12.000	.000	.250	.000	1.000
74.10.2	13.000	.000	.275	.000	1.000
75.10.2	14.000	.000	.300	.000	1.000
76.10.2	88.000	.000	.300	.000	1.000
77.10.2	94.000	.000	.250	.000	1.000
78.10.2	100.000	.000	.200	.000	1.000
79.10.2	106.000	.000	.100	.000	1.000
80.10.2	109.000	.000	.000	.000	1.000
81.12.2	-3.000	.000	.300	3.350	.000
82.12.2	-2.000	.000	.300	3.305	1.000
83.12.2	-1.000	.000	.300	3.252	1.000
84.12.2	.000	.000	.300	3.193	1.000
85.12.2	1.000	.000	.300	3.125	1.000
86.12.2	2.000	.000	.300	3.050	1.000
87.12.2	2.000	.200	.300	3.000	1.000
88.12.2	3.000	.000	.360	2.965	1.000
89.12.2	4.000	.000	.450	2.887	1.000
90.12.2	5.000	.000	.535	2.800	1.000
91.12.2	6.000	.000	.600	2.710	1.000
92.12.2	7.000	.000	.640	2.613	1.000
93.12.2	8.000	.000	.673	2.512	1.000
94.12.2	9.000	.000	.695	2.412	1.000
95.12.2	10.000	.000	.705	2.300	1.000
96.12.2	11.000	.000	.700	2.190	1.000
97.12.2	12.000	.000	.695	2.075	1.000
98.12.2	13.000	.000	.670	1.960	1.000
99.12.2	17.000	.000	.595	1.503	1.000
100.12.2	21.000	.000	.510	1.073	1.000
101.12.2	27.000	.000	.380	.405	1.000
102.12.2	33.000	.000	.315	.070	1.000
103.12.2	39.000	.000	.300	.000	1.000
104.24.0	82.000	.000	6.850	7.270	.000
105.24.0	88.000	.000	6.670	7.370	2.000
106.24.0	94.000	.000	6.367	7.360	3.000

INPUTDATA DESCRIBING KNUCKLE-LINES
NO= NUMBER OF KNUCKLELINE
INTERP.FACTOR REFERS ALWAYS TO THE PRECEDING INTERVAL

LINE NO	FR NO	DX	Y	Z	INTERP
107.24.0	100.000	.000	5.960	7.390	3.000
108.24.0	106.000	.000	5.325	7.430	3.000
109.24.0	112.000	.000	4.415	7.470	3.000
110.24.0	118.000	.000	3.260	7.520	3.000
111.24.0	122.000	.000	2.383	7.550	3.000
112.24.0	126.000	.000	1.067	7.590	-2.000

INPUT DATA DESCRIBING CAMBER

CAMBER	U	V	H
1.000	5.000	.080	.000
2.000	5.000	.080	.000

INPUT DATA HALFBREADTHS

FRAME NO	-3.000	-2.000	-1.000	.000	1.000	5.000	9.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-37.540	-37.040	-36.540	-36.040	-35.540	-33.540	-31.540
INTERP CODE	2.	3.	3.	-2.	2.	3.	3.
WL .250	.000	.000	.000	.000	.000	.000	.169
WL .500	.000	.000	.000	.000	.000	.000	.230
WL .750	.000	.000	.000	.000	.000	.000	.291
WL 1.000	.000	.000	.000	.000	.000	.000	.352
WL 1.250	.000	.000	.000	.000	.000	.000	.412
WL 1.500	.000	.000	.000	.000	.000	.000	.473
WL 1.750	.000	.000	.000	.000	.000	.230	.534
WL 2.000	.000	.000	.000	.000	.000	.304	.594
WL 2.250	.000	.000	.000	.000	.000	.377	.655
WL 2.500	.000	.000	.000	.000	.000	.449	1.241
WL 2.750	.000	.000	.000	.000	.000	.519	2.823

FRAME NO	13.000	17.000	21.000	27.000	33.000	39.000	45.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-29.540	-27.540	-25.540	-21.340	-17.140	-12.940	-8.740
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL .250	.321	.348	.348	.348	1.575	1.749	1.796
WL .500	.372	.397	.397	1.340	3.060	3.198	3.291
WL .750	.423	.445	.445	2.912	4.326	4.620	4.729
WL 1.000	.474	.494	.494	4.049	5.137	5.336	5.422
WL 1.250	.526	.542	1.728	4.859	5.584	5.739	5.817
WL 1.500	.577	.603	3.036	5.335	5.895	6.021	6.091
WL 1.750	.628	2.016	4.132	5.672	6.131	6.233	6.293
WL 2.000	.886	3.263	4.805	5.936	6.314	6.396	6.449
WL 2.250	2.268	4.318	5.230	6.142	6.458	6.525	6.570
WL 2.500	3.650	4.893	5.562	6.308	6.573	6.629	6.667
WL 2.750	4.533	5.310	5.832	6.444	6.662	6.709	6.741

FRAME NO	51.000	57.000	64.000	70.000	76.000	82.000	88.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-4.540	-.340	4.560	8.760	12.960	17.160	21.360
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL .250	1.821	1.822	1.822	1.822	1.874	1.405	1.040
WL .500	3.343	3.343	3.344	3.331	3.082	2.393	1.662
WL .750	4.787	4.804	4.726	4.430	4.027	3.219	2.200
WL 1.000	5.471	5.465	5.360	5.050	4.612	3.860	2.663
WL 1.250	5.861	5.847	5.743	5.459	5.034	4.331	3.093
WL 1.500	6.131	6.117	6.019	5.765	5.359	4.691	3.462
WL 1.750	6.328	6.319	6.230	6.006	5.625	4.983	3.783
WL 2.000	6.480	6.473	6.397	6.198	5.845	5.224	4.055
WL 2.250	6.596	6.594	6.530	6.354	6.029	5.432	4.297
WL 2.500	6.689	6.689	6.636	6.481	6.185	5.614	4.512
WL 2.750	6.758	6.760	6.718	6.583	6.319	5.772	4.699

INPUT DATA HALFBREADTHS

FRAME NO	94.000	100.000	106.000	112.000	115.000	118.000	120.000
DX	.000	.000	.000	.000	.000	.000	.000
X	25.160	28.160	31.160	34.160	35.660	37.160	38.160
INTERP CODE	3.	3.	3.	3.	3.	-2.	1.
WL .250	.832	.679	.503	.280	.116	.000	.000
WL .500	1.251	1.014	.776	.510	.371	.145	.000
WL .750	1.598	1.275	.979	.686	.555	.443	.000
WL 1.000	1.890	1.482	1.142	.826	.694	.621	.415
WL 1.250	2.143	1.650	1.272	.938	.802	.739	.603
WL 1.500	2.362	1.788	1.367	1.022	.884	.827	.720
WL 1.750	2.557	1.898	1.435	1.081	.941	.890	.799
WL 2.000	2.733	1.985	1.479	1.118	.978	.929	.846
WL 2.250	2.909	2.059	1.501	1.135	.997	.943	.867
WL 2.500	3.074	2.129	1.504	1.129	.996	.933	.843
WL 2.750	3.237	2.204	1.496	1.093	.959	.873	.764

FRAME NO	122.000
DX	.000
X	39.160
WL .250	.000
WL .500	.000
WL .750	.000
WL 1.000	.000
WL 1.250	.000
WL 1.500	.000
WL 1.750	.395
WL 2.000	.500
WL 2.250	.540
WL 2.500	.503
WL 2.750	.376

X-COORD FOR CL-CONTOUR AFT AND FORW FOR WL

WL	X-AFT	X-FORW
.250	-32.090	36.206
.500	-32.340	37.199
.750	-32.590	37.888
1.000	-32.840	38.420
1.250	-33.090	38.830
1.500	-33.340	39.139
1.750	-33.590	39.247
2.000	-33.840	39.340
2.250	-34.090	39.434
2.500	-34.340	39.376
2.750	-34.590	39.258

INPUT DATA HALFBREADTHS

FRAME NO		-3.000	-2.000	-1.000	.000	1.000	5.000	9.000
	DX	.000	.000	.000	.000	.000	.000	.000
	X	-37.540	-37.040	-36.540	-36.040	-35.540	-33.540	-31.540
INTERP CODE		2.	3.	3.	-2.	2.	3.	3.
WL	3.000	.000	.000	.000	.000	.000	2.114	4.174
WL	3.250	.000	.000	.000	1.075	1.822	3.953	4.908
WL	3.500	2.431	3.071	3.402	3.736	4.021	4.852	5.412
WL	3.750	3.157	4.602	4.744	4.885	5.024	5.456	5.803
WL	4.000	3.343	5.060	5.480	5.543	5.605	5.851	6.093
WL	4.250	3.505	5.158	5.867	5.910	5.952	6.128	6.310
WL	4.500	.673	3.900	5.426	6.153	6.187	6.327	6.467
WL	4.750	1.238	4.040	5.521	6.327	6.335	6.468	6.574
WL	5.000	1.665	4.180	5.616	6.450	6.474	6.563	6.641
WL	5.250	1.952	4.308	5.711	6.534	6.553	6.621	6.674
WL	5.500	2.205	4.422	5.805	6.588	6.603	6.650	6.688

FRAME NO		13.000	17.000	21.000	27.000	33.000	39.000	45.000
	DX	.000	.000	.000	.000	.000	.000	.000
	X	-29.540	-27.540	-25.540	-21.340	-17.140	-12.940	-8.740
INTERP CODE		3.	3.	3.	3.	3.	3.	3.
WL	3.000	5.079	5.646	6.065	6.552	6.727	6.771	6.796
WL	3.250	5.496	5.935	6.259	6.637	6.773	6.812	6.838
WL	3.500	5.840	6.173	6.417	6.702	6.805	6.845	6.864
WL	3.750	6.113	6.361	6.540	6.748	6.830	6.861	6.882
WL	4.000	6.323	6.503	6.632	6.779	6.842	6.877	6.901
WL	4.250	6.479	6.609	6.697	6.801	6.854	6.889	6.910
WL	4.500	6.589	6.677	6.739	6.813	6.859	6.896	6.919
WL	4.750	6.659	6.718	6.759	6.817	6.863	6.903	6.927
WL	5.000	6.697	6.735	6.766	6.822	6.868	6.910	6.935
WL	5.250	6.711	6.744	6.774	6.827	6.872	6.917	6.943
WL	5.500	6.723	6.754	6.781	6.831	6.876	6.924	6.952

FRAME NO		51.000	57.000	64.000	70.000	76.000	82.000	88.000
	DX	.000	.000	.000	.000	.000	.000	.000
	X	-4.540	-.340	4.560	8.760	12.960	17.160	21.360
INTERP CODE		3.	3.	3.	3.	3.	3.	3.
WL	3.000	6.810	6.811	6.778	6.663	6.433	5.914	4.869
WL	3.250	6.849	6.849	6.823	6.727	6.529	6.044	5.029
WL	3.500	6.872	6.877	6.858	6.777	6.611	6.150	5.179
WL	3.750	6.891	6.898	6.884	6.817	6.675	6.248	5.313
WL	4.000	6.910	6.913	6.904	6.852	6.734	6.333	5.445
WL	4.250	6.922	6.922	6.916	6.877	6.776	6.407	5.564
WL	4.500	6.933	6.932	6.928	6.901	6.817	6.471	5.675
WL	4.750	6.941	6.941	6.939	6.925	6.857	6.535	5.782
WL	5.000	6.949	6.951	6.951	6.946	6.884	6.594	5.889
WL	5.250	6.957	6.960	6.963	6.958	6.906	6.640	5.994
WL	5.500	6.965	6.970	6.972	6.969	6.928	6.687	6.089

INPUT DATA HALFBREADTHS

FRAME NO	94.000	100.000	106.000	112.000	115.000	118.000	120.000
DX	.000	.000	.000	.000	.000	.000	.000
X	25.160	28.160	31.160	34.160	35.660	37.160	38.160
INTERP CODE	3.	3.	3.	3.	-2.	1.	1.
WL 3.000	3.400	2.296	1.487	1.010	.859	.740	.608
WL 3.250	3.563	2.411	1.489	.865	.643	.481	.263
WL 3.500	3.742	2.552	1.527	.679	.290	.000	.000
WL 3.750	3.922	2.723	1.606	.628	.169	.000	.000
WL 4.000	4.102	2.900	1.741	.708	.239	.000	.000
WL 4.250	4.286	3.104	1.930	.859	.383	.000	.000
WL 4.500	4.470	3.314	2.152	1.057	.556	.000	.000
WL 4.750	4.647	3.534	2.381	1.284	.753	.211	.000
WL 5.000	4.821	3.761	2.621	1.513	.962	.470	.000
WL 5.250	4.995	3.987	2.866	1.747	1.184	.680	.000
WL 5.500	5.169	4.213	3.112	1.982	1.405	.890	.373

FRAME NO	122.000
DX	.000
X	39.160
WL 3.000	.000
WL 3.250	.000
WL 3.500	.000
WL 3.750	.000
WL 4.000	.000
WL 4.250	.000
WL 4.500	.000
WL 4.750	.000
WL 5.000	.000
WL 5.250	.000
WL 5.500	.000

X-COORD FOR CL-CONTOUR AFT AND FORW FOR WL

WL	X-AFT	X-FORW
3.000	-34.840	39.078
3.250	-36.540	38.356
3.500	-37.830	36.243
3.750	-37.862	36.063
4.000	-37.895	36.216
4.250	-37.927	36.567
4.500	-37.563	36.917
4.750	-37.600	37.267
5.000	-37.638	37.618
5.250	-37.676	37.990
5.500	-37.714	38.365

INPUT DATA HALFBREADTHS

FRAME NO	-3.000	-2.000	-1.000	.000	1.000	5.000	9.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-37.540	-37.040	-36.540	-36.040	-35.540	-33.540	-31.540
INTERP CODE	2.	3.	3.	-2.	2.	3.	3.
WL 5.750	2.458	4.535	5.891	6.616	6.626	6.666	6.702
WL 6.000	2.680	4.649	5.972	6.634	6.644	6.683	6.716
WL 6.250	2.863	4.762	6.054	6.652	6.662	6.699	6.730
WL 6.500	3.045	4.875	6.135	6.671	6.680	6.716	6.745
WL 6.750	3.228	4.989	6.216	6.689	6.698	6.732	6.759
WL 7.000	3.410	5.095	6.297	6.707	6.715	6.744	6.769
WL 7.250	2.660	4.697	6.007	6.721	6.728	6.755	6.778
WL 7.500	1.910	4.292	5.697	6.735	6.742	6.766	6.788
WL 7.750	1.910	4.292	5.697	6.749	6.755	6.777	6.799
WL 8.000	1.910	4.292	5.697	6.763	6.769	6.789	6.806
WL 8.250	1.910	4.292	5.697	6.777	6.780	6.798	6.814

