

COMMISSION OF INQUIRY
APPOINTED PURSUANT TO SECTION 2 OF THE COMMISSIONS OF INQUIRY
ORDINANCE (CHAPTER 86) ON 22 OCTOBER 2012

SUPPLEMENTAL WITNESS STATEMENT OF LO NGOK YANG

1. I am the same LO Ngok Yang, alias Ken LO Ngok Yang, who has made the Witness Statement on 16 January 2013 on behalf of Cheoy Lee Shipyards Limited (“CLS”).
2. This further statement is necessitated by an assertion made by Counsel for the Commission that the vessel “LAMMA IV” would sink if the Tank Room and the Aft Peak were flooded at the same time. This cannot be correct and it is not the conclusion in the Expert Report prepared by Dr Armstrong.
3. CLS has all along proceeded with the design and construction of #4625, the “LAMMA IV”, on the basis that the bulkhead between the Tank Room and the Aft Peak was not meant to be watertight.
4. If the design of the bulkhead between the Tank Room and the Aft Peak were meant to be watertight, the notation for the access opening on the “Sections and Bulkheads” drawing would be the same as that appearing on the similar drawing for the “M.V. Eastern District No. 1” from which the design of #4625, the “LAMMA IV”, was adapted and would read “W.T. DOOR”. [Marine2/5/198]
5. It was not until CLS’s Mr Cheung Chuen Yau was interviewed by officers of Mardep in late December 2012 that CLS realised that the plans approved in 1995 actually contained several mistakes which I have pointed out in my earlier Witness

Statement. These mistakes led to the wrong calculations for Damage Stability being submitted to Mardep for their assessment.

6. As regard the errors in the calculations for the Damage Stability of a flooded steering gear compartment of the vessel, I have today consulted with Mr Kwong Kai Ki, the naval architect of CLS (“**Mr Kwong**”). He was only able to tell me that the computer software used for the 1996 calculations has not been in use for a substantial period of time, and could no longer be located. He cannot therefore check as to how the errors have occurred.
7. However, he was able to confirm with me that even with such errors in the calculations, the vessel’s stability would not be adversely affected.
8. I accept the criticism that investigation as to the Tank Room and the Aft Peak being flooded at the same time should have been made. I have asked Mr Kwong to recalculate the Damage Stability of #4625, the “LAMMA IV”, with the data as at the time the vessel was completed and at the time when ballast was added to the aft of the vessel.
9. I am informed by Mr Kwong that he has used the Autohydro to complete the calculations and prepared his reports accordingly, which reports are attached (see **Attachments Nos 12 and 13**).
10. With these reports, I shall try to explain to the Commission why #4625, the “LAMMA IV”, will remain afloat even if the Tank Room and the Aft Peak are flooded at the same time.

11. I should also point out that there is an error in paragraph 16 of my previous Witness Statement in that I have stated that the vessel "M.V. Eastern District No. 1" was built by CLS. This is wrong. This vessel was not built by CLS.

Dated this 18th day of January, 2013.

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke, positioned above the printed name.

LO NGOK YANG

YARD NO. 4625

"LAMMA IV"

REV.	DESCRIPTION	DRAWN	DATE



CHEOY LEE SHIPYARDS LTD.

89-91 HING WAH STREET WEST,

LAI CHI KOK, KLN. H.K.

TEL: (852) 2307 6333 FAX: (852) 2307 5577

TITLE:

28M FAST ALUMINIUM/GRP PASSENGER LAUNCH

DAMAGE STABILITY CALCULATION

(AS COMPLETED IN JUL 1996)

DRG. NO.:	4625/C1	PREPARED BY:	K.K. Kwong	17 Jan 2013
YARD NO.:	4625	CHECKED BY:	C.Y. Cheung	17 Jan 2013
REV:		APPROVED BY:		

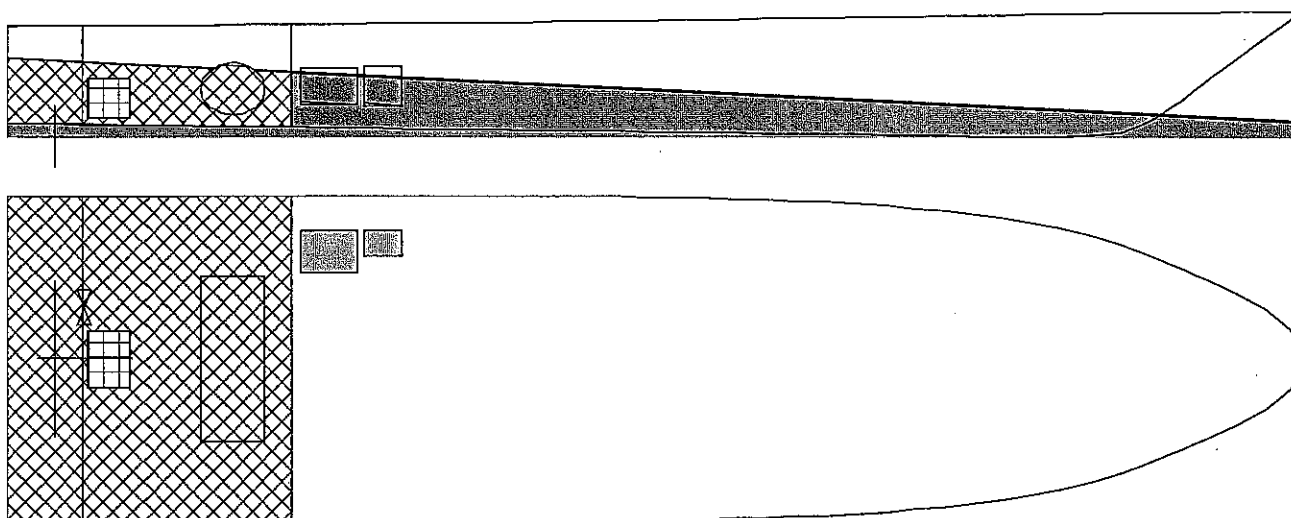
© COPYRIGHT CHEOY LEE SHIPYARDS LTD. ALL RIGHTS TO REPRODUCE THIS DESIGN OR ANY VARIATION THERE OF IN WHOLE OR IN PART ARE PROHIBITED.

The damage stability calculation is carried out using Autohydro® software. For lightship weight, centres of gravity referred to "Inclining experiment and stability (1996) "

I. Condition before damage - Full load departure

98% fuel, 100% fresh water, weight of each passenger = 68kg

Damage Case 1: Tank Space & Steering Gear Compartment damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	0.501 m	Heel	port 0.81 deg.	GM(Solid)	0.345 m
Draft MS	1.238 m	Equil	Yes	F/S Corr.	0.022 m
Draft AP	1.975 m	Wind	Off	GM(Fluid)	0.323 m
Trim	aft 1.473/24.890	Wave	No	KMt	3.650 m
LCG	9.529f m	VCG	3.305 m	TPcm	0.83
Displacement	70.36 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	21.62	8.773f	0.016p	3.572
Displacement	70.36	9.529f	0.005p	3.305

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.749f	0.006p	1.225	1.50
Subtotals:		98.00%	4.17	3.749f	0.006p	1.225	1.50

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TKP	0.980	10.00%	0.09	5.700f	2.260p	0.873	0.06
NO2 OILYW TKP	0.980	10.00%	0.04	6.868f	2.429p	0.851	0.01
Subtotals:		10.00%	0.14	6.065f	2.313p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.32%	5.35	3.305f	0.064p	1.172	1.57

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	114.73	6.413f	0.038p	1.004	1.000
AFTER PEAK	Flooded	1.025	-14.58	0.207a	0.031p	1.202	0.950
TANK SPACE	Flooded	1.025	-29.79	2.625f	0.039p	1.105	0.950
SubTotals:			70.36	9.388f	0.039p	0.921	

Least freeboard is 0.783 m at 1.000a

Least freeboard (to margin line) is 0.707 m at 1.000a

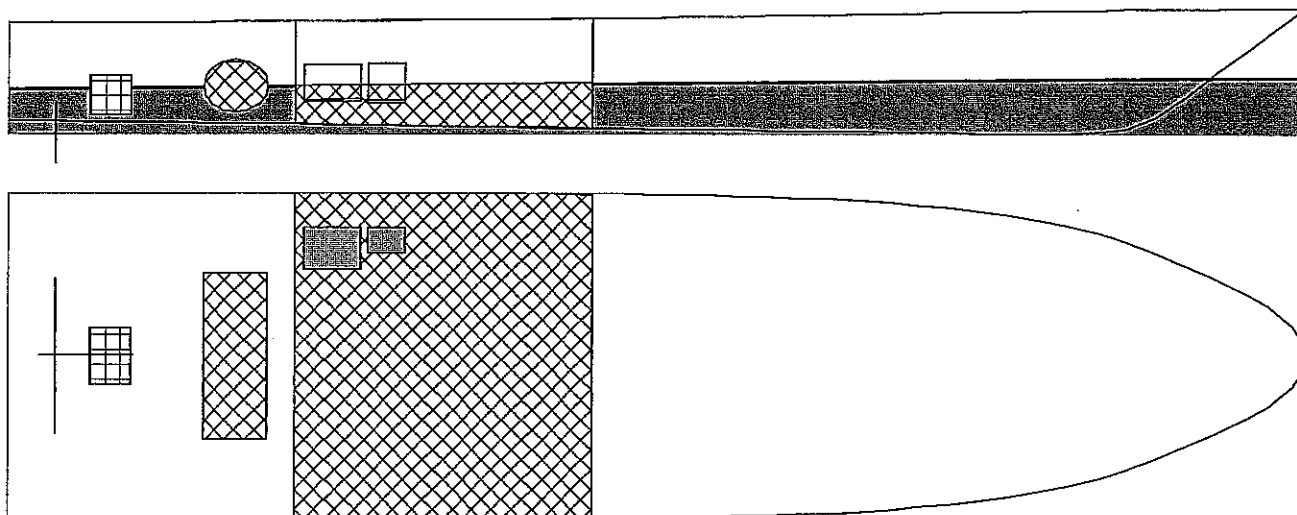
Hydrostatic Properties with Damage

Trim: aft 1.473/24.890, heel: port 0.81 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m ²)	LCF (m)	BMI (m)	BMt (m)
1.971	70.363	9.388f	0.039p	0.921	81.3	11.230f	26.020	2.712

Water Specific Gravity = 1.025.

