

FRAM

TRIM AND

STABILITY

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Ice load calculations
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Ship Consulting Ltd

SHIP'S NAME: Fram

FLAG STATE: Finland

OWNER: Alfons Håkans

MAIN DIMENSIONS:

Length pp	31.00 m
Breadth max	8.80 m
Draught	4.20 m

GENERAL

This Trim and Stability booklet contain some sample loading conditions.

Towing hook criterions has been shown on page 48.

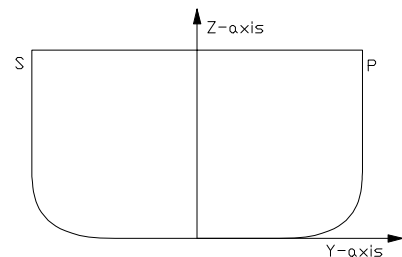
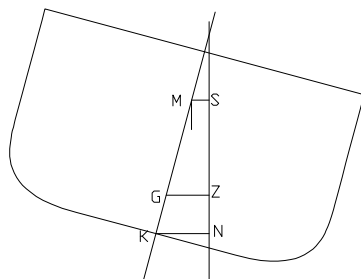
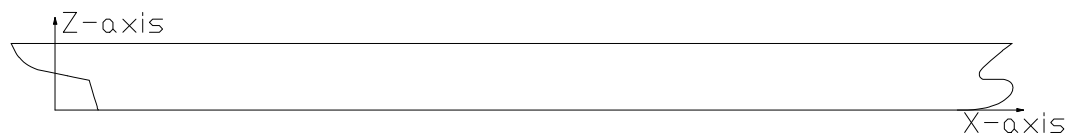
All door and hatches on main deck MUST be closed and secured at sea. The stability tables (MS) assume that these doors are watertight.

Bilges shall be kept pumped minimum content at all times.

Calculations have been done by using seawater density 1.005 t/m³.

SYMBOLIT / SYMBOLS

L/2	On sama kuin Lpp/2 (-/+ = perä/keula) / Denotes Lpp/2 (-/+ = aft/forw.)
BL	Peruslinja / Base line
CL	Keskilinja / Center line
TM	Keskisyväys / Mean draught
TFP	Syväys keulaperpendikkelissä / Draught at fore perpendicular
TAP	Syväys peräperpendikkelissä / Draught at aft perpendicular
Tr	Trimmi (-/+ = perä/keula) / Trim (-/+ = stern/head)
KM	Kohtisuora etäisyys peruslinjasta alkuvaintokeskukseen / Vertical distance from base line to transverse metacentre
KG	Painopisteen korkeus peruslinjasta / Centre of gravity above base line
GM0	Alkuvaintokeskuskorkeus / Transverse metacentric height
GMcorr	GM:n vapaan nestepinnankorjaus / Free surface correction of GM
GM	Korjattu GM / Corrected GM
GZ	Oikaiseva momentti / Righting lever
dGZ	GZ:n vapaan nestepinnankorjaus / Free surface correction of GZ
phi	Kallistuman kulma / Angle of inclination
e(phi)	Dynaaminen vakavuuskäyrä / Dynamic lever
MFS	Vapaasta nestepinnasta aiheutuva momentti / Moment of free liquid surface
L.C.G.=cgx	Pituussuuntainen painopiste vertailupisteestä / Longitudinal centre of gravity from reference point
T.C.G.=cgy	Poikittainen painopiste keskilinjasta / Transversal centre of gravity from CL
V.C.G.=cgz	Korkeussuuntainen painopiste peruslinjasta / Vertical centre of gravity from BL
SWBM	Tyynenveden taivutusmomentti / Still water bending moment
RHO=DENS	Tiheys / Density



$$GZ = KN - KG \cdot \sin(\phi)$$

$$GZ = MS + GM \cdot \sin(\phi)$$

$$MS = KN - KM \cdot \sin(\phi)$$

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FRAM

COMP. SUMMARY

DATE 2015-09-24
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USER TJJ
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REFERENCE POINT 15.5 M FORWARD FROM FRAME
CAPACITY OF Fresh Water RHO=1 TON/M3

		CENTRES OF GRAVITY					
name	comp. description	net volumeof m3	mass load t	cgx of volume m	cgy of volume m	cgz of volume m	Max. IY of surface m4
T1	FW TK 1	10.2	10.2	9.10	0.00	2.17	9.71
T5	COOLING W. TK 5	12.6	12.6	-3.33	-0.40	0.70	56.84
T10	COOLING W. TK 10	22.5	22.5	-12.80	-0.72	3.65	24.27

TOTAL OF Fresh Water		45.3	45.3	-5.34	-0.47	2.51	

CAPACITY OF Diesel Oil RHO=0.86 TON/M3

		CENTRES OF GRAVITY					
name	comp. description	net volumeof m3	mass load t	cgx of volume m	cgy of volume m	cgz of volume m	Max. IY of surface m4
T7	WASTE OIL TK 7	7.6	6.5	-8.27	0.00	0.68	16.58
T2P	FO TK 2P	16.1	13.8	5.09	1.31	1.89	8.23
T2S	FO TK 2S	16.1	13.8	5.09	-1.31	1.89	8.23
T3P	FO TK 3P	21.7	18.6	2.22	1.49	1.83	12.32
T3S	FO TK 3S	21.7	18.6	2.22	-1.49	1.83	12.32
T8P	FO TK 8P	16.8	14.4	-9.05	2.20	3.23	3.10
T8S	FO TK 8S	16.8	14.4	-9.05	-2.20	3.23	3.10

TOTAL OF Diesel Oil		116.7	100.3	-0.91	0.00	2.17	

CAPACITY OF Lubricating Oil RHO=0.9 TON/M3

		CENTRES OF GRAVITY					
name	comp. description	net volumeof m3	mass load t	cgx of volume m	cgy of volume m	cgz of volume m	Max. IY of surface m4
T6P	LO STORAGE TK 6P	4.4	4.0	-4.92	1.02	0.68	4.73

CAPACITY OF Grey Water RHO=1 TON/M3

		CENTRES OF GRAVITY					
name	comp. description	net volumeof m3	mass load t	cgx of volume m	cgy of volume m	cgz of volume m	Max. IY of surface m4
T4	SEWAGE TK 4	5.4	5.4	-0.19	0.00	0.74	29.07

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LOADING CONDITIONS

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LOADING CONDITION LC0, LIGHTSHIP

LOADING COMPONENTS

Deadweight	0.0	0.00	0.00	0.00	0.0
Lightweight	391.3	12.90	0.05	3.98	
Displacement (rho=1.005)	391.3	12.90	0.05	3.98	0.0

FLOATING POSITION

Draught moulded	3.321 m	KM	4.13 m
Trim	-1.366 m	KG	3.98 m
Heel, PS=+	13.1 deg		
TA	4.004 m	GM0	0.16 m
TF	2.638 m	GMCORR	0.00 m
Trimming moment	-385 tonm	GM	0.16 m

LOADING CONDITION LC0, LIGHTSHIP

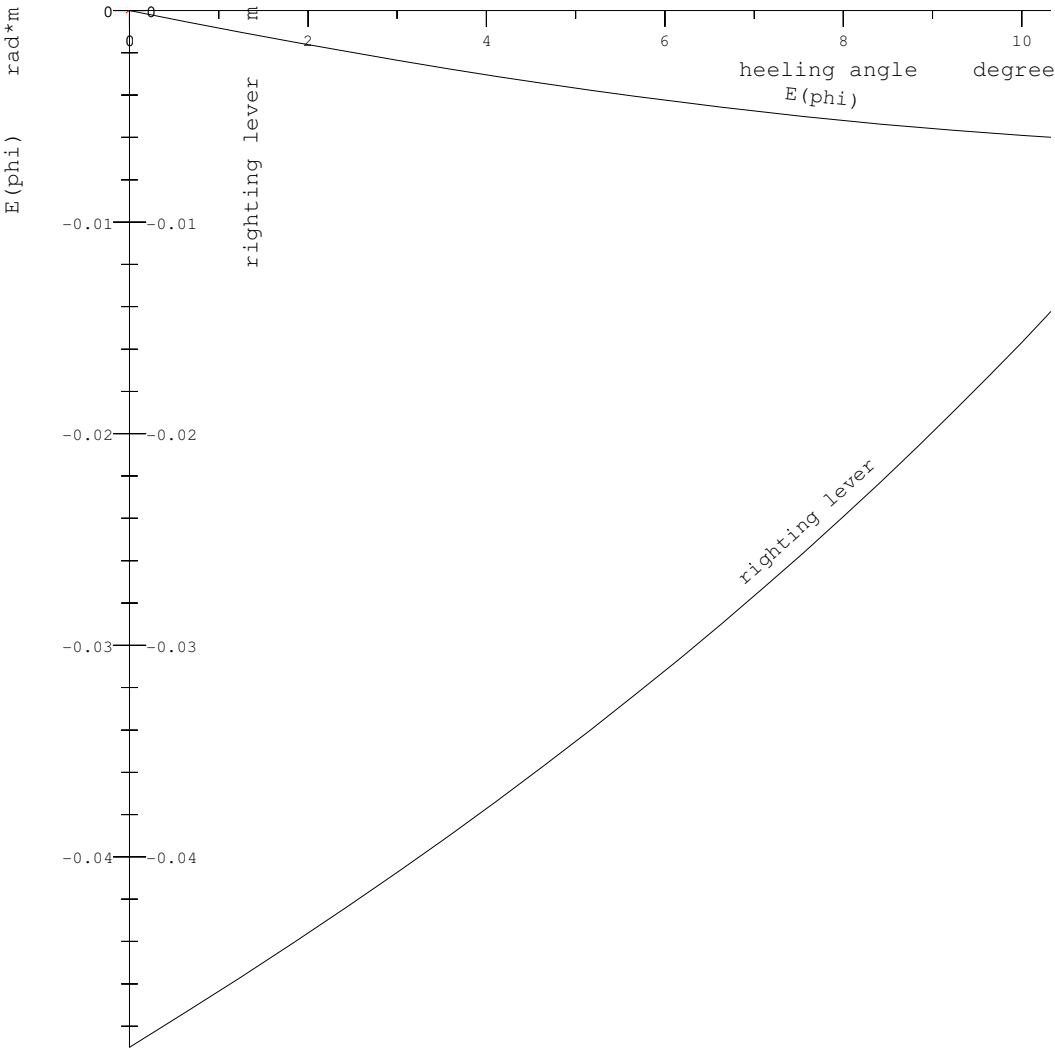
HEEL degree	MS m	HPHI m	EPHI rad*m	FSMOM tm	DGZ m
0.0	-0.049	-0.05	0.000	0.0	0.000
10.0	-0.043	-0.02	-0.006	0.0	0.000
20.0	-0.006	0.05	-0.003	0.0	0.000
30.0	0.000	0.08	0.009	0.0	0.000
40.0	-0.060	0.04	0.020	0.0	0.000
50.0	-0.121	0.00	0.023	0.0	0.000
60.0	-0.143	-0.01	0.022	0.0	0.000

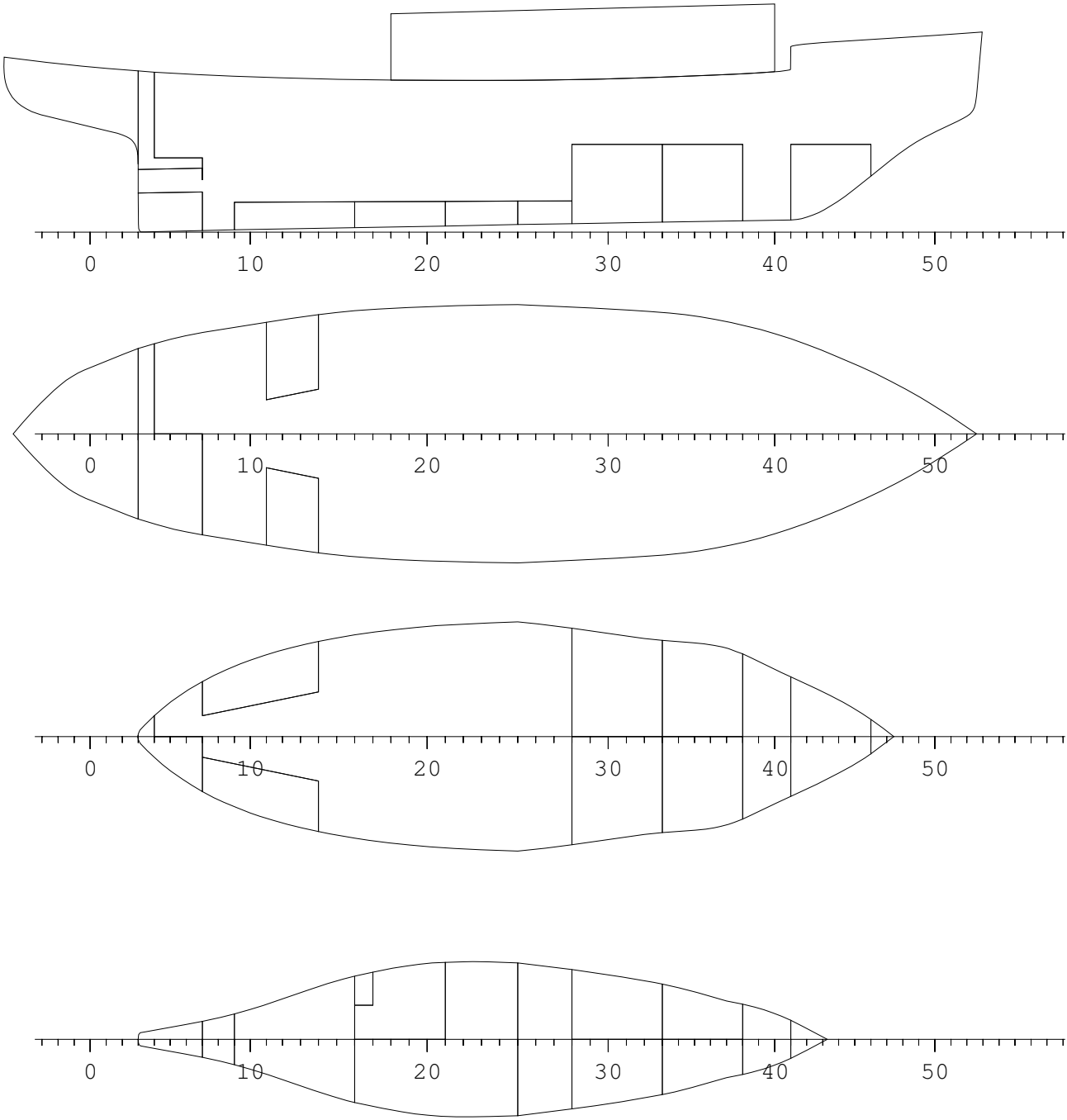
Loading condition: LIGHTSHIP

RCR	TEXT	REQ	ATTN	UNIT	STAT
AREA30	Area under GZ curve .	0.055	0.015	mrاد	NOT MET
AREA40	Area under GZ curve .	0.090	0.026	mrاد	NOT MET
AREA3040	Area under GZ curve .	0.030	0.011	mrاد	NOT MET
GZ0.2	Max GZ > 0.2	0.200	0.079	m	NOT MET
MAXGZ25	Max. GZ at an angle .	25.000	29.128	deg	OK
GM0.15	GM > 0.15 m	0.150	0.158	m	OK

STABILITY CURVES

PROJECT	P349/A
DATE	2015-09-24
CONDITION	LC0
DISP.	391 TON
DRAUGHT	3.45 M
TRIM	-1.43





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LOADING CONDITIONS

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LOADING CONDITION LC1, 100% STORES, DEPARTURE COND.

