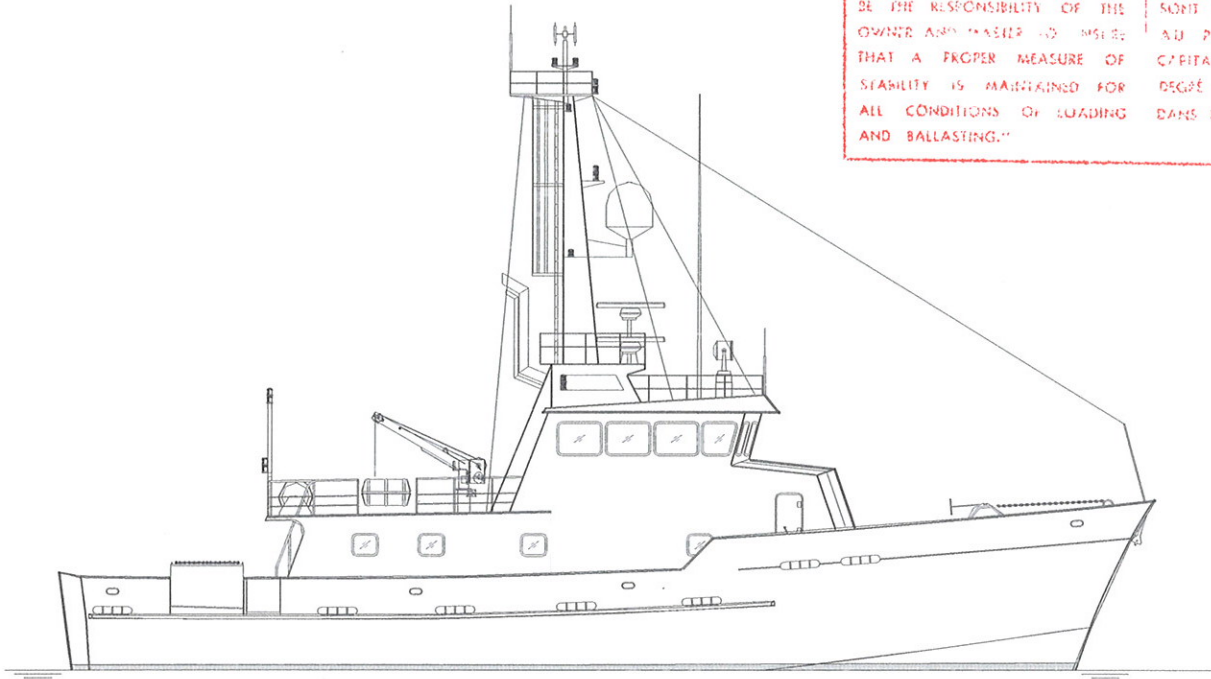


ARROW POST

"SUBJECT TO THE OWNER, HIS SHIPBUILDER OR NAVAL ARCHITECT BEING RESPONSIBLE FOR THE ACCURACY OF THE DESIGN OPERATING CONDITIONS PRESENTED HEREIN AND OF THE BASIC DATA FROM WHICH SUCH CONDITIONS WERE DEVELOPED, IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND MASTER TO INSURE THAT A PROPER MEASURE OF STABILITY IS MAINTAINED FOR ALL CONDITIONS OF LOADING AND BALLASTING."

"SOUS RÉSERVE QUE LE PROPRIÉTAIRE, SON ARCHITECTE NAVAL OU LE CONSTRUCTEUR DE NAVIRES SONT RESPONSABLES DE DÉVELOPPER LES CONDITIONS D'OPÉRATIONS SOUMISES ET LES CARACTÉRISTIQUES DE BASE À PARTIR DESQUELLES LES CONDITIONS SONT ÉLABORÉES, IL INCOMBE AU PROPRIÉTAIRE ET AU CAPITAINE DE MAINTENIR UN DEGRÉ APPROPRIÉ DE STABILITÉ DANS TOUTES LES CONDITIONS DE CHARGEMENT."



Trim & Stability Booklet

SUBJECT TO THE ANGLE OF DOWNFLOODING BEING IN EXCESS OF 40°

Prepared by:



MERLION
MARINE SERVICES INC.

MerLion Marine Services
PO Box 75447
White Rock, B.C. V4B 5L5

Project No. 2009-004
Revision No.: 0
Date: March, 2009

Transport Canada

Transports Canada

APPROVED

ON THE AUTHORITY OF THE CANADA SHIPPING ACT AND REGULATIONS MADE THEREUNDER.

[Signature]

ON BEHALF OF THE BOARD OF STEAMSHIP INSPECTION, DEPARTMENT OF TRANSPORT.

APPROUVÉ

EN VERTU DE LA LOI SUR LA MARINE MARCHANDE DU CANADA ET DES RÈGLEMENTS CONNEXES.

POUR LE COMPTE DU BUREAU D'INSPECTION DES NAVIRES À VAPEUR, MINISTÈRE DES TRANSPORTS.

Nov-19-09

DATE

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ARROW POST
TRIM & STABILITY

INTRODUCTION

TRIM & STABILITY

MANUAL OBJECTIVE

The Trim & Stability Manual is to be placed aboard the vessel for the use of the Master.

This Trim & Stability Manual is additional to the instructions, records, and manuals, such as the Emergency Procedures Manual, Maintenance Record for Lifesaving and Emergency Equipment, etc.

This Manual provides the following information:

- a) A general description of the vessel, its hydrostatic properties, and all necessary data for the computation of the vessel's trim and stability characteristics;
- b) A copy of the Report of Inclining Experiment for the vessel; and
- c) Tank data in the form of Tank Calibration Tables.

RESPONSIBILITIES

It is the responsibility of the Master to ensure that the vessel is operated within the Rules and Regulations of the Canada Shipping Act.

It is the responsibility of the Master to ensure that the vessel remains in compliance with the appropriate stability criteria at all times; in particular, reference is made the Standard Stab 6 – STANDARD FOR INTACT STABILITY NON-PASSENGER SHIPS AND PASSENGER SHIPS CARRYING NOT MORE THAN 12 PASSENGERS, from TP7301 – Stability, Subdivision and Load Line Standards. It is the responsibility of the Master to be aware of the current stability status at all times. It is recommended that the stability condition of the vessel be checked at least once a week.

Compliance with the stability criteria does not insure immunity against capsizing or foundering regardless of the circumstances; neither does such compliance absolve the Master from his responsibilities. The Master should therefore exercise prudence and good seamanship having regard to the season of the year, weather forecasts, and the navigational zone in which he is operating, and appropriate action should be taken.

Before operations commence, care should be taken to ensure that cargo and items of equipment have been properly stowed and lashed so as to minimize the possibility of shifting while at sea under the effects of rolling and pitching.

NOTE: Calculations in this booklet have been performed by computer. Calculations derived by hand will arrive at similar, but not identical, numerical results.

TRIM & STABILITY

DEFINITIONS

Length between Perpendiculars

The length between Perpendiculars is taken from the draft marks, and is measured as 25.50 metres.

Amidships

Amidships is located at Station 5 on the lines plan, which is 11.95m forward of the centerline of the rudder stock, 12.25m forward of the aft draft marks.

Lightship

The Lightship, as determined from the inclining experiment, is 204.947 tonnes, with a centre of gravity 3.904 metres above the Hydrostatic Baseline, 0.016 metres off centerline to port, and 0.375 metres aft of amidships.

Baseline

The Hydrostatic Baseline is taken at the bottom of the keel amidships. This baseline is used for all calculations in this manual.

Drafts

Draft marks are fitted 12.25m aft of amidships (0.30m aft of the centerline of the rudder stock), and along the stem. For the purposes of this manual, forward drafts are taken 13.25m forward of amidships.

Aft draft marks are measured from the bottom of the skegs, 0.458 metres below the hydrostatic baseline. Forward draft marks are measured from the extension of the keel, and are 0.625 metres above the hydrostatic baseline.

Downflooding Points

There are two downflooding points taken into consideration in this manual.

The Galley Vent is located 2.85m aft of amidships, 1.30m off centerline to starboard, and 7.70m above the baseline.

The Engine Room Air Intake is located 1.70m aft of amidships, 1.10m off centerline to port, and 8.340m above the baseline.

TRIM & STABILITY

STAB-6

STANDARD FOR INTACT STABILITY OF NON-PASSENGER SHIPS AND PASSENGER SHIPS CARRYING NOT MORE THAN 12 PASSENGERS

1 The provisions of this standard do not apply to the following:

- (i) Ships built or converted for towing, and
- (ii) Fishing vessels.

2 The following intact stability criteria should be complied with for non-passenger ships and for passenger ships carrying not more than 12 passengers.

- (i) The area under the righting lever (GZ) curve should not be less than 0.055 metre-radians (10.34 ft-⁹) up to 30 degrees angle of heel, and not less than 0.09 metre-radians (16.92 ft-⁹) up to 40 degrees or the angle of downflooding if this angle is less than 40 degrees. Additionally, the area under the righting lever (GZ) curve between the angle of heel of 30 degrees and 40 degrees, or between 30 degrees and the angle of downflooding if this angle is less than 40 degrees, should be not less than 0.03 metre-radians (5.64 ft-⁹).
- (ii) The righting lever GZ should be at least 0.20 metres (0.656 ft) at an angle of heel equal to or greater than 30 degrees.
- (iii) The maximum righting lever (GZ) should occur at an angle of heel preferably exceeding 30 degrees but not less than 25 degrees.
- (iv) The initial metacentric height (GM) should not be less than 0.15 metres (0.492 ft).

3 The criteria mentioned in Section 2 give minimum values but no maximum values. However, it is advisable to avoid excessive values as these might lead to acceleration forces which could be prejudicial to the ship, it's complement, or it's equipment.



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CHARACTERISTICS OF THE SHIP



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GENERAL PARTICULARS OF THE SHIP

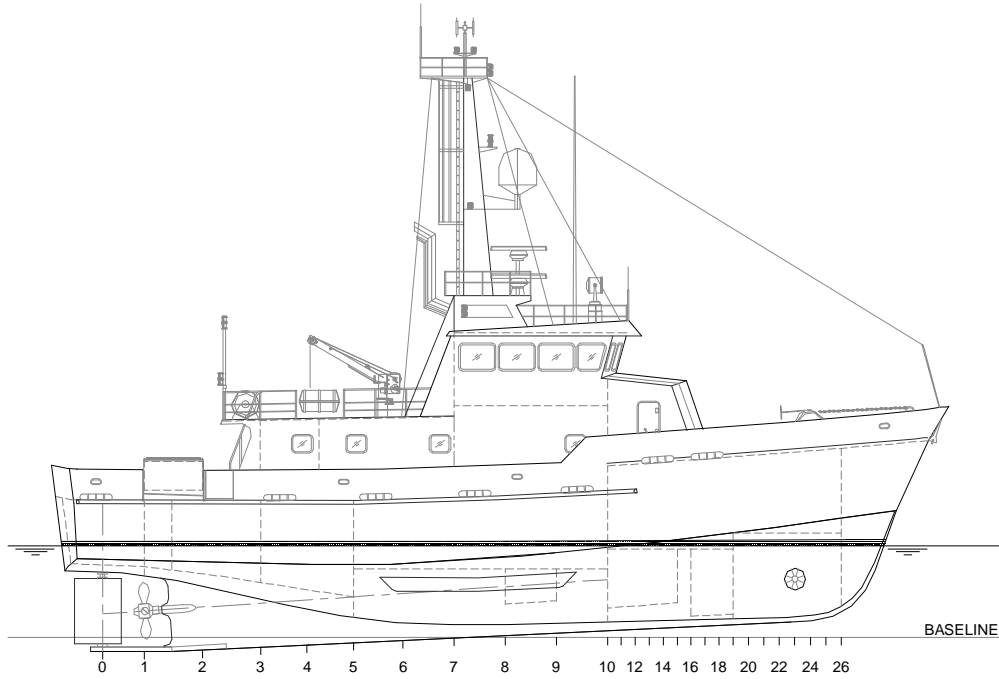
NAME	ARROW POST
TYPE OF VESSEL	Fisheries Patrol Vessel
OFFICIAL NUMBER	814696
PORT OF REGISTRY	Ottawa, Ontario
NUMBER OF CREW	6
SUPERNUMERARIES	6
LENGTH OF HULL	28.97 m
LENGTH BETWEEN PERPENDICULARS	25.50 m
BEAM (hull)	8.80 m
DEPTH (keel to deck)	4.07 m
CLASS OF VOYAGES	Home Trade II
GROSS TONNAGE	228.33
NET TONNAGE	93.10
BUILDER	Hike Metal Products Wheatley, Ontario
YEAR BUILT	1991

NOTES: **BASELINE** Draft is the draft to the hydrostatic baseline
USK Draft is the draft to the bottom of the keel.

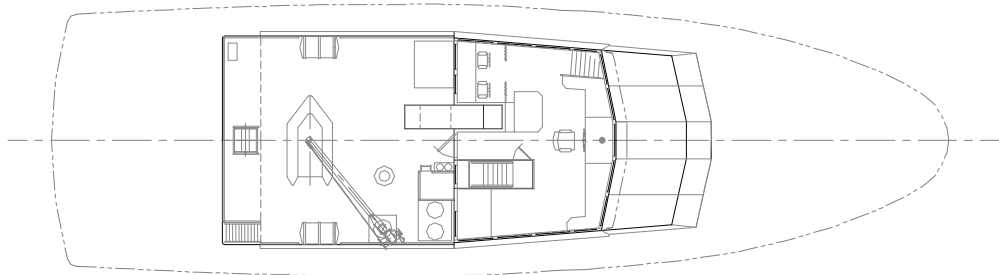
Length between Perpendiculars is nominal. Draft marks are located at the ends of the vessel.

TRIM & STABILITY

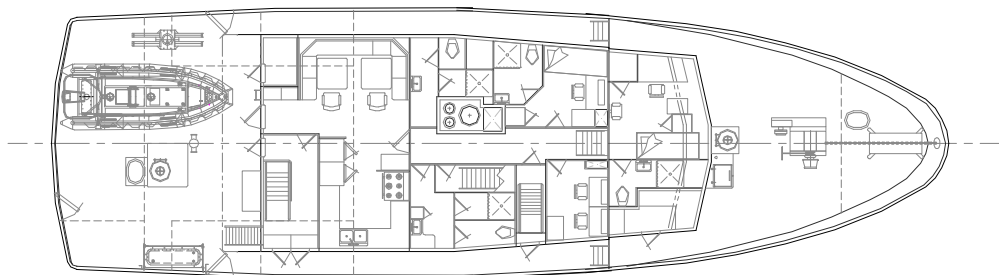
GENERAL ARRANGEMENT



OUTBOARD PROFILE

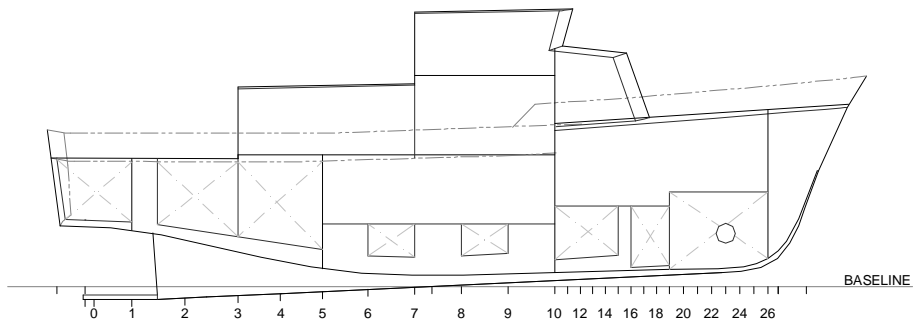


UPPER DECK PLAN

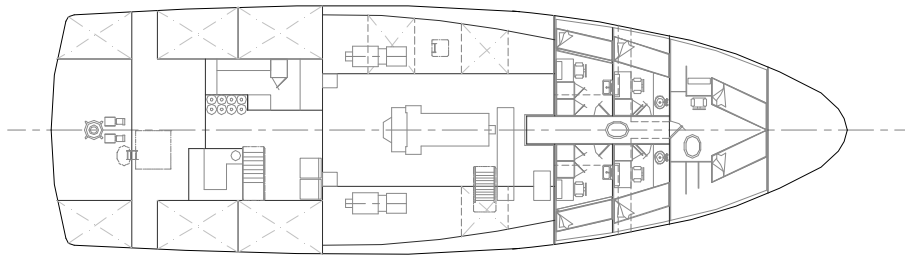


MAIN DECK PLAN

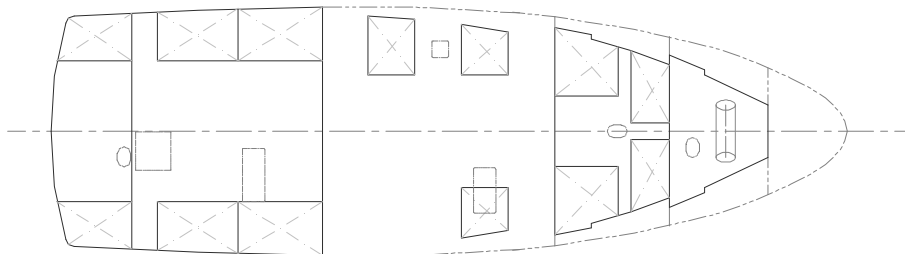
ARROW POST
TRIM & STABILITY



CENTRELINE ELEVATION



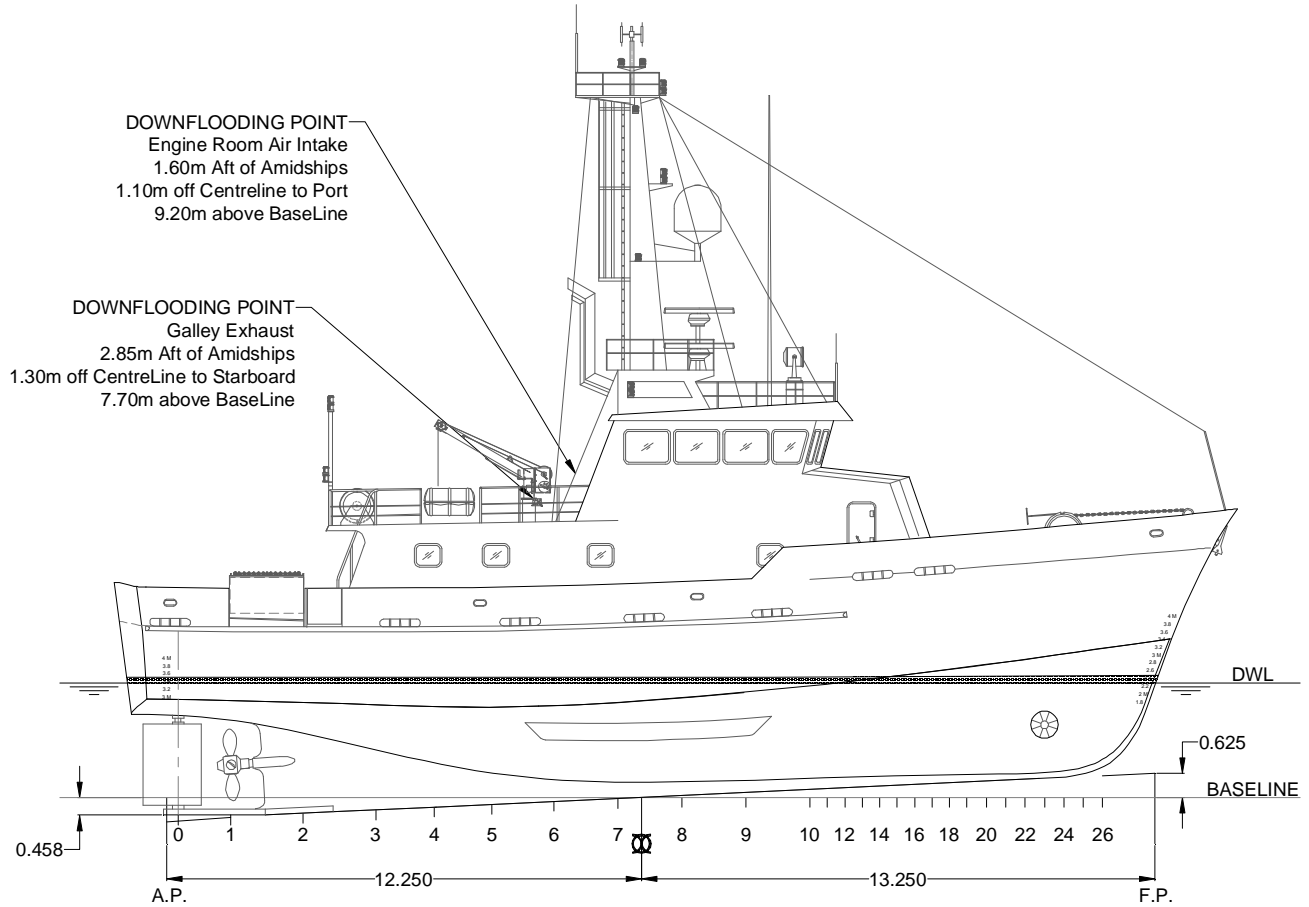
BELOW DECK PLAN



TANK PLAN

TRIM & STABILITY

LOCATION OF DRAFT MARKS





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TRIM & STABILITY

HYDROSTATIC CHARACTERISTICS

0.5m Forward Trim

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HYDROSTATIC PROPERTIES
Trim: Fwd 0.500/25.500, No Heel, VCG = 0.000

Draft@ Origin	Displacement Weight(MT)	Buoyancy-Ctr.		weight/ cm	Moment/ cm trim		KML	KMT
		LCB	VCB		LCF			
2.500	168.84	0.566f	1.772	1.61	1.233a	2.58	38.91	5.675
2.550	177.00	0.479f	1.805	1.66	1.413a	2.73	39.37	5.730
2.600	185.37	0.390f	1.839	1.70	1.559a	2.87	39.50	5.778
2.650	193.93	0.301f	1.872	1.73	1.678a	2.99	39.33	5.800
2.700	202.65	0.214f	1.905	1.76	1.758a	3.09	38.91	5.819
2.750	211.48	0.131f	1.938	1.77	1.799a	3.16	38.10	5.783
2.800	220.38	0.053f	1.970	1.79	1.791a	3.21	37.11	5.733
2.850	229.34	0.019a	2.002	1.80	1.783a	3.24	36.02	5.654
2.900	238.34	0.086a	2.034	1.81	1.763a	3.28	35.08	5.598
2.950	247.39	0.147a	2.065	1.81	1.758a	3.31	34.12	5.531
3.000	256.48	0.204a	2.096	1.82	1.752a	3.34	33.22	5.469
3.050	265.62	0.256a	2.127	1.83	1.729a	3.38	32.47	5.428
3.100	274.80	0.306a	2.158	1.84	1.726a	3.41	31.67	5.376
3.150	284.02	0.351a	2.188	1.85	1.707a	3.46	31.02	5.338
3.200	293.28	0.394a	2.218	1.86	1.692a	3.50	30.38	5.299
3.250	302.58	0.434a	2.248	1.87	1.676a	3.54	29.79	5.262
3.300	311.93	0.471a	2.278	1.87	1.675a	3.56	29.14	5.225
3.350	321.31	0.506a	2.308	1.88	1.659a	3.61	28.61	5.195
3.400	330.73	0.539a	2.337	1.89	1.636a	3.64	28.07	5.166
3.450	340.18	0.569a	2.366	1.89	1.636a	3.67	27.53	5.137
3.500	349.68	0.598a	2.396	1.90	1.620a	3.72	27.10	5.113
3.550	359.21	0.625a	2.425	1.91	1.605a	3.76	26.69	5.091
3.600	368.77	0.650a	2.454	1.92	1.602a	3.79	26.22	5.070
3.650	378.37	0.674a	2.483	1.92	1.587a	3.84	25.85	5.052
3.700	388.01	0.696a	2.512	1.93	1.577a	3.88	25.46	5.036
3.750	397.68	0.718a	2.540	1.94	1.566a	3.92	25.11	5.021
3.800	407.38	0.738a	2.569	1.94	1.555a	3.96	24.76	5.008
3.850	417.12	0.757a	2.598	1.95	1.546a	4.00	24.42	4.997
3.900	426.89	0.775a	2.626	1.96	1.538a	4.03	24.08	4.987
3.950	436.69	0.792a	2.655	1.96	1.530a	4.07	23.77	4.979
4.000	446.52	0.808a	2.683	1.97	1.517a	4.11	23.44	4.971

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
Trim is per 25.50m.