FRAME NO	13.000	17.000	21.000	27.000	33.000	39.000	45.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-29.540	-27.540	-25.540	-21.340	-17.140	-12.940	-8.740
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL 5.750	6.734	6.764	6.789	6.836	6.880	6.929	6.960
WL 6.000	6.746	6.773	6.796	6.840	6.885	6.932	6.968
WL 6.250	6.758	6.783	6.803	6.845	6.889	6.935	6.970
WL 6.500	6.770	6.792	6.811	6.850	6.893	6.938	6.973
WL 6.750	6.782	6.802	6.818	6.854	6.898	6.941	6.975
WL 7.000	6.790	6.809	6.825	6.859	6.902	6.944	6.978
WL 7.250	6.798	6.815	6.830	6.863	6.906	6.947	6.980
WL 7.500	6.806	6.821	6.835	6.868	6.909	6.950	6.983
WL 7.750	6.813	6.828	6.841	6.872	6.912	6.953	6.985
WL 8.000	6.821	6.834	6.846	6.876	6.914	6.956	6.988
WL 8.250	6.828	6.840	6.851	6.880	6.918	6.958	6.988

FRAME NO	51.000	57.000	64.000	70.000	76.000	82.000	88.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-4.540	-.340	4.560	8.760	12.960	17.160	21.360
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL 5.750	6.973	6.973	6.973	6.970	6.932	6.719	6.176
WL 6.000	6.981	6.977	6.973	6.970	6.936	6.748	6.259
WL 6.250	6.985	6.980	6.974	6.970	6.940	6.777	6.341
WL 6.500	6.987	6.984	6.975	6.970	6.941	6.801	6.423
WL 6.750	6.989	6.987	6.975	6.966	6.933	6.818	6.506
WL 7.000	6.992	6.991	6.976	6.958	6.925	6.834	6.581
WL 7.250	6.994	6.994	6.977	6.952	6.918	6.850	6.655
WL 7.500	6.996	6.995	6.979	6.957	6.929	6.867	6.697
WL 7.750	6.998	6.995	6.982	6.962	6.939	6.883	6.728
WL 8.000	7.000	6.996	6.984	6.967	6.946	6.895	6.758
WL 8.250	7.000	6.997	6.987	6.971	6.953	6.908	6.789

INPUT DATA HALFBREADTHS

FRAME NO		94.000	100.000	106.000	112.000	115.000	118.000	120.000
	DX	.000	.000	.000	.000	.000	.000	.000
	X	25.160	28.160	31.160	34.160	35.660	37.160	38.160
INTERP CODE		3.	3.	3.	3.	3.	-2.	1.
WL	5.750	5.341	4.439	3.367	2.237	1.649	1.115	.672
WL	6.000	5.503	4.670	3.641	2.504	1.903	1.347	.935
WL	6.250	5.664	4.903	3.923	2.795	2.184	1.610	1.209
WL	6.500	5.825	5.135	4.206	3.086	2.469	1.896	1.482
WL	6.750	5.987	5.367	4.494	3.415	2.795	2.194	1.791
WL	7.000	6.148	5.600	4.799	3.747	3.127	2.524	2.106
WL	7.250	6.305	5.832	5.105	4.101	3.493	2.870	2.447
WL	7.500	6.403	5.996	5.351	4.436	3.859	3.231	2.797
WL	7.750	6.459	6.071	5.451	4.570	4.016	3.433	3.023
WL	8.000	6.511	6.144	5.550	4.703	4.171	3.612	3.227
WL	8.250	6.562	6.217	5.650	4.836	4.327	3.785	3.415

FRAME NO		122.000	126.000	130.000
	DX	.000	.000	.000
	X	39.160	41.160	43.160
INTERP CODE		1.	1.	
WL	5.750	.000	.000	.000
WL	6.000	.000	.000	.000
WL	6.250	.597	.000	.000
WL	6.500	.950	.000	.000
WL	6.750	1.282	.000	.000
WL	7.000	1.621	.000	.000
WL	7.250	1.968	.000	.000
WL	7.500	2.315	.882	.000
WL	7.750	2.571	1.354	.000
WL	8.000	2.796	1.720	.000
WL	8.250	3.020	2.027	.000

X-COORD FOR CL-CONTOUR AFT AND FORW FOR WL

WL	X-AFT	X-FORW
5.750	-37.751	38.740
6.000	-37.789	39.115
6.250	-37.827	39.510
6.500	-37.865	39.908
6.750	-37.902	40.305
7.000	-37.940	40.705
7.250	-37.790	41.120
7.500	-37.640	41.535
7.750	-37.640	41.962
8.000	-37.640	42.392
8.250	-37.640	42.823

INPUT DATA HALFBREADTHS

FRAME NO	-3.000	-2.000	-1.000	.000	1.000	5.000	9.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-37.540	-37.040	-36.540	-36.040	-35.540	-33.540	-31.540
INTERP CODE	2.	3.	3.	-2.	2.	3.	3.
WL 8.500	1.910	4.292	5.697	6.783	6.791	6.808	6.823
WL 8.750	1.910	4.292	5.697	6.783	6.803	6.818	6.831
WL 9.000	1.910	4.292	5.697	6.783	6.814	6.828	6.839
WL 9.250	1.910	4.292	5.697	6.783	6.826	6.837	6.848
WL 9.500	1.910	4.292	5.697	6.783	6.837	6.847	6.856
WL 9.750	1.910	4.292	5.697	6.783	6.849	6.857	6.864
WL 10.000	1.910	4.292	5.697	6.783	6.860	6.866	6.873
WL 10.250	1.910	4.292	5.697	6.783	6.871	6.876	6.881
WL 10.500	1.910	4.292	5.697	6.783	6.883	6.886	6.889
WL 10.750	1.910	4.292	5.697	6.783	6.894	6.896	6.898
WL 11.000	1.910	4.292	5.697	6.783	6.906	6.905	6.906

FRAME NO	13.000	17.000	21.000	27.000	33.000	39.000	45.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-29.540	-27.540	-25.540	-21.340	-17.140	-12.940	-8.740
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL 8.500	6.836	6.847	6.857	6.884	6.921	6.960	6.989
WL 8.750	6.843	6.854	6.862	6.889	6.924	6.962	6.990
WL 9.000	6.850	6.860	6.868	6.893	6.927	6.964	6.990
WL 9.250	6.858	6.867	6.875	6.897	6.931	6.966	6.991
WL 9.500	6.865	6.873	6.881	6.902	6.934	6.968	6.991
WL 9.750	6.872	6.880	6.887	6.906	6.937	6.969	6.992
WL 10.000	6.880	6.887	6.893	6.911	6.941	6.971	6.992
WL 10.250	6.887	6.893	6.899	6.916	6.944	6.973	6.993
WL 10.500	6.895	6.900	6.905	6.921	6.947	6.975	6.993
WL 10.750	6.902	6.906	6.911	6.926	6.950	6.977	6.994
WL 11.000	6.909	6.913	6.917	6.931	6.954	6.979	6.995

FRAME NO	51.000	57.000	64.000	70.000	76.000	82.000	88.000
DX	.000	.000	.000	.000	.000	.000	.000
X	-4.540	-.340	4.560	8.760	12.960	17.160	21.360
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL 8.500	7.000	6.997	6.989	6.976	6.960	6.920	6.813
WL 8.750	7.000	6.998	6.991	6.981	6.967	6.932	6.834
WL 9.000	7.000	6.999	6.994	6.985	6.974	6.944	6.856
WL 9.250	7.000	6.999	6.996	6.990	6.981	6.957	6.878
WL 9.500	7.000	7.000	6.999	6.995	6.988	6.969	6.899
WL 9.750	7.000	7.000	6.999	6.996	6.991	6.975	6.912
WL 10.000	7.000	7.000	6.999	6.996	6.994	6.981	6.924
WL 10.250	7.000	7.000	6.999	6.997	6.996	6.987	6.936
WL 10.500	7.000	7.000	7.000	6.998	6.999	6.993	6.949
WL 10.750	7.000	7.000	7.000	6.999	6.999	6.999	6.961
WL 11.000	7.000	7.000	7.000	7.000	7.000	7.000	6.971

INPUT DATA HALFBREADTHS

FRAME NO	94.000	100.000	106.000	112.000	115.000	118.000	120.000
DX	.000	.000	.000	.000	.000	.000	.000
X	25.160	28.160	31.160	34.160	35.660	37.160	38.160
INTERP CODE	3.	3.	3.	3.	3.	3.	3.
WL 8.500	6.614	6.291	5.747	4.967	4.482	3.958	3.597
WL 8.750	6.656	6.353	5.835	5.089	4.626	4.128	3.780
WL 9.000	6.694	6.413	5.924	5.212	4.767	4.284	3.950
WL 9.250	6.731	6.473	6.013	5.334	4.908	4.441	4.117
WL 9.500	6.768	6.533	6.101	5.457	5.050	4.597	4.285
WL 9.750	6.793	6.580	6.176	5.564	5.174	4.747	4.450
WL 10.000	6.817	6.627	6.252	5.670	5.299	4.893	4.610
WL 10.250	6.842	6.674	6.327	5.777	5.423	5.039	4.770
WL 10.500	6.867	6.718	6.397	5.879	5.542	5.176	4.923
WL 10.750	6.888	6.754	6.461	5.974	5.654	5.311	5.073
WL 11.000	6.906	6.790	6.526	6.069	5.766	5.445	5.219

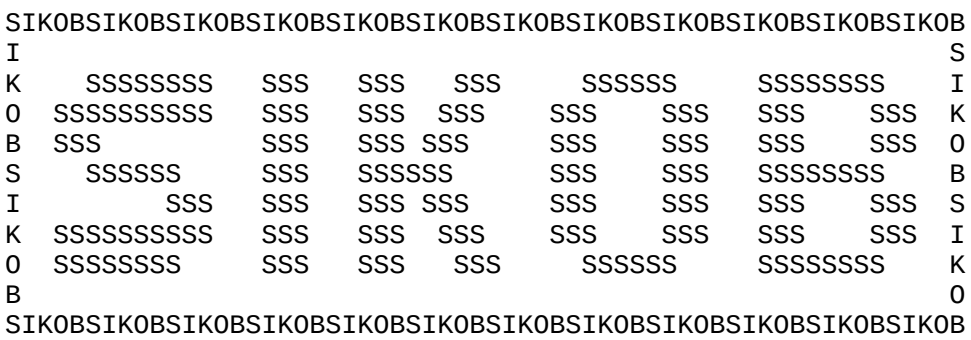
FRAME NO	122.000	126.000	130.000
DX	.000	.000	.000
X	39.160	41.160	43.160
INTERP CODE	3.	-2.	
WL 8.500	3.216	2.312	.450
WL 8.750	3.411	2.562	1.202
WL 9.000	3.599	2.802	1.650
WL 9.250	3.779	3.023	2.011
WL 9.500	3.959	3.244	2.329
WL 9.750	4.140	3.459	2.610
WL 10.000	4.316	3.671	2.878
WL 10.250	4.490	3.878	3.135
WL 10.500	4.658	4.079	3.382
WL 10.750	4.824	4.274	3.620
WL 11.000	4.983	4.465	3.849

X-COORD FOR CL-CONTOUR AFT AND FORW FOR WL

WL	X-AFT	X-FORW
8.500	-37.640	43.254
8.750	-37.640	43.685
9.000	-37.640	44.115
9.250	-37.640	44.460
9.500	-37.640	44.460
9.750	-37.640	44.460
10.000	-37.640	44.460
10.250	-37.640	44.460
10.500	-37.640	44.460
10.750	-37.640	44.460
11.000	-37.640	44.460

NUMBER OF HULLDATA = 3283 MAX NUMBER= 6000

II. BONJEAN CURVES



SECTION AREAS AND MOMENTS
THE CALCULATION IS MADE TO MOULDED LINES

H= HEIGHT ABOVE BL
A= AREA
MBL= AREA-MOMENT ABOUT BL
MLPP/2= AREA*DIST TO LPP/2

SECTIONAREAS AND MOMENTS

1.200 FORW FRAME .00 DIST FROM LPP/2= -34.840

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	16.225	64.950	-565.282
.100	.000	.000	.000	4.800	17.502	71.015	-609.770
.200	.000	.000	.000	4.900	18.790	77.260	-654.628
.300	.000	.000	.000	5.000	20.087	83.680	-699.818
.400	.000	.000	.000	5.100	21.391	90.269	-745.277
.500	.000	.000	.000	5.200	22.702	97.020	-790.944
.600	.000	.000	.000	5.300	24.018	103.927	-836.782
.700	.000	.000	.000	5.400	25.338	110.988	-882.759
.800	.000	.000	.000	5.500	26.660	118.197	-928.845
.900	.000	.000	.000	5.600	27.985	125.551	-975.012
1.000	.000	.000	.000	5.700	29.312	133.047	-1021.235
1.100	.000	.000	.000	5.800	30.640	140.684	-1067.506
1.200	.000	.000	.000	5.900	31.970	148.462	-1113.828
1.300	.000	.000	.000	6.000	33.301	156.381	-1160.198
1.400	.000	.000	.000	6.100	34.633	164.442	-1206.619
1.500	.000	.000	.000	6.200	35.967	172.644	-1253.086
1.600	.000	.000	.000	6.300	37.302	180.989	-1299.603
1.700	.000	.000	.000	6.400	38.639	189.476	-1346.167
1.800	.000	.000	.000	6.500	39.977	198.106	-1392.782
1.900	.000	.000	.000	6.600	41.316	206.879	-1439.446
2.000	.000	.000	.000	6.700	42.657	215.795	-1486.160
2.100	.000	.000	.000	6.800	43.999	224.855	-1532.919
2.200	.000	.000	.000	6.900	45.342	234.057	-1579.723
2.300	.000	.000	.000	7.000	46.687	243.401	-1626.568
2.400	.000	.000	.000	7.100	48.032	252.888	-1673.450
2.500	.000	.000	.000	7.200	49.379	262.516	-1720.365
2.600	.000	.000	.000	7.300	50.727	272.286	-1767.315
2.700	.000	.000	.000	7.400	52.075	282.199	-1814.301
2.800	.000	.000	.000	7.500	53.425	292.254	-1861.323
2.900	.000	.000	.000	7.600	54.091	297.273	-1884.546
3.000	.000	.000	.000	7.700	54.091	297.273	-1884.546
3.100	.146	.448	-5.090	7.800	54.091	297.273	-1884.546
3.200	.515	1.611	-17.936	7.900	54.091	297.273	-1884.546
3.300	1.055	3.369	-36.772	8.000	54.091	297.273	-1884.546
3.400	1.756	5.716	-61.163	8.100	54.091	297.273	-1884.545
3.500	2.578	8.554	-89.812	8.200	54.091	297.273	-1884.546
3.600	3.487	11.780	-121.470	8.300	54.091	297.273	-1884.546
3.700	4.467	15.360	-155.634	8.400	54.091	297.273	-1884.546
3.800	5.504	19.247	-191.750	8.500	54.091	297.273	-1884.548
3.900	6.587	23.417	-229.477	8.600	54.091	297.273	-1884.546
4.000	7.708	27.848	-268.555	8.700	54.091	297.273	-1884.547
4.100	8.861	32.517	-308.726	8.800	54.091	297.273	-1884.546
4.200	10.041	37.413	-349.824	8.900	54.091	297.273	-1884.545
4.300	11.243	42.524	-391.718	9.000	54.091	297.273	-1884.548
4.400	12.466	47.841	-434.304	9.100	54.091	297.273	-1884.548
4.500	13.705	53.357	-477.489	9.200	54.092	297.273	-1884.548
4.600	14.959	59.063	-521.176	9.300	54.091	297.273	-1884.546

