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**PRELIMINARY STABILITY REPORT**

**K-28**

8.50 Meter Skerry Cruiser

28 February 2010  
Revised 9 September 2010



**FOR REFERENCE ONLY**

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## OVERVIEW

- References: [1] ISO 12217-2 Stability and buoyancy assessment and categorization -- Part 2: Sailing boats of hull length greater than or equal to 6 m  
 [2] Maritime and Coastguard Agency Large Yacht Code 11.3 Damaged Stability

### Principle Dimensions:

LOA	8.500 m
LWL	6.200 m
Beam	1.830 m
Draft	1.150 m at Min Sailing Cond
Displacement	1284 kg
Sail Area	16.05 m <sup>2</sup>

### Load Conditions:

Load conditions are based on calculated light ship characteristics from the weight estimate. A 50 mm VCG margin was added to the calculated VCG to account for possible deviation from the calculated VCG after construction. The data contained in this report is preliminary until a deadweight survey and inclining experiment can be conducted to determine the actual light ship weight and center of gravity. The preliminary light ship weight and center of gravity is:

Light Ship Weight	1200 kg
LCG	3.41 m aft of Station 0
VCG	0.06 m below 1200 DWL

### Intact Stability:

Intact stability is evaluated against the requirements of reference [1].

Design Category	A	B	C	D
	Ocean	Offshore	Inshore	Sheltered
Wave Height (significant)	7m	4m	2m	0.5m max
Wind (Beaufort)	10	8	6	4
Minimum STIX Value	32	23	14	5
Minimum Mass	3000 kg	1500 kg	-	-
Minimum AVS	130-0.002*m (>100 deg)	130-0.005*m (>95 deg)	90 deg	75 deg

The significant wave height is the mean height of the highest one third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will be double this height.

The results of the intact stability calculations are:

Load Condition	Min Sailing Cond	Full Load Cond
GM	0.65 m	0.57 m
Dellenbaugh Angle	21.9 deg	21.6 deg
Righting Arm at 90°	0.27 m	0.18 m
AVS	122 deg	113 deg
Righting Area at AVS	28.5 m*deg	20.7 m*deg
STIX	21.3	16.8
Category	C	C

Damage Stability:

The subject vessel is divided into 4 watertight compartments with bulkheads located at stations 1, 9, and 13. Although the vessel is not required to comply with damage stability criteria, it was evaluated against the criteria of reference 2:

"The watertight bulkheads of the vessel should be so arranged that minor hull damage that results in the free flooding of any one compartment, will cause the vessel to float at a waterline which, at any point, is not less than 75mm below the weather deck, or bulkhead deck if not concurrent."

"... the residual stability should be such that any angle of equilibrium does not exceed 7 degrees from the upright, the resulting righting lever curve has a range to the downflooding angle of at least 15 degrees beyond any angle of equilibrium, the maximum righting lever within that range is not less than 100 mm and the area under the curve is not less than 0.015 metre radians."

The results of damage stability calculations are:

Load Condition	Full Load Cond		Min Sailing Cond	
	1	2	1	2
Damage Pattern				
Angle at Equil	0 deg	0 deg	0 deg	0 deg
Angle to AVS	136 deg	113 deg	150 deg	124 deg
Max Righting Arm	0.156 m	0.229 m	0.231 m	0.299 m
Righting Area	0.240 m*rad	0.300 m*rad	0.403 m*rad	0.448 m*rad
Freebd to Margin Line	0.026 m	0.065 m	0.098 m	0.162 m

**WEIGHT ESTIMATE**

Vessel:		K-28 15 Square Meter			Rev:	B		
<b>MIN SAILING COND</b>			Kg	Tonnes	LCG	TCG	VCG	
		Subtotal	1284	1.28	3.45	0.00	0.00	
	Margin =	0.0%	0	0.00				
		<b>Total</b>	<b>1284</b>	<b>1.28</b>	<b>3.45</b>	<b>0.00</b>	<b>-0.003</b>	
<b>Item</b>	<b>%</b>	<b>Weight</b>	<b>LCG</b>	<b>L.MOM</b>	<b>TCG</b>	<b>T.MOM</b>	<b>VCG</b>	<b>V.MOM</b>
LIGHT SHIP		1200	3.41	4088	0.00	0	-0.06	-67
FUEL:								
WATER:								
SEWAGE:								
LUBE OIL:								
Crew and effects	33	84	4.00	336	0.00	0	0.75	63
Galley stores	0	0	3.37	0	0.00	0	-0.05	0
<b>MISSION LOADS:</b>								
Autopilot		0.00	4.82	0	0.00	0	0.63	0
Mini Galley		0.00	2.56	0	0.00	0	0.40	0
Misc Stores		0.00	3.75	0	0.00	0	0.05	0
EPIRB		0.00	2.62	0	0.00	0	0.41	0
Liferaft		0.00	4.85	0	0.00	0	0.38	0

**WEIGHT ESTIMATE**

Vessel:		K-28 15 Square Meter			Rev:	B		
<b>FULL LOAD</b>			Kg	Tonnes	LCG	TCG	VCG	
		Subtotal	1485	1.49	3.52	0.00	0.09	
	Margin =	0.0%	0	0.00				
		<b>Total</b>	<b>1485</b>	<b>1.49</b>	<b>3.52</b>	<b>0.00</b>	<b>0.086</b>	
Item	%	Weight	LCG	L.MOM	TCG	T.MOM	VCG	V.MOM
LIGHT SHIP		1200	3.41	4088	0.00		-0.06	-67
FUEL:								
WATER:								
SEWAGE:								
LUBE OIL:								
Crew and effects	100	252	4.00	1008	0.00	0	0.75	189
Galley stores	100	12	3.37	40	0.00	0	-0.05	-1
MISSION LOADS:								
Autopilot		2.27	4.82	11	0.00	0	0.63	1
Mini Galley		0.68	2.56	2	0.00	0	0.40	0
Misc Stores		10.00	3.75	38	0.00	0	0.05	1
EPIRB		0.70	2.62	2	0.00	0	0.41	0
Liferaft		7.70	4.85	37	0.00	0	0.38	3

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K-28 15 SQM (06HULL05.GFT)  
 DAMAGE STABILITY

HYDROSTATIC PROPERTIES  
 No Trim, No Heel, VCG = -0.003

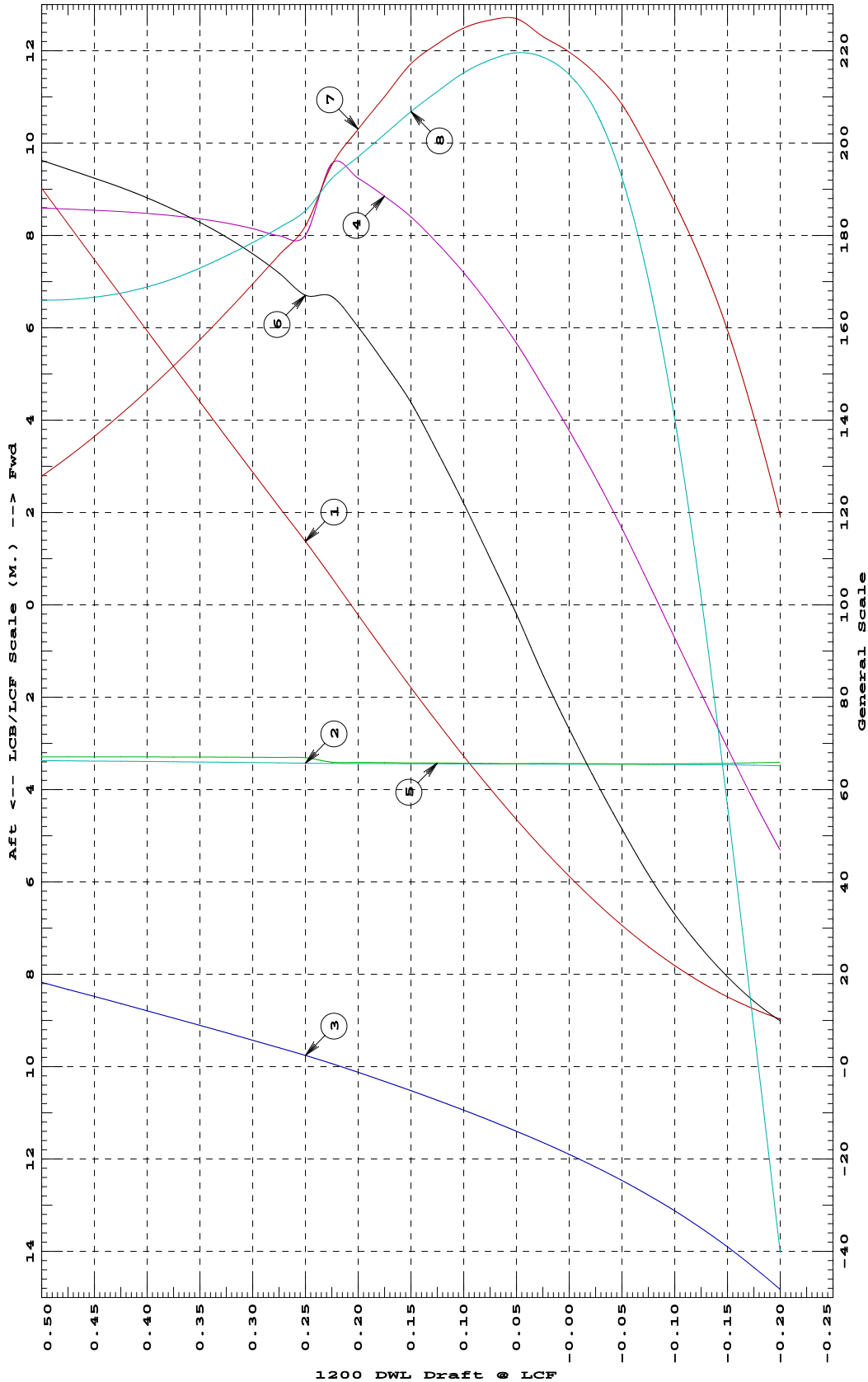
LCF Draft	Displacement Weight(KG)	Buoyancy-Ctr.		Weight/ CM	Moment/ LCF		CM trim	KML	KMT
---	---	LCB	VCB	---	---	---	---	---	---
-0.200	309	3.485a	-0.434	23	3.409a	2.98	5.96	-0.121	
-0.175	375	3.472a	-0.391	29	3.421a	4.25	7.04	0.025	
-0.150	454	3.464a	-0.351	34	3.432a	5.84	7.97	0.169	
-0.125	547	3.459a	-0.315	40	3.438a	7.71	8.73	0.305	
-0.100	656	3.456a	-0.281	46	3.440a	9.90	9.35	0.421	
-0.075	780	3.454a	-0.250	52	3.443a	12.48	9.92	0.511	
-0.050	918	3.452a	-0.222	58	3.444a	15.44	10.42	0.577	
-0.025	1,071	3.451a	-0.196	64	3.441a	18.58	10.75	0.621	
0.000	1,237	3.449a	-0.171	69	3.438a	21.92	10.99	0.644	
0.025	1,416	3.448a	-0.148	74	3.435a	25.47	11.15	0.656	
0.050	1,606	3.447a	-0.126	78	3.437a	29.39	11.35	0.659	
0.075	1,806	3.445a	-0.105	82	3.433a	33.03	11.33	0.654	
0.100	2,017	3.443a	-0.085	86	3.428a	36.60	11.25	0.646	
0.125	2,236	3.442a	-0.066	89	3.423a	39.95	11.07	0.634	
0.150	2,463	3.440a	-0.047	92	3.422a	43.15	10.86	0.620	
0.175	2,696	3.438a	-0.029	94	3.415a	45.69	10.50	0.606	
0.200	2,934	3.436a	-0.011	96	3.411a	48.05	10.15	0.591	
0.225	3,176	3.434a	0.006	98	3.407a	50.04	9.76	0.577	
0.250	3,412	3.429a	0.022	90	3.309a	50.12	9.10	0.556	
0.275	3,636	3.421a	0.037	90	3.302a	51.56	8.79	0.545	
0.300	3,862	3.414a	0.051	91	3.299a	52.81	8.47	0.535	
0.325	4,090	3.408a	0.066	91	3.297a	53.90	8.17	0.527	
0.350	4,319	3.402a	0.080	92	3.295a	54.85	7.87	0.519	
0.375	4,549	3.396a	0.095	92	3.293a	55.68	7.59	0.512	
0.400	4,779	3.391a	0.109	92	3.292a	56.44	7.32	0.507	
0.425	5,011	3.387a	0.123	93	3.291a	57.12	7.06	0.503	
0.450	5,242	3.382a	0.137	93	3.291a	57.72	6.82	0.500	
0.475	5,474	3.378a	0.151	93	3.291a	58.30	6.60	0.498	
0.500	5,707	3.375a	0.164	93	3.291a	58.88	6.39	0.498	

Distances in METERS.-----Specific Gravity = 1.025.-----Moment in M.-KG.  
 Trim is per 6.20M.

Draft is from 1200 DWL.

K-28 15 SQM (06HULL05.GFT)  
DAMAGE STABILITY

HYDROSTATIC PROPERTIES at LEVEL TRIM



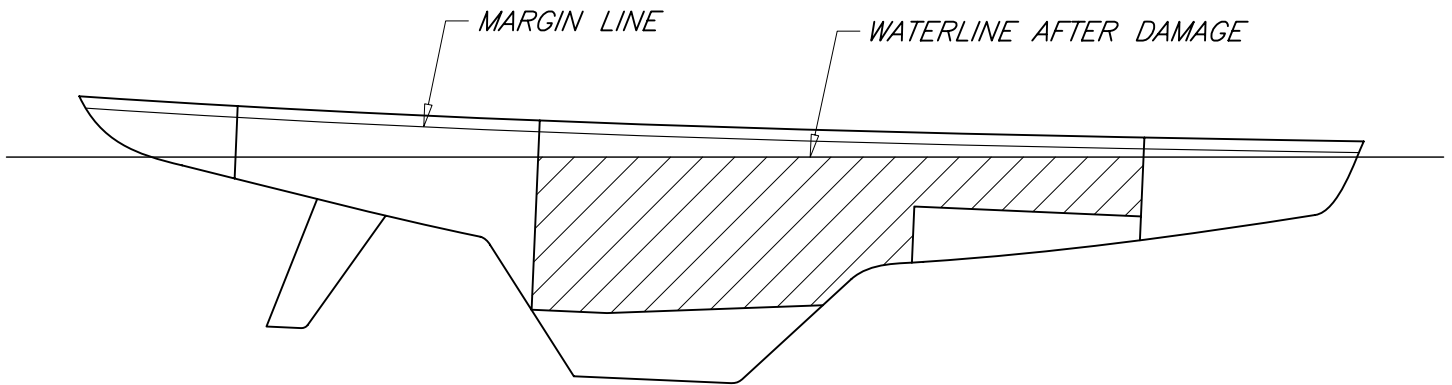
- ① Displacement 1=30 KG
- ② LCB (use top scale)
- ③ VCB (KB) 1=-.009 M.
- ④ Immersion 1=.5 KG/CM
- ④ WPA 1=.0488 Sq.M.
- ⑤ LCF (use top scale)
- ⑥ Moment/Trim 1=.3 M.-KG/CM
- ⑦ KML 1=.05 M.
- ⑧ KMT 1=-.003 M.