Draft is from Baseline.



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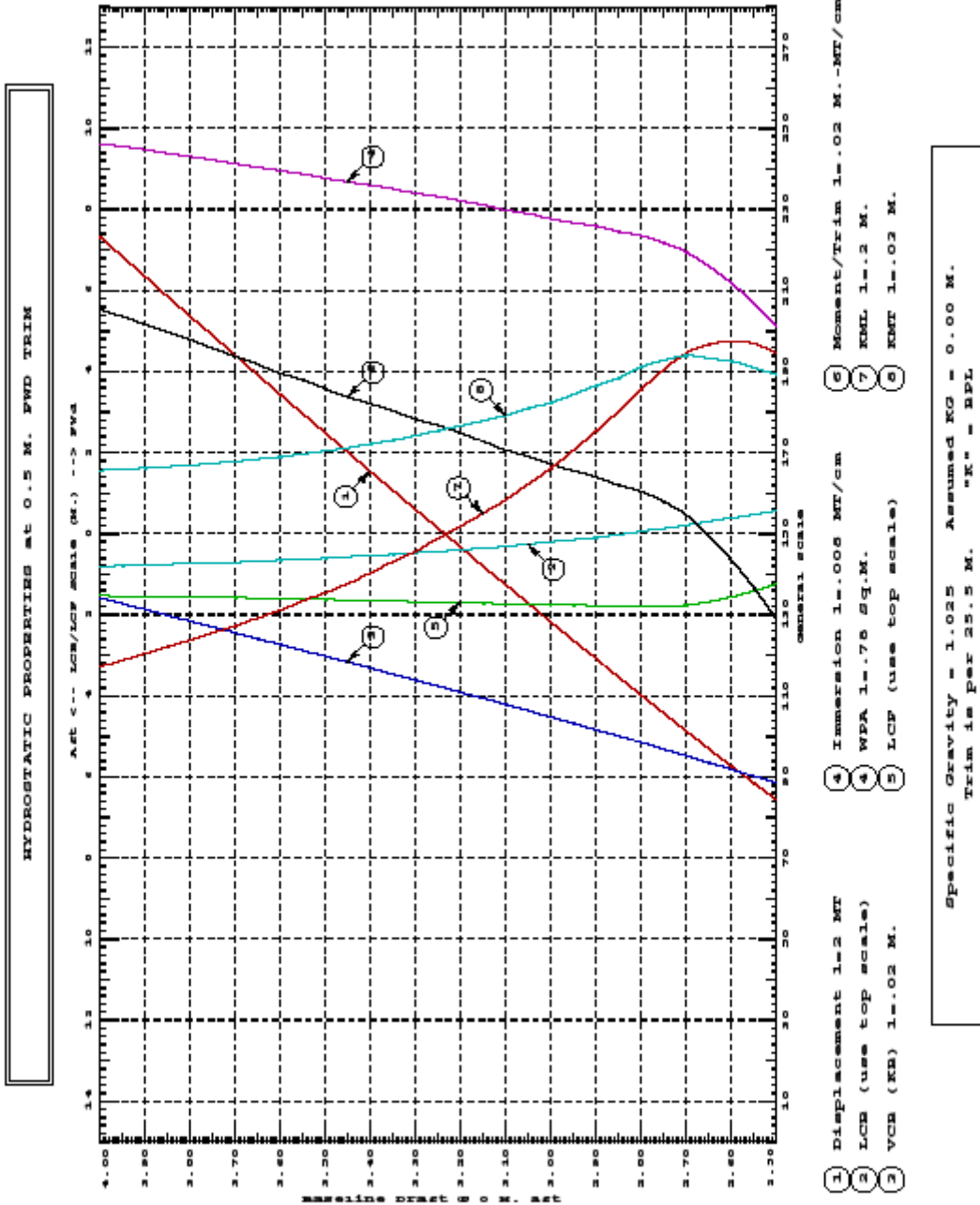
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TRIM & STABILITY

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Merlion Marine Services
ARROW POST

9004





ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

Level Trim

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HYDROSTATIC PROPERTIES
No Trim, No Heel, VCG = 0.000

Draft@ Origin	Displacement Weight(MT)	Buoyancy-Ctr. LCB	weight/ VCB	cm	LCF	Moment/ cm trim	KML	KMT
2.500	174.34	0.272a	1.787	1.71	2.009a	2.95	43.13	6.124
2.550	182.96	0.355a	1.822	1.73	2.015a	3.00	41.88	6.065
2.600	191.64	0.430a	1.856	1.74	1.997a	3.04	40.47	5.963
2.650	200.38	0.498a	1.889	1.75	1.976a	3.08	39.17	5.883
2.700	209.17	0.559a	1.922	1.76	1.961a	3.11	37.96	5.795
2.750	218.02	0.616a	1.955	1.77	1.940a	3.15	36.86	5.729
2.800	226.91	0.668a	1.987	1.78	1.927a	3.19	35.80	5.653
2.850	235.85	0.715a	2.019	1.79	1.917a	3.22	34.81	5.583
2.900	244.84	0.759a	2.050	1.80	1.895a	3.26	33.94	5.536
2.950	253.87	0.799a	2.082	1.81	1.886a	3.29	33.06	5.476
3.000	262.95	0.836a	2.112	1.82	1.864a	3.33	32.31	5.435
3.050	272.08	0.871a	2.143	1.83	1.858a	3.36	31.52	5.382
3.100	281.24	0.903a	2.173	1.84	1.851a	3.40	30.79	5.334
3.150	290.44	0.932a	2.204	1.85	1.818a	3.43	30.14	5.304
3.200	299.69	0.960a	2.234	1.85	1.815a	3.47	29.49	5.263
3.250	308.97	0.985a	2.263	1.86	1.811a	3.50	28.86	5.225
3.300	318.29	1.009a	2.293	1.87	1.790a	3.54	28.35	5.200
3.350	327.65	1.031a	2.322	1.88	1.775a	3.58	27.85	5.173
3.400	337.05	1.052a	2.352	1.88	1.771a	3.61	27.31	5.144
3.450	346.48	1.071a	2.381	1.89	1.755a	3.65	26.86	5.121
3.500	355.96	1.089a	2.410	1.90	1.739a	3.69	26.45	5.099
3.550	365.47	1.106a	2.439	1.91	1.736a	3.72	25.97	5.077
3.600	375.02	1.122a	2.468	1.91	1.720a	3.77	25.60	5.060
3.650	384.60	1.137a	2.497	1.92	1.717a	3.80	25.17	5.042
3.700	394.21	1.151a	2.526	1.93	1.696a	3.84	24.82	5.027
3.750	403.86	1.164a	2.554	1.93	1.680a	3.88	24.50	5.014
3.800	413.55	1.176a	2.583	1.94	1.677a	3.91	24.13	5.002
3.850	423.26	1.187a	2.611	1.95	1.662a	3.96	23.84	4.991
3.900	433.01	1.198a	2.640	1.95	1.656a	3.99	23.51	4.982
3.950	442.80	1.208a	2.668	1.96	1.644a	4.03	23.22	4.974
4.000	452.61	1.217a	2.697	1.97	1.632a	4.07	22.95	4.968

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
Trim is per 25.50m.

Draft is from Baseline.



ARROW POST

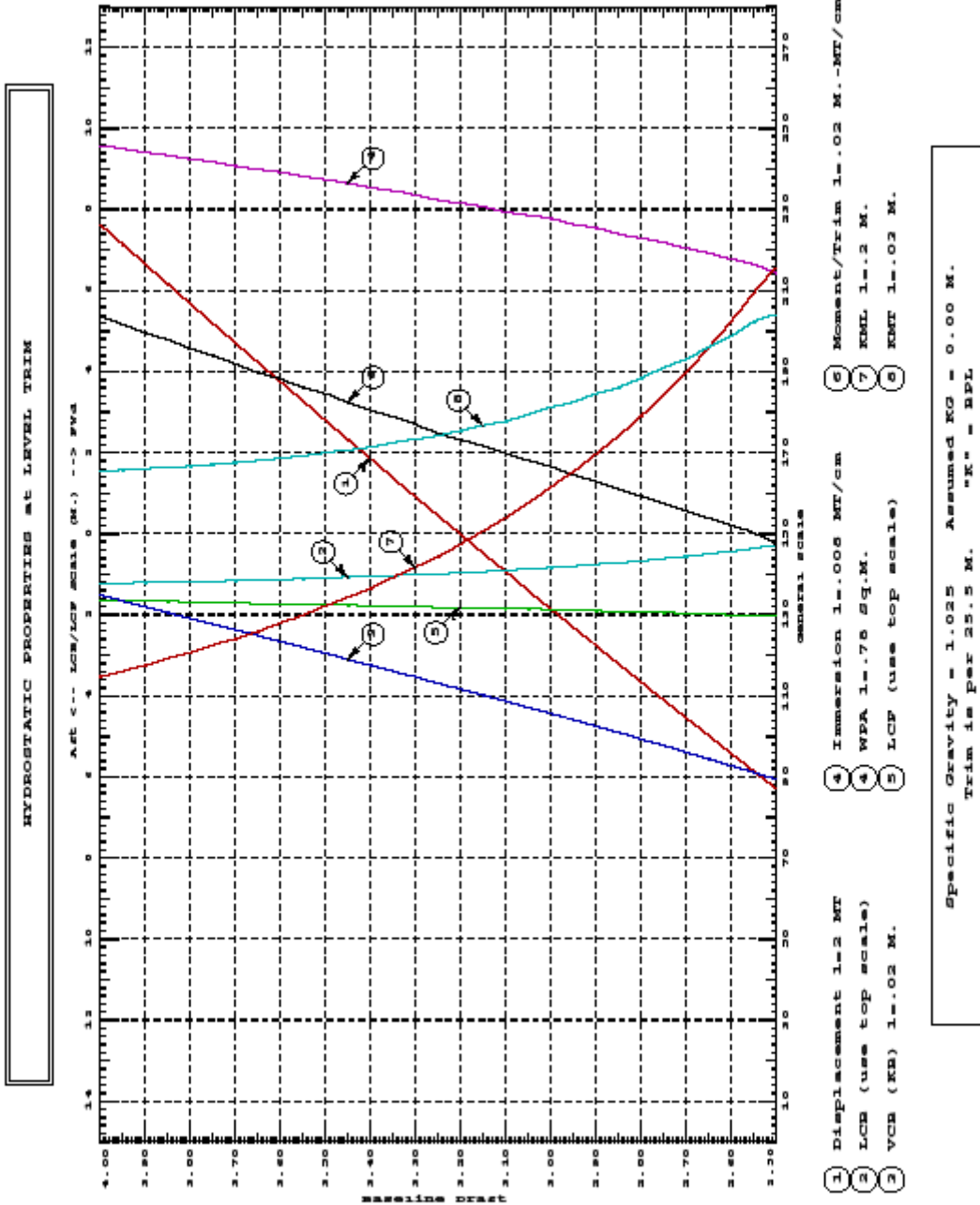
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January, 2009

TRIM & STABILITY

0.5m Aft Trim

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HYDROSTATIC PROPERTIES

Trim: Aft 0.500/25.500, No Heel, VCG = 0.000

Draft@ Origin	Displacement Weight(MT)	Buoyancy-Ctr.		weight/ cm	Moment/ cm trim		KML	KMT
		LCB	VCB		LCF			
2.500	181.46	1.122a	1.823	1.71	2.192a	2.94	41.24	6.052
2.550	190.06	1.170a	1.857	1.73	2.167a	2.98	39.91	5.962
2.600	198.72	1.213a	1.890	1.74	2.144a	3.01	38.68	5.877
2.650	207.43	1.252a	1.923	1.75	2.123a	3.05	37.53	5.794
2.700	216.20	1.286a	1.955	1.76	2.101a	3.09	36.44	5.727
2.750	225.02	1.318a	1.987	1.77	2.083a	3.13	35.43	5.654
2.800	233.89	1.347a	2.018	1.78	2.066a	3.16	34.49	5.588
2.850	242.82	1.373a	2.049	1.79	2.045a	3.20	33.62	5.538
2.900	251.78	1.396a	2.080	1.80	2.024a	3.23	32.73	5.479
2.950	260.79	1.418a	2.111	1.81	2.006a	3.27	31.98	5.435
3.000	269.85	1.437a	2.141	1.82	1.989a	3.31	31.25	5.391
3.050	278.95	1.455a	2.171	1.82	1.979a	3.34	30.54	5.344
3.100	288.09	1.471a	2.201	1.84	1.955a	3.38	29.94	5.314
3.150	297.28	1.486a	2.231	1.84	1.947a	3.42	29.29	5.273
3.200	306.51	1.500a	2.260	1.85	1.939a	3.45	28.69	5.236
3.250	315.77	1.513a	2.290	1.86	1.932a	3.48	28.11	5.202
3.300	325.08	1.524a	2.319	1.87	1.907a	3.52	27.64	5.182
3.350	334.43	1.535a	2.348	1.87	1.900a	3.56	27.12	5.153
3.400	343.81	1.545a	2.377	1.88	1.895a	3.59	26.61	5.126
3.450	353.23	1.554a	2.406	1.89	1.869a	3.63	26.19	5.109
3.500	362.68	1.562a	2.435	1.89	1.865a	3.66	25.73	5.086
3.550	372.17	1.569a	2.464	1.90	1.849a	3.70	25.35	5.070
3.600	381.70	1.576a	2.493	1.91	1.832a	3.74	24.99	5.054
3.650	391.26	1.582a	2.521	1.92	1.828a	3.77	24.59	5.037
3.700	400.86	1.588a	2.550	1.92	1.811a	3.82	24.27	5.025
3.750	410.49	1.593a	2.578	1.93	1.807a	3.85	23.89	5.011
3.800	420.15	1.598a	2.606	1.94	1.788a	3.89	23.60	5.002
3.850	429.85	1.602a	2.635	1.94	1.784a	3.92	23.25	4.991
3.900	439.58	1.606a	2.663	1.95	1.767a	3.97	23.00	4.984
3.950	449.34	1.609a	2.691	1.96	1.762a	4.00	22.68	4.976
4.000	459.13	1.612a	2.719	1.96	1.744a	4.04	22.45	4.970

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
Trim is per 25.50m.

Draft is from Baseline.



ARROW POST

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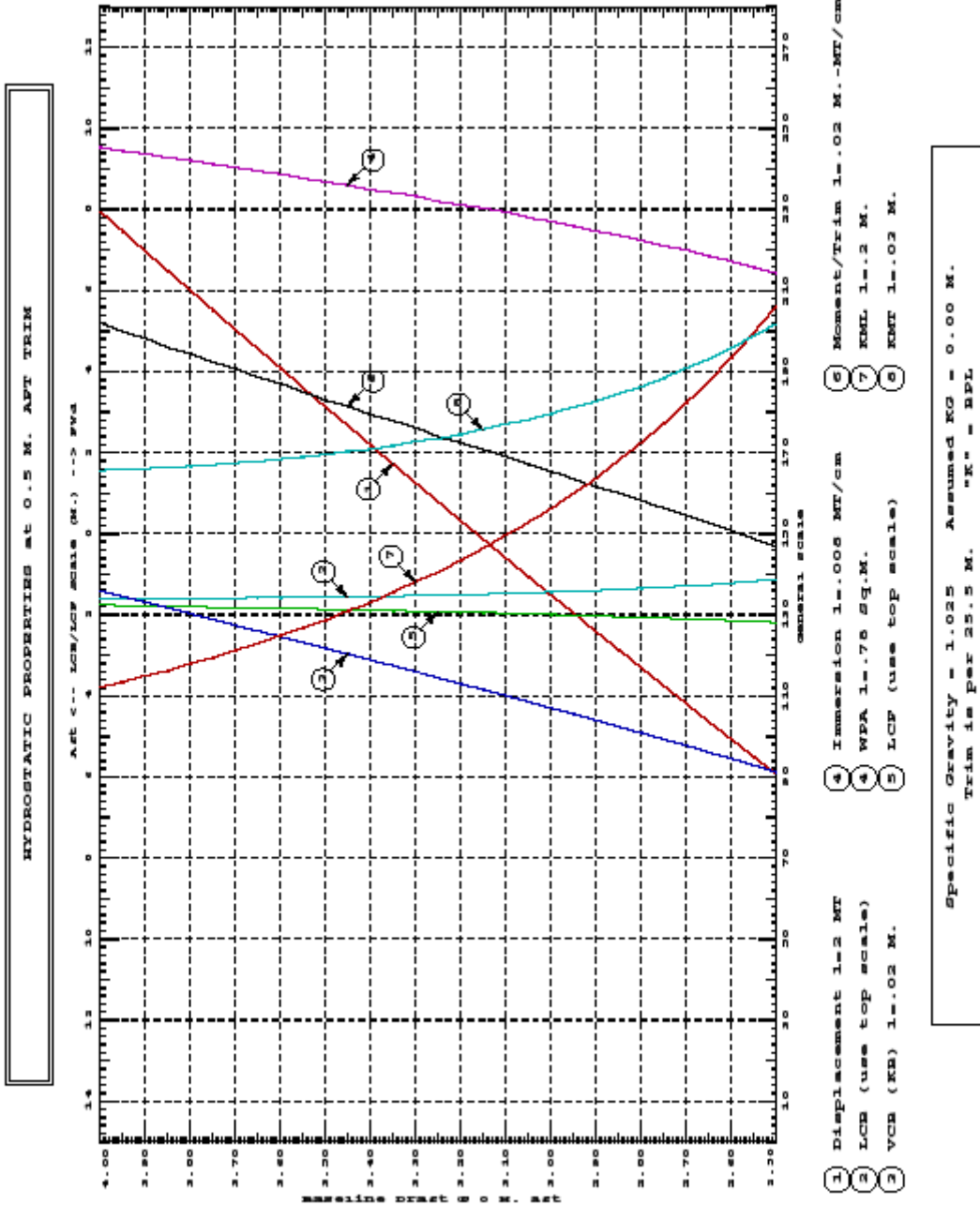
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TRIM & STABILITY

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Merlion Marine Services
ARROW POST

9004





ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

CROSS CURVES OF STABILITY

0.5m Forward Trim

03/13/09 14:35:33
GHS 11.50

Merlion Marine Services
ARROW POST

9004

CROSS CURVES OF STABILITY
Showing righting arms in heel at VCG = 0.00
Trim: Fwd 0.500/25.500 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees						
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s	35.00s
175.00	0.492s	0.948s	1.367s	1.754s	2.114s	2.448s	2.740s
200.00	0.496s	0.953s	1.375s	1.768s	2.134s	2.466s	2.746s
225.00	0.491s	0.951s	1.377s	1.775s	2.146s	2.467s	2.739s
250.00	0.481s	0.943s	1.374s	1.777s	2.145s	2.454s	2.727s
275.00	0.470s	0.932s	1.367s	1.775s	2.130s	2.434s	2.710s
300.00	0.460s	0.918s	1.358s	1.763s	2.106s	2.411s	2.691s
325.00	0.453s	0.905s	1.348s	1.742s	2.078s	2.386s	2.669s
350.00	0.447s	0.894s	1.334s	1.713s	2.049s	2.360s	2.647s
375.00	0.442s	0.885s	1.312s	1.681s	2.019s	2.333s	2.624s
400.00	0.438s	0.877s	1.283s	1.649s	1.989s	2.306s	2.601s
425.00	0.436s	0.867s	1.254s	1.616s	1.959s	2.279s	2.579s
450.00	0.434s	0.850s	1.225s	1.584s	1.928s	2.251s	2.557s

METRIC TONS							@ Deck Edge	
	40.00s	45.00s	50.00s	55.00s	60.00s	Arm	Angle	
175.00	2.990s	3.215s	3.419s	3.607s	3.783s	2.352s	28.52s	
200.00	2.989s	3.210s	3.408s	3.589s	3.768s	2.190s	25.79s	
225.00	2.984s	3.203s	3.399s	3.580s	3.759s	2.021s	23.26s	
250.00	2.974s	3.195s	3.393s	3.577s	3.758s	1.847s	20.90s	
275.00	2.960s	3.185s	3.389s	3.579s	3.763s	1.672s	18.71s	
300.00	2.945s	3.175s	3.386s	3.585s	3.768s	1.498s	16.66s	
325.00	2.928s	3.164s	3.384s	3.589s	3.773s	1.327s	14.75s	
350.00	2.910s	3.154s	3.383s	3.590s	3.775s	1.159s	12.97s	
375.00	2.893s	3.145s	3.380s	3.588s	3.777s	0.994s	11.23s	
400.00	2.877s	3.136s	3.373s	3.584s	3.777s	0.838s	9.55s	
425.00	2.861s	3.127s	3.365s	3.579s	3.776s	0.685s	7.86s	
450.00	2.847s	3.114s	3.354s	3.572s	3.774s	0.536s	6.18s	

Distances in METERS. --- Specific Gravity = 1.025. ---

Cross curves DO include the effectiveness of the deckhouse.