L O A D I N G C O M P O N E N T S

Name	Max. weight	Mass	Center of gravity cgx cgy cgz			Free s. moment
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Fresh Water, RHO=1.000

T1	FW TK 1	9.7	9.5	24.59	0.00	2.12	8.67
T5	COOLING W. T.	12.0	11.7	12.14	-0.40	0.68	53.90
T10	COOLING W. T.	21.4	21.0	2.72	-0.71	3.54	23.02
Total of FW		43.1	42.3	10.27	-0.46	2.42	85.59

Diesel Oil, RHO=0.860

T2P	FO TK 2P	13.2	12.9	20.59	1.29	1.82	6.57
T2S	FO TK 2S	13.2	12.9	20.59	-1.29	1.82	6.57
T3P	FO TK 3P	17.7	17.3	17.72	1.46	1.75	9.89
T3S	FO TK 3S	17.7	17.3	17.72	-1.46	1.75	9.89
T8P	FO TK 8P	13.7	13.4	6.43	2.16	3.09	2.55
T8S	FO TK 8S	13.7	13.4	6.43	-2.16	3.09	2.55
Total of DO		89.1	87.3	15.10	0.00	2.18	38.03

Lubricating Oil, RHO=0.900

T6P	LO STORAGE T.	3.8	3.7	10.58	1.00	0.66	4.00
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CREW+STORES

(CRE.	0.0	1.0	21.45	0.00	6.50	0.00
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Deadweight	134.3	13.50	-0.12	2.25	127.6
Lightweight	391.3	12.90	0.05	3.98	
Displacement (rho=1.005)	525.6	13.05	0.01	3.53	127.6

F L O A T I N G P O S I T I O N

Draught moulded	4.173	m	KM	4.44	m
Trim	-1.051	m	KG	3.53	m
Heel, PS=+	0.5	deg			
TA	4.698	m	GM0	0.90	m
TF	3.648	m	GMCORR	-0.24	m
Trimming moment	-392	tonm	GM	0.66	m

LOADING CONDITION LC1, 100% STORES, DEPARTURE COND.

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LOADING CONDITIONS

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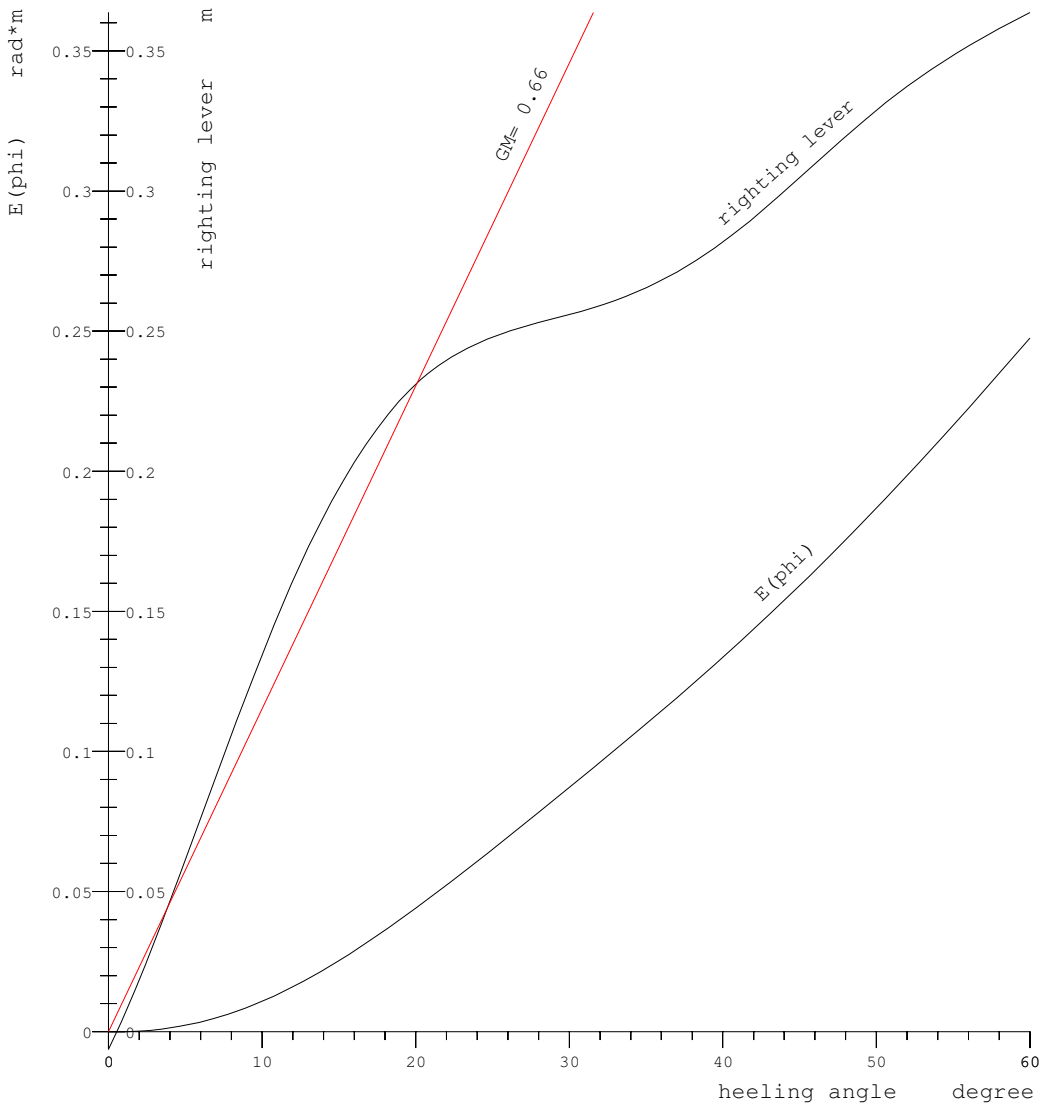
HEEL	MS	HPIH	EPHI	FSMOM	DGZ
degree	m	m	rad*m	tm	m
0.0	-0.006	-0.01	0.000	0.0	0.000
10.0	-0.003	0.13	0.011	10.0	0.019
20.0	-0.055	0.23	0.044	11.8	0.023
30.0	-0.172	0.26	0.087	12.1	0.023
40.0	-0.276	0.28	0.134	11.7	0.022
50.0	-0.342	0.33	0.187	10.9	0.021
60.0	-0.400	0.36	0.248	9.7	0.018

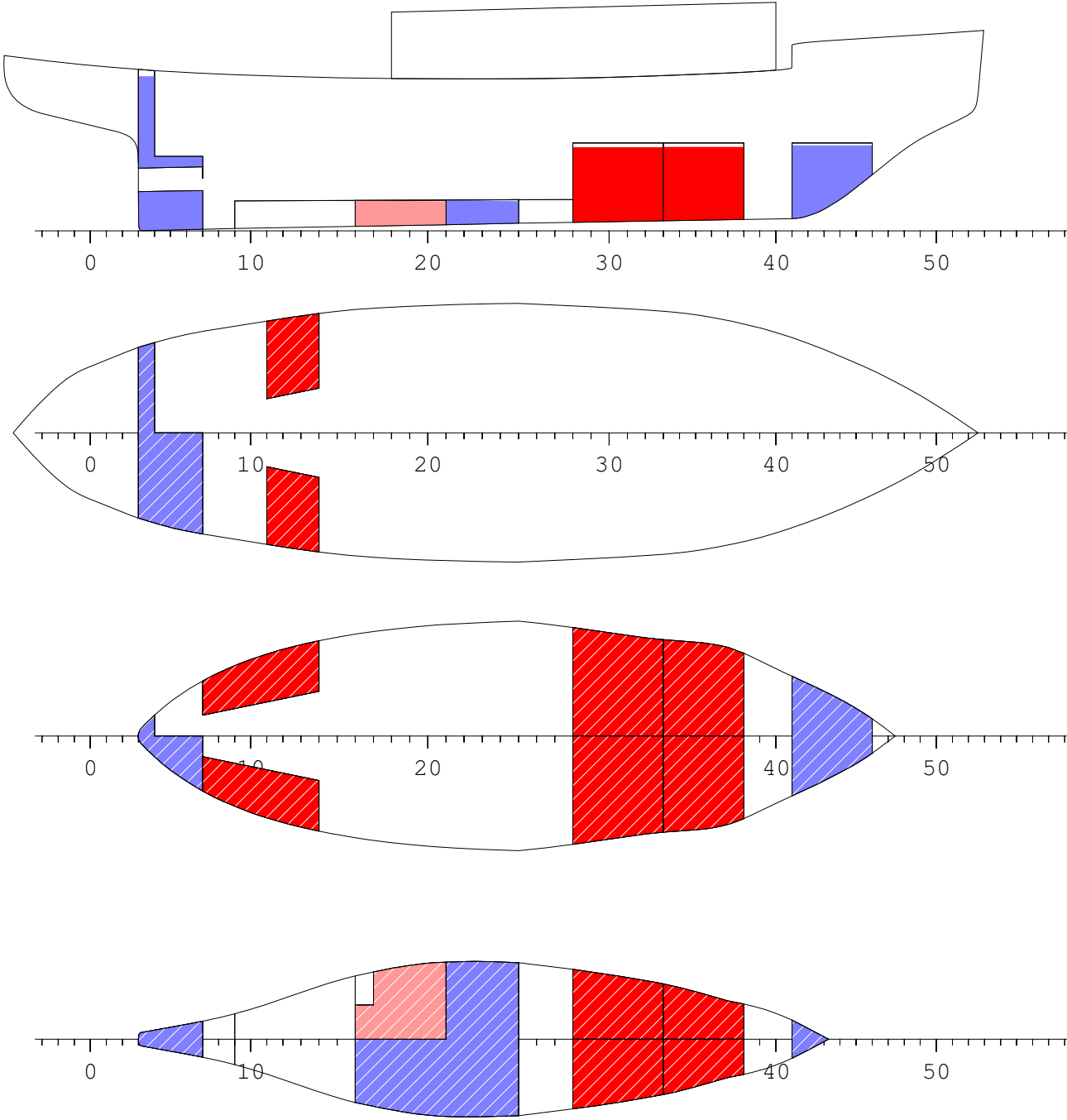
Loading condition: 100% STORES, DEPARTURE COND.