Damage Case 2: Engine Room damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	1.444 m	Heel	port 0.50 deg.	GM(Solid)	0.542 m
Draft MS	1.320 m	Equil	Yes	F/S Corr.	0.027 m
Draft AP	1.195 m	Wind	Off	GM(Fluid)	0.516 m
Trim	fwd 0.249/24.890	Wave	No	KMt	3.848 m
LCG	9.529f m	VCG	3.305 m	TPcm	0.91
Displacement	70.36 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	21.62	8.773f	0.015p	3.572
Displacement	70.36	9.529f	0.005p	3.305

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.750f	0.004p	1.225	1.80
Subtotals:		98.00%	4.17	3.750f	0.004p	1.225	1.80

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.788f	2.256p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.905f	2.427p	0.850	0.01
Subtotals:		10.00%	0.14	6.137f	2.309p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.32%	5.35	3.308f	0.062p	1.172	1.87

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	96.25	9.161f	0.027p	0.858	1.000
ENGINE ROOM	Flooded	1.025	-25.88	8.093f	0.030p	0.850	0.850
SubTotals:			70.36	9.554f	0.026p	0.860	

Least freeboard is 1.644 m at 3.750f

Least freeboard (to margin line) is 1.568 m at 3.750f

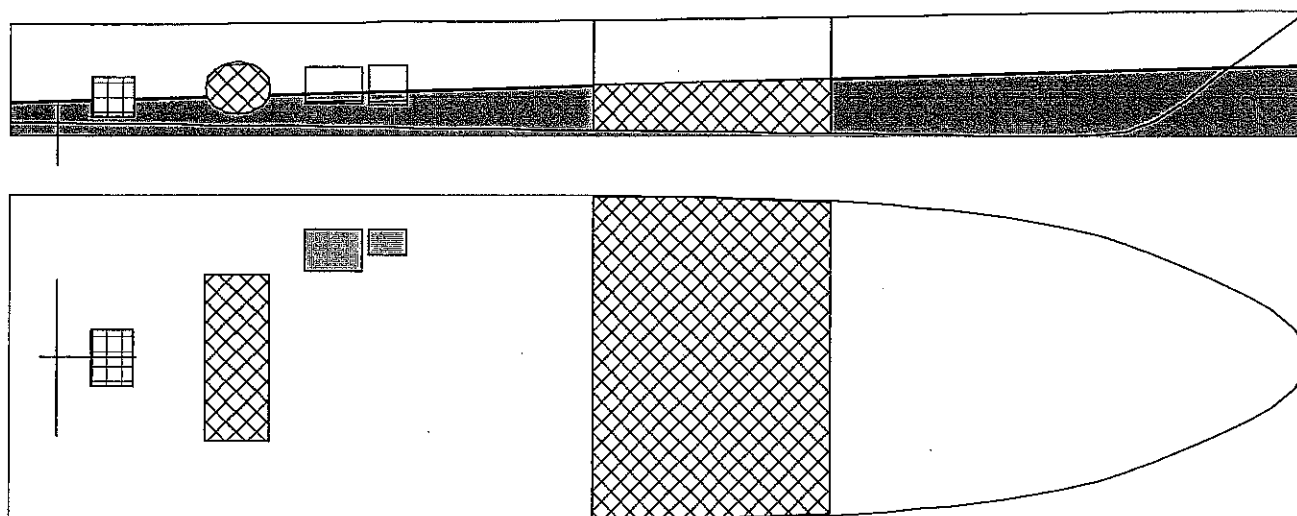
Hydrostatic Properties with Damage

Trim: fwd 0.249/24.890, heel: port 0.50 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.195	70.363	9.554f	0.026p	0.860	89.2	10.018f	68.157	2.961

Water Specific Gravity = 1.025.

Damage Case 3: Void Fr.9-Fr13 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	1.798 m	Heel	port 0.29 deg.	GM(Solid)	0.947 m
Draft MS	1.355 m	Equil	Yes	F/S Corr.	0.026 m
Draft AP	0.912 m	Wind	Off	GM(Fluid)	0.921 m
Trim	fwd 0.886/24.890	Wave	No	KMt	4.252 m
LCG	9.530f m	VCG	3.305 m	TPcm	1.00
Displacement	70.36 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	21.62	8.774f	0.015p	3.572
Displacement	70.36	9.530f	0.005p	3.305

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.751f	0.002p	1.225	1.78
Subtotals:		98.00%	4.17	3.751f	0.002p	1.225	1.78

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.820f	2.253p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.919f	2.426p	0.850	0.01
Subtotals:		10.00%	0.14	6.163f	2.307p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.18%	5.35	3.309f	0.061p	1.172	1.85

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	91.94	10.576f	0.016p	0.871	1.000
VOID FR9-FR13	Flooded	1.025	-21.58	13.702f	0.014p	0.936	0.950
SubTotals:			70.36	9.617f	0.017p	0.851	

Least freeboard is 1.414 m at 26.200f

Least freeboard (to margin line) is 1.338 m at 26.200f

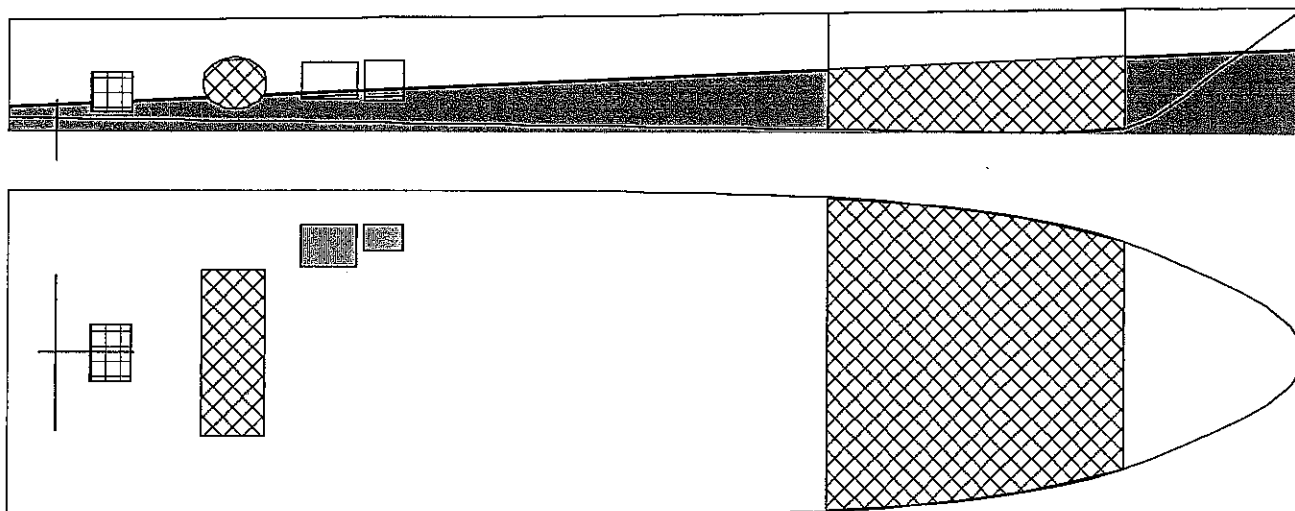
Hydrostatic Properties with Damage

Trim: fwd 0.886/24.890, heel: port 0.29 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.912	70.363	9.617f	0.017p	0.851	97.6	8.908f	68.989	3.377

Water Specific Gravity = 1.025.

Damage Case 4: Void Fr.13-Fr18 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	2.135 m	Heel	port 0.19 deg.	GM(Solid)	1.389 m
Draft MS	1.414 m	Equil	Yes	F/S Corr.	0.026 m
Draft AP	0.694 m	Wind	Off	GM(Fluid)	1.363 m
Trim	fwd 1.441/24.890	Wave	No	KMt	4.692 m
LCG	9.530f m	VCG	3.305 m	TPcm	1.05
Displacement	70.36 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	21.62	8.774f	0.015p	3.572
Displacement	70.36	9.530f	0.005p	3.305

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.751f	0.001p	1.225	1.78
Subtotals:		98.00%	4.17	3.751f	0.001p	1.225	1.78

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.848f	2.252p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.931f	2.426p	0.851	0.01
Subtotals:		10.00%	0.14	6.186f	2.307p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.12%	5.35	3.309f	0.061p	1.172	1.85

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	92.72	11.912f	0.011p	0.937	1.000
VOID FR13-FR18	Flooded	1.025	-22.35	18.965f	0.005p	1.208	0.950
SubTotals:			70.36	9.671f	0.013p	0.852	

Least freeboard is 1.048 m at 26.200f

Least freeboard (to margin line) is 0.972 m at 26.200f

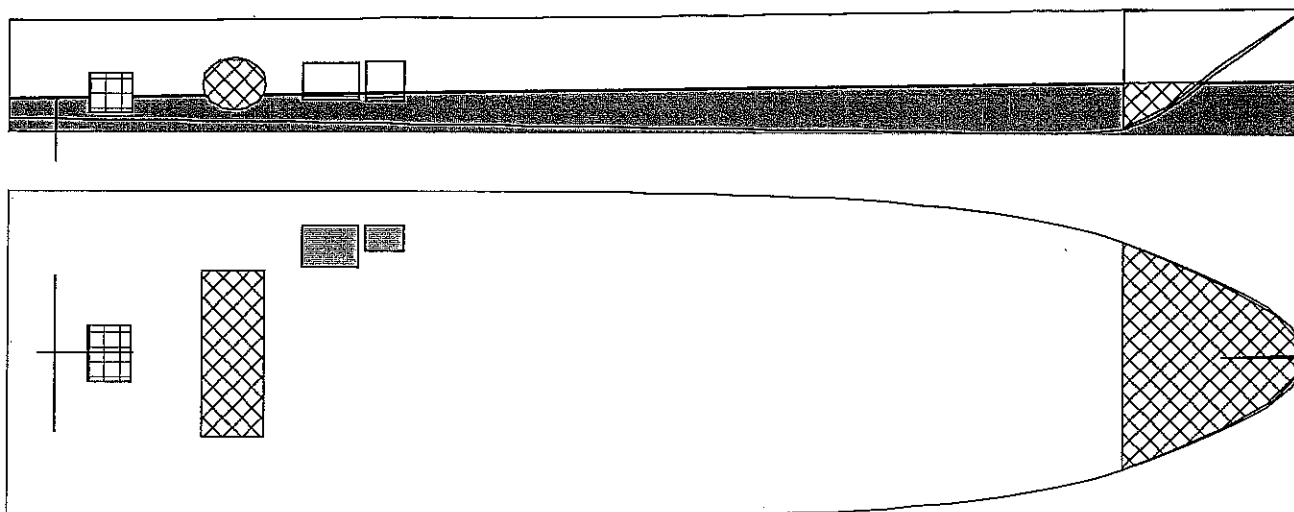
Hydrostatic Properties with Damage

Trim: fwd 1.441/24.890, heel: port 0.19 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.693	70.363	9.671f	0.013p	0.852	102.4	8.229f	48.766	3.821

Water Specific Gravity = 1.025.