Specific Gravity = 1.025 Assumed KG = -0.00 M.  
Trim is per 6.2 M. "K" = BPL

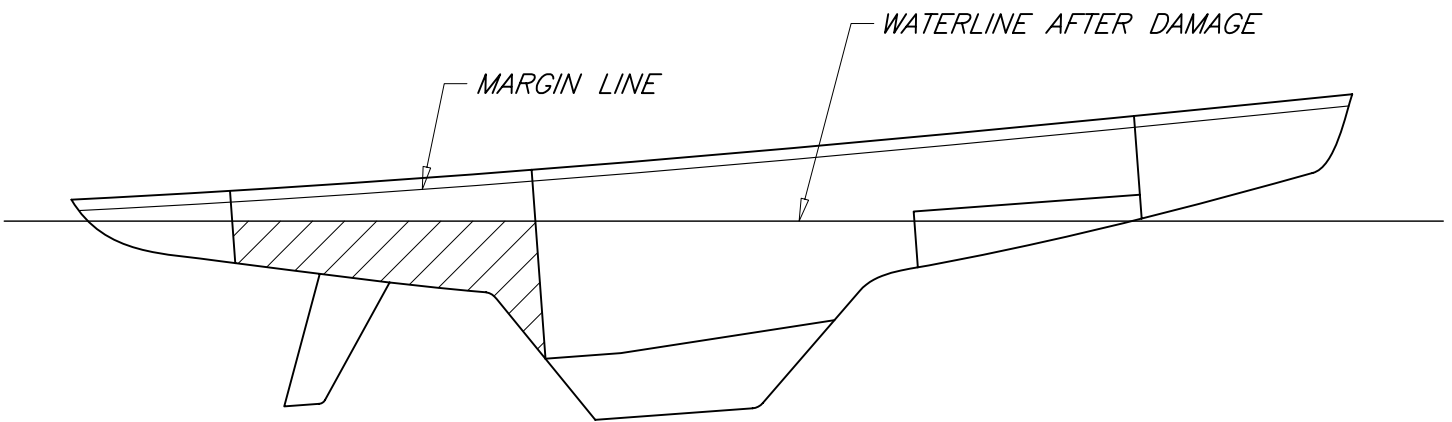
ISO STIX CALCULATION

Project:	K-28		Date:	09/09/10	
STIX =	<b>21.3</b>		<b>16.8</b>	Category:	<b>C</b>
Del ang =	21.9		21.6		
<b>Input:</b>	mMSC		mMAX		
Lh =	8.500 m		8.500 m		
Lwl =	6.259 m		6.519 m		
Bh =	1.833 m		1.833 m		
Bwl =	1.605 m		1.652 m		
mass =	1284 kg		1485 kg		
hce =	3.576 m		3.576 m		
hlp =	0.518 m		0.518 m		
As =	16.05 m <sup>2</sup>		16.05 m <sup>2</sup>		
GZ 90 =	0.272 m		0.179 m		
AVS =	122.11 deg		113.09 deg		
DFL =	122.11 deg		113.09 deg		
Agz =	28.47 m*deg		20.765 m*deg		
GM =	0.652 m		0.572 m		
<b>Output:</b>					
Lbs =	7.006		7.179		
F1 =	0.914		0.918		
FDL =	0.886		0.895		
Fb =	1.791		1.706		
FBD =	1.046		1.061		
Fr =	3.043		2.316		
FKR =	1.144		1.079		
FIR =	0.983		0.911		
FDS =	0.618		0.450		
FWM =	1.000		1.000		
FDF =	1.357		1.257		

*K-28 DAMAGE PATTERNS  
FULL LOAD CONDITION*

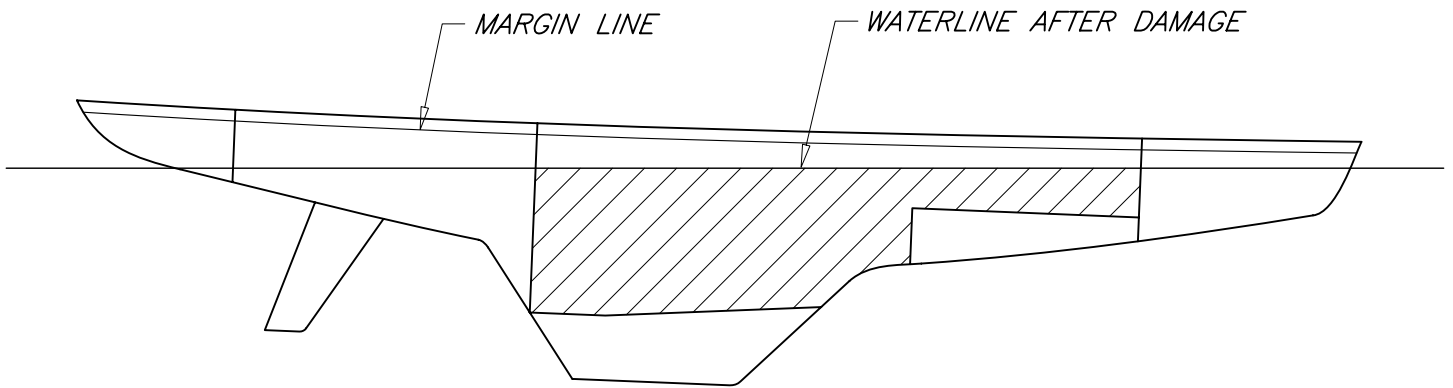


*CABIN COMPARTMENT FLOODED*

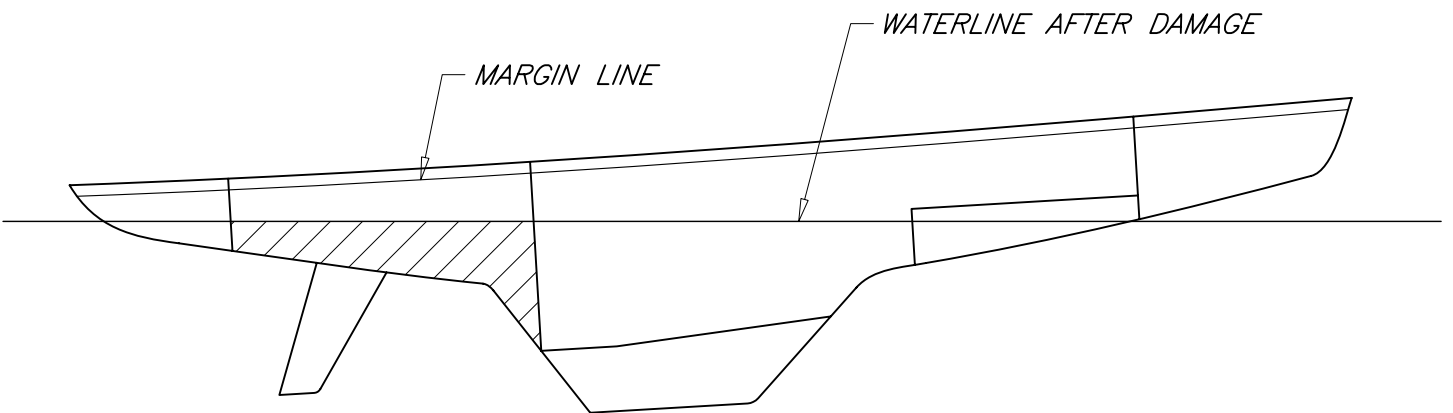


*LAZARETTE FLOODED*

*K-28 DAMAGE PATTERNS*  
*MINIMUM SAILING CONDITION*



*CABIN COMPARTMENT FLOODED*



*LAZARETTE FLOODED*

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K-28 15 SQM (06HULL05.GFT)  
INTACT STABILITY

MINIMUM SAILING CONDITION  
WEIGHT STATUS

Part-----	Weight(KG)----	LCG-----	TCG-----	VCG-----
WEIGHT	1,284	3.450a	0.000	-0.003
Distances in METERS.-----				

No downflood points with hatches closed.

HYDROSTATIC PROPERTIES

Trim: Aft 0.001/6.200, No Heel, VCG = -0.003

LCF	Displacement	Buoyancy-Ctr.	Weight/	Moment/										
Draft----	Weight(KG)----	LCB-----	VCB-----	CM-----	LCF----	CM trim----	GML-----	GMT-----						
0.007	1,284	3.450a	-0.165	70	3.440a	22.91	11.06	0.652						
Distances in METERS.-----					Specific Gravity = 1.025.-----					Moment in M.-KG.				
					Trim is per 6.20M.									

Draft is from BPL.

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K-28 15 SQM (06HULL05.GFT)  
 INTACT STABILITY

