

"ROYAL PINES PRINCESS"



**TRIM AND STABILITY BOOKLET
AND
INCLINING EXPERIMENT REPORT**

CLASS 1E



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This plan has been accepted as complying with the Standard/Rule as stated below	
Standard/Rule	NSCV
Class	1E ~ 216 PERSONS
Operational Area	SMOOTH WATERS
File No	955/0128
C of C No	21561
Accreditation No	266
Date	17/8/12
Signature	<i>[Handwritten Signature]</i>

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CLASS 1E

Prepared by: Oceanic Yacht Design

Document status: o1633-L02-01A

Date: August 2012

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

TABLE OF CONTENTS

PARTICULARS OF VESSEL	5
1.0 INFORMATION FOR THE MASTER	6
1.1 GENERAL NOTES	6
1.2 TANK USAGE AND FREE SURFACE EFFECTS	6
1.3 GENERAL LOADING NOTES	6
1.4 STOWING AND SECURING OF ONBOARD ITEMS	7
1.5 OPENINGS	7
1.6 DOWNFLOODING	7
1.7 STABILITY CRITERIA	8
1.8 ANGLE OF DECK IMMERSION	10
1.9 SEAMANSHIP	10
1.10 COORDINATE SYSTEM	11
2.0 LOADING CONDITIONS	12
2.1 DEPARTURE CONDITION	13
2.2 ARRIVAL CONDITION	18
2.3 MINIMUM OPERATING CONDITION	23
2.4 LDC - COMPARTMENT 1+MAIN DECK DAMAGED	28
2.5 LDC - COMPARTMENT 2+MAIN DECK DAMAGED	32
2.6 LDC - COMPARTMENT 3 DAMAGED	36
2.7 LDC - COMPARTMENT 4 DAMAGED	40
2.8 LDC - COMPARTMENT 5 DAMAGED	44
2.9 LDC - COMPARTMENT 6 DAMAGED	48
2.10 LDC - COMPARTMENT 7+MAIN DECK DAMAGED	53
2.11 LDC - COMPARTMENT 8+MAIN DECK DAMAGED	57
3.0 HYDROSTATICS	61
3.1 TABULAR HYDROSTATICS	62
3.2 GRAPHICAL HYDROSTATICS	63
4.0 STATICAL STABILITY	65
4.1 TABULAR CROSS CURVES	66
4.2 GRAPHICAL CROSS CURVES	67
5.0 TANK CAPACITIES	68
5.1 SEWAGE PORT (STBD SIMILAR)	68
5.2 FUEL PORT (STBD SIMILAR)	69
5.3 FRESH WATER PORT (STBD SIMILAR)	70
5.4 BALLAST AFT PORT (STBD SIMILAR)	71
5.5 BALLAST MID PORT (STBD SIMILAR)	72
5.6 BALLAST FWD PORT (STBD SIMILAR)	73
6.0 VESSEL INFORMATION	74
6.1 WINDAGE PROFILE LDC	74
6.2 WINDAGE PROFILE LAC	75
6.3 WINDAGE PROFILE MOC	76
6.4 TANKAGE PLAN	77
6.5 COMPARTMENT PLAN	78
7.0 HEELING LEVER CALCULATIONS	79
7.1 PERSON CROWDING	79
7.2 WINDAGE	79

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

7.3 TURNING	79
8.0 INCLINING EXPERIMENT REPORT	80
8.1 INTRODUCTION	80
8.2 LIGHTSHIP, LCG & VCG DERIVATION	81
8.3 LIGHTSHIP HYDROSTATICS	84
8.4 AFT PENDULUM DEFLECTIONS	85
8.5 FWD PENDULUM DEFLECTIONS	85

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

PARTICULARS OF VESSEL

Name of Vessel:	<i>"Royal Pines Princess"</i>
Length (measured):	26.00 m
Breadth (measured):	6.50 m
Depth (measured):	1.60 m
Loaded Draft (@ LCF):	0.645 m
Corresponding Displacement:	60.75 tonnes (departure condition)
Class of Vessel:	Class 1E – 216 persons

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of Q No

Accreditation No Date

Signature

1.0 INFORMATION FOR THE MASTER

1.1 GENERAL NOTES

A stamped approved copy of this booklet must be kept on board the vessel at all times, be complete, legible and readily available for use. If this booklet should be lost or become unusable, a replacement-approved copy must be obtained immediately from the relevant Statutory Authority or Oceanic Yacht Design.

The loading conditions shown in this booklet are typical for the intended service of the vessel. It is emphasised that a separate calculation is required for all other conditions of loading.

The vessel particulars to be used in all stability calculations are those based on the inclining experiment performed on the 23rd July 2012 by Oceanic Yacht Design.

The master of the vessel is reminded that although the vessel exceeds the National Standard for Commercial vessel's stability requirements, this does not mean that the vessel cannot capsize. Care must be taken to ensure that the vessel is properly handled in the weather conditions prevailing at the time.

1.2 TANK USAGE AND FREE SURFACE EFFECTS

Provided that a tank is completely filled with liquid no movement of the liquid is possible and the effect on the vessel's stability is precisely the same as if the tank contained solid material. Immediately after liquid is drawn from the tank the situation changes and the stability of the vessel is adversely affected by what is referred to as the "Free Surface Effect". This adverse affect on the stability is referred to as either a "loss in GM" or as a "virtual rise in VCG" and is calculated as follows:

$$\text{Loss in GM due to Free Surface Effects} = \frac{\text{Free Surface Moment (m)}}{\text{Vessel Displacement}}$$

In making up loading conditions, it is noted that free surface effects must be allowed for in all tanks that might be slack or could shortly become slack in that loading condition. This will mean that, for the departure condition, main fuel tanks and fresh water tanks are to be slack.

1.3 GENERAL LOADING NOTES

When using hydrostatic and cross curves, it shall be remembered that they are calculated for the vessel at level trim. When the vessel departs from this trim, the value of the hydrostatic elements and righting levers vary from those read off for level trim. This could result in the stability being overestimated. When making up loading conditions using the hydrostatics and cross-curves, every effort must be made to keep the vessel close to level trim at all times.

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

1.4 STOWING AND SECURING OF ONBOARD ITEMS

It is important that before commencing a voyage, large pieces of equipment, stores and heavy items onboard the vessel are securely stowed so as to prevent shifting in both the longitudinal and transverse directions.

1.5 OPENINGS

It is important for the safety of the ship that the number of openings through which water may enter the hull in the event of a severe heeling are kept to a minimum commensurate with the workings of the ship. These openings should be provided with a weather tight means of closure capable of being fitted quickly in an emergency.

In adverse weather conditions and when there is a possibility of encountering a severe gust, squall or large breaking waves, all exposed doors, skylights, vents, etc shall be kept closed and securely fastened to prevent the ingress of water.

1.6 DOWNFLOODING

The angle at which progressive flooding into the hulls below the weather-deck can occur when the vessel heels.

The following table specifies the possible downflooding points for this vessel.

Description	Longitudinal (m)	Vertical (m)	Transverse (m)
Aft Bulkhead Door	0.00	1.5	0.8 (S)

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

1.7 STABILITY CRITERIA

In all conditions of loading the following stability criteria are to be met:

INTACT:

NSCV Part C Section 6 Subsection 6A – Chapter 5A

Criterion No.	Criterion description
5A.1	The angle of maximum righting lever θ_{max} shall occur at an angle of not less than 15 degrees.
5A.2a	When the angle of maximum righting lever θ_{max} occurs at 15 degrees, the area under the righting lever curve up to an angle of 15 degrees shall not be less than 4.01 metre-degrees.
5A.2b	When the angle of maximum righting lever θ_{max} occurs between 15 degrees and 30 degrees, the area under the righting lever curve up to the angle of maximum righting lever θ_{max} shall not be less than the area determined by the use of the formula: $A_{\theta-\theta_{max}} = 3.15 + 0.057(30 - \theta_{max})$ Where: $A_{\theta-\theta_{max}}$ = the area under the righting lever curve up to the angle of maximum righting lever θ_{max} in metre-degrees. θ_{max} = the angle of heel at which the righting lever curve reaches its maximum, in degrees.
5A.2c	When the angle of maximum righting lever θ_{max} occurs at 30 degrees or more, the area under the righting lever curve up to an angle of 30 degrees shall not be less than 3.15 metre-degrees.
5A.3	The area under the righting lever curve up to an angle of 40 degrees, or the angle of flooding θ_f if this is less than 40 degrees, shall not be less than 5.16 metre-degrees.
5A.4	The area under the righting lever curve between the angles of heel of 30 degrees and 40 degrees, or between 30 degrees and the angle of flooding θ_f if this angle is less than 40 degrees, shall be not less than 1.72 metre-degrees.
5A.5	The righting lever shall have a value not less than 0.2 metres at an angle of heel equal to or greater than 30 degrees.
5A.6a	The minimum metacentric height (G_{FM}) shall be not less than 0.15 m.
5A.7a	The angle of heel θ_h shall not exceed 10 degrees when any of the individual heeling moments due to person crowding, wind or turn is applied.
5A.8	The angle of heel θ_h shall not exceed 15 degrees when the combined effect of the two greatest heeling moments resulting from person crowding, the effect of wind or the effect of turn are applied simultaneously.

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

5A.9

When the angle of maximum righting lever θ_{max} occurs at less than 25 degrees, the area under the curve of righting levers and above the largest single heeling lever curve up to 40 degrees (or the angle of flooding θ_f if this is less than 40 degrees) shall not be less than:

$$A_{RS} = 1.03 + 0.2 A_{40/\theta_f}$$

Where:

A_{RS} = minimum residual area under the curve of righting levers above the single heeling lever curve up to 40 degrees (or the angle of flooding θ_f if this is less than 40 degrees), in metre-degrees.

A_{40/θ_f} = total area under curve of righting levers up to an angle of 40 degrees (or the angle of flooding θ_f if this is less than 40 degrees), in metre-degrees.

5A.10

When the angle of maximum righting lever θ_{max} occurs at less than 25 degrees, the area under the curve of righting levers and above the largest single heeling lever curve up to 40 degrees (or the angle of flooding θ_f if this is less than 40 degrees) shall not be less than:

$$A_{RC} = 0.65 + 0.13 A_{40/\theta_f}$$

Where:

A_{RC} = minimum residual area under the curve of righting levers above the combined heeling lever curve up to 40 degrees (or the angle of flooding θ_f if this is less than 40 degrees), in metre-degrees.

A_{40/θ_f} = total area under curve of righting levers up to an angle of 40 degrees (or the angle of flooding θ_f if this is less than 40 degrees), in metre-degrees.

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No Col C No

Accreditation No Date

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DAMAGED:

NSCV Part C Section 6 Subsection 6B

- Criteria Criteria Description
- FF.1 The final waterline shall be below the level of any opening through which further flooding could take place by the vertical distance specified as follows:

$$F_f = H_{cs} + 75$$

where

F_f = the minimum freeboard in the equilibrium flooded condition from the flooded waterline to the lowest edge of a sill or coaming, in mm

H_{cs} = the minimum required coaming or sill height for weathertight integrity from the deck to the lowest edge of a sill or coaming specified in Part C Section 2, in mm

- FF.3 The vessel shall have positive freeboard sufficient to ensure important emergency equipment, emergency radios, power supplies and public address systems needed for organising the evacuation remain accessible and operational.
- FF.4 The vessel shall have positive freeboard such that, within the range of positive stability governed by the criteria of Clause 8.4.4, openings that are neither watertight or weathertight through which further flooding could take place shall not be submerged.
- EA.1a The maximum permissible angle of the deck to the horizontal after equilibrium shall not exceed the angle specified as follows:

Maximum allowable angle	Conditions of application
12 degrees	All heavy masses including deck and other cargo but not including vehicles are secured against shifting.

- FCB. 1 The range of positive righting lever in the equilibrium flooded condition shall be at least 10 degrees
- FCB. 2b The positive area under the righting lever curve shall not be less than 0.86 metre degrees

1.8 ANGLE OF DECK IMMERSION

The angle at which the deck edge is first immersed when heeled.

1.9 SEAMANSHIP

In all situations the master is responsible for the safety of the vessel, and in no way is the master absolved from this responsibility by complying with the stability criteria set out in this booklet. Therefore the master should demonstrate extreme care and good seamanship whilst sailing under all weather conditions and situations.

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Standard/Rule

Class

Operational Areas

File No Cell C No

Accreditation No Date

1.10 COORDINATE SYSTEM

The coordinate system used for all calculations is:

ORIGIN: The point on the baseline at the transom of the vessel.

Baseline: Coinciding with the underside of the keel.

X:	Positive fwd
Y:	Positive starboard
Z:	Positive upwards
Trim:	Positive by stern

See profile figure in section 6.1 for reference.

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

2.0 LOADING CONDITIONS

Notes:

1. The GZ values shown in the loading conditions may vary from those derived by using Section 4, because the values in the loading conditions are calculated for the actual trim as the vessel heels, whereas those derived by using KN values from Section 4 are for an even keel condition.
2. The upper deck is limited to a maximum of 80 persons

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

2.1 DEPARTURE CONDITION

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.120	0.112	1.257	-2.514	0.339	0.180
Sewage Stbd	10%	1.120	0.112	1.257	2.514	0.339	0.180
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			60.750	9.420	0.000	1.912	1.586
FS correction						0.026	
VCG fluid						1.938	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.629
Displacement t	60.75
Heel deg	0.0
Draft at FP m	0.472
Draft at AP m	0.787
Draft at LCF m	0.645
Trim (+ve by stern) m	0.315
WL Length m	24.096
Beam max extents on WL m	6.379
Wetted Area m ²	146.882
Waterpl. Area m ²	134.251
Prismatic coeff. (Cp)	0.668
Block coeff. (Cb)	0.490
Max Sect. area coeff. (Cm)	0.738
Waterpl. area coeff. (Cwp)	0.873
LCB from zero pt. (+ve fwd) m	9.401
LCF from zero pt. (+ve fwd) m	10.845
KB m	0.412
KG fluid m	1.938
BMT m	6.656
BML m	94.559
GMt corrected m	5.131
GML m	93.034
KMt m	7.068
KML m	94.963
Immersion (TPc) tonne/cm	1.377
MTc tonne.m	2.354
RM at 1deg = GMt.Disp.sin(1) tonne.m	5.440
Max deck inclination deg	0.7524
Trim angle (+ve by stern) deg	0.7524

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Standard/Rule

Class

Operational Areas

File No C of C No

Creditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.628
Deck Edge (freeboard pos = -0.313 m)		0.704
DF point	Downflooding point	0.713

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	0.000	0.751	1.028	0.936	0.682	0.361	0.010
Area under GZ curve from zero heel m. deg	0.0000	4.0130	13.3190	23.3474	31.5202	36.7773	38.6485
Displacement t	60.75	60.75	60.76	60.75	60.75	60.75	60.75
Draft at FP m	0.472	0.399	0.178	-0.170	-0.631	-1.282	-2.300
Draft at AP m	0.787	0.782	0.682	0.603	0.540	0.474	0.383
WL Length m	24.096	24.036	23.236	23.178	23.408	23.686	23.860
Beam max extents on WL m	6.379	5.906	4.208	3.071	2.550	2.232	1.934
Wetted Area m ²	146.882	133.215	126.865	129.111	129.555	129.238	129.033
Waterpl. Area m ²	134.251	116.925	91.473	65.856	52.497	43.558	38.007
Prismatic coeff. (Cp)	0.668	0.661	0.696	0.698	0.684	0.668	0.657
Block coeff. (Cb)	0.490	0.379	0.438	0.493	0.487	0.479	0.494
LCB from zero pt. (+ve fwd) m	9.401	9.394	9.386	9.366	9.343	9.319	9.298
LCF from zero pt. (+ve fwd) m	10.845	10.620	11.253	11.412	11.330	11.190	11.095
Max deck inclination deg	0.7524	10.0400	20.0306	30.0386	40.0476	50.0530	60.0515
Trim angle (+ve by stern) deg	0.7524	0.9140	1.2036	1.8450	2.7914	4.1826	6.3739

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		11
Deck Edge (immersion pos = -0.313 m)		12.5
DF point	Downflooding point	52.6

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Standard/Rule

Class

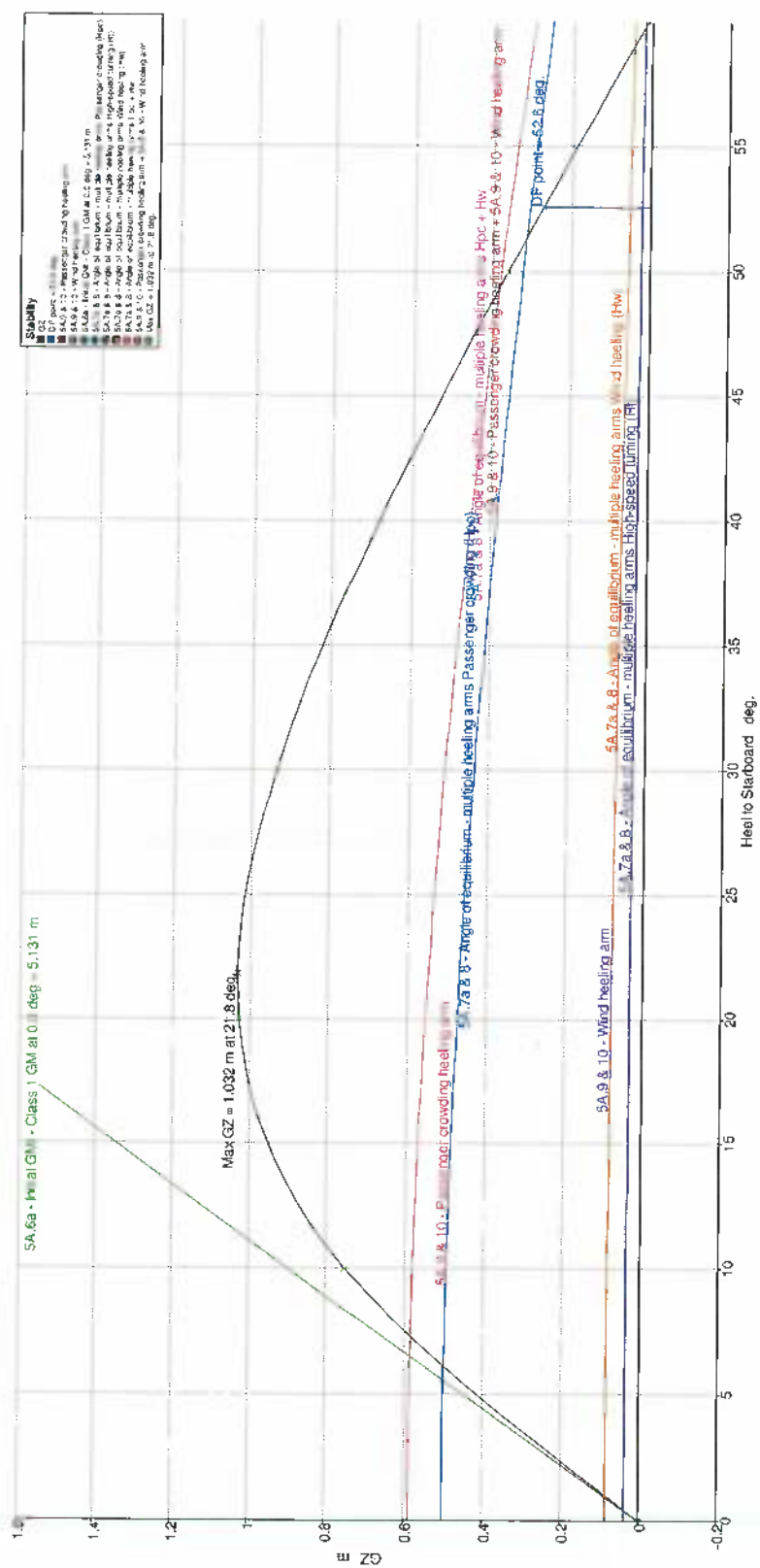
Operational Areas

File No C of C No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
Ch.5A -	5A.1 - Angle of max GZ				Pass
	shall not be less than ($\geq$)	15.0	deg	21.8	Pass
					Pass
Ch.5A -	5A.2 - Area 0 to 30 or GZmax				
	from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	30.0	deg		
	angle of max. GZ	21.8	deg	21.8	
	first downflooding angle	52.5	deg		
	lower heel angle	15.0	deg		
	required GZ area at lower heel angle	4.0107	m.deg		
	higher heel angle	30.0	deg		
	required GZ area at higher heel angle	3.1513	m.deg		
	shall not be less than ($\geq$)	3.6201	m.deg	15.1890	Pass
					Pass
Ch.5A -	5A.3 - Area 0 to 40				
	from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	first downflooding angle	52.5	deg		
	angle of vanishing stability	60.0	deg		
	shall not be less than ($\geq$)	5.1623	m.deg	31.5092	Pass
					Pass
Ch.5A -	5A.4 - Area 30 to 40				
	from the greater of				
	spec. heel angle	30.0	deg	30.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	first downflooding angle	52.5	deg		
	angle of vanishing stability	60.0	deg		
	shall not be less than ($\geq$)	1.7189	m.deg	8.1689	Pass
					Pass
Ch.5A -	5A.5 - Max GZ at 30 or greater				
	in the range from the greater of				
	spec. heel angle	30.0	deg		
	to the lesser of				
	spec. heel angle	180.0	deg		
	angle of max. GZ		deg		
	shall not be less than ($\geq$)	0.200	m	0.936	Pass
	Intermediate values				
	angle at which this GZ occurs	30	deg		
					Pass
Ch.5A -	5A.6a - Initial GMt - Class 1				
	spec. heel angle	0.0	deg		
	shall not be less than ($\geq$)	0.150	m	5.128	Pass
					Pass
Ch.5A -	5A.7a & 8 - Angle of equilibrium - multiple heeling arms				
	Pass. crowding arm = $nPass M / disp. D \cos^n(\phi)$				
	number of passengers: $nPass =$	216			
	passenger mass: $M =$	0.080	tonne		
	distance from centre line: $D =$	1.771	m		
	cosine power: $n =$	1			
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: $a =$	0.9998			
	vessel speed: $v =$	10.000	kts		
	turn radius, R , as percentage of Lwl	509.00	%		
	$h = KG - \text{vert. centre of projected lat. u'water area}$	1.590	m		
	cosine power: $n =$	1			
	Wind arm: $a P A (h - H) / (g disp.) \cos^n(\phi)$				
	constant: $a =$	1.00028			
	wind model	Pressure			
	wind pressure: $P =$	300.0	Pa		