Damage Case 5: Fore Peak damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		..14	10.00%

Floating Status

Draft FP	1.372 m	Heel	port 0.19 deg.	GM(Solid)	1.404 m
Draft MS	1.137 m	Equil	Yes	F/S Corr.	0.026 m
Draft AP	0.901 m	Wind	Off	GM(Fluid)	1.378 m
Trim	fwd 0.472/24.890	Wave	No	KMt	4.709 m
LCG	9.529f m	VCG	3.305 m	TPcm	1.18
Displacement	70.36 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	21.62	8.774f	0.015p	3.572
Displacement	70.36	9.529f	0.005p	3.305

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.750f	0.001p	1.225	1.76
Subtotals:		98.00%	4.17	3.750f	0.001p	1.225	1.76

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.799f	2.252p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.910f	2.426p	0.850	0.01
Subtotals:		10.00%	0.14	6.146f	2.306p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		1.75%	5.35	3.308f	0.061p	1.172	1.83

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	70.80	9.660f	0.013p	0.748	1.000
FORE PEAK	Flooded	1.025	-0.43	22.963f	0.002p	1.062	0.950
SubTotals:			70.36	9.578f	0.013p	0.746	

Least freeboard is 1.862 m at 26.200f

Least freeboard (to margin line) is 1.786 m at 26.200f

Hydrostatic Properties with Damage

Trim: fwd 0.472/24.890, heel: port 0.19 deg.

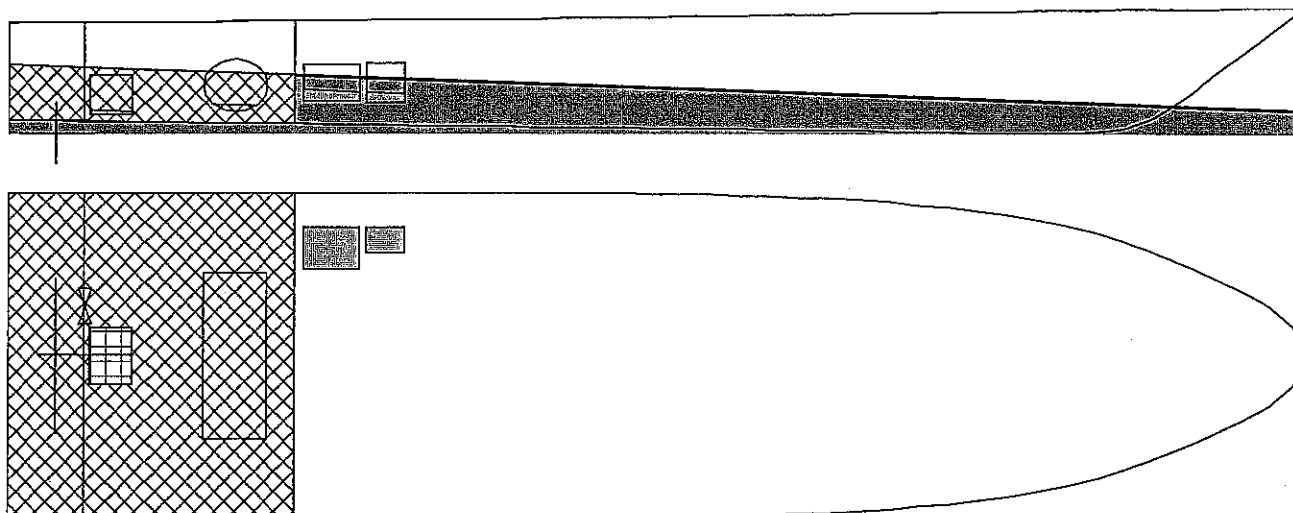
Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.901	70.363	9.578f	0.013p	0.746	115.6	9.324f	64.742	3.938

Water Specific Gravity = 1.025.

II. Condition before damage - Full load arrival

10% fuel, 10% fresh water, Weight of each passenger = 68Kg

Damage Case 1A: Tank Space & Steering Gear Compartment damaged

**Fluid Legend**

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	97.99%

Floating Status

Draft FP	0.671 m	Heel	port 8.59 deg.	GM(Solid)	0.364 m
Draft MS	1.204 m	Equil	Yes	F/S Corr.	0.023 m
Draft AP	1.736 m	Wind	Off	GM(Fluid)	0.340 m
Trim	aft 1.053/24.890	Wave	No	KMt	3.774 m
LCG	9.908f m	VCG	3.415 m	TPcm	0.85
Displacement	66.90 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	18.16	10.024f	0.195p	4.025
Displacement	66.90	9.908f	0.053p	3.415

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.730f	0.918p	0.753	1.43
Subtotals:		10.00%	0.43	3.730f	0.918p	0.753	1.43

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.121f	0.181p	0.564	0.13
Subtotals:		10.00%	0.10	1.121f	0.181p	0.564	0.13

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	97.99%	0.93	5.772f	2.255p	1.291	0.01
NO2 OILYW TK.P	0.980	97.99%	0.42	6.898f	2.428p	1.290	0.00
Subtotals:		97.99%	1.35	6.124f	2.309p	1.291	0.01

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.81%	1.88	5.307f	1.877p	1.129	1.57

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	104.89	6.875f	0.431p	0.963	1.000
AFTER PEAK	Flooded	1.025	-12.34	0.206a	0.371p	1.108	0.950
TANK SPACE	Flooded	1.025	-25.65	2.650f	0.458p	1.037	0.950
SubTotals:			66.90	9.800f	0.431p	0.908	

Least freeboard is 0.565 m at 1.000a

Least freeboard (to margin line) is 0.489 m at 1.000a

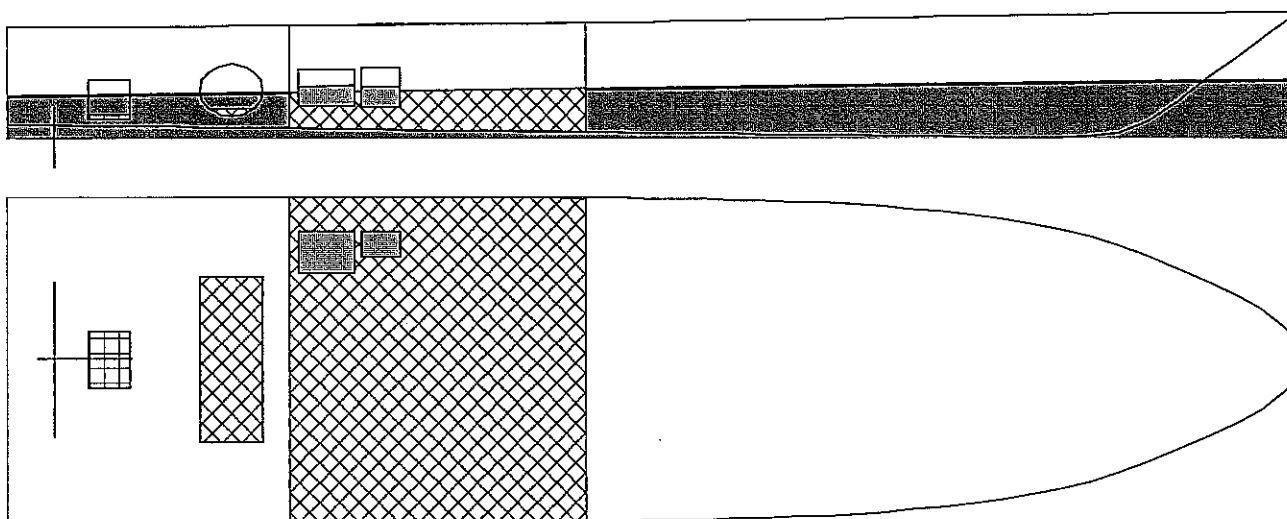
Hydrostatic Properties with Damage

Trim: aft 1.053/24.890, heel: port 8.59 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.715	66.898	9.800f	0.431p	0.908	83.3	11.279f	29.819	2.877

Water Specific Gravity = 1.025.

Damage Case 2A: Engine Room damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	97.99%

Floating Status

Draft FP	1.487 m	Heel	port 5.37 deg.	GM(Solid)	0.577 m
Draft MS	1.291 m	Equil	Yes	F/S Corr.	0.040 m
Draft AP	1.095 m	Wind	Off	GM(Fluid)	0.537 m
Trim	fwd 0.390/24.890	Wave	No	KMt	3.989 m
LCG	9.908f m	VCG	3.414 m	TPcm	0.92
Displacement	66.90 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	18.16	10.025f	0.188p	4.024
Displacement	66.90	9.908f	0.051p	3.414

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.759f	0.660p	0.720	2.54
Subtotals:		10.00%	0.43	3.759f	0.660p	0.720	2.54

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.161f	0.113p	0.555	0.13
Subtotals:		10.00%	0.10	1.161f	0.113p	0.555	0.13

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TKP	0.980	97.99%	0.93	5.776f	2.255p	1.291	0.02
NO2 OILYW TKP	0.980	97.99%	0.42	6.901f	2.427p	1.290	0.01
Subtotals:		97.99%	1.35	6.128f	2.309p	1.290	0.03

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.82%	1.88	5.318f	1.815p	1.121	2.70

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	91.18	9.461f	0.307p	0.853	1.000
ENGINE ROOM	Flooded	1.025	-24.28	8.117f	0.349p	0.840	0.850
SubTotals:			66.90	9.949f	0.292p	0.858	

Least freeboard is 1.395 m at 11.875f

Least freeboard (to margin line) is 1.319 m at 11.875f

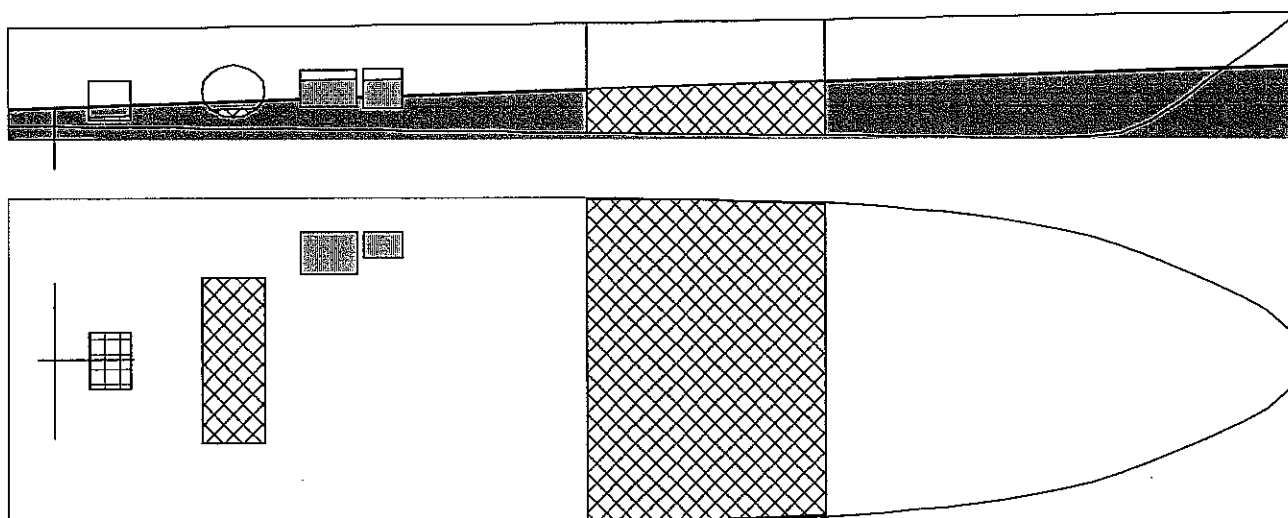
Hydrostatic Properties with Damage

Trim: fwd 0.390/24.890, heel: port 5.37 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.090	66.898	9.949f	0.292p	0.858	89.5	10.074f	72.176	3.105

Water Specific Gravity = 1.025.