RIGHTING ARMS vs HEEL ANGLE  
 LCG = 3.450a TCG = 0.000 VCG = -0.003

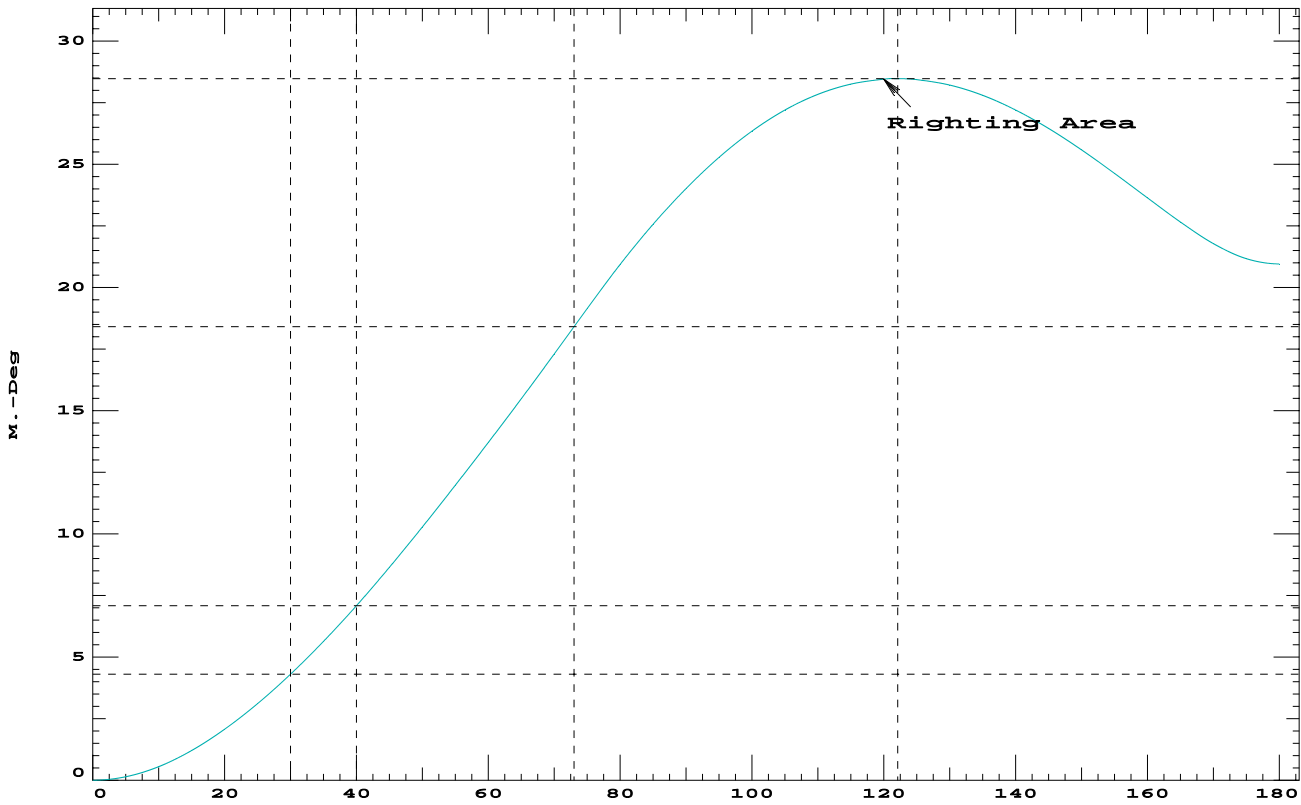
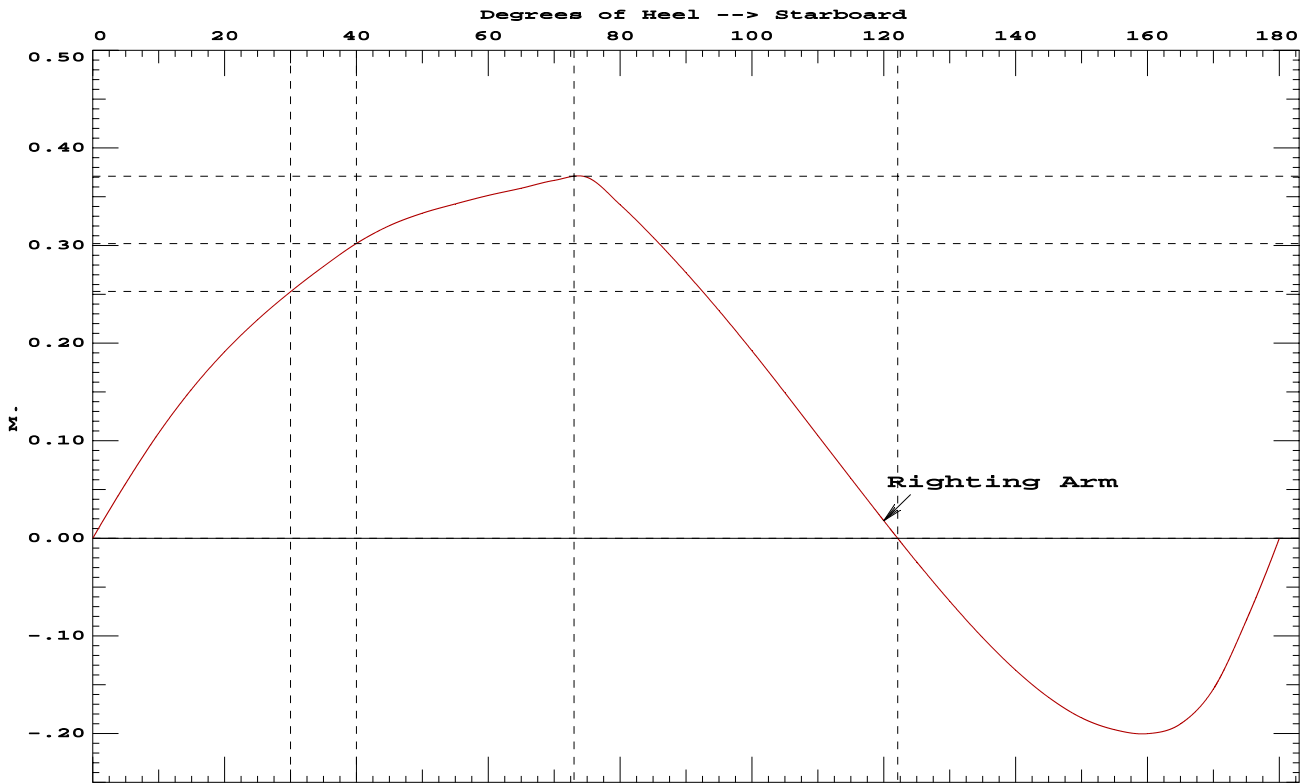
Origin	Degrees of		Displacement	Righting Arms		
Depth	Trim	Heel	Weight(KG)	in Trim	in Heel	Area
0.007	0.00	0.00	1,284	0.000	0.000	0.000
0.004	0.01f	5.00s	1,284	0.000	0.056s	0.140
-0.003	0.03f	10.00s	1,284	0.000	0.108s	0.553
-0.015	0.06f	15.00s	1,284	0.000	0.153s	1.207
-0.029	0.12f	20.00s	1,284	0.000	0.191s	2.070
-0.047	0.20f	25.00s	1,284	0.000	0.224s	3.110
-0.067	0.28f	30.00s	1,284	0.000	0.253s	4.303
-0.089	0.36f	35.00s	1,284	0.000	0.278s	5.632
-0.115	0.43f	40.00s	1,284	0.000	0.302s	7.085
-0.141	0.49f	45.00s	1,284	0.000	0.320s	8.643
-0.168	0.53f	50.00s	1,284	0.000	0.333s	10.279
-0.195	0.54f	55.00s	1,284	0.000	0.343s	11.970
-0.221	0.52f	60.00s	1,284	0.000	0.351s	13.706
-0.246	0.47f	65.00s	1,284	0.000	0.359s	15.481
-0.272	0.40f	70.00s	1,284	0.000	0.367s	17.294
-0.290	0.35f	73.75s	1,284	0.000	0.372s	18.680
-0.296	0.34f	75.00s	1,284	0.000	0.370s	19.144
-0.325	0.29f	80.00s	1,284	0.000	0.342s	20.932
-0.352	0.24f	85.00s	1,284	0.000	0.309s	22.561
-0.378	0.18f	90.00s	1,284	0.000	0.272s	24.014
-0.402	0.11f	95.00s	1,284	0.000	0.233s	25.279
-0.425	0.04f	100.00s	1,284	0.000	0.192s	26.344
-0.445	0.04a	105.00s	1,284	0.000	0.149s	27.198
-0.463	0.15a	110.00s	1,284	0.000	0.105s	27.834
-0.479	0.25a	115.00s	1,284	0.000	0.061s	28.251
-0.492	0.35a	120.00s	1,285	0.000	0.018s	28.450
-0.497	0.40a	122.11s	1,284	0.000	0.000s	28.469
-0.502	0.44a	125.00s	1,284	0.000	-0.024s	28.433
-0.509	0.53a	130.00s	1,284	0.000	-0.065s	28.211
-0.513	0.61a	135.00s	1,284	0.000	-0.102s	27.794
-0.515	0.68a	140.00s	1,284	0.000	-0.135s	27.200
-0.515	0.74a	145.00s	1,284	0.000	-0.163s	26.453
-0.513	0.79a	150.00s	1,284	0.000	-0.184s	25.583
-0.511	0.84a	155.00s	1,284	0.000	-0.196s	24.629
-0.509	0.90a	160.00s	1,283	0.000	-0.200s	23.634
-0.506	0.94a	165.00s	1,284	0.000	-0.190s	22.653
-0.505	0.95a	170.00s	1,284	0.000	-0.154s	21.781
-0.508	0.96a	175.00s	1,284	0.000	-0.084s	21.170
-0.510	0.97a	180.00s	1,284	0.000	0.000s	20.954

Distances in METERS.---Specific Gravity = 1.025.---Area in M.-Deg.

LIM-----"ISO 12217-2 DATA" CRITERION-----Min/Max-----Attained  
 (1) Area from 0 deg to RAZero > 5.000 M.-deg 28.469 P  
 -----Relative angles measured from 0.000 -----

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K-28 15 SQM (06HULL05.GFT)  
INTACT STABILITY



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K-28 15 SQM (06HULL05.GFT)  
INTACT STABILITY

FULL LOAD CONDITION  
WEIGHT STATUS

Part-----	Weight(KG)----	LCG-----	TCG-----	VCG-----
WEIGHT	1,485	3.520a	0.000	0.086
Distances in METERS.-----				

No downflood points with hatches closed.

HYDROSTATIC PROPERTIES

Trim: Aft 0.040/6.200, No Heel, VCG = 0.086

LCF	Displacement	Buoyancy-Ctr.	Weight/	Moment/					
Draft----	Weight(KG)----	LCB-----	VCB-----	CM-----	LCF----	CM trim----	GML-----	GMT-----	
0.035	1,485	3.521a	-0.139	75	3.519a	26.65	11.13	0.572	
Distances in METERS.-----Specific Gravity = 1.025.-----Moment in M.-KG.									
Trim is per 6.20M.									

Draft is from BPL.

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K-28 15 SQM (06HULL05.GFT)  
 INTACT STABILITY

RIGHTING ARMS vs HEEL ANGLE  
 LCG = 3.520a TCG = 0.000 VCG = 0.086

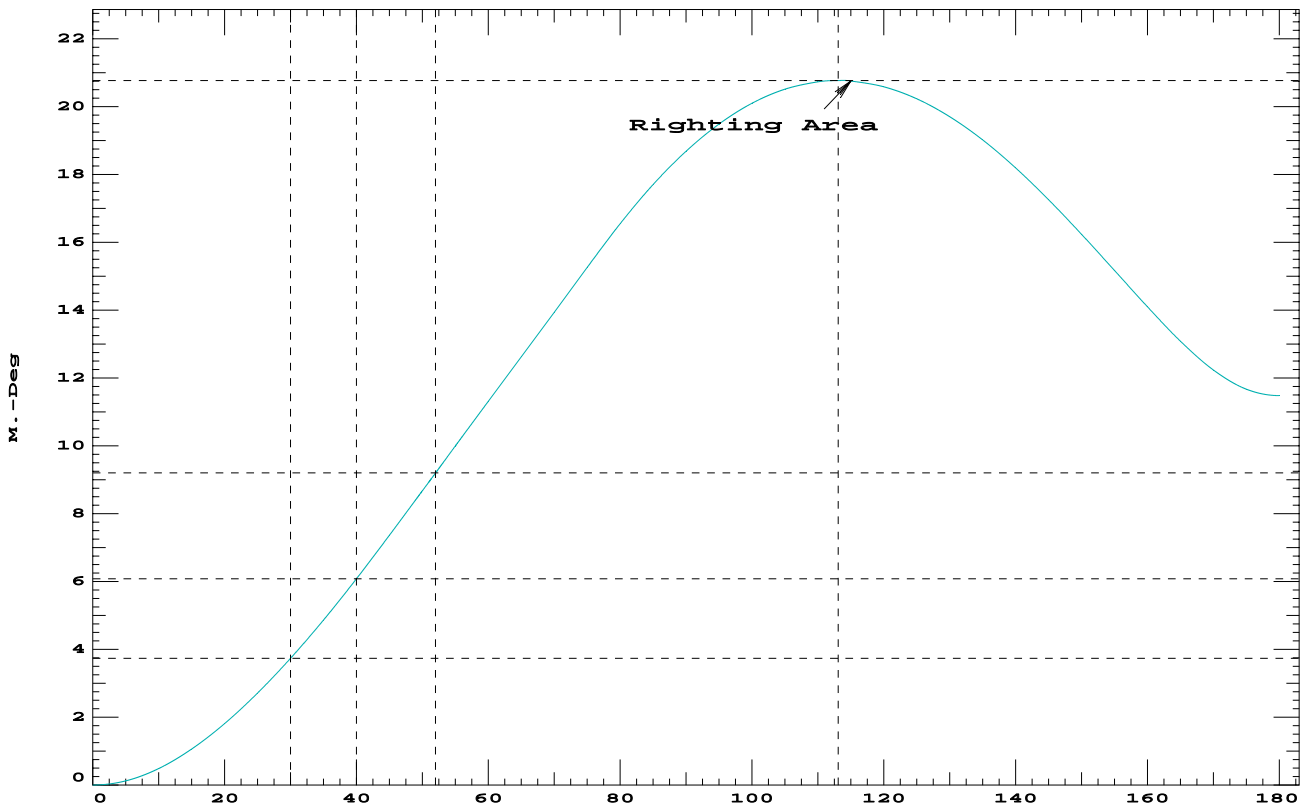
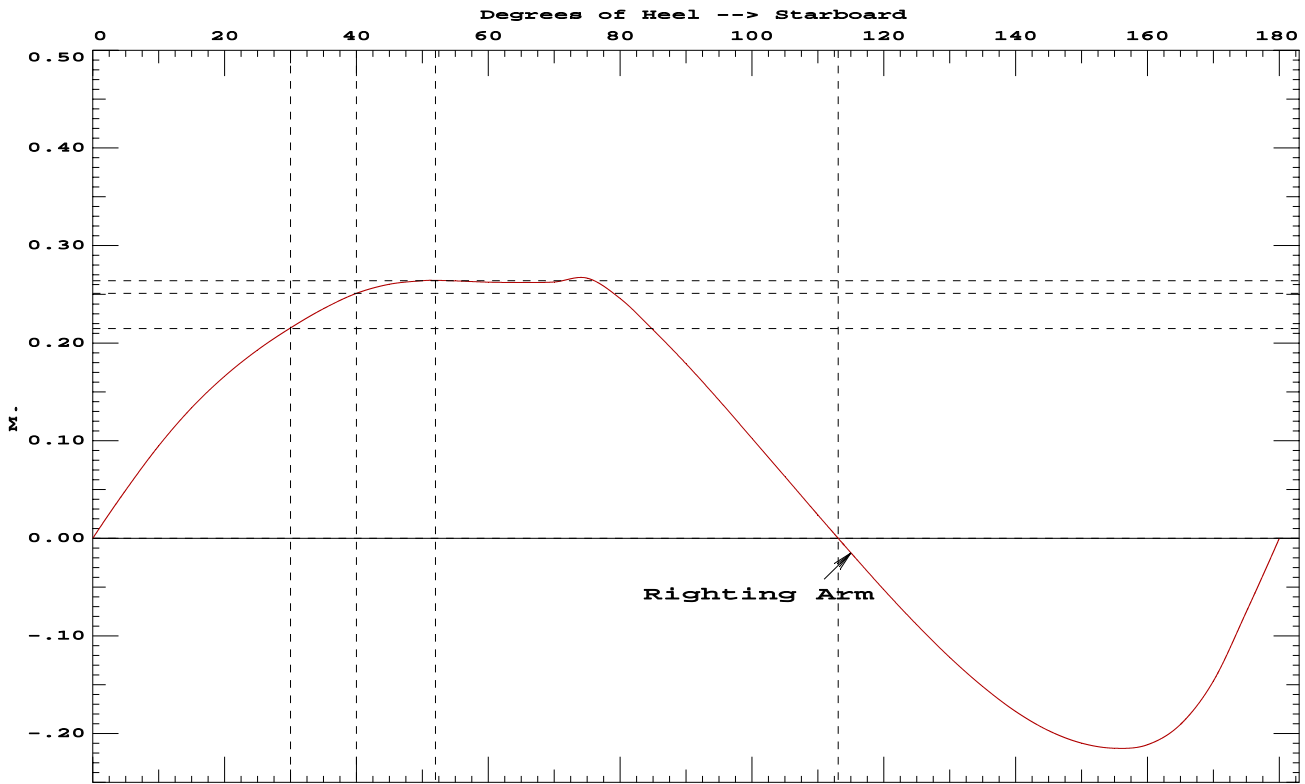
Origin	Degrees of	Displacement	Righting Arms			
Depth	Trim	Heel	Weight(KG)	in Trim	in Heel	Area
0.011	0.38a	0.00	1,485	0.000	0.000	0.000
0.009	0.37a	5.00s	1,485	0.000	0.049s	0.123
0.001	0.38a	10.00s	1,485	0.000	0.095s	0.485
-0.011	0.36a	15.00s	1,485	0.000	0.134s	1.059
-0.026	0.33a	20.00s	1,485	0.000	0.166s	1.812
-0.044	0.29a	25.00s	1,485	0.000	0.193s	2.712
-0.065	0.23a	30.00s	1,484	0.000	0.215s	3.735
-0.089	0.17a	35.00s	1,484	0.000	0.235s	4.863
-0.114	0.12a	40.00s	1,485	0.000	0.251s	6.080
-0.141	0.08a	45.00s	1,485	0.000	0.260s	7.361
-0.168	0.05a	50.00s	1,485	0.000	0.264s	8.675
-0.179	0.05a	52.00s	1,485	0.000	0.264s	9.203
-0.194	0.04a	55.00s	1,485	0.000	0.264s	9.995
-0.220	0.07a	60.00s	1,485	0.000	0.262s	11.312
-0.244	0.11a	65.00s	1,485	0.000	0.262s	12.623
-0.267	0.17a	70.00s	1,485	0.000	0.263s	13.934
-0.289	0.24a	75.00s	1,485	0.000	0.267s	15.256
-0.315	0.29a	80.00s	1,485	0.000	0.246s	16.547
-0.341	0.34a	85.00s	1,485	0.000	0.214s	17.701
-0.366	0.39a	90.00s	1,485	0.000	0.179s	18.683
-0.389	0.45a	95.00s	1,485	0.000	0.142s	19.485
-0.411	0.53a	100.00s	1,485	0.000	0.102s	20.096
-0.430	0.61a	105.00s	1,485	0.000	0.063s	20.510
-0.448	0.69a	110.00s	1,485	0.000	0.024s	20.728
-0.457	0.74a	113.09s	1,485	0.000	0.000s	20.765
-0.463	0.77a	115.00s	1,485	0.000	-0.015s	20.751
-0.475	0.83a	120.00s	1,485	0.000	-0.053s	20.582
-0.484	0.89a	125.00s	1,485	0.000	-0.089s	20.229
-0.491	0.94a	130.00s	1,485	0.000	-0.122s	19.702
-0.495	0.98a	135.00s	1,485	0.000	-0.152s	19.016
-0.497	1.01a	140.00s	1,485	0.000	-0.177s	18.191
-0.498	1.05a	145.00s	1,485	0.000	-0.197s	17.253
-0.497	1.08a	150.00s	1,485	0.000	-0.210s	16.233
-0.497	1.12a	155.00s	1,485	0.000	-0.215s	15.167
-0.495	1.16a	160.00s	1,485	0.000	-0.211s	14.097
-0.494	1.18a	165.00s	1,485	0.000	-0.191s	13.085
-0.495	1.19a	170.00s	1,485	0.000	-0.146s	12.233
-0.500	1.20a	175.00s	1,485	0.000	-0.075s	11.668
-0.502	1.20a	180.00s	1,485	0.000	0.000s	11.478

Distances in METERS.---Specific Gravity = 1.025.---Area in M.-Deg.