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

Code	Criteria	Value	Units	Actual	Status
	area centroid height (from zero point): $h =$	2.813	m		
	additional area: $A =$	61.020	m ²		
	$H =$ vert. centre of projected lat. u/water area	0.321	m		
	cosine power: $n =$	1			
	Criteria: Angle of equilibrium due to the following shall be less than (<)...				Pass
	Passenger crowding (H_{pc})	10.0	deg	6.1	Pass
	High-speed turning (H_t)	10.0	deg	0.4	Pass
	Wind heeling (H_w)	10.0	deg	1.0	Pass
	$H_{pc} + H_w$	15.0	deg	7.3	Pass
	Intermediate values				
	Pass. crowding heel arm amplitude (H_{pc})		m	0.504	
	Turning heel arm amplitude (H_t)		m	0.035	
	Model windage area		m ²	22.765	
	Model windage area centroid height (from zero point)		m	1.085	
	Total windage area		m ²	83.785	
	Total windage area centroid height (from zero point)		m	2.344	
	Wind heeling heel arm amplitude (H_w)		m	0.085	
Ch.5A -	5A.9 & 10 - GZ area between limits type 2 - multiple heeling arms				Pass
	5A.9 & 10 - Passenger crowding heeling arm				
	5A.9 & 10 - Wind heeling arm				
	Area1 integrated from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium (with heel arm)	6.1, 7.3	deg	6.1	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	angle of max. GZ	21.8	deg		
	first downflooding angle	52.5	deg		
	Area2 integrated from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	angle of first GZ peak	21.8	deg		
	angle of max. GZ	21.8	deg		
	first downflooding angle	52.5	deg		
	Criteria: Area1 shall be greater than (>)...				Pass
	5A.9 & 10 - Passenger crowding heeling arm	7.3318	m.deg	14.4710	Pass
	5A.9 & 10 - Passenger crowding heeling arm + 5A.9 & 10 - Wind heeling arm	4.7462	m.deg	11.9006	Pass
	Intermediate values				
	Area1: heel arm A., from 6.1 to 40.0 deg.		m.deg	14.4710	
	Area2: heel arm A., from 0.0 to 40.0 deg.		m.deg	31.5092	
	Area1: heel arms A+B., from 7.3 to 40.0 deg.		m.deg	11.9006	
	Area2: heel arms A+B., from 0.0 to 40.0 deg.		m.deg	31.5092	

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

2.2 ARRIVAL CONDITION

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	95%	1.120	1.064	1.236	-2.647	0.596	0.180
Sewage Stbd	95%	1.120	1.064	1.236	2.647	0.596	0.180
Fuel Port	10%	0.651	0.065	5.675	-0.294	0.070	0.047
Fuel Stbd	10%	0.651	0.065	5.675	0.294	0.070	0.047
Fresh Water Port	10%	1.332	0.133	8.061	-2.515	0.335	0.147
Fresh Water Stbd	10%	1.332	0.133	8.061	2.515	0.335	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			59.283	9.278	0.000		1.586
FS correction						0.027	
VCG fluid						1.975	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.617
Displacement t	59.28
Heel deg	0.0
Draft at FP m	0.446
Draft at AP m	0.789
Draft at LCF m	0.635
Trim (+ve by stern) m	0.342
WL Length m	24.032
Beam max extents on WL m	6.380
Wetted Area m ²	145.862
Waterpl. Area m ²	133.566
Prismatic coeff. (Cp)	0.652
Block coeff. (Cb)	0.478
Max Sect. area coeff. (Cm)	0.738
Waterpl. area coeff. (Cwp)	0.871
LCB from zero pt. (+ve fwd) m	9.258
LCF from zero pt. (+ve fwd) m	10.793
KB m	0.408
KG fluid m	1.975
BMT m	6.777
BML m	95.569
GML corrected m	5.210
GML m	94.002
KMT m	7.185
KML m	95.967
Immersion (TPC) tonne/cm	1.370
MTc tonne.m	2.321
RM at 1deg = GML Disp.sin(1) tonne.m	5.391
Max deck inclination deg	0.8167
Trim angle (+ve by stern) deg	0.8167

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.626
Deck Edge (freeboard pos = -0.313 m)		0.702
DF point	Downflooding point	0.711

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	0.000	0.753	1.024	0.928	0.669	0.342	-0.015
Area under GZ curve from zero heel m.deg	0.0000	4.0265	13.3188	23.2857	31.3569	36.4492	38.0969
Displacement t	59.28	59.28	59.28	59.29	59.29	59.28	59.28
Draft at FP m	0.446	0.368	0.140	-0.224	-0.712	-1.398	-2.473
Draft at AP m	0.789	0.785	0.684	0.605	0.545	0.481	0.394
WL Length m	24.032	23.953	23.130	23.068	23.256	23.551	23.733
Beam max extents on WL m	6.380	5.915	4.207	3.066	2.616	2.291	1.962
Wetted Area m^2	145.875	131.680	124.646	126.810	126.821	126.761	126.615
Waterpl. Area m^2	133.571	115.623	90.464	66.393	51.714	43.091	37.686
Prismatic coeff. (Cp)	0.652	0.645	0.681	0.683	0.670	0.655	0.644
Block coeff. (Cb)	0.478	0.371	0.430	0.484	0.486	0.458	0.477
LCB from zero pt. (+ve fwd) m	9.258	9.250	9.241	9.220	9.194	9.169	9.146
LCF from zero pt. (+ve fwd) m	10.793	10.546	11.125	11.321	11.164	11.086	11.022
Max deck inclination deg	0.8171	10.0473	20.0357	30.0443	40.0548	50.0607	60.0588
Trim angle (+ve by stern) deg	0.8171	0.9941	1.2984	1.9781	2.9963	4.4752	6.8087

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		10.9
Deck Edge (immersion pos = -0.313 m)		12.4
DF point	Downflooding point	52.4

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Standard/Rule

Class

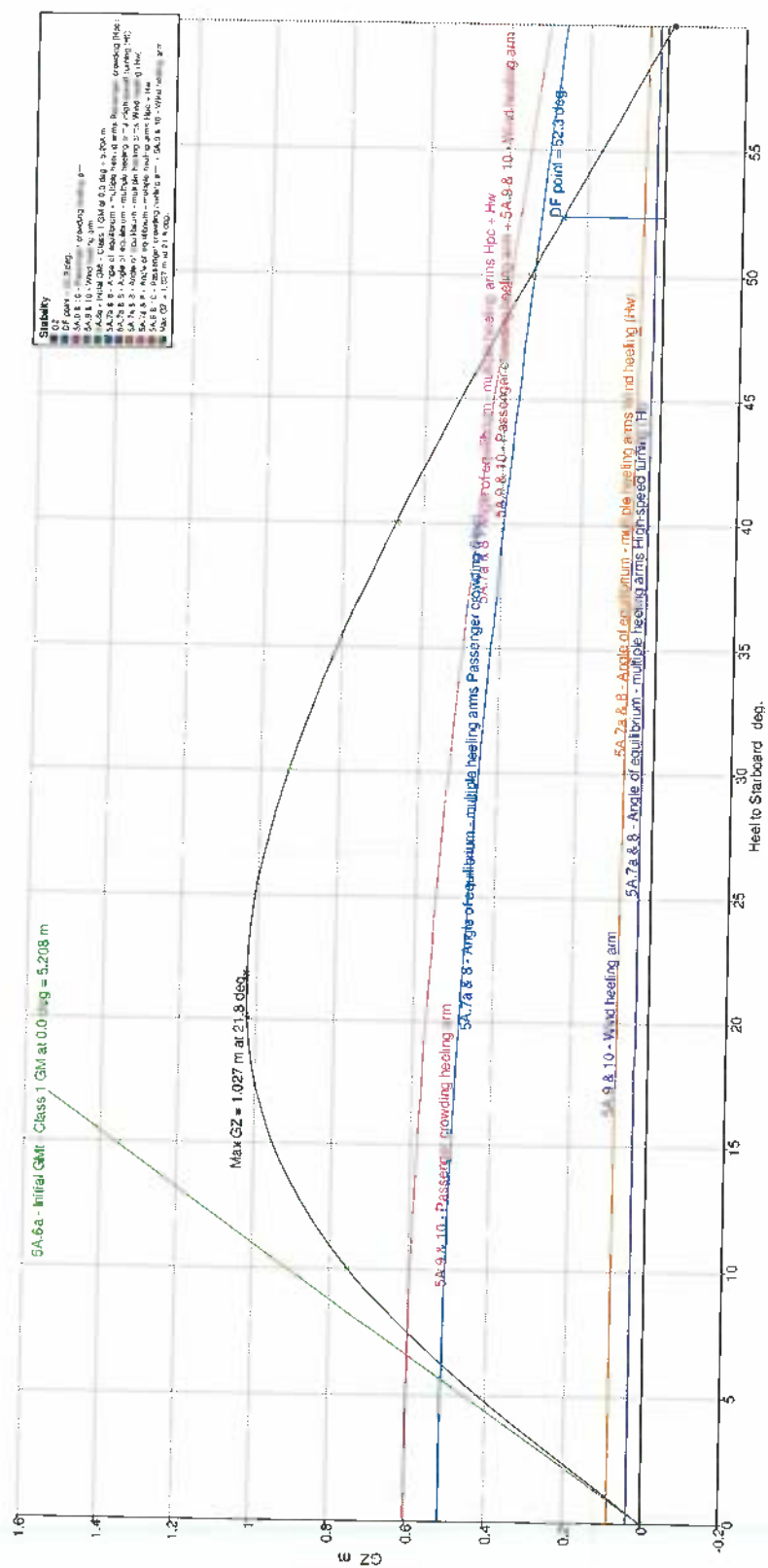
Operational Areas

File No C of C No

Accreditation No Date

Signature

GZ CURVE



This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
Ch.5A -	5A.1 - Angle of max GZ				Pass
	shall not be less than ($\geq$)	15.0	deg	21.8	Pass
Ch.5A -	5A.2 - Area 0 to 30 or GZmax				Pass
	from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	30.0	deg		
	angle of max. GZ	21.8	deg	21.8	
	first downflooding angle	52.3	deg		
	lower heel angle	15.0	deg		
	required GZ area at lower heel angle	4.0107	m.deg		
	higher heel angle	30.0	deg		
	required GZ area at higher heel angle	3.1513	m.deg		
	shall not be less than ($\geq$)	3.6201	m.deg	15.1841	Pass
Ch.5A -	5A.3 - Area 0 to 40				Pass
	from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	first downflooding angle	52.3	deg		
	angle of vanishing stability	59.6	deg		
	shall not be less than ($\geq$)	5.1623	m.deg	31.3569	Pass
Ch.5A -	5A.4 - Area 30 to 40				Pass
	from the greater of				
	spec. heel angle	30.0	deg	30.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	first downflooding angle	52.3	deg		
	angle of vanishing stability	59.6	deg		
	shall not be less than ($\geq$)	1.7189	m.deg	8.0712	Pass
Ch.5A -	5A.5 - Max GZ at 30 or greater				Pass
	in the range from the greater of				
	spec. heel angle	30.0	deg		
	to the lesser of				
	spec. heel angle	180.0	deg		
	angle of max. GZ		deg		
	shall not be less than ($\geq$)	0.200	m	0.928	Pass
	Intermediate values				
	angle at which this GZ occurs	30	deg		
Ch.5A -	5A.6a - Initial GMt - Class 1				Pass
	spec. heel angle	0.0	deg		
	shall not be less than ($\geq$)	0.150	m	5.208	Pass
Ch.5A -	5A.7a & 8 - Angle of equilibrium - multiple heeling arms				Pass
	Pass. crowding arm = $n \text{Pass} M / \text{disp. } D \cos^n(\phi)$				
	number of passengers: $n \text{Pass} =$	216			
	passenger mass: $M =$	0.080	tonne		
	distance from centre line: $D =$	1.771	m		
	cosine power: $n =$	1			
	Turn arm: $a \text{ v}^2 / (R g) h \cos^n(\phi)$				
	constant: $a =$	0.9998			
	vessel speed: $v =$	10.000	kts		
	turn radius, R , as percentage of L_{wl}	509.00	%		
	$h = KG$ - vert. centre of projected lat. u'water area	1.633	m		
	cosine power: $n =$	1			
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: $a =$	1.00028			
	wind model	Pressure			
	wind pressure: $P =$	300.0	Pa		

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

Code	Criteria	Value	Units	Actual	Status
	area centroid height (from zero point): $h =$	2.813	m		
	additional area: $A =$	61.020	m ²		
	$H =$ vert. centre of projected lat. u'water area	0.315	m		
	cosine power: $n =$	1			
	Criteria: Angle of equilibrium due to the following shall be less than (<)...				Pass
	Passenger crowding (H_{pc})	10.0	deg	6.3	Pass
	High-speed turning (H_t)	10.0	deg	0.4	Pass
	Wind heeling (H_w)	10.0	deg	1.0	Pass
	$H_{pc} + H_w$	15.0	deg	7.5	Pass
	Intermediate values				
	Pass. crowding heel arm amplitude (H_{pc})		m	0.516	
	Turning heel arm amplitude (H_t)		m	0.036	
	Model windage area		m ²	23.058	
	Model windage area centroid height (from zero point)		m	1.079	
	Total windage area		m ²	84.078	
	Total windage area centroid height (from zero point)		m	2.338	
	Wind heeling heel arm amplitude (H_w)		m	0.088	
Ch.5A -	5A.9 & 10 - GZ area between limits type 2 - multiple heeling arms				Pass
	5A.9 & 10 - Passenger crowding heeling arm				
	5A.9 & 10 - Wind heeling arm				
	Area1 integrated from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium (with heel arm)	6.3, 7.5	deg	6.3	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	angle of max. GZ	21.8	deg		
	first downflooding angle	52.3	deg		
	Area2 integrated from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	angle of first GZ peak	21.8	deg		
	angle of max. GZ	21.8	deg		
	first downflooding angle	52.3	deg		
	Criteria: Area1 shall be greater than (>)...				Pass
	5A.9 & 10 - Wind heeling arm	7.3014	m.deg	13.9294	Pass
	5A.9 & 10 - Passenger crowding heeling arm + 5A.9 & 10 - Wind heeling arm	4.7264	m.deg	11.2998	Pass
	Intermediate values				
	Area1: heel arm B., from 1.0 to 40.0 deg.		m.deg	13.9294	
	Area2: heel arm B., from 0.0 to 40.0 deg.		m.deg	31.3569	
	Area1: heel arms A+B., from 7.7 to 40.0 deg.		m.deg	11.2998	
	Area2: heel arms A+B., from 0.0 to 40.0 deg.		m.deg	31.3569	

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

2.3 MINIMUM OPERATING CONDITION

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	0	0.080	0.000	4.590	0.000	4.600	0.000
Main Deck Pax	2	0.080	0.160	12.000	0.000	1.875	0.000
Stores	0	2.500	0.000	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	10%	0.651	0.065	5.675	-0.294	0.070	0.047
Fuel Stbd	10%	0.651	0.065	5.675	0.294	0.070	0.047
Fresh Water Port	10%	1.332	0.133	8.061	-2.515	0.335	0.147
Fresh Water Stbd	10%	1.332	0.133	8.061	2.515	0.335	0.147
Ballast Aft Port	0%	1.324	0.000	9.698	-2.250	0.268	0.000
Ballast Aft Stbd	0%	1.324	0.000	9.698	2.250	0.268	0.000
Ballast Mid Port	0%	1.286	0.000	12.898	-2.250	0.277	0.000
Ballast Mid Stbd	0%	1.286	0.000	12.898	2.250	0.277	0.000
Ballast Fwd Port	0%	1.106	0.000	16.098	-2.250	0.297	0.000
Ballast Fwd Stbd	0%	1.106	0.000	16.098	2.250	0.297	0.000
Total Loadcase			30.700	9.171	0.000	1.859	0.747
FS correction						0.024	
VCG fluid						1.884	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.411
Displacement t	30.70
Heel deg	0.0
Draft at FP m	0.324
Draft at AP m	0.497
Draft at LCF m	0.422
Trim (+ve by stern) m	0.173
WL Length m	23.615
Beam max extents on WL m	5.983
Wetted Area m ²	128.496
Waterpl. Area m ²	123.047
Prismatic coeff. (Cp)	0.668
Block coeff. (Cb)	0.426
Max Sect. area coeff. (Cm)	0.644
Waterpl. area coeff. (Cwp)	0.871
LCB from zero pt. (+ve fwd) m	9.158
LOF from zero pt. (+ve fwd) m	10.402
KB m	0.282
KG fluid m	1.884
BMT m	10.948
BML m	156.469
GML corrected m	9.346
GML m	154.868
KML m	11.230
KML m	156.747
Immersion (TPC) tonne/cm	1.261
MTC tonne.m	1.980
RM at 1deg = GML Disp.sin(1) tonne.m	5.008
Max deck inclination deg	0.4117
Trim angle (+ve by stern) deg	0.4117

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.92
Deck Edge (freeboard pos = -0.313 m)		0.995
DF point	Downflooding point	1.003

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	0.000	1.032	1.317	1.336	1.101	0.750	0.345
Area under GZ curve from zero heel m.deg	0.0000	5.6209	17.8373	31.2581	43.6172	52.9248	58.4212
Displacement t	30.70	30.70	30.70	30.70	30.70	30.70	30.70
Draft at FP m	0.324	0.201	-0.047	-0.454	-1.054	-1.893	-3.193
Draft at AP m	0.497	0.432	0.214	-0.110	-0.507	-1.042	-1.864
WL Length m	23.615	23.326	22.752	22.423	22.238	22.689	22.977
Beam max extents on WL m	5.983	4.641	3.992	3.278	2.903	2.543	2.170
Wetted Area m ²	128.496	102.484	90.434	85.778	84.015	83.614	83.232
Waterpl. Area m ²	123.047	92.383	77.425	61.922	47.010	38.807	33.602
Prismatic coeff. (Cp)	0.668	0.673	0.699	0.715	0.718	0.698	0.683
Block coeff. (Cb)	0.426	0.365	0.348	0.381	0.376	0.381	0.408
LCB from zero pt. (+ve fwd) m	9.158	9.154	9.151	9.143	9.130	9.113	9.098
LCF from zero pt. (+ve fwd) m	10.402	10.495	10.433	10.548	10.685	10.769	10.717
Max deck inclination deg	0.4117	10.0145	20.0082	30.0077	40.0104	50.0125	60.0127
Trim angle (+ve by stern) deg	0.4117	0.5500	0.6237	0.8216	1.3038	2.0290	3.1688

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		20
Deck Edge (immersion pos = -0.313 m)		22.1
DF point	Downflooding point	Not immersed in positive range