RCR	TEXT	REQ	ATTN	UNIT	STAT
AREA30	Area under GZ curve .	0.055	0.087	mrاد	OK
AREA40	Area under GZ curve .	0.090	0.134	mrاد	OK
AREA3040	Area under GZ curve .	0.030	0.047	mrاد	OK
GZ0.2	Max GZ > 0.2	0.200	0.364	m	OK
MAXGZ25	Max. GZ at an angle .	25.000	60.000	deg	OK
GM0.15	GM > 0.15 m	0.150	0.660	m	OK

STABILITY CURVES

PROJECT	P349/A
DATE	2015-09-24
CONDITION	LC1
DISP.	526 TON
DRAUGHT	4.17 M
TRIM	-1.05





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LOADING CONDITIONS

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LOADING CONDITION LC2, 50% STORES

L O A D I N G C O M P O N E N T S

Name	Max. weight	Mass	Center of gravity cgx cgy cgz			Free s. moment
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Fresh Water, RHO=1.000

T1	FW TK 1	9.7	4.9	24.45	0.00	1.68	3.81
T5	COOLING W. T.	12.0	11.7	12.14	-0.40	0.68	53.90
T10	COOLING W. T.	21.4	21.0	2.72	-0.71	3.54	23.02
Total of FW		43.1	37.6	8.47	-0.52	2.40	80.72

Diesel Oil, RHO=0.860

T7	WASTE OIL TK.	6.2	3.1	7.26	0.00	0.48	6.85
T2P	FO TK 2P	13.2	6.6	20.57	1.08	1.29	3.98
T2S	FO TK 2S	13.2	6.6	20.57	-1.08	1.29	3.98
T3P	FO TK 3P	17.7	8.9	17.71	1.26	1.20	6.42
T3S	FO TK 3S	17.7	8.9	17.71	-1.26	1.20	6.42
T8P	FO TK 8P	13.7	6.8	6.06	1.82	2.17	0.98
T8S	FO TK 8S	13.7	6.8	6.06	-1.82	2.17	0.98
Total of DO		95.3	47.7	14.47	0.00	1.45	29.59

Lubricating Oil, RHO=0.900

T6P	LO STORAGE T.	3.8	3.7	10.58	1.00	0.66	4.00
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Grey Water, RHO=1.000

T4	SEWAGE TK 4	5.1	2.6	15.30	0.00	0.56	15.22
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CREW+STORES

(CRE.	0.0	1.0	21.45	0.00	6.50	0.00
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Deadweight	92.5	11.97	-0.17	1.84	129.5
Lightweight	391.3	12.90	0.05	3.98	
Displacement (rho=1.005)	483.8	12.72	0.01	3.57	129.5

F L O A T I N G P O S I T I O N

Draught moulded	3.919 m	KM	4.36 m
Trim	-1.553 m	KG	3.57 m
Heel, PS=+	0.8 deg		
TA	4.695 m	GM0	0.79 m
TF	3.142 m	GMCORR	-0.27 m
Trimming moment	-534 tonm	GM	0.52 m

LOADING CONDITION LC2, 50% STORES

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LOADING CONDITIONS

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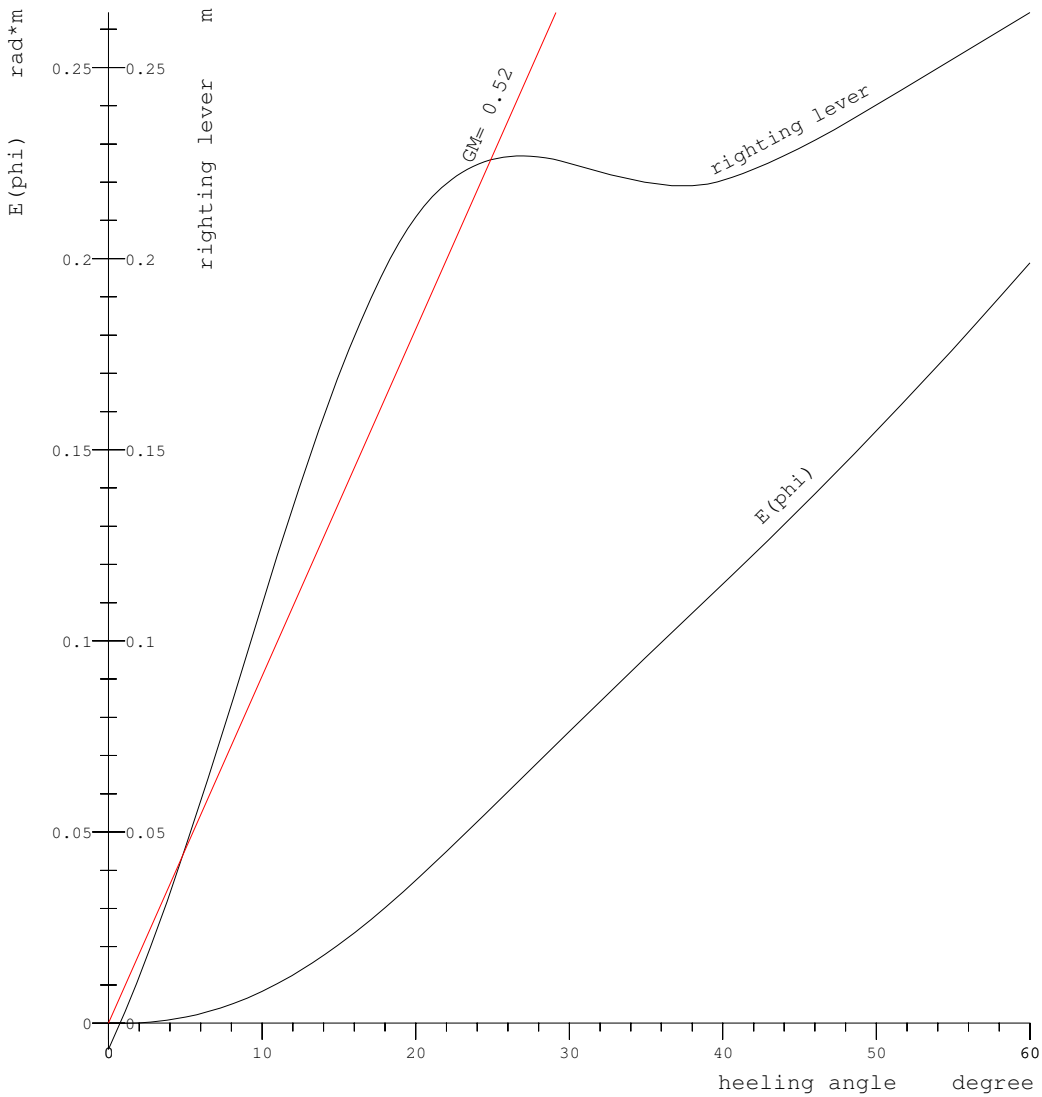
HEEL degree	MS m	HPIH m	EPHI rad*m	FSMOM tm	DGZ m
0.0	-0.007	-0.01	0.000	0.0	0.000
10.0	-0.002	0.11	0.008	12.3	0.025
20.0	-0.019	0.21	0.037	18.9	0.039
30.0	-0.117	0.22	0.076	25.4	0.052
40.0	-0.221	0.22	0.115	31.6	0.065
50.0	-0.287	0.24	0.155	36.9	0.076
60.0	-0.334	0.26	0.199	40.4	0.083

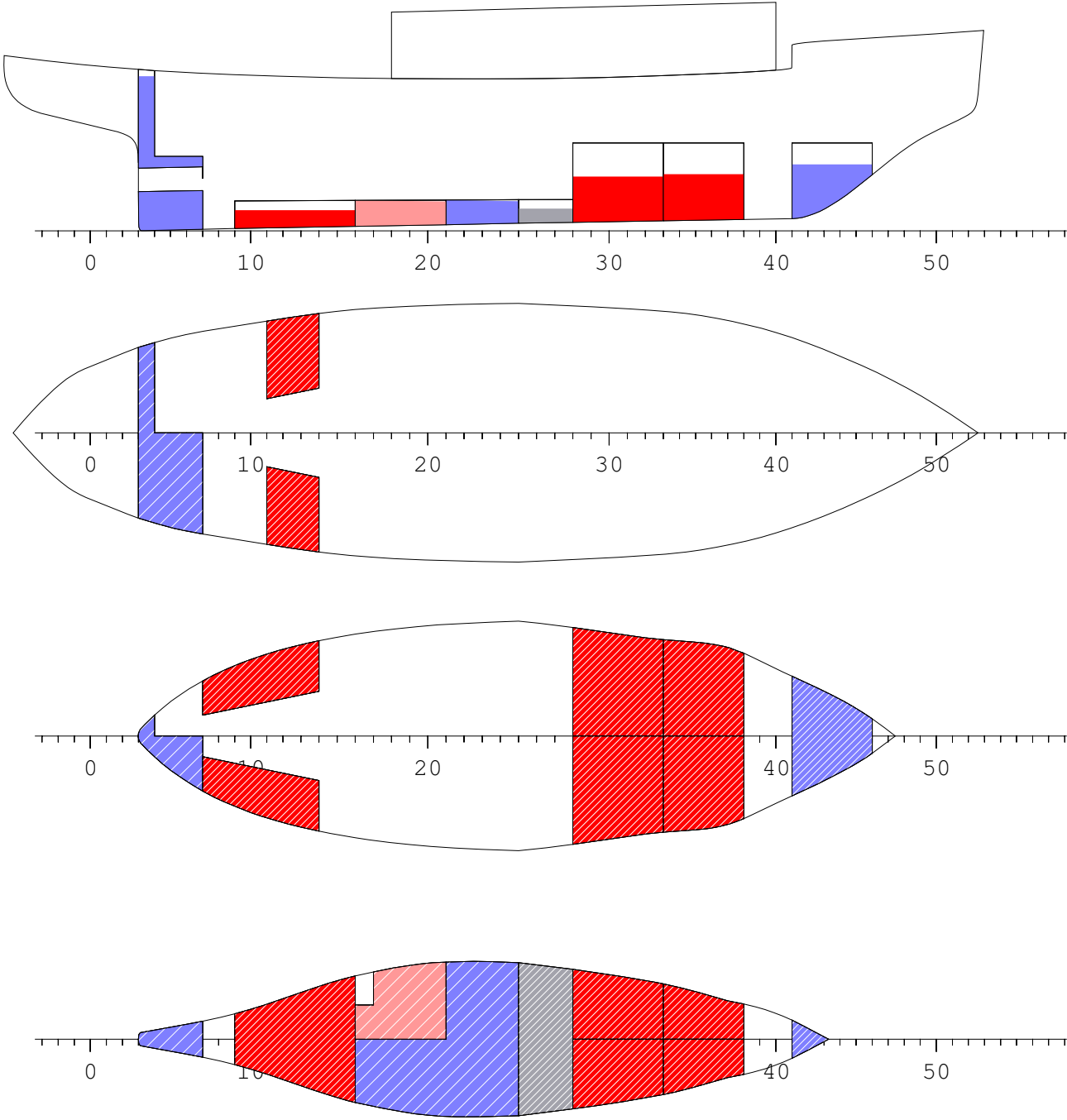
Loading condition: 50% STORES

RCR	TEXT	REQ	ATTV	UNIT	STAT
AREA30	Area under GZ curve .	0.055	0.076	mrاد	OK
AREA40	Area under GZ curve .	0.090	0.115	mrاد	OK
AREA3040	Area under GZ curve .	0.030	0.039	mrاد	OK
GZ0.2	Max GZ > 0.2	0.200	0.264	m	OK
MAXGZ25	Max. GZ at an angle .	25.000	60.000	deg	OK
GM0.15	GM > 0.15 m	0.150	0.520	m	OK

STABILITY CURVES

PROJECT	P349/A
DATE	2015-09-24
CONDITION	LC2
DISP.	484 TON
DRAUGHT	3.92 M
TRIM	-1.55





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LOADING CONDITIONS

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LOADING CONDITION LC3, 10% STORES, ARRIVAL COND.

L O A D I N G C O M P O N E N T S

Name	Max. weight	Mass	Center of gravity cgx cgz			Free s. moment
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Fresh Water, RHO=1.000

T1	FW TK 1	9.7	1.5	24.23	0.00	1.18	1.07
T5	COOLING W. T.	12.0	12.0	12.14	-0.40	0.69	54.70
T10	COOLING W. T.	21.4	21.0	2.72	-0.71	3.54	23.02
Total of FW		43.1	34.5	6.93	-0.57	2.44	78.80

Diesel Oil, RHO=0.860

T7	WASTE OIL TK.	6.2	3.5	7.26	0.00	0.51	7.69
T2P	FO TK 2P	13.2	2.5	20.54	0.80	0.86	1.89
T2S	FO TK 2S	13.2	5.0	20.56	-1.00	1.14	3.25
T3P	FO TK 3P	17.7	3.5	17.69	1.00	0.79	3.64
T3S	FO TK 3S	17.7	3.5	17.69	-1.00	0.79	3.64
Total of DO		67.9	18.1	16.86	-0.16	0.84	20.10

Lubricating Oil, RHO=0.900

T6P	LO STORAGE T.	3.8	3.8	10.58	1.00	0.66	4.06
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Grey Water, RHO=1.000

T4	SEWAGE TK 4	5.1	5.1	15.31	0.00	0.72	27.60
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CREW+STORES

(CRE.	0.0	1.0	21.45	0.00	6.50	0.00
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Deadweight	62.5	10.94	-0.30	1.80	130.6
Lightweight	391.3	12.90	0.05	3.98	
Displacement (rho=1.005)	453.8	12.63	0.00	3.68	130.6

F L O A T I N G P O S I T I O N

Draught moulded	3.750 m	KM	4.29 m
Trim	-1.718 m	KG	3.68 m
Heel, PS=+	0.0 deg		
TA	4.610 m	GM0	0.62 m
TF	2.891 m	GMCORR	-0.29 m
Trimming moment	-556 tonm	GM	0.33 m

LOADING CONDITION LC3, 10% STORES, ARRIVAL COND.