SECTIONAREAS AND MOMENTS

4.300 FORW FRAME .00 DIST FROM LPP/2= -31.740

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	23.970	86.206	-760.816
.100	.020	.001	-.644	4.800	25.283	92.442	-802.485
.200	.045	.005	-1.443	4.900	26.602	98.841	-844.360
.300	.076	.012	-2.397	5.000	27.927	105.397	-886.402
.400	.110	.025	-3.505	5.100	29.256	112.107	-928.574
.500	.150	.043	-4.767	5.200	30.587	118.965	-970.840
.600	.195	.067	-6.184	5.300	31.921	125.968	-1013.177
.700	.244	.099	-7.755	5.400	33.256	133.112	-1055.560
.800	.299	.140	-9.481	5.500	34.593	140.395	-1097.977
.900	.358	.191	-11.362	5.600	35.930	147.818	-1140.427
1.000	.422	.252	-13.397	5.700	37.269	155.381	-1182.914
1.100	.491	.324	-15.587	5.800	38.609	163.084	-1225.436
1.200	.565	.409	-17.931	5.900	39.949	170.928	-1267.995
1.300	.644	.508	-20.429	6.000	41.291	178.913	-1310.591
1.400	.727	.620	-23.083	6.100	42.635	187.039	-1353.222
1.500	.816	.749	-25.890	6.200	43.979	195.306	-1395.889
1.600	.909	.893	-28.852	6.300	45.324	203.715	-1438.592
1.700	1.007	1.055	-31.969	6.400	46.671	212.266	-1481.334
1.800	1.110	1.236	-35.240	6.500	48.019	220.960	-1524.115
1.900	1.218	1.436	-38.666	6.600	49.368	229.796	-1566.935
2.000	1.331	1.656	-42.246	6.700	50.718	238.775	-1609.790
2.100	1.449	1.897	-45.981	6.800	52.069	247.897	-1652.680
2.200	1.571	2.160	-49.871	6.900	53.421	257.159	-1695.598
2.300	1.699	2.447	-53.914	7.000	54.774	266.562	-1738.541
2.400	1.831	2.758	-58.113	7.100	56.128	276.106	-1781.508
2.500	1.982	3.128	-62.902	7.200	57.483	285.790	-1824.498
2.600	2.244	3.797	-71.213	7.300	58.838	295.615	-1867.511
2.700	2.633	4.829	-83.563	7.400	60.194	305.581	-1910.549
2.800	3.146	6.241	-99.850	7.500	61.550	315.689	-1953.613
2.900	3.792	8.082	-120.343	7.600	62.227	320.780	-1975.070
3.000	4.551	10.324	-144.451	7.700	62.227	320.780	-1975.070
3.100	5.393	12.892	-171.173	7.800	62.227	320.780	-1975.071
3.200	6.303	15.760	-200.067	7.900	62.227	320.780	-1975.071
3.300	7.269	18.901	-230.732	8.000	62.227	320.780	-1975.070
3.400	8.282	22.294	-262.874	8.100	62.227	320.780	-1975.070
3.500	9.336	25.929	-296.315	8.200	62.227	320.780	-1975.071
3.600	10.426	29.800	-330.926	8.300	62.227	320.780	-1975.071
3.700	11.550	33.904	-366.608	8.400	62.227	320.780	-1975.070
3.800	12.704	38.231	-403.232	8.500	62.227	320.780	-1975.069
3.900	13.884	42.774	-440.684	8.600	62.227	320.780	-1975.071
4.000	15.087	47.527	-478.873	8.700	62.227	320.780	-1975.070
4.100	16.311	52.483	-517.715	8.800	62.227	320.780	-1975.071
4.200	17.553	57.638	-557.141	8.900	62.227	320.780	-1975.070
4.300	18.812	62.986	-597.082	9.000	62.227	320.780	-1975.071
4.400	20.084	68.523	-637.475	9.100	62.227	320.780	-1975.069
4.500	21.369	74.241	-678.264	9.200	62.227	320.780	-1975.071
4.600	22.665	80.137	-719.394	9.300	62.227	320.780	-1975.070

SECTIONAREAS AND MOMENTS

7.400 FORW FRAME .00 DIST FROM LPP/2= -28.640

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	31.644	105.896	-906.282
.100	.062	.003	-1.773	4.800	32.982	112.250	-944.592
.200	.128	.013	-3.656	4.900	34.322	118.751	-982.980
.300	.197	.030	-5.649	5.000	35.664	125.396	-1021.425
.400	.271	.056	-7.752	5.100	37.008	132.181	-1059.909
.500	.348	.091	-9.964	5.200	38.353	139.106	-1098.418
.600	.429	.136	-12.287	5.300	39.698	146.169	-1136.946
.700	.514	.191	-14.719	5.400	41.044	153.371	-1175.499
.800	.603	.257	-17.260	5.500	42.391	160.712	-1214.079
.900	.695	.336	-19.912	5.600	43.739	168.193	-1252.684
1.000	.792	.428	-22.673	5.700	45.088	175.813	-1291.312
1.100	.892	.533	-25.544	5.800	46.437	183.574	-1329.964
1.200	.996	.653	-28.525	5.900	47.788	191.474	-1368.640
1.300	1.104	.788	-31.616	6.000	49.139	199.514	-1407.341
1.400	1.216	.939	-34.817	6.100	50.491	207.694	-1446.067
1.500	1.331	1.106	-38.127	6.200	51.844	216.016	-1484.818
1.600	1.451	1.291	-41.547	6.300	53.198	224.478	-1523.595
1.700	1.574	1.495	-45.077	6.400	54.553	233.081	-1562.397
1.800	1.713	1.739	-49.074	6.500	55.909	241.824	-1601.222
1.900	1.956	2.189	-56.025	6.600	57.265	250.710	-1640.072
2.000	2.313	2.886	-66.244	6.700	58.622	259.736	-1678.948
2.100	2.779	3.842	-79.591	6.800	59.981	268.905	-1717.850
2.200	3.350	5.071	-95.949	6.900	61.340	278.213	-1756.770
2.300	4.016	6.571	-115.026	7.000	62.699	287.662	-1795.706
2.400	4.771	8.344	-136.633	7.100	64.059	297.250	-1834.658
2.500	5.602	10.382	-160.443	7.200	65.420	306.979	-1873.626
2.600	6.496	12.661	-186.040	7.300	66.781	316.847	-1912.609
2.700	7.444	15.174	-213.188	7.400	68.143	326.856	-1951.611
2.800	8.435	17.901	-241.590	7.500	69.505	337.006	-1990.628
2.900	9.462	20.828	-271.002	7.600	70.189	342.152	-2010.202
3.000	10.520	23.950	-301.306	7.700	70.189	342.152	-2010.201
3.100	11.608	27.267	-332.457	7.800	70.189	342.152	-2010.200
3.200	12.724	30.782	-364.412	7.900	70.189	342.152	-2010.199
3.300	13.866	34.494	-397.118	8.000	70.189	342.152	-2010.200
3.400	15.032	38.402	-430.529	8.100	70.189	342.152	-2010.200
3.500	16.222	42.506	-464.597	8.200	70.189	342.152	-2010.200
3.600	17.432	46.803	-499.261	8.300	70.189	342.152	-2010.201
3.700	18.662	51.290	-534.469	8.400	70.189	342.152	-2010.201
3.800	19.908	55.965	-570.167	8.500	70.189	342.152	-2010.202
3.900	21.170	60.823	-606.307	8.600	70.189	342.152	-2010.202
4.000	22.446	65.862	-642.842	8.700	70.189	342.152	-2010.201
4.100	23.734	71.078	-679.729	8.800	70.189	342.152	-2010.199
4.200	25.032	76.469	-716.930	8.900	70.189	342.152	-2010.201
4.300	26.341	82.030	-754.404	9.000	70.189	342.152	-2010.200
4.400	27.657	87.757	-792.109	9.100	70.189	342.152	-2010.202
4.500	28.981	93.646	-830.012	9.200	70.189	342.152	-2010.202
4.600	30.310	99.694	-868.080	9.300	70.189	342.152	-2010.201

SECTIONAREAS AND MOMENTS

10.500 FORW FRAME .00 DIST FROM LPP/2= -25.540

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	39.762	123.360	-1015.511
.100	.062	.003	-1.582	4.800	41.113	129.781	-1050.035
.200	.128	.013	-3.265	4.900	42.466	136.341	-1084.579
.300	.198	.031	-5.047	5.000	43.819	143.038	-1119.134
.400	.271	.056	-6.929	5.100	45.172	149.874	-1153.702
.500	.349	.091	-8.912	5.200	46.527	156.848	-1188.287
.600	.430	.136	-10.994	5.300	47.881	163.960	-1222.888
.700	.516	.192	-13.176	5.400	49.237	171.211	-1257.505
.800	.605	.259	-15.458	5.500	50.593	178.601	-1292.135
.900	.699	.338	-17.840	5.600	51.949	186.130	-1326.781
1.000	.796	.430	-20.323	5.700	53.306	193.798	-1361.442
1.100	.902	.543	-23.048	5.800	54.664	201.605	-1396.121
1.200	1.119	.792	-28.567	5.900	56.022	209.552	-1430.813
1.300	1.463	1.225	-37.375	6.000	57.381	217.637	-1465.520
1.400	1.921	1.843	-49.054	6.100	58.741	225.862	-1500.241
1.500	2.480	2.654	-63.327	6.200	60.101	234.226	-1534.977
1.600	3.136	3.672	-80.096	6.300	61.461	242.730	-1569.727
1.700	3.887	4.912	-99.276	6.400	62.823	251.374	-1604.493
1.800	4.713	6.358	-120.370	6.500	64.185	260.158	-1639.275
1.900	5.601	8.001	-143.037	6.600	65.547	269.082	-1674.072
2.000	6.540	9.832	-167.020	6.700	66.910	278.147	-1708.885
2.100	7.520	11.842	-192.051	6.800	68.274	287.351	-1743.712
2.200	8.534	14.024	-217.970	6.900	69.638	296.696	-1778.553
2.300	9.580	16.377	-244.683	7.000	71.003	306.181	-1813.408
2.400	10.655	18.902	-272.119	7.100	72.368	315.805	-1848.276
2.500	11.755	21.598	-300.217	7.200	73.734	325.570	-1883.154
2.600	12.879	24.464	-328.922	7.300	75.100	335.473	-1918.042
2.700	14.025	27.500	-358.186	7.400	76.466	345.516	-1952.940
2.800	15.191	30.708	-387.975	7.500	77.833	355.699	-1987.847
2.900	16.377	34.088	-418.263	7.600	78.522	360.890	-2005.454
3.000	17.581	37.641	-449.020	7.700	78.522	360.890	-2005.455
3.100	18.802	41.366	-480.212	7.800	78.522	360.890	-2005.455
3.200	20.039	45.263	-511.809	7.900	78.522	360.890	-2005.454
3.300	21.291	49.331	-543.779	8.000	78.522	360.890	-2005.455
3.400	22.556	53.570	-576.093	8.100	78.522	360.890	-2005.455
3.500	23.834	57.978	-608.723	8.200	78.522	360.890	-2005.455
3.600	25.123	62.553	-641.639	8.300	78.522	360.890	-2005.455
3.700	26.422	67.294	-674.813	8.400	78.522	360.890	-2005.454
3.800	27.730	72.199	-708.218	8.500	78.522	360.890	-2005.456
3.900	29.046	77.266	-741.829	8.600	78.522	360.890	-2005.456
4.000	30.369	82.492	-775.622	8.700	78.522	360.890	-2005.455
4.100	31.698	87.876	-809.574	8.800	78.522	360.890	-2005.456
4.200	33.033	93.416	-843.664	8.900	78.522	360.890	-2005.456
4.300	34.372	99.108	-877.871	9.000	78.522	360.890	-2005.455
4.400	35.716	104.951	-912.179	9.100	78.522	360.891	-2005.456
4.500	37.062	110.943	-946.566	9.200	78.522	360.890	-2005.455
4.600	38.411	117.080	-981.018	9.300	78.522	360.890	-2005.455