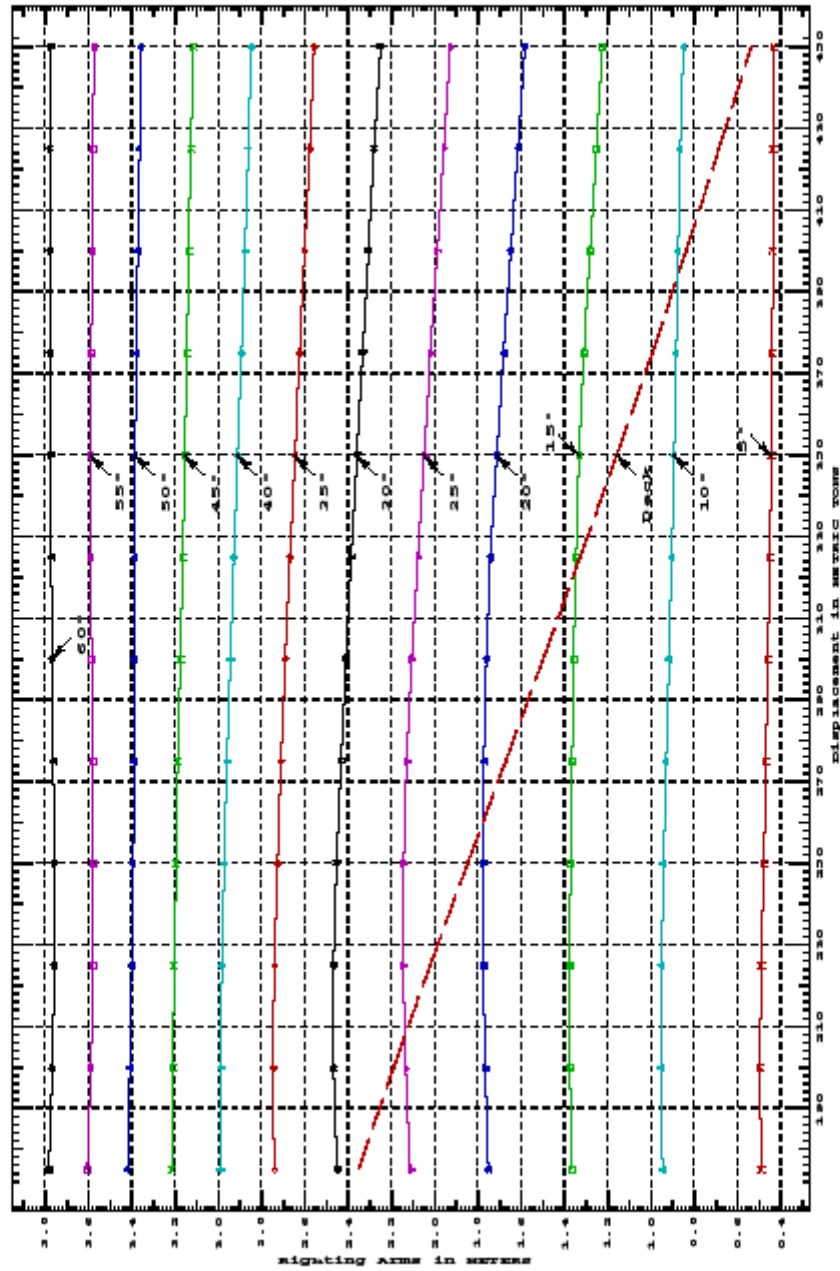
TRIM & STABILITY

03/13/09 18:53:33
GHS 11.50

Merlion Marine Services
ARROW POST

9004

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



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



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

Level Trim

03/13/09 14:35:33
GHS 11.50

Merlion Marine Services
ARROW POST

9004

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

Displacement METRIC TONS	Heel Angles in Degrees						
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s	35.00s
175.00	0.516s	0.983s	1.410s	1.804s	2.169s	2.506s	2.795s
200.00	0.508s	0.978s	1.409s	1.809s	2.180s	2.513s	2.786s
225.00	0.495s	0.967s	1.402s	1.807s	2.182s	2.499s	2.765s
250.00	0.480s	0.952s	1.392s	1.802s	2.169s	2.473s	2.740s
275.00	0.469s	0.935s	1.379s	1.792s	2.143s	2.442s	2.713s
300.00	0.459s	0.918s	1.366s	1.771s	2.109s	2.410s	2.686s
325.00	0.452s	0.904s	1.351s	1.740s	2.073s	2.377s	2.659s
350.00	0.446s	0.893s	1.330s	1.704s	2.036s	2.345s	2.631s
375.00	0.442s	0.884s	1.301s	1.666s	2.000s	2.313s	2.604s
400.00	0.438s	0.876s	1.269s	1.627s	1.964s	2.281s	2.577s
425.00	0.436s	0.861s	1.235s	1.589s	1.929s	2.250s	2.552s
450.00	0.434s	0.838s	1.202s	1.553s	1.894s	2.219s	2.527s

METRIC TONS							@ Deck Edge	
	40.00s	45.00s	50.00s	55.00s	60.00s	Arm	Angle	
175.00	3.034s	3.246s	3.441s	3.623s	3.801s	2.386s	28.17s	
200.00	3.020s	3.231s	3.423s	3.600s	3.774s	2.180s	25.00s	
225.00	3.002s	3.217s	3.410s	3.587s	3.762s	2.012s	22.66s	
250.00	2.983s	3.202s	3.399s	3.582s	3.761s	1.802s	20.00s	
275.00	2.962s	3.186s	3.391s	3.582s	3.762s	1.635s	18.04s	
300.00	2.940s	3.171s	3.384s	3.584s	3.763s	1.450s	15.98s	
325.00	2.918s	3.156s	3.378s	3.582s	3.763s	1.273s	14.11s	
350.00	2.896s	3.143s	3.373s	3.578s	3.760s	1.099s	12.31s	
375.00	2.876s	3.130s	3.364s	3.571s	3.757s	0.935s	10.57s	
400.00	2.856s	3.118s	3.353s	3.562s	3.753s	0.777s	8.86s	
425.00	2.837s	3.103s	3.340s	3.552s	3.748s	0.620s	7.11s	
450.00	2.820s	3.087s	3.325s	3.542s	3.743s	0.471s	5.43s	

Distances in METERS. --- Specific Gravity = 1.025. ---

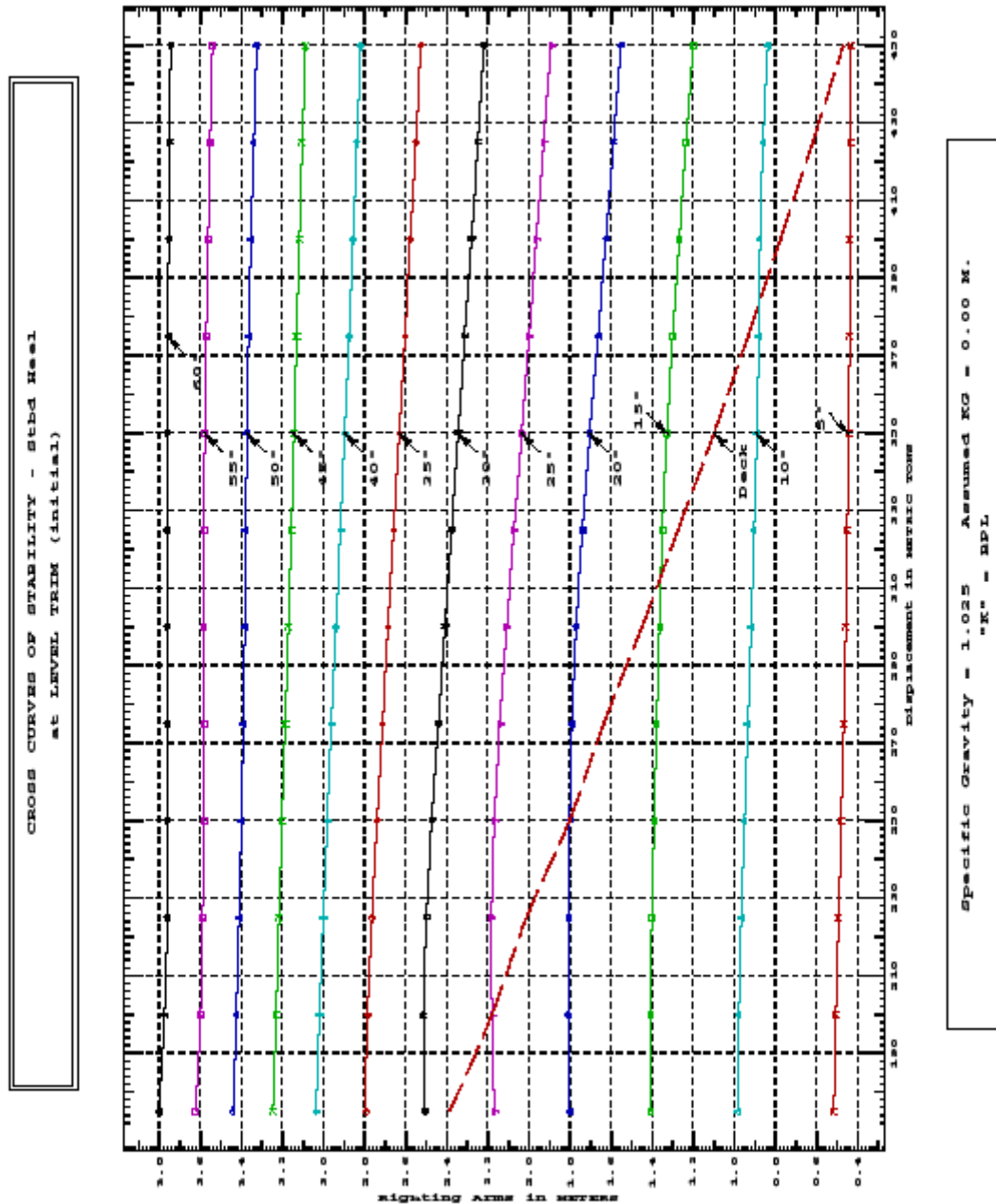
Cross curves DO include the effectiveness of the deckhouse.

TRIM & STABILITY

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ARROW POST

9004





ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

0.5m Aft Trim

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9004

CROSS CURVES OF STABILITY

Showing righting arms in heel at VCG = 0.00

Trim: Aft 0.500/25.500 at zero heel (trim righting arm held at zero)

Displacement METRIC TONS	Heel Angles in Degrees						
	5.00s	10.00s	15.00s	20.00s	25.00s	30.00s	35.00s
175.00	0.528s	1.011s	1.449s	1.852s	2.222s	2.561s	2.844s
200.00	0.511s	0.995s	1.438s	1.846s	2.223s	2.550s	2.817s
225.00	0.493s	0.976s	1.423s	1.837s	2.211s	2.521s	2.783s
250.00	0.479s	0.956s	1.406s	1.824s	2.184s	2.484s	2.747s
275.00	0.468s	0.935s	1.389s	1.801s	2.146s	2.444s	2.712s
300.00	0.459s	0.918s	1.371s	1.769s	2.105s	2.403s	2.677s
325.00	0.452s	0.904s	1.348s	1.730s	2.061s	2.363s	2.643s
350.00	0.446s	0.893s	1.318s	1.687s	2.017s	2.324s	2.611s
375.00	0.442s	0.883s	1.284s	1.643s	1.974s	2.286s	2.579s
400.00	0.439s	0.867s	1.248s	1.599s	1.933s	2.250s	2.549s
425.00	0.436s	0.845s	1.211s	1.557s	1.893s	2.216s	2.521s
450.00	0.431s	0.818s	1.174s	1.519s	1.857s	2.183s	2.494s

METRIC TONS							@ Deck Edge	
	40.00s	45.00s	50.00s	55.00s	60.00s	Arm	Angle	
175.00	3.075s	3.276s	3.463s	3.637s	3.813s	2.368s	27.08s	
200.00	3.045s	3.250s	3.437s	3.611s	3.780s	2.147s	23.96s	
225.00	3.015s	3.227s	3.419s	3.595s	3.767s	1.922s	21.08s	
250.00	2.986s	3.204s	3.403s	3.587s	3.763s	1.706s	18.54s	
275.00	2.958s	3.183s	3.390s	3.584s	3.760s	1.496s	16.24s	
300.00	2.930s	3.163s	3.379s	3.579s	3.755s	1.301s	14.21s	
325.00	2.904s	3.144s	3.369s	3.571s	3.749s	1.110s	12.28s	
350.00	2.878s	3.127s	3.358s	3.560s	3.741s	0.931s	10.43s	
375.00	2.854s	3.111s	3.344s	3.548s	3.733s	0.760s	8.60s	
400.00	2.831s	3.094s	3.327s	3.535s	3.724s	0.590s	6.73s	
425.00	2.810s	3.075s	3.310s	3.521s	3.716s	0.436s	5.00s	
450.00	2.788s	3.054s	3.291s	3.507s	3.707s	0.270s	3.11s	

Distances in METERS. --- Specific Gravity = 1.025. ---

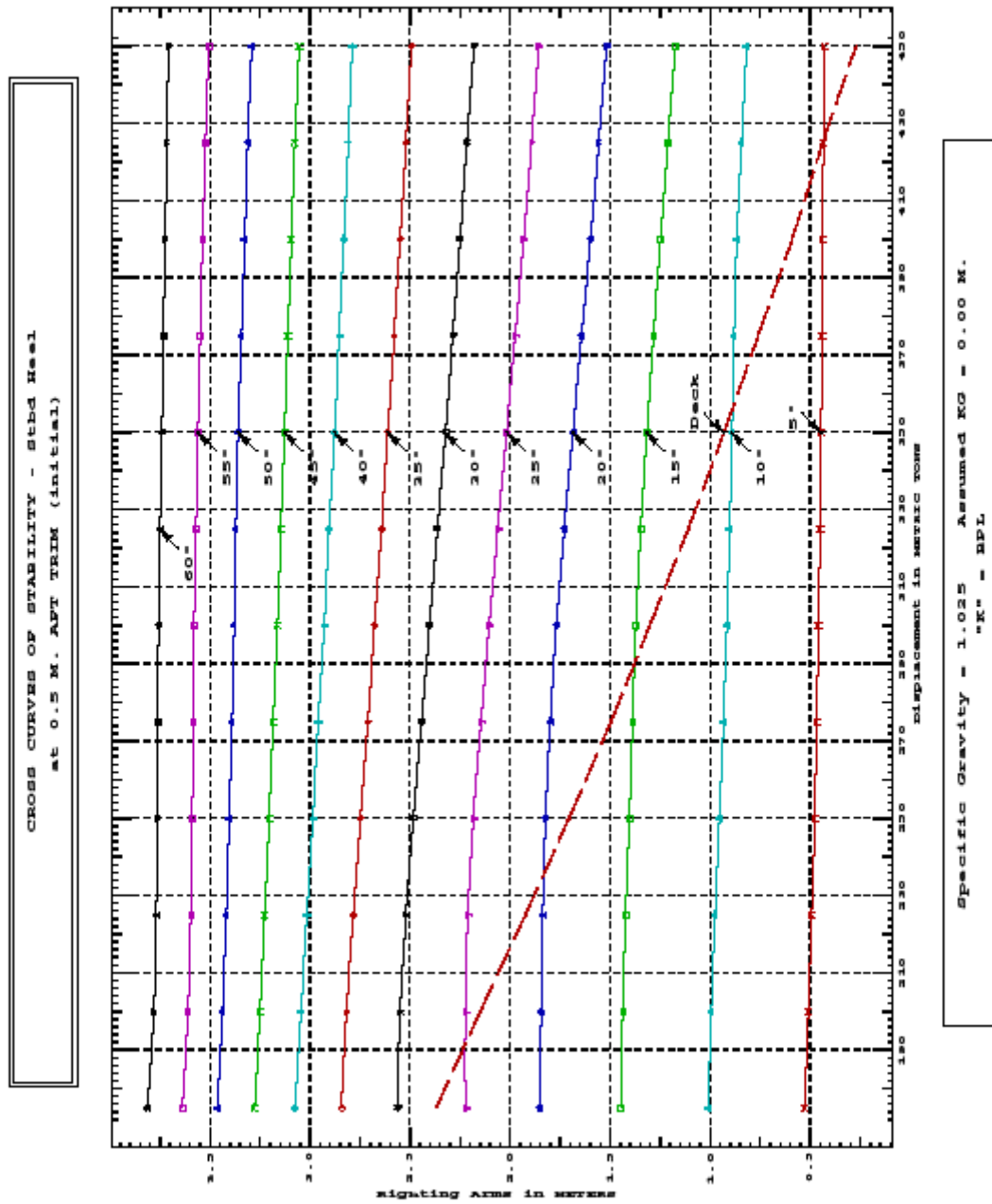
Cross curves DO include the effectiveness of the deckhouse.

TRIM & STABILITY

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ARROW POST

9004



TRIM & STABILITY

TANK CAPACITIES

TANK	No. 1 Fuel Tank Port	NO. 1 Fuel Tank Stbd	No. 2 Fuel Tank Port	No. 2 Fuel Tank Stbd	No. 3 Fuel Tank Port	No. 3 Fuel Tank Stbd	Fuel Day Tank
GHS Name	FOTK1.P	FOTK1.S	FOTK2.P	FOTK2.S	FOTK3.P	FOTK3.S	FODAYTK.S
Contents	Diesel Fuel	Diesel Fuel	Diesel Fuel	Diesel Fuel	Diesel Fuel	Diesel Fuel	Diesel Fuel
Specific Gravity	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Maximum Fill	95%	95%	95%	95%	95%	95%	95%
Volume (litres)	9,290	9,290	12,004	12,004	5,625	5,625	901
Weight (tonnes)	7.900	7.900	10.200	10.200	4.780	4.780	0.770
LCG	8.180 A	8.180 A	5.318 A	5.318 A	5.406 F	5.406 F	3.450 A
TCG	3.282 P	3.282 S	3.311 P	3.311 S	1.818 P	1.818 S	0
VCG	3.300	3.300	3.168	3.168	2.089	2.089	0.644
Maximum Free Surface	1.09	1.09	1.36	1.36	1.66	1.66	0.11

TRIM & STABILITY

TANK	No. 1 Fresh Water Tank Port	No. 1 Fresh Water Tank Stbd	No. 2 Fresh Water Tank Port	No. 2 Fresh Water Tank Stbd	Hydraulic Oil Tank
GHS Name	FWTK1.P	FWTK1.S	FWTK2.P	FWTK2.S	HOTK.S
Contents	Fresh Water	Fresh Water	Fresh Water	Fresh Water	Hydraulic Oil
Specific Gravity	1.000	1.000	1.000	1.000	0.880
Maximum Fill	100%	100%	100%	100%	95%
Volume (litres)	6,617	6,617	3,744	3,744	1,479
Weight (tonnes)	6.620	6.620	3.740	3.740	1.300
LCG	11.755 A	11.755 A	7.694 F	7.694 F	1.832 F
TCG	3.183 P	3.183 S	1.182 P	1.182 S	2.539 S
VCG	3.512	3.512	2.065	2.065	1.790
Maximum Free Surface	0.83	0.83	1.08	1.08	0.40

TRIM & STABILITY

TANK	Gasoline Tank	Sludge Tank	Grey Water Tank	
GHS Name	GASTK.S	SLUDGE.P	GREYWTR.P	
Contents	Gasoline	Sludge	Grey Water	
Specific Gravity	0.765	0.880	1.000	
Maximum Fill	95%	95%	95%	
Volume (litres)	869	1,900	1,479	
Weight (tonnes)	0.660	1.670	1.480	
LCG	9.662 A	1.418 A	1.832 F	
TCG	3.694 S	2.655 P	2.539 P	
VCG	5.286	1.768	1.790	
Maximum Free Surface	0.04	0.72	0.45	



Project 2009-004
January, 2009

ARROW POST
TRIM & STABILITY

STABILITY CONDITIONS



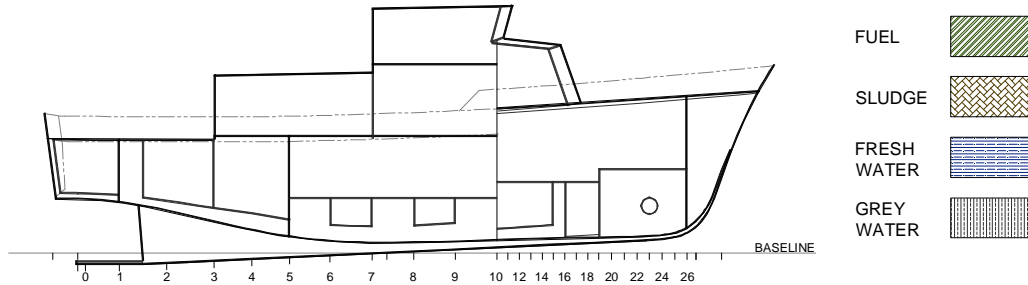
ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

1 - LIGHTSHIP



03/15/09 13:46:42
GHS 11.50

Merlion Marine Services
ARROW POST

9004

LIGHTSHIP

WEIGHT and DISPLACEMENT STATUS
 Baseline draft: 2.744 @ 13.25f, 2.630 @ 12.25a
 Trim: Fwd 0.114/25.500, Heel: Port 0.47 deg.

Part	Weight (MT)	LCG	TCG	VCG	FSM
WEIGHT	204.95	0.375a	0.016p	3.904	
Load					
Total Tanks	0.00				0.00
	Displ (MT)	LCB	TCB	VCB	
HULL	1.025	204.97	0.366a	0.032p	1.907
Total Displacement	1.025	204.97	0.366a	0.032p	1.907

Righting Arms: 0.000 0.000p
 Distances in METERS.-----Moments in m.-MT.

HYDROSTATIC PROPERTIES
 Trim: Fwd 0.114/25.500, Heel: Port 0.47 deg., VCG = 3.904

Draft@ Origin	Displacement Weight (MT)	Buoyancy-Ctr. LCB	weight/VCB	weight/cm	Moment/LCF	trim	GML	GMT
2.685	204.97	0.366a	1.907	1.76	1.934a	2.79	34.77	1.934

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
 Trim is per 25.50m.
 Draft is from Baseline.