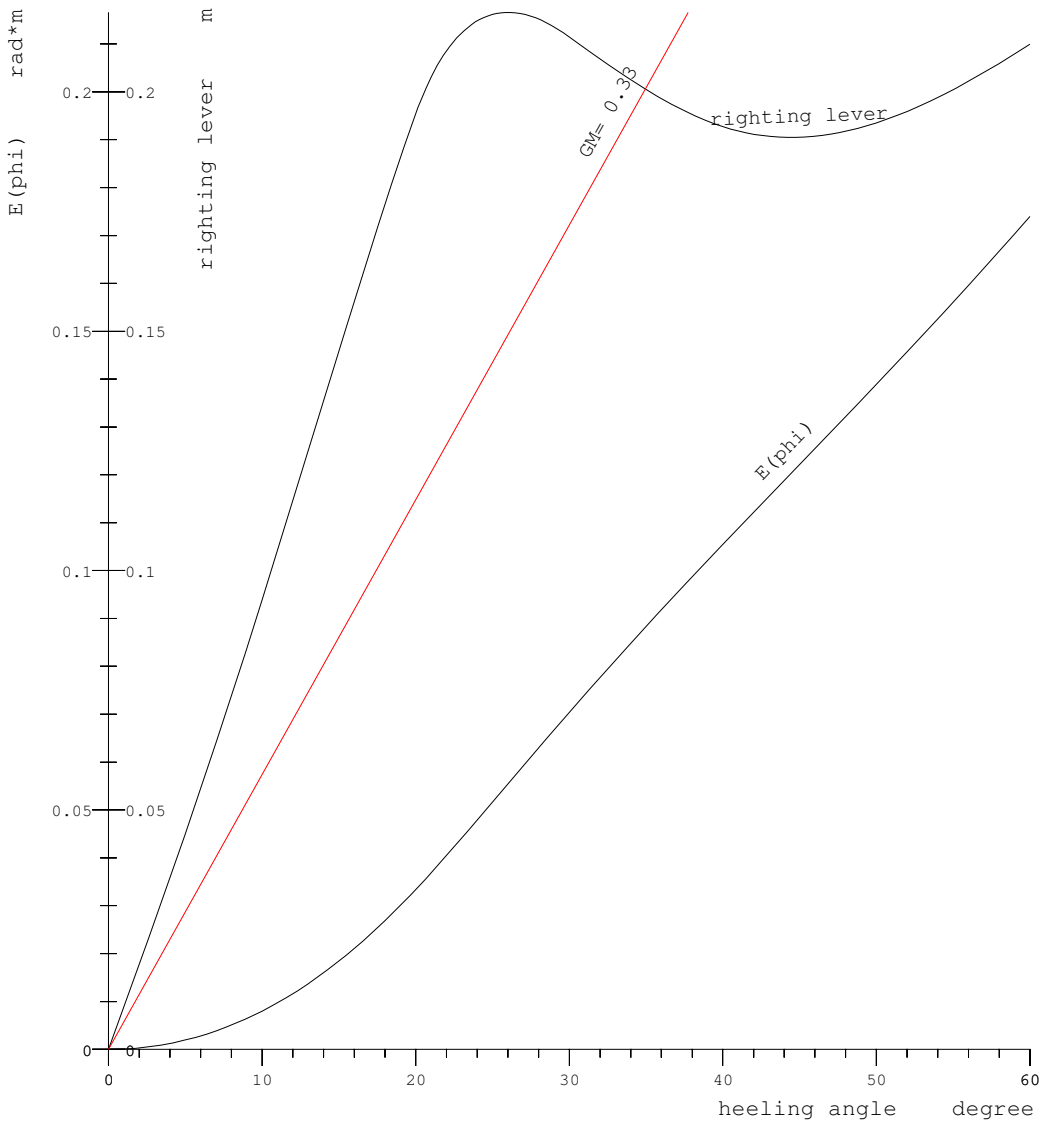
HEEL degree	MS m	HPhi m	EPHI rad*m	FSMOM tm	DGZ m
0.0	0.000	0.00	0.000	0.0	0.000
10.0	0.004	0.09	0.008	8.0	0.018
20.0	0.010	0.20	0.033	11.6	0.025
30.0	-0.064	0.21	0.070	14.9	0.033
40.0	-0.163	0.19	0.105	18.5	0.041
50.0	-0.232	0.19	0.139	21.2	0.047
60.0	-0.275	0.21	0.174	22.2	0.049

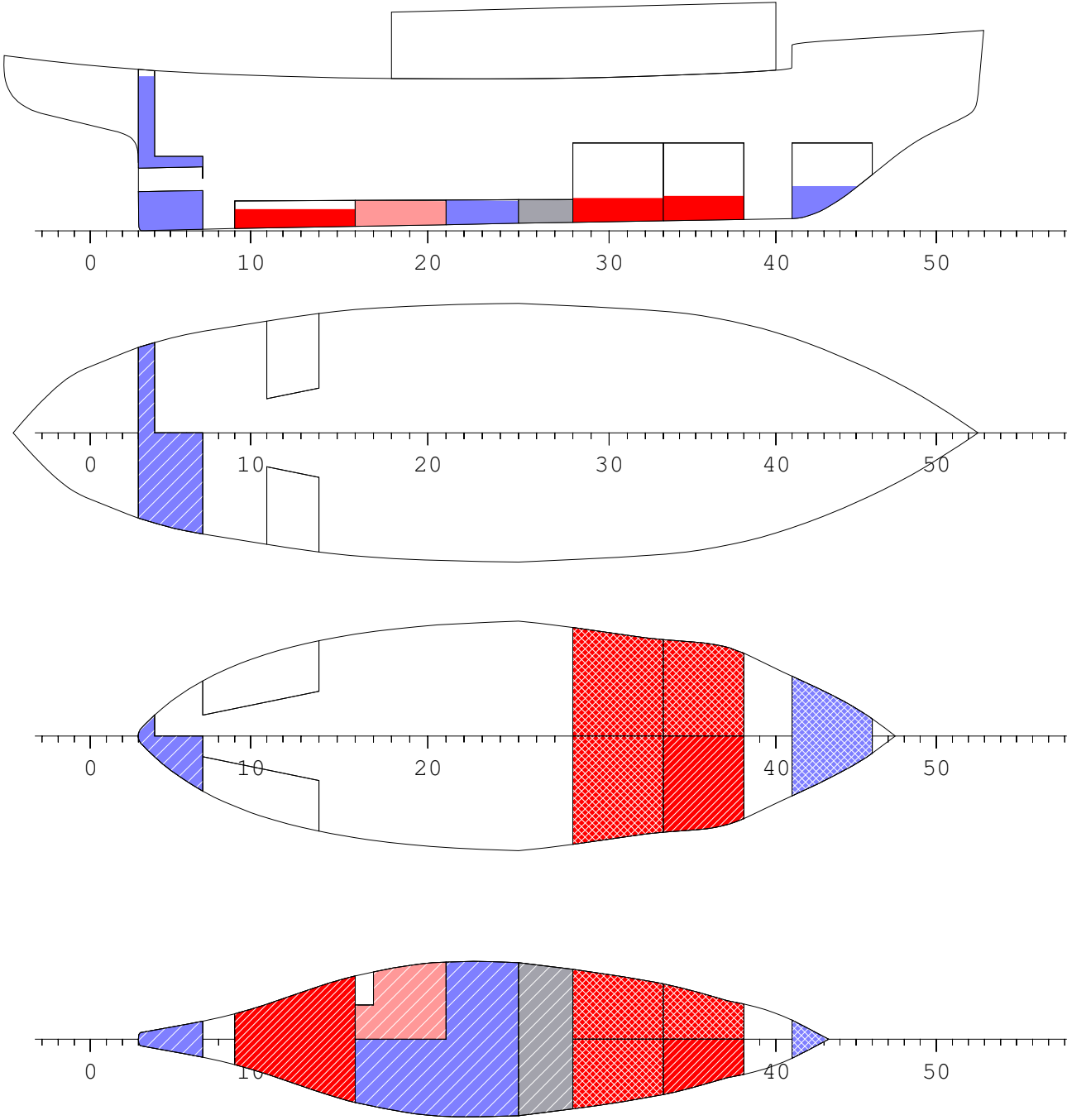
Loading condition: 10% STORES, ARRIVAL COND.

RCR	TEXT	REQ	ATTN	UNIT	STAT
AREA30	Area under GZ curve .	0.055	0.070	mrاد	OK
AREA40	Area under GZ curve .	0.090	0.105	mrاد	OK
AREA3040	Area under GZ curve .	0.030	0.035	mrاد	OK
GZ0.2	Max GZ > 0.2	0.200	0.211	m	OK
MAXGZ25	Max. GZ at an angle .	25.000	26.025	deg	OK
GM0.15	GM > 0.15 m	0.150	0.329	m	OK

STABILITY CURVES

PROJECT	P349/A
DATE	2015-09-24
CONDITION	LC3
DISP.	454 TON
DRAUGHT	3.75 M
TRIM	-1.72





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LOADING CONDITIONS

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LOADING CONDITION LC4, 10% STORES WITH ICE LOAD

L O A D I N G C O M P O N E N T S

Name	Max. weight	Mass	Center of gravity			Free s. moment
			cgx	cgy	cgz	

Fresh Water, RHO=1.000

T1	FW TK 1	9.7	2.5	24.31	0.00	1.37	1.85
T5	COOLING W. T.	12.0	12.0	12.14	-0.40	0.69	54.70
T10	COOLING W. T.	21.4	21.0	2.72	-0.71	3.54	23.02
Total of FW		43.1	35.5	7.42	-0.55	2.42	79.58

Diesel Oil, RHO=0.860

T7	WASTE OIL TK.	6.2	3.5	7.26	0.00	0.51	7.69
T2P	FO TK 2P	13.2	4.4	20.56	0.96	1.08	2.95
T2S	FO TK 2S	13.2	6.4	20.57	-1.07	1.27	3.90
T3P	FO TK 3P	17.7	3.7	17.69	1.01	0.80	3.75
T3S	FO TK 3S	17.7	3.7	17.69	-1.01	0.80	3.75
Total of DO		67.9	21.7	17.44	-0.12	0.95	22.05

Lubricating Oil, RHO=0.900

T6P	LO STORAGE T.	3.8	3.8	10.58	1.00	0.66	4.06
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Grey Water, RHO=1.000

T4	SEWAGE TK 4	5.1	5.1	15.31	0.00	0.72	27.60
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CREW+STORES

(CRE.	0.0	1.0	21.45	0.00	6.50	0.00
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ICE

(ICE)	0.0	5.2	15.10	0.00	6.42	0.00
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Deadweight	72.3	11.90	-0.26	2.11	133.3
Lightweight	391.3	12.90	0.05	3.98	
Displacement (rho=1.005)	463.6	12.74	0.00	3.69	133.3

F L O A T I N G P O S I T I O N

Draught moulded	3.817	m	KM	4.31	m
Trim	-1.550	m	KG	3.69	m
Heel, PS=+	0.2	deg			
TA	4.592	m	GM0	0.62	m
TF	3.042	m	GMCORR	-0.29	m
Trimming moment	-511	tonm	GM	0.33	m

LOADING CONDITION LC4, 10% STORES WITH ICE LOAD

SHIP CONSULTING
NAPA/D/LD/121219
P349/A
FRAM

LOADING CONDITIONS

DATE 2015-09-24
TIME 12:17
USER TJJ
Page 21

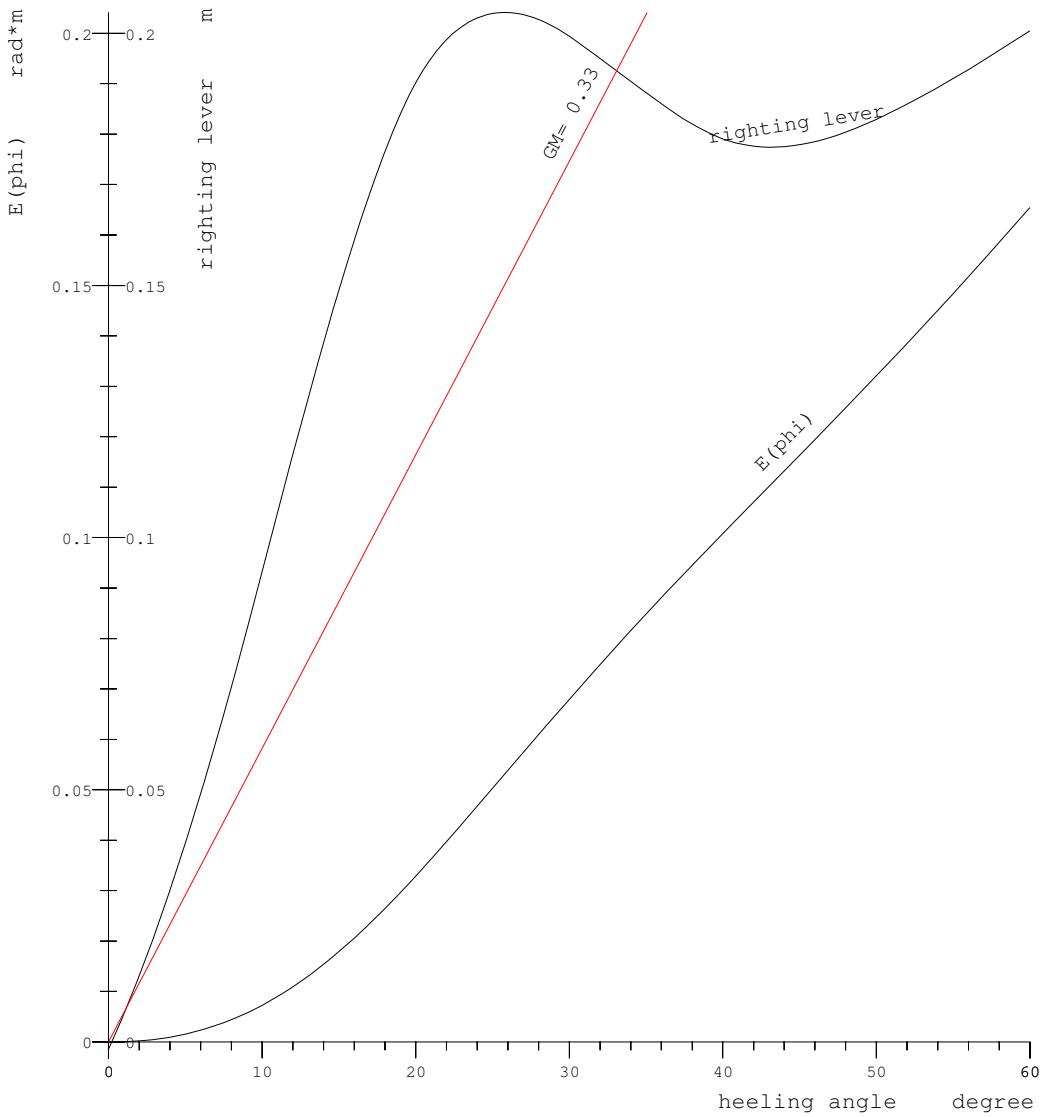
HEEL degree	MS m	HPhi m	EPHI rad*m	FSMOM tm	DGZ m
0.0	-0.001	0.00	0.000	0.0	0.000
10.0	0.004	0.09	0.007	8.5	0.018
20.0	0.005	0.19	0.033	12.6	0.027
30.0	-0.075	0.20	0.068	16.5	0.036
40.0	-0.175	0.18	0.101	21.0	0.045
50.0	-0.241	0.18	0.132	24.1	0.052
60.0	-0.284	0.20	0.165	24.9	0.054