LIM-----"ISO 12217-2 DATA" CRITERION-----Min/Max-----Attained  
 (1) Area from 0 deg to RAZero > 5.000 M.-deg 20.765 P  
 -----Relative angles measured from 0.000 -----

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GHS 9.26D

K-28 15 SQM (06HULL05.GFT)  
INTACT STABILITY



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GHS 9.26D

K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

FULL LOAD CONDITION

WEIGHT STATUS

Part-----	Weight(KG)----	LCG-----	TCG-----	VCG-----
WEIGHT	1,485	3.520a	0.000	0.086
Distances in METERS.-----				

No downflood points with hatches closed.

HYDROSTATIC PROPERTIES

Trim: Aft 0.040/6.200, No Heel, VCG = 0.086

LCF	Displacement	Buoyancy-Ctr.	Weight/	Moment/
Draft----	Weight(KG)----	LCB-----	VCB-----	CM-----
0.035	1,485	3.521a	-0.139	75
				3.519a
				26.65
				11.13
				0.572
Distances in METERS.-----				
Specific Gravity = 1.025.-----				
Moment in M.-KG.				
Trim is per 6.20M.				

Draft is from BPL.

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K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

DAMAGE PATTERN 1

CABIN COMPARTMENT FLOODED

DISPLACEMENT and FREEBOARD STATUS

BPL draft: 0.485 @ 0.00, 0.214 @ 6.20a

Trim: Fwd 0.271/6.200, Heel: zero

Part-----	SpGr-----	Displ(KG)---	LCB-----	TCB-----	VCB-----	RefHt-----
HULL	1.025	4,257	3.065a	0.000	0.084	-0.485
CABIN.C	Flooded 1.025	-2,772	2.822a	0.000	0.097	-0.485
Total Displacement-->		1.025	1,485	3.519a	0.000	0.060

Distances in METERS.-----

Least freeboard is 0.102 M. located at 1.000f

Least extra freeboard (to margin line) is 0.026 M. located at 1.000f

RIGHTING ARMS vs HEEL ANGLE with FLOODING

LCG = 3.520a TCG = 0.000 VCG = 0.086

Origin	Degrees of	Displacement	Righting Arms			
Depth---	Trim---	Heel---	Weight(KG)---	in Trim--	in Heel	--> Area
0.485	2.50f	0.00	1,485	0.000	0.000	0.0000
0.483	2.50f	5.00s	1,485	0.000	0.027s	0.0012
0.478	2.49f	10.00s	1,485	0.000	0.054s	0.0047
0.469	2.47f	15.00s	1,485	0.000	0.080s	0.0106
0.458	2.45f	20.00s	1,485	0.000	0.104s	0.0186
0.446	2.45f	25.00s	1,485	0.000	0.123s	0.0285
0.434	2.45f	30.00s	1,485	0.000	0.137s	0.0399
0.422	2.46f	35.00s	1,485	0.000	0.147s	0.0523
0.409	2.48f	40.00s	1,485	0.000	0.153s	0.0655
0.397	2.50f	45.00s	1,485	0.000	0.156s	0.0790
0.391	2.51f	47.64s	1,485	0.000	0.156s	0.0861
0.385	2.53f	50.00s	1,485	0.000	0.156s	0.0926
0.372	2.57f	55.00s	1,485	0.000	0.154s	0.1061
0.359	2.62f	60.00s	1,485	0.000	0.150s	0.1194
0.345	2.68f	65.00s	1,485	0.000	0.144s	0.1322
0.332	2.74f	70.00s	1,485	0.000	0.137s	0.1445
0.318	2.80f	75.00s	1,485	0.000	0.128s	0.1560
0.304	2.86f	80.00s	1,485	0.000	0.118s	0.1668
0.289	2.92f	85.00s	1,484	0.000	0.108s	0.1767
0.274	2.90f	90.00s	1,485	0.000	0.100s	0.1857
0.277	3.06f	95.00s	1,485	0.000	0.104s	0.1945
0.297	3.37f	100.00s	1,485	0.000	0.111s	0.2039
0.302	3.60f	105.00s	1,485	0.000	0.100s	0.2132
0.299	3.78f	110.00s	1,485	0.000	0.084s	0.2213
0.301	4.00f	115.00s	1,485	0.000	0.067s	0.2279
0.306	4.25f	120.00s	1,485	0.000	0.050s	0.2330
0.310	4.47f	125.00s	1,485	0.000	0.033s	0.2366
0.310	4.66f	130.00s	1,485	0.000	0.017s	0.2388
0.308	4.82f	135.00s	1,485	0.000	0.002s	0.2396
0.307	4.83f	135.82s	1,485	0.000	0.000s	0.2396
0.303	4.94f	140.00s	1,485	0.000	-0.011s	0.2392
0.295	5.02f	145.00s	1,485	0.000	-0.021s	0.2379
0.285	5.08f	150.00s	1,485	0.000	-0.027s	0.2357
0.274	5.12f	155.00s	1,485	0.000	-0.029s	0.2333
0.261	5.14f	160.00s	1,485	0.000	-0.025s	0.2309
0.247	5.11f	165.00s	1,485	0.000	-0.020s	0.2289

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K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

0.236	5.07f	170.00s	1,485	0.000	-0.014s	0.2275
0.229	5.04f	175.00s	1,485	0.000	-0.007s	0.2265
0.226	5.03f	180.00s	1,485	0.000	0.000s	0.2262

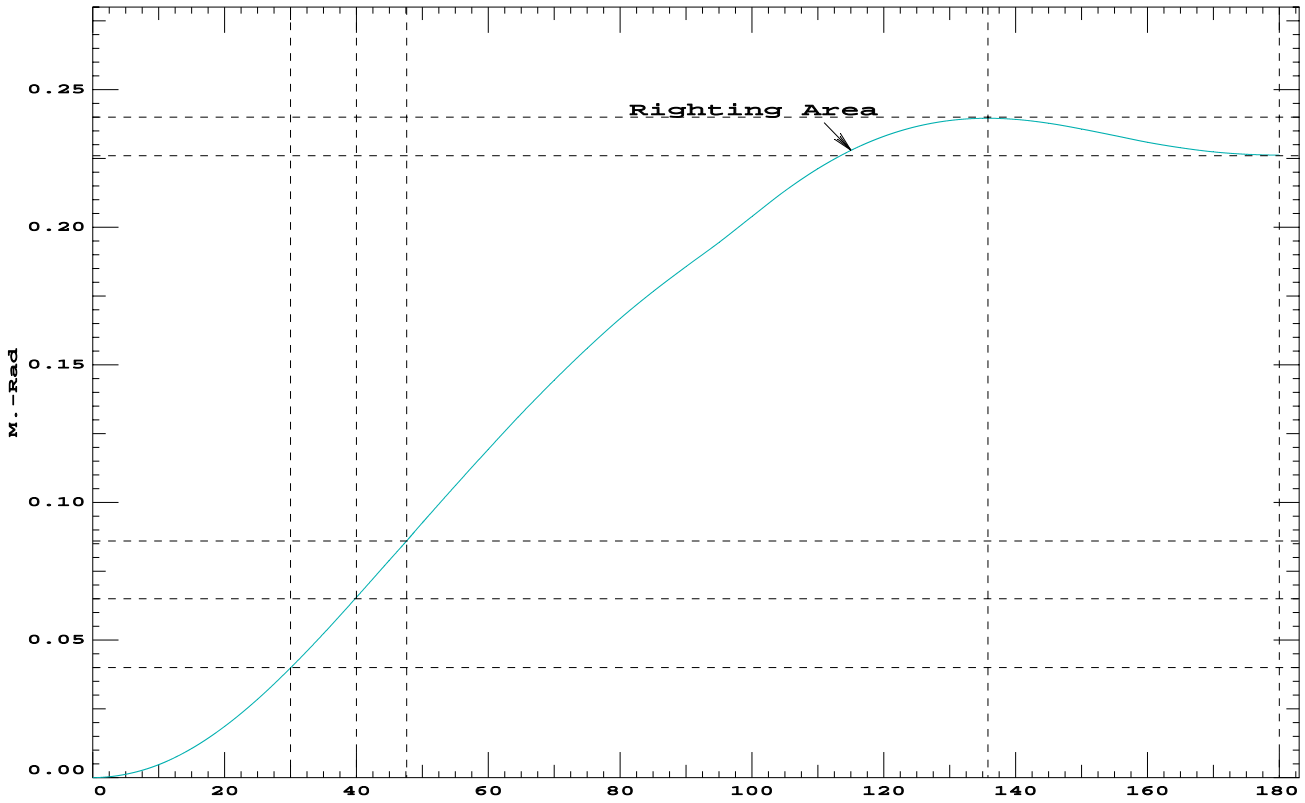
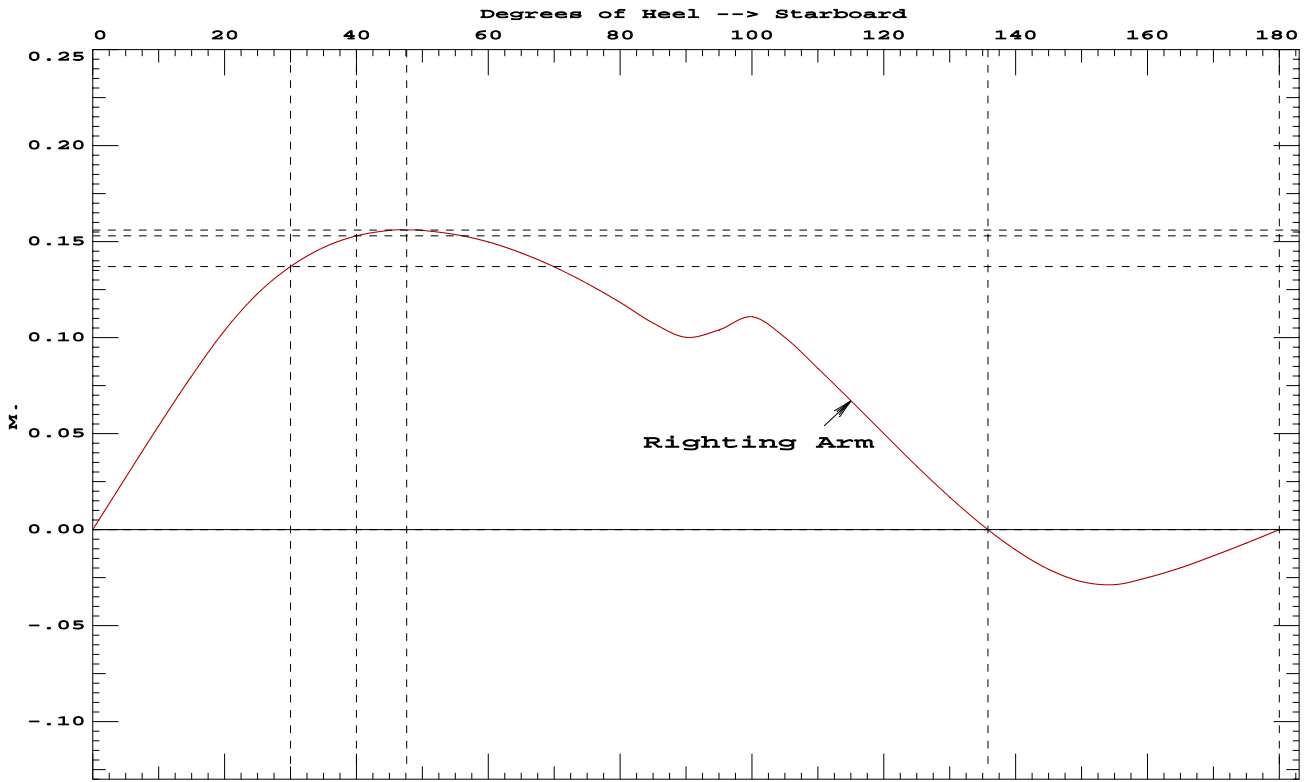
Distances in METERS.---Specific Gravity = 1.025.---Area in M.-Rad.