Baseline draft: 2.744 @ 13.25f, 2.630 @ 12.25a
 KEEL draft: 2.119 @ 13.25f, 3.088 @ 12.25a



ARROW POST

TRIM & STABILITY

03/15/09 13:46:42
GHS 11.50

Merlion Marine Services
ARROW POST

9004

LIGHTSHIP

RIGHTING ARMS vs HEEL ANGLE
LCG = 0.375a TCG = 0.016p VCG = 3.904

Origin	Degrees of	Displacement	Righting Arms	Flood Pt			
Depth	Trim	Heel	weight(MT)	in Trim			
				in Heel			
				Area			
				Height			
2.685	0.26f	0.47p	204.97	0.000	0.000	0.0000	5.038(1)
2.665	0.28f	5.47p	204.91	0.000	0.162	0.0071	5.138(1)
2.607	0.40f	10.47p	204.95	0.000	0.288	0.0270	5.221(1)
2.509	0.60f	15.47p	204.95	0.000	0.383	0.0565	5.288(1)
2.375	0.86f	20.47p	204.94	0.000	0.454	0.0932	5.336(1)
2.204	1.17f	25.47p	204.95	0.000	0.509	0.1353	5.364(1)
2.024	1.46f	30.00p	204.95	0.000	0.533	0.1767	5.364(1)
2.005	1.49f	30.47p	204.94	0.000	0.534	0.1811	5.363(1)
2.002	1.49f	30.53p	204.95	0.000	0.534	0.1817	5.362(1)
1.788	1.77f	35.47p	204.95	0.000	0.517	0.2272	5.322(1)
1.574	1.96f	40.00p	204.92	0.000	0.487	0.2670	5.254(1)
1.550	1.98f	40.47p	204.93	0.000	0.484	0.2709	5.246(1)
1.290	2.13f	45.47p	205.00	0.000	0.449	0.3117	5.138(1)
1.012	2.23f	50.47p	205.00	0.000	0.414	0.3493	4.998(1)
0.716	2.29f	55.47p	204.96	0.000	0.387	0.3842	4.829(1)
0.406	2.32f	60.47p	204.98	0.000	0.385	0.4177	4.631(1)

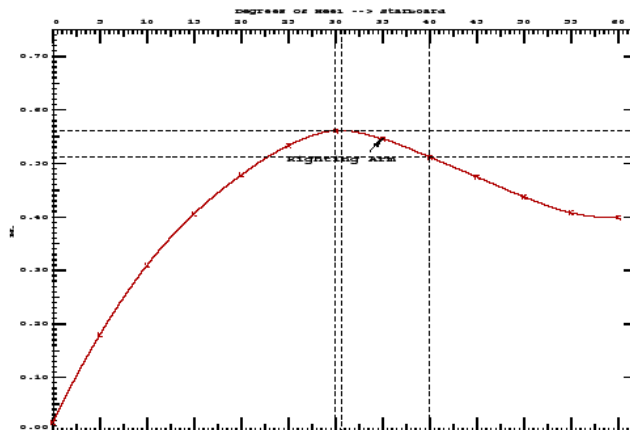
Distances in METERS.-----Specific Gravity = 1.025.-----Area in m.-Rad.

Critical Points	LCP	TCP	VCP
(1) Galley Exhaust	FLOOD 2.850a	1.300s	7.700
(2) ER Air Intake	FLOOD 1.700a	1.100s	8.340

LIM	STABILITY CRITERION	Min/Max	Attained
(1)	Area from 0 deg to abs 30	> 0.0550 m.-Rad	0.1767 PASS
(2)	Area from 0 deg to abs 40 or Flood	> 0.0900 m.-Rad	0.2670 PASS
(3)	Area from abs 30 deg to abs 40 or Flood	> 0.0300 m.-Rad	0.0903 PASS
(4)	Righting Arm at abs 30 deg	> 0.200 m.	0.533 PASS
(5)	Angle from 0 deg to MaxRA	> 25.00 deg	90.00 PASS
(6)	GM Upright	> 0.150 m.	1.934 PASS

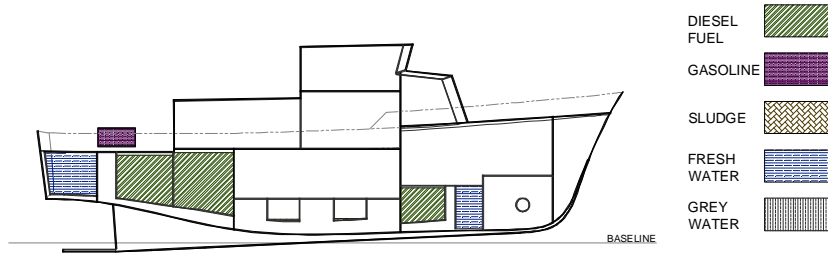
-----Relative angles measured from 0.470p-----

03/18/09 13:16:04 Merlion Marine Services
GHS 11.50 ARROW POST 9004
LIGHTSHIP



TRIM & STABILITY

2 – OPERATIONAL LIGHTSHIP - FULL LOAD



03/15/09 13:46:42
GHS 11.50

Merlion Marine Services
ARROW POST

9004

**OPERATIONAL LIGHTSHIP
FULL LOAD**

WEIGHT and DISPLACEMENT STATUS
 BASELINE draft: 2.831 @ 13.25f, 3.252 @ 12.25a
 Trim: Aft 0.421/25.500, Heel: Stbd 0.15 deg.

Part-----	weight(MT)	LCG-----	TCG-----	VCG-----			
LIGHT SHIP	204.95	0.375a	0.016p	3.904			
Crew (6) & Effects	1.50	4.000f	0.000	5.000			
Provisions	2.00	5.000a	0.000	4.000			
Total Fixed----->	208.45	0.388a	0.016p	3.913			
Load-----	SpGr-----	weight(MT)	LCG-----	TCG-----	VCG-----	FSM-----	
FOTK1.P	0.950	0.850	7.90	8.185a	3.281p	3.301	1.09
FOTK1.S	0.950	0.850	7.90	8.185a	3.282s	3.301	1.09
FOTK2.P	0.950	0.850	10.21	5.324a	3.311p	3.169	1.36
FOTK2.S	0.950	0.850	10.20	5.324a	3.312s	3.168	1.36
FOTK3.P	0.950	0.850	4.78	5.401f	1.818p	2.089	1.66
FOTK3.S	0.950	0.850	4.78	5.400f	1.820s	2.089	1.67
FODAYTK.C	0.950	0.850	0.77	3.450a	0.000	3.644	0.11
HOTK.S	0.800	0.880	1.10	1.822f	2.506s	1.728	0.33
SLUDGE.P	0.100	0.880	0.18	1.402a	2.251p	1.272	0.05
GREYWTR.P	0.100	1.000	0.16	1.742f	2.213p	1.317	0.03
FWTK1.P	1.000	1.000	6.62	11.755a	3.183p	3.512	0.00
FWTK1.S	1.000	1.000	6.62	11.755a	3.183s	3.512	0.00
FWTK2.P	1.000	1.000	3.74	7.694f	1.182p	2.065	0.00
FWTK2.S	1.000	1.000	3.74	7.694f	1.182s	2.065	0.00
GASTK.S	0.950	0.765	0.66	9.669a	3.694s	5.286	0.04
Total Tanks----->			69.35	4.201a	0.065s	2.990	8.79
Total weight----->			277.79	1.340a	0.004s	3.682	
			Disp1(MT)	LCB-----	TCB-----	VCB-----	
HULL		1.025	277.77	1.365a	0.008s	2.166	
Total Displacement-->		1.025	277.77	1.365a	0.008s	2.166	
Righting Arms:				0.000	0.000		
Distances in METERS.				-----Moments in m.-MT.			

HYDROSTATIC PROPERTIES
 Trim: Aft 0.421/25.500, Heel: Stbd 0.15 deg., VCG = 3.682

Draft@	Displacement	Buoyancy-Ctr.	weight/	Moment/
Origin---	weight(MT)	LCB-----	VCB-----	cm trim----
3.050	277.77	1.365a	2.166	1.82
				1.960a
				2.94
				26.95
				1.634

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
 Trim is per 25.50m.

Draft is from BASELINE. True Free Surface included.

BASELINE draft: 2.831 @ 13.25f, 3.252 @ 12.25a
 KEEL draft: 2.206 @ 13.25f, 3.710 @ 12.25a



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

03/15/09 13:46:42
GHS 11.50

Merlion Marine Services
ARROW POST

9004

OPERATIONAL LIGHTSHIP
FULL LOAD

RIGHTING ARMS VS HEEL ANGLE
Fixed CG: LCG = 0.388a TCG = 0.016p VCG = 3.913

Origin	Degrees of	Displacement	Righting Arms	Flood Pt			
Depth	Trim	Heel	weight(MT)	in Trim			
				in Heel			
				Area			
				Height			
3.049	0.95a	0.15s	277.79	0.000	0.000	0.0000	4.599(1)
3.033	0.95a	5.15s	277.87	0.000	0.144	0.0063	4.471(1)
2.985	0.95a	10.15s	277.78	0.000	0.290	0.0252	4.318(1)
2.901	0.91a	15.15s	277.78	0.000	0.427	0.0565	4.145(1)
2.782	0.84a	20.15s	277.79	0.000	0.531	0.0985	3.956(1)
2.643	0.82a	25.15s	277.79	0.000	0.577	0.1473	3.733(1)
2.486	0.82a	30.00s	277.79	0.000	0.589	0.1969	3.491(1)
2.481	0.82a	30.15s	277.79	0.000	0.589	0.1984	3.483(1)
2.442	0.82a	31.24s	277.78	0.000	0.589	0.2096	3.426(1)
2.290	0.84a	35.15s	277.84	0.000	0.587	0.2498	3.215(1)
2.076	0.88a	40.00s	277.76	0.000	0.580	0.2992	2.942(1)
2.069	0.89a	40.15s	277.78	0.000	0.580	0.3007	2.934(1)
1.821	0.93a	45.15s	277.78	0.000	0.569	0.3508	2.641(1)
1.548	0.95a	50.15s	277.74	0.000	0.560	0.4001	2.341(1)
1.249	0.95a	55.15s	277.78	0.000	0.559	0.4488	2.037(1)
0.929	0.95a	60.15s	277.78	0.000	0.564	0.4978	1.728(1)

Distances in METERS.----Specific Gravity = 1.025.-----Area in m.-Rad.

Note: The Center of Gravity shown above is for the Fixed weight of 208.45 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Point-----LCP-----TCP-----VCP
(1) Galley Exhaust FLOOD 2.850a 1.300s 7.700

LIM	STABILITY CRITERION	Min/Max	Attained
(1)	Area from 0 deg to abs 30	> 0.0550 m.-Rad	0.1969 PASS
(2)	Area from 0 deg to abs 40 or Flood	> 0.0900 m.-Rad	0.2992 PASS
(3)	Area from abs 30 deg to abs 40 or Flood	> 0.0300 m.-Rad	0.1024 PASS
(4)	Righting Arm at abs 30 deg	> 0.200 m.	0.589 PASS
(5)	Angle from 0 deg to MaxRA	> 25.00 deg	82.77 PASS
(6)	GM Upright	> 0.150 m.	1.633 PASS

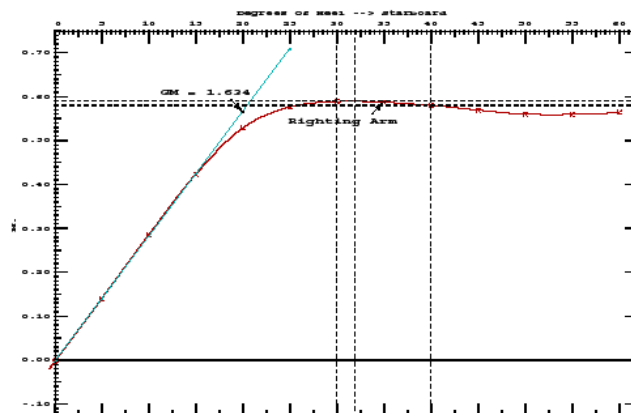
-----Relative angles measured from 0.148 -----

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9004

OPERATIONAL LIGHTSHIP
FULL LOAD





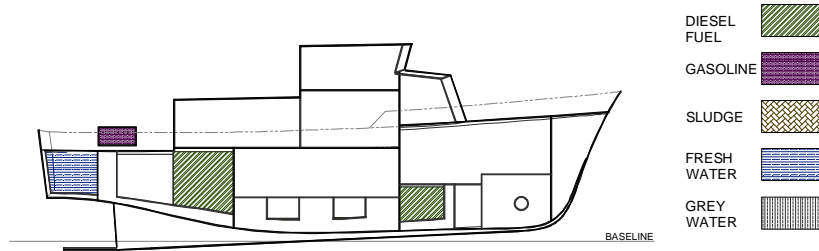
ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

3 – DEPARTURE – NORMAL FULL LOAD



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Merlion Marine Services
ARROW POST

9004

DEPARTURE NORMAL FULL LOAD

WEIGHT and DISPLACEMENT STATUS
 BASELINE draft: 2.770 @ 13.25f, 3.093 @ 12.25a
 Trim: Aft 0.323/25.500, Heel: Stbd 0.21 deg.

Part	Load	SpGr	weight(MT)	LCG	TCG	VCG	FSM
LIGHT SHIP			204.95	0.375a	0.016p	3.904	
Crew (6) & Effects			1.50	4.000f	0.000	5.000	
Supernumeraries (6)			0.60	5.000f	0.000	5.000	
Provisions			2.00	5.000a	0.000	4.000	
Total Fixed			209.05	0.372a	0.016p	3.916	
FOTK1.P	0.050	0.850	0.42	7.853a	2.872p	2.161	0.22
FOTK1.S	0.050	0.850	0.42	7.850a	2.876s	2.161	0.23
FOTK2.P	0.950	0.850	10.21	5.322a	3.311p	3.169	1.36
FOTK2.S	0.950	0.850	10.20	5.322a	3.312s	3.168	1.36
FOTK3.P	0.950	0.850	4.78	5.402f	1.817p	2.089	1.66
FOTK3.S	0.950	0.850	4.78	5.402f	1.820s	2.089	1.67
FODAYTK.C	0.950	0.850	0.77	3.450a	0.000	3.644	0.11
HOTK.S	0.800	0.880	1.10	1.824f	2.506s	1.728	0.33
SLUDGE.P	0.050	0.880	0.09	1.384a	2.182p	1.209	0.02
GREYWTR.P	0.050	1.000	0.08	1.702f	2.157p	1.256	0.01
FWTK1.P	1.000	1.000	6.62	11.755a	3.183p	3.512	0.00
FWTK1.S	1.000	1.000	6.62	11.755a	3.183s	3.512	0.00
FWTK2.P	0.050	1.000	0.19	7.651f	0.614p	0.994	0.04
FWTK2.S	0.050	1.000	0.19	7.650f	0.615s	0.994	0.04
GASTK.S	0.950	0.765	0.66	9.668a	3.695s	5.286	0.04
Total Tanks			47.11	4.740a	0.103s	3.008	7.08
Total weight			256.15	1.176a	0.006s	3.749	
HULL		1.025	256.16	1.197a	0.012s	2.092	
Total Displacement		1.025	256.16	1.197a	0.012s	2.092	
Righting Arms:				0.000	0.000s		
Distances in METERS.				Moments in m.-MT.			

HYDROSTATIC PROPERTIES

Trim: Aft 0.323/25.500, Heel: Stbd 0.21 deg., VCG = 3.749

Draft@	Displacement	Buoyancy-Ctr.	weight/	Moment/
Origin	weight(MT)	LCB	VCB	cm trim
2.938	256.16	1.197a	2.092	1.81
				1.968a
				2.89
				28.79
				1.687

Distances in METERS. Specific Gravity = 1.025. Moment in m.-MT.
 Trim is per 25.50m.

Draft is from BASELINE.

True Free Surface included.

BASELINE draft: 2.770 @ 13.25f, 3.093 @ 12.25a
 KEEL draft: 2.145 @ 13.25f, 3.551 @ 12.25a



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Project 2009-004

January, 2009

TRIM & STABILITY

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Merlion Marine Services
ARROW POST

9004

DEPARTURE
NORMAL FULL LOAD

RIGHTING ARMS VS HEEL ANGLE
Fixed CG: LCG = 0.372a TCG = 0.016p VCG = 3.916

Origin	Degrees of	Displacement	Righting Arms	Flood Pt			
Depth	Trim	Heel	in Trim	in Heel			
		weight(MT)	Area	Height			
2.938	0.73a	0.21s	256.15	0.000	0.000	0.0000	4.721(1)
2.921	0.73a	5.21s	256.15	0.000	0.148	0.0064	4.592(1)
2.873	0.73a	10.21s	256.15	0.000	0.295	0.0258	4.438(1)
2.786	0.65a	15.21s	256.15	0.000	0.421	0.0572	4.270(1)
2.662	0.50a	20.21s	256.15	0.000	0.524	0.0986	4.090(1)
2.511	0.38a	25.21s	256.15	0.000	0.577	0.1470	3.883(1)
2.377	0.32a	29.19s	256.15	0.000	0.586	0.1876	3.695(1)
2.349	0.31a	30.00s	256.15	0.000	0.586	0.1959	3.655(1)
2.341	0.30a	30.21s	256.15	0.000	0.586	0.1980	3.644(1)
2.145	0.24a	35.21s	256.12	0.000	0.575	0.2488	3.385(1)
1.931	0.22a	40.00s	256.13	0.000	0.558	0.2962	3.121(1)
1.921	0.22a	40.21s	256.15	0.000	0.557	0.2982	3.110(1)
1.670	0.21a	45.21s	256.13	0.000	0.536	0.3459	2.822(1)
1.395	0.19a	50.21s	256.12	0.000	0.515	0.3918	2.524(1)
1.097	0.16a	55.21s	256.11	0.000	0.502	0.4361	2.221(1)
0.777	0.13a	60.21s	256.15	0.000	0.505	0.4799	1.915(1)

Distances in METERS.----Specific Gravity = 1.025.-----Area in m.-Rad.

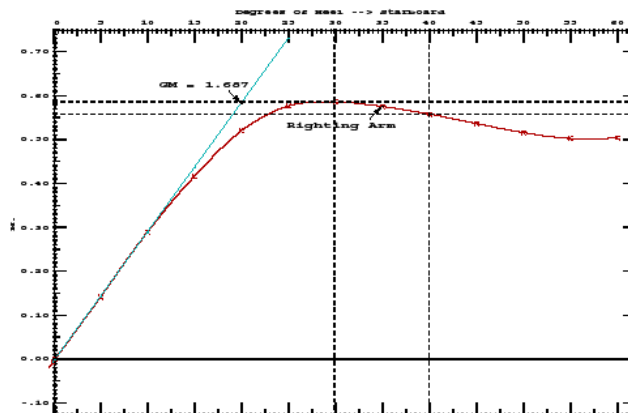
Note: The Center of Gravity shown above is for the Fixed weight of 209.05 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

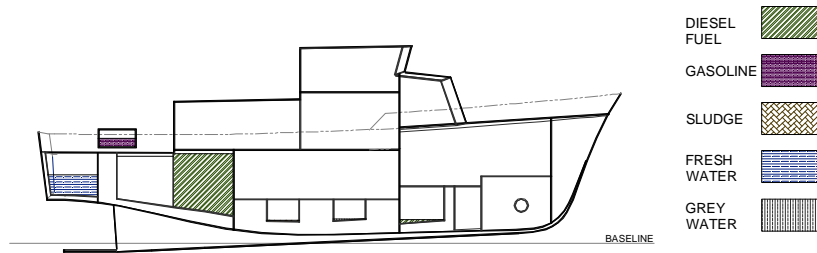
Critical Point-----LCP-----TCP-----VCP
(1) Galley Exhaust FLOOD 2.850a 1.300s 7.700

LIM	STABILITY CRITERION	Min/Max	Attained
(1)	Area from 0 deg to abs 30	> 0.0550 m.-Rad	0.1959 PASS
(2)	Area from 0 deg to abs 40 or Flood	> 0.0900 m.-Rad	0.2962 PASS
(3)	Area from abs 30 deg to abs 40 or Flood	> 0.0300 m.-Rad	0.1003 PASS
(4)	Righting Arm at abs 30 deg	> 0.200 m.	0.586 PASS
(5)	Angle from 0 deg to MaxRA	> 25.00 deg	83.75 PASS
(6)	GM Upright	> 0.150 m.	1.683 PASS

-----Relative angles measured from 0.206s-----

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GHS 11.50 ARROW POST 9004
DEPARTURE
NORMAL FULL LOAD



TRIM & STABILITY
4 – MID VOYAGE – FO#3 DRAWN DOWN

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 GHS 11.50

 Merlion Marine Services
 ARROW POST

9004

 MID VOYAGE
 FO#3 DRAWN DOWN

 WEIGHT and DISPLACEMENT STATUS
 BASELINE draft: 2.696 @ 13.25f, 3.003 @ 12.25a
 Trim: Aft 0.307/25.500, Heel: Port 0.08 deg.

Part	Load	SpGr	weight(MT)	LCG	TCG	VCG	FSM
LIGHT SHIP			204.95	0.375a	0.016p	3.904	
Crew (6) & Effects			1.50	4.000f	0.000	5.000	
Supernumeraries (6)			0.60	5.000f	0.000	5.000	
Provisions			2.00	5.000a	0.000	4.000	
Total Fixed			209.05	0.372a	0.016p	3.916	
FOTK1.P	0.050	0.850	0.42	7.849a	2.875p	2.161	0.23
FOTK1.S	0.050	0.850	0.42	7.850a	2.873s	2.161	0.23
FOTK2.P	0.950	0.850	10.20	5.322a	3.311p	3.168	1.36
FOTK2.S	0.950	0.850	10.21	5.322a	3.311s	3.169	1.36
FOTK3.P	0.100	0.850	0.50	5.319f	1.337p	1.238	0.15
FOTK3.S	0.100	0.850	0.50	5.320f	1.336s	1.238	0.15
FODAYTK.C	0.950	0.850	0.77	3.450a	0.000	3.644	0.11
HOTK.S	0.800	0.880	1.10	1.824f	2.505s	1.728	0.33
SLUDGE.P	0.250	0.880	0.44	1.408a	2.379p	1.402	0.15
GREYWTR.P	0.100	1.000	0.16	1.748f	2.213p	1.317	0.03
FWTK1.P	0.500	1.000	3.31	11.719a	3.121p	3.012	0.59
FWTK1.S	0.500	1.000	3.31	11.719a	3.120s	3.012	0.59
FWTK2.P	0.050	1.000	0.19	7.651f	0.615p	0.994	0.04
FWTK2.S	0.050	1.000	0.19	7.651f	0.614s	0.994	0.04
GASTK.S	0.500	0.765	0.35	9.672a	3.723s	5.112	0.04
Total Tanks			32.05	5.893a	0.083s	2.974	5.39
Total weight			241.10	1.106a	0.003p	3.791	
HULL		1.025	241.08	1.127a	0.005p	2.040	
Total Displacement		1.025	241.08	1.127a	0.005p	2.040	
Righting Arms:				0.000	0.000		
Distances in METERS.				Moments in m.-MT.			