SECTIONAREAS AND MOMENTS

13.650 FORW FRAME .00 DIST FROM LPP/2= -22.390

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	46.693	135.007	-1045.453
.100	.062	.003	-1.387	4.800	48.054	141.471	-1075.922
.200	.128	.013	-2.863	4.900	49.415	148.073	-1106.400
.300	.198	.031	-4.427	5.000	50.777	154.813	-1136.886
.400	.271	.056	-6.078	5.100	52.139	161.691	-1167.382
.500	.349	.091	-7.818	5.200	53.501	168.708	-1197.888
.600	.437	.140	-9.795	5.300	54.864	175.863	-1228.404
.700	.645	.277	-14.446	5.400	56.227	183.157	-1258.928
.800	.988	.535	-22.119	5.500	57.591	190.589	-1289.459
.900	1.444	.923	-32.333	5.600	58.955	198.159	-1320.000
1.000	2.003	1.455	-44.857	5.700	60.319	205.868	-1350.551
1.100	2.672	2.159	-59.832	5.800	61.684	213.717	-1381.112
1.200	3.455	3.059	-77.346	5.900	63.050	221.704	-1411.681
1.300	4.314	4.134	-96.588	6.000	64.415	229.829	-1442.257
1.400	5.228	5.368	-117.057	6.100	65.781	238.094	-1472.842
1.500	6.190	6.763	-138.590	6.200	67.148	246.497	-1503.437
1.600	7.198	8.327	-161.168	6.300	68.515	255.040	-1534.041
1.700	8.252	10.066	-184.771	6.400	69.882	263.723	-1564.655
1.800	9.343	11.975	-209.192	6.500	71.250	272.545	-1595.281
1.900	10.463	14.047	-234.257	6.600	72.618	281.506	-1625.914
2.000	11.606	16.277	-259.867	6.700	73.986	290.607	-1656.556
2.100	12.771	18.664	-285.932	6.800	75.355	299.847	-1687.204
2.200	13.952	21.204	-312.385	6.900	76.725	309.227	-1717.863
2.300	15.150	23.899	-339.198	7.000	78.094	318.747	-1748.532
2.400	16.363	26.750	-366.363	7.100	79.464	328.406	-1779.209
2.500	17.591	29.759	-393.862	7.200	80.835	338.205	-1809.895
2.600	18.833	32.926	-421.670	7.300	82.206	348.144	-1840.587
2.700	20.088	36.252	-449.766	7.400	83.577	358.222	-1871.288
2.800	21.355	39.736	-478.129	7.500	84.948	368.439	-1901.994
2.900	22.632	43.378	-506.740	7.600	85.644	373.678	-1917.572
3.000	23.921	47.178	-535.581	7.700	85.644	373.678	-1917.572
3.100	25.218	51.135	-564.631	7.800	85.644	373.679	-1917.573
3.200	26.524	55.249	-593.873	7.900	85.644	373.678	-1917.573
3.300	27.838	59.519	-623.289	8.000	85.644	373.678	-1917.572
3.400	29.159	63.944	-652.863	8.100	85.644	373.678	-1917.574
3.500	30.486	68.523	-682.580	8.200	85.644	373.678	-1917.573
3.600	31.819	73.254	-712.422	8.300	85.644	373.679	-1917.572
3.700	33.156	78.137	-742.373	8.400	85.644	373.678	-1917.573
3.800	34.498	83.170	-772.421	8.500	85.644	373.678	-1917.573
3.900	35.844	88.351	-802.552	8.600	85.644	373.678	-1917.572
4.000	37.193	93.679	-832.755	8.700	85.644	373.678	-1917.572
4.100	38.545	99.154	-863.021	8.800	85.644	373.678	-1917.573
4.200	39.899	104.774	-893.341	8.900	85.644	373.679	-1917.572
4.300	41.255	110.538	-923.707	9.000	85.644	373.679	-1917.572
4.400	42.613	116.444	-954.110	9.100	85.644	373.678	-1917.572
4.500	43.972	122.493	-984.541	9.200	85.644	373.679	-1917.574
4.600	45.332	128.681	-1014.991	9.300	85.644	373.678	-1917.573

SECTIONAREAS AND MOMENTS

16.800 FORW FRAME .00 DIST FROM LPP/2= -19.240

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	51.951	141.769	-999.536
.100	.062	.003	-1.193	4.800	53.319	148.268	-1025.862
.200	.128	.013	-2.463	4.900	54.688	154.906	-1052.193
.300	.232	.040	-4.464	5.000	56.057	161.682	-1078.532
.400	.500	.135	-9.616	5.100	57.426	168.597	-1104.879
.500	.914	.323	-17.583	5.200	58.796	175.651	-1131.231
.600	1.455	.621	-27.993	5.300	60.166	182.844	-1157.591
.700	2.110	1.048	-40.597	5.400	61.536	190.175	-1183.954
.800	2.861	1.612	-55.051	5.500	62.907	197.645	-1210.324
.900	3.696	2.322	-71.102	5.600	64.278	205.253	-1236.700
1.000	4.603	3.185	-88.562	5.700	65.649	213.000	-1263.083
1.100	5.578	4.209	-107.318	5.800	67.020	220.887	-1289.472
1.200	6.615	5.402	-127.282	5.900	68.392	228.913	-1315.868
1.300	7.697	6.754	-148.081	6.000	69.765	237.078	-1342.270
1.400	8.809	8.256	-169.483	6.100	71.137	245.382	-1368.681
1.500	9.947	9.907	-191.386	6.200	72.510	253.826	-1395.096
1.600	11.108	11.706	-213.720	6.300	73.884	262.410	-1421.519
1.700	12.288	13.654	-236.430	6.400	75.257	271.133	-1447.950
1.800	13.487	15.751	-259.484	6.500	76.631	279.995	-1474.387
1.900	14.702	17.999	-282.862	6.600	78.006	288.998	-1500.830
2.000	15.933	20.399	-306.542	6.700	79.380	298.140	-1527.280
2.100	17.178	22.952	-330.497	6.800	80.756	307.422	-1553.738
2.200	18.436	25.657	-354.708	6.900	82.131	316.844	-1580.201
2.300	19.706	28.516	-379.153	7.000	83.507	326.406	-1606.673
2.400	20.988	31.528	-403.812	7.100	84.883	336.108	-1633.149
2.500	22.280	34.693	-428.668	7.200	86.260	345.950	-1659.635
2.600	23.581	38.012	-453.705	7.300	87.636	355.931	-1686.124
2.700	24.891	41.483	-478.907	7.400	89.013	366.053	-1712.618
2.800	26.209	45.106	-504.258	7.500	90.391	376.315	-1739.119
2.900	27.533	48.881	-529.742	7.600	91.095	381.615	-1752.659
3.000	28.864	52.807	-555.342	7.700	91.095	381.614	-1752.659
3.100	30.200	56.882	-581.048	7.800	91.095	381.615	-1752.660
3.200	31.541	61.106	-606.848	7.900	91.095	381.615	-1752.659
3.300	32.886	65.478	-632.729	8.000	91.095	381.614	-1752.659
3.400	34.235	69.997	-658.684	8.100	91.095	381.614	-1752.659
3.500	35.587	74.662	-684.701	8.200	91.095	381.615	-1752.660
3.600	36.943	79.473	-710.774	8.300	91.094	381.614	-1752.658
3.700	38.300	84.429	-736.899	8.400	91.095	381.614	-1752.659
3.800	39.660	89.529	-763.065	8.500	91.095	381.614	-1752.660
3.900	41.022	94.771	-789.263	8.600	91.095	381.615	-1752.659
4.000	42.385	100.155	-815.484	8.700	91.095	381.614	-1752.660
4.100	43.749	105.679	-841.730	8.800	91.095	381.614	-1752.661
4.200	45.114	111.345	-868.000	8.900	91.095	381.615	-1752.660
4.300	46.481	117.152	-894.288	9.000	91.095	381.614	-1752.660
4.400	47.848	123.099	-920.590	9.100	91.095	381.614	-1752.659
4.500	49.215	129.184	-946.900	9.200	91.095	381.615	-1752.659
4.600	50.583	135.408	-973.216	9.300	91.095	381.614	-1752.659

SECTIONAREAS AND MOMENTS

19.950 FORW FRAME .00 DIST FROM LPP/2= -16.090

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	54.269	144.351	-873.189
.100	.077	.004	-1.240	4.800	55.644	150.882	-895.309
.200	.271	.035	-4.363	4.900	57.019	157.551	-917.436
.300	.597	.117	-9.611	5.000	58.395	164.361	-939.569
.400	1.055	.278	-16.972	5.100	59.771	171.310	-961.710
.500	1.638	.542	-26.349	5.200	61.147	178.398	-983.856
.600	2.337	.927	-37.605	5.300	62.524	185.626	-1006.008
.700	3.147	1.455	-50.634	5.400	63.901	192.993	-1028.166
.800	4.043	2.127	-65.054	5.500	65.278	200.501	-1050.329
.900	5.013	2.952	-80.652	5.600	66.656	208.147	-1072.497
1.000	6.040	3.929	-97.186	5.700	68.034	215.934	-1094.673
1.100	7.110	5.052	-114.393	5.800	69.413	223.860	-1116.851
1.200	8.213	6.321	-132.149	5.900	70.792	231.926	-1139.037
1.300	9.346	7.737	-150.376	6.000	72.171	240.132	-1161.229
1.400	10.504	9.301	-169.014	6.100	73.550	248.479	-1183.425
1.500	11.685	11.014	-188.018	6.200	74.930	256.965	-1205.626
1.600	12.887	12.877	-207.351	6.300	76.310	265.590	-1227.833
1.700	14.107	14.890	-226.978	6.400	77.691	274.356	-1250.043
1.800	15.343	17.054	-246.873	6.500	79.071	283.262	-1272.259
1.900	16.595	19.369	-267.007	6.600	80.453	292.307	-1294.481
2.000	17.859	21.835	-287.359	6.700	81.834	301.494	-1316.708
2.100	19.137	24.454	-307.908	6.800	83.216	310.821	-1338.941
2.200	20.425	27.223	-328.637	6.900	84.598	320.289	-1361.179
2.300	21.723	30.145	-349.530	7.000	85.980	329.897	-1383.422
2.400	23.031	33.219	-370.574	7.100	87.363	339.645	-1405.670
2.500	24.348	36.444	-391.756	7.200	88.746	349.533	-1427.923
2.600	25.672	39.821	-413.061	7.300	90.129	359.562	-1450.180
2.700	27.003	43.348	-434.478	7.400	91.513	369.732	-1472.442
2.800	28.340	47.025	-455.993	7.500	92.897	380.041	-1494.708
2.900	29.683	50.852	-477.596	7.600	93.609	385.409	-1506.175
3.000	31.030	54.827	-499.275	7.700	93.609	385.409	-1506.175
3.100	32.382	58.949	-521.020	7.800	93.609	385.409	-1506.175
3.200	33.737	63.217	-542.821	7.900	93.609	385.409	-1506.176
3.300	35.094	67.630	-564.670	8.000	93.609	385.409	-1506.176
3.400	36.455	72.188	-586.563	8.100	93.609	385.409	-1506.176
3.500	37.818	76.890	-608.492	8.200	93.609	385.409	-1506.176
3.600	39.183	81.736	-630.455	8.300	93.609	385.409	-1506.176
3.700	40.550	86.725	-652.447	8.400	93.609	385.409	-1506.175
3.800	41.918	91.856	-674.463	8.500	93.609	385.409	-1506.175
3.900	43.287	97.128	-696.496	8.600	93.609	385.409	-1506.176
4.000	44.658	102.540	-718.542	8.700	93.609	385.409	-1506.176
4.100	46.029	108.093	-740.602	8.800	93.609	385.409	-1506.176
4.200	47.401	113.787	-762.678	8.900	93.609	385.409	-1506.175
4.300	48.774	119.622	-784.767	9.000	93.609	385.409	-1506.176
4.400	50.147	125.596	-806.865	9.100	93.609	385.409	-1506.174
4.500	51.521	131.709	-828.968	9.200	93.609	385.409	-1506.176
4.600	52.895	137.961	-851.075	9.300	93.609	385.409	-1506.176

SECTIONAREAS AND MOMENTS

23.100 FORW FRAME .00 DIST FROM LPP/2= -12.940

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	54.740	145.076	-708.338
.100	.118	.007	-1.526	4.800	56.121	151.633	-726.203
.200	.352	.043	-4.553	4.900	57.502	158.332	-744.075
.300	.702	.131	-9.080	5.000	58.884	165.172	-761.955
.400	1.168	.295	-15.110	5.100	60.266	172.152	-779.842
.500	1.750	.558	-22.639	5.200	61.649	179.274	-797.736
.600	2.455	.947	-31.764	5.300	63.032	186.536	-815.637
.700	3.289	1.490	-42.560	5.400	64.416	193.941	-833.545
.800	4.212	2.184	-54.508	5.500	65.801	201.487	-851.462
.900	5.204	3.027	-67.336	5.600	67.186	209.173	-869.384
1.000	6.249	4.020	-80.863	5.700	68.571	217.001	-887.311
1.100	7.335	5.161	-94.913	5.800	69.957	224.970	-905.244
1.200	8.454	6.448	-109.395	5.900	71.343	233.078	-923.179
1.300	9.602	7.883	-124.246	6.000	72.729	241.326	-941.117
1.400	10.774	9.465	-139.416	6.100	74.116	249.715	-959.059
1.500	11.968	11.197	-154.868	6.200	75.503	258.244	-977.004
1.600	13.182	13.078	-170.571	6.300	76.890	266.912	-994.951
1.700	14.413	15.109	-186.499	6.400	78.277	275.721	-1012.902
1.800	15.659	17.291	-202.629	6.500	79.664	284.671	-1030.857
1.900	16.920	19.623	-218.941	6.600	81.052	293.760	-1048.814
2.000	18.193	22.106	-235.417	6.700	82.440	302.990	-1066.774
2.100	19.478	24.740	-252.042	6.800	83.828	312.360	-1084.738
2.200	20.773	27.525	-268.804	6.900	85.217	321.871	-1102.704
2.300	22.078	30.461	-285.690	7.000	86.605	331.523	-1120.673
2.400	23.392	33.549	-302.691	7.100	87.994	341.314	-1138.646
2.500	24.714	36.788	-319.798	7.200	89.383	351.247	-1156.622
2.600	26.043	40.178	-337.000	7.300	90.773	361.320	-1174.601
2.700	27.379	43.718	-354.286	7.400	92.163	371.534	-1192.583
2.800	28.721	47.408	-371.648	7.500	93.553	381.890	-1210.570
2.900	30.068	51.247	-389.081	7.600	94.274	387.323	-1219.905
3.000	31.420	55.236	-406.576	7.700	94.274	387.323	-1219.904
3.100	32.776	59.372	-424.124	7.800	94.274	387.323	-1219.905
3.200	34.136	63.654	-441.715	7.900	94.274	387.323	-1219.905
3.300	35.498	68.082	-459.344	8.000	94.274	387.323	-1219.905
3.400	36.863	72.656	-477.011	8.100	94.274	387.323	-1219.905
3.500	38.231	77.375	-494.712	8.200	94.274	387.323	-1219.905
3.600	39.601	82.238	-512.437	8.300	94.274	387.323	-1219.905
3.700	40.972	87.242	-530.180	8.400	94.274	387.323	-1219.905
3.800	42.344	92.388	-547.936	8.500	94.274	387.323	-1219.905
3.900	43.718	97.676	-565.709	8.600	94.274	387.323	-1219.904
4.000	45.093	103.107	-583.499	8.700	94.274	387.323	-1219.905
4.100	46.469	108.679	-601.303	8.800	94.274	387.323	-1219.906
4.200	47.846	114.394	-619.121	8.900	94.274	387.323	-1219.905
4.300	49.223	120.249	-636.950	9.000	94.274	387.323	-1219.905
4.400	50.602	126.245	-654.786	9.100	94.274	387.323	-1219.905
4.500	51.981	132.382	-672.630	9.200	94.274	387.323	-1219.905
4.600	53.360	138.658	-690.481	9.300	94.274	387.323	-1219.905