LIM-----	MCA 11.3.4 CRITERION-----	Min/Max-----	Attained
(1)	Absolute Angle at Equilibrium	< 7.00 deg	0.00 P
(2)	Angle from Equilibrium to RAZero	> 15.00 deg	135.82 P
(3)	Righting Arm at MaxRA	> 0.100 M.	0.156 P
(4)	Area from Equilibrium to RAZero	> 0.0150 M.-Rad	0.2396 P

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K-28 15 SQM (06HULL05.GFT)  
DAMAGE STABILITY



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K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

DAMAGE PATTERN 2

LAZARETTE COMPARTMENT FLOODED

DISPLACEMENT and FREEBOARD STATUS

BPL draft: -0.142 @ 0.00, 0.315 @ 6.20a

Trim: Aft 0.456/6.200, Heel: zero

Part	SpGr	Displ(KG)	LCB	TCB	VCB	RefHt
HULL	1.025	2,295	4.168a	0.000	-0.035	0.141
LAZARET.C	Flooded 1.025	-809	5.330a	0.000	0.078	0.141
Total Displacement-->		1.025	1,485	3.534a	0.000	-0.097

Distances in METERS.

Least freeboard is 0.141 M. located at 7.590a

Least extra freeboard (to margin line) is 0.065 M. located at 7.590a

RIGHTING ARMS vs HEEL ANGLE with FLOODING

LCG = 3.520a TCG = 0.000 VCG = 0.086

Origin	Degrees of	Displacement	Righting Arms	Area
Depth	Trim	Heel	Weight(KG)	in Trim--in Heel -->
-0.141	4.20a	0.00	1,485	0.000 0.000 0.0000
-0.144	4.22a	5.00s	1,485	0.000 0.043s 0.0019
-0.154	4.27a	10.00s	1,485	0.000 0.084s 0.0075
-0.168	4.34a	15.00s	1,485	0.000 0.121s 0.0164
-0.188	4.41a	20.00s	1,485	0.000 0.153s 0.0284
-0.211	4.49a	25.00s	1,485	0.000 0.181s 0.0431
-0.238	4.57a	30.00s	1,485	0.000 0.203s 0.0599
-0.268	4.69a	35.00s	1,485	0.000 0.219s 0.0783
-0.299	4.82a	40.00s	1,485	0.000 0.227s 0.0978
-0.331	4.96a	45.00s	1,485	0.000 0.229s 0.1178
-0.340	5.00a	46.25s	1,485	0.000 0.229s 0.1228
-0.364	5.11a	50.00s	1,485	0.000 0.227s 0.1377
-0.396	5.26a	55.00s	1,485	0.000 0.220s 0.1573
-0.426	5.41a	60.00s	1,485	0.000 0.210s 0.1760
-0.455	5.58a	65.00s	1,485	0.000 0.198s 0.1938
-0.481	5.77a	70.00s	1,485	0.000 0.186s 0.2106
-0.506	6.01a	75.00s	1,485	0.000 0.176s 0.2263
-0.532	6.37a	80.00s	1,485	0.000 0.172s 0.2415
-0.565	6.92a	85.00s	1,485	0.000 0.168s 0.2563
-0.600	7.38a	90.00s	1,485	0.000 0.146s 0.2701
-0.630	7.68a	95.00s	1,485	0.000 0.116s 0.2816
-0.658	7.96a	100.00s	1,485	0.000 0.084s 0.2904
-0.691	8.43a	105.00s	1,485	0.000 0.052s 0.2964
-0.729	9.04a	110.00s	1,485	0.000 0.019s 0.2994
-0.748	9.34a	112.80s	1,485	0.000 0.000s 0.2999
-0.763	9.59a	115.00s	1,485	0.000 -0.015s 0.2996
-0.788	9.99a	120.00s	1,484	0.000 -0.047s 0.2969
-0.807	10.27a	125.00s	1,485	0.000 -0.079s 0.2914
-0.815	10.35a	130.00s	1,485	0.000 -0.107s 0.2833
-0.814	10.23a	135.00s	1,484	0.000 -0.132s 0.2728
-0.805	9.97a	140.00s	1,485	0.000 -0.153s 0.2604
-0.793	9.62a	145.00s	1,485	0.000 -0.168s 0.2464
-0.775	9.18a	150.00s	1,485	0.000 -0.177s 0.2313
-0.753	8.66a	155.00s	1,485	0.000 -0.176s 0.2158
-0.732	8.16a	160.00s	1,485	0.000 -0.163s 0.2009
-0.713	7.69a	165.00s	1,485	0.000 -0.138s 0.1877

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GHS 9.26D

K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

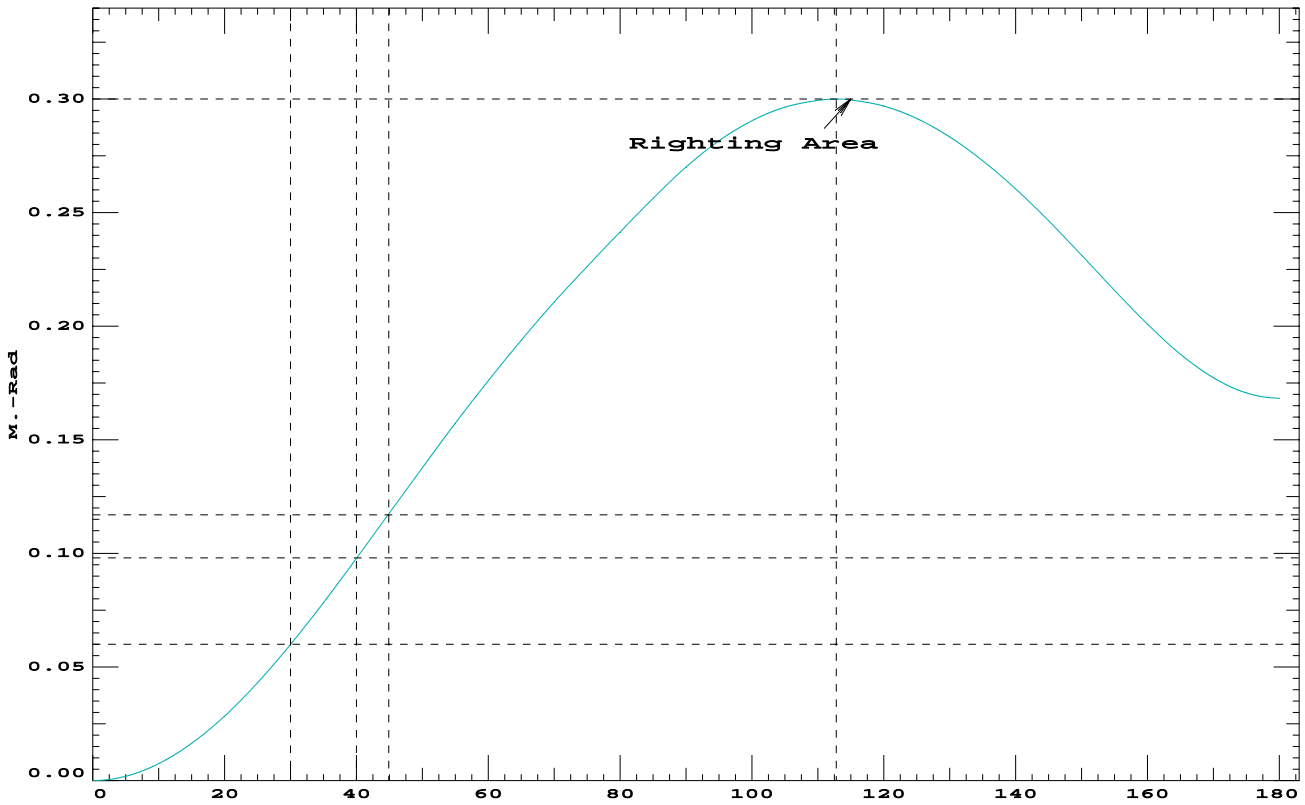
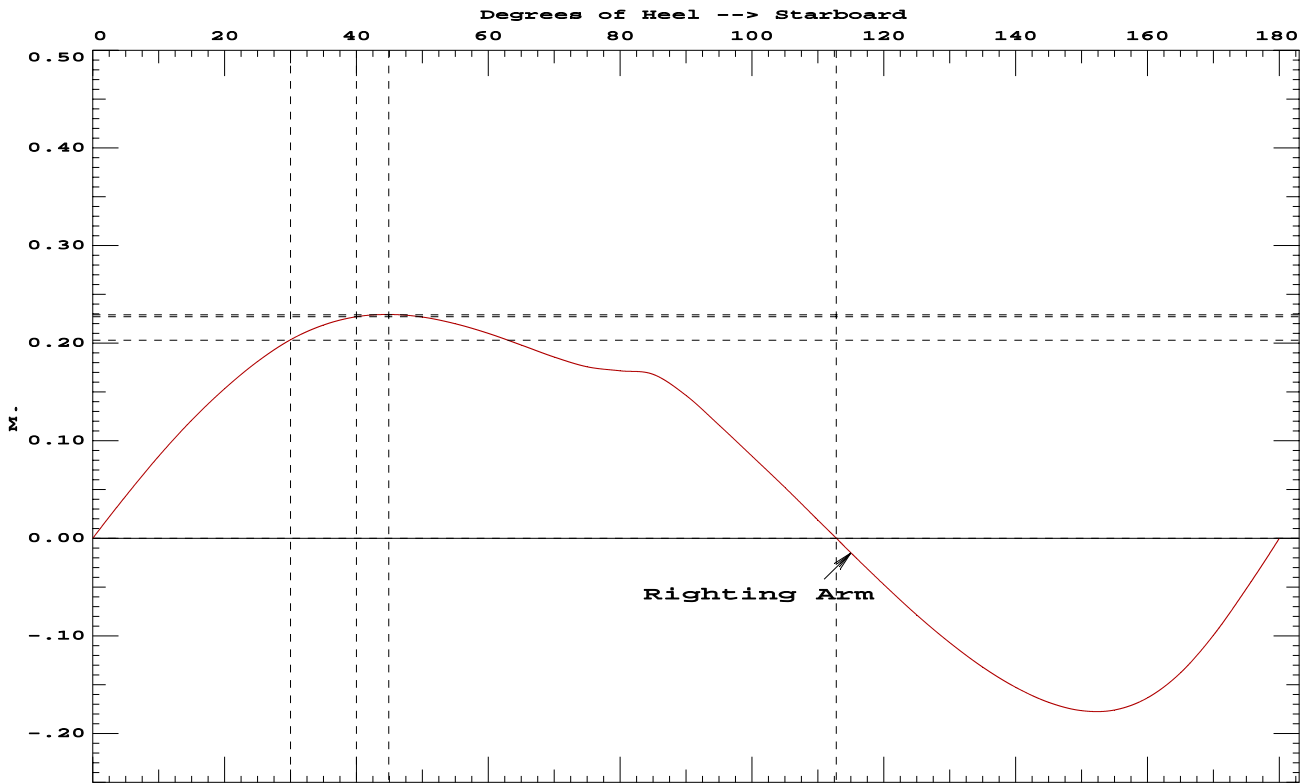
-0.701	7.37a	170.00s	1,485	0.000	-0.099s	0.1773
-0.696	7.19a	175.00s	1,485	0.000	-0.052s	0.1706
-0.694	7.14a	180.00s	1,485	0.000	0.000s	0.1683

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

LIM-----	MCA 11.3.4 CRITERION-----	Min/Max-----	Attained
(1)	Absolute Angle at Equilibrium	< 7.00 deg	0.00 P
(2)	Angle from Equilibrium to RZero	> 15.00 deg	112.80 P
(3)	Righting Arm at MaxRA	> 0.100 M.	0.229 P
(4)	Area from Equilibrium to RZero	> 0.0150 M.-Rad	0.2999 P

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K-28 15 SQM (06HULL05.GFT)  
DAMAGE STABILITY



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GHS 9.26D

K-28 15 SQM (06HULL05.GFT)  
DAMAGE STABILITY

MINIMUM SAILING CONDITION  
WEIGHT STATUS

Part-----	Weight(KG)-----	LCG-----	TCG-----	VCG-----
WEIGHT	1,284	3.450a	0.000	-0.003
Distances in METERS.-----				

No downflood points with hatches closed.

HYDROSTATIC PROPERTIES

Trim: Aft 0.001/6.200, No Heel, VCG = -0.003

LCF	Displacement	Buoyancy-Ctr.	Weight/	Moment/
Draft----	Weight(KG)-----	LCB-----	VCB-----	CM-----
0.007	1,284	3.451a	-0.165	70
				3.441a
				22.91
				11.06
				0.652
Distances in METERS.-----				
Specific Gravity = 1.025.-----				
Moment in M.-KG.				
Trim is per 6.20M.				

Draft is from BPL.