HYDROSTATIC PROPERTIES

Trim: Aft 0.307/25.500, Heel: Port 0.08 deg., VCG = 3.791

Draft@	Displacement	Buoyancy-Ctr.	weight/	Moment/
Origin	weight(MT)	LCB	VCB	cm trim
2.856	241.08	1.127a	2.040	1.79
				1.993a
				2.85
				30.13
				1.734

Distances in METERS. Specific Gravity = 1.025. Moment in m.-MT.
 Trim is per 25.50m.

Draft is from BASELINE.

True Free Surface included.

 BASELINE draft: 2.696 @ 13.25f, 3.003 @ 12.25a
 KEEL draft: 2.071 @ 13.25f, 3.461 @ 12.25a



ARROW POST

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January, 2009

TRIM & STABILITY

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Merlion Marine Services
ARROW POST

9004

MID VOYAGE
FO#3 DRAWN DOWN

RIGHTING ARMS VS HEEL ANGLE
Fixed CG: LCG = 0.372a TCG = 0.016p VCG = 3.916

Origin	Degrees of	Displacement	Righting Arms	Flood Pt			
Depth	Trim	Heel	weight(MT)	in Trim			
				in Heel			
				Area			
				Height			
2.855	0.69a	0.08p	241.10	0.000	0.000	0.0000	4.812(1)
2.840	0.69a	5.08p	241.09	0.000	0.152	0.0066	4.910(1)
2.791	0.68a	10.08p	241.07	0.000	0.299	0.0264	4.983(1)
2.704	0.59a	15.08p	241.09	0.000	0.419	0.0579	5.039(1)
2.579	0.41a	20.08p	241.09	0.000	0.515	0.0988	5.078(1)
2.422	0.22a	25.08p	241.09	0.000	0.576	0.1467	5.092(1)
2.296	0.12a	28.75p	241.09	0.000	0.586	0.1840	5.074(1)
2.250	0.09a	30.00p	241.11	0.000	0.585	0.1968	5.064(1)
2.247	0.09a	30.08p	241.09	0.000	0.585	0.1976	5.063(1)
2.048	0.02f	35.08p	241.06	0.000	0.567	0.2481	5.001(1)
1.827	0.09f	40.00p	241.04	0.000	0.541	0.2957	4.912(1)
1.823	0.10f	40.08p	241.09	0.000	0.540	0.2965	4.910(1)
1.572	0.14f	45.08p	241.07	0.000	0.511	0.3424	4.793(1)
1.297	0.18f	50.08p	241.07	0.000	0.481	0.3857	4.650(1)
1.001	0.23f	55.08p	241.06	0.000	0.459	0.4266	4.484(1)
0.683	0.27f	60.08p	241.08	0.000	0.456	0.4664	4.297(1)

Distances in METERS.-----Specific Gravity = 1.025.-----Area in m.-Rad.

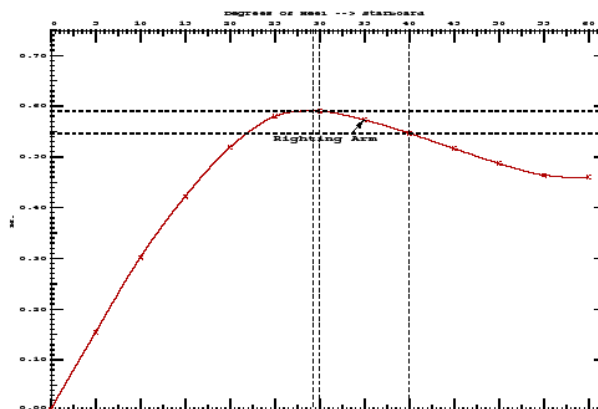
Note: The Center of Gravity shown above is for the Fixed weight of 209.05 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Points	LCP	TCP	VCP
(1) Galley Exhaust	FLOOD 2.850a	1.300s	7.700
(2) ER Air Intake	FLOOD 1.700a	1.100s	8.340

LIM	STABILITY CRITERION	Min/Max	Attained
(1)	Area from 0 deg to abs 30	> 0.0550 m.-Rad	0.1968 PASS
(2)	Area from 0 deg to abs 40 or Flood	> 0.0900 m.-Rad	0.2957 PASS
(3)	Area from abs 30 deg to abs 40 or Flood	> 0.0300 m.-Rad	0.0989 PASS
(4)	Righting Arm at abs 30 deg	> 0.200 m.	0.585 PASS
(5)	Angle from 0 deg to MaxRA	> 25.00 deg	84.28 PASS
(6)	GM Upright	> 0.150 m.	1.734 PASS

-----Relative angles measured from 0.084 -----

03/18/09 13:16:04 Merlion Marine Services
GHS 11.50 ARROW POST 9004
MID VOYAGE
FO#3 DRAWN DOWN





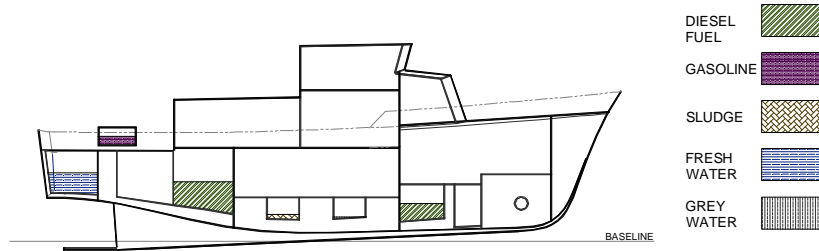
ARROW POST

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TRIM & STABILITY

5 – MID VOYAGE – FO#2 & FO#3 @ 50%



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Merlion Marine Services
ARROW POST

9004

MID VOYAGE
FO#2 & FO#3 @ 50%

WEIGHT and DISPLACEMENT STATUS
BASELINE draft: 2.795 @ 13.25f, 2.883 @ 12.25a
Trim: Aft 0.088/25.500, Heel: Port 0.08 deg.

Part	Weight (MT)	LCG	TCG	VCG			
LIGHT SHIP	204.95	0.375a	0.016p	3.904			
Crew (6) & Effects	1.50	4.000f	0.000	5.000			
Supernumeraries (6)	0.60	5.000f	0.000	5.000			
Provisions	2.00	5.000a	0.000	4.000			
Total Fixed	209.05	0.372a	0.016p	3.916			
Part	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FOTK1.P	0.050	0.850	0.42	7.820a	2.877p	2.160	0.23
FOTK1.S	0.050	0.850	0.42	7.821a	2.875s	2.160	0.23
FOTK2.P	0.500	0.850	5.37	5.299a	3.230p	2.593	1.07
FOTK2.S	0.500	0.850	5.37	5.299a	3.230s	2.593	1.06
FOTK3.P	0.500	0.850	2.52	5.391f	1.651p	1.721	0.92
FOTK3.S	0.500	0.850	2.52	5.391f	1.650s	1.721	0.91
FODAYTK.C	0.950	0.850	0.77	3.450a	0.000	3.644	0.11
HOTK.S	0.800	0.880	1.10	1.828f	2.505s	1.728	0.33
SLUDGE.P	0.250	0.880	0.44	1.401a	2.379p	1.402	0.15
GREYWTR.P	0.100	1.000	0.16	1.759f	2.212p	1.317	0.03
FWTK1.P	0.500	1.000	3.31	11.715a	3.121p	3.012	0.59
FWTK1.S	0.500	1.000	3.31	11.715a	3.120s	3.012	0.59
FWTK2.P	0.050	1.000	0.19	7.657f	0.614p	0.994	0.04
FWTK2.S	0.050	1.000	0.19	7.657f	0.614s	0.994	0.04
GASTK.S	0.500	0.765	0.35	9.665a	3.723s	5.112	0.04
Total Tanks			26.40	4.366a	0.100s	2.496	6.34
Total weight			235.45	0.820a	0.003p	3.757	
HULL	SpGr	Weight (MT)	LCB	TCB	VCB		
HULL	1.025	235.44	0.826a	0.005p	2.018		
Total Displacement	1.025	235.44	0.826a	0.005p	2.018		

Righting Arms: 0.000 0.000
Distances in METERS.-----Moments in m.-MT.

HYDROSTATIC PROPERTIES
Trim: Aft 0.088/25.500, Heel: Port 0.08 deg., VCG = 3.757

Draft@ Origin	Displacement	Buoyancy-Ctr.	weight/	Moment/
Weight (MT)	LCB	VCB	cm	cm trim
2.841	235.44	0.826a	2.018	1.79
				1.941a
				2.86
				30.95
				1.802

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
Trim is per 25.50m.

Draft is from BASELINE. True Free Surface included.

BASELINE draft: 2.795 @ 13.25f, 2.883 @ 12.25a
KEEL draft: 2.170 @ 13.25f, 3.341 @ 12.25a



ARROW POST

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January, 2009

TRIM & STABILITY

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GHS 11.50

Merlion Marine Services
ARROW POST

9004

MID VOYAGE
FO#2 & FO#3 @ 50%

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 0.372a TCG = 0.016p VCG = 3.916

Origin Depth	Degrees of Trim	Degrees of Heel	Displacement weight(MT)	Righting Arms in Trim	Righting Arms in Heel	Area	Flood Pt Height
2.841	0.20a	0.08p	235.45	0.000	0.000	0.0000	4.851(1)
2.825	0.20a	5.08p	235.45	0.000	0.158	0.0069	4.950(1)
2.776	0.17a	10.08p	235.45	0.000	0.305	0.0272	5.024(1)
2.687	0.05a	15.08p	235.45	0.000	0.421	0.0591	5.084(1)
2.559	0.14f	20.08p	235.45	0.000	0.514	0.1000	5.126(1)
2.398	0.38f	25.08p	235.45	0.000	0.580	0.1479	5.146(1)
2.248	0.54f	29.25p	235.43	0.000	0.595	0.1908	5.132(1)
2.220	0.57f	30.00p	235.43	0.000	0.595	0.1986	5.126(1)
2.217	0.57f	30.08p	235.45	0.000	0.594	0.1995	5.125(1)
2.015	0.72f	35.08p	235.41	0.000	0.579	0.2510	5.069(1)
1.789	0.82f	40.00p	235.41	0.000	0.554	0.2996	4.985(1)
1.786	0.83f	40.08p	235.45	0.000	0.554	0.3005	4.983(1)
1.532	0.90f	45.08p	235.46	0.000	0.524	0.3475	4.870(1)
1.255	0.96f	50.08p	235.46	0.000	0.493	0.3919	4.730(1)
0.958	1.01f	55.08p	235.44	0.000	0.468	0.4339	4.564(1)
0.642	1.04f	60.08p	235.44	0.000	0.464	0.4744	4.376(1)

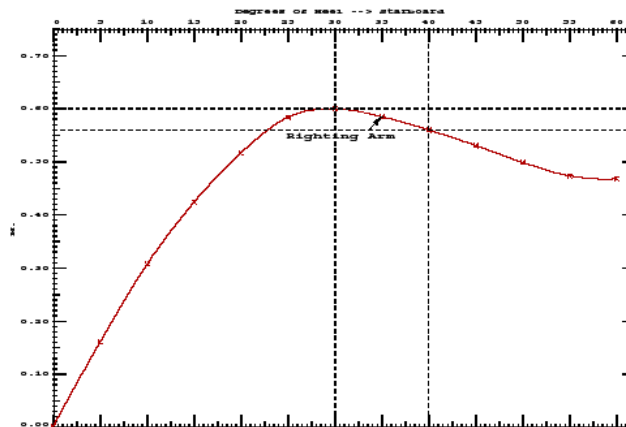
Distances in METERS.----Specific Gravity = 1.025.-----Area in m.-Rad.

Note: The Center of Gravity shown above is for the Fixed weight of 209.05 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Points	LCP	TCP	VCP
(1) Galley Exhaust	FLOOD 2.850a	1.300s	7.700
(2) ER Air Intake	FLOOD 1.700a	1.100s	8.340

LIM	STABILITY CRITERION	Min/Max	Attained
(1)	Area from 0 deg to abs 30	> 0.0550 m.-Rad	0.1986 PASS
(2)	Area from 0 deg to abs 40 or Flood	> 0.0900 m.-Rad	0.2996 PASS
(3)	Area from abs 30 deg to abs 40 or Flood	> 0.0300 m.-Rad	0.1010 PASS
(4)	Righting Arm at abs 30 deg	> 0.200 m.	0.595 PASS
(5)	Angle from 0 deg to MaxRA	> 25.00 deg	85.47 PASS
(6)	GM Upright	> 0.150 m.	1.802 PASS

GHS 11.50 ARROW POST 9004
MID VOYAGE
FO#2 & FO#3 @ 50%





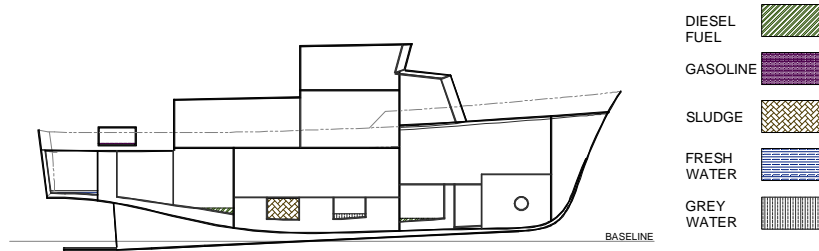
ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

6 – PORT ARRIVAL – 10% TANKS



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GHS 11.50

Merlion Marine Services
ARROW POST

9004

PORT ARRIVAL 10% Tanks

WEIGHT and DISPLACEMENT STATUS
 BASELINE draft: 2.817 @ 13.25f, 2.703 @ 12.25a
 Trim: Fwd 0.114/25.500, Heel: Port 0.78 deg.

Part	Weight (MT)	LCG	TCG	VCG			
LIGHT SHIP	204.95	0.375a	0.016p	3.904			
Crew (6) & Effects	1.50	4.000f	0.000	5.000			
Supernumeraries (6)	0.60	5.000f	0.000	5.000			
Provisions	1.50	5.000a	0.000	4.000			
Total Fixed	208.55	0.361a	0.016p	3.916			
Part	Load	SpGr	Weight (MT)	LCG	TCG	VCG	FSM
FOTK1.P	0.050	0.850	0.42	7.790a	2.886p	2.160	0.24
FOTK1.S	0.050	0.850	0.42	7.801a	2.871s	2.160	0.22
FOTK2.P	0.100	0.850	1.07	5.141a	2.951p	1.972	0.45
FOTK2.S	0.100	0.850	1.07	5.144a	2.940s	1.972	0.42
FOTK3.P	0.100	0.850	0.50	5.341f	1.338p	1.239	0.15
FOTK3.S	0.100	0.850	0.50	5.345f	1.330s	1.239	0.14
FODAYTK.C	0.500	0.850	0.40	3.450a	0.004p	3.363	0.11
HOTK.S	0.800	0.880	1.10	1.831f	2.501s	1.728	0.32
SLUDGE.P	0.950	0.880	1.67	1.417a	2.661p	1.768	0.73
GREYWTR.P	0.250	1.000	0.39	1.803f	2.318p	1.442	0.10
FWTK1.P	0.100	1.000	0.66	11.630a	3.013p	2.543	0.33
FWTK1.S	0.100	1.000	0.66	11.635a	3.000s	2.543	0.33
FWTK2.P	0.050	1.000	0.19	7.662f	0.616p	0.994	0.04
FWTK2.S	0.050	1.000	0.19	7.664f	0.611s	0.994	0.04
GASTK.S	0.100	0.765	0.07	9.651a	3.861s	4.910	0.01
Total Tanks			9.32	2.833a	0.255p	1.946	3.63
Total weight			217.86	0.467a	0.026p	3.831	
HULL	Disp (MT)	LCB	TCB	VCB			
HULL	217.89	0.459a	0.051p	1.955			
Total Displacement	217.89	0.459a	0.051p	1.955			

Righting Arms: 0.000 0.000p
 Distances in METERS.-----Moments in m.-MT.

HYDROSTATIC PROPERTIES
 Trim: Fwd 0.114/25.500, Heel: Port 0.78 deg., VCG = 3.831

Draft@	Displacement	Buoyancy-Ctr.	Weight/	Moment/
Origin	Weight (MT)	LCB	VCB	cm trim
2.758	217.89	0.459a	1.955	1.78
				1.912a
				2.83
				33.10
				1.875

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in m.-MT.
 Trim is per 25.50m.

Draft is from BASELINE. True Free Surface included.

BASELINE draft: 2.817 @ 13.25f, 2.703 @ 12.25a
 KEEL draft: 2.192 @ 13.25f, 3.161 @ 12.25a



ARROW POST

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TRIM & STABILITY

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GHS 11.50

Merlion Marine Services
ARROW POST

9004

PORT ARRIVAL
10% Tanks

RIGHTING ARMS vs HEEL ANGLE

Fixed CG: LCG = 0.361a TCG = 0.016p VCG = 3.916

Origin Depth	Degrees of Trim	Degrees of Heel	Displacement weight(MT)	Righting Arms in Trim	Righting Arms in Heel	Area	Flood Pt Height
2.758	0.26f	0.78p	217.89	0.000	0.000	0.0000	4.972(1)
2.737	0.26f	5.78p	217.87	0.000	0.161	0.0070	5.068(1)
2.678	0.36f	10.78p	217.86	0.000	0.292	0.0270	5.147(1)
2.580	0.54f	15.78p	217.86	0.000	0.392	0.0570	5.210(1)
2.444	0.78f	20.78p	217.86	0.000	0.470	0.0948	5.254(1)
2.273	1.07f	25.78p	217.87	0.000	0.530	0.1386	5.278(1)
2.109	1.31f	30.00p	217.77	0.000	0.548	0.1785	5.272(1)
2.078	1.35f	30.78p	217.86	0.000	0.548	0.1859	5.267(1)
1.865	1.57f	35.78p	217.83	0.000	0.530	0.2332	5.217(1)
1.666	1.72f	40.00p	217.85	0.000	0.505	0.2714	5.150(1)
1.628	1.74f	40.78p	217.84	0.000	0.501	0.2783	5.136(1)
1.367	1.86f	45.78p	217.91	0.000	0.469	0.3206	5.024(1)
1.087	1.94f	50.78p	217.90	0.000	0.437	0.3601	4.882(1)
0.789	1.99f	55.78p	217.86	0.000	0.415	0.3972	4.712(1)
0.474	2.01f	60.78p	217.80	0.000	0.417	0.4333	4.516(1)

Distances in METERS.-----Specific Gravity = 1.025.-----Area in m.-Rad.

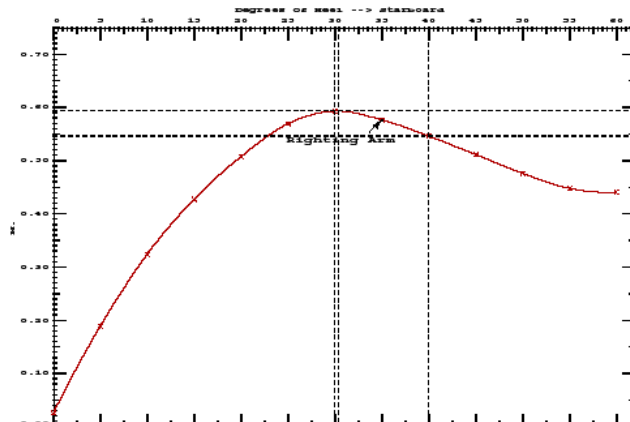
Note: The Center of Gravity shown above is for the Fixed weight of 208.55 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.