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Standard/Rule

Class

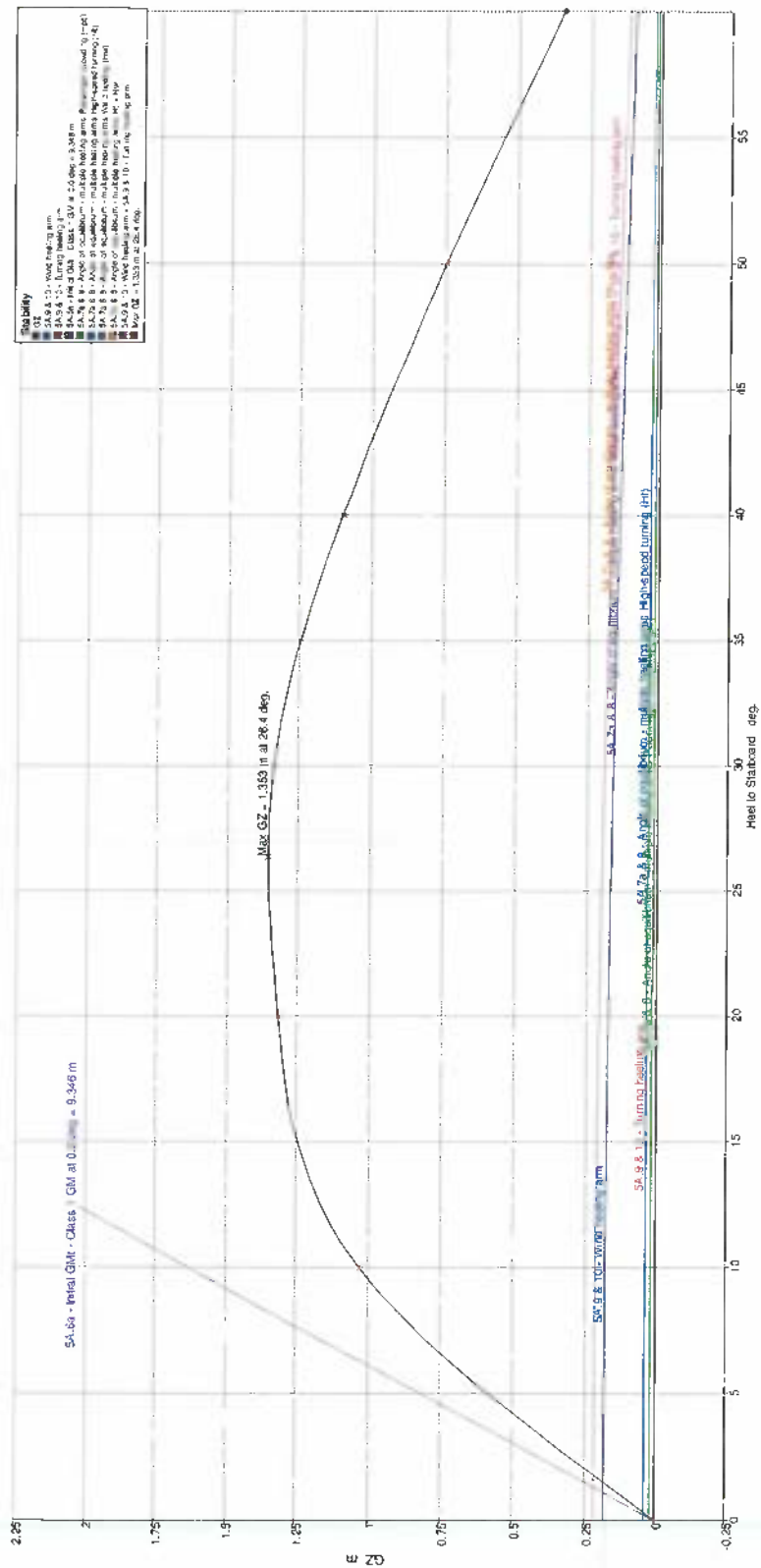
Operational Areas

File No C of C No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
Ch.5A -	5A.1 - Angle of max GZ				Pass
	shall not be less than ($\geq$)	15.0	deg	26.4	Pass
Ch.5A -	5A.2 - Area 0 to 30 or GZmax				Pass
	from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	30.0	deg		
	angle of max. GZ	26.4	deg	26.4	
	first downflooding angle	n/a	deg		
	lower heel angle	15.0	deg		
	required GZ area at lower heel angle	4.0107	m.deg		
	higher heel angle	30.0	deg		
	required GZ area at higher heel angle	3.1513	m.deg		
	shall not be less than ($\geq$)	3.3596	m.deg	26.3589	Pass
Ch.5A -	5A.3 - Area 0 to 40				Pass
	from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	first downflooding angle	n/a	deg		
	angle of vanishing stability	60.0	deg		
	shall not be less than ($\geq$)	5.1623	m.deg	43.6172	Pass
Ch.5A -	5A.4 - Area 30 to 40				Pass
	from the greater of				
	spec. heel angle	30.0	deg	30.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	first downflooding angle	n/a	deg		
	angle of vanishing stability	60.0	deg		
	shall not be less than ($\geq$)	1.7189	m.deg	12.3591	Pass
Ch.5A -	5A.5 - Max GZ at 30 or greater				Pass
	in the range from the greater of				
	spec. heel angle	30.0	deg		
	to the lesser of				
	spec. heel angle	180.0	deg		
	angle of max. GZ		deg		
	shall not be less than ($\geq$)	0.200	m	1.336	Pass
	Intermediate values				
	angle at which this GZ occurs	30	deg		
Ch.5A -	5A.6a - Initial GMt - Class 1				Pass
	spec. heel angle	0.0	deg		
	shall not be less than ($\geq$)	0.150	m	9.346	Pass
Ch.5A -	5A.7a & 8 - Angle of equilibrium - multiple heeling arms				Pass
	Pass. crowding arm = $nPass M / disp. D \cos^n(\phi)$				
	number of passengers: $nPass =$	2			
	passenger mass: $M =$	0.090	tonne		
	distance from centre line: $D =$	2.875	m		
	cosine power: $n =$	1			
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: $a =$	0.9998			
	vessel speed: $v =$	10.000	mts		
	turn radius, R , as percentage of Lwl	509.00	%		
	$h = KG - \text{vert. centre of projected lat. u'water area}$	1.650	m		
	cosine power: $n =$	1			
	Wind arm: $a P A (h - H) / (g disp.) \cos^n(\phi)$				
	constant: $a =$	1.00028			
	wind model	Pressure			
	wind pressure: $P =$	300.0	Pa		

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

Code	Criteria	Value	Units	Actual	Status
	area centroid height (from zero point): h =	2.813	m		
	additional area: A =	61.020	m ²		
	H = vert. centre of projected lat. u/water area	0.209	m		
	cosine power: n =	1			
	Criteria: Angle of equilibrium due to the following shall be less than (<)...				Pass
	Passenger crowding (Hpc)	10.0	deg	0.1	Pass
	High-speed turning (Ht)	10.0	deg	0.3	Pass
	Wind heeling (Hw)	10.0	deg	1.5	Pass
	Ht + Hw	15.0	deg	1.8	Pass
	Intermediate values				
	Pass. crowding heel arm amplitude (Hpc)		m	0.015	
	Turning heel arm amplitude (Ht)		m	0.037	
	Model windage area		m ²	28.043	
	Model windage area centroid height (from zero point)		m	0.979	
	Total windage area		m ²	89.063	
	Total windage area centroid height (from zero point)		m	2.236	
	Wind heeling heel arm amplitude (Hw)		m	0.180	
					Pass
Ch.5A -	5A.9 & 10 - GZ area between limits type 2 - multiple heeling arms				
	5A.9 & 10 - Wind heeling arm				
	5A.9 & 10 - Turning heeling arm				
	Area1 integrated from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium (with heel arm)	1.5, 1.8	deg	4.4	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	angle of max. GZ	26.4	deg		
	first downflooding angle	n/a	deg		
	Area2 integrated from the greater of				
	spec. heel angle	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	40.0	deg	40.0	
	angle of first GZ peak	26.4	deg		
	angle of max. GZ	26.4	deg		
	first downflooding angle	n/a	deg		
	Criteria: Area1 shall be greater than (>)...				Pass
	5A.9 & 10 - Wind heeling arm	9.7534	m.deg	37.1263	Pass
	5A.9 & 10 - Wind heeling arm + 5A.9 & 10 - Turning heeling arm	6.3202	m.deg	35.8228	Pass
	Intermediate values				
	Area1: heel arm B., from 1.5 to 40.0 deg.		m.deg	37.1263	
	Area2: heel arm B., from 0.0 to 40.0 deg.		m.deg	43.6172	
	Area1: heel arms B+C., from 1.8 to 40.0 deg.		m.deg	35.8228	
	Area2: heel arms B+C., from 0.0 to 40.0 deg.		m.deg	43.6172	

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

2.4 LDC - COMPARTMENT 1+MAIN DECK DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 1 + Main Deck, Sewage Stbd

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax (on main deck)	80	0.080	6.400	15.000	0.000	1.875	0.000
Main Deck Pax	136	0.080	10.880	15.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	Damaged						
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			60.638	11.072	-0.005	1.627	1.406
FS correction						0.023	
VCG fluid						1.650	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.717
Displacement t	60.64
Heel deg	0.5
Draft at FP m	0.523
Draft at AP m	0.911
Draft at LCF m	0.713
Trim (+ve by stern) m	0.388
WL Length m	24.261
Beam max extents on WL m	6.278
Wetted Area m ²	153.114
Waterpl. Area m ²	118.727
Prismatic coeff. (Cp)	0.547
Block coeff. (Cb)	0.426
Max Sect. area coeff. (Cm)	0.796
Waterpl. area coeff. (Cwp)	0.780
LCB from zero pt. (+ve fwd) m	11.053
LCF from zero pt. (+ve fwd) m	12.302
KB m	0.452
KG fluid m	1.650
BMt m	5.851
BML m	68.278
GMt corrected m	4.653
GML m	67.080
KMt m	6.302
KML m	68.718
Immersion (TPc) tonne/cm	1.217
MTC tonne.m	1.694
RM at 1deg = GMt.Disp.sin(1) tonne.m	4.924
Max deck inclination deg	1.0748
Trim angle (+ve by stern) deg	0.9259

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.471
Deck Edge (freeboard pos = -0.313 m)		0.547
DF point	Downflooding point	0.581

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	-0.045	0.313	0.204	0.008	-0.205	-0.417	-0.618
Area under GZ curve from zero heel m.deg	0.0000	1.6374	4.4961	5.5492	4.5761	1.4525	-3.7293
Displacement t	60.64	60.64	60.64	60.64	60.64	60.64	60.64
Draft at FP m	0.524	0.419	0.289	0.134	-0.056	-0.307	-0.680
Draft at AP m	0.910	1.208	1.720	2.347	3.132	4.193	5.810
WL Length m	24.256	23.955	23.724	23.970	24.499	24.839	25.080
Beam max extents on WL m	6.399	6.359	3.998	2.848	2.428	2.091	1.749
Wetted Area m ²	153.176	159.925	193.189	209.973	218.883	224.813	229.154
Waterpl. Area m ²	118.034	64.996	41.167	30.515	24.637	21.107	18.895
Prismatic coeff. (Cp)	0.548	0.402	0.356	0.335	0.318	0.308	0.301
Block coeff. (Cb)	0.419	0.257	0.268	0.272	0.248	0.242	0.255
LCB from zero pt. (+ve fwd) m	11.053	11.034	11.002	10.969	10.942	10.925	10.919
LCF from zero pt. (+ve fwd) m	12.377	13.303	13.070	13.015	13.001	13.009	13.018
Max deck inclination deg	0.9213	10.1687	20.2449	30.3133	40.3492	50.3442	60.2975
Trim angle (+ve by stern) deg	0.9213	1.8827	3.4107	5.2672	7.5627	10.6150	15.1239

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		5.7
Deck Edge (immersion pos = -0.313 m)		6.6
DF point	Downflooding point	12.4

DAMAGED PROFILE



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Standard/Rule

Class

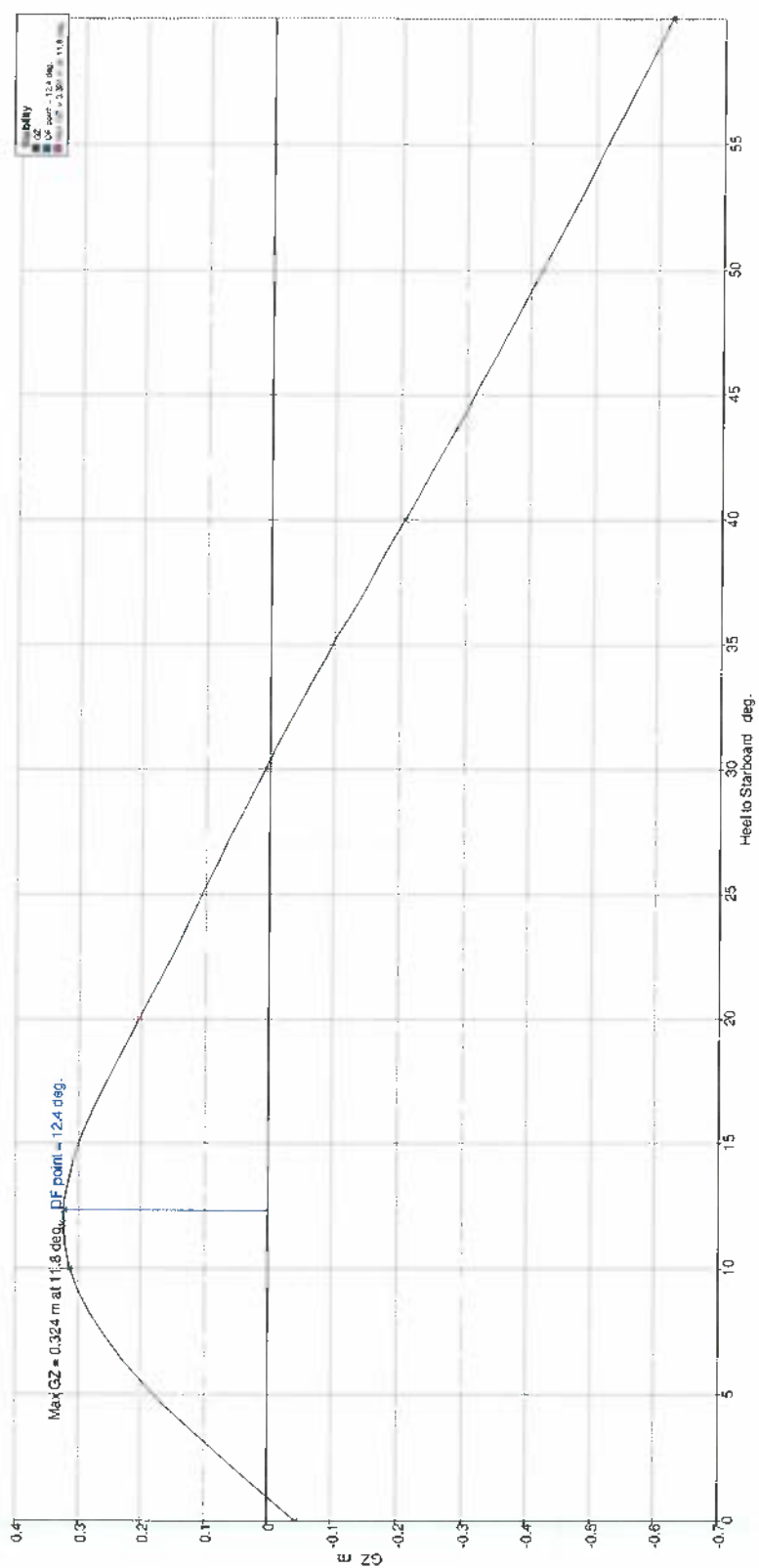
Operational Areas

File No Cert No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Comments

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.581	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	1.1	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.9	deg	0.9	
	to the lesser of				
	first downflooding angle	12.4	deg	12.4	
	angle of vanishing stability	30.4	deg		
	shall be greater than (>)	10.0	deg	11.4	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.9	deg	0.9	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	12.4	deg	12.4	
	angle of vanishing stability	30.4	deg		
	shall be greater than (>)	0.8594	m.deg	2.4166	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

ALL PASSENGERS ARE TO BE LOCATED ON THE MAIN DECK AND ARE TO BE DISTRIBUTED AS FAR FORWARD AS POSSIBLE TO MINIMISE TRIM TO THE STERN.

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with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No Co/C No

Accreditation No Date

Signature

2.5 LDC - COMPARTMENT 2+MAIN DECK DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 2 + Main Deck, Fuel Port, Fuel Stbd

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	15.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	Damaged						
Fuel Stbd	Damaged						
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			59.514	10.046	0.000	1.944	1.492
FS correction						0.025	
VCG fluid						1.969	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.694
Displacement t	59.51
Heel deg	0.0
Draft at FP m	0.478
Draft at AP m	0.910
Draft at LCF m	0.682
Trim (+ve by stern) m	0.432
WL Length m	24.144
Beam max extents on WL m	6.400
Wetted Area m ²	151.351
Waterpl. Area m ²	109.571
Prismatic coeff. (Cp)	0.540
Block coeff. (Cb)	0.413
Max Sect. area coeff. (Cm)	0.796
Waterpl. area coeff. (Cwp)	0.709
LCB from zero pt. (+ve fwd) m	10.018
LCF from zero pt. (+ve fwd) m	12.663
KB m	0.449
KG fluid m	1.969
BMT m	5.381
BML m	63.332
GMt corrected m	3.860
GML m	61.812
KMt m	5.828
KML m	63.771
Immersion (TPc) tonne/cm	1.123
MTc tonne.m	1.532
RM at 1deg = GMT.Disp.sin(1) tonne.m	4.009
Max deck inclination deg	1.0308
Trim angle (+ve by stern) deg	1.0308

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.503
Deck Edge (freeboard pos = -0.313 m)		0.579
DF point	Downflooding point	0.59

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	0.000	0.305	0.143	-0.106	-0.370	-0.628	-0.867
Area under GZ curve from zero heel m.deg	0.0000	1.8187	4.3280	4.5029	2.1300	-2.8759	-10.360
Displacement t	59.51	59.51	59.51	59.51	59.51	59.51	59.51
Draft at FP m	0.478	0.351	0.181	-0.027	-0.284	-0.632	-1.145
Draft at AP m	0.910	1.195	1.678	2.281	3.041	4.072	5.632
WL Length m	24.144	23.778	23.462	23.707	24.213	24.586	24.851
Beam max extents on WL m	6.400	6.357	4.089	2.927	2.423	2.097	1.767
Wetted Area m ²	151.351	155.197	185.099	200.889	209.803	215.460	219.736
Waterpl. Area m ²	109.571	64.170	39.992	29.004	23.537	20.037	17.833
Prismatic coeff. (Cp)	0.540	0.402	0.358	0.337	0.320	0.309	0.302
Block coeff. (Cb)	0.413	0.257	0.264	0.267	0.252	0.244	0.255
LCB from zero pt. (+ve fwd) m	10.018	9.992	9.953	9.913	9.882	9.861	9.857
LCF from zero pt. (+ve fwd) m	12.663	13.365	13.404	13.234	13.304	13.274	13.258
Max deck inclination deg	1.0308	10.1925	20.2677	30.3402	40.3794	50.3757	60.3240
Trim angle (+ve by stern) deg	1.0308	2.0120	3.5672	5.4893	7.8836	11.0846	15.7609

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		5.8
Deck Edge (immersion pos = -0.313 m)		6.7
DF point	Downflooding point	12.7

DAMAGED PROFILE



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Standard/Rule

Class

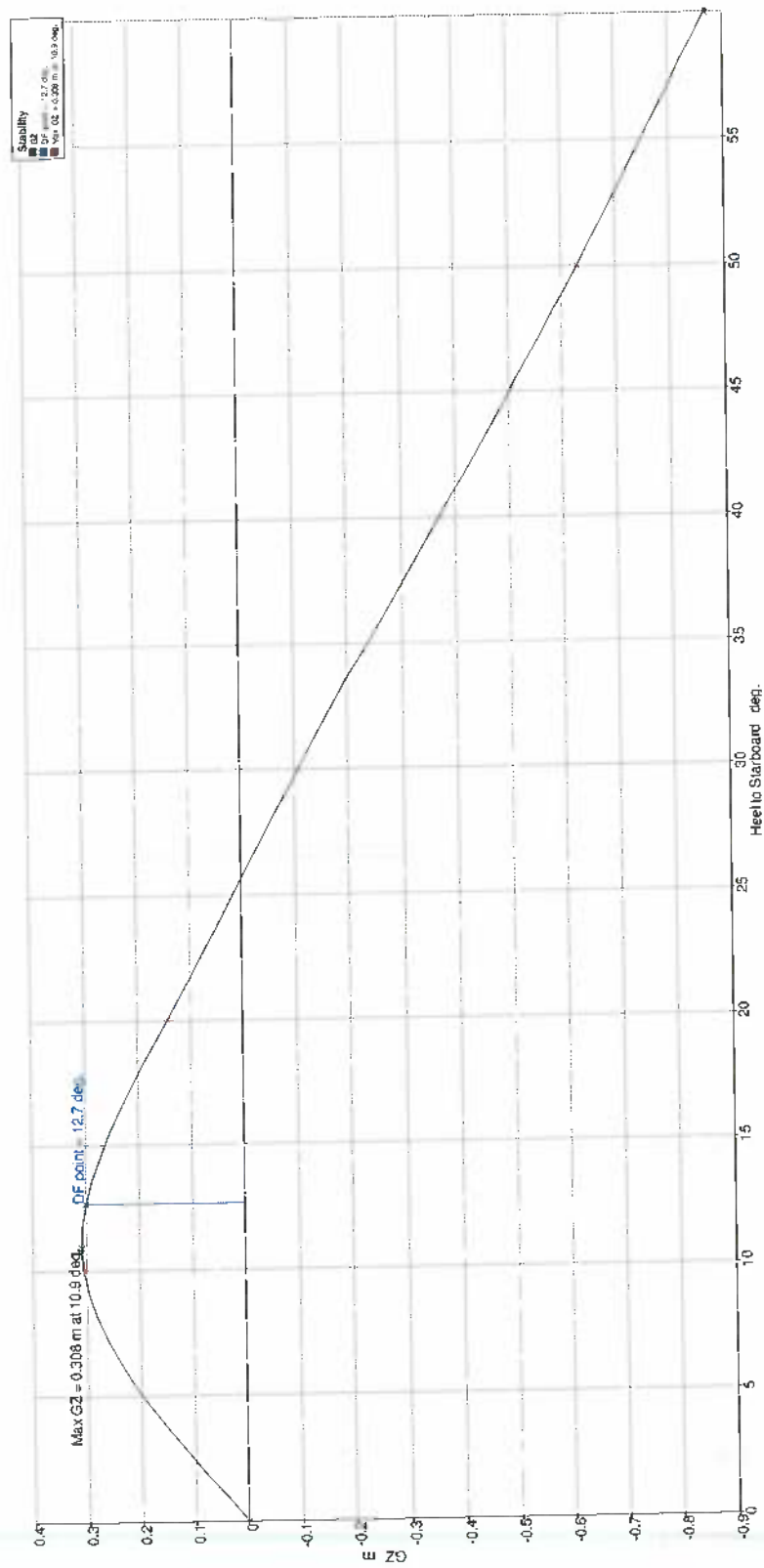
Operational Areas

File No C of C No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.590	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	1.0	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.0	deg	0.0	
	to the lesser of				
	first downflooding angle	12.7	deg	12.7	
	angle of vanishing stability	25.7	deg		
	shall be greater than (>)	10.0	deg	12.7	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	12.7	deg	12.7	
	angle of vanishing stability	25.7	deg		
	shall be greater than (>)	0.8594	m.deg	2.6392	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

ALL PASSENGERS ON THE MAIN DECK ARE TO BE DISTRIBUTED AS FAR FORWARD AS POSSIBLE TO MINIMISE TRIM TO THE STERN.