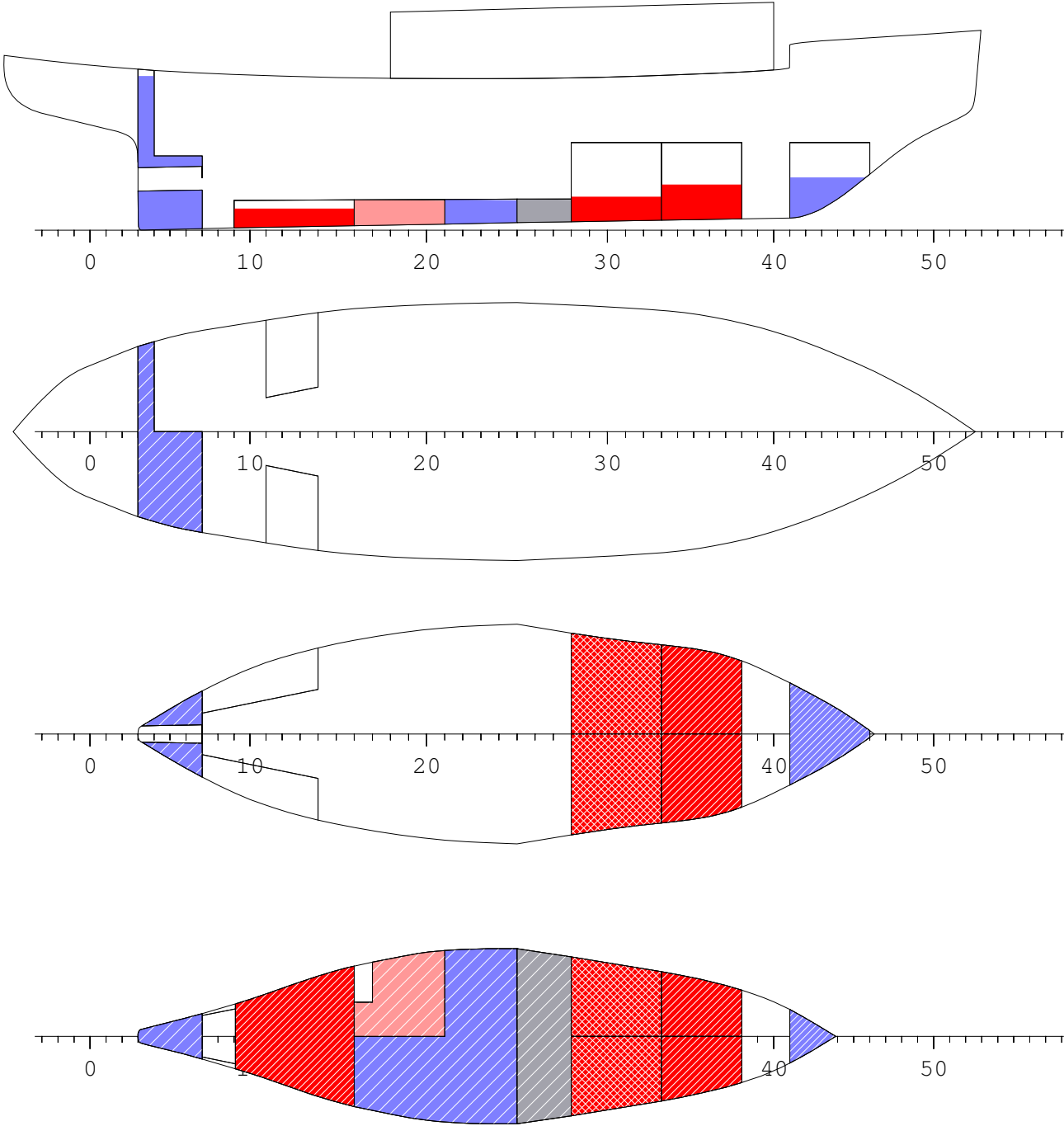
Loading condition: 10% STORES WITH ICE LOAD

RCR	TEXT	REQ	ATTN	UNIT	STAT
AREA30	Area under GZ curve .	0.055	0.068	mrاد	OK
AREA40	Area under GZ curve .	0.090	0.101	mrاد	OK
AREA3040	Area under GZ curve .	0.030	0.033	mrاد	OK
GZ0.2	Max GZ > 0.2	0.200	0.201	m	OK
MAXGZ25	Max. GZ at an angle .	25.000	25.815	deg	OK
GM0.15	GM > 0.15 m	0.150	0.334	m	OK

STABILITY CURVES

PROJECT	P349/A
DATE	2015-09-24
CONDITION	LC4
DISP.	464 TON
DRAUGHT	3.82 M
TRIM	-1.55





TK	m	3.300	3.350	3.400	3.450	3.500	3.550	3.600	3.650
VOLM	m3	342	350	358	367	375	384	393	401
DISP	t	346	354	363	371	380	388	397	406
LCB	m	13.867	13.872	13.877	13.880	13.884	13.886	13.886	13.884
VCB	m	2.043	2.072	2.102	2.132	2.162	2.192	2.223	2.254
KMT	m	3.962	3.978	3.994	4.012	4.031	4.052	4.075	4.098
KML	m	22.238	22.256	22.315	22.425	22.804	23.344	23.814	24.113
TCP	t/cm	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8
MCT	tm/cm	2.3	2.3	2.4	2.4	2.5	2.6	2.8	2.9
CB		0.3944	0.3978	0.4012	0.4047	0.4081	0.4115	0.4150	0.4186
CP		0.5818	0.5835	0.5852	0.5870	0.5888	0.5907	0.5927	0.5949
CW		0.6197	0.6258	0.6322	0.6390	0.6476	0.6583	0.6687	0.6780
CM		0.6778	0.6817	0.6856	0.6893	0.6930	0.6966	0.7002	0.7037
WSA	m2	238	242	245	249	253	257	262	266
LCA	m	14.10	14.10	14.09	14.07	14.01	13.91	13.83	13.78
transv. metac. height m									
-2.000		4.137	4.155	4.174	4.194	4.213	4.233	4.254	4.275
-1.800		4.114	4.132	4.152	4.171	4.191	4.211	4.231	4.253
-1.600		4.092	4.110	4.129	4.149	4.169	4.189	4.210	4.231
-1.400		4.070	4.089	4.109	4.128	4.148	4.169	4.190	4.211
-1.200		4.050	4.069	4.089	4.108	4.129	4.150	4.171	4.192
-1.000		4.030	4.049	4.069	4.090	4.110	4.131	4.153	4.174
-0.800		4.010	4.030	4.051	4.071	4.092	4.114	4.136	4.158
-0.600		3.991	4.012	4.033	4.054	4.075	4.097	4.119	4.142
-0.400		3.976	3.995	4.015	4.037	4.059	4.081	4.104	4.127
-0.200		3.968	3.984	4.002	4.022	4.043	4.066	4.089	4.112
0.000		3.962	3.978	3.994	4.012	4.031	4.052	4.075	4.098
0.200		3.958	3.974	3.990	4.007	4.025	4.043	4.064	4.086
0.400		3.955	3.971	3.987	4.004	4.021	4.039	4.058	4.078
0.600		3.954	3.970	3.985	4.002	4.019	4.037	4.056	4.075
0.800		3.955	3.970	3.985	4.002	4.019	4.036	4.055	4.073
1.000		3.956	3.971	3.987	4.003	4.020	4.037	4.055	4.074
TOTAL DISPLACEMENT t									
-2.000		373	382	391	401	410	419	429	438
-1.800		370	379	388	397	406	415	425	434
-1.600		366	375	384	393	402	412	421	430
-1.400		363	371	380	389	399	408	417	427
-1.200		359	368	377	386	395	404	414	423
-1.000		356	365	374	383	392	401	410	420
-0.800		354	362	371	380	389	398	407	417
-0.600		351	360	369	377	386	395	404	414
-0.400		349	358	366	375	384	393	402	411
-0.200		348	356	364	373	382	390	399	408
0.000		346	354	363	371	380	388	397	406
0.200		345	353	361	370	378	387	395	404
0.400		343	352	360	368	377	385	394	403
0.600		342	350	359	367	376	384	393	402
0.800		341	349	358	366	374	383	392	400

TK	m	3.300	3.350	3.400	3.450	3.500	3.550	3.600	3.650
1.000		340	348	357	365	374	382	391	399
long. centre of buoy. m									
-2.000		12.389	12.384	12.378	12.373	12.368	12.364	12.360	12.356
-1.800		12.547	12.541	12.535	12.529	12.524	12.519	12.514	12.509
-1.600		12.705	12.699	12.693	12.687	12.680	12.674	12.668	12.663
-1.400		12.864	12.857	12.851	12.844	12.837	12.831	12.824	12.817
-1.200		13.021	13.015	13.008	13.001	12.994	12.987	12.980	12.973
-1.000		13.175	13.170	13.164	13.158	13.150	13.143	13.135	13.128
-0.800		13.325	13.322	13.317	13.311	13.305	13.298	13.291	13.283
-0.600		13.470	13.469	13.466	13.462	13.457	13.451	13.445	13.438
-0.400		13.605	13.609	13.610	13.609	13.605	13.601	13.596	13.589
-0.200		13.736	13.741	13.745	13.748	13.748	13.747	13.743	13.738
0.000		13.867	13.872	13.877	13.880	13.884	13.886	13.886	13.884
0.200		13.997	14.002	14.006	14.011	14.015	14.018	14.022	14.023
0.400		14.126	14.131	14.136	14.141	14.145	14.149	14.153	14.156
0.600		14.257	14.262	14.266	14.271	14.275	14.279	14.283	14.287
0.800		14.390	14.393	14.397	14.401	14.405	14.409	14.413	14.417
1.000		14.524	14.527	14.529	14.532	14.536	14.539	14.543	14.546

TK	m	3.700	3.750	3.800	3.850	3.900	3.950	4.000	4.050
VOLM	m3	410	420	429	438	448	457	467	477
DISP	t	415	424	434	443	453	462	472	482
LCB	m	13.880	13.876	13.870	13.864	13.857	13.850	13.843	13.835
VCB	m	2.285	2.316	2.347	2.378	2.409	2.441	2.472	2.504
KMT	m	4.122	4.146	4.170	4.195	4.220	4.245	4.271	4.296
KML	m	24.378	24.813	25.054	25.229	25.436	25.561	25.631	25.652
TCP	t/cm	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.0
MCT	tm/cm	3.0	3.1	3.2	3.3	3.4	3.4	3.5	3.6
CB		0.4222	0.4258	0.4294	0.4331	0.4367	0.4404	0.4441	0.4477
CP		0.5971	0.5993	0.6017	0.6040	0.6064	0.6088	0.6113	0.6137
CW		0.6866	0.6965	0.7052	0.7135	0.7218	0.7298	0.7372	0.7442
CM		0.7071	0.7104	0.7137	0.7170	0.7202	0.7233	0.7265	0.7296
WSA	m2	270	274	279	283	287	291	294	298
LCA	m	13.73	13.66	13.61	13.57	13.53	13.50	13.47	13.45
transv. metac. height m									
-2.000		4.296	4.318	4.340	4.363	4.386	4.409	4.433	4.457
-1.800		4.274	4.296	4.319	4.342	4.365	4.389	4.413	4.437
-1.600		4.253	4.275	4.298	4.321	4.345	4.369	4.393	4.418
-1.400		4.233	4.256	4.279	4.302	4.326	4.350	4.375	4.400
-1.200		4.214	4.237	4.260	4.284	4.308	4.332	4.357	4.382
-1.000		4.197	4.219	4.242	4.266	4.290	4.315	4.340	4.366
-0.800		4.180	4.203	4.226	4.250	4.274	4.299	4.324	4.350
-0.600		4.165	4.187	4.211	4.235	4.259	4.284	4.309	4.335
-0.400		4.150	4.173	4.197	4.221	4.245	4.270	4.295	4.321
-0.200		4.135	4.159	4.183	4.208	4.232	4.257	4.283	4.308
0.000		4.122	4.146	4.170	4.195	4.220	4.245	4.271	4.296
0.200		4.110	4.134	4.158	4.183	4.209	4.234	4.260	4.285
0.400		4.099	4.123	4.147	4.172	4.198	4.223	4.249	4.275
0.600		4.095	4.116	4.138	4.162	4.188	4.213	4.239	4.265
0.800		4.093	4.113	4.134	4.156	4.180	4.205	4.230	4.256
1.000		4.093	4.113	4.133	4.154	4.176	4.199	4.223	4.249
TOTAL DISPLACEMENT t									
-2.000		448	457	467	477	487	497	507	517
-1.800		444	453	463	473	483	493	503	513
-1.600		440	449	459	469	479	489	499	509
-1.400		436	446	455	465	475	485	495	505
-1.200		433	442	452	461	471	481	491	501
-1.000		429	439	448	458	468	477	487	497
-0.800		426	435	445	455	464	474	484	494
-0.600		423	432	442	451	461	471	481	491
-0.400		420	429	439	448	458	468	478	488
-0.200		418	427	436	446	455	465	475	485
0.000		415	424	434	443	453	462	472	482
0.200		413	422	432	441	450	460	470	479
0.400		412	421	430	439	448	458	468	477
0.600		410	419	428	437	447	456	466	475
0.800		409	418	427	436	445	454	464	473

TK	m	3.700	3.750	3.800	3.850	3.900	3.950	4.000	4.050
1.000		408	417	426	435	444	453	462	472
long. centre of buoy. m									
-2.000		12.353	12.349	12.346	12.343	12.340	12.337	12.335	12.333
-1.800		12.504	12.500	12.496	12.492	12.488	12.485	12.482	12.479
-1.600		12.657	12.652	12.647	12.642	12.638	12.633	12.630	12.626
-1.400		12.811	12.805	12.799	12.794	12.788	12.783	12.779	12.774
-1.200		12.966	12.959	12.952	12.946	12.940	12.934	12.929	12.923
-1.000		13.121	13.114	13.106	13.099	13.092	13.086	13.080	13.074
-0.800		13.276	13.268	13.260	13.253	13.246	13.239	13.232	13.225
-0.600		13.430	13.422	13.415	13.407	13.399	13.392	13.385	13.378
-0.400		13.583	13.576	13.568	13.561	13.553	13.545	13.538	13.530
-0.200		13.733	13.727	13.720	13.713	13.706	13.698	13.691	13.683
0.000		13.880	13.876	13.870	13.864	13.857	13.850	13.843	13.835
0.200		14.023	14.021	14.017	14.012	14.006	14.000	13.993	13.985
0.400		14.159	14.160	14.159	14.156	14.152	14.146	14.140	14.133
0.600		14.290	14.293	14.294	14.294	14.293	14.289	14.284	14.278
0.800		14.420	14.423	14.425	14.426	14.427	14.426	14.423	14.419
1.000		14.549	14.552	14.554	14.556	14.557	14.557	14.556	14.554