Critical Points	LCP	TCP	VCP
(1) Galley Exhaust	FLOOD 2.850a	1.300s	7.700
(2) ER Air Intake	FLOOD 1.700a	1.100s	8.340

LIM	STABILITY CRITERION	Min/Max	Attained
(1)	Area from 0 deg to abs 30	> 0.0550 m.-Rad	0.1785 PASS
(2)	Area from 0 deg to abs 40 or Flood	> 0.0900 m.-Rad	0.2714 PASS
(3)	Area from abs 30 deg to abs 40 or Flood	> 0.0300 m.-Rad	0.0929 PASS
(4)	Righting Arm at abs 30 deg	> 0.200 m.	0.548 PASS
(5)	Angle from 0 deg to MaxRA	> 25.00 deg	87.05 PASS
(6)	GM Upright	> 0.150 m.	1.883 PASS

-----Relative angles measured from 0.780p-----

03/18/09 13:16:04 Merlion Marine Services
GHS 11.50 ARROW POST 9004
PORT ARRIVAL
10% Tanks





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TRIM & STABILITY

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TANK CALIBRATION TABLES



ARROW POST

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January, 2009

TRIM & STABILITY

03/15/09 11:57:46
GHS 11.50

Merlion Marine Services
ARROW POST

9004

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FOTK1.P, Contents: DIESEL at 0.850 Specific Gravity

#1 FO Tank Port

Sndng	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON	LCG	TCG	VCG		
50	.000	1		0.00	6.963a	2.549p	1.808	0.00	
100	.001	5		0.00	7.075a	2.589p	1.843	0.00	
150	.001	14		0.01	7.130a	2.623p	1.882	0.00	
200	.003	31		0.03	7.229a	2.652p	1.922	0.01	
250	.006	60		0.05	7.347a	2.688p	1.960	0.02	
300	.011	103		0.09	7.446a	2.725p	1.997	0.03	
350	.016	158		0.13	7.516a	2.760p	2.035	0.05	
400	.024	234		0.20	7.620a	2.791p	2.074	0.14	
450	.034	330		0.28	7.707a	2.827p	2.111	0.14	
500	.046	447		0.38	7.787a	2.864p	2.148	0.20	
550	.060	585		0.50	7.854a	2.904p	2.184	0.29	
600	.076	742		0.63	7.909a	2.946p	2.220	0.39	
650	.094	918		0.78	7.954a	2.987p	2.254	0.49	
700	.113	1107		0.94	7.993a	3.024p	2.287	0.56	
750	.133	1301		1.11	8.024a	3.053p	2.319	0.57	
800	.153	1496		1.27	8.046a	3.076p	2.349	0.59	
850	.173	1694		1.44	8.064a	3.094p	2.378	0.60	
900	.194	1893		1.61	8.078a	3.109p	2.406	0.62	
950	.214	2093		1.78	8.090a	3.121p	2.434	0.64	
1000	.235	2295		1.95	8.100a	3.133p	2.462	0.65	
1050	.256	2499		2.12	8.108a	3.142p	2.489	0.67	
1100	.277	2705		2.30	8.115a	3.151p	2.517	0.68	
1150	.298	2912		2.47	8.121a	3.159p	2.544	0.70	
1200	.319	3120		2.65	8.127a	3.167p	2.571	0.71	
1250	.341	3330		2.83	8.131a	3.174p	2.598	0.73	
1300	.362	3542		3.01	8.136a	3.180p	2.625	0.74	
1350	.384	3755		3.19	8.139a	3.186p	2.652	0.76	
1400	.406	3969		3.37	8.143a	3.192p	2.678	0.77	
1450	.428	4185		3.56	8.146a	3.197p	2.705	0.79	
1500	.450	4402		3.74	8.149a	3.202p	2.732	0.80	
1550	.472	4620		3.93	8.152a	3.207p	2.759	0.82	
1600	.495	4840		4.11	8.154a	3.212p	2.786	0.83	
1650	.518	5062		4.30	8.156a	3.217p	2.812	0.85	
1700	.540	5284		4.49	8.158a	3.221p	2.839	0.86	
1750	.563	5508		4.68	8.160a	3.225p	2.866	0.88	
1800	.586	5733		4.87	8.162a	3.230p	2.893	0.89	
1850	.609	5959		5.07	8.164a	3.234p	2.919	0.91	
1900	.633	6187		5.26	8.165a	3.238p	2.946	0.92	
1950	.656	6415		5.45	8.167a	3.241p	2.973	0.93	
2000	.680	6645		5.65	8.168a	3.245p	3.000	0.95	
2050	.703	6876		5.84	8.170a	3.249p	3.027	0.96	
2100	.727	7108		6.04	8.171a	3.252p	3.054	0.98	
2150	.751	7341		6.24	8.172a	3.256p	3.080	0.99	
2200	.775	7576		6.44	8.173a	3.259p	3.107	1.00	
2250	.799	7811		6.64	8.174a	3.263p	3.134	1.02	
2300	.823	8048		6.84	8.175a	3.266p	3.161	1.03	
2350	.847	8286		7.04	8.176a	3.269p	3.188	1.05	
2400	.872	8525		7.25	8.177a	3.272p	3.215	1.06	
2450	.896	8765		7.45	8.178a	3.275p	3.242	1.08	
2500	.921	9006		7.66	8.179a	3.278p	3.269	1.09	
2550	.946	9248		7.86	8.180a	3.281p	3.296	1.09	
2600	.970	9489		8.07	8.181a	3.284p	3.322	1.09	
2650	.993	9706		8.25	8.181a	3.285p	3.346	0.28	
2700	1.000	9779		8.31	8.181a	3.282p	3.355	0.00	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FOTK1.S, Contents: DIESEL at 0.850 Specific Gravity

#1 FO Tank Stbd

Snding	Load	Volume		Weight METRIC TON	Center of Gravity			FSM m.-MT
		LITERS			LCG	TCG	VCG	
50	.000	1		0.00	6.963a	2.549s	1.808	0.00
100	.001	5		0.00	7.075a	2.589s	1.843	0.00
150	.001	14		0.01	7.130a	2.623s	1.882	0.00
200	.003	31		0.03	7.229a	2.652s	1.922	0.01
250	.006	60		0.05	7.347a	2.688s	1.960	0.02
300	.011	103		0.09	7.446a	2.725s	1.997	0.03
350	.016	158		0.13	7.516a	2.760s	2.035	0.05
400	.024	234		0.20	7.620a	2.791s	2.074	0.14
450	.034	330		0.28	7.707a	2.827s	2.111	0.14
500	.046	447		0.38	7.787a	2.864s	2.148	0.20
550	.060	585		0.50	7.854a	2.904s	2.184	0.29
600	.076	742		0.63	7.909a	2.946s	2.220	0.39
650	.094	918		0.78	7.954a	2.987s	2.254	0.49
700	.113	1107		0.94	7.993a	3.024s	2.287	0.56
750	.133	1301		1.11	8.024a	3.053s	2.319	0.57
800	.153	1496		1.27	8.046a	3.076s	2.349	0.59
850	.173	1694		1.44	8.064a	3.094s	2.378	0.60
900	.194	1893		1.61	8.078a	3.109s	2.406	0.62
950	.214	2093		1.78	8.090a	3.121s	2.434	0.64
1000	.235	2295		1.95	8.100a	3.133s	2.462	0.65
1050	.256	2499		2.12	8.108a	3.142s	2.489	0.67
1100	.277	2705		2.30	8.115a	3.151s	2.517	0.68
1150	.298	2912		2.47	8.121a	3.159s	2.544	0.70
1200	.319	3120		2.65	8.127a	3.167s	2.571	0.71
1250	.341	3330		2.83	8.131a	3.174s	2.598	0.73
1300	.362	3542		3.01	8.136a	3.180s	2.625	0.74
1350	.384	3755		3.19	8.139a	3.186s	2.652	0.76
1400	.406	3969		3.37	8.143a	3.192s	2.678	0.77
1450	.428	4185		3.56	8.146a	3.197s	2.705	0.79
1500	.450	4402		3.74	8.149a	3.202s	2.732	0.80
1550	.472	4620		3.93	8.152a	3.207s	2.759	0.82
1600	.495	4840		4.11	8.154a	3.212s	2.786	0.83
1650	.518	5062		4.30	8.156a	3.217s	2.812	0.85
1700	.540	5284		4.49	8.158a	3.221s	2.839	0.86
1750	.563	5508		4.68	8.160a	3.225s	2.866	0.88
1800	.586	5733		4.87	8.162a	3.230s	2.893	0.89
1850	.609	5959		5.07	8.164a	3.234s	2.919	0.91
1900	.633	6187		5.26	8.165a	3.238s	2.946	0.92
1950	.656	6415		5.45	8.167a	3.241s	2.973	0.93
2000	.680	6645		5.65	8.168a	3.245s	3.000	0.95
2050	.703	6876		5.84	8.170a	3.249s	3.027	0.96
2100	.727	7108		6.04	8.171a	3.252s	3.054	0.98
2150	.751	7341		6.24	8.172a	3.256s	3.080	0.99
2200	.775	7576		6.44	8.173a	3.259s	3.107	1.00
2250	.799	7811		6.64	8.174a	3.263s	3.134	1.02
2300	.823	8048		6.84	8.175a	3.266s	3.161	1.03
2350	.847	8286		7.04	8.176a	3.269s	3.188	1.05
2400	.872	8525		7.25	8.177a	3.272s	3.215	1.06
2450	.896	8765		7.45	8.178a	3.275s	3.242	1.08
2500	.921	9006		7.66	8.179a	3.278s	3.269	1.09
2550	.946	9248		7.86	8.180a	3.281s	3.296	1.09
2600	.970	9489		8.07	8.181a	3.284s	3.322	1.09
2650	.993	9706		8.25	8.181a	3.285s	3.346	0.28
2700	1.000	9779		8.31	8.181a	3.282s	3.355	0.00

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

Tank: FOTK2.P, Contents: DIESEL at 0.850 Specific Gravity

#2 FO Tank Port

Snding	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
50	.000	1	0.00	4.016a	2.529p	1.452	0.00
100	.000	5	0.00	4.185a	2.561p	1.488	0.00
150	.001	16	0.01	4.313a	2.591p	1.524	0.00
200	.003	34	0.03	4.400a	2.616p	1.563	0.00
250	.005	64	0.05	4.524a	2.640p	1.601	0.01
300	.008	107	0.09	4.646a	2.668p	1.638	0.02
350	.013	162	0.14	4.726a	2.696p	1.674	0.03
400	.018	234	0.20	4.811a	2.723p	1.711	0.05
450	.025	321	0.27	4.888a	2.751p	1.747	0.08
500	.034	424	0.36	4.953a	2.780p	1.783	0.11
550	.043	543	0.46	5.006a	2.810p	1.818	0.15
600	.053	675	0.57	5.049a	2.840p	1.852	0.19
650	.065	822	0.70	5.085a	2.870p	1.886	0.25
700	.078	983	0.84	5.115a	2.899p	1.919	0.32
750	.092	1156	0.98	5.140a	2.928p	1.953	0.39
800	.106	1343	1.14	5.161a	2.957p	1.986	0.47
850	.122	1541	1.31	5.179a	2.985p	2.018	0.57
900	.139	1752	1.49	5.195a	3.013p	2.051	0.67
950	.156	1974	1.68	5.210a	3.040p	2.084	0.75
1000	.174	2202	1.87	5.222a	3.064p	2.115	0.77
1050	.192	2431	2.07	5.233a	3.084p	2.146	0.79
1100	.211	2661	2.26	5.242a	3.101p	2.176	0.81
1150	.229	2894	2.46	5.249a	3.116p	2.205	0.83
1200	.248	3128	2.66	5.256a	3.129p	2.234	0.84
1250	.266	3364	2.86	5.261a	3.141p	2.262	0.86
1300	.285	3601	3.06	5.266a	3.152p	2.291	0.88
1350	.304	3840	3.26	5.271a	3.162p	2.319	0.89
1400	.323	4081	3.47	5.274a	3.171p	2.346	0.91
1450	.342	4323	3.67	5.278a	3.179p	2.374	0.93
1500	.361	4566	3.88	5.281a	3.187p	2.401	0.95
1550	.381	4811	4.09	5.284a	3.194p	2.429	0.96
1600	.400	5058	4.30	5.287a	3.201p	2.456	0.98
1650	.420	5305	4.51	5.289a	3.207p	2.483	1.00
1700	.440	5555	4.72	5.291a	3.213p	2.511	1.01
1750	.459	5805	4.93	5.293a	3.219p	2.538	1.03
1800	.479	6057	5.15	5.295a	3.225p	2.565	1.05
1850	.499	6311	5.36	5.297a	3.230p	2.592	1.06
1900	.520	6565	5.58	5.299a	3.235p	2.619	1.08
1950	.540	6821	5.80	5.300a	3.240p	2.646	1.10
2000	.560	7078	6.02	5.302a	3.245p	2.673	1.11
2050	.581	7337	6.24	5.303a	3.249p	2.700	1.13
2100	.601	7596	6.46	5.304a	3.254p	2.727	1.14
2150	.622	7857	6.68	5.305a	3.258p	2.754	1.16
2200	.643	8119	6.90	5.307a	3.262p	2.781	1.18
2250	.663	8382	7.12	5.308a	3.266p	2.808	1.19
2300	.684	8647	7.35	5.309a	3.270p	2.835	1.21
2350	.705	8912	7.58	5.310a	3.274p	2.862	1.22
2400	.726	9178	7.80	5.311a	3.278p	2.889	1.23
2450	.748	9446	8.03	5.311a	3.281p	2.916	1.25
2500	.769	9714	8.26	5.312a	3.285p	2.943	1.26
2550	.790	9984	8.49	5.313a	3.288p	2.970	1.28
2600	.812	10254	8.72	5.314a	3.292p	2.997	1.29
2650	.833	10526	8.95	5.315a	3.295p	3.024	1.30
2700	.855	10798	9.18	5.315a	3.298p	3.050	1.32
2750	.876	11071	9.41	5.316a	3.301p	3.077	1.33
2800	.898	11345	9.64	5.317a	3.304p	3.104	1.34
2850	.920	11620	9.88	5.317a	3.307p	3.131	1.36
2900	.941	11896	10.11	5.318a	3.310p	3.158	1.36
2950	.963	12172	10.35	5.318a	3.313p	3.185	1.36
3000	.985	12444	10.58	5.319a	3.315p	3.211	1.01
3050	.998	12612	10.72	5.318a	3.313p	3.227	0.06
3085	1.000	12636	10.74	5.317a	3.312p	3.230	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

Tank: FOTK2.S, Contents: DIESEL at 0.850 Specific Gravity
#2 FO Tank Stbd

Snding	Load	Volume	Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
50	.000	1	0.00	4.016a	2.529s	1.452	0.00
100	.000	5	0.00	4.185a	2.561s	1.488	0.00
150	.001	16	0.01	4.313a	2.591s	1.524	0.00
200	.003	34	0.03	4.400a	2.616s	1.563	0.00
250	.005	64	0.05	4.524a	2.640s	1.601	0.01
300	.008	107	0.09	4.646a	2.668s	1.638	0.02
350	.013	162	0.14	4.726a	2.696s	1.674	0.03
400	.018	234	0.20	4.811a	2.723s	1.711	0.05
450	.025	321	0.27	4.888a	2.751s	1.747	0.08
500	.034	424	0.36	4.953a	2.780s	1.783	0.11
550	.043	543	0.46	5.006a	2.810s	1.818	0.15
600	.053	675	0.57	5.049a	2.840s	1.852	0.19
650	.065	822	0.70	5.085a	2.870s	1.886	0.25
700	.078	983	0.84	5.115a	2.899s	1.919	0.32
750	.092	1156	0.98	5.140a	2.928s	1.953	0.39
800	.106	1343	1.14	5.161a	2.957s	1.986	0.47
850	.122	1541	1.31	5.179a	2.985s	2.018	0.57
900	.139	1752	1.49	5.195a	3.013s	2.051	0.67
950	.156	1974	1.68	5.210a	3.040s	2.084	0.75
1000	.174	2202	1.87	5.222a	3.064s	2.115	0.77
1050	.192	2431	2.07	5.233a	3.084s	2.146	0.79
1100	.211	2661	2.26	5.242a	3.101s	2.176	0.81
1150	.229	2894	2.46	5.249a	3.116s	2.205	0.83
1200	.248	3128	2.66	5.256a	3.129s	2.234	0.84
1250	.266	3364	2.86	5.261a	3.141s	2.262	0.86
1300	.285	3601	3.06	5.266a	3.152s	2.291	0.88
1350	.304	3840	3.26	5.271a	3.162s	2.319	0.89
1400	.323	4081	3.47	5.274a	3.171s	2.346	0.91
1450	.342	4323	3.67	5.278a	3.179s	2.374	0.93
1500	.361	4566	3.88	5.281a	3.187s	2.401	0.95
1550	.381	4811	4.09	5.284a	3.194s	2.429	0.96
1600	.400	5058	4.30	5.287a	3.201s	2.456	0.98
1650	.420	5305	4.51	5.289a	3.207s	2.483	1.00
1700	.440	5555	4.72	5.291a	3.213s	2.511	1.01
1750	.459	5805	4.93	5.293a	3.219s	2.538	1.03
1800	.479	6057	5.15	5.295a	3.225s	2.565	1.05
1850	.499	6311	5.36	5.297a	3.230s	2.592	1.06
1900	.520	6565	5.58	5.299a	3.235s	2.619	1.08
1950	.540	6821	5.80	5.300a	3.240s	2.646	1.10
2000	.560	7078	6.02	5.302a	3.245s	2.673	1.11
2050	.581	7337	6.24	5.303a	3.249s	2.700	1.13
2100	.601	7596	6.46	5.304a	3.254s	2.727	1.14
2150	.622	7857	6.68	5.305a	3.258s	2.754	1.16
2200	.643	8119	6.90	5.307a	3.262s	2.781	1.18
2250	.663	8382	7.12	5.308a	3.266s	2.808	1.19
2300	.684	8647	7.35	5.309a	3.270s	2.835	1.21
2350	.705	8912	7.58	5.310a	3.274s	2.862	1.22
2400	.726	9178	7.80	5.311a	3.278s	2.889	1.23
2450	.748	9446	8.03	5.311a	3.281s	2.916	1.25
2500	.769	9714	8.26	5.312a	3.285s	2.943	1.26
2550	.790	9984	8.49	5.313a	3.288s	2.970	1.28
2600	.812	10254	8.72	5.314a	3.292s	2.997	1.29
2650	.833	10526	8.95	5.315a	3.295s	3.024	1.30
2700	.855	10798	9.18	5.315a	3.298s	3.050	1.32
2750	.876	11071	9.41	5.316a	3.301s	3.077	1.33
2800	.898	11345	9.64	5.317a	3.304s	3.104	1.34
2850	.920	11620	9.88	5.317a	3.307s	3.131	1.36
2900	.941	11896	10.11	5.318a	3.310s	3.158	1.36
2950	.963	12172	10.35	5.318a	3.313s	3.185	1.36
3000	.985	12444	10.58	5.319a	3.315s	3.211	1.01
3050	.998	12612	10.72	5.318a	3.313s	3.227	0.06
3085	1.000	12636	10.74	5.317a	3.312s	3.230	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FOTK3.P, Contents: DIESEL at 0.850 Specific Gravity

#3 FO Tank Port

Snding	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON	LCG	TCG	VCG		
50	.000	1		0.00	4.668f	1.035p	0.872	0.00	
100	.001	8		0.01	4.832f	1.062p	0.910	0.00	
150	.004	25		0.02	5.026f	1.090p	0.947	0.00	
200	.009	52		0.04	5.125f	1.117p	0.982	0.01	
250	.015	89		0.08	5.190f	1.147p	1.017	0.01	
300	.023	137		0.12	5.234f	1.176p	1.051	0.02	
350	.033	195		0.17	5.265f	1.206p	1.084	0.03	
400	.044	263		0.22	5.288f	1.234p	1.117	0.05	
450	.057	340		0.29	5.305f	1.262p	1.150	0.07	
500	.072	426		0.36	5.319f	1.290p	1.183	0.09	
550	.088	520		0.44	5.330f	1.316p	1.215	0.12	
600	.105	623		0.53	5.339f	1.342p	1.248	0.15	
650	.124	734		0.62	5.346f	1.367p	1.280	0.19	
700	.144	852		0.72	5.353f	1.392p	1.312	0.23	
750	.165	978		0.83	5.358f	1.416p	1.345	0.27	
800	.188	1111		0.94	5.363f	1.439p	1.377	0.31	
850	.211	1250		1.06	5.367f	1.461p	1.408	0.36	
900	.236	1396		1.19	5.371f	1.483p	1.440	0.41	
950	.262	1549		1.32	5.375f	1.503p	1.472	0.46	
1000	.288	1707		1.45	5.378f	1.524p	1.503	0.51	
1050	.316	1871		1.59	5.380f	1.544p	1.535	0.57	
1100	.345	2041		1.73	5.383f	1.563p	1.566	0.62	
1150	.374	2216		1.88	5.385f	1.581p	1.598	0.68	
1200	.405	2396		2.04	5.387f	1.599p	1.629	0.74	
1250	.436	2582		2.19	5.389f	1.617p	1.660	0.80	
1300	.468	2772		2.36	5.391f	1.634p	1.691	0.86	
1350	.501	2967		2.52	5.393f	1.650p	1.722	0.92	
1400	.535	3166		2.69	5.395f	1.667p	1.753	0.98	
1450	.569	3369		2.86	5.396f	1.682p	1.783	1.04	
1500	.604	3577		3.04	5.397f	1.697p	1.814	1.10	
1550	.640	3788		3.22	5.399f	1.712p	1.845	1.17	
1600	.676	4004		3.40	5.400f	1.727p	1.875	1.23	
1650	.713	4223		3.59	5.401f	1.741p	1.906	1.29	
1700	.751	4446		3.78	5.402f	1.754p	1.936	1.35	
1750	.789	4673		3.97	5.403f	1.768p	1.966	1.42	
1800	.828	4902		4.17	5.404f	1.780p	1.997	1.48	
1850	.867	5135		4.37	5.405f	1.793p	2.027	1.54	
1900	.907	5372		4.57	5.406f	1.805p	2.057	1.60	
1950	.948	5611		4.77	5.406f	1.817p	2.087	1.66	
2000	.988	5853		4.98	5.407f	1.829p	2.117	1.72	
2014	1.000	5920		5.03	5.407f	1.832p	2.125	1.65	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FOTK3.S, Contents: DIESEL at 0.850 Specific Gravity

#3 FO Tank Stbd

Snding	Load	Volume		Weight METRIC TON	Center of Gravity			FSM m.-MT
		LITERS			LCG	TCG	VCG	
50	.000	1		0.00	4.668f	1.035s	0.872	0.00
100	.001	8		0.01	4.832f	1.062s	0.910	0.00
150	.004	25		0.02	5.026f	1.090s	0.947	0.00
200	.009	52		0.04	5.125f	1.117s	0.982	0.01
250	.015	89		0.08	5.190f	1.147s	1.017	0.01
300	.023	137		0.12	5.234f	1.176s	1.051	0.02
350	.033	195		0.17	5.265f	1.206s	1.084	0.03
400	.044	263		0.22	5.288f	1.234s	1.117	0.05
450	.057	340		0.29	5.305f	1.262s	1.150	0.07
500	.072	426		0.36	5.319f	1.290s	1.183	0.09
550	.088	520		0.44	5.330f	1.316s	1.215	0.12
600	.105	623		0.53	5.339f	1.342s	1.248	0.15
650	.124	734		0.62	5.346f	1.367s	1.280	0.19
700	.144	852		0.72	5.353f	1.392s	1.312	0.23
750	.165	978		0.83	5.358f	1.416s	1.345	0.27
800	.188	1111		0.94	5.363f	1.439s	1.377	0.31
850	.211	1250		1.06	5.367f	1.461s	1.408	0.36
900	.236	1396		1.19	5.371f	1.483s	1.440	0.41
950	.262	1549		1.32	5.375f	1.503s	1.472	0.46
1000	.288	1707		1.45	5.378f	1.524s	1.503	0.51
1050	.316	1871		1.59	5.380f	1.544s	1.535	0.57
1100	.345	2041		1.73	5.383f	1.563s	1.566	0.62
1150	.374	2216		1.88	5.385f	1.581s	1.598	0.68
1200	.405	2396		2.04	5.387f	1.599s	1.629	0.74
1250	.436	2582		2.19	5.389f	1.617s	1.660	0.80
1300	.468	2772		2.36	5.391f	1.634s	1.691	0.86
1350	.501	2967		2.52	5.393f	1.650s	1.722	0.92
1400	.535	3166		2.69	5.395f	1.667s	1.753	0.98
1450	.569	3369		2.86	5.396f	1.682s	1.783	1.04
1500	.604	3577		3.04	5.397f	1.697s	1.814	1.10
1550	.640	3788		3.22	5.399f	1.712s	1.845	1.17
1600	.676	4004		3.40	5.400f	1.727s	1.875	1.23
1650	.713	4223		3.59	5.401f	1.741s	1.906	1.29
1700	.751	4446		3.78	5.402f	1.754s	1.936	1.35
1750	.789	4673		3.97	5.403f	1.768s	1.966	1.42
1800	.828	4902		4.17	5.404f	1.780s	1.997	1.48
1850	.867	5135		4.37	5.405f	1.793s	2.027	1.54
1900	.907	5372		4.57	5.406f	1.805s	2.057	1.60
1950	.948	5611		4.77	5.406f	1.817s	2.087	1.66
2000	.988	5853		4.98	5.407f	1.829s	2.117	1.72
2014	1.000	5920		5.03	5.407f	1.832s	2.125	1.65

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FODAYTK.C, Contents: DIESEL at 0.850 Specific Gravity