Damage Case 3A: Void Fr.9-Fr13 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	97.99%

Floating Status

Draft FP	1.841 m	Heel	port 2.89 deg.	GM(Solid)	0.990 m
Draft MS	1.337 m	Equil	Yes	F/S Corr.	0.044 m
Draft AP	0.833 m	Wind	Off	GM(Fluid)	0.946 m
Trim	fwd 1.007/24.890	Wave	No	KMt	4.402 m
LCG	9.908f m	VCG	3.414 m	TPcm	1.00
Displacement	66.90 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	18.16	10.026f	0.181p	4.024
Displacement	66.90	9.908f	0.049p	3.414

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.772f	0.378p	0.699	2.79
Subtotals:		10.00%	0.43	3.772f	0.378p	0.699	2.79

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.177f	0.061p	0.552	0.13
Subtotals:		10.00%	0.10	1.177f	0.061p	0.552	0.13

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	98.00%	0.93	5.779f	2.252p	1.291	0.02
NO2 OILYW TK.P	0.980	97.98%	0.42	6.902f	2.426p	1.290	0.01
Subtotals:		97.99%	1.35	6.130f	2.306p	1.290	0.03

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.77%	1.88	5.323f	1.746p	1.116	2.95

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	88.19	10.906f	0.171p	0.871	1.000
VOID FR9-FR13	Flooded	1.025	-21.29	13.715f	0.145p	0.934	0.950
SubTotals:			66.90	10.012f	0.179p	0.851	

Least freeboard is 1.334 m at 23.750f

Least freeboard (to margin line) is 1.258 m at 23.750f

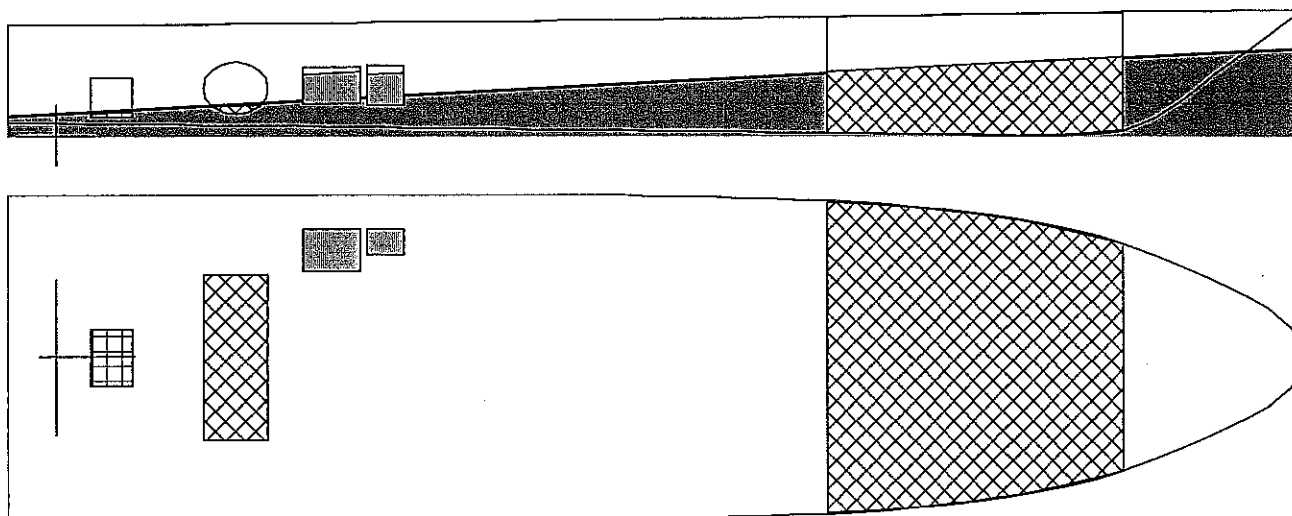
Hydrostatic Properties with Damage

Trim: fwd 1.007/24.890, heel: port 2.89 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.831	66.898	10.012f	0.179p	0.851	97.7	8.967f	73.263	3.515

Water Specific Gravity = 1.025.

Damage Case 4A: Void Fr.13-Fr18 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	98.00%

Floating Status

Draft FP	2.207 m	Heel	port 1.91 deg.	GM(Solid)	1.455 m
Draft MS	1.407 m	Equil	Yes	F/S Corr.	0.045 m
Draft AP	0.608 m	Wind	Off	GM(Fluid)	1.411 m
Trim	fwd 1.598/24.890	Wave	No	KMt	4.866 m
LCG	9.909f m	VCG	3.414 m	TPcm	1.05
Displacement	66.90 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	18.16	10.026f	0.178p	4.024
Displacement	66.90	9.909f	0.048p	3.414

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.785f	0.263p	0.695	2.84
Subtotals:		10.00%	0.43	3.785f	0.263p	0.695	2.84

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.193f	0.040p	0.552	0.12
Subtotals:		10.00%	0.10	1.193f	0.040p	0.552	0.12

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	98.00%	0.93	5.781f	2.251p	1.291	0.01
NO2 OILYW TK.P	0.980	97.99%	0.42	6.903f	2.426p	1.290	0.01
Subtotals:		98.00%	1.35	6.131f	2.306p	1.290	0.02

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.75%	1.88	5.328f	1.719p	1.115	2.99

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	90.11	12.369f	0.112p	0.955	1.000
VOID FR13-FR18	Flooded	1.025	-23.21	18.989f	0.051p	1.232	0.950
SubTotals:			66.90	10.072f	0.133p	0.858	

Least freeboard is 0.956 m at 26.200f

Least freeboard (to margin line) is 0.880 m at 26.200f

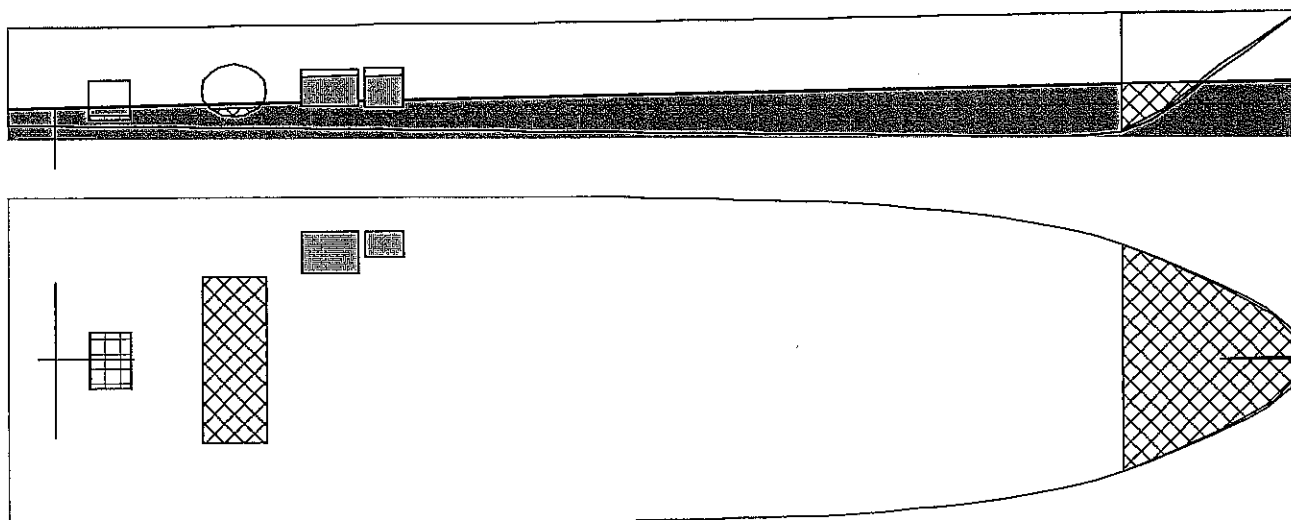
Hydrostatic Properties with Damage

Trim: fwd 1.598/24.890, heel: port 1.91 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.606	66.898	10.072f	0.133p	0.858	102.5	8.302f	52.518	3.973

Water Specific Gravity = 1.025.

Damage Case 5A: Fore Peak damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	97.99%

Floating Status

Draft FP	1.430 m	Heel	port 1.91 deg.	GM(Solid)	1.465 m
Draft MS	1.124 m	Equil	Yes	F/S Corr.	0.044 m
Draft AP	0.819 m	Wind	Off	GM(Fluid)	1.421 m
Trim	fwd 0.611/24.890	Wave	No	KMt	4.878 m
LCG	9.908f m	VCG	3.414 m	TPcm	1.19
Displacement	66.90 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	48.74	9.865f	0.000	3.187
Deadweight	18.16	10.025f	0.178p	4.024
Displacement	66.90	9.908f	0.048p	3.414

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	48.74	9.865f	0.000	3.187u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	65.02	10.041f	0.000	3.481u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.763f	0.264p	0.694	2.77
Subtotals:		10.00%	0.43	3.763f	0.264p	0.694	2.77

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.167f	0.040p	0.551	0.12
Subtotals:		10.00%	0.10	1.167f	0.040p	0.551	0.12

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	97.98%	0.93	5.778f	2.252p	1.290	0.03
NO2 OILYW TK.P	0.980	98.00%	0.42	6.901f	2.426p	1.290	0.01
Subtotals:		97.99%	1.35	6.129f	2.306p	1.290	0.04

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.62%	1.88	5.320f	1.719p	1.115	2.94

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	67.38	10.067f	0.137p	0.743	1.000
FORE PEAK	Flooded	1.025	-0.48	22.981f	0.007p	1.098	0.950
SubTotals:			66.90	9.974f	0.138p	0.740	

Least freeboard is 1.753 m at 20.000f

Least freeboard (to margin line) is 1.677 m at 20.000f

Hydrostatic Properties with Damage

Trim: fwd 0.611/24.890, heel: port 1.91 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.818	66.898	9.974f	0.138p	0.740	115.7	9.373f	68.543	4.097

Water Specific Gravity = 1.025.