TK	m	4.100	4.150	4.200
VOLM	m3	486	496	506
DISP	t	492	502	512
LCB	m	13.827	13.819	13.810
VCB	m	2.535	2.567	2.598
KMT	m	4.322	4.347	4.373
KML	m	25.641	25.605	25.551
TCP	t/cm	2.0	2.0	2.0
MCT	tm/cm	3.7	3.7	3.8
CB		0.4514	0.4551	0.4587
CP		0.6161	0.6186	0.6210
CW		0.7510	0.7575	0.7638
CM		0.7326	0.7357	0.7387
WSA	m2	302	306	309
LCA	m	13.43	13.41	13.39

transv. metac. height	m			
-2.000		4.480	4.504	4.526
-1.800		4.461	4.486	4.509
-1.600		4.443	4.468	4.492
-1.400		4.425	4.450	4.475
-1.200		4.407	4.433	4.458
-1.000		4.391	4.416	4.442
-0.800		4.375	4.401	4.426
-0.600		4.360	4.386	4.412
-0.400		4.347	4.372	4.398
-0.200		4.334	4.359	4.385
0.000		4.322	4.347	4.373
0.200		4.311	4.337	4.363
0.400		4.301	4.327	4.353
0.600		4.291	4.318	4.343
0.800		4.283	4.309	4.335
1.000		4.275	4.301	4.327

TOTAL DISPLACEMENT	t			
-2.000		527	537	548
-1.800		523	533	544
-1.600		519	529	539
-1.400		515	525	535
-1.200		511	521	532
-1.000		508	518	528
-0.800		504	514	524
-0.600		501	511	521
-0.400		498	508	518
-0.200		495	505	515
0.000		492	502	512
0.200		489	499	509
0.400		487	497	507
0.600		485	495	505
0.800		483	493	503

TK	m	4.100	4.150	4.200
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1.000	481	491	501
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long. centre of buoy. m

-2.000	12.331	12.330	12.329
-1.800	12.476	12.474	12.472
-1.600	12.622	12.619	12.616
-1.400	12.770	12.766	12.762
-1.200	12.918	12.914	12.910
-1.000	13.068	13.063	13.058
-0.800	13.219	13.213	13.207
-0.600	13.371	13.364	13.358
-0.400	13.523	13.516	13.509
-0.200	13.675	13.667	13.660
0.000	13.827	13.819	13.810
0.200	13.977	13.969	13.960
0.400	14.125	14.117	14.109
0.600	14.271	14.263	14.254
0.800	14.413	14.405	14.398
1.000	14.550	14.544	14.537

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -2.00 M UNIT: m

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.004	0.038	0.047	-0.017	-0.096	-0.139
3.400	0.000	0.004	0.035	0.022	-0.053	-0.132	-0.174
3.500	0.000	0.005	0.030	-0.005	-0.091	-0.169	-0.212
3.600	0.000	0.005	0.021	-0.035	-0.130	-0.206	-0.251
3.700	0.000	0.005	0.007	-0.068	-0.170	-0.244	-0.293
3.800	0.000	0.004	-0.010	-0.103	-0.211	-0.285	-0.337
3.900	0.000	0.004	-0.032	-0.140	-0.253	-0.327	-0.383
4.000	0.000	0.002	-0.057	-0.179	-0.295	-0.371	-0.432
4.100	0.000	-0.003	-0.086	-0.219	-0.337	-0.416	-0.482
4.200	0.000	-0.012	-0.118	-0.259	-0.378	-0.461	-0.532

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -1.80 M UNIT: m

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.004	0.039	0.058	0.001	-0.074	-0.113
3.400	0.000	0.005	0.038	0.034	-0.035	-0.110	-0.149
3.500	0.000	0.005	0.034	0.008	-0.073	-0.146	-0.185
3.600	0.000	0.005	0.027	-0.021	-0.111	-0.183	-0.224
3.700	0.000	0.005	0.015	-0.053	-0.150	-0.221	-0.265
3.800	0.000	0.005	-0.001	-0.087	-0.191	-0.261	-0.309
3.900	0.000	0.004	-0.021	-0.123	-0.232	-0.303	-0.355
4.000	0.000	0.003	-0.044	-0.161	-0.273	-0.346	-0.403
4.100	0.000	0.000	-0.072	-0.200	-0.315	-0.391	-0.454
4.200	0.000	-0.006	-0.102	-0.239	-0.356	-0.436	-0.505

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -1.60 M UNIT: m

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.004	0.040	0.067	0.017	-0.054	-0.089
3.400	0.000	0.005	0.040	0.045	-0.019	-0.089	-0.124
3.500	0.000	0.005	0.037	0.020	-0.055	-0.125	-0.160
3.600	0.000	0.005	0.031	-0.008	-0.093	-0.162	-0.198
3.700	0.000	0.005	0.021	-0.038	-0.132	-0.200	-0.239
3.800	0.000	0.005	0.007	-0.072	-0.171	-0.239	-0.282
3.900	0.000	0.005	-0.011	-0.107	-0.212	-0.280	-0.328
4.000	0.000	0.004	-0.033	-0.144	-0.253	-0.323	-0.377
4.100	0.000	0.002	-0.059	-0.182	-0.294	-0.367	-0.427
4.200	0.000	-0.002	-0.087	-0.220	-0.335	-0.412	-0.478

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -1.40 M UNIT: m

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.040	0.076	0.031	-0.035	-0.065
3.400	0.000	0.005	0.041	0.055	-0.004	-0.070	-0.100
3.500	0.000	0.005	0.039	0.031	-0.040	-0.106	-0.136
3.600	0.000	0.006	0.035	0.004	-0.077	-0.142	-0.174
3.700	0.000	0.006	0.027	-0.026	-0.114	-0.179	-0.214
3.800	0.000	0.006	0.014	-0.058	-0.153	-0.217	-0.257
3.900	0.000	0.005	-0.003	-0.092	-0.193	-0.258	-0.303
4.000	0.000	0.004	-0.023	-0.128	-0.234	-0.300	-0.351
4.100	0.000	0.003	-0.048	-0.166	-0.275	-0.344	-0.401
4.200	0.000	0.001	-0.075	-0.203	-0.315	-0.388	-0.453

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -1.20 M UNIT: m

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.041	0.084	0.045	-0.016	-0.042
3.400	0.000	0.005	0.041	0.064	0.011	-0.051	-0.077
3.500	0.000	0.005	0.041	0.040	-0.025	-0.087	-0.113
3.600	0.000	0.006	0.037	0.014	-0.061	-0.123	-0.151
3.700	0.000	0.006	0.031	-0.015	-0.098	-0.159	-0.191
3.800	0.000	0.006	0.020	-0.046	-0.137	-0.197	-0.233
3.900	0.000	0.005	0.005	-0.079	-0.176	-0.237	-0.279
4.000	0.000	0.005	-0.015	-0.114	-0.216	-0.278	-0.327
4.100	0.000	0.004	-0.038	-0.151	-0.256	-0.322	-0.377
4.200	0.000	0.002	-0.063	-0.187	-0.295	-0.365	-0.428

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -1.00 M UNIT: m

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.042	0.092	0.058	0.002	-0.020
3.400	0.000	0.005	0.042	0.072	0.024	-0.033	-0.055
3.500	0.000	0.005	0.041	0.049	-0.011	-0.069	-0.091
3.600	0.000	0.006	0.039	0.023	-0.047	-0.104	-0.129
3.700	0.000	0.006	0.034	-0.005	-0.084	-0.141	-0.169
3.800	0.000	0.006	0.024	-0.035	-0.121	-0.178	-0.211
3.900	0.000	0.006	0.010	-0.068	-0.159	-0.217	-0.256
4.000	0.000	0.005	-0.008	-0.102	-0.199	-0.258	-0.304
4.100	0.000	0.004	-0.029	-0.137	-0.238	-0.301	-0.353
4.200	0.000	0.003	-0.054	-0.173	-0.277	-0.344	-0.404

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -0.80 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.043	0.099	0.071	0.020	0.002
3.400	0.000	0.005	0.042	0.079	0.036	-0.016	-0.033
3.500	0.000	0.005	0.042	0.057	0.001	-0.051	-0.070
3.600	0.000	0.006	0.041	0.031	-0.034	-0.087	-0.108
3.700	0.000	0.006	0.036	0.004	-0.070	-0.124	-0.148
3.800	0.000	0.006	0.028	-0.026	-0.107	-0.161	-0.190
3.900	0.000	0.006	0.015	-0.057	-0.144	-0.199	-0.234
4.000	0.000	0.005	-0.002	-0.091	-0.183	-0.240	-0.282
4.100	0.000	0.004	-0.022	-0.125	-0.221	-0.281	-0.331
4.200	0.000	0.003	-0.045	-0.159	-0.260	-0.324	-0.382

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -0.60 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.044	0.106	0.083	0.037	0.023
3.400	0.000	0.005	0.043	0.086	0.049	0.001	-0.013
3.500	0.000	0.006	0.043	0.064	0.013	-0.034	-0.050
3.600	0.000	0.006	0.041	0.039	-0.022	-0.071	-0.088
3.700	0.000	0.006	0.038	0.012	-0.058	-0.107	-0.128
3.800	0.000	0.006	0.031	-0.017	-0.093	-0.144	-0.170
3.900	0.000	0.006	0.019	-0.048	-0.130	-0.182	-0.214
4.000	0.000	0.005	0.004	-0.081	-0.168	-0.222	-0.261
4.100	0.000	0.005	-0.016	-0.114	-0.206	-0.263	-0.310
4.200	0.000	0.004	-0.038	-0.147	-0.244	-0.305	-0.360

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -0.40 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.006	0.045	0.111	0.093	0.051	0.040
3.400	0.000	0.006	0.045	0.093	0.060	0.018	0.007
3.500	0.000	0.006	0.044	0.071	0.025	-0.018	-0.030
3.600	0.000	0.006	0.042	0.046	-0.010	-0.055	-0.069
3.700	0.000	0.006	0.039	0.019	-0.046	-0.092	-0.109
3.800	0.000	0.006	0.033	-0.010	-0.081	-0.129	-0.151
3.900	0.000	0.006	0.023	-0.040	-0.117	-0.166	-0.195
4.000	0.000	0.005	0.008	-0.072	-0.154	-0.205	-0.242
4.100	0.000	0.005	-0.011	-0.104	-0.191	-0.246	-0.290
4.200	0.000	0.004	-0.032	-0.136	-0.229	-0.287	-0.340

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: -0.20 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.045	0.113	0.098	0.060	0.052
3.400	0.000	0.006	0.046	0.098	0.070	0.031	0.024
3.500	0.000	0.006	0.045	0.077	0.036	-0.003	-0.012
3.600	0.000	0.006	0.043	0.052	0.001	-0.040	-0.050
3.700	0.000	0.006	0.040	0.025	-0.034	-0.077	-0.091
3.800	0.000	0.006	0.034	-0.003	-0.069	-0.114	-0.133
3.900	0.000	0.006	0.025	-0.033	-0.105	-0.152	-0.177
4.000	0.000	0.005	0.011	-0.064	-0.142	-0.190	-0.224
4.100	0.000	0.005	-0.006	-0.095	-0.178	-0.230	-0.272
4.200	0.000	0.004	-0.027	-0.126	-0.215	-0.270	-0.321

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: 0.00 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.044	0.113	0.102	0.067	0.061
3.400	0.000	0.006	0.045	0.100	0.075	0.040	0.035
3.500	0.000	0.006	0.046	0.082	0.045	0.009	0.004
3.600	0.000	0.006	0.044	0.058	0.012	-0.026	-0.033
3.700	0.000	0.006	0.041	0.031	-0.023	-0.063	-0.074
3.800	0.000	0.006	0.036	0.003	-0.058	-0.100	-0.116
3.900	0.000	0.006	0.027	-0.027	-0.094	-0.138	-0.160
4.000	0.000	0.005	0.014	-0.057	-0.130	-0.176	-0.207
4.100	0.000	0.005	-0.003	-0.087	-0.166	-0.215	-0.255
4.200	0.000	0.004	-0.023	-0.117	-0.202	-0.255	-0.304

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: 0.20 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.043	0.113	0.105	0.073	0.068
3.400	0.000	0.005	0.044	0.100	0.078	0.046	0.043
3.500	0.000	0.006	0.045	0.083	0.050	0.017	0.015
3.600	0.000	0.006	0.045	0.062	0.020	-0.014	-0.018
3.700	0.000	0.006	0.042	0.036	-0.013	-0.050	-0.057
3.800	0.000	0.006	0.037	0.009	-0.048	-0.087	-0.099
3.900	0.000	0.006	0.028	-0.021	-0.084	-0.125	-0.144
4.000	0.000	0.005	0.016	-0.050	-0.119	-0.163	-0.191
4.100	0.000	0.005	0.000	-0.080	-0.155	-0.201	-0.238
4.200	0.000	0.004	-0.020	-0.109	-0.190	-0.240	-0.287