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K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

DAMAGE PATTERN 1

CABIN COMPARTMENT FLOODED

DISPLACEMENT and FREEBOARD STATUS

BPL draft: 0.416 @ 0.00, 0.163 @ 6.20a

Trim: Fwd 0.253/6.200, Heel: zero

Part-----	SpGr-----	Displ(KG)---	LCB-----	TCB-----	VCB-----	RefHt-----
HULL	1.025	3,711	3.071a	0.000	0.049	-0.415
CABIN.C	Flooded 1.025	-2,427	2.870a	0.000	0.061	-0.415
Total Displacement-->		1.025	1,284	3.451a	0.000	0.025

Distances in METERS.-----

Least freeboard is 0.175 M. located at 1.000f

Least extra freeboard (to margin line) is 0.098 M. located at 1.000f

RIGHTING ARMS vs HEEL ANGLE with FLOODING

LCG = 3.450a TCG = 0.000 VCG = -0.003

Origin	Degrees of	Displacement	Righting Arms			
Depth---	Trim---	Heel---	Weight(KG)---	in Trim--	in Heel	--> Area
0.415	2.34f	0.00	1,284	0.000	0.000	0.0000
0.414	2.33f	5.00s	1,284	0.000	0.035s	0.0015
0.409	2.33f	10.00s	1,284	0.000	0.070s	0.0061
0.401	2.32f	15.00s	1,284	0.000	0.103s	0.0137
0.390	2.32f	20.00s	1,285	0.000	0.134s	0.0241
0.377	2.33f	25.00s	1,284	0.000	0.161s	0.0370
0.364	2.36f	30.00s	1,284	0.000	0.184s	0.0521
0.351	2.40f	35.00s	1,284	0.000	0.202s	0.0689
0.337	2.45f	40.00s	1,284	0.000	0.215s	0.0872
0.323	2.50f	45.00s	1,285	0.000	0.224s	0.1063
0.308	2.54f	50.00s	1,285	0.000	0.229s	0.1261
0.292	2.57f	55.00s	1,284	0.000	0.231s	0.1462
0.290	2.58f	55.63s	1,284	0.000	0.231s	0.1487
0.276	2.61f	60.00s	1,284	0.000	0.230s	0.1663
0.260	2.64f	65.00s	1,284	0.000	0.226s	0.1862
0.243	2.68f	70.00s	1,284	0.000	0.221s	0.2058
0.226	2.70f	75.00s	1,284	0.000	0.214s	0.2248
0.209	2.71f	80.00s	1,284	0.000	0.206s	0.2431
0.192	2.70f	85.00s	1,284	0.000	0.198s	0.2607
0.185	2.75f	90.00s	1,283	0.000	0.202s	0.2781
0.191	2.89f	95.00s	1,284	0.000	0.216s	0.2963
0.180	2.96f	100.00s	1,284	0.000	0.203s	0.3148
0.167	3.02f	105.00s	1,284	0.000	0.185s	0.3317
0.157	3.10f	110.00s	1,284	0.000	0.166s	0.3471
0.147	3.18f	115.00s	1,284	0.000	0.146s	0.3607
0.141	3.28f	120.00s	1,284	0.000	0.124s	0.3724
0.137	3.40f	125.00s	1,284	0.000	0.102s	0.3823
0.136	3.55f	130.00s	1,284	0.000	0.079s	0.3902
0.138	3.70f	135.00s	1,284	0.000	0.056s	0.3961
0.141	3.86f	140.00s	1,284	0.000	0.035s	0.4001
0.143	4.00f	145.00s	1,284	0.000	0.015s	0.4022
0.143	4.12f	150.00s	1,284	0.000	-0.000s	0.4029
0.142	4.23f	155.00s	1,284	0.000	-0.011s	0.4024
0.140	4.32f	160.00s	1,284	0.000	-0.014s	0.4012
0.136	4.38f	165.00s	1,284	0.000	-0.012s	0.4000
0.131	4.40f	170.00s	1,284	0.000	-0.010s	0.3991

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DAMAGE STABILITY

0.126 4.39f 175.00s 1,284 0.000 -0.005s 0.3984

0.124 4.38f 180.00s 1,284 0.000 0.000s 0.3982

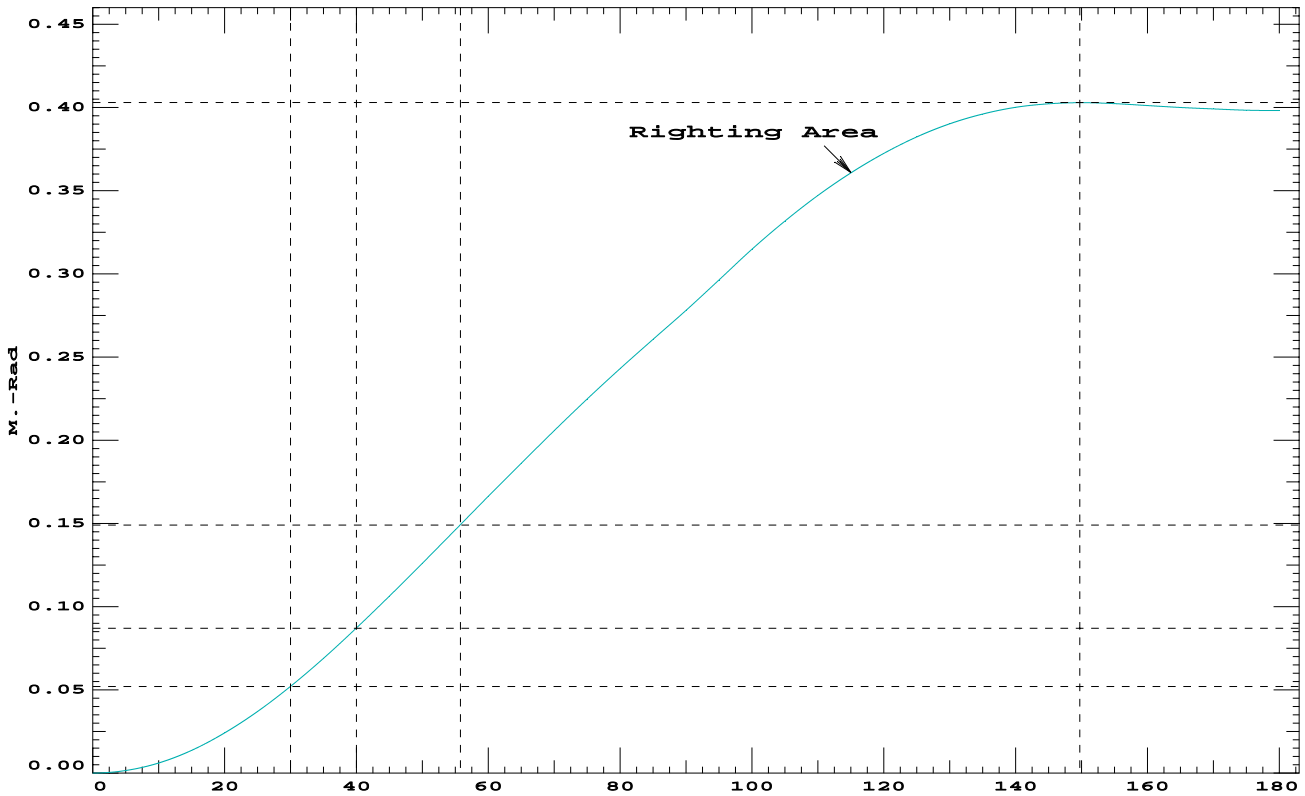
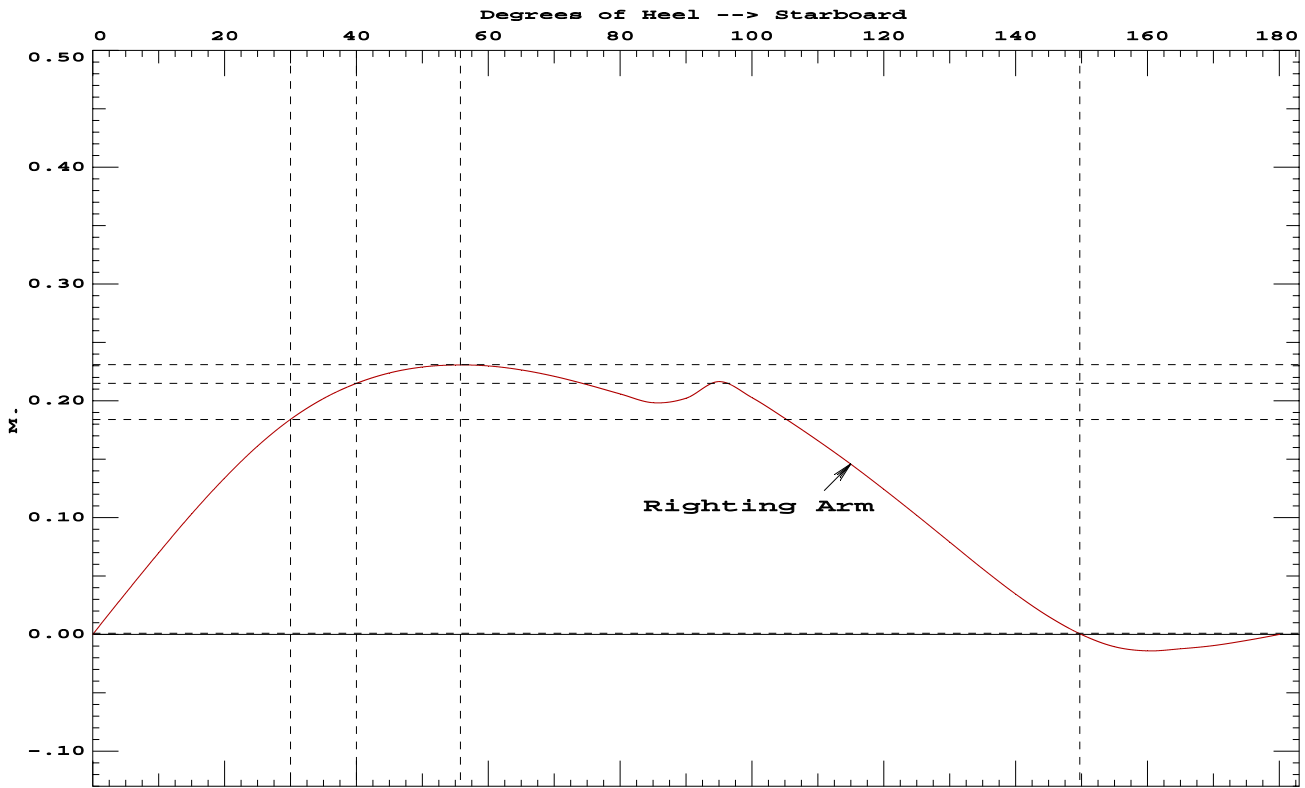
Distances in METERS.---Specific Gravity = 1.025.---Area in M.-Rad.

LIM-----MCA 11.3.4 CRITERION-----Min/Max-----Attained

(1) Absolute Angle at Equilibrium	<	7.00	deg	0.00	P
(2) Angle from Equilibrium to RZero	>	15.00	deg	150.00	P
(3) Righting Arm at MaxRA	>	0.100	M.	0.231	P
(4) Area from Equilibrium to RZero	>	0.0150	M.-Rad	0.4029	P

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K-28 15 SQM (06HULL05.GFT)  
DAMAGE STABILITY



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GHS 9.26D

K-28 15 SQM (06HULL05.GFT)

DAMAGE STABILITY

DAMAGE PATTERN 2

LAZARETTE COMPARTMENT FLOODED

DISPLACEMENT and FREEBOARD STATUS

BPL draft: -0.132 @ 0.00, 0.237 @ 6.20a

Trim: Aft 0.368/6.200, Heel: zero

Part	SpGr	Displ(KG)	LCB	TCB	VCB	RefHt
HULL	1.025	1,924	4.070a	0.000	-0.076	0.131
LAZARET.C	Flooded 1.025	-640	5.297a	0.000	0.039	0.131
Total Displacement-->		1.025	1,284	3.458a	0.000	-0.133

Distances in METERS.-----  
Least freeboard is 0.238 M. located at 7.590a  
Least extra freeboard (to margin line) is 0.162 M. located at 7.590a

RIGHTING ARMS vs HEEL ANGLE with FLOODING

LCG = 3.450a TCG = 0.000 VCG = -0.003

Origin	Degrees of	Displacement	Righting Arms	Area
Depth	Trim	Heel	Weight(KG)	in Trim--in Heel -->
-0.131	3.39a	0.00	1,284	0.000 0.000 0.0000
-0.134	3.41a	5.00s	1,284	0.000 0.052s 0.0023
-0.144	3.46a	10.00s	1,284	0.000 0.100s 0.0089
-0.160	3.53a	15.00s	1,284	0.000 0.144s 0.0196
-0.180	3.60a	20.00s	1,284	0.000 0.183s 0.0339
-0.203	3.67a	25.00s	1,284	0.000 0.216s 0.0513
-0.230	3.73a	30.00s	1,284	0.000 0.246s 0.0715
-0.260	3.82a	35.00s	1,284	0.000 0.269s 0.0940
-0.293	3.92a	40.00s	1,283	0.000 0.286s 0.1183
-0.326	4.04a	45.00s	1,283	0.000 0.295s 0.1437
-0.359	4.17a	50.00s	1,284	0.000 0.299s 0.1696
-0.370	4.21a	51.69s	1,284	0.000 0.299s 0.1784
-0.392	4.30a	55.00s	1,284	0.000 0.298s 0.1957
-0.422	4.42a	60.00s	1,284	0.000 0.295s 0.2217
-0.450	4.54a	65.00s	1,284	0.000 0.291s 0.2472
-0.473	4.67a	70.00s	1,284	0.000 0.290s 0.2726
-0.494	4.84a	75.00s	1,284	0.000 0.292s 0.2979
-0.516	5.07a	80.00s	1,284	0.000 0.298s 0.3237
-0.542	5.26a	85.00s	1,284	0.000 0.278s 0.3490
-0.570	5.49a	90.00s	1,284	0.000 0.249s 0.3720
-0.595	5.65a	95.00s	1,284	0.000 0.217s 0.3924
-0.614	5.71a	100.00s	1,284	0.000 0.181s 0.4098
-0.630	5.75a	105.00s	1,284	0.000 0.144s 0.4240
-0.644	5.77a	110.00s	1,283	0.000 0.106s 0.4349
-0.654	5.79a	115.00s	1,284	0.000 0.068s 0.4425
-0.662	5.77a	120.00s	1,284	0.000 0.029s 0.4468
-0.667	5.78a	123.89s	1,284	0.000 0.000s 0.4478
-0.668	5.77a	125.00s	1,284	0.000 -0.008s 0.4477
-0.672	5.79a	130.00s	1,284	0.000 -0.045s 0.4453
-0.675	5.84a	135.00s	1,284	0.000 -0.081s 0.4398
-0.678	5.93a	140.00s	1,284	0.000 -0.114s 0.4313
-0.679	6.03a	145.00s	1,283	0.000 -0.142s 0.4201
-0.677	6.05a	150.00s	1,284	0.000 -0.163s 0.4067
-0.670	5.96a	155.00s	1,284	0.000 -0.174s 0.3919
-0.660	5.78a	160.00s	1,284	0.000 -0.170s 0.3768
-0.648	5.52a	165.00s	1,285	0.000 -0.149s 0.3628

10-09-09 10:29:20

GHS 9.26D

K-28 15 SQM (06HULL05.GFT)