YARD NO. 4625

"LAMMA IV"

REV.	DESCRIPTION	DRAWN	DATE



CHEOY LEE SHIPYARDS LTD.

89-91 HING WAH STREET WEST,
LAI CHI KOK, KLN. H.K.

TEL: (852) 2307 6333 FAX: (852) 2307 5577

TITLE:

28M FAST ALUMINIUM/GRP PASSENGER LAUNCH

DAMAGE STABILITY CALCULATION

(AS COMPLETED IN JUL 2005)

DRG. NO.:	4625/C2	PREPARED BY:	K.K. Kwong	17 Jan 2013
YARD NO.:	4625	CHECKED BY:	C.Y. Cheung	17 Jan 2013
REV:		APPROVED BY:		

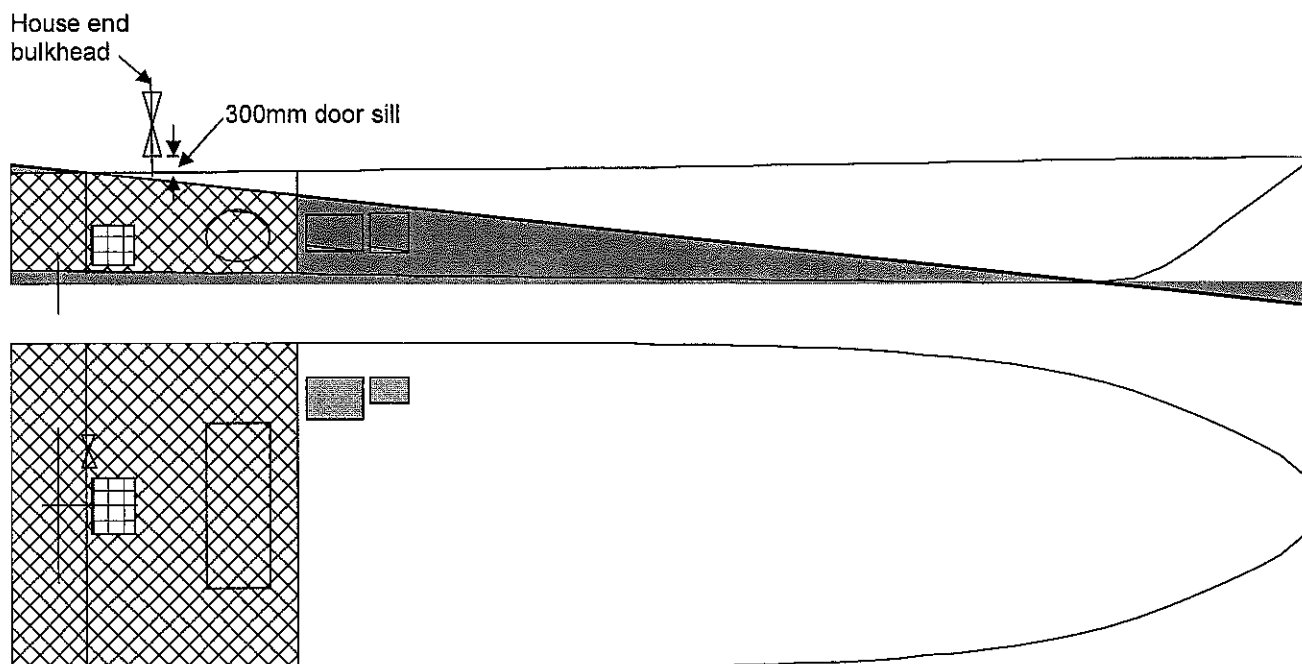
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The damage stability calculation is carried out using Autohydro® software. For lightship weight, centres of gravity referred to "Inclining experiment in Stability Booklet (2005) "

I. Condition before damage - Full load departure

98% fuel, 100% fresh water, Weight of each passenger = 68kg

Damage Case 1: Tank Space & Steering Gear Compartment damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	-0.400 m	Heel	port 0.27 deg.	GM(Solid)	0.845 m
Draft MS	1.281 m	Equil	Yes	F/S Corr.	0.019 m
Draft AP	2.962 m	Wind	Off	GM(Fluid)	0.826 m
Trim	aft 3.363/24.890	Wave	No	KMt	3.453 m
LCG	8.496f m	VCG	2.615 m	TPcm	0.75
Displacement	81.98 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	21.62	8.772f	0.015p	3.572
Displacement	81.98	8.496f	0.004p	2.615

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.748f	0.002p	1.225	1.51
Subtotals:		98.00%	4.17	3.748f	0.002p	1.225	1.51

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.604f	2.261p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.828f	2.426p	0.855	0.01
Subtotals:		10.00%	0.14	5.986f	2.313p	0.867	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.32%	5.35	3.302f	0.061p	1.172	1.59

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	156.33	5.170f	0.009p	1.345	1.000
AFTER PEAK	Flooded	1.025	-23.58	0.199a	0.000	1.672	0.950
TANK SPACE	Flooded	1.025	-50.77	2.619f	0.009p	1.567	0.950
SubTotals:			81.98	8.293f	0.011p	1.114	

Least freeboard is -0.245 m at 1.000a

Least freeboard (to margin line) is -0.321 m at 1.000a

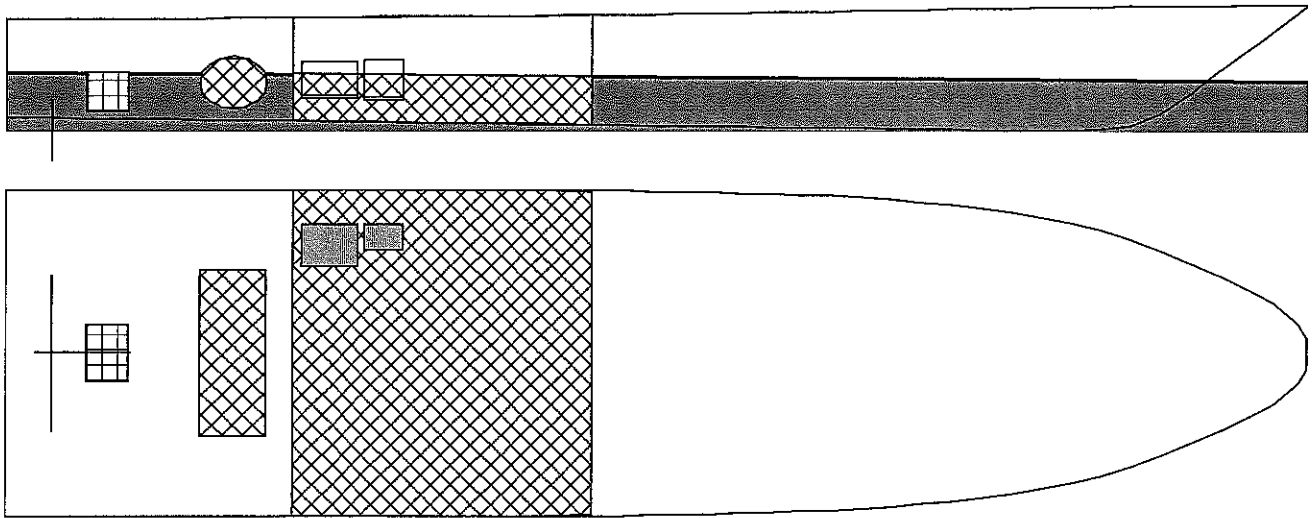
Hydrostatic Properties with Damage

Trim: aft 3.363/24.890, heel: port 0.27 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
2.935	81.983	8.293f	0.011p	1.114	72.9	10.539f	15.276	2.341

Water Specific Gravity = 1.025.

Damage Case 2: Engine Room damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	1.282 m	Heel	port 0.23 deg.	GM(Solid)	0.994 m
Draft MS	1.398 m	Equil	Yes	F/S Corr.	0.022 m
Draft AP	1.514 m	Wind	Off	GM(Fluid)	0.971 m
Trim	aft 0.232/24.890	Wave	No	KMt	3.609 m
LCG	8.496f m	VCG	2.615 m	TPcm	0.92
Displacement	81.98 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	21.62	8.773f	0.015p	3.572
Displacement	81.98	8.496f	0.004p	2.615

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.750f	0.002p	1.225	1.76
Subtotals:		98.00%	4.17	3.750f	0.002p	1.225	1.76

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.763f	2.253p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.895f	2.426p	0.850	0.01
Subtotals:		10.00%	0.14	6.117f	2.307p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.32%	5.35	3.307f	0.061p	1.172	1.83

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	113.07	8.356f	0.011p	0.932	1.000
ENGINE ROOM	Flooded	1.025	-31.09	8.029f	0.012p	0.935	0.850
SubTotals:			81.98	8.481f	0.011p	0.930	

Least freeboard is 1.330 m at 1.000a

Least freeboard (to margin line) is 1.254 m at 1.000a

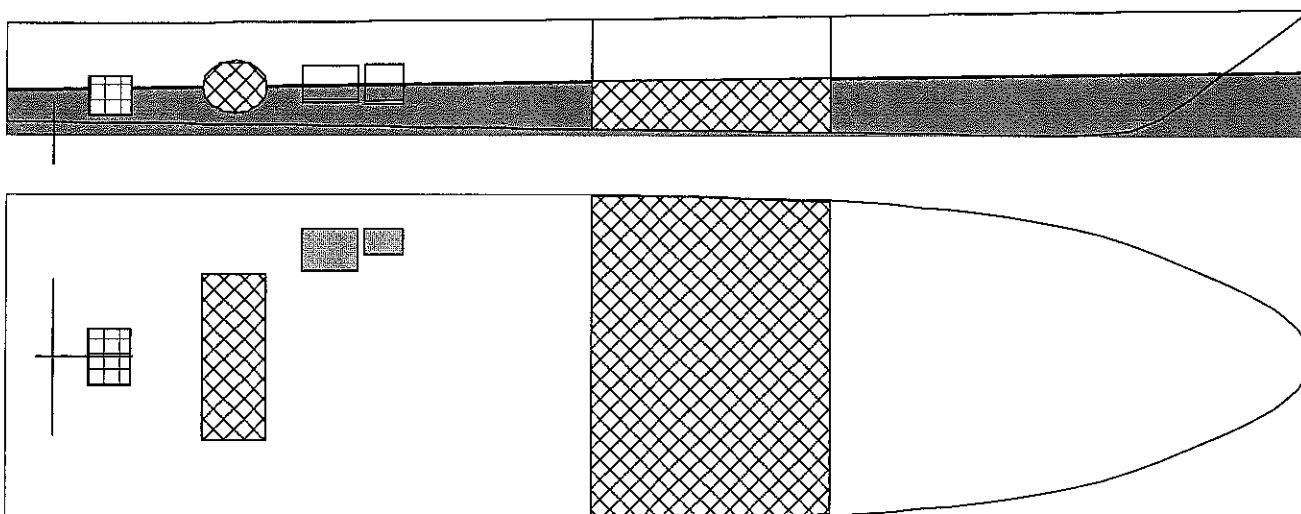
Hydrostatic Properties with Damage

Trim: aft 0.232/24.890, heel: port 0.23 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.514	81.983	8.481f	0.011p	0.930	89.5	9.813f	57.819	2.657

Water Specific Gravity = 1.025.