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

2.6 LDC - COMPARTMENT 3 DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 3, Fresh Water Port

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	Damaged						
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			59.484	9.448	0.056	1.940	1.439
FS correction						0.024	
VCG fluid						1.964	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.687
Displacement t	59.48
Heel deg	0.1
Draft at FP m	0.477
Draft at AP m	0.897
Draft at LCF m	0.690
Trim (+ve by stern) m	0.420
WL Length m	24.139
Beam max extents on WL m	6.394
Wetted Area m ²	150.776
Waterpl. Area m ²	112.579
Prismatic coeff. (Cp)	0.550
Block coeff. (Cb)	0.419
Max Sect. area coeff. (Cm)	0.794
Waterpl. area coeff. (Cwp)	0.729
LCB from zero pt. (+ve fwd) m	9.422
LCF from zero pt. (+ve fwd) m	11.839
KB m	0.450
KG fluid m	1.964
BMT m	5.766
BML m	81.606
GMt corrected m	4.252
GML m	80.092
KMt m	6.215
KML m	82.043
Immersion (TPc) tonne/cm	1.154
MTC tonne.m	1.984
RM at 1deg = GMt.Disp.sin(1) tonne.m	4.414
Max deck inclination deg	1.0109
Trim angle (+ve by stern) deg	1.0024

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.51
Deck Edge (freeboard pos = -0.313 m)		0.585
DF point	Downflooding point	0.601

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	-0.009	0.290	0.128	-0.119	-0.380	-0.635	-0.871
Area under GZ curve from zero heel m.deg	0.0000	1.6930	4.0472	4.0834	1.5974	-3.4957	-11.037
Displacement t	59.48	59.48	59.48	59.48	59.48	59.48	59.49
Draft at FP m	0.477	0.347	0.170	-0.045	-0.310	-0.668	-1.193
Draft at AP m	0.897	1.168	1.632	2.214	2.945	3.938	5.438
WL Length m	24.137	23.759	23.420	23.657	24.156	24.526	24.790
Beam max extents on WL m	6.400	6.357	4.105	2.940	2.424	2.093	1.765
Wetted Area m ²	150.791	153.153	182.000	197.881	206.505	212.093	216.350
Waterpl. Area m ²	112.480	62.255	39.457	28.894	23.183	19.680	17.496
Prismatic coeff. (Cp)	0.550	0.410	0.365	0.343	0.326	0.315	0.308
Block coeff. (Cb)	0.419	0.262	0.268	0.271	0.257	0.249	0.260
LCB from zero pt. (+ve fwd) m	9.422	9.397	9.358	9.319	9.290	9.269	9.268
LCF from zero pt. (+ve fwd) m	11.850	13.193	13.086	13.023	12.998	12.963	12.963
Max deck inclination deg	1.0026	10.1822	20.2555	30.3259	40.3637	50.3603	60.3104
Trim angle (+ve by stern) deg	1.0026	1.9573	3.4844	5.3727	7.7184	10.8574	15.4382

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		6.1
Deck Edge (immersion pos = -0.313 m)		6.9
DF point	Downflooding point	13.2

DAMAGED PROFILE



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Standard/Rule

Class

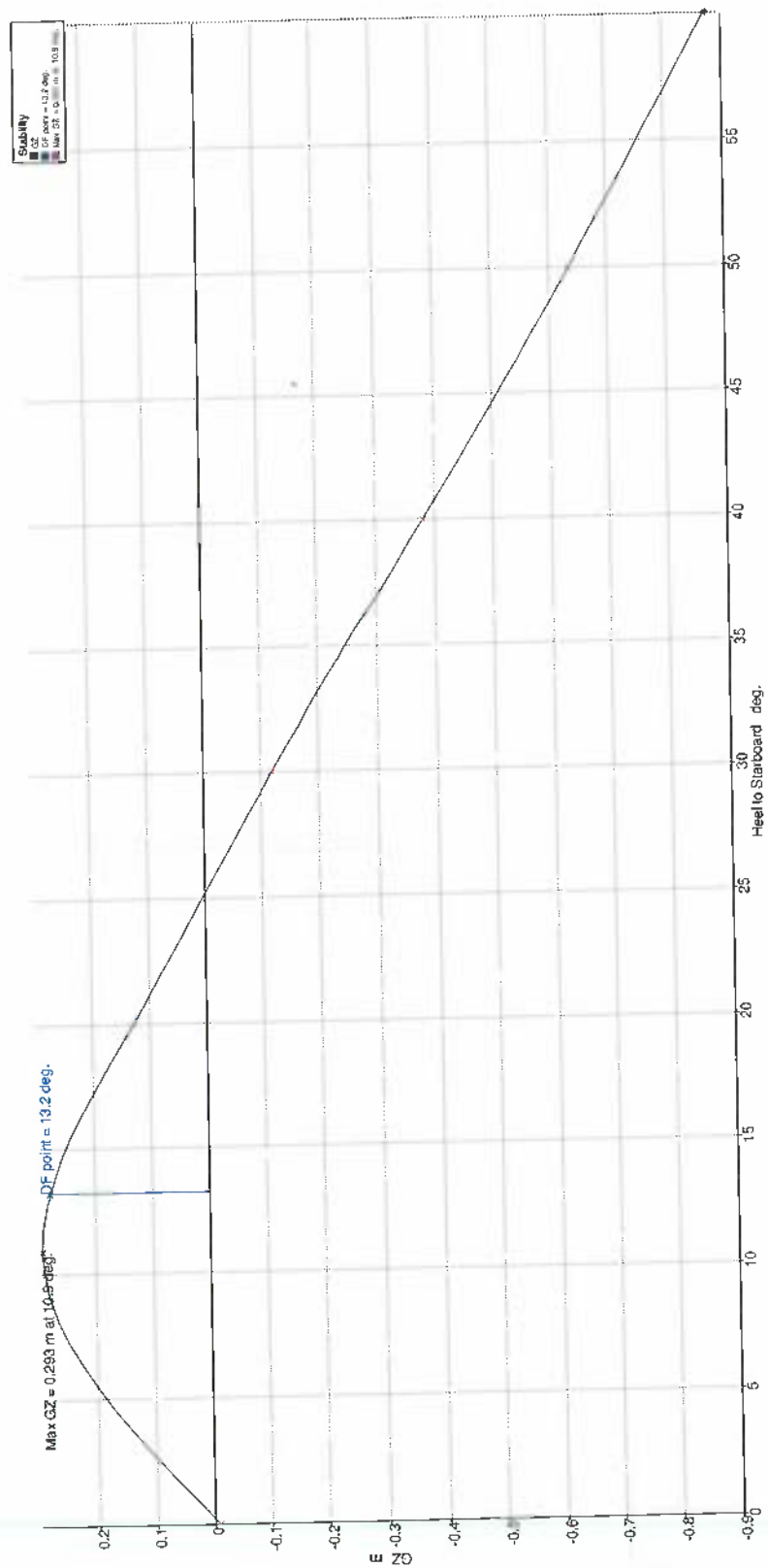
Operational Areas

File No C of C No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.601	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	1.0	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.2	deg	0.2	
	to the lesser of				
	first downflooding angle	13.2	deg	13.2	
	angle of vanishing stability	25.1	deg		
	shall be greater than (>)	10.0	deg	13.0	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.2	deg	0.2	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	13.2	deg	13.2	
	angle of vanishing stability	25.1	deg		
	shall be greater than (>)	0.8594	m.deg	2.6219	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

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with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

2.7 LDC - COMPARTMENT 4 DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 4, Ballast Aft Port

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	Damaged						
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			59.493	9.381	0.055	1.939	1.437
FS correction						0.024	
VCG fluid						1.964	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.684
Displacement t	59.49
Heel deg	0.2
Draft at FP m	0.531
Draft at AP m	0.836
Draft at LCF m	0.698
Trim (+ve by stern) m	0.305
WL Length m	24.270
Beam max extents on WL m	6.395
Wetted Area m ²	150.543
Waterpl. Area m ²	119.849
Prismatic coeff. (Cp)	0.599
Block coeff. (Cb)	0.447
Max Sect. area coeff. (Cm)	0.764
Waterpl. area coeff. (Cwp)	0.772
LCB from zero pt. (+ve fwd) m	9.362
LCF from zero pt. (+ve fwd) m	10.909
KB m	0.443
KG fluid m	1.964
BMT m	6.223
BML m	99.147
GMt corrected m	4.702
GML m	97.627
KMT m	6.666
KML m	99.582
Immersion (TPC) tonne/cm	1.228
MTc tonne.m	2.419
RM at 1deg = GMt Disp.sin(1) tonne.m	4.882
Max deck inclination deg	0.7521
Trim angle (+ve by stern) deg	0.7267

This plan has been accepted as complying
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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.568
Deck Edge (freeboard pos = -0.313 m)		0.644
DF point	Downflooding point	0.661

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	-0.016	0.330	0.175	-0.074	-0.339	-0.600	-0.845
Area under GZ curve from zero heel m.deg	0.0000	1.8878	4.7069	5.2061	3.1541	-1.5583	-8.7921
Displacement t	59.49	59.49	59.49	59.49	59.49	59.49	59.49
Draft at FP m	0.532	0.437	0.310	0.162	-0.019	-0.258	-0.611
Draft at AP m	0.836	1.035	1.424	1.903	2.506	3.322	4.564
WL Length m	24.255	23.954	23.684	23.913	24.435	24.752	24.973
Beam max extents on WL m	6.399	6.355	4.026	2.867	2.289	1.976	1.755
Wetted Area m ²	150.501	149.708	178.222	194.427	202.975	208.370	212.341
Waterpl. Area m ²	119.908	65.863	40.746	29.652	23.931	20.431	18.224
Prismatic coeff. (Cp)	0.599	0.462	0.396	0.370	0.351	0.339	0.331
Block coeff. (Cb)	0.447	0.284	0.295	0.301	0.294	0.286	0.283
LCB from zero pt. (+ve fwd) m	9.362	9.342	9.311	9.280	9.254	9.237	9.233
LCF from zero pt. (+ve fwd) m	10.903	12.227	12.312	12.392	12.398	12.406	12.429
Max deck inclination deg	0.7266	10.0970	20.1489	30.1946	40.2199	50.2189	60.1902
Trim angle (+ve by stem) deg	0.7266	1.4247	2.6566	4.1476	6.0023	8.4798	12.1624

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		7.4
Deck Edge (immersion pos = -0.313 m)		8.4
DF point	Downflooding point	16.1

DAMAGED PROFILE



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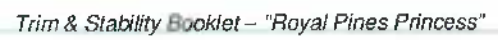
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File No C of C No

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Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points)				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.661	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	0.8	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.3	deg	0.3	
	to the lesser of				
	first downflooding angle	16.1	deg	16.1	
	angle of vanishing stability	27.0	deg		
	shall be greater than (>)	10.0	deg	15.8	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.3	deg	0.3	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	16.1	deg	16.1	
	angle of vanishing stability	27.0	deg		
	shall be greater than (>)	0.8594	m.deg	3.8363	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No Col C No

Accreditation No Date

Signature

2.8 LDC - COMPARTMENT 5 DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 5, Ballast Mid Port

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	Damaged						
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			59.529	9.316	0.054	1.939	1.438
FS correction						0.024	
VCG fluid						1.963	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.683
Displacement t	59.53
Heel deg	0.2
Draft at FP m	0.575
Draft at AP m	0.791
Draft at LCF m	0.696
Trim (+ve by stern) m	0.216
WL Length m	24.349
Beam max extents on WL m	6.381
Wetted Area m ²	150.865
Waterpl. Area m ²	120.576
Prismatic coeff. (Cp)	0.643
Block coeff. (Cb)	0.472
Max Sect. area coeff. (Cm)	0.739
Waterpl. area coeff. (Cwp)	0.776
LCB from zero pt. (+ve fwd) m	9.304
LCF from zero pt. (+ve fwd) m	10.553
KB m	0.438
KG fluid m	1.963
BMT m	6.250
BML m	97.057
GML corrected m	4.726
GML m	95.533
KML m	6.688
KML m	97.491
Immersion (TPC) tonne/cm	1.236
MTc tonne.m	2.368
RM at 1deg = GMt.Disp.sin(1) tonne.m	4.910
Max deck inclination deg	0.5700
Trim angle (+ve by stern) deg	0.5157

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.611
Deck Edge (freeboard pos = -0.313 m)		0.687
DF point	Downflooding point	0.705

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	-0.020	0.361	0.208	-0.042	-0.310	-0.576	-0.826
Area under GZ curve from zero heel m.deg	0.0000	2.0458	5.2047	6.0292	4.2837	-0.1626	-7.1827
Displacement t	59.52	59.53	59.53	59.53	59.53	59.53	59.53
Draft at FP m	0.575	0.499	0.406	0.301	0.175	0.009	-0.228
Draft at AP m	0.791	0.952	1.287	1.700	2.219	2.920	3.985
WL Length m	24.346	24.086	23.881	24.143	24.622	24.896	25.089
Beam max extents on WL m	6.381	6.361	3.980	2.826	2.253	1.925	1.727
Wetted Area m ²	150.886	148.230	175.917	191.797	200.068	205.804	210.078
Waterpl. Area m ²	120.581	67.781	41.144	30.115	24.091	20.591	18.452
Prismatic coeff. (Cp)	0.643	0.506	0.423	0.392	0.371	0.359	0.350
Block coeff. (Cb)	0.472	0.300	0.315	0.323	0.316	0.311	0.305
LCB from zero pt. (+ve fwd) m	9.304	9.286	9.259	9.233	9.211	9.196	9.192
LCF from zero pt. (+ve fwd) m	10.555	11.449	11.715	11.755	11.870	11.942	11.968
Max deck inclination deg	0.5146	10.0558	20.0932	30.1259	40.1446	50.1452	60.1265
Trim angle (+ve by stern) deg	0.5146	1.0800	2.1009	3.3357	4.8672	6.9122	9.9518

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		8.4
Deck Edge (immersion pos = -0.313 m)		9.4
DF point	Downflooding point	18.4

DAMAGED PROFILE



This plan has been accepted as complying
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Standard/Rule

Class

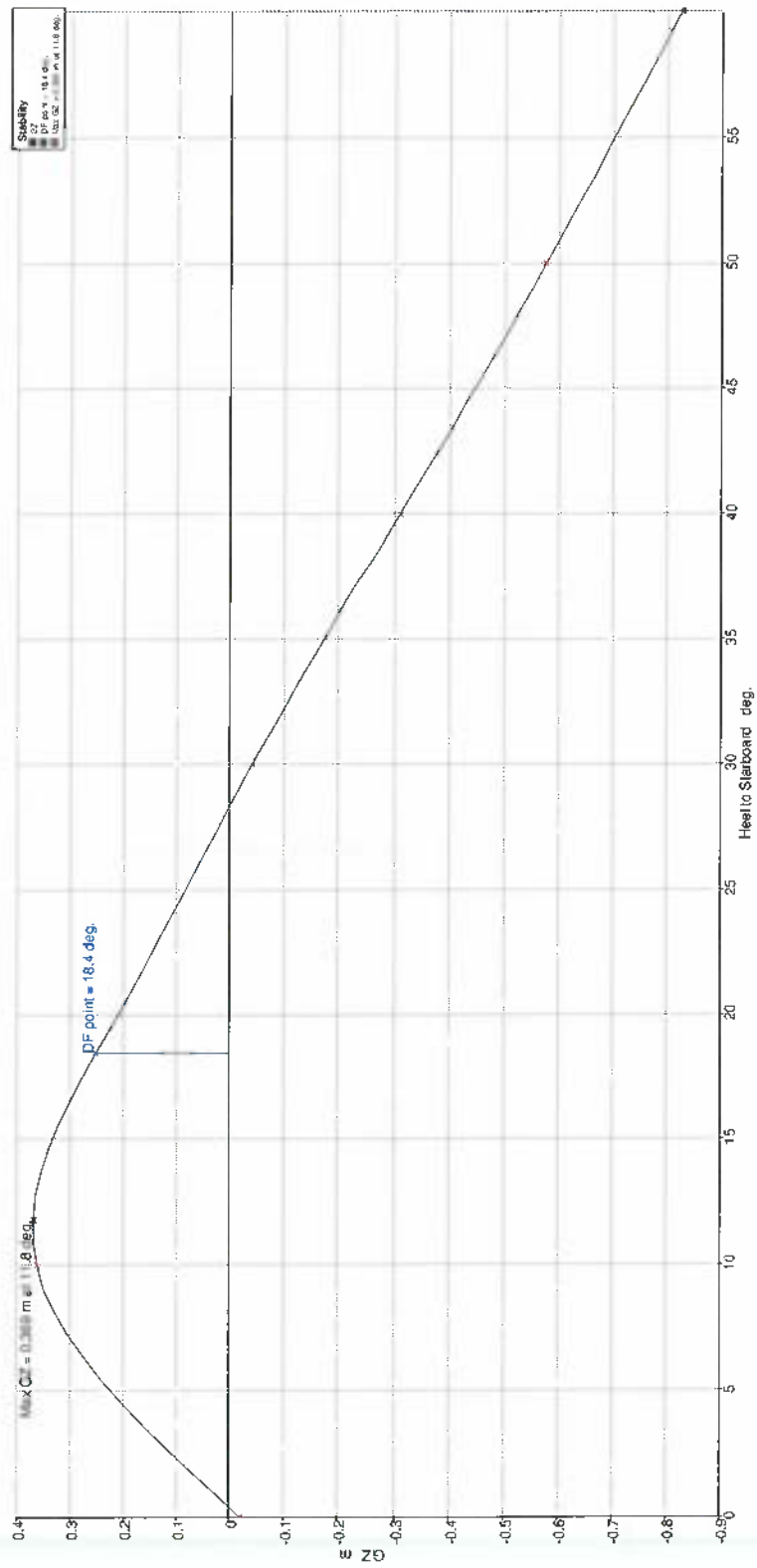
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File No C of C No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No Col C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.705	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	0.6	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.4	deg	0.4	
	to the lesser of				
	first downflooding angle	18.4	deg	18.4	
	angle of vanishing stability	28.3	deg		
	shall be greater than (>)	10.0	deg	18.1	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.4	deg	0.4	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	18.4	deg	18.4	
	angle of vanishing stability	28.3	deg		
	shall be greater than (>)	0.8594	m.deg	4.8524	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Planned Review

2.9 LDC - COMPARTMENT 6 DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 6, Ballast Fwd Port

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	Damaged						
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			59.700	9.276	0.046	1.934	1.462
FS correction						0.024	
VCG fluid						1.959	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.684
Displacement t	59.70
Heel deg	0.2
Draft at FP m	0.614
Draft at AP m	0.753
Draft at LCF m	0.694
Trim (+ve by stern) m	0.139
WL Length m	24.428
Beam max extents on WL m	6.360
Wetted Area m ²	151.226
Waterpl. Area m ²	121.285
Prismatic coeff. (Cp)	0.687
Block coeff. (Cb)	0.498
Max Sect. area coeff. (Cm)	0.728
Waterpl. area coeff. (Cwp)	0.781
LCB from zero pt. (+ve fwd) m	9.266
LCF from zero pt. (+ve fwd) m	10.210
KB m	0.434
KG fluid m	1.959
BMT m	6.275
BML m	88.403
GMt corrected m	4.750
GML m	86.878
KMt m	6.709
KML m	88.835
Immersion (TPC) tonne/cm	1.243
MTc tonne.m	2.160
RM at 1deg = GMt.Disp.sin(1) tonne.m	4.949
Max deck inclination deg	0.4068
Trim angle (+ve by stern) deg	0.3321

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with the Standard/Rule as stated below

Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.651
Deck Edge (freeboard pos = -0.313 m)		0.727
DF point	Downflooding point	0.744

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	-0.020	0.391	0.240	-0.011	-0.283	-0.552	-0.807
Area under GZ curve from zero heel m.deg	0.0000	2.2160	5.6964	6.8280	5.3721	1.1818	-5.6242
Displacement t	59.70	59.70	59.70	59.70	59.70	59.69	59.70
Draft at FP m	0.615	0.552	0.489	0.416	0.331	0.223	0.071
Draft at AP m	0.753	0.890	1.184	1.549	2.005	2.622	3.562
WL Length m	24.426	24.449	24.046	24.340	24.765	25.008	25.179
Beam max extents on WL m	6.360	6.363	3.945	2.838	2.228	1.902	1.704
Wetted Area m ²	151.245	147.688	174.660	190.149	198.946	204.623	208.898
Waterpl. Area m ²	121.283	68.857	41.601	30.087	24.182	20.750	18.652
Prismatic coeff. (Cp)	0.687	0.544	0.448	0.411	0.389	0.376	0.367
Block coeff. (Cb)	0.498	0.310	0.332	0.337	0.334	0.330	0.324
LCB from zero pt. (+ve fwd) m	9.266	9.253	9.230	9.207	9.188	9.176	9.172
LCF from zero pt. (+ve fwd) m	10.211	10.801	11.074	11.209	11.310	11.365	11.414
Max deck inclination deg	0.3300	10.0311	20.0582	30.0827	40.0971	50.0987	60.0870
Trim angle (+ve by stern) deg	0.3300	0.8051	1.6585	2.7021	3.9881	5.7042	8.2715

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		9.2
Deck Edge (immersion pos = -0.313 m)		10.2
DF point	Downflooding point	20.5

DAMAGED PROFILE



This plan has been accepted as complying
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Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