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE

INITIAL TRIM: 0.40 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.042	0.113	0.106	0.077	0.075
3.400	0.000	0.005	0.043	0.100	0.080	0.051	0.050
3.500	0.000	0.006	0.044	0.084	0.054	0.023	0.022
3.600	0.000	0.006	0.045	0.064	0.026	-0.006	-0.008
3.700	0.000	0.006	0.043	0.041	-0.005	-0.038	-0.043
3.800	0.000	0.006	0.038	0.013	-0.038	-0.074	-0.084
3.900	0.000	0.006	0.029	-0.015	-0.074	-0.112	-0.129
4.000	0.000	0.005	0.017	-0.044	-0.109	-0.150	-0.175
4.100	0.000	0.005	0.002	-0.073	-0.145	-0.188	-0.223
4.200	0.000	0.004	-0.017	-0.102	-0.180	-0.227	-0.272

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE

INITIAL TRIM: 0.60 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.042	0.112	0.107	0.081	0.080
3.400	0.000	0.005	0.043	0.099	0.082	0.055	0.055
3.500	0.000	0.006	0.043	0.083	0.056	0.028	0.029
3.600	0.000	0.006	0.044	0.064	0.029	-0.001	-0.001
3.700	0.000	0.006	0.043	0.042	0.001	-0.031	-0.033
3.800	0.000	0.006	0.039	0.017	-0.030	-0.064	-0.071
3.900	0.000	0.006	0.030	-0.010	-0.064	-0.100	-0.115
4.000	0.000	0.005	0.018	-0.039	-0.100	-0.138	-0.161
4.100	0.000	0.005	0.003	-0.067	-0.135	-0.176	-0.209
4.200	0.000	0.004	-0.016	-0.096	-0.170	-0.215	-0.258

RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE

INITIAL TRIM: 0.80 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.041	0.110	0.108	0.083	0.084
3.400	0.000	0.005	0.042	0.098	0.083	0.058	0.060
3.500	0.000	0.005	0.042	0.082	0.057	0.031	0.034
3.600	0.000	0.006	0.043	0.063	0.031	0.003	0.005
3.700	0.000	0.006	0.042	0.042	0.004	-0.026	-0.027
3.800	0.000	0.006	0.039	0.019	-0.025	-0.057	-0.062
3.900	0.000	0.006	0.031	-0.006	-0.057	-0.090	-0.102
4.000	0.000	0.005	0.019	-0.034	-0.091	-0.127	-0.148
4.100	0.000	0.005	0.004	-0.062	-0.126	-0.165	-0.196
4.200	0.000	0.004	-0.014	-0.090	-0.161	-0.203	-0.245

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STABILITY TABLES

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RESIDUARY STABILITY LEVER MS AS A FUNCTION OF DRAUGHT AND HEELING ANGLE
INITIAL TRIM: 1.00 M UNIT: m

=====

INITIAL	HEELING ANGLE (DEGREES)						
DRAUGHT	0.0	10.0	20.0	30.0	40.0	50.0	60.0
3.300	0.000	0.005	0.040	0.108	0.107	0.085	0.087
3.400	0.000	0.005	0.041	0.096	0.083	0.060	0.064
3.500	0.000	0.005	0.042	0.081	0.058	0.033	0.038
3.600	0.000	0.006	0.042	0.062	0.032	0.006	0.009
3.700	0.000	0.006	0.041	0.041	0.006	-0.023	-0.022
3.800	0.000	0.006	0.038	0.019	-0.022	-0.052	-0.056
3.900	0.000	0.006	0.031	-0.004	-0.052	-0.083	-0.094
4.000	0.000	0.005	0.020	-0.030	-0.084	-0.117	-0.136
4.100	0.000	0.005	0.004	-0.057	-0.118	-0.154	-0.183
4.200	0.000	0.004	-0.013	-0.084	-0.152	-0.192	-0.232

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Compartment tables

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Compartment ident: T1
Compartment descr: FW TK 1
Contents: Fresh Water (FW, RHO = 1)

Extreme points of comp: Aft end at frame 41.00 (23.61 m)
Fore end at frame 46.00 (26.31 m)
Lowest point 0.40 m above BL
Highest point 2.95 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.400	0.0	0.00	0.00	0.00	0.00	0.00
0.600	0.0	23.85	0.00	0.54	0.01	0.01
0.800	0.1	23.97	0.00	0.69	0.07	0.06
1.000	0.3	24.05	0.00	0.83	0.19	0.21
1.200	0.7	24.13	0.00	0.97	0.40	0.46
1.400	1.2	24.20	0.00	1.11	0.72	0.86
1.600	1.8	24.25	0.00	1.24	1.15	1.35
1.800	2.6	24.32	0.00	1.38	1.72	1.98
2.000	3.6	24.38	0.00	1.52	2.41	2.75
2.200	4.7	24.44	0.00	1.66	3.06	3.71
2.400	5.9	24.49	0.00	1.80	3.67	4.90
2.600	7.4	24.54	0.00	1.93	4.24	6.37
2.800	9.0	24.58	0.00	2.07	4.79	8.15
2.950	10.2	24.60	0.00	2.17	5.19	9.69

Compartment ident: T10
Compartment descr: COOLING W. TK 10
Contents: Fresh Water (FW, RHO = 1)

Extreme points of comp: Aft end at frame 3.00 (1.62 m)
Fore end at frame 7.00 (3.78 m)
Lowest point 0.01 m above BL
Highest point 5.42 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.005	0.0	0.00	0.00	0.00	0.00	0.00
0.205	0.1	2.71	0.00	0.13	0.24	0.01
0.405	0.3	2.76	0.00	0.25	0.38	0.02
0.605	0.5	2.80	0.00	0.38	0.49	0.06
0.805	0.8	2.83	0.00	0.50	0.59	0.12
1.005	1.1	2.85	0.00	0.63	0.67	0.21
1.205	1.6	2.88	0.00	0.76	0.75	0.33
1.405	2.0	2.92	0.00	0.84	0.39	0.48
1.605	2.3	2.94	0.00	0.95	0.27	0.64
1.805	2.6	2.98	0.00	1.04	0.33	0.90
2.005	3.0	3.00	0.00	1.16	0.57	1.30
2.205	3.6	3.00	0.00	1.32	1.19	1.84
2.405	4.4	3.00	0.00	1.50	1.32	2.56
2.605	5.1	2.99	-0.03	1.64	0.98	0.77
2.805	5.7	2.98	-0.09	1.74	1.12	1.08
3.005	6.3	2.97	-0.15	1.86	1.31	1.51
3.205	7.0	2.95	-0.22	1.99	1.58	2.19
3.405	7.9	2.93	-0.28	2.13	2.03	3.57
3.605	8.9	2.90	-0.34	2.29	2.56	6.40
3.805	10.1	2.87	-0.39	2.46	2.87	9.25
4.005	11.4	2.83	-0.45	2.63	3.11	12.02
4.205	12.9	2.81	-0.50	2.79	3.32	14.93
4.405	14.4	2.78	-0.55	2.95	3.51	17.84
4.605	16.0	2.76	-0.60	3.11	3.67	20.47
4.805	17.7	2.74	-0.64	3.26	3.79	22.55
5.005	19.4	2.73	-0.68	3.40	3.86	23.86
5.205	21.1	2.71	-0.71	3.54	3.88	24.24
5.405	22.4	2.70	-0.72	3.65	0.03	5.84
5.424	22.5	2.70	-0.72	3.65	0.00	0.58

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Compartment tables

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Compartment ident: T5
Compartment descr: COOLING W. TK 5
Contents: Fresh Water (FW, RHO = 1)

Extreme points of comp: Aft end at frame 16.00 (8.92 m)
Fore end at frame 25.00 (14.41 m)
Lowest point 0.14 m above BL
Highest point 1.04 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.143	0.0	0.00	0.00	0.00	0.00	0.00
0.343	0.8	11.81	-0.22	0.29	21.74	3.72
0.543	3.2	12.02	-0.30	0.41	34.93	16.20
0.743	6.6	12.09	-0.35	0.53	43.70	33.92
0.943	10.6	12.14	-0.39	0.65	49.73	51.10
1.042	12.6	12.17	-0.40	0.70	0.05	8.28

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Compartment tables

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Compartment ident: T2P
 Compartment descr: FO TK 2P
 Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 33.00 (19.29 m)
 Fore end at frame 38.00 (21.99 m)
 Lowest point 0.33 m above BL
 Highest point 2.95 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.330	0.0	0.00	0.00	0.00	0.00	0.00
0.530	0.2	20.42	0.32	0.47	1.31	0.16
0.730	0.8	20.48	0.51	0.59	2.18	0.64
0.930	1.6	20.51	0.66	0.71	2.88	1.36
1.130	2.7	20.53	0.78	0.84	3.36	2.10
1.330	3.8	20.55	0.88	0.96	3.71	2.78
1.530	5.1	20.56	0.96	1.07	4.00	3.48
1.730	6.4	20.56	1.03	1.19	4.26	4.17
1.930	7.9	20.57	1.08	1.31	4.47	4.81
2.130	9.4	20.57	1.14	1.42	4.67	5.45
2.330	10.9	20.58	1.19	1.54	4.86	6.12
2.530	12.5	20.58	1.23	1.65	5.03	6.80
2.730	14.2	20.59	1.27	1.77	5.20	7.48
2.930	15.9	20.59	1.31	1.88	5.36	8.16
2.950	16.1	20.59	1.31	1.89	5.38	8.23

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Compartment tables

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Compartment ident: T2S
 Compartment descr: FO TK 2S
 Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 33.00 (19.29 m)
 Fore end at frame 38.00 (21.99 m)
 Lowest point 0.33 m above BL
 Highest point 2.95 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.330	0.0	0.00	0.00	0.00	0.00	0.00
0.530	0.2	20.42	-0.32	0.47	1.31	0.16
0.730	0.8	20.48	-0.51	0.59	2.18	0.64
0.930	1.6	20.51	-0.66	0.71	2.88	1.36
1.130	2.7	20.53	-0.78	0.84	3.36	2.10
1.330	3.8	20.55	-0.88	0.96	3.71	2.78
1.530	5.1	20.56	-0.96	1.07	4.00	3.48
1.730	6.4	20.56	-1.03	1.19	4.26	4.17
1.930	7.9	20.57	-1.08	1.31	4.47	4.81
2.130	9.4	20.57	-1.14	1.42	4.67	5.45
2.330	10.9	20.58	-1.19	1.54	4.86	6.12
2.530	12.5	20.58	-1.23	1.65	5.03	6.80
2.730	14.2	20.59	-1.27	1.77	5.20	7.48
2.930	15.9	20.59	-1.31	1.88	5.36	8.16
2.950	16.1	20.59	-1.31	1.89	5.38	8.23

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Compartment tables

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Compartment ident: T3P
Compartment descr: FO TK 3P
Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 28.00 (16.24 m)
Fore end at frame 33.00 (19.29 m)
Lowest point 0.28 m above BL
Highest point 2.95 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.280	0.0	0.00	0.00	0.00	0.00	0.00
0.480	0.4	17.57	0.44	0.41	2.74	0.45
0.680	1.3	17.66	0.69	0.54	4.33	1.66
0.880	2.5	17.68	0.86	0.66	5.31	3.00
1.080	4.0	17.69	0.99	0.78	5.97	4.20
1.280	5.5	17.70	1.08	0.89	6.46	5.29
1.480	7.2	17.70	1.16	1.01	6.83	6.23
1.680	9.0	17.71	1.22	1.12	7.14	7.06
1.880	10.8	17.71	1.28	1.23	7.40	7.84
2.080	12.7	17.72	1.32	1.34	7.63	8.58
2.280	14.7	17.72	1.37	1.45	7.86	9.39
2.480	16.7	17.72	1.40	1.57	8.09	10.27
2.680	18.8	17.72	1.44	1.68	8.31	11.16
2.880	20.9	17.72	1.48	1.79	8.52	12.03
2.950	21.7	17.72	1.49	1.83	8.59	12.32

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Compartment tables

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Compartment ident: T3S
Compartment descr: FO TK 3S
Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 28.00 (16.24 m)
Fore end at frame 33.00 (19.29 m)
Lowest point 0.28 m above BL
Highest point 2.95 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.280	0.0	0.00	0.00	0.00	0.00	0.00
0.480	0.4	17.57	-0.44	0.41	2.74	0.45
0.680	1.3	17.66	-0.69	0.54	4.33	1.66
0.880	2.5	17.68	-0.86	0.66	5.31	3.00
1.080	4.0	17.69	-0.99	0.78	5.97	4.20
1.280	5.5	17.70	-1.08	0.89	6.46	5.29
1.480	7.2	17.70	-1.16	1.01	6.83	6.23
1.680	9.0	17.71	-1.22	1.12	7.14	7.06
1.880	10.8	17.71	-1.28	1.23	7.40	7.84
2.080	12.7	17.72	-1.32	1.34	7.63	8.58
2.280	14.7	17.72	-1.37	1.45	7.86	9.39
2.480	16.7	17.72	-1.40	1.57	8.09	10.27
2.680	18.8	17.72	-1.44	1.68	8.31	11.16
2.880	20.9	17.72	-1.48	1.79	8.52	12.03
2.950	21.7	17.72	-1.49	1.83	8.59	12.32

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Compartment tables

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Compartment ident: T7
Compartment descr: WASTE OIL TK 7
Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 9.00 (4.86 m)
Fore end at frame 16.00 (8.92 m)
Lowest point 0.06 m above BL
Highest point 1.02 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.063	0.0	0.00	0.00	0.00	0.00	0.00
0.263	0.3	7.15	0.00	0.21	4.91	0.45
0.463	1.5	7.28	0.00	0.34	9.82	3.51
0.663	3.4	7.27	0.00	0.47	13.43	7.55
0.863	5.7	7.24	0.00	0.59	16.55	12.63
1.018	7.6	7.23	0.00	0.68	0.04	3.86