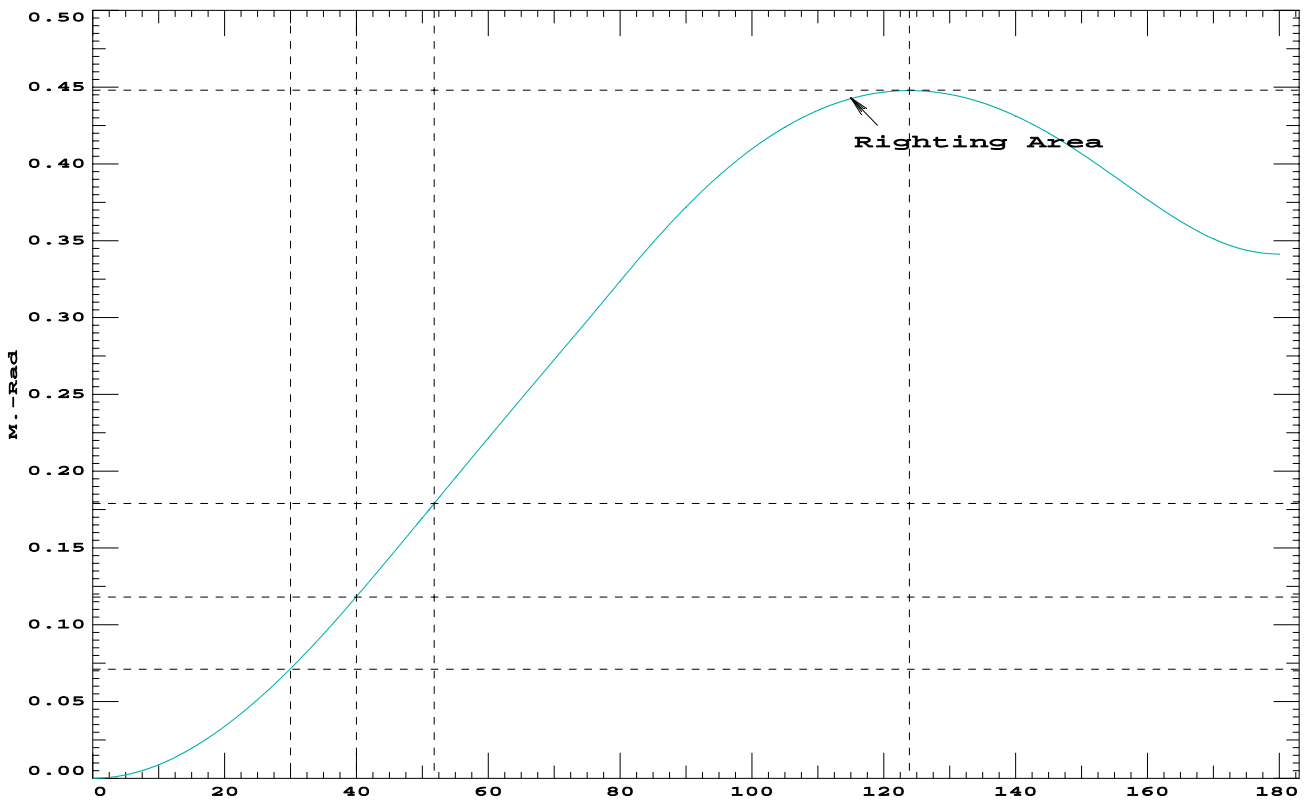
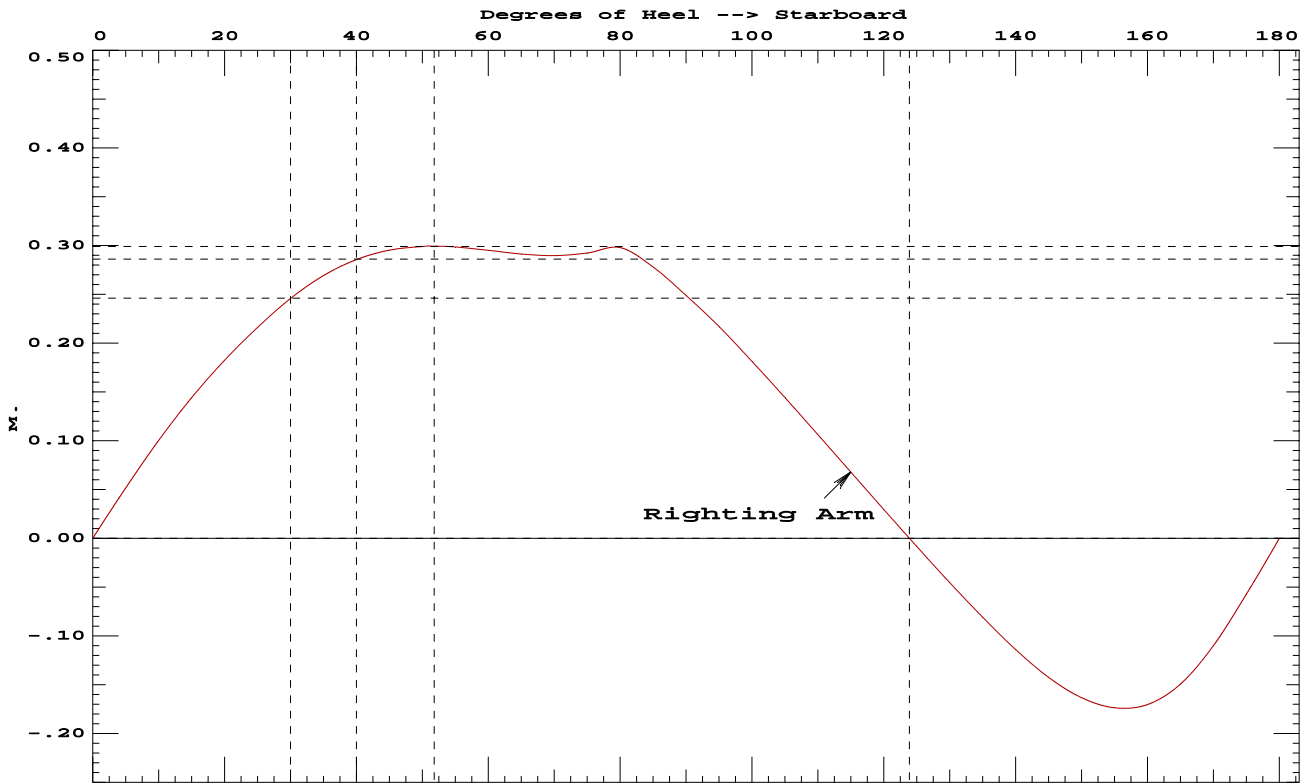
DAMAGE STABILITY

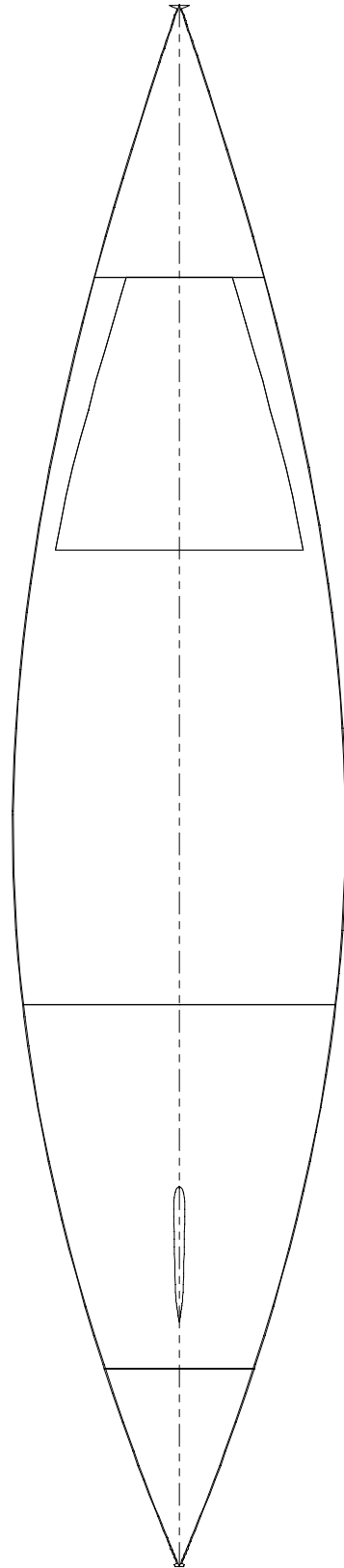
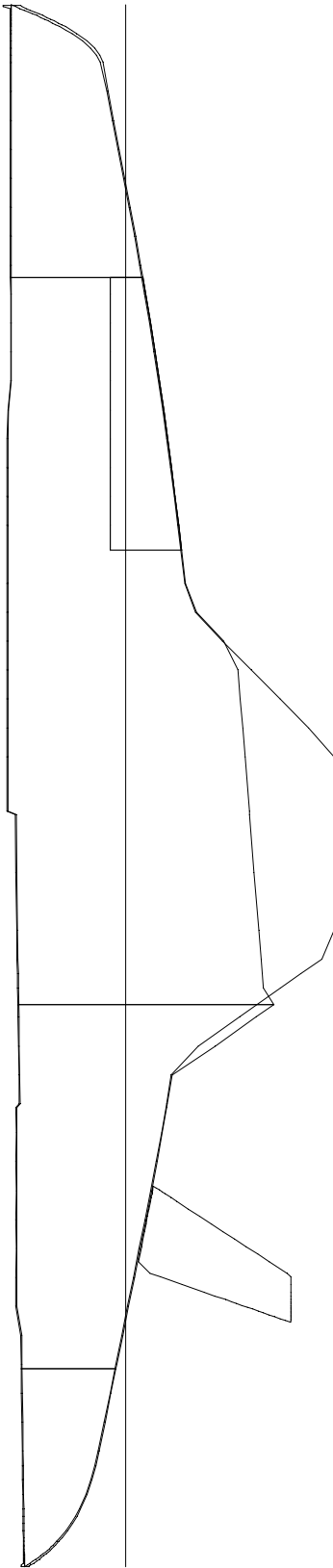
-0.639	5.29a	170.00s	1,284	0.000	-0.110s	0.3513
-0.637	5.18a	175.00s	1,284	0.000	-0.057s	0.3439
-0.637	5.16a	180.00s	1,284	0.000	0.000s	0.3414

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

LIM-----	MCA 11.3.4 CRITERION-----	Min/Max-----	Attained
(1)	Absolute Angle at Equilibrium	< 7.00 deg	0.00 P
(2)	Angle from Equilibrium to RZero	> 15.00 deg	123.89 P
(3)	Righting Arm at MaxRA	> 0.100 M.	0.299 P
(4)	Area from Equilibrium to RZero	> 0.0150 M.-Rad	0.4478 P

K-28 15 SQM (06HULL05.GFT)  
DAMAGE STABILITY





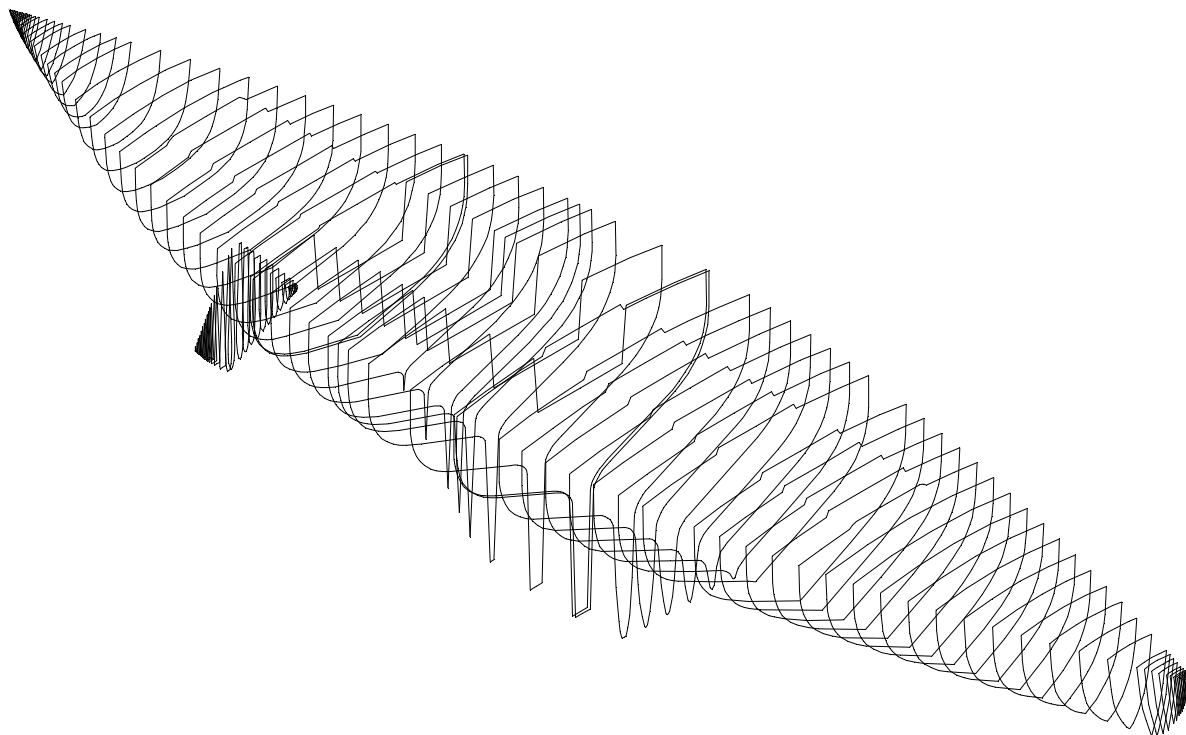
Scale = 1:40

10-09-09 10:28  
GHS-GHS/PM 2.84

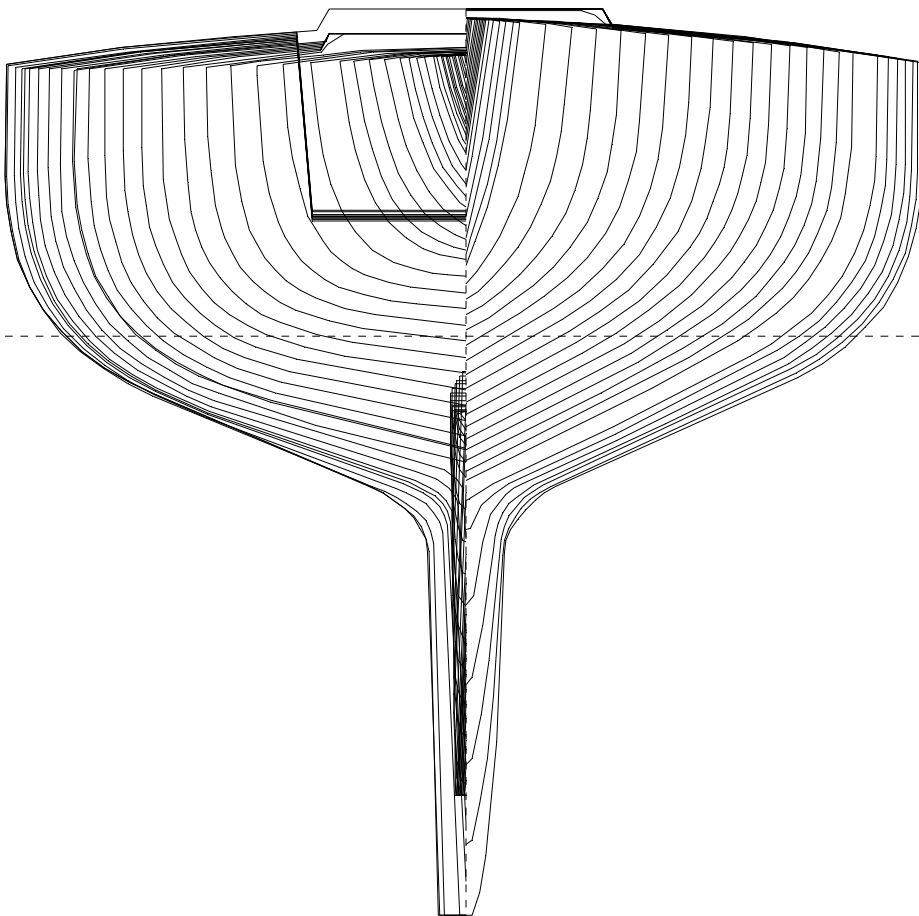
K-28 15 SQM (06HULL05.GFT)