GZ CURVE

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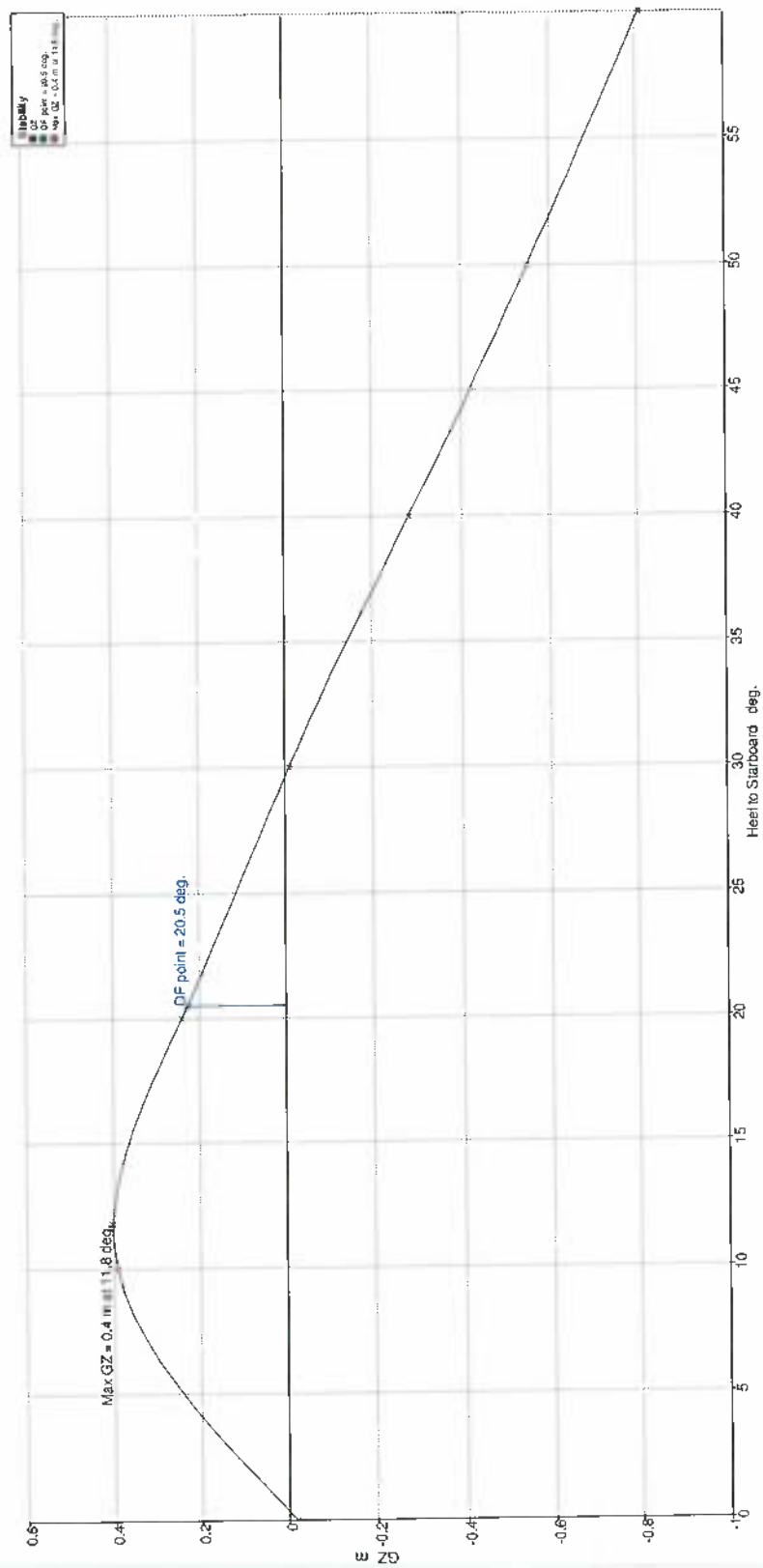
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Operational Areas

File No C of C No

Accreditation No Date

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.744	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	0.4	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.4	deg	0.4	
	to the lesser of				
	first downflooding angle	20.5	deg	20.5	
	angle of vanishing stability	29.5	deg		
	shall be greater than (>)	10.0	deg	20.1	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.4	deg	0.4	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	20.5	deg	20.5	
	angle of vanishing stability	29.5	deg		
	shall be greater than (>)	0.8594	m.deg	5.8170	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

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Operational Areas

File No C of C No

Accreditation No Date

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2.10 LDC - COMPARTMENT 7+MAIN DECK DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 7 + Main Deck

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			60.750	9.420	0.000	1.912	1.585
FS correction						0.026	
VCG fluid						1.938	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.678
Displacement t	60.75
Heel deg	0.0
Draft at FP m	0.629
Draft at AP m	0.727
Draft at LCF m	0.687
Trim (+ve by stern) m	0.098
WL Length m	24.453
Beam max extents on WL m	6.347
Wetted Area m ²	151.084
Waterpl. Area m ²	122.477
Prismatic coeff. (Cp)	0.731
Block coeff. (Cb)	0.525
Max Sect. area coeff. (Cm)	0.720
Waterpl. area coeff. (Cwp)	0.789
LCB from zero pt. (+ve fwd) m	9.413
LCF from zero pt. (+ve fwd) m	9.929
KB m	0.426
KG fluid m	1.938
BMT m	6.292
BML m	74.333
GMt corrected m	4.781
GML m	72.821
KMt m	6.718
KML m	74.758
Immersion (TPc) tonne/cm	1.255
MTc tonne.m	1.842
RM at 1deg = GMt Disp.sin(1) tonne.m	5.069
Max deck inclination deg	0.2345
Trim angle (+ve by stern) deg	0.2345

This plan has been accepted as complying
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Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.691
Deck Edge (freeboard pos = -0.313 m)		0.767
DF point	Downflooding point	0.773

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	0.000	0.439	0.293	0.041	-0.233	-0.506	-0.767
Area under GZ curve from zero heel m.deg	0.0000	2.5687	6.5695	8.2314	7.2932	3.5863	-2.7882
Displacement t	60.75	60.75	60.75	60.75	60.75	60.75	60.75
Draft at FP m	0.629	0.617	0.605	0.590	0.574	0.557	0.542
Draft at AP m	0.727	0.832	1.083	1.396	1.791	2.328	3.146
WL Length m	24.453	24.581	24.292	24.620	24.977	25.182	25.327
Beam max extents on WL m	6.347	6.183	4.037	2.759	2.193	1.869	1.673
Wetted Area m ²	151.084	147.589	175.217	191.508	200.345	206.145	210.448
Waterpl. Area m ²	122.477	70.237	42.152	30.307	24.442	20.964	18.846
Prismatic coeff. (Cp)	0.731	0.599	0.481	0.439	0.415	0.400	0.391
Block coeff. (Cb)	0.525	0.338	0.344	0.368	0.361	0.357	0.352
LCB from zero pt. (+ve fwd) m	9.413	9.405	9.388	9.370	9.355	9.344	9.340
LCF from zero pt. (+ve fwd) m	9.929	10.404	10.615	10.702	10.806	10.851	10.891
Max deck inclination deg	0.2345	10.0127	20.0275	30.0419	40.0514	50.0539	60.0485
Trim angle (+ve by stern) deg	0.2345	0.5136	1.1394	1.9226	2.9022	4.2172	6.1877

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		10
Deck Edge (immersion pos = -0.313 m)		10.9
DF point	Downflooding point	22.8

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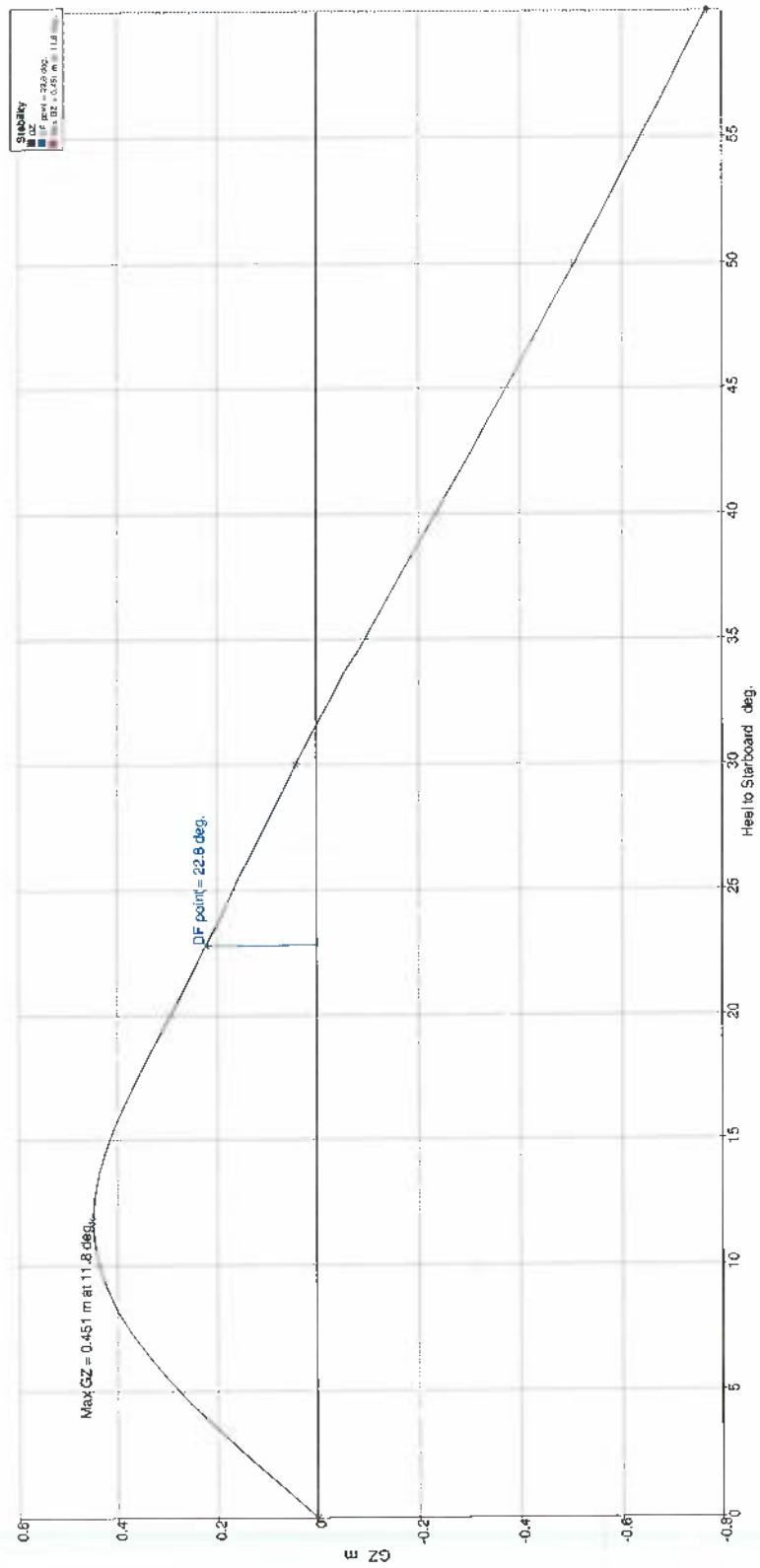
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File No C of C No

Accreditation No Date

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GZ CURVE



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Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.773	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	0.2	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.0	deg	0.0	
	to the lesser of				
	first downflooding angle	22.8	deg	22.8	
	angle of vanishing stability	31.6	deg		
	shall be greater than (>)	10.0	deg	22.8	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	22.8	deg	22.8	
	angle of vanishing stability	31.6	deg		
	shall be greater than (>)	0.8594	m.deg	7.2795	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

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Class

Operational Areas

File No C of C No

Accreditation No Date

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2.11 LDC - COMPARTMENT 8+MAIN DECK DAMAGED

LOADING TABLE

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Compartments Damaged – Compartment 8 + Main Deck

Fluid analysis method: Use corrected VCG

Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m
Lightship	1	29.920	29.920	9.240	0.000	1.892	0.000
Upper Deck Pax	80	0.080	6.400	4.590	0.000	4.600	0.000
Main Deck Pax	136	0.080	10.880	12.000	0.000	1.875	0.000
Stores	1	2.500	2.500	3.000	0.000	1.375	0.000
Sewage Port	10%	1.119	0.112	1.257	-2.514	0.339	0.179
Sewage Stbd	10%	1.119	0.112	1.257	2.514	0.339	0.179
Fuel Port	95%	0.651	0.618	5.676	-0.366	0.356	0.047
Fuel Stbd	95%	0.651	0.618	5.676	0.366	0.356	0.047
Fresh Water Port	95%	1.332	1.266	8.074	-2.617	0.587	0.147
Fresh Water Stbd	95%	1.332	1.266	8.074	2.617	0.587	0.147
Ballast Aft Port	95%	1.324	1.257	11.271	-2.619	0.590	0.149
Ballast Aft Stbd	95%	1.324	1.257	11.271	2.619	0.590	0.149
Ballast Mid Port	95%	1.286	1.221	14.460	-2.619	0.598	0.147
Ballast Mid Stbd	95%	1.286	1.221	14.460	2.619	0.598	0.147
Ballast Fwd Port	95%	1.106	1.051	17.584	-2.591	0.617	0.123
Ballast Fwd Stbd	95%	1.106	1.051	17.584	2.591	0.617	0.123
Total Loadcase			60.750	9.420	0.000	1.912	1.585
FS correction						0.026	
VCG fluid						1.938	

EQUILIBRIUM HYDROSTATICS

Draft Amidships m	0.632
Displacement t	60.75
Heel deg	0.0
Draft at FP m	0.482
Draft at AP m	0.783
Draft at LCF m	0.649
Trim (+ve by stern) m	0.300
WL Length m	24.121
Beam max extents on WL m	6.376
Wetted Area m ²	147.171
Waterpl. Area m ²	132.536
Prismatic coeff. (Cp)	0.673
Block coeff. (Cb)	0.492
Max Sect. area coeff. (Cm)	0.737
Waterpl. area coeff. (Cwp)	0.862
LCB from zero pt. (+ve fwd) m	9.402
LCF from zero pt. (+ve fwd) m	10.687
KB m	0.413
KG fluid m	1.938
BMT m	6.653
BML m	90.098
GMt corrected m	5.128
GML m	88.573
KMt m	7.065
KML m	90.504
Immersion (TPc) tonne/cm	1.358
MTc tonne.m	2.241
RM at 1deg = GMt.Disp.sin(1) tonne.m	5.437
Max deck inclination deg	0.7170
Trim angle (+ve by stern) deg	0.7170

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Operational Areas

File No C.O. No

Accreditation No Date

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DECK EDGE IMMERSION

Key point	Type	Freeboard m
Margin Line (freeboard pos = -0.313 m)		0.633
Deck Edge (freeboard pos = -0.313 m)		0.709
DF point	Downflooding point	0.717

GZ CURVE DATA

Heel to Starboard deg	0.0	10.0	20.0	30.0	40.0	50.0	60.0
GZ m	0.000	0.483	0.344	0.091	-0.188	-0.468	-0.737
Area under GZ curve from zero heel m.deg	0.0000	2.8084	7.3018	9.4689	9.0079	5.7173	-0.3142
Displacement t	60.75	60.75	60.75	60.75	60.75	60.75	60.75
Draft at FP m	0.482	0.379	0.216	0.027	-0.203	-0.510	-0.970
Draft at AP m	0.783	0.927	1.241	1.630	2.121	2.786	3.798
WL Length m	24.121	23.805	23.431	23.671	24.187	24.540	24.781
Beam max extents on WL m	6.376	6.366	4.125	2.943	2.352	1.998	1.769
Wetted Area m ²	147.171	140.363	162.311	177.405	186.065	191.924	196.297
Waterpl. Area m ²	132.536	79.080	47.338	34.362	27.445	23.340	20.783
Prismatic coeff. (Cp)	0.673	0.540	0.452	0.418	0.394	0.379	0.370
Block coeff. (Cb)	0.492	0.316	0.324	0.331	0.321	0.317	0.315
LCB from zero pt. (+ve fwd) m	9.402	9.383	9.353	9.321	9.295	9.276	9.269
LCF from zero pt. (+ve fwd) m	10.687	11.505	11.643	11.732	11.799	11.768	11.733
Max deck inclination deg	0.7170	10.0817	20.1261	30.1650	40.1866	50.1858	60.1617
Trim angle (+ve by stern) deg	0.7170	1.3074	2.4443	3.8188	5.5289	7.8165	11.2312

CRITICAL POINTS

Key point	Type	Immersion angle deg
Margin Line (immersion pos = -0.313 m)		8.7
Deck Edge (immersion pos = -0.313 m)		9.7
DF point	Downflooding point	19.3

DAMAGED PROFILE



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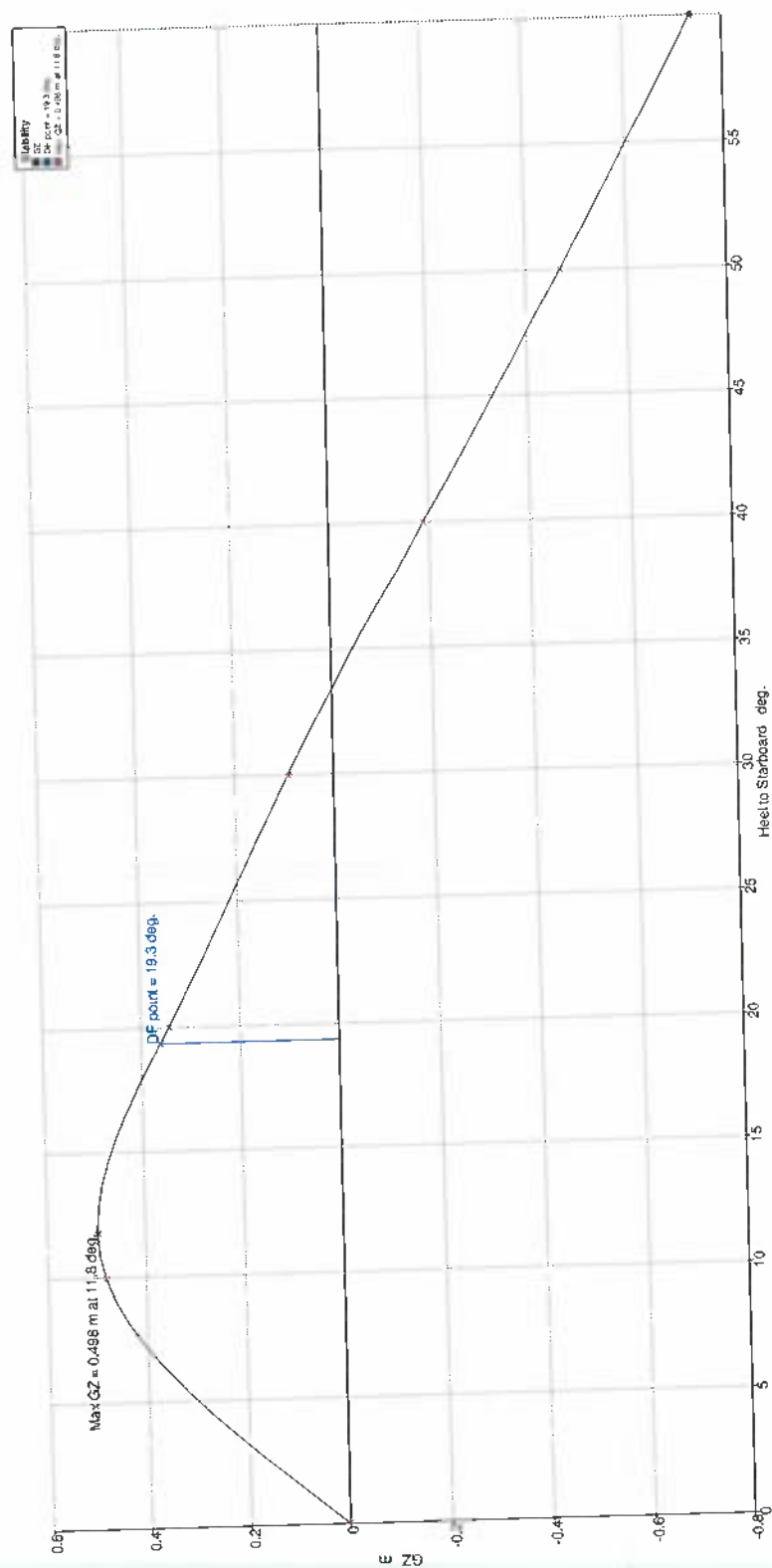
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File No C of C No

Accreditation No Date

Signature

GZ CURVE



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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

STABILITY CRITERIA

Code	Criteria	Value	Units	Actual	Status
8.4.2	FF.1: Freeboard to DF points				Pass
	the min. freeboard of the	Down flooding Points			
	shall be greater than (>)	0.225	m	0.717	Pass
8.4.3	EA.1a: Maximum angle of inclination				Pass
	the angle of	MaxSlope			
	shall not be greater than (<=)	12.0	deg	0.7	Pass
8.4.4	FCB.1: Range of positive stability				Pass
	from the greater of				
	spec. heel angle	0.0	deg		
	angle of equilibrium	0.0	deg	0.0	
	to the lesser of				
	first downflooding angle	19.3	deg	19.3	
	angle of vanishing stability	33.4	deg		
	shall be greater than (>)	10.0	deg	19.3	Pass
8.4.4	FCB.2b: Area under GZ curve				Pass
	from the greater of				
	angle of equilibrium	0.0	deg	0.0	
	to the lesser of				
	spec. heel angle	27.0	deg		
	first downflooding angle	19.3	deg	19.3	
	angle of vanishing stability	33.4	deg		
	shall be greater than (>)	0.8594	m.deg	7.0707	Pass

NOTE: THE VESSEL SATISFIES ALL CRITERIA IN THIS CONDITION.