SECTIONAREAS AND MOMENTS

25.900 FORW FRAME .00 DIST FROM LPP/2= -10.140

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	55.066	145.641	-558.374
.100	.120	.007	-1.212	4.800	56.451	152.216	-572.408
.200	.358	.044	-3.632	4.900	57.835	158.931	-586.449
.300	.716	.134	-7.255	5.000	59.221	165.789	-600.496
.400	1.192	.302	-12.083	5.100	60.606	172.788	-614.549
.500	1.786	.570	-18.107	5.200	61.993	179.929	-628.609
.600	2.506	.967	-25.412	5.300	63.380	187.211	-642.675
.700	3.358	1.522	-34.053	5.400	64.768	194.636	-656.748
.800	4.298	2.228	-43.584	5.500	66.157	202.204	-670.828
.900	5.304	3.083	-53.786	5.600	67.546	209.914	-684.915
1.000	6.363	4.090	-64.520	5.700	68.936	217.767	-699.007
1.100	7.461	5.243	-75.658	5.800	70.326	225.761	-713.105
1.200	8.592	6.544	-87.128	5.900	71.717	233.898	-727.209
1.300	9.752	7.993	-98.881	6.000	73.108	242.177	-741.318
1.400	10.935	9.591	-110.880	6.100	74.500	250.597	-755.430
1.500	12.140	11.338	-123.095	6.200	75.892	259.157	-769.544
1.600	13.363	13.234	-135.500	6.300	77.284	267.857	-783.660
1.700	14.603	15.281	-148.076	6.400	78.676	276.698	-797.777
1.800	15.858	17.477	-160.804	6.500	80.069	285.680	-811.897
1.900	17.127	19.825	-173.669	6.600	81.462	294.803	-826.020
2.000	18.408	22.323	-186.659	6.700	82.854	304.065	-840.144
2.100	19.700	24.972	-199.762	6.800	84.248	313.469	-854.270
2.200	21.003	27.772	-212.966	6.900	85.641	323.013	-868.399
2.300	22.314	30.723	-226.264	7.000	87.034	332.699	-882.530
2.400	23.634	33.825	-239.648	7.100	88.428	342.525	-896.662
2.500	24.962	37.077	-253.110	7.200	89.822	352.492	-910.797
2.600	26.296	40.481	-266.643	7.300	91.216	362.599	-924.933
2.700	27.637	44.034	-280.238	7.400	92.611	372.848	-939.073
2.800	28.983	47.736	-293.891	7.500	94.005	383.238	-953.215
2.900	30.335	51.588	-307.593	7.600	94.733	388.720	-960.595
3.000	31.690	55.587	-321.341	7.700	94.733	388.720	-960.595
3.100	33.050	59.734	-335.129	7.800	94.733	388.720	-960.595
3.200	34.413	64.029	-348.951	7.900	94.733	388.720	-960.595
3.300	35.780	68.469	-362.804	8.000	94.733	388.720	-960.595
3.400	37.148	73.054	-376.683	8.100	94.733	388.720	-960.595
3.500	38.519	77.783	-390.584	8.200	94.733	388.720	-960.595
3.600	39.892	82.656	-404.503	8.300	94.733	388.720	-960.595
3.700	41.266	87.671	-418.435	8.400	94.733	388.720	-960.595
3.800	42.641	92.829	-432.380	8.500	94.733	388.720	-960.595
3.900	44.018	98.129	-446.340	8.600	94.733	388.720	-960.595
4.000	45.396	103.573	-460.316	8.700	94.733	388.720	-960.595
4.100	46.775	109.160	-474.303	8.800	94.733	388.720	-960.595
4.200	48.156	114.888	-488.298	8.900	94.733	388.720	-960.595
4.300	49.536	120.756	-502.300	9.000	94.733	388.720	-960.595
4.400	50.918	126.766	-516.308	9.100	94.733	388.720	-960.595
4.500	52.300	132.917	-530.324	9.200	94.733	388.720	-960.594
4.600	53.683	139.208	-544.345	9.300	94.733	388.720	-960.595

SECTIONAREAS AND MOMENTS

28.700 FORW FRAME .00 DIST FROM LPP/2= -7.340

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	55.288	146.033	-405.812
.100	.120	.007	-.883	4.800	56.674	152.619	-415.990
.200	.361	.044	-2.650	4.900	58.062	159.348	-426.172
.300	.723	.136	-5.304	5.000	59.449	166.217	-436.359
.400	1.205	.305	-8.846	5.100	60.838	173.229	-446.551
.500	1.808	.578	-13.272	5.200	62.227	180.383	-456.747
.600	2.539	.981	-18.636	5.300	63.617	187.680	-466.948
.700	3.402	1.543	-24.970	5.400	65.007	195.119	-477.154
.800	4.352	2.256	-31.944	5.500	66.399	202.701	-487.366
.900	5.367	3.119	-39.396	5.600	67.790	210.426	-497.582
1.000	6.435	4.134	-47.231	5.700	69.183	218.294	-507.804
1.100	7.542	5.296	-55.355	5.800	70.576	226.305	-518.030
1.200	8.681	6.607	-63.718	5.900	71.970	234.460	-528.262
1.300	9.848	8.066	-72.285	6.000	73.365	242.758	-538.498
1.400	11.039	9.674	-81.027	6.100	74.760	251.198	-548.739
1.500	12.251	11.432	-89.924	6.200	76.155	259.779	-558.979
1.600	13.482	13.339	-98.956	6.300	77.551	268.501	-569.222
1.700	14.729	15.397	-108.108	6.400	78.946	277.363	-579.467
1.800	15.990	17.605	-117.368	6.500	80.342	286.367	-589.712
1.900	17.265	19.963	-126.726	6.600	81.738	295.511	-599.959
2.000	18.552	22.473	-136.171	6.700	83.135	304.796	-610.207
2.100	19.850	25.133	-145.696	6.800	84.531	314.221	-620.457
2.200	21.157	27.944	-155.292	6.900	85.927	323.788	-630.708
2.300	22.473	30.905	-164.953	7.000	87.324	333.496	-640.960
2.400	23.798	34.018	-174.674	7.100	88.721	343.344	-651.214
2.500	25.129	37.281	-184.450	7.200	90.118	353.335	-661.470
2.600	26.468	40.694	-194.274	7.300	91.516	363.465	-671.726
2.700	27.812	44.256	-204.141	7.400	92.913	373.737	-681.984
2.800	29.162	47.968	-214.048	7.500	94.311	384.150	-692.243
2.900	30.516	51.828	-223.989	7.600	95.043	389.663	-697.616
3.000	31.875	55.835	-233.960	7.700	95.043	389.663	-697.616
3.100	33.237	59.990	-243.959	7.800	95.043	389.663	-697.616
3.200	34.603	64.292	-253.982	7.900	95.043	389.663	-697.616
3.300	35.971	68.740	-264.028	8.000	95.043	389.663	-697.616
3.400	37.342	73.333	-274.090	8.100	95.043	389.663	-697.616
3.500	38.715	78.068	-284.166	8.200	95.043	389.663	-697.616
3.600	40.089	82.947	-294.253	8.300	95.043	389.663	-697.616
3.700	41.465	87.969	-304.351	8.400	95.043	389.663	-697.616
3.800	42.842	93.133	-314.460	8.500	95.043	389.663	-697.616
3.900	44.221	98.442	-324.581	8.600	95.043	389.663	-697.616
4.000	45.601	103.894	-334.712	8.700	95.043	389.663	-697.616
4.100	46.983	109.490	-344.853	8.800	95.043	389.663	-697.616
4.200	48.365	115.226	-355.000	8.900	95.043	389.663	-697.616
4.300	49.748	121.104	-365.151	9.000	95.043	389.663	-697.616
4.400	51.132	127.124	-375.308	9.100	95.043	389.663	-697.616
4.500	52.517	133.285	-385.471	9.200	95.043	389.663	-697.616
4.600	53.902	139.589	-395.639	9.300	95.043	389.663	-697.616

SECTIONAREAS AND MOMENTS

32.200 FORW FRAME .00 DIST FROM LPP/2= -3.840

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	55.433	146.282	-212.863
.100	.121	.007	-.464	4.800	56.821	152.876	-218.194
.200	.364	.044	-1.396	4.900	58.210	159.613	-223.527
.300	.728	.137	-2.796	5.000	59.600	166.491	-228.864
.400	1.215	.308	-4.665	5.100	60.990	173.513	-234.202
.500	1.824	.583	-7.003	5.200	62.381	180.676	-239.544
.600	2.562	.990	-9.837	5.300	63.773	187.982	-244.888
.700	3.433	1.558	-13.184	5.400	65.165	195.431	-250.234
.800	4.391	2.277	-16.862	5.500	66.558	203.023	-255.583
.900	5.413	3.146	-20.787	5.600	67.952	210.757	-260.934
1.000	6.487	4.166	-24.908	5.700	69.346	218.633	-266.287
1.100	7.599	5.334	-29.179	5.800	70.740	226.652	-271.643
1.200	8.743	6.650	-33.574	5.900	72.136	234.815	-277.001
1.300	9.915	8.116	-38.075	6.000	73.531	243.120	-282.361
1.400	11.111	9.730	-42.667	6.100	74.928	251.569	-287.723
1.500	12.328	11.495	-47.339	6.200	76.325	260.159	-293.086
1.600	13.563	13.409	-52.081	6.300	77.722	268.890	-298.451
1.700	14.814	15.473	-56.885	6.400	79.119	277.762	-303.816
1.800	16.079	17.688	-61.745	6.500	80.516	286.775	-309.182
1.900	17.358	20.054	-66.655	6.600	81.914	295.928	-314.548
2.000	18.649	22.570	-71.610	6.700	83.311	305.223	-319.915
2.100	19.950	25.238	-76.607	6.800	84.709	314.658	-325.283
2.200	21.260	28.055	-81.639	6.900	86.107	324.234	-330.651
2.300	22.579	31.023	-86.705	7.000	87.505	333.952	-336.021
2.400	23.906	34.142	-91.801	7.100	88.904	343.811	-341.391
2.500	25.241	37.412	-96.925	7.200	90.302	353.812	-346.761
2.600	26.582	40.831	-102.074	7.300	91.701	363.953	-352.133
2.700	27.929	44.400	-107.246	7.400	93.100	374.236	-357.505
2.800	29.280	48.118	-112.437	7.500	94.500	384.661	-362.878
2.900	30.637	51.984	-117.646	7.600	95.234	390.191	-365.698
3.000	31.997	55.997	-122.869	7.700	95.234	390.190	-365.698
3.100	33.361	60.157	-128.107	7.800	95.234	390.191	-365.698
3.200	34.728	64.463	-133.356	7.900	95.234	390.190	-365.698
3.300	36.098	68.915	-138.616	8.000	95.234	390.190	-365.698
3.400	37.470	73.511	-143.885	8.100	95.234	390.190	-365.698
3.500	38.844	78.250	-149.160	8.200	95.234	390.191	-365.698
3.600	40.219	83.133	-154.442	8.300	95.234	390.190	-365.698
3.700	41.596	88.160	-159.730	8.400	95.234	390.190	-365.698
3.800	42.975	93.329	-165.023	8.500	95.234	390.190	-365.698
3.900	44.355	98.642	-170.323	8.600	95.234	390.191	-365.698
4.000	45.736	104.099	-175.628	8.700	95.234	390.191	-365.698
4.100	47.119	109.699	-180.937	8.800	95.234	390.190	-365.698
4.200	48.503	115.441	-186.250	8.900	95.234	390.190	-365.698
4.300	49.887	121.325	-191.566	9.000	95.234	390.190	-365.698
4.400	51.272	127.351	-196.886	9.100	95.234	390.190	-365.698
4.500	52.659	133.519	-202.209	9.200	95.234	390.191	-365.698
4.600	54.046	139.830	-207.535	9.300	95.234	390.190	-365.698