Part Name	Class	Description	Location		Volume
HULL	HULL		1.000f to	7.590a	
BOWTANK.C	TANK		0.500a to	2.000a	0.241
FOREPEAK.C	TANK		0.997f to	0.500a	0.329
CABIN.C	TANK		0.500a to	4.500a	3.953
LAZARET.C	TANK		4.500a to	6.500a	1.494
AFTPEAK.C	TANK		6.500a to	7.590a	0.154

-----  
Locations in Meters fwd/aft of the origin.      Volumes in cubic Meters.  
-----



HULL Isometric Projection



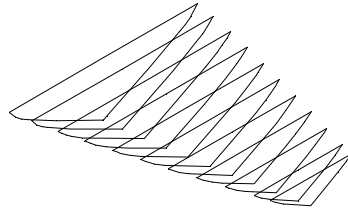
Stbd

Stbd

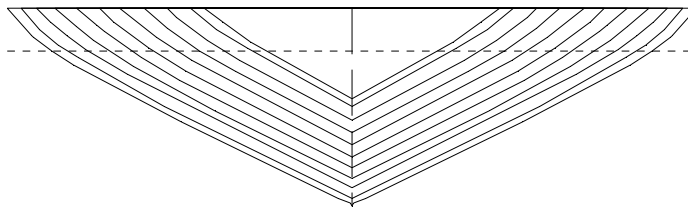
HULL Body Plan (2 components)  
Scale = 1:15

Component 1: HULL.C

Component 2: RDDR.C

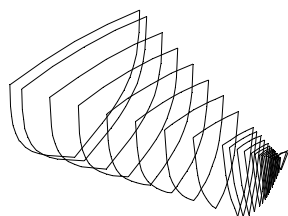


BOWTANK.C Isometric Projection

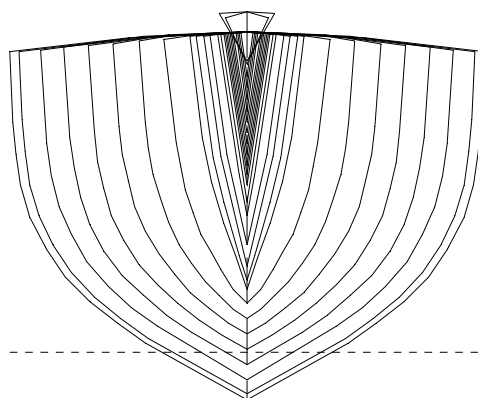


BOWTANK.C Body Plan (1 component)  
Scale = 1:15

Component 1: BOWTANK.C 95.00% permeability

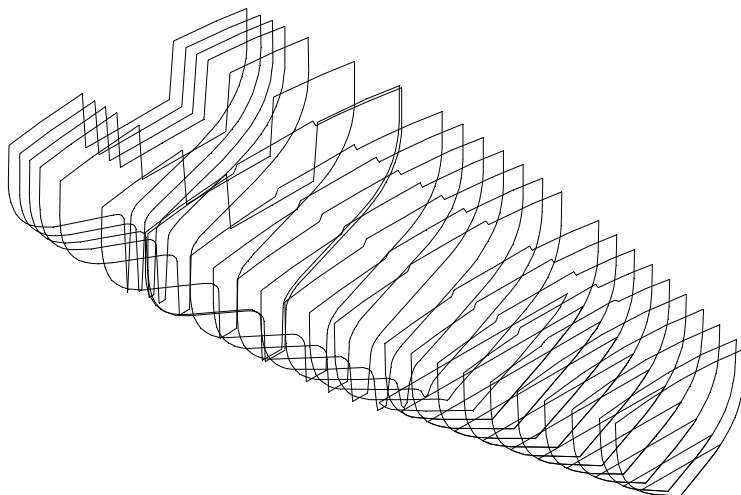


FOREPEAK.C Isometric Projection

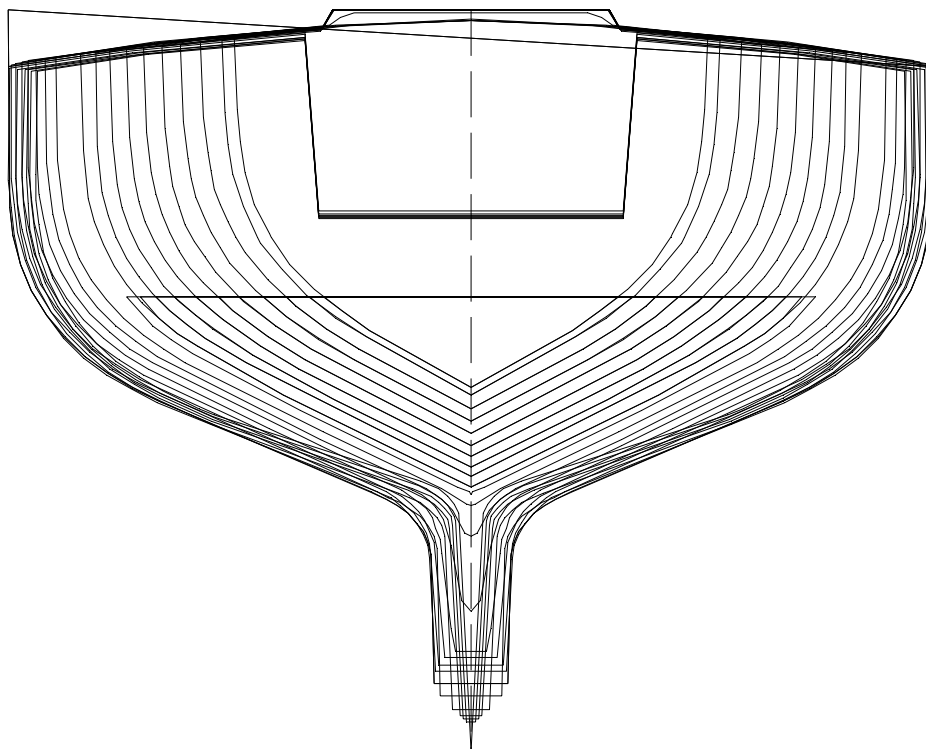


FOREPEAK.C Body Plan (1 component)  
Scale = 1:15

Component 1: FOREPEAK.C 95.00% permeability



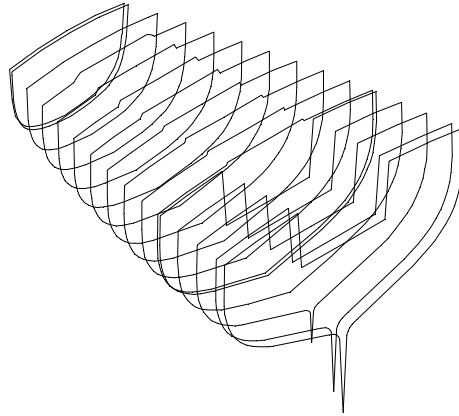
CABIN.C Isometric Projection



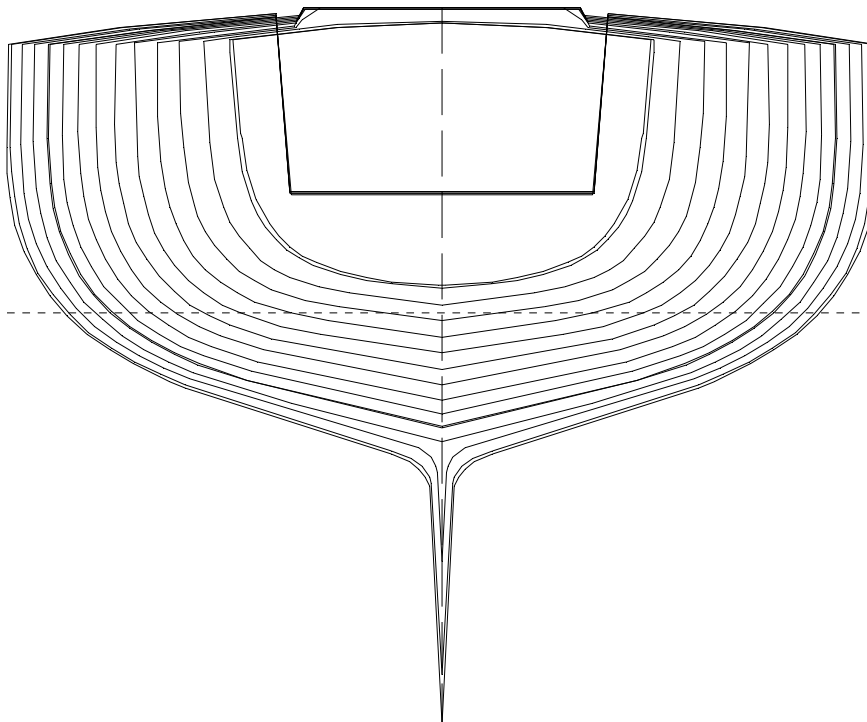
CABIN.C Body Plan (2 components)  
Scale = 1:15

Component 1: CABIN.C 95.00% permeability

Component 2: BOWTANK.C (deducting) 95.00% permeability

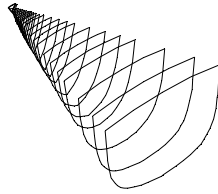


LAZARET.C Isometric Projection

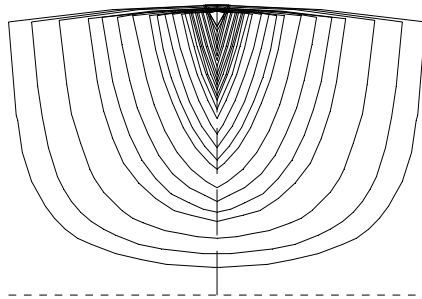


LAZARET.C Body Plan (1 component)  
Scale = 1:15

Component 1: LAZARET.C 95.00% permeability



AFTPEAK.C Isometric Projection



AFTPEAK.C Body Plan (1 component)  
Scale = 1:15

Component 1: AFTPEAK.C 95.00% permeability

```
`Project: K-28
`Date: 9 September 2010
`Author: Paul Kotzebue
`Purpose: ISO 12217-2 Stability and MCA 11.3.4 Damage Stability
`Geometry: 06HULL05.GFT
```

```
CLEAR VARIABLES
CLEAR MACROS
CLEAR REPORT
```

```
MACRO MSC
DELETE ALL WEIGHT
WEIGHT 1284 3.45 0.00 -0.003 `set msc cond
SOLVE
\MINIMUM SAILING CONDITION\
STATUS FI
\
\No downflood points with hatches closed.
\
GHS
/
```

```
MACRO FULLLOAD
DELETE ALL WEIGHT
WEIGHT 1485 3.52 0.00 0.086 `set full load cond
SOLVE
\FULL LOAD CONDITION\
STATUS FI
\
\No downflood points with hatches closed.
\
GHS
/
```

```
MACRO DAMPAT01
\DAMAGE PATTERN 1\
\CABIN COMPARTMENT FLOODED\
TYPE (*) INTACT `all compartments intact
TYPE (CABIN.C) FLOODED
/
```

```
MACRO DAMPAT02
\DAMAGE PATTERN 2\
\LAZARETTE COMPARTMENT FLOODED\
TYPE (*) INTACT `all compartments intact
TYPE (LAZARET.C) FLOODED
/
```

```
MACRO RUNCASE
.%1 `set damage condition
SOLVE `solve for damage equil
STATUS DI FREEBD
ANGLES *
RA 0 5 ... 180 /LIMIT:ATTAINED
TYPE (*) INTACT
SOLVE
/
```

```
MACRO RUNDAM
.%1 `set intact condition
```

PAGE  
.RUNCASE DAMPAT01  
PAGE  
.RUNCASE DAMPAT02  
/

`\*\*\*\*\*START OF PROGRAM\*\*\*\*\*`

UNITS KG  
WATER 1.025  
LBP 0.00 6.20

SUBTITLE OFF  
SUBTITLE INTACT STABILITY\

REPORT 06\_STAB.PF /P:0

LIMIT OFF  
LIMIT AREA:DEGREES

CRTPT OFF

LIMIT TITLE "ISO 12217-2 DATA"  
`LIMIT AREA FROM 0 TO FLD > 5  
LIMIT AREA FROM 0 TO RA0 > 5

.MSC  
PAGE  
RA 0 5 ... 180 /LIMIT:ATTAINED  
PAGE  
.FULLLOAD  
PAGE  
RA 0 5 ... 180 /LIMIT:ATTAINED

SUBTITLE OFF  
SUBTITLE DAMAGE STABILITY\  
PAGE

LIMIT OFF

LIMIT TITLE MCA 11.3.4  
LIMIT ANGLE AT EQUIL < 7  
LIMIT ANGLE FROM EQUIL TO RA0 > 15  
LIMIT RA AT MAX > 0.100  
LIMIT AREA FROM EQUIL TO RA0 > 0.015

.RUNDAM FULLLOAD  
PAGE  
.RUNDAM MSC

REPORT OFF