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

Signature

3.0 HYDROSTATICS

Abbreviations used in hydrostatic table:

Draft:	Draft at the longitudinal centre of floatation
Displacement:	Displacement in tonnes in salt water
LCB:	Longitudinal centre of buoyancy relative to the origin
LCF:	Longitudinal centre of floatation relative to the origin
KB:	Vertical centre of buoyancy relative to baseline
KMt:	Initial transverse metacentric height above baseline
KML:	Initial longitudinal metacentric height above baseline
TPc:	Tonnes per centimetre immersion
MTc:	Moment to trim one centimetre

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Standard/Rule

Class

Operational Areas

File No C of C No

Accreditation No Date

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3.1 TABULAR HYDROSTATICS

Fixed Trim = 0 m (+ve by stern)

Specific gravity = 1.025; (Density = 1.025 tonne/m³)

Draft Amidships m	Displace- ment t	LCB from zero pt. (+ve fwd) m	VCB m	LCF from zero pt. (+ve fwd) m	BMI m	KMI m	KML m	Immersion (TPC) tonne/cm	MTc tonne.m
0.300	15.99	10.182	0.200	10.346	12.171	12.371	251.079	1.051	1.667
0.325	18.72	10.208	0.216	10.365	13.040	13.256	232.786	1.136	1.810
0.350	21.67	10.230	0.233	10.384	13.885	14.118	217.120	1.220	1.954
0.375	24.79	10.256	0.249	10.515	13.444	13.693	199.756	1.268	2.056
0.400	28.00	10.294	0.265	10.659	12.454	12.718	183.372	1.294	2.131
0.425	31.26	10.338	0.280	10.765	11.464	11.744	169.176	1.312	2.194
0.450	34.54	10.388	0.295	10.865	10.553	10.848	156.089	1.324	2.236
0.475	37.87	10.434	0.310	10.933	9.765	10.074	145.269	1.335	2.281
0.500	41.22	10.477	0.324	10.989	9.078	9.402	135.774	1.345	2.320
0.525	44.59	10.517	0.339	11.038	8.481	8.819	127.450	1.354	2.355
0.550	47.99	10.556	0.353	11.083	7.961	8.313	120.157	1.362	2.389
0.575	51.40	10.592	0.367	11.121	7.498	7.865	113.601	1.369	2.419
0.600	54.83	10.626	0.380	11.158	7.093	7.473	107.828	1.377	2.448
0.625	58.28	10.659	0.394	11.191	6.729	7.123	102.577	1.383	2.475
0.650	61.75	10.690	0.408	11.223	6.405	6.813	97.902	1.390	2.502
0.675	65.25	10.717	0.421	11.159	6.336	6.758	95.336	1.412	2.574
0.700	68.79	10.740	0.435	11.186	6.059	6.495	91.341	1.418	2.599
0.725	72.34	10.763	0.449	11.212	5.808	6.257	87.685	1.424	2.623
0.750	75.91	10.784	0.462	11.237	5.579	6.042	84.329	1.430	2.646
0.775	79.49	10.806	0.476	11.262	5.370	5.846	81.265	1.436	2.670
0.800	83.09	10.826	0.489	11.284	5.178	5.667	78.405	1.442	2.692
0.825	86.70	10.846	0.503	11.307	5.001	5.504	75.779	1.447	2.714
0.850	90.32	10.866	0.516	11.424	4.666	5.182	71.981	1.437	2.684
0.875	93.92	10.888	0.529	11.445	4.522	5.051	69.762	1.443	2.704
0.900	97.53	10.909	0.543	11.465	4.388	4.931	67.694	1.448	2.724

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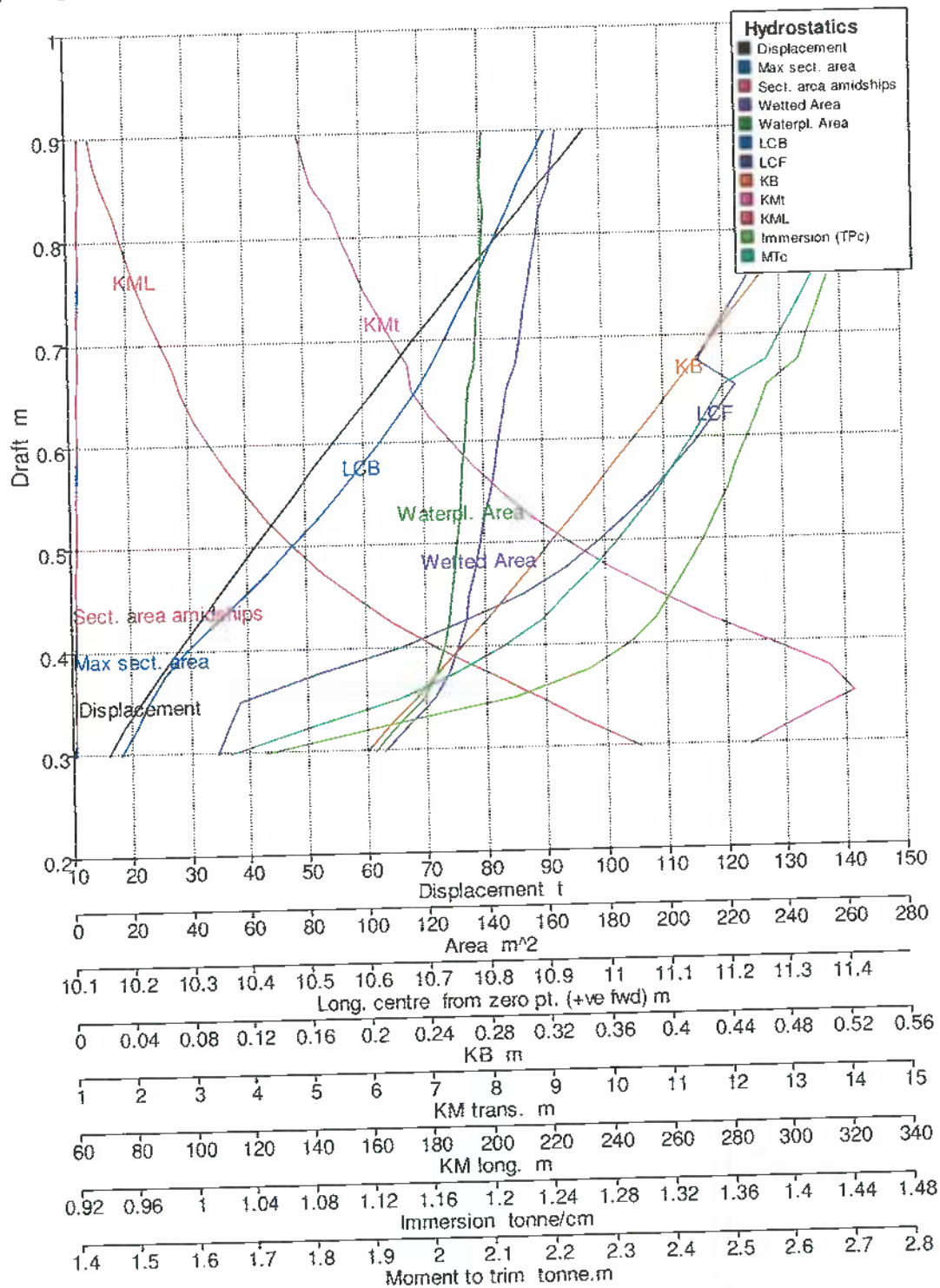
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3.2 GRAPHICAL HYDROSTATICS

Fixed Trim = 0 m (+ve by stern)
Specific gravity = 1.025; (Density = 1.025 tonne/m³)



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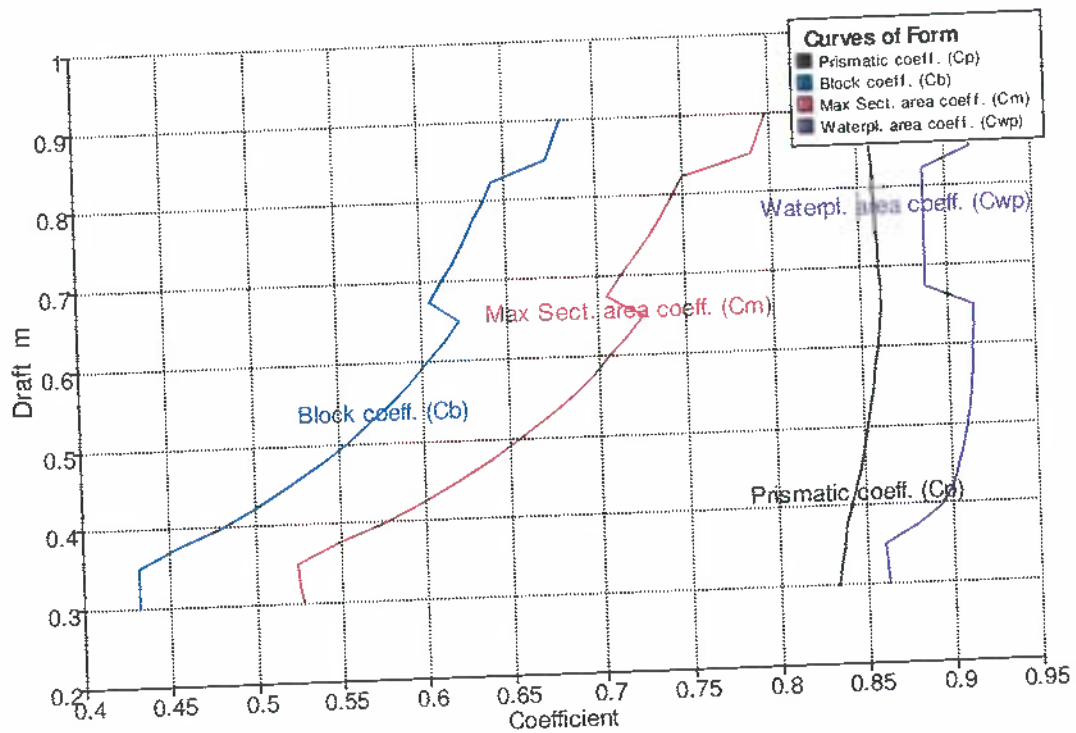
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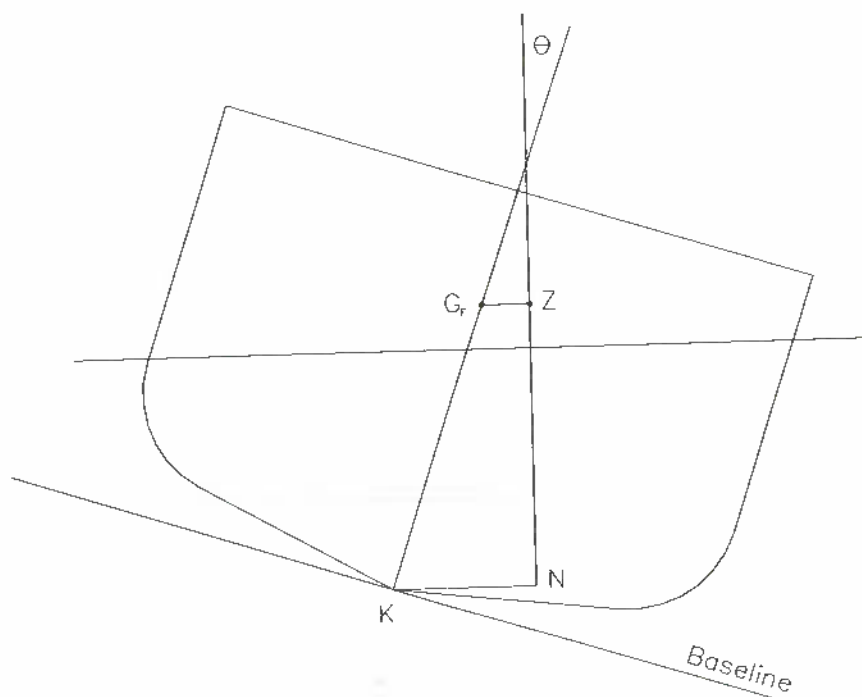
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4.0 STATICAL STABILITY

Righting Levers KN in metres

$$G_Z = KN - KG_r \sin \theta$$



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Class

Operational Areas

File No C of C No

Accreditation No Date

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4.1 TABULAR CROSS CURVES

Initial Trim = 0 m (+ve by stern)
 Specific gravity = 1.025; (Density = 1.025 tonne/m³)
 VCG = 0 m; TCG = 0 m

Displacement tonne	Draft Amidships m	LCG m	KN 0.0 deg.	KN 10.0 deg. Starb.	KN 20.0 deg. Starb.	KN 30.0 deg. Starb.	KN 40.0 deg. Starb.	KN 50.0 deg. Starb.
15.00	0.290	10.171	0.000	1.564	2.227	2.419	2.460	2.356
20.00	0.336	10.218	0.000	1.487	2.126	2.374	2.436	2.319
25.00	0.377	10.258	0.000	1.425	2.037	2.341	2.392	2.272
30.00	0.415	10.321	0.000	1.369	1.967	2.299	2.340	2.221
35.00	0.453	10.395	0.000	1.317	1.910	2.248	2.283	2.168
40.00	0.491	10.461	0.000	1.270	1.864	2.192	2.224	2.114
45.00	0.528	10.522	0.000	1.227	1.828	2.132	2.164	2.059
50.00	0.565	10.577	0.000	1.186	1.796	2.070	2.103	2.005
55.00	0.601	10.628	0.000	1.147	1.762	2.010	2.041	1.950
60.00	0.637	10.674	0.000	1.109	1.725	1.951	1.980	1.896
65.00	0.673	10.715	0.000	1.074	1.685	1.893	1.919	1.843
70.00	0.709	10.748	0.000	1.040	1.643	1.835	1.860	1.790
75.00	0.744	10.779	0.000	1.007	1.599	1.778	1.802	1.737
80.00	0.779	10.809	0.000	0.976	1.553	1.722	1.746	1.686
85.00	0.813	10.836	0.000	0.945	1.505	1.665	1.691	1.636
90.00	0.848	10.864	0.000	0.917	1.457	1.610	1.637	1.588
95.00	0.883	10.894	0.000	0.891	1.407	1.554	1.583	1.541
100.0	0.917	10.923	0.000	0.866	1.356	1.498	1.530	1.494

Displacement tonne	Draft Amidships m	LCG m	KN 60.0 deg. Starb.	KN 70.0 deg. Starb.	KN 80.0 deg. Starb.	KN 90.0 deg. Starb.
15.00	0.290	10.171	2.128	1.812	1.429	0.999
20.00	0.336	10.218	2.090	1.777	1.402	0.979
25.00	0.377	10.258	2.047	1.743	1.377	0.967
30.00	0.415	10.321	2.002	1.708	1.354	0.956
35.00	0.453	10.395	1.957	1.673	1.332	0.948
40.00	0.491	10.461	1.912	1.639	1.311	0.940
45.00	0.528	10.522	1.867	1.606	1.290	0.933
50.00	0.565	10.577	1.822	1.572	1.270	0.926
55.00	0.601	10.628	1.777	1.539	1.250	0.920
60.00	0.637	10.674	1.733	1.507	1.230	0.914
65.00	0.673	10.715	1.689	1.475	1.211	0.908
70.00	0.709	10.748	1.646	1.443	1.192	0.903
75.00	0.744	10.779	1.603	1.412	1.173	0.897
80.00	0.779	10.809	1.561	1.381	1.155	0.892
85.00	0.813	10.836	1.520	1.351	1.137	0.887
90.00	0.848	10.864	1.480	1.321	1.119	0.882
95.00	0.883	10.894	1.441	1.292	1.102	0.877
100.0	0.917	10.923	1.403	1.264	1.085	0.873

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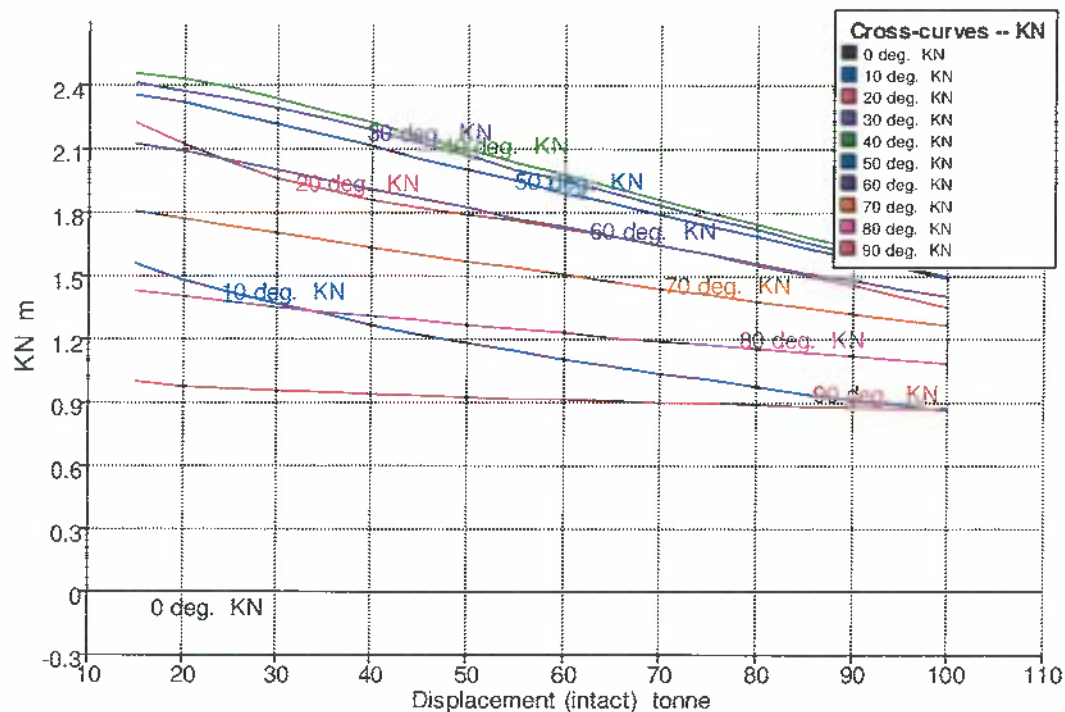
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4.2 GRAPHICAL CROSS CURVES

Initial Trim = 0 m (+ve by stern)
 Specific gravity = 1.025; (Density = 1.025 tonne/m³)
 VCG = 0 m; TCG = 0 m



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Operational Areas

File No C of C No

Accreditation No Date

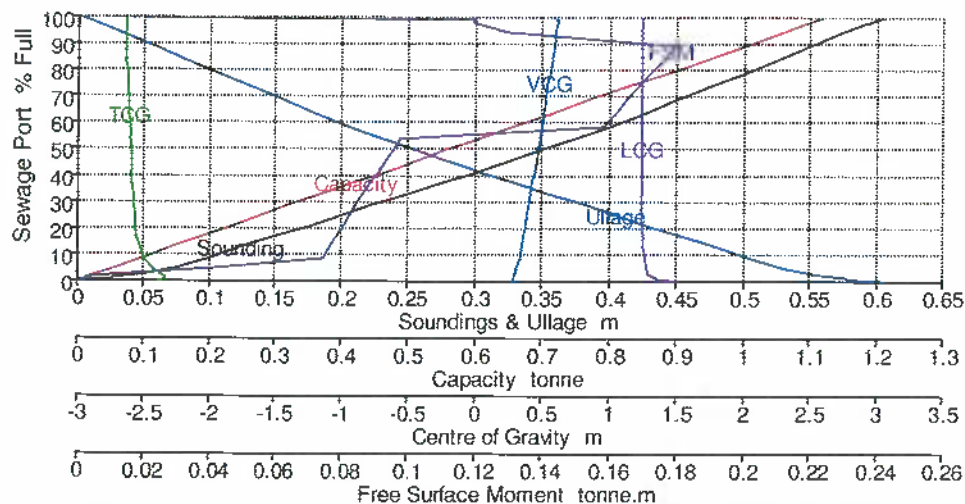
Signature

5.0 TANK CAPACITIES

5.1 SEWAGE PORT (STBD SIMILAR)

Fluid Type = Sea Water Specific gravity = 1.025
 Permeability = 98 %
 Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m ³	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Sewage Port	0.605	0.000	100.000	1.092	1.119	1.236	-2.648	0.609	0.000
	0.600	0.005	99.082	1.082	1.109	1.236	-2.648	0.607	0.120
	0.594	0.011	98.000	1.070	1.097	1.236	-2.647	0.604	0.119
	0.594	0.011	97.900	1.069	1.096	1.236	-2.647	0.604	0.119
	0.575	0.030	94.500	1.032	1.058	1.236	-2.647	0.595	0.130
	0.550	0.055	89.385	0.976	1.000	1.236	-2.643	0.581	0.179
	0.525	0.080	84.151	0.919	0.942	1.236	-2.638	0.567	0.176
	0.500	0.105	78.954	0.862	0.884	1.237	-2.633	0.553	0.172
	0.475	0.130	73.793	0.806	0.826	1.237	-2.627	0.539	0.169
	0.450	0.155	68.668	0.750	0.768	1.237	-2.621	0.524	0.165
	0.425	0.180	63.580	0.694	0.712	1.237	-2.614	0.509	0.161
	0.400	0.205	58.528	0.639	0.655	1.237	-2.606	0.494	0.158
	0.375	0.230	53.998	0.590	0.604	1.237	-2.601	0.481	0.098
	0.350	0.255	49.729	0.543	0.557	1.238	-2.598	0.468	0.095
	0.325	0.280	45.493	0.497	0.509	1.238	-2.595	0.455	0.093
	0.300	0.305	41.290	0.451	0.462	1.239	-2.591	0.442	0.091
	0.275	0.330	37.121	0.405	0.415	1.239	-2.587	0.429	0.089
	0.250	0.355	32.986	0.360	0.369	1.240	-2.583	0.416	0.087
	0.225	0.380	28.883	0.315	0.323	1.241	-2.578	0.403	0.085
	0.200	0.405	24.814	0.271	0.278	1.242	-2.571	0.390	0.082
	0.175	0.430	20.779	0.227	0.233	1.244	-2.563	0.376	0.080
	0.150	0.455	16.777	0.183	0.188	1.247	-2.551	0.363	0.078
	0.125	0.480	12.808	0.140	0.143	1.251	-2.534	0.349	0.076
	0.100	0.505	8.872	0.097	0.099	1.260	-2.502	0.334	0.075
	0.075	0.530	5.179	0.057	0.058	1.272	-2.444	0.318	0.042
	0.050	0.555	2.473	0.027	0.028	1.294	-2.385	0.301	0.013
	0.028	0.577	1.000	0.011	0.011	1.342	-2.351	0.286	0.002
	0.025	0.580	0.836	0.009	0.009	1.356	-2.350	0.284	0.002
	0.000	0.605	0.000	0.000	0.000	1.520	-2.399	0.270	0.000