Damage Case 3: Void Fr.9-Fr13 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	1.645 m	Heel	port 0.18 deg.	GM(Solid)	1.296 m
Draft MS	1.411 m	Equil	Yes	F/S Corr.	0.022 m
Draft AP	1.176 m	Wind	Off	GM(Fluid)	1.273 m
Trim	fwd 0.470/24.890	Wave	No	KMt	3.911 m
LCG	8.496f m	VCG	2.615 m	TPcm	1.00
Displacement	81.98 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	21.62	8.774f	0.015p	3.572
Displacement	81.98	8.496f	0.004p	2.615

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.750f	0.001p	1.225	1.76
Subtotals:		98.00%	4.17	3.750f	0.001p	1.225	1.76

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.799f	2.252p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.910f	2.426p	0.850	0.01
Subtotals:		10.00%	0.14	6.146f	2.306p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.18%	5.35	3.308f	0.061p	1.172	1.83

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	104.46	9.633f	0.009p	0.901	1.000
VOID FR9-FR13	Flooded	1.025	-22.48	13.661f	0.008p	0.954	0.950
SubTotals:			81.98	8.529f	0.009p	0.886	

Least freeboard is 1.590 m at 26.200f

Least freeboard (to margin line) is 1.514 m at 26.200f

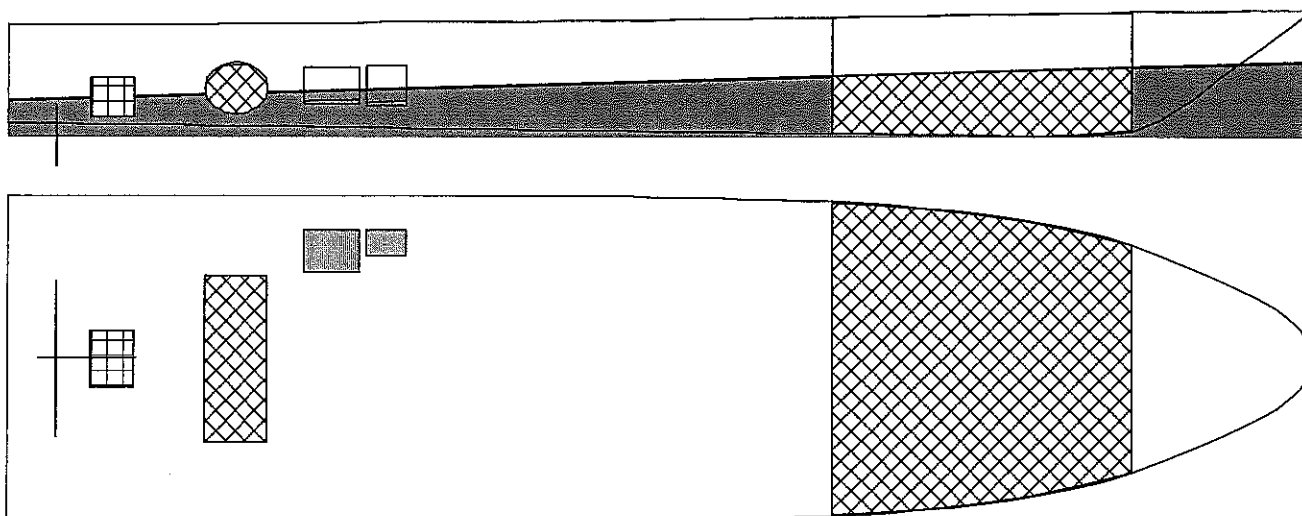
Hydrostatic Properties with Damage

Trim: fwd 0.470/24.890, heel: port 0.18 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.176	81.983	8.529f	0.009p	0.886	97.7	8.704f	57.402	3.003

Water Specific Gravity = 1.025.

Damage Case 4: Void Fr.13-Fr18 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	1.876 m	Heel	port 0.14 deg.	GM(Solid)	1.653 m
Draft MS	1.430 m	Equil	Yes	F/S Corr.	0.022 m
Draft AP	0.984 m	Wind	Off	GM(Fluid)	1.631 m
Trim	fwd 0.892/24.890	Wave	No	KMt	4.268 m
LCG	8.496f m	VCG	2.615 m	TPcm	1.05
Displacement	81.98 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	21.62	8.774f	0.015p	3.572
Displacement	81.98	8.496f	0.004p	2.615

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.750f	0.001p	1.225	1.76
Subtotals:		98.00%	4.17	3.750f	0.001p	1.225	1.76

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	10.00%	0.09	5.820f	2.252p	0.873	0.06
NO2 OILYW TK.P	0.980	10.00%	0.04	6.919f	2.426p	0.850	0.01
Subtotals:		10.00%	0.14	6.163f	2.306p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		2.12%	5.35	3.309f	0.060p	1.172	1.83

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	101.32	10.528f	0.007p	0.911	1.000
VOID FR13-FR18	Flooded	1.025	-19.34	18.877f	0.004p	1.121	0.950
SubTotals:			81.98	8.559f	0.008p	0.862	

Least freeboard is 1.337 m at 26.200f

Least freeboard (to margin line) is 1.261 m at 26.200f

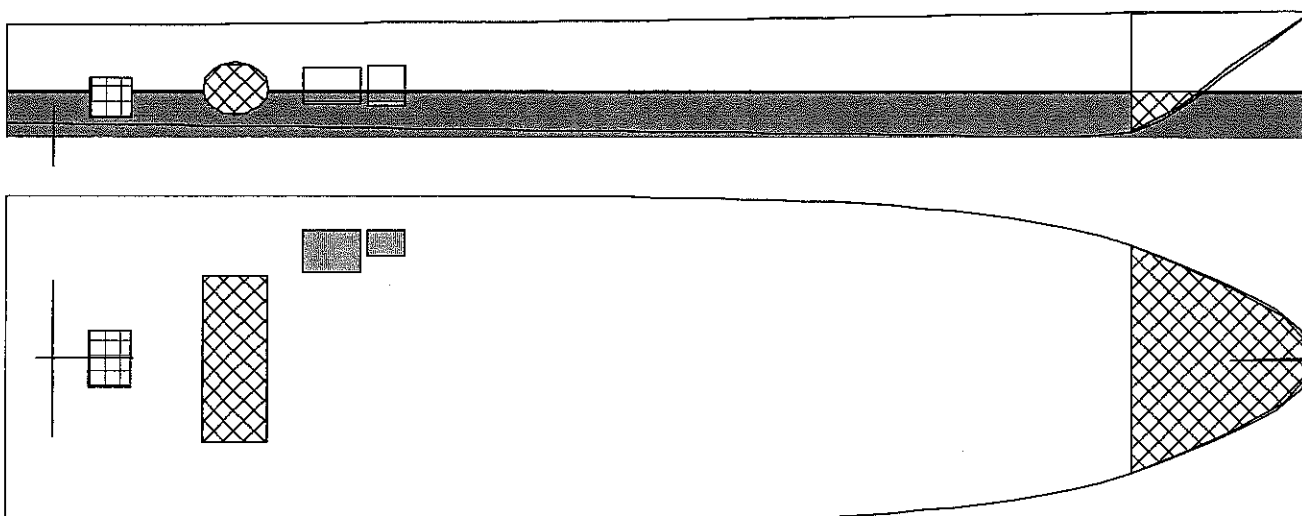
Hydrostatic Properties with Damage

Trim: fwd 0.892/24.890, heel: port 0.14 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
0.984	81.983	8.559f	0.008p	0.862	102.4	8.016f	39.170	3.386

Water Specific Gravity = 1.025.

Damage Case 5: Fore Peak damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.17	98.00%
FRESH WATER		1.04	100.00%
Oily WATER		.14	10.00%

Floating Status

Draft FP	1.176 m	Heel	port 0.14 deg.	GM(Solid)	1.670 m
Draft MS	1.174 m	Equil	Yes	F/S Corr.	0.022 m
Draft AP	1.173 m	Wind	Off	GM(Fluid)	1.648 m
Trim	0.003/24.890	Wave	No	KMt	4.286 m
LCG	8.496f m	VCG	2.615 m	TPcm	1.18
Displacement	81.98 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	21.62	8.773f	0.015p	3.572
Displacement	81.98	8.496f	0.004p	2.615

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	98.00%	4.17	3.750f	0.001p	1.225	1.75
Subtotals:		98.00%	4.17	3.750f	0.001p	1.225	1.75

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	100.00%	1.04	1.150f	0.000	1.000	0.00
Subtotals:		100.00%	1.04	1.150f	0.000	1.000	0.00

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK P	0.980	10.00%	0.09	5.775f	2.252p	0.873	0.06
NO2 OILYW TK P	0.980	10.00%	0.04	6.900f	2.426p	0.850	0.01
Subtotals:		10.00%	0.14	6.126f	2.306p	0.866	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		1.75%	5.35	3.307f	0.060p	1.172	1.82

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	82.28	8.548f	0.008p	0.791	1.000
FORE PEAK	Flooded	1.025	-0.29	22.907f	0.000	0.941	0.950
SubTotals:			81.98	8.496f	0.008p	0.790	

Least freeboard is 1.686 m at 1.000a

Least freeboard (to margin line) is 1.610 m at 1.000a

Hydrostatic Properties with Damage

Trim: 0.003/24.890, heel: port 0.14 deg.