SECTIONAREAS AND MOMENTS

35.700 FORW FRAME .00 DIST FROM LPP/2= -.340

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	55.419	146.267	-18.843
.100	.121	.007	-.041	4.800	56.808	152.861	-19.315
.200	.364	.044	-.124	4.900	58.197	159.598	-19.787
.300	.728	.137	-.248	5.000	59.586	166.477	-20.259
.400	1.215	.308	-.413	5.100	60.977	173.500	-20.732
.500	1.823	.583	-.620	5.200	62.368	180.665	-21.205
.600	2.562	.991	-.871	5.300	63.760	187.973	-21.679
.700	3.437	1.560	-1.169	5.400	65.153	195.425	-22.152
.800	4.397	2.281	-1.495	5.500	66.547	203.020	-22.626
.900	5.420	3.151	-1.843	5.600	67.941	210.758	-23.100
1.000	6.493	4.170	-2.207	5.700	69.335	218.636	-23.574
1.100	7.603	5.336	-2.585	5.800	70.730	226.655	-24.048
1.200	8.745	6.650	-2.973	5.900	72.125	234.816	-24.522
1.300	9.915	8.112	-3.371	6.000	73.520	243.117	-24.997
1.400	11.107	9.722	-3.777	6.100	74.916	251.560	-25.471
1.500	12.321	11.482	-4.189	6.200	76.312	260.144	-25.946
1.600	13.554	13.393	-4.608	6.300	77.707	268.869	-26.421
1.700	14.802	15.453	-5.033	6.400	79.104	277.736	-26.895
1.800	16.066	17.665	-5.462	6.500	80.500	286.744	-27.370
1.900	17.343	20.028	-5.897	6.600	81.897	295.894	-27.845
2.000	18.632	22.541	-6.335	6.700	83.295	305.185	-28.320
2.100	19.932	25.206	-6.777	6.800	84.692	314.618	-28.795
2.200	21.242	28.022	-7.222	6.900	86.090	324.192	-29.271
2.300	22.561	30.990	-7.671	7.000	87.488	333.909	-29.746
2.400	23.888	34.108	-8.122	7.100	88.886	343.767	-30.221
2.500	25.222	37.377	-8.575	7.200	90.285	353.767	-30.697
2.600	26.563	40.797	-9.031	7.300	91.683	363.908	-31.172
2.700	27.910	44.366	-9.489	7.400	93.082	374.191	-31.648
2.800	29.262	48.084	-9.949	7.500	94.482	384.615	-32.124
2.900	30.618	51.950	-10.410	7.600	95.216	390.146	-32.373
3.000	31.978	55.963	-10.873	7.700	95.216	390.145	-32.373
3.100	33.342	60.123	-11.336	7.800	95.216	390.145	-32.373
3.200	34.709	64.429	-11.801	7.900	95.216	390.145	-32.373
3.300	36.079	68.881	-12.267	8.000	95.216	390.145	-32.373
3.400	37.451	73.478	-12.733	8.100	95.216	390.145	-32.373
3.500	38.826	78.219	-13.201	8.200	95.216	390.145	-32.373
3.600	40.202	83.106	-13.669	8.300	95.216	390.145	-32.373
3.700	41.580	88.135	-14.137	8.400	95.216	390.146	-32.373
3.800	42.960	93.309	-14.606	8.500	95.216	390.146	-32.373
3.900	44.341	98.626	-15.076	8.600	95.216	390.145	-32.373
4.000	45.723	104.085	-15.546	8.700	95.216	390.146	-32.373
4.100	47.106	109.686	-16.016	8.800	95.216	390.146	-32.373
4.200	48.490	115.428	-16.486	8.900	95.216	390.146	-32.373
4.300	49.874	121.312	-16.957	9.000	95.216	390.146	-32.373
4.400	51.259	127.338	-17.428	9.100	95.216	390.145	-32.373
4.500	52.645	133.506	-17.899	9.200	95.216	390.146	-32.373
4.600	54.032	139.815	-18.371	9.300	95.216	390.145	-32.373

SECTIONAREAS AND MOMENTS

40.250 FORW FRAME .00 DIST FROM LPP/2= 4.210

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	55.073	145.630	231.857
.100	.121	.007	.509	4.800	56.461	152.222	237.700
.200	.364	.044	1.530	4.900	57.850	158.958	243.547
.300	.728	.137	3.065	5.000	59.239	165.837	249.398
.400	1.216	.308	5.118	5.100	60.630	172.860	255.253
.500	1.825	.583	7.683	5.200	62.022	180.027	261.112
.600	2.562	.990	10.786	5.300	63.414	187.339	266.975
.700	3.428	1.554	14.432	5.400	64.808	194.793	272.841
.800	4.375	2.265	18.420	5.500	66.202	202.391	278.710
.900	5.382	3.121	22.659	5.600	67.597	210.131	284.581
1.000	6.437	4.124	27.101	5.700	68.991	218.011	290.453
1.100	7.530	5.272	31.702	5.800	70.386	226.030	296.324
1.200	8.654	6.565	36.435	5.900	71.780	234.188	302.195
1.300	9.806	8.004	41.283	6.000	73.175	242.486	308.067
1.400	10.981	9.591	46.231	6.100	74.570	250.924	313.938
1.500	12.178	11.327	51.269	6.200	75.964	259.502	319.810
1.600	13.394	13.211	56.388	6.300	77.359	268.220	325.683
1.700	14.627	15.246	61.578	6.400	78.754	277.078	331.556
1.800	15.875	17.430	66.834	6.500	80.149	286.076	337.429
1.900	17.138	19.766	72.149	6.600	81.544	295.214	343.302
2.000	18.413	22.254	77.519	6.700	82.940	304.492	349.176
2.100	19.700	24.893	82.938	6.800	84.335	313.910	355.050
2.200	20.998	27.683	88.403	6.900	85.730	323.467	360.923
2.300	22.306	30.626	93.909	7.000	87.125	333.165	366.798
2.400	23.623	33.721	99.453	7.100	88.521	343.003	372.673
2.500	24.948	36.967	105.031	7.200	89.917	352.982	378.549
2.600	26.280	40.365	110.640	7.300	91.312	363.101	384.425
2.700	27.619	43.913	116.278	7.400	92.708	373.361	390.301
2.800	28.964	47.612	121.940	7.500	94.104	383.761	396.179
2.900	30.315	51.460	127.624	7.600	95.500	394.303	402.057
3.000	31.669	55.456	133.327	7.700	96.897	404.985	407.936
3.100	33.028	59.600	139.047	7.800	98.294	415.809	413.816
3.200	34.390	63.892	144.783	7.900	99.690	426.775	419.696
3.300	35.756	68.330	150.532	8.000	101.087	437.880	425.578
3.400	37.124	72.914	156.293	8.100	101.818	443.751	428.655
3.500	38.495	77.645	162.066	8.200	101.818	443.751	428.655
3.600	39.869	82.521	167.848	8.300	101.818	443.751	428.655
3.700	41.244	87.541	173.639	8.400	101.818	443.751	428.655
3.800	42.622	92.707	179.438	8.500	101.818	443.751	428.655
3.900	44.001	98.016	185.245	8.600	101.818	443.751	428.655
4.000	45.382	103.470	191.057	8.700	101.818	443.751	428.655
4.100	46.763	109.066	196.874	8.800	101.818	443.751	428.655
4.200	48.146	114.805	202.696	8.900	101.818	443.751	428.655
4.300	49.530	120.685	208.520	9.000	101.818	443.751	428.655
4.400	50.914	126.707	214.349	9.100	101.818	443.751	428.655
4.500	52.300	132.872	220.181	9.200	101.818	443.751	428.655
4.600	53.686	139.180	226.018	9.300	101.818	443.751	428.655

SECTIONAREAS AND MOMENTS

44.800 FORW FRAME .00 DIST FROM LPP/2= 8.760

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	53.732	143.031	470.691
.100	.121	.007	1.060	4.800	55.117	149.610	482.824
.200	.364	.045	3.188	4.900	56.504	156.336	494.972
.300	.729	.137	6.384	5.000	57.892	163.209	507.135
.400	1.220	.310	10.691	5.100	59.282	170.227	519.310
.500	1.833	.586	16.055	5.200	60.673	177.390	531.493
.600	2.551	.982	22.345	5.300	62.064	184.696	543.684
.700	3.365	1.512	29.474	5.400	63.457	192.146	555.882
.800	4.250	2.176	37.230	5.500	64.850	199.740	568.089
.900	5.192	2.978	45.482	5.600	66.244	207.477	580.300
1.000	6.181	3.918	54.149	5.700	67.638	215.353	592.511
1.100	7.210	4.998	63.157	5.800	69.032	223.368	604.723
1.200	8.272	6.219	72.461	5.900	70.426	231.523	616.934
1.300	9.363	7.584	82.024	6.000	71.820	239.818	629.146
1.400	10.482	9.094	91.818	6.100	73.214	248.251	641.357
1.500	11.623	10.750	101.821	6.200	74.608	256.824	653.569
1.600	12.787	12.553	112.013	6.300	76.002	265.537	665.780
1.700	13.970	14.506	122.377	6.400	77.396	274.389	677.992
1.800	15.171	16.608	132.899	6.500	78.790	283.380	690.203
1.900	16.389	18.860	143.565	6.600	80.184	292.510	702.414
2.000	17.621	21.264	154.361	6.700	81.578	301.778	714.622
2.100	18.867	23.819	165.279	6.800	82.971	311.182	726.827
2.200	20.127	26.526	176.308	6.900	84.364	320.721	739.025
2.300	21.397	29.385	187.440	7.000	85.756	330.395	751.218
2.400	22.679	32.397	198.667	7.100	87.147	340.203	763.406
2.500	23.970	35.561	209.980	7.200	88.538	350.147	775.589
2.600	25.271	38.878	221.374	7.300	89.928	360.227	787.769
2.700	26.580	42.347	232.840	7.400	91.319	370.449	799.951
2.800	27.897	45.967	244.374	7.500	92.710	380.813	812.138
2.900	29.220	49.739	255.967	7.600	94.101	391.320	824.328
3.000	30.550	53.662	267.615	7.700	95.493	401.968	836.522
3.100	31.885	57.735	279.313	7.800	96.886	412.759	848.719
3.200	33.226	61.958	291.056	7.900	98.279	423.693	860.921
3.300	34.571	66.330	302.842	8.000	99.672	434.769	873.125
3.400	35.921	70.852	314.665	8.100	100.398	440.599	879.484
3.500	37.274	75.522	326.522	8.200	100.398	440.598	879.483
3.600	38.631	80.339	338.411	8.300	100.398	440.598	879.483
3.700	39.992	85.305	350.327	8.400	100.398	440.599	879.484
3.800	41.355	90.418	362.271	8.500	100.398	440.599	879.483
3.900	42.721	95.678	374.240	8.600	100.398	440.599	879.483
4.000	44.091	101.086	386.234	8.700	100.398	440.599	879.484
4.100	45.462	106.641	398.248	8.800	100.398	440.598	879.483
4.200	46.836	112.341	410.280	8.900	100.398	440.599	879.483
4.300	48.211	118.186	422.329	9.000	100.398	440.598	879.483
4.400	49.588	124.178	434.394	9.100	100.398	440.599	879.484
4.500	50.968	130.315	446.476	9.200	100.398	440.599	879.483
4.600	52.349	136.600	458.575	9.300	100.398	440.599	879.483

SECTIONAREAS AND MOMENTS

49.350 FORW FRAME .00 DIST FROM LPP/2= 13.310

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	51.153	137.678	680.850
.100	.131	.008	1.738	4.800	52.521	144.176	699.059
.200	.389	.047	5.173	4.900	53.892	150.823	717.302
.300	.759	.141	10.099	5.000	55.265	157.619	735.573
.400	1.231	.307	16.385	5.100	56.640	164.562	753.872
.500	1.796	.562	23.904	5.200	58.016	171.652	772.196
.600	2.446	.920	32.561	5.300	59.395	178.889	790.544
.700	3.177	1.396	42.280	5.400	60.775	186.275	808.920
.800	3.971	1.992	52.852	5.500	62.158	193.809	827.320
.900	4.818	2.712	64.121	5.600	63.541	201.488	845.736
1.000	5.709	3.559	75.992	5.700	64.925	209.308	864.158
1.100	6.641	4.537	88.386	5.800	66.310	217.268	882.582
1.200	7.607	5.649	101.244	5.900	67.694	225.368	901.013
1.300	8.604	6.895	114.517	6.000	69.080	233.610	919.449
1.400	9.629	8.280	128.163	6.100	70.465	241.993	937.891
1.500	10.680	9.804	142.148	6.200	71.851	250.516	956.339
1.600	11.754	11.469	156.448	6.300	73.238	259.181	974.792
1.700	12.850	13.278	171.038	6.400	74.624	267.987	993.247
1.800	13.967	15.232	185.898	6.500	76.011	276.932	1011.706
1.900	15.102	17.332	201.007	6.600	77.398	286.014	1030.161
2.000	16.255	19.580	216.347	6.700	78.784	295.231	1048.610
2.100	17.423	21.976	231.904	6.800	80.169	304.582	1067.049
2.200	18.607	24.521	247.662	6.900	81.554	314.068	1085.482
2.300	19.805	27.217	263.608	7.000	82.938	323.689	1103.906
2.400	21.017	30.064	279.731	7.100	84.322	333.444	1122.322
2.500	22.240	33.062	296.019	7.200	85.705	343.333	1140.731
2.600	23.476	36.213	312.464	7.300	87.088	353.358	1159.137
2.700	24.722	39.516	329.055	7.400	88.471	363.527	1177.551
2.800	25.979	42.973	345.786	7.500	89.856	373.842	1195.979
2.900	27.246	46.583	362.646	7.600	91.241	384.302	1214.420
3.000	28.522	50.347	379.629	7.700	92.628	394.908	1232.873
3.100	29.807	54.265	396.725	7.800	94.015	405.659	1251.336
3.200	31.099	58.337	413.929	7.900	95.403	416.553	1269.808
3.300	32.399	62.562	431.232	8.000	96.791	427.591	1288.286
3.400	33.706	66.941	448.631	8.100	97.510	433.367	1297.860
3.500	35.020	71.473	466.117	8.200	97.510	433.366	1297.859
3.600	36.340	76.159	483.683	8.300	97.510	433.366	1297.859
3.700	37.665	80.995	501.321	8.400	97.510	433.367	1297.860
3.800	38.995	85.984	519.026	8.500	97.510	433.367	1297.859
3.900	40.331	91.125	536.799	8.600	97.510	433.366	1297.860
4.000	41.671	96.419	554.637	8.700	97.510	433.366	1297.859
4.100	43.015	101.863	572.530	8.800	97.510	433.367	1297.859
4.200	44.363	107.457	590.470	8.900	97.510	433.367	1297.859
4.300	45.714	113.200	608.455	9.000	97.510	433.366	1297.859
4.400	47.069	119.093	626.486	9.100	97.510	433.366	1297.859
4.500	48.427	125.136	644.562	9.200	97.510	433.367	1297.859
4.600	49.788	131.331	662.683	9.300	97.510	433.366	1297.860