Fuel Oil Day Tank

Snding	Load	Volume		Weight		Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON	LCG	TCG	VCG		
50	.040	38		0.03	3.450a	0.000	3.075	0.11	
100	.080	76		0.06	3.450a	0.000	3.100	0.11	
150	.120	114		0.10	3.450a	0.000	3.125	0.11	
200	.160	152		0.13	3.450a	0.000	3.150	0.11	
250	.200	190		0.16	3.450a	0.000	3.175	0.11	
300	.240	228		0.19	3.450a	0.000	3.200	0.11	
350	.280	265		0.23	3.450a	0.000	3.225	0.11	
400	.320	303		0.26	3.450a	0.000	3.250	0.11	
450	.360	341		0.29	3.450a	0.000	3.275	0.11	
500	.400	379		0.32	3.450a	0.000	3.300	0.11	
550	.440	417		0.35	3.450a	0.000	3.325	0.11	
600	.480	455		0.39	3.450a	0.000	3.350	0.11	
650	.520	493		0.42	3.450a	0.000	3.375	0.11	
700	.560	531		0.45	3.450a	0.000	3.400	0.11	
750	.600	569		0.48	3.450a	0.000	3.425	0.11	
800	.640	607		0.52	3.450a	0.000	3.450	0.11	
850	.680	645		0.55	3.450a	0.000	3.475	0.11	
900	.720	683		0.58	3.450a	0.000	3.500	0.11	
950	.760	720		0.61	3.450a	0.000	3.525	0.11	
1000	.800	758		0.64	3.450a	0.000	3.550	0.11	
1050	.840	796		0.68	3.450a	0.000	3.575	0.11	
1100	.880	834		0.71	3.450a	0.000	3.600	0.11	
1150	.920	872		0.74	3.450a	0.000	3.625	0.11	
1200	.960	910		0.77	3.450a	0.000	3.650	0.11	
1250	1.000	948		0.81	3.450a	0.000	3.675	0.11	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: HOTK.S, Contents: HYDR OIL at 0.880 Specific Gravity

Hydraulic Tank

Snding	Load	Volume		Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
50	.001	1	0.00	1.333f	2.036s	1.116	0.00
100	.006	9	0.01	1.550f	2.064s	1.154	0.00
150	.015	24	0.02	1.634f	2.095s	1.189	0.00
200	.030	47	0.04	1.690f	2.125s	1.223	0.01
250	.050	79	0.07	1.726f	2.156s	1.257	0.01
300	.076	118	0.10	1.750f	2.187s	1.290	0.02
350	.105	164	0.14	1.766f	2.217s	1.323	0.03
400	.139	217	0.19	1.779f	2.245s	1.355	0.04
450	.178	277	0.24	1.788f	2.272s	1.388	0.06
500	.220	342	0.30	1.796f	2.298s	1.420	0.07
550	.265	413	0.36	1.802f	2.323s	1.452	0.09
600	.315	490	0.43	1.807f	2.347s	1.484	0.11
650	.367	572	0.50	1.811f	2.370s	1.516	0.14
700	.423	658	0.58	1.815f	2.392s	1.547	0.16
750	.482	750	0.66	1.818f	2.413s	1.579	0.19
800	.543	846	0.74	1.821f	2.434s	1.610	0.21
850	.608	946	0.83	1.824f	2.453s	1.641	0.24
900	.675	1051	0.92	1.826f	2.473s	1.673	0.27
950	.745	1159	1.02	1.828f	2.491s	1.704	0.30
1000	.817	1272	1.12	1.830f	2.509s	1.735	0.34
1050	.891	1388	1.22	1.831f	2.526s	1.766	0.37
1100	.968	1508	1.33	1.833f	2.543s	1.797	0.40
1120	1.000	1557	1.37	1.833f	2.550s	1.809	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: SLUDGE.P, Contents: SLUDGE at 0.880 Specific Gravity

Sludge Tank

Snding	Load	Volume		Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
50	.001	2	0.00	1.107a	2.034p	1.078	0.00
100	.007	14	0.01	1.259a	2.071p	1.113	0.00
150	.017	35	0.03	1.316a	2.111p	1.147	0.00
200	.033	66	0.06	1.344a	2.151p	1.180	0.01
250	.053	106	0.09	1.361a	2.188p	1.213	0.02
300	.077	155	0.14	1.372a	2.224p	1.246	0.03
350	.106	212	0.19	1.381a	2.259p	1.278	0.05
400	.138	277	0.24	1.387a	2.292p	1.311	0.07
450	.175	349	0.31	1.392a	2.324p	1.343	0.10
500	.214	428	0.38	1.396a	2.354p	1.375	0.13
550	.257	514	0.45	1.399a	2.383p	1.407	0.16
600	.303	606	0.53	1.402a	2.411p	1.439	0.19
650	.352	704	0.62	1.404a	2.438p	1.470	0.23
700	.404	808	0.71	1.406a	2.464p	1.502	0.27
750	.459	918	0.81	1.408a	2.489p	1.534	0.31
800	.516	1032	0.91	1.410a	2.513p	1.565	0.36
850	.576	1153	1.01	1.412a	2.537p	1.596	0.41
900	.639	1278	1.12	1.413a	2.560p	1.628	0.46
950	.704	1408	1.24	1.414a	2.582p	1.659	0.51
1000	.771	1542	1.36	1.415a	2.603p	1.690	0.57
1050	.841	1681	1.48	1.417a	2.624p	1.721	0.63
1100	.912	1825	1.61	1.418a	2.645p	1.752	0.69
1150	.986	1973	1.74	1.419a	2.664p	1.783	0.75
1159	1.000	2000	1.76	1.419a	2.668p	1.789	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS
No Trim, No Heel

Tank: GREYWTR.P, Contents: GREYWTR at 1.000 Specific Gravity
Grey Water Tank

Snding	Load	Volume		Weight METRIC TON	Center of Gravity			FSM m.-MT
		LITERS			LCG	TCG	VCG	
50	.001	1		0.00	1.333f	2.036p	1.116	0.00
100	.006	9		0.01	1.550f	2.064p	1.154	0.00
150	.015	24		0.02	1.634f	2.095p	1.189	0.00
200	.030	47		0.05	1.690f	2.125p	1.223	0.01
250	.050	79		0.08	1.726f	2.156p	1.257	0.01
300	.076	118		0.12	1.750f	2.187p	1.290	0.02
350	.105	164		0.16	1.766f	2.217p	1.323	0.03
400	.139	217		0.22	1.779f	2.245p	1.355	0.05
450	.178	277		0.28	1.788f	2.272p	1.388	0.07
500	.220	342		0.34	1.796f	2.298p	1.420	0.08
550	.265	413		0.41	1.802f	2.323p	1.452	0.11
600	.315	490		0.49	1.807f	2.347p	1.484	0.13
650	.367	572		0.57	1.811f	2.370p	1.516	0.16
700	.423	658		0.66	1.815f	2.392p	1.547	0.18
750	.482	750		0.75	1.818f	2.413p	1.579	0.21
800	.543	846		0.85	1.821f	2.434p	1.610	0.24
850	.608	946		0.95	1.824f	2.453p	1.641	0.28
900	.675	1051		1.05	1.826f	2.473p	1.673	0.31
950	.745	1159		1.16	1.828f	2.491p	1.704	0.35
1000	.817	1272		1.27	1.830f	2.509p	1.735	0.38
1050	.891	1388		1.39	1.831f	2.526p	1.766	0.42
1100	.968	1508		1.51	1.833f	2.543p	1.797	0.46
1120	1.000	1557		1.56	1.833f	2.550p	1.809	

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FWTK1.P, Contents: FRESH WATER at 1.000 Specific Gravity

#1 FW Tank Port

Snding	Load	Volume		Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON	LCG	TCG	VCG	
50	.000	2		0.00	10.778a	2.597p	2.308	0.00
100	.003	18		0.02	11.102a	2.653p	2.349	0.04
150	.010	67		0.07	11.398a	2.725p	2.388	0.05
200	.023	151		0.15	11.532a	2.815p	2.423	0.14
250	.040	263		0.26	11.583a	2.898p	2.455	0.28
300	.059	391		0.39	11.612a	2.954p	2.486	0.30
350	.079	520		0.52	11.628a	2.985p	2.514	0.32
400	.099	652		0.65	11.639a	3.005p	2.541	0.33
450	.119	787		0.79	11.648a	3.019p	2.568	0.34
500	.139	923		0.92	11.654a	3.031p	2.594	0.36
550	.160	1062		1.06	11.660a	3.041p	2.621	0.37
600	.182	1202		1.20	11.665a	3.049p	2.647	0.38
650	.203	1345		1.35	11.670a	3.056p	2.674	0.40
700	.225	1490		1.49	11.674a	3.063p	2.701	0.41
750	.248	1638		1.64	11.678a	3.069p	2.727	0.43
800	.270	1787		1.79	11.682a	3.075p	2.754	0.44
850	.293	1939		1.94	11.685a	3.081p	2.781	0.46
900	.316	2092		2.09	11.689a	3.086p	2.808	0.47
950	.340	2248		2.25	11.692a	3.091p	2.835	0.49
1000	.364	2406		2.41	11.696a	3.096p	2.862	0.50
1050	.388	2566		2.57	11.699a	3.101p	2.889	0.52
1100	.412	2728		2.73	11.702a	3.106p	2.916	0.54
1150	.437	2892		2.89	11.705a	3.110p	2.944	0.55
1200	.462	3058		3.06	11.708a	3.114p	2.971	0.57
1250	.488	3227		3.23	11.711a	3.119p	2.998	0.59
1300	.513	3397		3.40	11.715a	3.123p	3.026	0.60
1350	.539	3570		3.57	11.718a	3.127p	3.053	0.62
1400	.566	3742		3.74	11.720a	3.132p	3.081	0.64
1450	.592	3916		3.92	11.722a	3.136p	3.108	0.65
1500	.618	4091		4.09	11.724a	3.140p	3.136	0.67
1550	.645	4269		4.27	11.726a	3.144p	3.164	0.69
1600	.672	4448		4.45	11.728a	3.148p	3.191	0.70
1650	.700	4629		4.63	11.730a	3.152p	3.219	0.72
1700	.727	4811		4.81	11.732a	3.156p	3.247	0.73
1750	.755	4996		5.00	11.734a	3.159p	3.275	0.75
1800	.783	5181		5.18	11.736a	3.163p	3.303	0.77
1850	.811	5369		5.37	11.738a	3.167p	3.331	0.78
1900	.840	5558		5.56	11.740a	3.170p	3.359	0.80
1950	.869	5748		5.75	11.742a	3.174p	3.387	0.81
2000	.898	5941		5.94	11.744a	3.177p	3.415	0.83
2050	.927	6134		6.13	11.746a	3.181p	3.443	0.83
2100	.956	6328		6.33	11.748a	3.184p	3.471	0.84
2150	.985	6517		6.52	11.750a	3.186p	3.498	0.51
2196	.999	6611		6.61	11.754a	3.184p	3.511	0.01

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FWTK1.S, Contents: FRESH WATER at 1.000 Specific Gravity

#1 FW Tank Stbd

Snding	Load	Volume		Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON	LCG	TCG	VCG	
50	.000	2		0.00	10.778a	2.597s	2.308	0.00
100	.003	18		0.02	11.102a	2.653s	2.349	0.04
150	.010	67		0.07	11.398a	2.725s	2.388	0.05
200	.023	151		0.15	11.532a	2.815s	2.423	0.14
250	.040	263		0.26	11.583a	2.898s	2.455	0.28
300	.059	391		0.39	11.612a	2.954s	2.486	0.30
350	.079	520		0.52	11.628a	2.985s	2.514	0.32
400	.099	652		0.65	11.639a	3.005s	2.541	0.33
450	.119	787		0.79	11.648a	3.019s	2.568	0.34
500	.139	923		0.92	11.654a	3.031s	2.594	0.36
550	.160	1062		1.06	11.660a	3.041s	2.621	0.37
600	.182	1202		1.20	11.665a	3.049s	2.647	0.38
650	.203	1345		1.35	11.670a	3.056s	2.674	0.40
700	.225	1490		1.49	11.674a	3.063s	2.701	0.41
750	.248	1638		1.64	11.678a	3.069s	2.727	0.43
800	.270	1787		1.79	11.682a	3.075s	2.754	0.44
850	.293	1939		1.94	11.685a	3.081s	2.781	0.46
900	.316	2092		2.09	11.689a	3.086s	2.808	0.47
950	.340	2248		2.25	11.692a	3.091s	2.835	0.49
1000	.364	2406		2.41	11.696a	3.096s	2.862	0.50
1050	.388	2566		2.57	11.699a	3.101s	2.889	0.52
1100	.412	2728		2.73	11.702a	3.106s	2.916	0.54
1150	.437	2892		2.89	11.705a	3.110s	2.944	0.55
1200	.462	3058		3.06	11.708a	3.114s	2.971	0.57
1250	.488	3227		3.23	11.711a	3.119s	2.998	0.59
1300	.513	3397		3.40	11.715a	3.123s	3.026	0.60
1350	.539	3570		3.57	11.718a	3.127s	3.053	0.62
1400	.566	3742		3.74	11.720a	3.132s	3.081	0.64
1450	.592	3916		3.92	11.722a	3.136s	3.108	0.65
1500	.618	4091		4.09	11.724a	3.140s	3.136	0.67
1550	.645	4269		4.27	11.726a	3.144s	3.164	0.69
1600	.672	4448		4.45	11.728a	3.148s	3.191	0.70
1650	.700	4629		4.63	11.730a	3.152s	3.219	0.72
1700	.727	4811		4.81	11.732a	3.156s	3.247	0.73
1750	.755	4996		5.00	11.734a	3.159s	3.275	0.75
1800	.783	5181		5.18	11.736a	3.163s	3.303	0.77
1850	.811	5369		5.37	11.738a	3.167s	3.331	0.78
1900	.840	5558		5.56	11.740a	3.170s	3.359	0.80
1950	.869	5748		5.75	11.742a	3.174s	3.387	0.81
2000	.898	5941		5.94	11.744a	3.177s	3.415	0.83
2050	.927	6134		6.13	11.746a	3.181s	3.443	0.83
2100	.956	6328		6.33	11.748a	3.184s	3.471	0.84
2150	.985	6517		6.52	11.750a	3.186s	3.498	0.51
2196	.999	6611		6.61	11.754a	3.184s	3.511	0.01

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FWTK2.P, Contents: FRESH WATER at 1.000 Specific Gravity

#2 FW Tank Port

Snding	Load	Volume		Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
50	.000	1	0.00	7.335f	0.407p	0.748	0.00
100	.002	8	0.01	7.510f	0.433p	0.784	0.00
150	.005	20	0.02	7.578f	0.463p	0.818	0.00
200	.011	39	0.04	7.610f	0.493p	0.852	0.00
250	.017	65	0.06	7.630f	0.523p	0.885	0.01
300	.025	95	0.10	7.643f	0.551p	0.918	0.02
350	.035	131	0.13	7.651f	0.578p	0.951	0.02
400	.046	172	0.17	7.658f	0.605p	0.983	0.03
450	.058	218	0.22	7.663f	0.630p	1.016	0.05
500	.072	269	0.27	7.667f	0.655p	1.048	0.06
550	.087	324	0.32	7.670f	0.679p	1.080	0.08
600	.103	384	0.38	7.672f	0.703p	1.112	0.09
650	.120	448	0.45	7.675f	0.725p	1.144	0.11
700	.138	516	0.52	7.677f	0.747p	1.176	0.14
750	.157	588	0.59	7.678f	0.768p	1.208	0.16
800	.177	664	0.66	7.680f	0.789p	1.240	0.18
850	.199	744	0.74	7.681f	0.809p	1.272	0.21
900	.221	827	0.83	7.682f	0.829p	1.303	0.24
950	.244	913	0.91	7.683f	0.848p	1.335	0.27
1000	.268	1003	1.00	7.684f	0.866p	1.366	0.30
1050	.293	1096	1.10	7.685f	0.885p	1.398	0.33
1100	.318	1192	1.19	7.686f	0.902p	1.429	0.36
1150	.345	1291	1.29	7.687f	0.919p	1.460	0.40
1200	.372	1393	1.39	7.687f	0.936p	1.492	0.43
1250	.400	1498	1.50	7.688f	0.952p	1.523	0.47
1300	.429	1606	1.61	7.688f	0.968p	1.554	0.50
1350	.458	1716	1.72	7.689f	0.983p	1.585	0.54
1400	.488	1829	1.83	7.689f	0.998p	1.616	0.57
1450	.519	1944	1.94	7.690f	1.013p	1.647	0.61
1500	.551	2061	2.06	7.690f	1.027p	1.677	0.65
1550	.583	2181	2.18	7.691f	1.041p	1.708	0.68
1600	.615	2303	2.30	7.691f	1.055p	1.739	0.72
1650	.648	2428	2.43	7.691f	1.068p	1.769	0.76
1700	.682	2554	2.55	7.692f	1.081p	1.800	0.80
1750	.717	2682	2.68	7.692f	1.094p	1.830	0.84
1800	.751	2813	2.81	7.692f	1.106p	1.861	0.88
1850	.787	2945	2.95	7.693f	1.118p	1.891	0.91
1900	.823	3079	3.08	7.693f	1.130p	1.921	0.95
1950	.859	3215	3.22	7.693f	1.141p	1.952	0.98
2000	.896	3353	3.35	7.694f	1.152p	1.982	1.02
2050	.933	3492	3.49	7.694f	1.163p	2.012	1.06
2100	.970	3633	3.63	7.694f	1.174p	2.042	1.10
2139	1.000	3743	3.74	7.694f	1.182p	2.065	0.49

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: FWTK2.S, Contents: FRESH WATER at 1.000 Specific Gravity

#2 FW Tank Stbd

Snding	Load	Volume		Center of Gravity			FSM m.-MT
		LITERS	METRIC TON	LCG	TCG	VCG	
50	.000	1	0.00	7.335f	0.407s	0.748	0.00
100	.002	8	0.01	7.510f	0.433s	0.784	0.00
150	.005	20	0.02	7.578f	0.463s	0.818	0.00
200	.011	39	0.04	7.610f	0.493s	0.852	0.00
250	.017	65	0.06	7.630f	0.523s	0.885	0.01
300	.025	95	0.10	7.643f	0.551s	0.918	0.02
350	.035	131	0.13	7.651f	0.578s	0.951	0.02
400	.046	172	0.17	7.658f	0.605s	0.983	0.03
450	.058	218	0.22	7.663f	0.630s	1.016	0.05
500	.072	269	0.27	7.667f	0.655s	1.048	0.06
550	.087	324	0.32	7.670f	0.679s	1.080	0.08
600	.103	384	0.38	7.672f	0.703s	1.112	0.09
650	.120	448	0.45	7.675f	0.725s	1.144	0.11
700	.138	516	0.52	7.677f	0.747s	1.176	0.14
750	.157	588	0.59	7.678f	0.768s	1.208	0.16
800	.177	664	0.66	7.680f	0.789s	1.240	0.18
850	.199	744	0.74	7.681f	0.809s	1.272	0.21
900	.221	827	0.83	7.682f	0.829s	1.303	0.24
950	.244	913	0.91	7.683f	0.848s	1.335	0.27
1000	.268	1003	1.00	7.684f	0.866s	1.366	0.30
1050	.293	1096	1.10	7.685f	0.885s	1.398	0.33
1100	.318	1192	1.19	7.686f	0.902s	1.429	0.36
1150	.345	1291	1.29	7.687f	0.919s	1.460	0.40
1200	.372	1393	1.39	7.687f	0.936s	1.492	0.43
1250	.400	1498	1.50	7.688f	0.952s	1.523	0.47
1300	.429	1606	1.61	7.688f	0.968s	1.554	0.50
1350	.458	1716	1.72	7.689f	0.983s	1.585	0.54
1400	.488	1829	1.83	7.689f	0.998s	1.616	0.57
1450	.519	1944	1.94	7.690f	1.013s	1.647	0.61
1500	.551	2061	2.06	7.690f	1.027s	1.677	0.65
1550	.583	2181	2.18	7.691f	1.041s	1.708	0.68
1600	.615	2303	2.30	7.691f	1.055s	1.739	0.72
1650	.648	2428	2.43	7.691f	1.068s	1.769	0.76
1700	.682	2554	2.55	7.692f	1.081s	1.800	0.80
1750	.717	2682	2.68	7.692f	1.094s	1.830	0.84
1800	.751	2813	2.81	7.692f	1.106s	1.861	0.88
1850	.787	2945	2.95	7.693f	1.118s	1.891	0.91
1900	.823	3079	3.08	7.693f	1.130s	1.921	0.95
1950	.859	3215	3.22	7.693f	1.141s	1.952	0.98
2000	.896	3353	3.35	7.694f	1.152s	1.982	1.02
2050	.933	3492	3.49	7.694f	1.163s	2.012	1.06
2100	.970	3633	3.63	7.694f	1.174s	2.042	1.10
2139	1.000	3743	3.74	7.694f	1.182s	2.065	0.49

Soundings in mm.-----Other distances in METERS.-----



ARROW POST

Project 2009-004

January, 2009

TRIM & STABILITY

TANK CHARACTERISTICS

No Trim, No Heel

Tank: GASTK.S, Contents: GASOLINE at 0.765 Specific Gravity

Gasoline Tank

Snding	Load	Volume		Weight	Center of Gravity			FSM m.-MT
		LITERS	METRIC	TON	LCG	TCG	VCG	
50	.190	174		0.13	9.662a	3.811s	4.971	0.02
100	.252	230		0.18	9.662a	3.782s	5.004	0.03
150	.320	293		0.22	9.662a	3.757s	5.036	0.04
200	.388	355		0.27	9.662a	3.740s	5.066	0.04
250	.456	417		0.32	9.662a	3.729s	5.095	0.04
300	.524	480		0.37	9.662a	3.720s	5.122	0.04
350	.592	542		0.41	9.662a	3.713s	5.149	0.04
400	.661	604		0.46	9.662a	3.708s	5.175	0.04
450	.729	667		0.51	9.662a	3.704s	5.202	0.04
500	.797	729		0.56	9.662a	3.700s	5.228	0.04
550	.865	791		0.61	9.662a	3.697s	5.254	0.04
600	.933	854		0.65	9.662a	3.695s	5.279	0.04
649	1.000	915		0.70	9.662a	3.693s	5.304	

Soundings in mm.-----Other distances in METERS.-----



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January, 2009

ARROW POST
TRIM & STABILITY

INCLINING EXPERIMENT



ARROW POST

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January, 2009

TRIM & STABILITY

CONDITIONS

DATE December 30, 2008
LOCATION Patricia Bay, B.C.