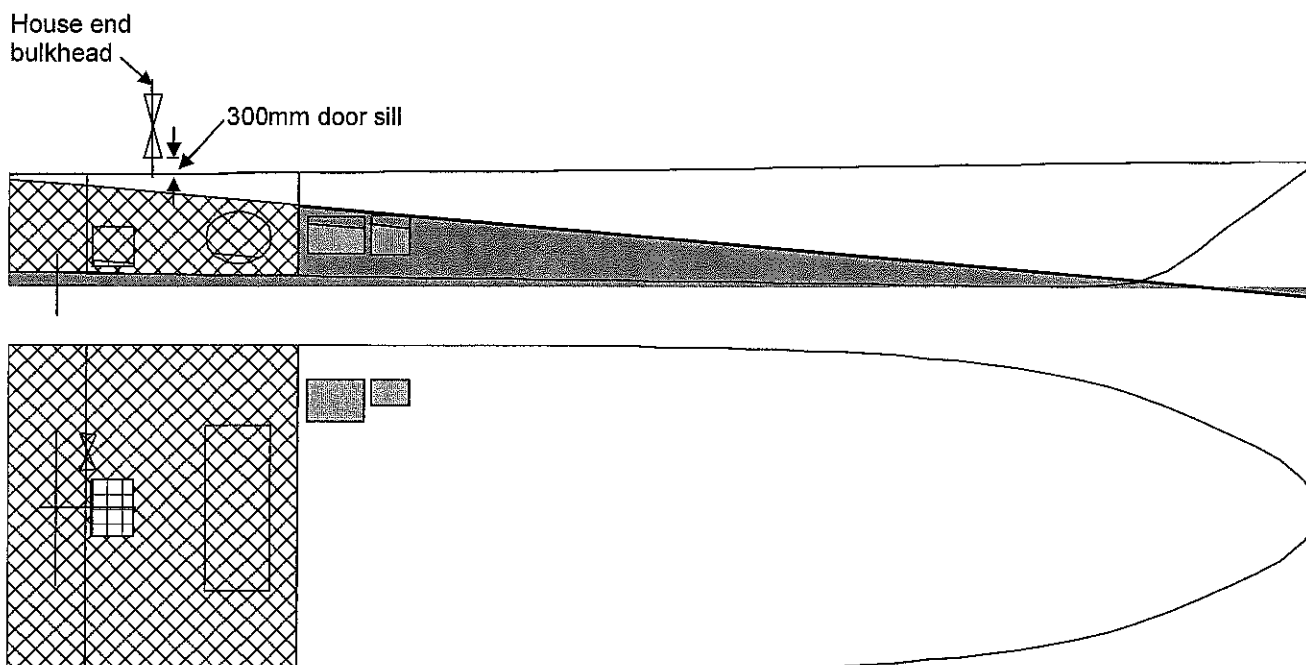
Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.173	81.983	8.496f	0.008p	0.790	115.5	9.147f	54.295	3.474

Water Specific Gravity = 1.025.

II. Condition before damage - Full load arrival

10% fuel, 10% fresh water, Weight of each passenger = 68Kg

Damage Case 1A: Tank Space & Steering Gear Compartment damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	97.99%

Floating Status

Draft FP	-0.085 m	Heel	port 3.01 deg.	GM(Solid)	0.806 m
Draft MS	1.276 m	Equil	Yes	F/S Corr.	0.038 m
Draft AP	2.636 m	Wind	Off	GM(Fluid)	0.768 m
Trim	aft 2.717/24.890	Wave	No	KMt	3.478 m
LCG	8.773f m	VCG	2.678 m	TPcm	0.76
Displacement	78.52 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	18.16	10.022f	0.181p	4.024
Displacement	78.52	8.773f	0.042p	2.678

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.690f	0.397p	0.703	2.81
Subtotals:		10.00%	0.43	3.690f	0.397p	0.703	2.81

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.076f	0.063p	0.556	0.13
Subtotals:		10.00%	0.10	1.076f	0.063p	0.556	0.13

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	97.99%	A %v5.768	5.768f	2.251p	1.291	0.01
NO2 OILYW TK.P	0.980	97.98%	0.42	6.896f	2.426p	1.290	0.01
Subtotals:		97.99%	1.35	6.120f	2.306p	1.290	0.02

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.81%	1.88	5.292f	1.750p	1.117	2.95

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	143.56	5.466f	0.120p	1.240	1.000
AFTER PEAK	Flooded	1.025	-21.37	0.210a	0.094p	1.562	0.950
TANK SPACE	Flooded	1.025	-43.67	2.618f	0.118p	1.422	0.950
SubTotals:			78.52	8.596f	0.128p	1.051	

Least freeboard is -0.060 m at 1.000a

Least freeboard (to margin line) is -0.136 m at 1.000a

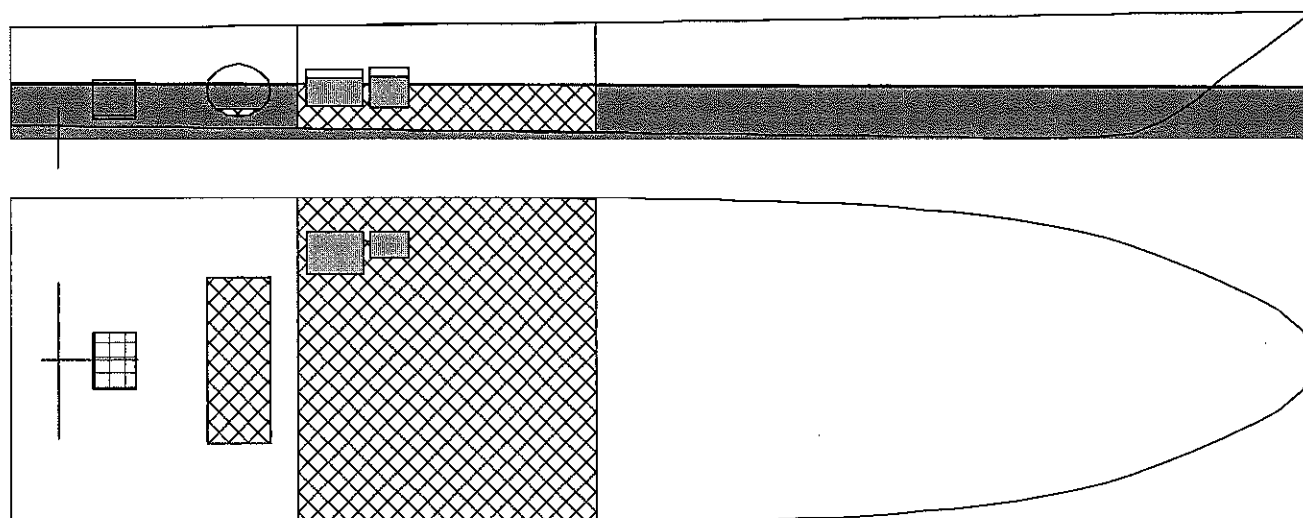
Hydrostatic Properties with Damage

Trim: aft 2.717/24.890, heel: port 3.01 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
2.617	78.518	8.596f	0.128p	1.051	74.4	10.929f	17.450	2.407

Water Specific Gravity = 1.025.

Damage Case 2A: Engine Room damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	98.00%

Floating Status

Draft FP	1.329 m	Heel	port 2.38 deg.	GM(Solid)	1.000 m
Draft MS	1.374 m	Equil	Yes	F/S Corr.	0.038 m
Draft AP	1.419 m	Wind	Off	GM(Fluid)	0.962 m
Trim	aft 0.090/24.890	Wave	No	KMt	3.677 m
LCG	8.773f m	VCG	2.678 m	TPcm	0.92
Displacement	78.52 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	18.16	10.025f	0.180p	4.024
Displacement	78.52	8.773f	0.042p	2.678

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.748f	0.319p	0.696	2.77
Subtotals:		10.00%	0.43	3.748f	0.319p	0.696	2.77

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.148f	0.050p	0.551	0.12
Subtotals:		10.00%	0.10	1.148f	0.050p	0.551	0.12

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK P	0.980	98.00%	0.93	5.774f	2.253p	1.291	0.06
NO2 OILYW TK P	0.980	98.00%	0.42	6.900f	2.426p	1.290	0.01
Subtotals:		98.00%	1.35	6.126f	2.307p	1.290	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.82%	1.88	5.314f	1.733p	1.115	2.96

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	108.05	8.570f	0.120p	0.910	1.000
ENGINE ROOM	Flooded	1.025	-29.54	8.046f	0.132p	0.912	0.850
SubTotals:			78.52	8.767f	0.115p	0.910	

Least freeboard is 1.301 m at 1.000a

Least freeboard (to margin line) is 1.225 m at 1.000a

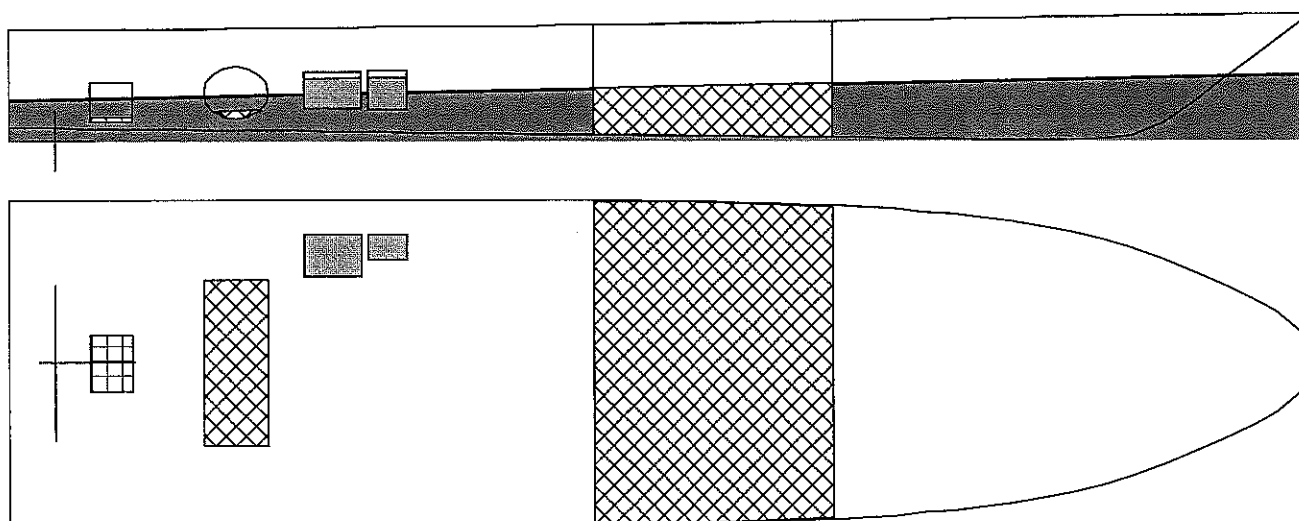
Hydrostatic Properties with Damage

Trim: aft 0.090/24.890, heel: port 2.38 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.418	78.518	8.767f	0.115p	0.910	89.5	9.875f	60.654	2.732

Water Specific Gravity = 1.025.