SECTIONAREAS AND MOMENTS

53.900 FORW FRAME .00 DIST FROM LPP/2= 17.860

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	45.091	124.506	805.331
.100	.103	.006	1.843	4.800	46.379	130.624	828.336
.200	.290	.035	5.184	4.900	47.673	136.898	851.439
.300	.557	.102	9.956	5.000	48.972	143.327	874.635
.400	.902	.223	16.118	5.100	50.275	149.910	897.916
.500	1.321	.413	23.599	5.200	51.583	156.645	921.274
.600	1.809	.681	32.310	5.300	52.895	163.533	944.706
.700	2.361	1.041	42.176	5.400	54.211	170.576	968.216
.800	2.973	1.500	53.092	5.500	55.532	177.773	991.803
.900	3.638	2.066	64.971	5.600	56.856	185.124	1015.456
1.000	4.352	2.744	77.724	5.700	58.184	192.624	1039.165
1.100	5.109	3.540	91.245	5.800	59.514	200.274	1062.927
1.200	5.905	4.455	105.458	5.900	60.848	208.074	1086.740
1.300	6.735	5.493	120.291	6.000	62.184	216.024	1110.605
1.400	7.597	6.657	135.681	6.100	63.523	224.126	1134.521
1.500	8.487	7.948	151.581	6.200	64.865	232.379	1158.489
1.600	9.404	9.369	167.949	6.300	66.210	240.784	1182.506
1.700	10.344	10.921	184.752	6.400	67.557	249.340	1206.571
1.800	11.308	12.607	201.958	6.500	68.907	258.047	1230.680
1.900	12.292	14.428	219.535	6.600	70.259	266.903	1254.829
2.000	13.296	16.385	237.458	6.700	71.613	275.909	1279.014
2.100	14.317	18.480	255.709	6.800	72.969	285.062	1303.234
2.200	15.357	20.715	274.271	6.900	74.327	294.365	1327.489
2.300	16.412	23.091	293.126	7.000	75.687	303.816	1351.776
2.400	17.484	25.608	312.261	7.100	77.049	313.416	1376.096
2.500	18.570	28.270	331.661	7.200	78.413	323.166	1400.449
2.600	19.670	31.076	351.312	7.300	79.778	333.065	1424.837
2.700	20.784	34.026	371.197	7.400	81.145	343.113	1449.253
2.800	21.910	37.123	391.308	7.500	82.514	353.309	1473.696
2.900	23.048	40.367	411.635	7.600	83.884	363.654	1498.166
3.000	24.198	43.759	432.170	7.700	85.255	374.146	1522.662
3.100	25.359	47.300	452.907	7.800	86.628	384.786	1547.183
3.200	26.531	50.992	473.842	7.900	88.003	395.573	1571.725
3.300	27.713	54.836	494.962	8.000	89.378	406.506	1596.287
3.400	28.905	58.829	516.249	8.100	90.079	412.139	1608.815
3.500	30.106	62.971	537.694	8.200	90.079	412.139	1608.814
3.600	31.315	67.264	559.293	8.300	90.079	412.139	1608.814
3.700	32.533	71.709	581.042	8.400	90.079	412.139	1608.814
3.800	33.759	76.306	602.933	8.500	90.079	412.139	1608.814
3.900	34.992	81.054	624.962	8.600	90.079	412.140	1608.815
4.000	36.233	85.955	647.118	8.700	90.079	412.139	1608.814
4.100	37.480	91.007	669.398	8.800	90.079	412.139	1608.815
4.200	38.734	96.211	691.794	8.900	90.079	412.139	1608.814
4.300	39.994	101.567	714.300	9.000	90.079	412.139	1608.814
4.400	41.260	107.074	736.910	9.100	90.079	412.139	1608.814
4.500	42.532	112.731	759.617	9.200	90.079	412.139	1608.814
4.600	43.809	118.542	782.424	9.300	90.079	412.139	1608.814

SECTIONAREAS AND MOMENTS

57.975 FORW FRAME .00 DIST FROM LPP/2= 21.935

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	35.768	101.706	784.575
.100	.089	.005	1.960	4.800	36.896	107.061	809.303
.200	.237	.028	5.190	4.900	38.032	112.574	834.236
.300	.437	.078	9.582	5.000	39.178	118.246	859.371
.400	.686	.166	15.050	5.100	40.333	124.080	884.709
.500	.981	.299	21.524	5.200	41.498	130.077	910.251
.600	1.320	.485	28.946	5.300	42.671	136.238	935.990
.700	1.699	.732	37.267	5.400	43.853	142.562	961.919
.800	2.117	1.046	46.433	5.500	45.044	149.050	988.031
.900	2.571	1.432	56.393	5.600	46.242	155.701	1014.321
1.000	3.059	1.897	67.108	5.700	47.449	162.518	1040.784
1.100	3.582	2.445	78.566	5.800	48.663	169.499	1067.417
1.200	4.137	3.085	90.755	5.900	49.884	176.646	1094.214
1.300	4.725	3.819	103.637	6.000	51.114	183.960	1121.175
1.400	5.342	4.652	117.167	6.100	52.350	191.440	1148.298
1.500	5.986	5.587	131.309	6.200	53.594	199.090	1175.582
1.600	6.657	6.628	146.032	6.300	54.845	206.911	1203.028
1.700	7.354	7.777	161.307	6.400	56.104	214.903	1230.637
1.800	8.074	9.037	177.100	6.500	57.370	223.069	1258.408
1.900	8.816	10.410	193.377	6.600	58.643	231.411	1286.342
2.000	9.579	11.898	210.109	6.700	59.924	239.930	1314.444
2.100	10.362	13.502	227.280	6.800	61.213	248.628	1342.706
2.200	11.164	15.227	244.872	6.900	62.508	257.502	1371.124
2.300	11.984	17.073	262.868	7.000	63.811	266.554	1399.691
2.400	12.822	19.043	281.250	7.100	65.120	275.785	1428.414
2.500	13.677	21.137	300.000	7.200	66.437	285.201	1457.299
2.600	14.548	23.357	319.099	7.300	67.760	294.790	1486.310
2.700	15.433	25.705	338.529	7.400	69.086	304.538	1515.401
2.800	16.334	28.181	358.277	7.500	70.416	314.449	1544.583
2.900	17.248	30.787	378.332	7.600	71.750	324.521	1573.846
3.000	18.176	33.524	398.686	7.700	73.087	334.748	1603.169
3.100	19.117	36.395	419.332	7.800	74.427	345.127	1632.546
3.200	20.071	39.401	440.264	7.900	75.768	355.662	1661.982
3.300	21.038	42.544	461.477	8.000	77.113	366.351	1691.476
3.400	22.018	45.827	482.968	8.100	77.774	371.657	1705.968
3.500	23.010	49.250	504.733	8.200	77.774	371.657	1705.969
3.600	24.014	52.814	526.756	8.300	77.774	371.657	1705.968
3.700	25.030	56.520	549.027	8.400	77.774	371.657	1705.969
3.800	26.056	60.369	571.542	8.500	77.774	371.657	1705.969
3.900	27.094	64.365	594.304	8.600	77.774	371.657	1705.969
4.000	28.143	68.508	617.311	8.700	77.774	371.657	1705.968
4.100	29.202	72.799	640.554	8.800	77.774	371.657	1705.968
4.200	30.272	77.240	664.022	8.900	77.774	371.657	1705.969
4.300	31.352	81.829	687.710	9.000	77.774	371.657	1705.969
4.400	32.442	86.570	711.613	9.100	77.774	371.656	1705.968
4.500	33.541	91.462	735.728	9.200	77.774	371.657	1705.968
4.600	34.650	96.507	760.049	9.300	77.774	371.657	1705.969

SECTIONAREAS AND MOMENTS

62.050 FORW FRAME .00 DIST FROM LPP/2= 26.010

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	24.614	70.619	640.198
.100	.073	.004	1.904	4.800	25.483	74.749	662.810
.200	.192	.022	4.995	4.900	26.367	79.039	685.818
.300	.350	.062	9.091	5.000	27.267	83.493	709.221
.400	.541	.129	14.064	5.100	28.182	88.114	733.019
.500	.762	.229	19.822	5.200	29.112	92.905	757.213
.600	1.011	.366	26.305	5.300	30.058	97.868	781.801
.700	1.287	.545	33.462	5.400	31.018	103.007	806.786
.800	1.586	.770	41.242	5.500	31.994	108.325	832.167
.900	1.907	1.043	49.599	5.600	32.985	113.825	857.943
1.000	2.249	1.368	58.495	5.700	33.991	119.510	884.114
1.100	2.610	1.748	67.894	5.800	35.012	125.382	910.674
1.200	2.990	2.184	77.766	5.900	36.048	131.442	937.616
1.300	3.387	2.680	88.084	6.000	37.099	137.691	964.935
1.400	3.799	3.238	98.819	6.100	38.163	144.134	992.630
1.500	4.227	3.858	109.948	6.200	39.243	150.772	1020.704
1.600	4.669	4.544	121.452	6.300	40.337	157.608	1049.155
1.700	5.125	5.296	133.311	6.400	41.445	164.646	1077.982
1.800	5.594	6.117	145.507	6.500	42.568	171.889	1107.187
1.900	6.076	7.007	158.024	6.600	43.705	179.339	1136.770
2.000	6.569	7.969	170.850	6.700	44.857	186.999	1166.730
2.100	7.074	9.005	183.985	6.800	46.023	194.872	1197.068
2.200	7.591	10.116	197.433	6.900	47.204	202.962	1227.785
2.300	8.119	11.306	211.186	7.000	48.400	211.270	1258.879
2.400	8.660	12.575	225.236	7.100	49.610	219.800	1290.346
2.500	9.211	13.926	239.576	7.200	50.834	228.553	1322.187
2.600	9.774	15.361	254.210	7.300	52.072	237.529	1354.391
2.700	10.348	16.882	269.139	7.400	53.323	246.726	1386.936
2.800	10.933	18.492	284.366	7.500	54.582	256.102	1419.669
2.900	11.530	20.194	299.898	7.600	55.845	265.643	1452.539
3.000	12.139	21.991	315.738	7.700	57.114	275.348	1485.536
3.100	12.760	23.885	331.892	7.800	58.387	285.217	1518.657
3.200	13.393	25.880	348.363	7.900	59.666	295.250	1551.900
3.300	14.039	27.980	365.165	8.000	60.948	305.447	1585.263
3.400	14.699	30.189	382.319	8.100	61.529	310.108	1600.363
3.500	15.373	32.513	399.839	8.200	61.529	310.108	1600.364
3.600	16.060	34.956	417.732	8.300	61.529	310.107	1600.364
3.700	16.763	37.520	436.006	8.400	61.529	310.108	1600.363
3.800	17.480	40.210	454.662	8.500	61.529	310.108	1600.363
3.900	18.212	43.027	473.697	8.600	61.529	310.107	1600.363
4.000	18.959	45.976	493.112	8.700	61.529	310.108	1600.364
4.100	19.720	49.060	512.917	8.800	61.529	310.108	1600.363
4.200	20.497	52.284	533.124	8.900	61.529	310.108	1600.363
4.300	21.289	55.652	553.734	9.000	61.529	310.108	1600.363
4.400	22.097	59.167	574.748	9.100	61.529	310.108	1600.363
4.500	22.921	62.831	596.165	9.200	61.529	310.108	1600.363
4.600	23.759	66.648	617.983	9.300	61.529	310.108	1600.363

SECTIONAREAS AND MOMENTS

66.125 FORW FRAME .00 DIST FROM LPP/2= 30.085

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	15.188	42.217	456.922
.100	.048	.003	1.442	4.800	15.746	44.870	473.720
.200	.132	.016	3.967	4.900	16.323	47.670	491.087
.300	.246	.044	7.395	5.000	16.920	50.622	509.031
.400	.385	.093	11.597	5.100	17.536	53.732	527.556
.500	.548	.167	16.478	5.200	18.171	57.002	546.662
.600	.730	.267	21.964	5.300	18.825	60.438	566.350
.700	.930	.397	27.991	5.400	19.499	64.043	586.620
.800	1.147	.560	34.510	5.500	20.192	67.821	607.475
.900	1.379	.757	41.480	5.600	20.905	71.777	628.917
1.000	1.624	.990	48.863	5.700	21.637	75.915	650.952
1.100	1.882	1.261	56.624	5.800	22.390	80.243	673.592
1.200	2.152	1.571	64.731	5.900	23.163	84.767	696.856
1.300	2.431	1.921	73.150	6.000	23.957	89.494	720.758
1.400	2.721	2.311	81.847	6.100	24.773	94.430	745.304
1.500	3.018	2.743	90.793	6.200	25.611	99.580	770.493
1.600	3.323	3.215	99.961	6.300	26.469	104.947	796.331
1.700	3.634	3.729	109.324	6.400	27.350	110.537	822.816
1.800	3.951	4.283	118.859	6.500	28.251	116.354	849.946
1.900	4.273	4.879	128.542	6.600	29.175	122.402	877.724
2.000	4.599	5.515	138.351	6.700	30.120	128.685	906.146
2.100	4.928	6.190	148.267	6.800	31.086	135.209	935.224
2.200	5.261	6.905	158.270	6.900	32.075	141.984	964.976
2.300	5.596	7.659	168.347	7.000	33.087	149.015	995.411
2.400	5.933	8.451	178.482	7.100	34.121	156.306	1026.527
2.500	6.271	9.280	188.666	7.200	35.178	163.862	1058.320
2.600	6.611	10.147	198.894	7.300	36.257	171.687	1090.790
2.700	6.952	11.051	209.161	7.400	37.359	179.785	1123.936
2.800	7.295	11.994	219.474	7.500	38.477	188.120	1157.592
2.900	7.640	12.976	229.840	7.600	39.603	196.621	1191.467
3.000	7.986	13.999	240.272	7.700	40.736	205.289	1225.558
3.100	8.336	15.065	250.789	7.800	41.877	214.127	1259.866
3.200	8.689	16.177	261.411	7.900	43.024	223.136	1294.390
3.300	9.047	17.340	272.172	8.000	44.179	232.315	1329.127
3.400	9.410	18.558	283.113	8.100	44.605	235.730	1341.935
3.500	9.781	19.838	294.272	8.200	44.605	235.730	1341.935
3.600	10.161	21.184	305.679	8.300	44.605	235.730	1341.935
3.700	10.549	22.601	317.362	8.400	44.605	235.730	1341.935
3.800	10.947	24.096	329.353	8.500	44.605	235.730	1341.935
3.900	11.357	25.674	341.684	8.600	44.605	235.730	1341.935
4.000	11.780	27.343	354.390	8.700	44.605	235.730	1341.936
4.100	12.216	29.110	367.517	8.800	44.605	235.730	1341.935
4.200	12.668	30.986	381.115	8.900	44.605	235.730	1341.936
4.300	13.137	32.977	395.212	9.000	44.605	235.730	1341.935
4.400	13.622	35.091	409.828	9.100	44.605	235.730	1341.935
4.500	14.126	37.333	424.982	9.200	44.605	235.730	1341.935
4.600	14.648	39.707	440.679	9.300	44.605	235.730	1341.935