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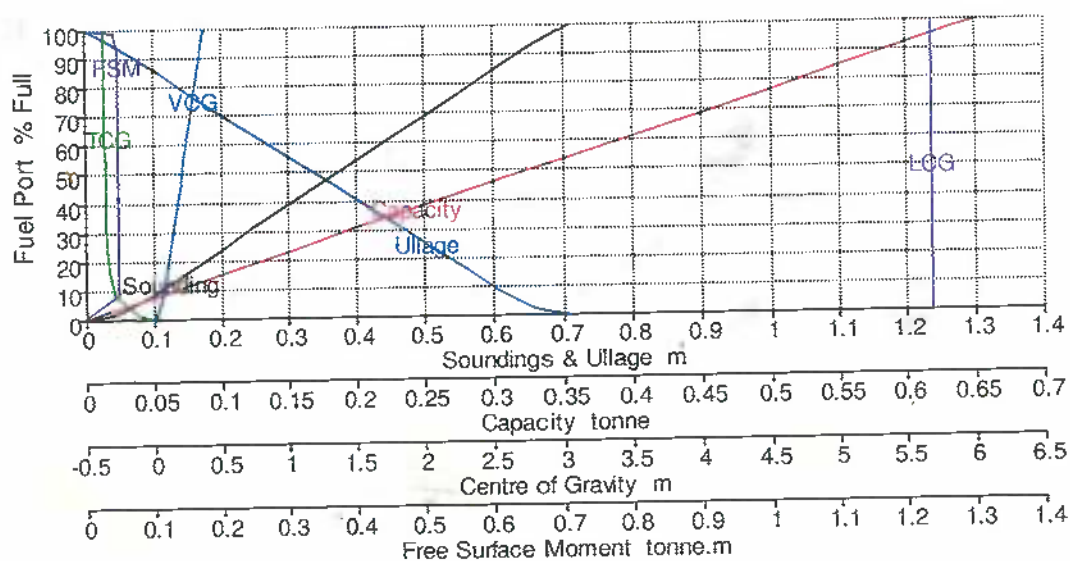
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5.2 FUEL PORT (STBD SIMILAR)

Fluid Type = Diesel Specific gravity = 0.84
 Permeability = 98 %
 Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m ³	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Fuel Port	0.710	0.000	100.000	0.775	0.651	5.678	-0.367	0.373	0.000
	0.700	0.010	98.660	0.764	0.642	5.678	-0.367	0.368	0.042
	0.695	0.015	98.000	0.759	0.638	5.677	-0.367	0.366	0.042
	0.694	0.016	97.900	0.758	0.637	5.677	-0.367	0.366	0.042
	0.650	0.060	91.758	0.711	0.597	5.675	-0.366	0.345	0.047
	0.600	0.110	84.214	0.652	0.548	5.675	-0.365	0.320	0.047
	0.550	0.160	76.669	0.594	0.499	5.675	-0.364	0.295	0.047
	0.500	0.210	69.125	0.535	0.450	5.675	-0.363	0.270	0.047
	0.450	0.260	61.581	0.477	0.401	5.675	-0.362	0.245	0.047
	0.400	0.310	54.037	0.419	0.352	5.675	-0.360	0.220	0.047
	0.350	0.360	46.493	0.360	0.302	5.675	-0.358	0.195	0.047
	0.300	0.410	38.949	0.302	0.253	5.675	-0.354	0.170	0.047
	0.250	0.460	31.404	0.243	0.204	5.675	-0.349	0.144	0.047
	0.200	0.510	23.860	0.185	0.155	5.675	-0.341	0.119	0.047
	0.150	0.560	16.316	0.126	0.106	5.675	-0.325	0.093	0.047
	0.100	0.610	8.772	0.068	0.057	5.675	-0.283	0.066	0.047
	0.050	0.660	2.292	0.018	0.015	5.675	-0.149	0.033	0.010
	0.033	0.677	1.000	0.008	0.007	5.675	-0.099	0.022	0.003
	0.000	0.710	0.000	0.000	0.000	5.677	-0.004	0.000	0.000



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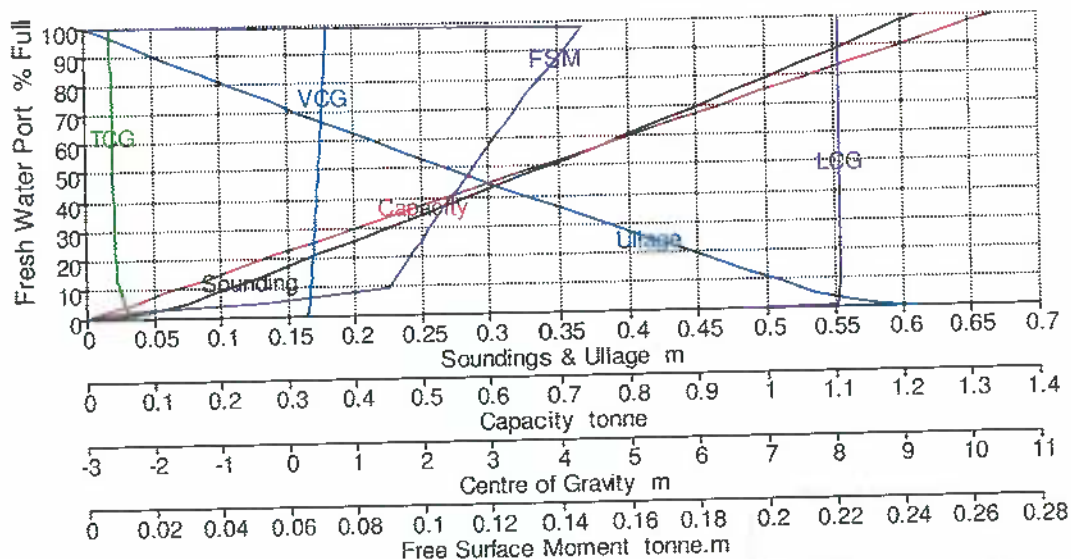
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5.3 FRESH WATER PORT (STBD SIMILAR)

Fluid Type = Fresh Water Specific gravity = 1
 Permeability = 98 %
 Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m ³	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Fresh Water Port	0.610	0.000	100.000	1.332	1.332	8.074	-2.620	0.600	0.000
	0.600	0.010	98.014	1.306	1.306	8.074	-2.619	0.595	0.147
	0.600	0.010	98.000	1.306	1.306	8.074	-2.619	0.595	0.147
	0.599	0.011	97.900	1.304	1.304	8.074	-2.619	0.595	0.147
	0.575	0.035	93.218	1.242	1.242	8.074	-2.617	0.582	0.144
	0.550	0.060	88.459	1.179	1.179	8.074	-2.615	0.568	0.140
	0.525	0.085	83.736	1.116	1.116	8.074	-2.612	0.555	0.137
	0.500	0.110	79.050	1.053	1.053	8.074	-2.610	0.542	0.134
	0.475	0.135	74.400	0.991	0.991	8.074	-2.608	0.529	0.131
	0.450	0.160	69.786	0.930	0.930	8.074	-2.606	0.516	0.128
	0.425	0.185	65.209	0.869	0.869	8.074	-2.603	0.503	0.125
	0.400	0.210	60.668	0.808	0.808	8.074	-2.601	0.490	0.122
	0.375	0.235	56.163	0.748	0.748	8.073	-2.598	0.477	0.119
	0.350	0.260	51.694	0.689	0.689	8.073	-2.595	0.464	0.116
	0.325	0.285	47.262	0.630	0.630	8.073	-2.592	0.451	0.113
	0.300	0.310	42.867	0.571	0.571	8.073	-2.589	0.438	0.111
	0.275	0.335	38.508	0.513	0.513	8.072	-2.585	0.425	0.108
	0.250	0.360	34.185	0.455	0.455	8.072	-2.581	0.412	0.105
	0.225	0.385	29.898	0.398	0.398	8.071	-2.576	0.399	0.102
	0.200	0.410	25.648	0.342	0.342	8.070	-2.570	0.386	0.100
	0.175	0.435	21.434	0.286	0.286	8.069	-2.562	0.372	0.097
	0.150	0.460	17.256	0.230	0.230	8.067	-2.551	0.359	0.095
	0.125	0.485	13.115	0.175	0.175	8.065	-2.535	0.346	0.092
	0.100	0.510	9.010	0.120	0.120	8.059	-2.505	0.331	0.090
	0.075	0.535	5.112	0.068	0.068	8.052	-2.446	0.315	0.054
	0.050	0.560	2.248	0.030	0.030	8.041	-2.380	0.298	0.016
	0.034	0.577	1.000	0.013	0.013	8.024	-2.337	0.287	0.005
	0.025	0.585	0.540	0.007	0.007	8.007	-2.314	0.282	0.002
	0.000	0.610	0.000	0.000	0.000	6.627	-2.250	0.265	0.000



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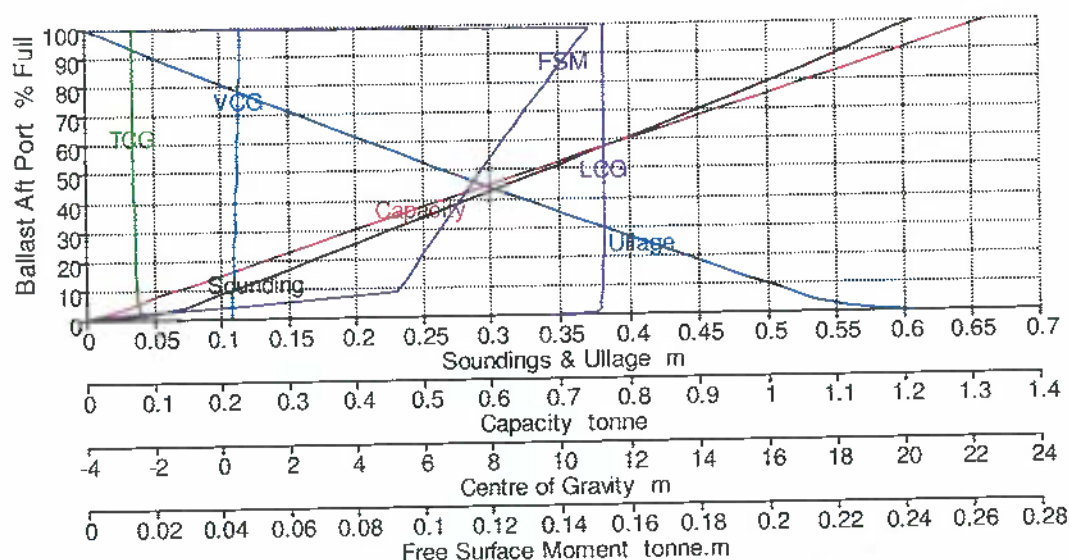
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5.4 BALLAST AFT PORT (STBD SIMILAR)

Fluid Type = Fresh Water Specific gravity = 1
 Permeability = 98 %
 Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m ³	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Ballast Aft Port	0.607	0.000	100.000	1.324	1.324	11.272	-2.622	0.604	0.000
	0.600	0.007	98.595	1.305	1.305	11.272	-2.621	0.600	0.149
	0.597	0.010	98.000	1.297	1.297	11.272	-2.621	0.598	0.148
	0.596	0.011	97.900	1.296	1.296	11.272	-2.621	0.598	0.148
	0.575	0.032	93.746	1.241	1.241	11.271	-2.619	0.587	0.146
	0.550	0.057	88.934	1.177	1.177	11.271	-2.617	0.573	0.142
	0.525	0.082	84.157	1.114	1.114	11.271	-2.615	0.560	0.139
	0.500	0.107	79.416	1.051	1.051	11.270	-2.613	0.547	0.136
	0.475	0.132	74.711	0.989	0.989	11.270	-2.610	0.534	0.133
	0.450	0.157	70.042	0.927	0.927	11.270	-2.608	0.521	0.130
	0.425	0.182	65.408	0.866	0.866	11.269	-2.605	0.508	0.127
	0.400	0.207	60.810	0.805	0.805	11.269	-2.603	0.495	0.124
	0.375	0.232	56.247	0.744	0.744	11.268	-2.600	0.482	0.121
	0.350	0.257	51.721	0.685	0.685	11.267	-2.597	0.469	0.118
	0.325	0.282	47.230	0.625	0.625	11.266	-2.594	0.456	0.116
	0.300	0.307	42.774	0.566	0.566	11.265	-2.591	0.443	0.113
	0.275	0.332	38.355	0.508	0.508	11.264	-2.587	0.430	0.110
	0.250	0.357	33.971	0.450	0.450	11.262	-2.582	0.417	0.107
	0.225	0.382	29.623	0.392	0.392	11.260	-2.577	0.404	0.105
	0.200	0.407	25.311	0.335	0.335	11.257	-2.571	0.391	0.102
	0.175	0.432	21.034	0.278	0.278	11.253	-2.562	0.377	0.100
	0.150	0.457	16.793	0.222	0.222	11.247	-2.550	0.364	0.097
	0.125	0.482	12.588	0.167	0.167	11.237	-2.532	0.350	0.095
	0.100	0.507	8.419	0.111	0.111	11.217	-2.497	0.336	0.092
	0.075	0.532	4.640	0.061	0.061	11.195	-2.435	0.319	0.045
	0.050	0.557	1.954	0.026	0.026	11.157	-2.371	0.302	0.013
	0.037	0.570	1.000	0.013	0.013	11.114	-2.337	0.294	0.005
	0.025	0.582	0.411	0.005	0.005	11.031	-2.307	0.286	0.001
	0.000	0.607	0.000	0.000	0.000	9.698	-2.250	0.268	0.000



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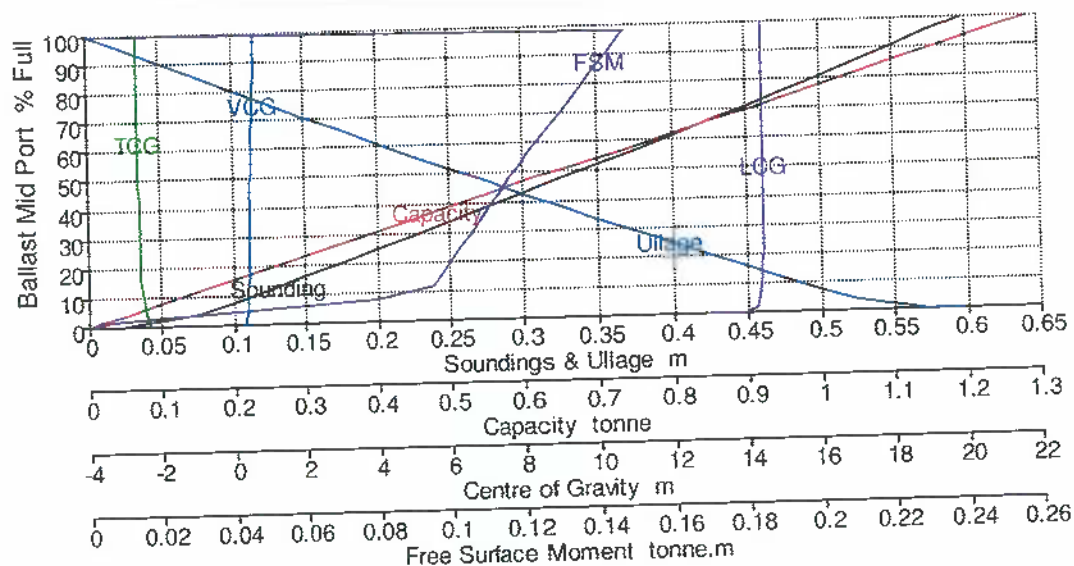
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5.5 BALLAST MID PORT (STBD SIMILAR)

Fluid Type = Fresh Water Specific gravity = 1
 Permeability = 98 %
 Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m ³	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Ballast Mid Port	0.598	0.000	100.000	1.286	1.286	14.461	-2.621	0.611	0.000
	0.588	0.010	98.000	1.260	1.260	14.461	-2.620	0.606	0.147
	0.587	0.010	97.900	1.259	1.259	14.461	-2.620	0.606	0.147
	0.575	0.023	95.477	1.227	1.227	14.460	-2.619	0.599	0.146
	0.550	0.048	90.519	1.164	1.164	14.460	-2.617	0.586	0.143
	0.525	0.073	85.597	1.100	1.100	14.459	-2.615	0.573	0.140
	0.500	0.098	80.711	1.038	1.038	14.458	-2.613	0.560	0.136
	0.475	0.123	75.861	0.975	0.975	14.458	-2.610	0.547	0.133
	0.450	0.148	71.048	0.913	0.913	14.457	-2.608	0.534	0.130
	0.425	0.173	66.271	0.852	0.852	14.456	-2.605	0.521	0.128
	0.400	0.198	61.531	0.791	0.791	14.454	-2.603	0.507	0.125
	0.375	0.223	56.826	0.731	0.731	14.453	-2.600	0.494	0.122
	0.350	0.248	52.158	0.671	0.671	14.451	-2.597	0.481	0.119
	0.325	0.273	47.527	0.611	0.611	14.449	-2.594	0.468	0.116
	0.300	0.298	42.931	0.552	0.552	14.447	-2.590	0.455	0.113
	0.275	0.323	38.372	0.493	0.493	14.444	-2.586	0.442	0.111
	0.250	0.348	33.849	0.435	0.435	14.441	-2.581	0.429	0.108
	0.225	0.373	29.363	0.377	0.377	14.436	-2.575	0.416	0.106
	0.200	0.398	24.913	0.320	0.320	14.430	-2.568	0.403	0.103
	0.175	0.423	20.499	0.264	0.264	14.422	-2.558	0.390	0.101
	0.150	0.448	16.121	0.207	0.207	14.408	-2.544	0.376	0.098
	0.125	0.473	11.780	0.151	0.151	14.385	-2.521	0.362	0.096
	0.100	0.498	7.539	0.097	0.097	14.347	-2.477	0.346	0.080
	0.075	0.523	4.014	0.052	0.052	14.306	-2.417	0.330	0.033
	0.050	0.548	1.589	0.020	0.020	14.220	-2.357	0.313	0.009
	0.041	0.556	1.000	0.013	0.013	14.161	-2.336	0.307	0.005
	0.025	0.573	0.278	0.004	0.004	13.927	-2.300	0.296	0.001
	0.000	0.598	0.000	0.000	0.000	12.898	-2.250	0.277	0.000



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Operational Areas

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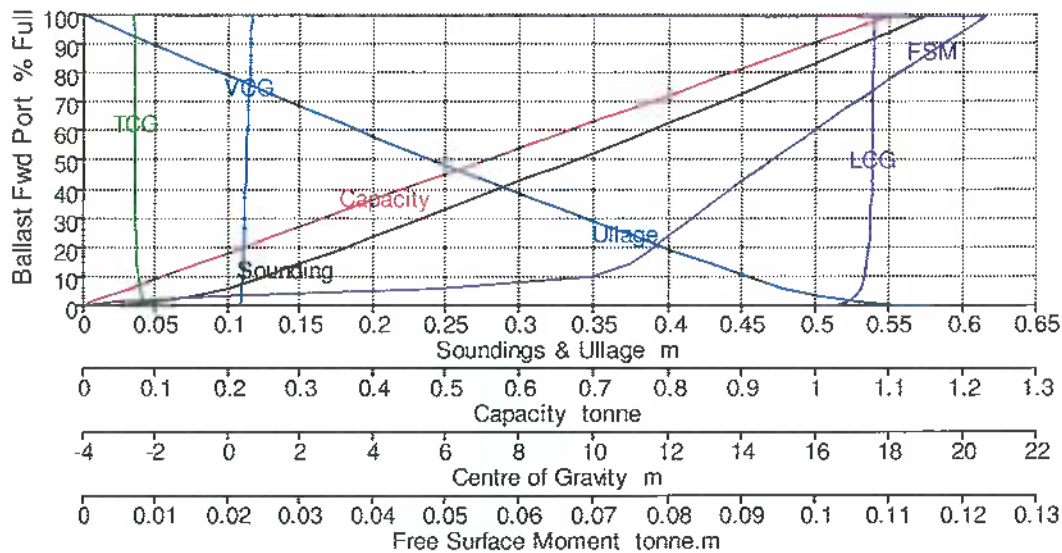
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5.6 BALLAST FWD PORT (STBD SIMILAR)