Damage Case 3A: Void Fr.9-Fr13 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	97.99%

Floating Status

Draft FP	1.690 m	Heel	port 1.79 deg.	GM(Solid)	1.327 m
Draft MS	1.394 m	Equil	Yes	F/S Corr.	0.038 m
Draft AP	1.098 m	Wind	Off	GM(Fluid)	1.289 m
Trim	fwd 0.592/24.890	Wave	No	KMt	4.003 m
LCG	8.773f m	VCG	2.678 m	TPcm	1.00
Displacement	78.52 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	18.16	10.025f	0.178p	4.024
Displacement	78.52	8.773f	0.041p	2.678

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u

Total Fixed:	76.64	8.858f	0.000	2.716u
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Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.763f	0.250p	0.694	2.78
Subtotals:		10.00%	0.43	3.763f	0.250p	0.694	2.78

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.166f	0.037p	0.551	0.12
Subtotals:		10.00%	0.10	1.166f	0.037p	0.551	0.12

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	97.99%	0.93	5.778f	2.252p	1.290	0.04
NO2 OILYW TK.P	0.980	98.00%	0.42	6.901f	2.426p	1.290	0.01
Subtotals:		97.99%	1.35	6.129f	2.306p	1.290	0.05

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.77%	1.88	5.320f	1.716p	1.115	2.95

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	100.73	9.887f	0.095p	0.891	1.000
VOID FR9-FR13	Flooded	1.025	-22.21	13.673f	0.087p	0.950	0.950
SubTotals:			78.52	8.817f	0.097p	0.874	

Least freeboard is 1.496 m at 20.000f

Least freeboard (to margin line) is 1.420 m at 20.000f

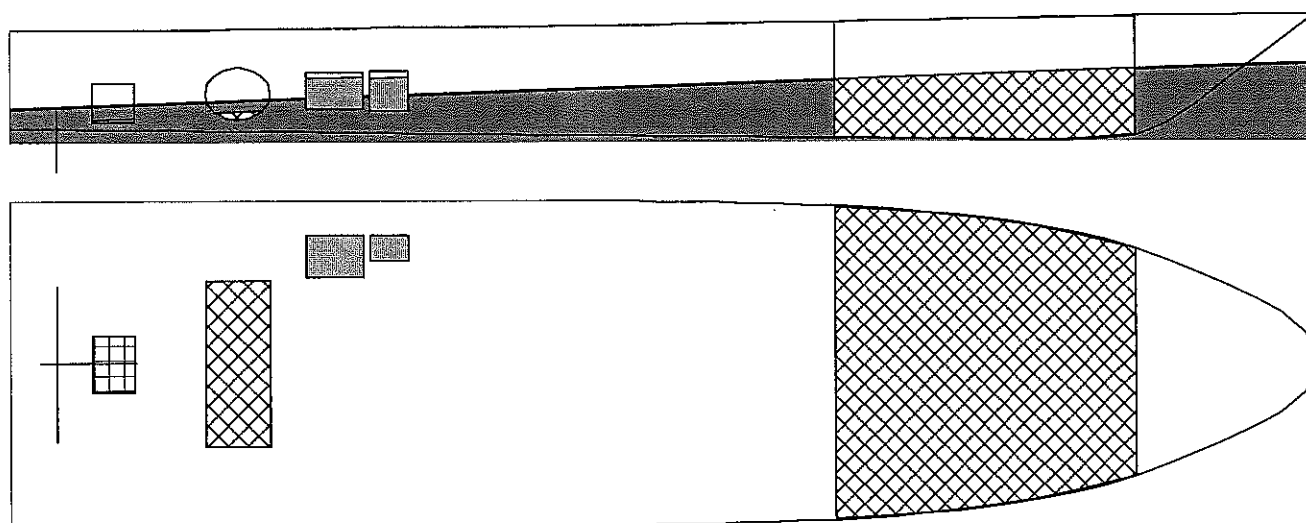
Hydrostatic Properties with Damage

Trim: fwd 0.592/24.890, heel: port 1.79 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m ²)	LCF (m)	BMI (m)	BMt (m)
1.097	78.518	8.817f	0.097p	0.874	97.7	8.762f	60.496	3.094

Water Specific Gravity = 1.025.

Damage Case 4A: Void Fr.13-Fr18 damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	98.00%

Floating Status

Draft FP	1.952 m	Heel	port 1.38 deg.	GM(Solid)	1.704 m
Draft MS	1.425 m	Equil	Yes	F/S Corr.	0.038 m
Draft AP	0.898 m	Wind	Off	GM(Fluid)	1.666 m
Trim	fwd 1.053/24.890	Wave	No	KMt	4.380 m
LCG	8.774f m	VCG	2.678 m	TPcm	1.05
Displacement	78.52 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	18.16	10.026f	0.177p	4.024
Displacement	78.52	8.774f	0.041p	2.678

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
FORE PEAK	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.773f	0.200p	0.693	2.86
Subtotals:		10.00%	0.43	3.773f	0.200p	0.693	2.86

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.179f	0.029p	0.551	0.12
Subtotals:		10.00%	0.10	1.179f	0.029p	0.551	0.12

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK.P	0.980	98.00%	0.93	5.779f	2.251p	1.290	0.01
NO2 OILYW TK.P	0.980	98.00%	0.42	6.902f	2.426p	1.290	0.01
Subtotals:		98.00%	1.35	6.130f	2.305p	1.290	0.02

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.75%	1.88	5.324f	1.704p	1.114	3.01

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	98.73	10.909f	0.075p	0.916	1.000
VOID FR13-FR18	Flooded	1.025	-20.21	18.904f	0.037p	1.147	0.950
SubTotals:			78.52	8.850f	0.085p	0.856	

Least freeboard is 1.244 m at 26.200f

Least freeboard (to margin line) is 1.168 m at 26.200f

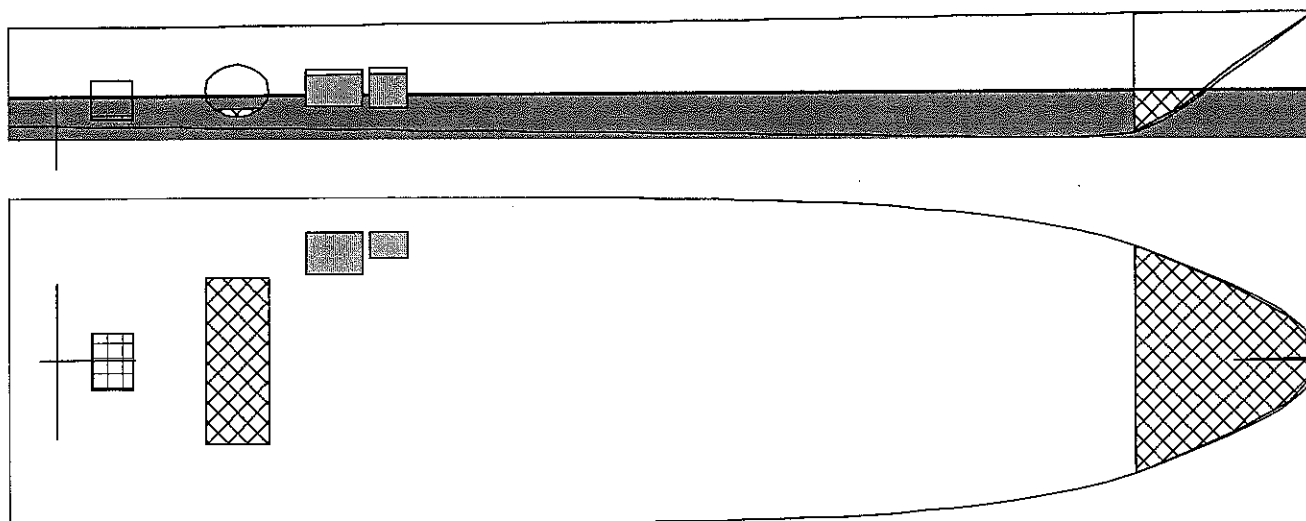
Hydrostatic Properties with Damage

Trim: fwd 1.053/24.890, heel: port 1.38 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m ²)	LCF (m)	BMI (m)	BMt (m)
0.897	78.518	8.850f	0.085p	0.856	102.4	8.074f	41.637	3.490

Water Specific Gravity = 1.025.

Damage Case 5A: Fore Peak damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.43	10.00%
FRESH WATER		.10	10.00%
Oily WATER		1.35	98.00%

Floating Status

Draft FP	1.234 m	Heel	port 1.36 deg.	GM(Solid)	1.719 m
Draft MS	1.163 m	Equil	Yes	F/S Corr.	0.038 m
Draft AP	1.092 m	Wind	Off	GM(Fluid)	1.682 m
Trim	fwd 0.142/24.890	Wave	No	KMt	4.397 m
LCG	8.773f m	VCG	2.678 m	TPcm	1.18
Displacement	78.52 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	18.16	10.025f	0.177p	4.024
Displacement	78.52	8.773f	0.041p	2.678

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u
PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status**SEA WATER**

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
AFTER PEAK	1.025	<empty>					
ENGINE ROOM	1.025	<empty>					
TANK SPACE	1.025	<empty>					
VOID FR13-FR18	1.025	<empty>					
VOID FR9-FR13	1.025	<empty>					

FUEL OIL

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FO TANK	0.850	10.00%	0.43	3.753f	0.200p	0.692	2.78
Subtotals:		10.00%	0.43	3.753f	0.200p	0.692	2.78

FRESH WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW TANK	1.000	10.00%	0.10	1.154f	0.029p	0.550	0.12
Subtotals:		10.00%	0.10	1.154f	0.029p	0.550	0.12

Oily WATER

Tank Name	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
NO1 OILYW TK P	0.980	98.00%	0.93	5.776f	2.252p	1.290	0.06
NO2 OILYW TK P	0.980	98.00%	0.42	6.900f	2.426p	1.290	0.01
Subtotals:		98.00%	1.35	6.127f	2.306p	1.290	0.07

All Tanks

	Spgr	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:		0.62%	1.88	5.316f	1.704p	1.114	2.98

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	78.85	8.843f	0.086p	0.777	1.000
FORE PEAK	Flooded	1.025	-0.33	22.923f	0.004p	0.976	0.950
SubTotals:			78.52	8.784f	0.086p	0.776	

Least freeboard is 1.699 m at 1.000a

Least freeboard (to margin line) is 1.623 m at 1.000a

Hydrostatic Properties with Damage

Trim: fwd 0.142/24.890, heel: port 1.36 deg.

Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m2)	LCF (m)	BMI (m)	BMt (m)
1.092	78.518	8.784f	0.086p	0.776	115.5	9.196f	57.054	3.584

Water Specific Gravity = 1.025.

COMMISSION OF INQUIRY
APPOINTED PURSUANT TO SECTION 2 OF
THE COMMISSIONS OF INQUIRY
ORDINANCE (CHAPTER 86) ON 22 OCTOBER 2012

SUPPLEMENTAL WITNESS STATEMENT OF
LO NGOK YANG

Filed on the 18th day of January 2013.

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