SECTIONAREAS AND MOMENTS

70.200 FORW FRAME .00 DIST FROM LPP/2= 34.160

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	8.005	20.212	273.436
.100	.009	.001	.298	4.800	8.261	21.432	282.207
.200	.042	.006	1.443	4.900	8.536	22.766	291.602
.300	.098	.020	3.352	5.000	8.830	24.218	301.625
.400	.174	.047	5.943	5.100	9.142	25.794	312.280
.500	.268	.089	9.144	5.200	9.472	27.497	323.574
.600	.377	.149	12.891	5.300	9.822	29.331	335.508
.700	.501	.230	17.130	5.400	10.190	31.300	348.079
.800	.639	.333	21.815	5.500	10.576	33.408	361.293
.900	.788	.460	26.909	5.600	10.983	35.663	375.173
1.000	.948	.612	32.376	5.700	11.409	38.074	389.747
1.100	1.118	.791	38.186	5.800	11.857	40.647	405.030
1.200	1.297	.997	44.310	5.900	12.325	43.387	421.030
1.300	1.485	1.232	50.717	6.000	12.815	46.302	437.763
1.400	1.680	1.495	57.376	6.100	13.327	49.401	455.259
1.500	1.881	1.787	64.256	6.200	13.863	52.694	473.551
1.600	2.088	2.108	71.331	6.300	14.422	56.188	492.644
1.700	2.300	2.458	78.573	6.400	15.004	59.883	512.524
1.800	2.516	2.836	85.958	6.500	15.609	63.787	533.198
1.900	2.736	3.243	93.460	6.600	16.239	67.913	554.716
2.000	2.958	3.676	101.058	6.700	16.895	72.277	577.133
2.100	3.183	4.137	108.730	6.800	17.578	76.887	600.463
2.200	3.409	4.623	116.455	6.900	18.287	81.747	624.693
2.300	3.636	5.133	124.207	7.000	19.023	86.861	649.831
2.400	3.863	5.667	131.961	7.100	19.786	92.243	675.906
2.500	4.089	6.222	139.696	7.200	20.578	97.903	702.947
2.600	4.314	6.795	147.377	7.300	21.398	103.850	730.965
2.700	4.537	7.384	154.973	7.400	22.247	110.088	759.956
2.800	4.755	7.985	162.438	7.500	23.124	116.619	789.901
2.900	4.968	8.593	169.719	7.600	24.016	123.358	820.392
3.000	5.174	9.201	176.760	7.700	24.919	130.268	851.249
3.100	5.372	9.802	183.492	7.800	25.833	137.352	882.471
3.200	5.557	10.387	189.839	7.900	26.758	144.610	914.057
3.300	5.730	10.948	195.742	8.000	27.693	152.046	946.006
3.400	5.887	11.474	201.100	8.100	27.922	153.878	953.813
3.500	6.028	11.961	205.930	8.200	27.922	153.878	953.813
3.600	6.160	12.430	210.440	8.300	27.922	153.878	953.813
3.700	6.287	12.893	214.773	8.400	27.922	153.878	953.813
3.800	6.413	13.365	219.072	8.500	27.922	153.878	953.813
3.900	6.543	13.863	223.493	8.600	27.922	153.878	953.813
4.000	6.680	14.405	228.177	8.700	27.922	153.878	953.813
4.100	6.826	14.999	233.184	8.800	27.922	153.878	953.813
4.200	6.985	15.656	238.594	8.900	27.922	153.878	953.813
4.300	7.156	16.386	244.464	9.000	27.922	153.878	953.813
4.400	7.343	17.199	250.841	9.100	27.922	153.878	953.813
4.500	7.546	18.102	257.775	9.200	27.922	153.878	953.813
4.600	7.766	19.104	265.295	9.300	27.922	153.878	953.813

SECTIONAREAS AND MOMENTS

72.775 FORW FRAME .00 DIST FROM LPP/2= 36.735

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	4.550	9.347	167.131
.100	.000	.000	.000	4.800	4.623	9.693	169.808
.200	.000	.000	.000	4.900	4.715	10.144	173.222
.300	.000	.000	.000	5.000	4.827	10.696	177.323
.400	.003	.001	.123	5.100	4.957	11.350	182.078
.500	.033	.015	1.219	5.200	5.103	12.105	187.460
.600	.089	.046	3.254	5.300	5.266	12.963	193.461
.700	.165	.095	6.056	5.400	5.446	13.926	200.077
.800	.259	.166	9.528	5.500	5.644	15.001	207.317
.900	.371	.261	13.617	5.600	5.859	16.197	215.233
1.000	.497	.381	18.241	5.700	6.094	17.527	223.878
1.100	.634	.525	23.282	5.800	6.350	18.994	233.249
1.200	.780	.693	28.639	5.900	6.623	20.595	243.305
1.300	.933	.885	34.275	6.000	6.915	22.334	254.038
1.400	1.094	1.101	40.173	6.100	7.227	24.221	265.495
1.500	1.261	1.344	46.308	6.200	7.560	26.269	277.726
1.600	1.433	1.611	52.652	6.300	7.915	28.486	290.761
1.700	1.611	1.904	59.177	6.400	8.292	30.883	304.622
1.800	1.793	2.223	65.857	6.500	8.693	33.466	319.334
1.900	1.978	2.566	72.667	6.600	9.117	36.244	334.913
2.000	2.166	2.933	79.581	6.700	9.565	39.224	351.373
2.100	2.357	3.323	86.570	6.800	10.038	42.416	368.744
2.200	2.548	3.735	93.607	6.900	10.537	45.833	387.068
2.300	2.740	4.167	100.667	7.000	11.062	49.487	406.378
2.400	2.933	4.619	107.728	7.100	11.615	53.386	426.695
2.500	3.124	5.089	114.774	7.200	12.197	57.541	448.040
2.600	3.314	5.572	121.743	7.300	12.806	61.961	470.435
2.700	3.500	6.066	128.581	7.400	13.445	66.655	493.896
2.800	3.681	6.562	135.209	7.500	14.113	71.634	518.446
2.900	3.853	7.052	141.529	7.600	14.805	76.861	543.876
3.000	4.013	7.526	147.433	7.700	15.512	82.265	569.826
3.100	4.160	7.973	152.812	7.800	16.232	87.848	596.289
3.200	4.288	8.376	157.525	7.900	16.966	93.611	623.257
3.300	4.392	8.714	161.337	8.000	17.714	99.556	650.726
3.400	4.459	8.938	163.806	8.100	18.475	105.684	678.692
3.500	4.466	8.962	164.062	8.200	19.250	111.999	707.151
3.600	4.466	8.962	164.062	8.300	20.038	118.501	736.104
3.700	4.466	8.962	164.062	8.400	20.840	125.195	765.553
3.800	4.466	8.962	164.062	8.500	21.655	132.083	795.496
3.900	4.466	8.962	164.062	8.600	22.483	139.166	825.930
4.000	4.466	8.962	164.062	8.700	23.325	146.446	856.846
4.100	4.466	8.962	164.062	8.800	24.179	153.922	888.232
4.200	4.466	8.962	164.062	8.900	25.046	161.592	920.070
4.300	4.466	8.962	164.062	9.000	25.925	169.457	952.349
4.400	4.467	8.964	164.079	9.100	26.816	177.519	985.072
4.500	4.476	9.006	164.421	9.200	27.719	185.780	1018.240
4.600	4.501	9.120	165.346	9.300	27.926	187.693	1025.865

SECTIONAREAS AND MOMENTS

75.350 FORW FRAME .00 DIST FROM LPP/2= 39.310

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	.000	.000	.000
.100	.000	.000	.000	4.800	.000	.000	.000
.200	.000	.000	.000	4.900	.000	.000	.000
.300	.000	.000	.000	5.000	.000	.000	.000
.400	.000	.000	.000	5.100	.000	.000	.000
.500	.000	.000	.000	5.200	.000	.000	.000
.600	.000	.000	.000	5.300	.000	.000	.000
.700	.000	.000	.000	5.400	.000	.000	.000
.800	.000	.000	.000	5.500	.000	.000	.000
.900	.000	.000	.000	5.600	.000	.000	.000
1.000	.000	.000	.000	5.700	.000	.000	.000
1.100	.000	.000	.000	5.800	.000	.000	.000
1.200	.000	.000	.000	5.900	.000	.000	.000
1.300	.000	.000	.000	6.000	.000	.000	.000
1.400	.000	.000	.000	6.100	.000	.000	.000
1.500	.000	.000	.000	6.200	.018	.111	.706
1.600	.000	.000	.000	6.300	.086	.534	3.365
1.700	.000	.000	.000	6.400	.191	1.202	7.496
1.800	.000	.000	.000	6.500	.327	2.083	12.867
1.900	.000	.000	.000	6.600	.494	3.175	19.419
2.000	.000	.000	.000	6.700	.689	4.472	27.085
2.100	.000	.000	.000	6.800	.912	5.977	35.845
2.200	.000	.000	.000	6.900	1.163	7.695	45.704
2.300	.000	.000	.000	7.000	1.441	9.632	56.660
2.400	.000	.000	.000	7.100	1.748	11.795	68.717
2.500	.000	.000	.000	7.200	2.083	14.188	81.874
2.600	.000	.000	.000	7.300	2.446	16.824	96.165
2.700	.000	.000	.000	7.400	2.840	19.718	111.644
2.800	.000	.000	.000	7.500	3.265	22.887	128.363
2.900	.000	.000	.000	7.600	3.722	26.338	146.331
3.000	.000	.000	.000	7.700	4.200	29.992	165.104
3.100	.000	.000	.000	7.800	4.696	33.836	184.600
3.200	.000	.000	.000	7.900	5.211	37.877	204.834
3.300	.000	.000	.000	8.000	5.744	42.119	225.813
3.400	.000	.000	.000	8.100	6.297	46.566	247.528
3.500	.000	.000	.000	8.200	6.868	51.220	269.974
3.600	.000	.000	.000	8.300	7.457	56.080	293.130
3.700	.000	.000	.000	8.400	8.063	61.144	316.967
3.800	.000	.000	.000	8.500	8.686	66.409	341.463
3.900	.000	.000	.000	8.600	9.326	71.876	366.597
4.000	.000	.000	.000	8.700	9.981	77.543	392.351
4.100	.000	.000	.000	8.800	10.652	83.412	418.716
4.200	.000	.000	.000	8.900	11.338	89.484	445.687
4.300	.000	.000	.000	9.000	12.039	95.761	473.257
4.400	.000	.000	.000	9.100	12.755	102.243	501.411
4.500	.000	.000	.000	9.200	13.486	108.930	530.137
4.600	.000	.000	.000	9.300	13.593	109.915	534.342

SECTIONAREAS AND MOMENTS

77.925 FORW FRAME .00 DIST FROM LPP/2= 41.885

H	A	MBL	MLPP/2	H	A	MBL	MLPP/2
.000	.000	.000	.000	4.700	.000	.000	.000
.100	.000	.000	.000	4.800	.000	.000	.000
.200	.000	.000	.000	4.900	.000	.000	.000
.300	.000	.000	.000	5.000	.000	.000	.000
.400	.000	.000	.000	5.100	.000	.000	.000
.500	.000	.000	.000	5.200	.000	.000	.000
.600	.000	.000	.000	5.300	.000	.000	.000
.700	.000	.000	.000	5.400	.000	.000	.000
.800	.000	.000	.000	5.500	.000	.000	.000
.900	.000	.000	.000	5.600	.000	.000	.000
1.100	.000	.000	.000	5.800	.000	.000	.000
1.200	.000	.000	.000	5.900	.000	.000	.000
1.300	.000	.000	.000	6.000	.000	.000	.000
1.400	.000	.000	.000	6.100	.000	.000	.000
1.500	.000	.000	.000	6.200	.000	.000	.000
1.600	.000	.000	.000	6.300	.000	.000	.000
1.700	.000	.000	.000	6.400	.000	.000	.000
1.800	.000	.000	.000	6.500	.000	.000	.000
1.900	.000	.000	.000	6.600	.000	.000	.000
2.000	.000	.000	.000	6.700	.000	.000	.000
2.100	.000	.000	.000	6.800	.000	.000	.000
2.200	.000	.000	.000	6.900	.000	.000	.000
2.300	.000	.000	.000	7.000	.000	.000	.000
2.400	.000	.000	.000	7.100	.000	.000	.000
2.500	.000	.000	.000	7.200	.000	.000	.000
2.600	.000	.000	.000	7.300	.000	.000	.000
2.700	.000	.000	.000	7.400	.000	.000	.000
2.800	.000	.000	.000	7.500	.000	.000	.000
2.900	.000	.000	.000	7.600	.000	.000	.000
3.000	.000	.000	.000	7.700	.000	.000	.000
3.100	.000	.000	.000	7.800	.163	1.267	6.845
3.200	.000	.000	.000	7.900	.358	2.796	15.004
3.300	.000	.000	.000	8.000	.569	4.476	23.851
3.400	.000	.000	.000	8.100	.796	6.303	33.359
3.500	.000	.000	.000	8.200	1.038	8.271	43.471
3.600	.000	.000	.000	8.300	1.297	10.407	54.316
3.700	.000	.000	.000	8.400	1.585	12.813	66.380
3.800	.000	.000	.000	8.500	1.915	15.601	80.202
3.900	.000	.000	.000	8.600	2.281	18.730	95.526
4.000	.000	.000	.000	8.700	2.678	22.165	112.161
4.100	.000	.000	.000	8.800	3.103	25.888	129.978
4.200	.000	.000	.000	8.900	3.553	29.868	148.812
4.300	.000	.000	.000	9.000	4.026	34.099	168.612
4.400	.000	.000	.000	9.100	4.524	38.613	189.505
4.500	.000	.000	.000	9.200	5.053	43.448	211.634
4.600	.000	.000	.000	9.300	5.099	43.871	213.560