Fluid Type = Fresh Water Specific gravity = 1
 Permeability = 98 %
 Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m ³	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Ballast Fwd Port	0.578	0.000	100.000	1.106	1.106	17.586	-2.593	0.629	0.000
	0.575	0.003	99.307	1.098	1.098	17.586	-2.593	0.627	0.123
	0.569	0.009	98.000	1.084	1.084	17.585	-2.592	0.624	0.122
	0.569	0.010	97.900	1.083	1.083	17.585	-2.592	0.624	0.122
	0.550	0.028	93.894	1.038	1.038	17.583	-2.590	0.614	0.120
	0.525	0.053	88.533	0.979	0.979	17.580	-2.588	0.601	0.117
	0.500	0.078	83.224	0.920	0.920	17.578	-2.586	0.587	0.113
	0.475	0.103	77.965	0.862	0.862	17.575	-2.583	0.574	0.110
	0.450	0.128	72.759	0.805	0.805	17.571	-2.580	0.561	0.107
	0.425	0.153	67.603	0.748	0.748	17.568	-2.578	0.548	0.104
	0.400	0.178	62.500	0.691	0.691	17.563	-2.575	0.534	0.101
	0.375	0.203	57.447	0.635	0.635	17.559	-2.572	0.521	0.098
	0.350	0.228	52.446	0.580	0.580	17.554	-2.569	0.508	0.096
	0.325	0.253	47.497	0.525	0.525	17.548	-2.565	0.495	0.093
	0.300	0.278	42.599	0.471	0.471	17.540	-2.561	0.482	0.090
	0.275	0.303	37.752	0.418	0.418	17.532	-2.557	0.469	0.087
	0.250	0.328	32.957	0.364	0.364	17.521	-2.552	0.455	0.085
	0.225	0.353	28.213	0.312	0.312	17.507	-2.546	0.442	0.082
	0.200	0.378	23.521	0.260	0.260	17.488	-2.538	0.429	0.080
	0.175	0.403	18.880	0.209	0.209	17.461	-2.528	0.415	0.077
	0.150	0.428	14.291	0.158	0.158	17.418	-2.512	0.401	0.075
	0.125	0.453	9.820	0.109	0.109	17.346	-2.484	0.385	0.070
	0.100	0.478	5.822	0.064	0.064	17.255	-2.441	0.369	0.048
	0.075	0.503	2.831	0.031	0.031	17.123	-2.391	0.351	0.019
	0.050	0.528	1.000	0.011	0.011	16.924	-2.344	0.334	0.005
	0.050	0.528	0.984	0.011	0.011	16.921	-2.343	0.333	0.004
	0.025	0.553	0.150	0.002	0.002	16.618	-2.296	0.315	0.000
	0.000	0.578	0.000	0.000	0.000	16.098	-2.250	0.297	0.000



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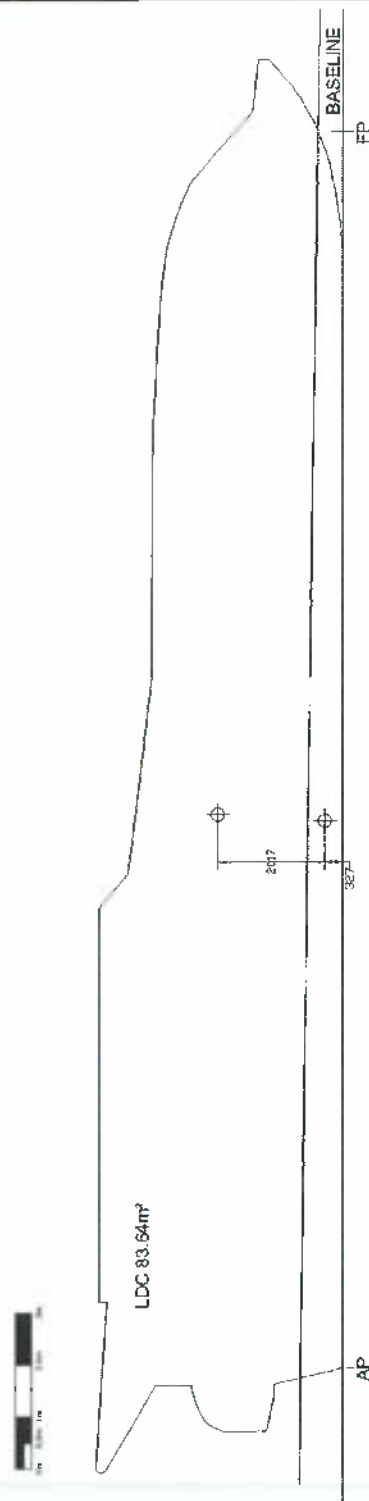
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6.0 VESSEL INFORMATION

6.1 WINDAGE PROFILE LDC



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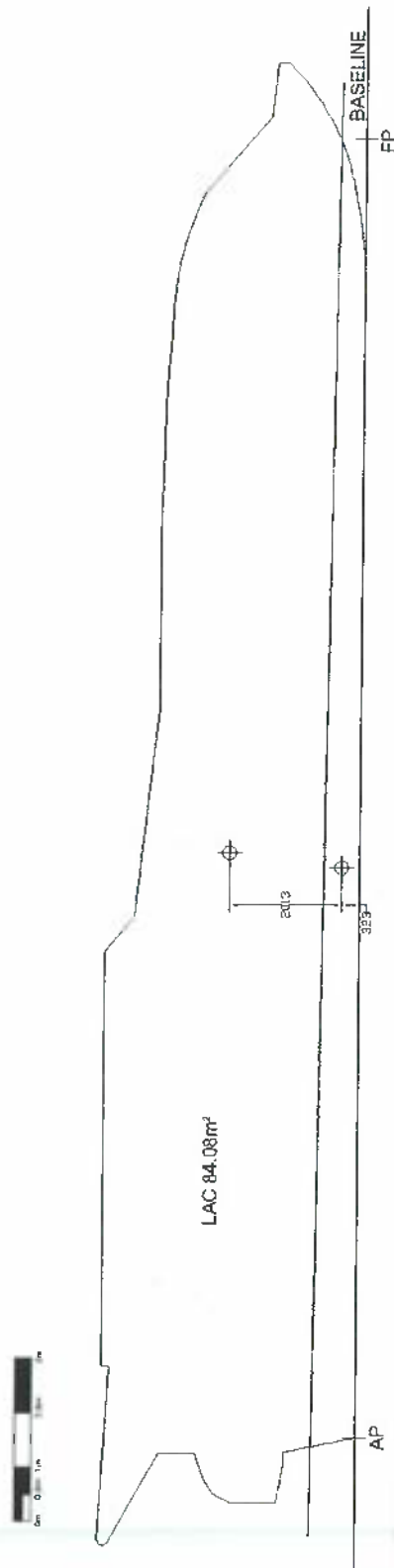
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6.2 WINDAGE PROFILE LAC



This plan has been accepted as complying
with the Standard/Rule as stated below

Standard/Rule

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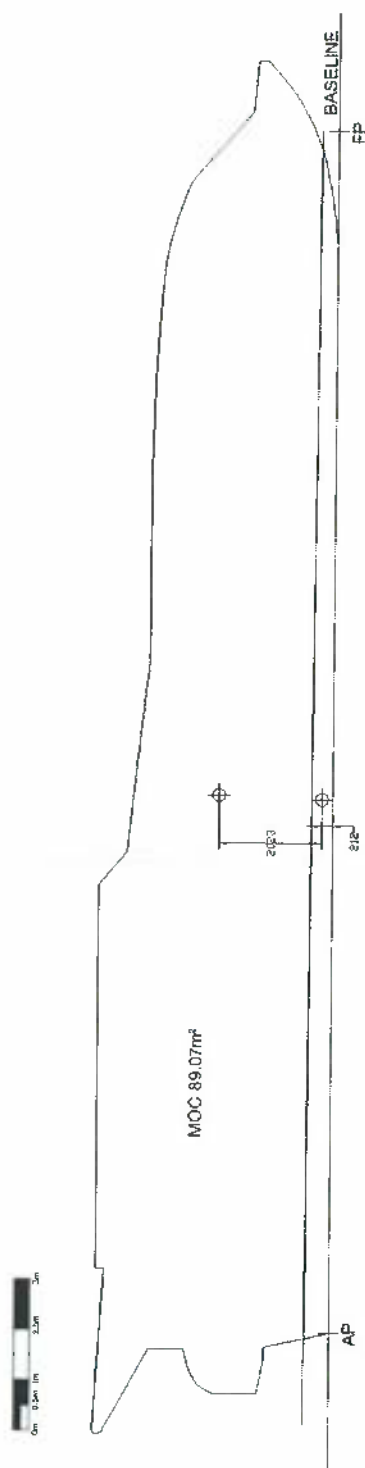
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6.3 WINDAGE PROFILE MOC



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6.4 TANKAGE PLAN



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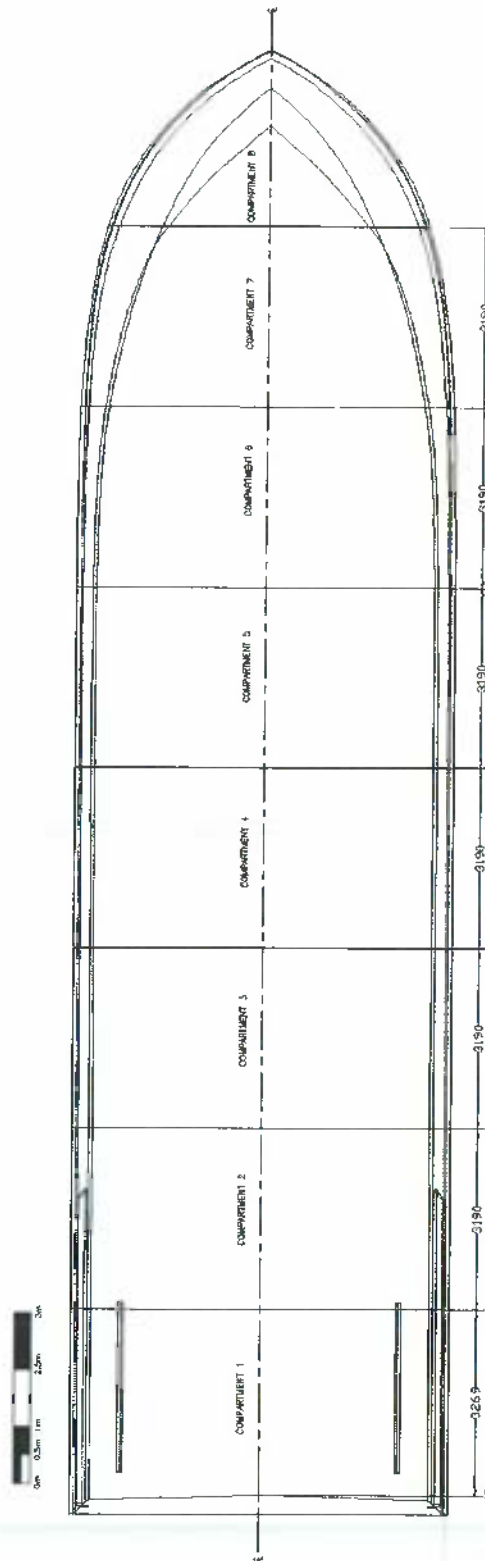
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6.5 COMPARTMENT PLAN



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with the Standard/Rule as stated below

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7.0 HEELING LEVER CALCULATIONS

7.1 PERSON CROWDING

$$\begin{aligned}
 M_p &= \text{No. persons} \times \text{person wt} \times \text{lever} \\
 &= (80 \times 0.08 \times 1.50) + (136 \times 0.08 \times 1.93) \\
 &= 30.60 \text{ t-m} \\
 \\
 HZ_p \text{ (LDC)} &= 30.6/60.75 \\
 &= 0.504 \text{ m} \\
 \\
 HZ_p \text{ (LAC)} &= 30.6/59.28 \\
 &= 0.516 \text{ m} \\
 \\
 M_p &= \text{No. persons} \times \text{person wt} \times \text{lever} \\
 &= 2 \times 0.08 \times 2.875 \\
 &= 0.46 \text{ t-m} \\
 \\
 HZ_p \text{ (MOC)} &= 0.46/30.7 \\
 &= 0.015 \text{ m}
 \end{aligned}$$

7.2 WINDAGE

Lever below is between the centre of area above and below the waterline.

Loadcase	Displacement (t)	Pressure (Pa)	Area (m ²)	Lever (m)	M _w (t.m)	HZ _w (m)
LDC	60.75	300	83.64	2.017	5.159	0.085
LAC	59.28	300	84.08	2.013	5.176	0.087
MOC	30.7	300	89.07	2.023	5.510	0.179

7.3 TURNING

Lever below is between the VCG and the centre of area below the waterline.

Loadcase	Displacement (t)	Speed (kts)	Lever (m)	LWL (m)	M _t (t.m)	HZ _t (m)
LDC	60.75	10	1.528	24.096	2.042	0.034
LAC	59.28	10	1.656	24.031	2.165	0.037
MOC	30.7	10	1.647	23.615	1.135	0.03696

For the purposes of these calculations, an overestimated speed of 10 knots has been used.

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File No C of C No

Accreditation No Date

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8.0 INCLINING EXPERIMENT REPORT

8.1 INTRODUCTION

DATE: 23rd July 2012

PLACE: Sanctuary Cove Marina

WEATHER: Fine and calm <10kts breeze

EXPERIMENT CONDUCTED BY: N.Bentley
Oceanic Yacht Design

ATTENDING SURVEYOR: C.Hutchings
Oceanic Yacht Design

REPORTED BY: N.Bentley

TOTAL PERSONS ON BOARD: 2 during incline

MOORING ARRANGEMENT: Slack Lines
Floating Freely

TANK CONDITIONS:

Fuel Port	100	%
Fuel Stbd	100	%
Fresh Water Aft	95	%
Fresh Water Fwd	95	%
Ballast Aft Port	100	%
Ballast Aft Stbd	100	%
Ballast Mid Port	100	%
Ballast Mid Stbd	100	%
Ballast Fwd Port	100	%
Ballast Fwd Stbd	100	%
Sewage Port	0	%
Sewage Stbd	0	%

BILGES: Dry

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8.2 LIGHTSHIP, LCG & VCG DERIVATION

Draft and freeboard measurements

measurements taken with weights, gear and persons onboard.

Freeboard Aft Measured from transom/hull join

Depth Moulded:	_____	1.500 m
Port Freeboard:	_____	0.915 m
Stbd Freeboard:	_____	0.910 m
Draft:	_____	0.588 m

Freeboard Fwd Measured at top of stem on deck on Centreline

Depth Moulded:	_____	1.592 m
Centreline Freeboard:	_____	1.165 m
Draft:	_____	0.427 m

Distance between measured pts:	_____	25.920 m
Vessel Trim:	_____	0.355 deg aft

S.G. water at draft measurement:	_____	1.015
Displacement at draft measurement:	_____	43.320 t

Corresponding Displacement at inclining:

Displacement:	_____	43.320 t
Persons:	_____	0.000 t
Other:	_____	0 t

Inclining Displacement	_____	43.320 t
------------------------	-------	----------

Tank conditions at inclining

Description	Capacity (t)	LCG (m)	L-M (t-m)	VCG (m)	V-M (t-m)	FSM (t-m)
Fuel Port	0.62	5.68	3.52	0.36	0.22	0.05
Fuel Stbd	0.62	5.68	3.52	0.36	0.22	0.05
Fresh Water Port	1.33	8.07	10.74	0.60	0.80	0.00
Fresh Water Stbd	1.33	8.07	10.74	0.60	0.80	0.00
Ballast Aft Port	1.32	11.27	14.88	0.60	0.79	0.00
Ballast Aft Stbd	1.32	11.27	14.88	0.60	0.79	0.00
Ballast Mid Port	1.29	14.46	18.65	0.61	0.79	0.00
Ballast Mid Stbd	1.29	14.46	18.65	0.61	0.79	0.00
Ballast Fwd Port	1.11	17.58	19.52	0.63	0.70	0.00
Ballast Fwd Stbd	1.11	17.58	19.52	0.63	0.70	0.00
Total	11.34	11.871	134.618	0.581	6.59	0.09

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File No C of C No

Accreditation No Date

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Calculation of GM at inclining:

$$G_f M = \left(\frac{wd}{a} \right)_{mean} \frac{l}{\Delta}$$

Aft Pendulum

Fwd Pendulum

$$= \frac{187.48 \times 1.64}{43.320}$$

$$= \frac{181.49 \times 1.728}{43.320}$$

GM = 7.097

GM = 7.239

Total FSM = 0.09 t-m

FSC = 0.002 m

GM = G_fM + FSC

= 7.171 m

Calculation of KG at inclining:

KG = KM - GM

KM = 8.842 m (from hydrostatics - as inclined)

KG = 1.671 m

Calculation of LCG at inclining:

LCB = 9.706 m (from hydrostatics - as inclined)

KB = 0.338 m (from hydrostatics - as inclined)

trim = 0.355 deg aft

LCG = 9.714 m

Items Off

Description	Mass (t)	LCG (m)	L-M (t-m)	VCG (m)	V-M (t-m)
Person at aft pendulum	0.09	6.80	0.58	1.38	0.12
Aft Incline Bucket	0.02	7.28	0.15	0.90	0.02
Person at fwd pendulum	0.10	20.80	2.08	1.38	0.14
Fwd Incline Bucket	0.02	20.30	0.41	0.90	0.02
Inclining weights	2.52	5.10	12.85	4.05	10.21
Fluids	11.34	11.87	134.62	0.58	6.59
Total	14.085	10.698	150.679	1.213	17.090

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File No C of C No

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LIGHTSHIP CONDITION

Item	Weights (t)	LCG (m)	L-M (t-m)	VCG (m)	V-M (t-m)
Vessel as inclined	43.32	9.71	420.82	1.67	72.41
Items Off	-14.09	10.70	-150.68	1.21	-17.09
Total	29.235	9.240	270.14	1.892	55.32

Therefore,

Lightship	29.2 tonnes
LCG	9.24 m fwd of origin
VCG	1.892 m above baseline

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with the Standard/Rule as stated below

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File No C of C No

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8.3 LIGHTSHIP HYDROSTATICS

AS MEASURED HYDROSTATICS

Draft Amidships m	0.512
Displacement t	43.32
Heel deg	0
Draft at FP m	0.436
Draft at AP m	0.588
Draft at LCF m	0.519
Trim (+ve by stern) m	0.152
WL Length m	23.956
Beam max extents on WL m	6.027
Wetted Area m ²	138.372
Waterpl. Area m ²	129.999
Prismatic coeff. (Cp)	0.728
Block coeff. (Cb)	0.503
Max Sect. area coeff. (Cm)	0.695
Waterpl. area coeff. (Cwp)	0.9
LCB from zero pt. (+ve fwd) m	9.706
LCF from zero pt. (+ve fwd) m	10.848
KB m	0.338
KG m	-1.902
BM m	8.505
BML m	123.732
GM m	11.987
GML m	127.214
KM m	8.843
KML m	124.067
Immersion (TPC) tonne/cm	1.319
MTC tonne.m	2.295
RM at 1deg = GMt.Disp.sin(1) tonne.m	9.062
Max deck inclination deg	0.3627
Trim angle (+ve by stern) deg	0.3627

AS INCLINED HYDROSTATICS

Draft Amidships m	0.512
Displacement t	43.32
Heel deg	0
Draft at FP m	0.436
Draft at AP m	0.588
Draft at LCF m	0.519
Trim (+ve by stern) m	0.152
WL Length m	23.955
Beam max extents on WL m	6.027
Wetted Area m ²	138.372
Waterpl. Area m ²	129.988
Prismatic coeff. (Cp)	0.728
Block coeff. (Cb)	0.503
Max Sect. area coeff. (Cm)	0.695
Waterpl. area coeff. (Cwp)	0.9
LCB from zero pt. (+ve fwd) m	9.706
LCF from zero pt. (+ve fwd) m	10.848
KB m	0.338
KG fluid m	1.5
BM m	8.505
BML m	123.721
GM corrected m	7.342
GML m	122.559
KM m	8.842
KML m	124.056
Immersion (TPC) tonne/cm	1.319
MTC tonne.m	2.211
RM at 1deg = GMt.Disp.sin(1) tonne.m	5.551
Max deck inclination deg	0.363
Trim angle (+ve by stern) deg	0.363

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8.4 AFT PENDULUM DEFLECTIONS

Pendulum Length 1.640 m
 Pendulum Location 7.280 m fwd of datum

Weight Move No.	Direction of Move	Weight Moved w (t)	Distance Moved d (m)	Pendulum Reading (mm)	Pendulum Deflection a (mm)	$\frac{w \times d}{a}$ (t)	Average $\frac{w \times d}{a}$	% Diff. from Average	% Diff. from Final Average
0	Nil	-	-	0	-	-	-	-	-
1	P to S	0.630	3.420	11	11	195.9	195.9	-	4.5
2	P to S	0.630	3.420	23	12	179.6	187.7	-4.3	-4.2
3	S to P	1.260	3.420	0	23	187.4	187.6	-0.1	-0.1
4	S to P	0.630	3.420	-11.5	11.5	187.4	187.5	-0.1	-0.1
5	S to P	0.630	3.420	-23	11.5	187.4	187.5	-0.1	-0.1
6	P to S	1.260	3.420	0	23	187.4	187.5	-0.1	-0.1

Average = 187.47

< 5% OK

Maximum Heel to Port 0.80 degrees

Maximum Heel to Stbd 0.80 degrees

8.5 FWD PENDULUM DEFLECTIONS

Pendulum Length 1.728 m
 Pendulum Location 20.300 m fwd of datum

Weight Move No.	Direction of Move	Weight Moved w (t)	Distance Moved d (m)	Pendulum Reading (mm)	Pendulum Deflection a (mm)	$\frac{w \times d}{a}$ (t)	Average $\frac{w \times d}{a}$	% Diff. from Average	% Diff. from Final Average
0	Nil	-	-	0	-	-	-	-	-
1	P to S	0.630	3.420	12	12	179.6	179.6	-	-4.2
2	P to S	0.630	3.420	24	12	179.6	179.6	0.0	-4.2
3	S to P	1.260	3.420	0	24	179.6	179.6	0.0	-4.2
4	S to P	0.630	3.420	-11.5	11.5	187.4	181.5	3.2	-0.1
5	S to P	0.630	3.420	-23.5	12	179.6	181.1	-0.9	-4.2
6	P to S	1.260	3.420	0	23.5	183.4	181.5	1.0	-2.2

Average = 181.49

< 5% OK

Maximum Heel to Port 0.80 degrees

Maximum Heel to Stbd 0.78 degrees

1. The plan has been approved by the governing
body of the School and is a copy of the below

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2. The plan has been approved by the governing
body of the School and is a copy of the below

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3. The plan has been approved by the governing
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Creditation No Date

Signature