WEATHER

Air Temperature 3°C
 Wind Speed Light, 5-10 knots
 Wind Direction SE
 Sky Overcast

SEA

Rippled

SHIP

Heading 280°T
 Moorings 1 Bow, 1 Stern, slack

IN ATTENDANCE

Name	
Bill Pemberton	Transport Canada
Al Linden	Coast Guard
Dave Barry	Coast Guard
Jim Bull	Coast Guard
John Marrack	Marrack Enterprises
Carolyn Woodlock	Marrack Enterprises
Peter Nicol	MerLion Marine Services
Alex Brydon	MerLion Marine Services

SPECIFIC GRAVITY OF WATER

Location	Specific Gravity
----------	------------------

Stern, 2m depth	1.025
Bow, 1.5m depth	1.023
Bow, surface	1.022

DOWNFLOODING POINTS

Description	Longitudinal	Transverse	Vertical
Galley Vent	2.80 Aft	1.30 Stbd	8.80 Above BL
Engine Room Air Intake	1.60 Aft	1.10 Port	9.20 Above BL

BALLAST None



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TRIM & STABILITY

DRAFTS

Location	Draft Marks	Baseline
Port Aft	3.460 metres	3.002 metres
Starboard Aft	3.430 metres	2.972 metres
Mean Draft Aft	3.445 metres	2.987 metres
Port Forward	2.105 metres	2.730 metres
Starboard Forward	2.105 metres	2.730 metres
Mean Draft Forward	2.105 metres	2.730 metres
Mean Draft Amidships		2.864 metres
Trim		0.257 metres by the stern

HEEL	Heel	Beam	Angle
Aft	0.030 metres	7.606 metres	0.226 ° port

DISPLACEMENT AS INCLINED

03/13/09 11:32:11
GHS 11.50

Merlion Marine Services
ARROW POST

9004

WEIGHT and DISPLACEMENT STATUS
Baseline draft: 2.730 @ 13.25f, 2.987 @ 12.25a
Trim: Aft 0.257/25.500, Heel: Port 0.23 deg.

Part	weight(MT)	LCG	TCG	VCG
WEIGHT	241.33	1.050a	0.007p	3.777
	SpGr	LCB	TCB	VCB
HULL	1.023	241.33	1.067a	0.014p
HOUSE	1.023	0.00		
Total Displacement-->	1.023	241.33	1.067a	0.014p
Righting Arms:		0.000	0.000p	
Distances in METERS.				

HYDROSTATIC PROPERTIES
Trim: Aft 0.257/25.500, Heel: Port 0.23 deg., VCG = 3.777

Draft@	Displacement	Buoyancy-Ctr.	weight/	Moment/
Origin	weight(MT)	LCB	VCB	cm
2.864	241.33	1.067a	2.041	1.79
				1.978a
				2.86
				30.19
				1.765
Distances in METERS.-----Specific Gravity = 1.023.-----Moment in m.-MT.				
Trim is per 25.50m.				

Draft is from Baseline.

Baseline draft: 2.730 @ 13.25f, 2.987 @ 12.25a

Marks draft refers to the line:
0.625 above baseline @ 13.250f and 0.458 below baseline @ 12.250a

Marks draft: 2.105 @ 13.25f, 3.445 @ 12.25a



ARROW POST

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TRIM & STABILITY

WEIGHTS AND MOMENTS

	ID	Weight tonnes	TCG	LCG	VCG
Inclining Weight	#1	0.458	-2.500	3.460	7.560
Inclining Weight	#2	0.458	2.170	4.960	7.560
Inclining Weight	#3	0.458	-1.800	6.220	7.560
Inclining Weight	#4	0.458	2.400	9.795	4.885

Shift #	Weight #	Weight	Direction	Distance	Moment	Net Moment
0						
1	#1	0.458	P→S	5.000	2.290	2.290
2	#3	0.458	P→S	3.600	1.649	3.939
3	#1	0.458	S→P	-5.000	-2.290	1.649
4	#3	0.458	S→P	-3.600	-1.649	0.000
5	#2	0.458	S→P	-4.340	-1.988	-1.988
6	#4	0.458	S→P	-4.800	-2.198	-4.186
7	#2	0.458	P→S	4.340	1.988	-2.198
8	#4	0.458	P→S	4.800	2.198	0.000



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PENDULA	Length	Location
Pendulum #1	3930 mm	Hung from aft end of wheelhouse
Pendulum #2	2566 mm	Tripod on main deck aft
Pendulum #3	7140 mm	U tube at aft end of house

Pendulum #1

Shift #	Direction	Deflection (shift)	Tan ϕ	Total Deflection	Total Tan ϕ
0					
1	P→S	24	0.0061	24	0.0061
2	P→S	11.5	0.0029	36	0.0090
3	S→P	-21	-0.0053	15	0.0037
4	S→P	-15	-0.0038	-1	-0.0001
5	S→P	-19.5	-0.0050	-20	-0.0051
6	S→P	-20	-0.0051	-40	-0.0102
7	P→S	20	0.0051	-20	-0.0051
8	P→S	19	0.0048	-1	-0.0003

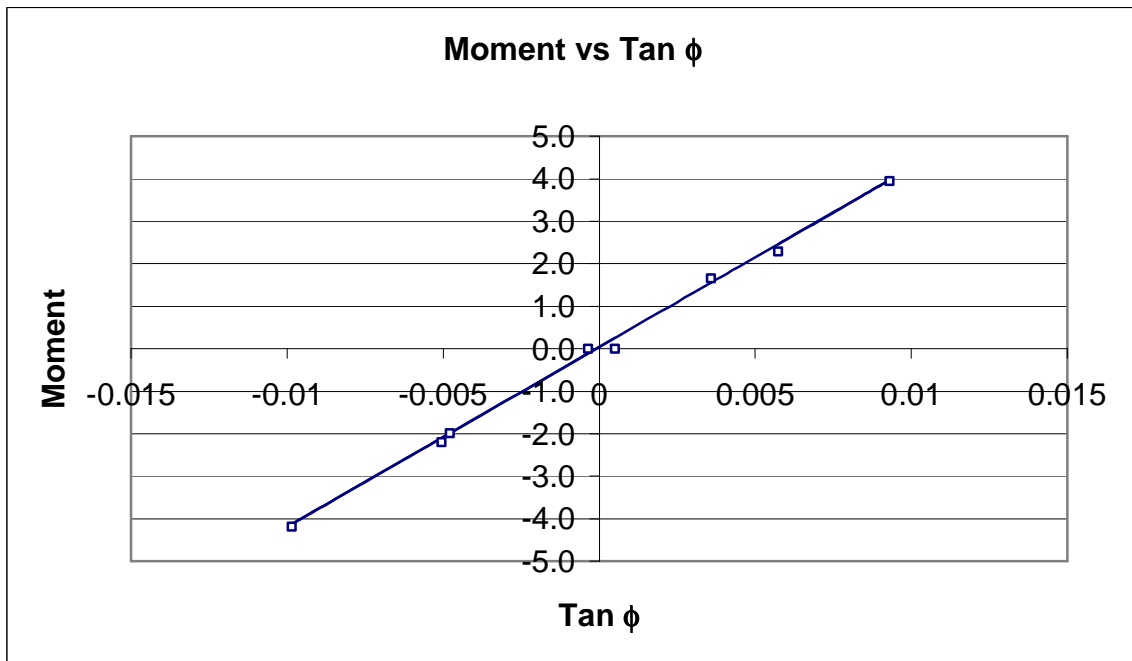
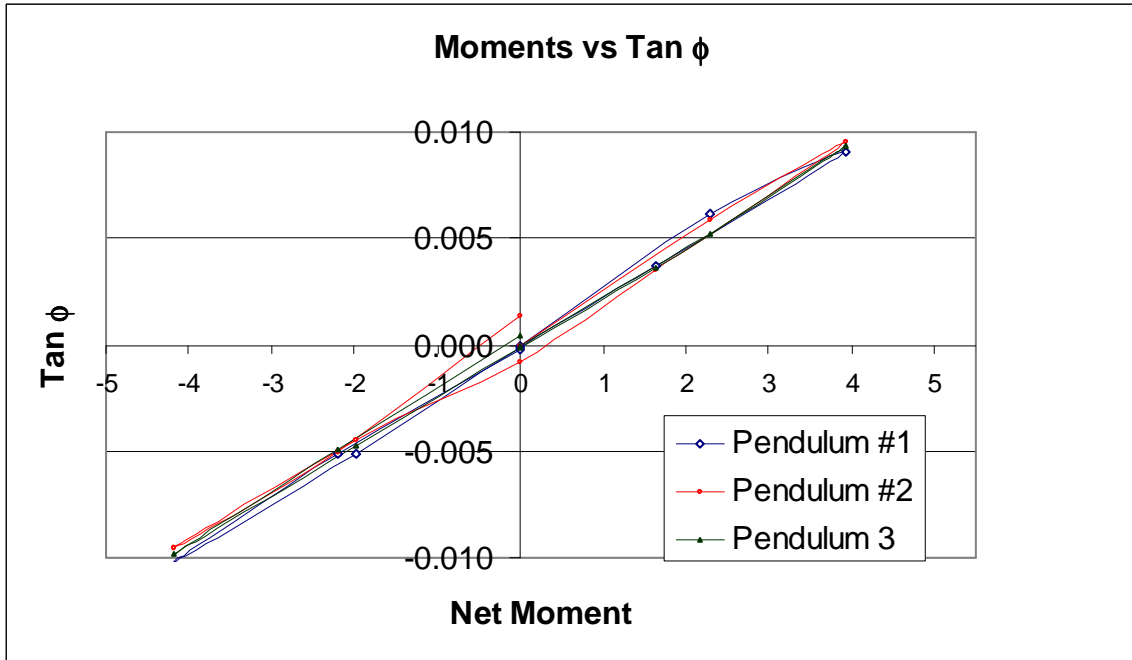
Pendulum #2

Shift #	Direction	Deflection (shift)	Tan ϕ	Total Deflection	Total Tan ϕ
0					
1	P→S	15	0.0058	15	0.0058
2	P→S	9.5	0.0037	25	0.0095
3	S→P	-15.5	-0.0060	9	0.0035
4	S→P	-11	-0.0043	-2	-0.0008
5	S→P	-9.5	-0.0037	-12	-0.0045
6	S→P	-13	-0.0051	-25	-0.0095
7	P→S	11.5	0.0045	-13	-0.0051
8	P→S	16.5	0.0064	4	0.0014

Pendulum #3

Shift #	Direction	Deflection Port	Deflection Stbd	Deflection (shift)	Tan ϕ	Total Deflection	Total Tan ϕ
0							
1	P→S	18.5	19	37.5	0.0053	38	0.0053
2	P→S	14.5	15	29.5	0.0041	67	0.0094
3	S→P	-20.5	-21	-41.5	-0.0058	26	0.0036
4	S→P	-14	-12.5	-26.5	-0.0037	-1	-0.0001
5	S→P	-16	-17	-33	-0.0046	-34	-0.0048
6	S→P	-18	-18	-36	-0.0050	-70	-0.0098
7	P→S	17	17.5	34.5	0.0048	-36	-0.0050
8	P→S	20	18.5	38.5	0.0054	3	0.0004

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GM AS INCLINED

DISPLACEMENT AS INCLINED

241.331 tonnes

Pendulum #1

Shift #	Shift Moment	Shift Tan ϕ	GM (shift)	Net Moment	Net Tan ϕ	GM (Net)
0						
1	2.290	0.0061	1.554	2.290	0.0061	1.554
2	1.649	0.0029	2.335	3.939	0.0090	1.807
3	-2.290	-0.0053	1.776	1.649	0.0037	1.852
4	-1.649	-0.0038	1.790	0.000	-0.0001	0.000
5	-1.988	-0.0050	1.660	-1.988	-0.0051	1.618
6	-2.198	-0.0051	1.790	-4.186	-0.0102	1.704
7	1.988	0.0051	1.618	-2.198	-0.0051	1.790
8	2.198	0.0048	1.884	0.000	-0.0003	0.000
Average			1.801			1.721

Pendulum #2

Shift #	Shift Moment	Shift Tan ϕ	GM (shift)	Net Moment	Net Tan ϕ	GM (Net)
0						
1	2.290	0.0058	1.623	2.290	0.0058	1.623
2	1.649	0.0037	1.845	3.939	0.0095	1.709
3	-2.290	-0.0060	1.571	1.649	0.0035	1.948
4	-1.649	-0.0043	1.594	0.000	-0.0008	0.000
5	-1.988	-0.0037	2.225	-1.988	-0.0045	1.838
6	-2.198	-0.0051	1.798	-4.186	-0.0095	1.817
7	1.988	0.0045	1.838	-2.198	-0.0051	1.798
8	2.198	0.0064	1.417	0.000	0.0014	0.000
Average			1.739			1.789

Pendulum #2

Shift #	Shift Moment	Shift Tan ϕ	GM (shift)	Net Moment	Net Tan ϕ	GM (Net)
0						
1	2.290	0.0053	1.807	2.290	0.0053	1.807
2	1.649	0.0041	1.654	3.939	0.0094	1.739
3	-2.290	-0.0058	1.633	1.649	0.0036	1.913
4	-1.649	-0.0037	1.841	0.000	-0.0001	0.000
5	-1.988	-0.0046	1.782	-1.988	-0.0048	1.730
6	-2.198	-0.0050	1.807	-4.186	-0.0098	1.769
7	1.988	0.0048	1.705	-2.198	-0.0050	1.832
8	2.198	0.0054	1.689	0.000	0.0004	0.000
Average			1.740			1.798

AVERAGE GM (all readings)

1.765 metres



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TRIM & STABILITY

WEIGHTS TO BE DEDUCTED

ITEM INCLINING APPARATUS	Weight	LCG	TCG	VCG	Free Surface Moment
		+ve Aft	+ve Stbd	above Base	
Inclining Weight #1	0.458	3.460	-2.500	7.560	
Inclining Weight #2	0.458	4.960	2.170	7.560	
Inclining Weight #3	0.458	6.220	-1.800	7.560	
Inclining Weight #4	0.458	9.795	2.400	4.885	
Pendulum Apparatus	0.013	6.275	0.000	5.738	
Personnel	0.600	6.518	0.000	5.738	

TANKS

Sndg

	Sndg	Weight	LCG	TCG	VCG	Free Surface Moment
#1 Port Fuel Oil	MT	0.000				
#1 Stbd Fuel Oil	MT	0.000				
#2 Port Fuel Oil	6383 l	5.430	5.280	-3.233	2.600	1.07
#2 Stbd Fuel oil	6877 l	5.850	5.284	3.241	2.652	1.10
#3 Port Fuel Oil	MT	0.000				
#3 Stbd Fuel Oil	MT	0.000				
Fuel Oil Day Tank	819 l.	0.700	3.449	0.000	3.590	0.11
Gasoline Tank	MT	0.000				
Fuel Overflow / Sludge Tank	MT	0.000				
Grey Water Tank	MT	0.000				
#1 Port Fresh Water	100%	6.620	11.755	-3.183	3.512	0.00
#1 Stbd Fresh Water	100%	6.620	11.755	3.183	3.512	0.00
#2 Port Fresh Water	100%	3.670	-7.694	-1.197	2.070	0.00
#2 Stbd Fresh Water	100%	3.670	-7.694	1.197	2.070	0.00

FIXED WEIGHTS

	Weight	LCG	TCG	VCG
Fwd Cabin - personal effects	0.035	-9.900	0.000	4.400
Fwd cabin - ship stores	0.040	-9.900	0.000	4.400
Bow Thruster Comp't - personal effects	0.040	-9.900	0.000	2.500
Bow thruster comp't - ship stores	0.040	-9.900	0.000	2.500
4 crew cabins - personal effects	0.040	-6.150	0.000	4.250
Sonar comp't - ship stores	0.135	-6.150	0.000	2.000
Office - manuals	0.120	-3.500	2.000	5.750
Engineer's cabin - manuals	0.030	-3.500	-1.750	5.750
Engine room - tools & spares	0.250	-1.250	0.000	2.750
WC P&S - stores	0.020	1.000	0.000	5.500
Mess - stores	0.150	3.850	-2.500	5.500
Galley - freezer stores	0.090	4.500	0.600	5.750
Bosun's lkr - stores	0.300	6.000	-1.800	3.000
Galley stores	0.230	7.700	2.000	3.000
Hold - stores	0.285	9.600	0.000	3.000
Gasoline tanks on deck	0.250	10.800	-1.500	4.700

TOTAL TO BE DEDUCTED	37.060	4.935	0.025	3.172	2.28
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ARROW POST

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TRIM & STABILITY

WEIGHTS TO BE ADDED

ITEM	Weight	LCG	TCG	VCG
Shepherd Boat	0.175	5.300	0.000	7.400
Work Boat	0.500	11.000	-1.500	5.000
TOTAL ITEMS TO BE ADDED	0.675	9.522	-1.111	5.622

DERIVATION OF LIGHTSHIP

	Weight	LCG	TCG	VCG	Free Surface Moment
		+ve Aft -ve Forward	+ve Stbd -ve Port	above Baseline	
Displacement as Inclined	241.331	1.050	-0.007	3.777	
Free Surface Correction					2.280
As Inclined	241.331	1.050	-0.007	3.786	
Deduct Weights to be Removed	-37.060	4.935	0.025	3.172	
Add Weights to be Added	0.675	9.522	-1.111	5.622	
Lightship	204.947	0.375	-0.016	3.904	



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APPENDICES



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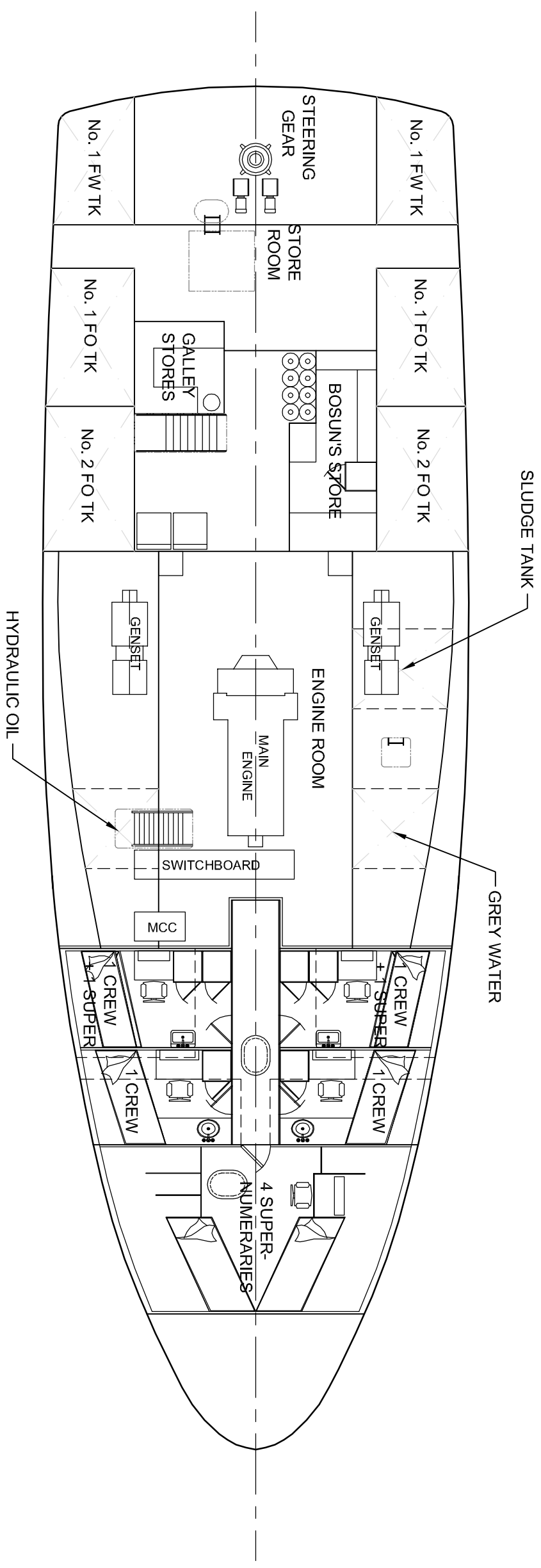
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TITLE
ARROW POST
 GENERAL ARRANGMENT

DRAWN: WAB
 DATE: 2009-03-12
 SCALE: -

APPROVAL	DATE	REVISION	DATE	SHEET	DRAWING No.
				4	B9004-04
				OF	REVISION
				5	0

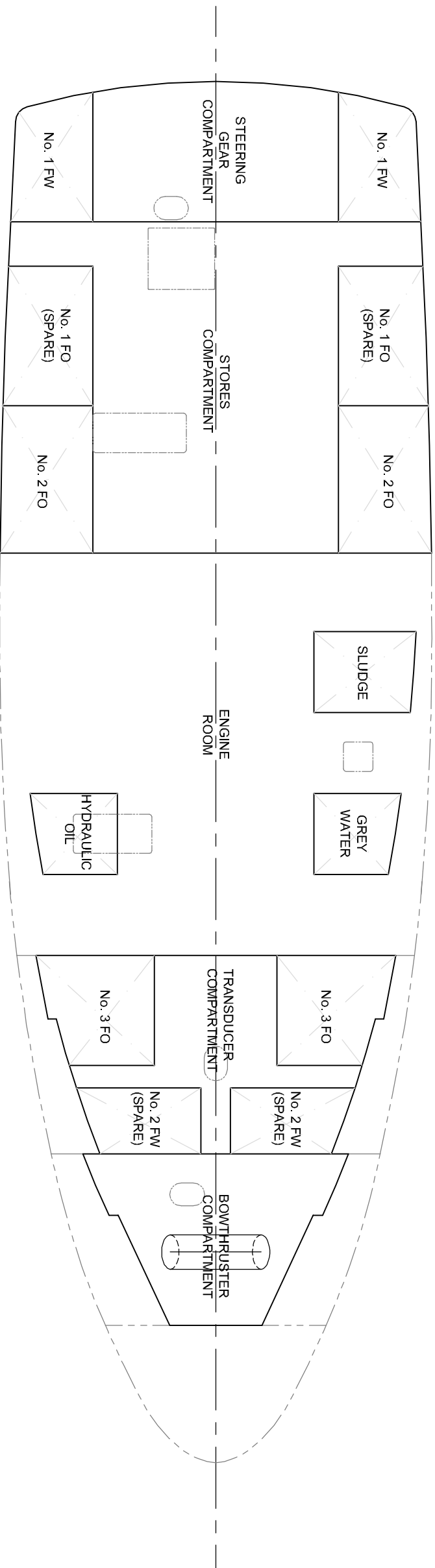


BELOW DECK PLAN



TITLE
ARROW POST
 GENERAL ARRANGMENT

DRAWN: WAB	APPROVAL	DATE	REVISION	DATE	SHEET	DRAWING No.
DATE: 2009-03-12					5	B9004-05
SCALE: -					OF	REVISION
					5	0



TANK PLAN