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Compartment ident: T8P
 Compartment descr: FO TK 8P
 Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 7.00 (3.78 m)
 Fore end at frame 14.00 (7.70 m)
 Lowest point 0.85 m above BL
 Highest point 5.21 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.854	0.0	0.00	0.00	0.00	0.00	0.00
1.054	0.1	5.99	1.32	1.02	1.42	0.12
1.254	0.4	6.11	1.42	1.14	2.46	0.25
1.454	0.9	6.07	1.47	1.26	3.38	0.41
1.654	1.5	6.04	1.51	1.38	4.22	0.61
1.854	2.3	6.01	1.56	1.51	5.01	0.84
2.054	3.2	5.98	1.61	1.63	5.77	1.10
2.254	4.2	5.96	1.65	1.76	6.52	1.38
2.454	5.3	5.94	1.69	1.88	7.25	1.69
2.654	6.5	5.93	1.74	2.01	7.97	2.01
2.854	7.2	5.98	1.78	2.09	0.84	0.99
3.054	7.9	6.05	1.82	2.16	0.89	1.14
3.254	8.6	6.11	1.86	2.24	0.93	1.32
3.454	9.3	6.17	1.90	2.33	0.97	1.49
3.654	10.1	6.22	1.94	2.42	1.01	1.67
3.854	10.9	6.26	1.98	2.51	1.05	1.86
4.054	11.7	6.30	2.01	2.62	1.09	2.05
4.254	12.5	6.33	2.05	2.72	1.12	2.25
4.454	13.4	6.37	2.08	2.82	1.16	2.47
4.654	14.3	6.39	2.11	2.93	1.19	2.70
4.854	15.2	6.42	2.15	3.04	1.23	2.93
5.054	16.1	6.44	2.18	3.15	1.25	3.10
5.212	16.8	6.45	2.20	3.23	0.00	0.12

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Compartment tables

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Compartment ident: T8S
Compartment descr: FO TK 8S
Contents: Diesel Oil (DO, RHO = 0.86)

Extreme points of comp: Aft end at frame 7.00 (3.78 m)
Fore end at frame 14.00 (7.70 m)
Lowest point 0.85 m above BL
Highest point 5.21 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.854	0.0	0.00	0.00	0.00	0.00	0.00
1.054	0.1	5.99	-1.32	1.02	1.42	0.12
1.254	0.4	6.11	-1.42	1.14	2.46	0.25
1.454	0.9	6.07	-1.47	1.26	3.38	0.41
1.654	1.5	6.04	-1.51	1.38	4.22	0.61
1.854	2.3	6.01	-1.56	1.51	5.01	0.84
2.054	3.2	5.98	-1.61	1.63	5.77	1.10
2.254	4.2	5.96	-1.65	1.76	6.52	1.38
2.454	5.3	5.94	-1.69	1.88	7.25	1.69
2.654	6.5	5.93	-1.74	2.01	7.97	2.01
2.854	7.2	5.98	-1.78	2.09	0.84	0.99
3.054	7.9	6.05	-1.82	2.16	0.89	1.14
3.254	8.6	6.11	-1.86	2.24	0.93	1.32
3.454	9.3	6.17	-1.90	2.33	0.97	1.49
3.654	10.1	6.22	-1.94	2.42	1.01	1.67
3.854	10.9	6.26	-1.98	2.51	1.05	1.86
4.054	11.7	6.30	-2.01	2.62	1.09	2.05
4.254	12.5	6.33	-2.05	2.72	1.12	2.25
4.454	13.4	6.37	-2.08	2.82	1.16	2.47
4.654	14.3	6.39	-2.11	2.93	1.19	2.70
4.854	15.2	6.42	-2.15	3.04	1.23	2.93
5.054	16.1	6.44	-2.18	3.15	1.25	3.10
5.212	16.8	6.45	-2.20	3.23	0.00	0.12

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Compartment tables

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Compartment ident: T6P
Compartment descr: LO STORAGE TK 6P
Contents: Lubricating Oil (LO, RHO = 0.9)

Extreme points of comp: Aft end at frame 16.00 (8.92 m)
Fore end at frame 21.00 (11.97 m)
Lowest point 0.14 m above BL
Highest point 1.03 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.143	0.0	0.00	0.00	0.00	0.00	0.00
0.343	0.4	10.44	0.46	0.28	2.89	0.51
0.543	1.3	10.50	0.70	0.40	3.81	1.69
0.743	2.5	10.54	0.86	0.52	4.38	3.05
0.943	3.8	10.57	0.98	0.63	4.75	4.30
1.031	4.4	10.58	1.02	0.68	0.02	0.93

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Compartment tables

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Compartment ident: T4
Compartment descr: SEWAGE TK 4
Contents: Grey Water (GWT, RHO = 1)

Extreme points of comp: Aft end at frame 25.00 (14.41 m)
Fore end at frame 28.00 (16.24 m)
Lowest point 0.25 m above BL
Highest point 1.05 m above BL

T	VNET	CGX	CGY	CGZ	TMX	TMY
m	m3	m	m	m	m4	m4
0.250	0.0	0.00	0.00	0.00	0.00	0.00
0.450	0.6	15.27	0.00	0.38	1.37	3.00
0.650	1.8	15.30	0.00	0.50	2.11	10.76
0.850	3.5	15.30	0.00	0.62	2.62	20.65
1.050	5.4	15.31	0.00	0.74	0.04	6.51

FRAM KOUKKUNYKÄISY

HINAAJAN KOUKKU -- NYKÄISYKAAVAT

AT DEPARTURE

Vakiot		Lasketut vakiot		
L	31	C1	0,54516129	0,55
B	8,8	C4	1,09032258	1,09
D	5,15			
d	4,17			
DISP	525,6			
A	102	GM3	0,53	
r	1,8	GM4	0,37	
h	2,83			
fik	12,83			
I	8,45			
T	225,4			
V	2,5			

Kallistus- kulma	k1	k2	C2	C2	C3	C3	RADIANS
10		0,158	0,151	0,73384153	1,00	0,55589436	0,56 0,17453293
20		0,165	0,139	0,96768307	1,00	0,71178871	0,71 0,34906585
30		0,205	0,125	1,2015246	1,20	0,86768307	0,87 0,52359878
40		0,215	0,109	1,43536613	1,44	1,02357742	0,85 0,6981317
50		0,219	0,092	1,66920767	1,67	1,17947178	0,85 0,87266463
GZ	erotus	summa	pinta-ala				
10	0,13	-0,028	-0,028	-0,00243			
20	0,23	0,065	0,032	0,00283			
30	0,26	0,055	0,153	0,01334			
40	0,28	0,065	0,273	0,02383	>0,01		
50	0,33	0,111	0,449	0,03915			

AT ARRIVAL

Vakiot		Lasketut vakiot		
L	31	C1	0,54516129	0,55
B	8,8	C4	1,09032258	1,09
D	5,15			
d	3,75			
DISP	453,8			
A	91	GM3	0,41	
r	1,8	GM4	0,44	
h	3,25			
fik	18,55			
I	8,45			
T	225,4			
V	2,5			

Kallistus- kulma	k1	k2	C2	C2	C3	C3	RADIANS
10		0,163	0,183	0,66169888	1,00	0,50779925	0,50 0,17453293
20		0,163	0,168	0,82339775	1,00	0,6155985	0,62 0,34906585
30		0,159	0,150	0,98509663	1,00	0,72339775	0,72 0,52359878
40		0,175	0,130	1,14679551	1,15	0,83119701	0,83 0,6981317
50		0,175	0,108	1,30849439	1,31	0,93899626	0,85 0,87266463
GZ	erotus	summa	pinta-ala				
10	0,09	-0,073	-0,073	-0,00639			
20	0,20	0,037	0,037	0,00326			
30	0,21	0,051	0,126	0,01102			
40	0,19	0,015	0,193	0,01683	>0,01		
50	0,19	0,015	0,223	0,01949			

			LCG	VCG	LMOM	VMOM
KANSI	PINTA-ALA	JÄÄNPAINO				
PÄÄKANSI	125	2500		13	5,4	32500
1 K.	36	720		15	7,3	10800
2 K.	40	800		18	9,6	14400
YHTEENSÄ	201	4020	14,353234	6,576119	57700	26436
LAITA	71	710		17,5	5,1	12425
Kansirakennus 1k.	29	290		16,5	6	4785
Kansirakennus 2k.	18	180		20,1	8,9	3618
YHTEENSÄ	118	1180	17,650847	5,900847	20828	6963
KAIKKI YHTEENSÄ		5200	15,101538	6,422885	78528	33399

INCLINING TEST REPORT

Ship's name:	Fram	
Main dimensions:	Length pp.	31.00 m
	Breadth moulded	8.80 m
	Draft	4.20 m
Date:	16.9.2015	
Place:	Harbour of Pori, Finland	
Density of seawater:	1.003 t/m ³	
Present:	Kalle Pelli	Alfons Håkans
	Tuomas Junnila	Ship Consulting

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A N G L E S O F I N C L I N A T I O N

Pendulum : P1
Pendulum description .. : FORE
Pendulum length : 3.332 m
Pendulum weight factor. : 1

	OBS READING	DIST	ANGLE
	m	m	degree

0	0.000	0.000	0.160
1	0.053	0.053	1.072
2	0.106	0.106	1.982
3	0.054	0.054	1.089
4	0.006	0.006	0.263
5	-0.042	-0.042	-0.562
6	-0.098	-0.098	-1.524
7	-0.044	-0.044	-0.596
8	0.004	0.004	0.229

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A N G L E S O F I N C L I N A T I O N

Pendulum : P2
Pendulum description .. : AFT
Pendulum length : 2.701 m
Pendulum weight factor. : 1

OBS READING		DIST	ANGLE
m		m	degree

0	0.000	0.000	0.160
1	0.045	0.045	1.115
2	0.090	0.090	2.069
3	0.048	0.048	1.178
4	0.006	0.006	0.288
5	-0.035	-0.035	-0.582
6	-0.081	-0.081	-1.557
7	-0.036	-0.036	-0.603
8	0.005	0.005	0.266

I N C L I N I N G M O M E N T S

Obs	Weight shifted (t)	Distance shifted (m)	Location of weights PS SB		Inclining moment (tm)
0	0.00	0.00	0.725	0.725	0.00
			0.725	0.725	
1	0.73	6.95	0.725	0.725	5.04
			0.725		
			0.725		
2	0.73	6.85	0.725		10.01
			0.725		
			0.725		
			0.725		
3	0.73	-6.80	0.725	0.725	5.08
			0.725		
			0.725		
4	0.73	-6.80	0.725	0.725	0.14
			0.725	0.725	
5	0.73	-6.85	0.725	0.725	-4.82
				0.725	
				0.725	
6	0.73	-6.80		0.725	-9.75
				0.725	
				0.725	
				0.725	
7	0.73	6.75	0.725	0.725	-4.86
				0.725	
				0.725	
8	0.73	6.65	0.725	0.725	-0.04
			0.725	0.725	

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M A S S E S T O B E S U B T R A C T E D

DES	MASS	XCG	YCG	ZCG
6 PERSONS	0.5	7.00	0.00	6.15
INC. WEIGHT 1	0.7	8.30	3.50	6.80
TOTAL	1.2			

T A N K S T O B E S U B T R A C T E D

NAME	VNET m3	DENS t/m3	MASS t	XM m	YM m	ZM m	IYM tm
T1	8.0	1.000	8.0	24.54	0.00	1.99	7
T2P	12.0	0.860	10.3	20.57	1.22	1.62	6
T2S	12.0	0.860	10.3	20.57	-1.21	1.62	6
T3S	16.7	0.860	14.4	17.71	-1.40	1.57	9
T3P	15.0	0.860	12.9	17.70	1.37	1.47	8
T4	0.2	0.860	0.2	15.09	0.01	0.32	1
T5	12.6	0.860	10.8	12.17	-0.40	0.70	0
T6P	2.4	1.000	2.4	10.49	0.84	0.51	3
T10	22.5	1.000	22.5	2.70	-0.72	3.65	0
TOTAL	101.4		91.8	14.42	-0.23	1.98	

M E T A C E N T R I C H E I G H T A N D C E N T E R O F G R A V I T Y

D U R I N G E X P E R I M E N T

Mean draught moulded..... : 3.986 m
Mean draught under keel..... : 3.996 m
Trim..... : -0.919 m
Initial heeling angle..... : 0.160 deg
Water density..... : 1.003 t/m3
Displacement..... : 484.4 t
Height of metacenter above BL... : 4.332 m

Obs Nr.	Inclining moment tm	total mom. tm	difference degree	Inclining angle total degree	Metacentric height m
0	0.0	0.0	0.160	0.160	
1	5.0	5.0	0.933	1.093	0.639
2	5.0	10.0	0.932	2.026	0.630
3	-4.9	5.1	-0.892	1.134	0.653
4	-4.9	0.1	-0.858	0.275	0.680
5	-5.0	-4.8	-0.848	-0.572	0.693
6	-4.9	-9.8	-0.969	-1.541	0.602
7	4.9	-4.9	0.941	-0.600	0.615
8	4.8	0.0	0.848	0.248	0.673

Metacentric height during experiment GM = 0.648 m
Free surface correction GMC= 0.079 m
Corrected metacentric height GM0= 0.727 m
Height of metacenter above baseline KM = 4.332 m

Center of gravity above BL KG = 3.604 m

L I G H T S H I P

	Weight (t)	Center of gravity		
		CGX (m)	CGY (m)	CGZ (m)
During experiment	484.4	13.174	0.002	3.604
Weights to be subtracted	-1.2	7.782	2.106	6.541
Tanks to be subtracted	-91.8	14.419	-0.228	1.980
Light ship	391.3	12.898	0.049	3.976

SHIP CONSULTING
NAPA/D/INC/121219
P349/A
FRAM

Inclining test

DATE 2015-09-24
TIME 12:37
USER TJJ
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E S T I M A T I O N O F E R R O R S

P R O B A B L E E R R O R S I N G M

Case no	Error EI GMI-GM	EI^2 *1000
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0-1	-0.009	0.084
1-2	-0.018	0.338
2-3	0.005	0.028
3-4	0.032	0.995
4-5	0.045	2.040
5-6	-0.046	2.144
6-7	-0.033	1.095
7-8	0.025	0.621

Sum	0.000	7.347
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Probable absolute error= 0.011 m
Probable relative error= 1.575 %

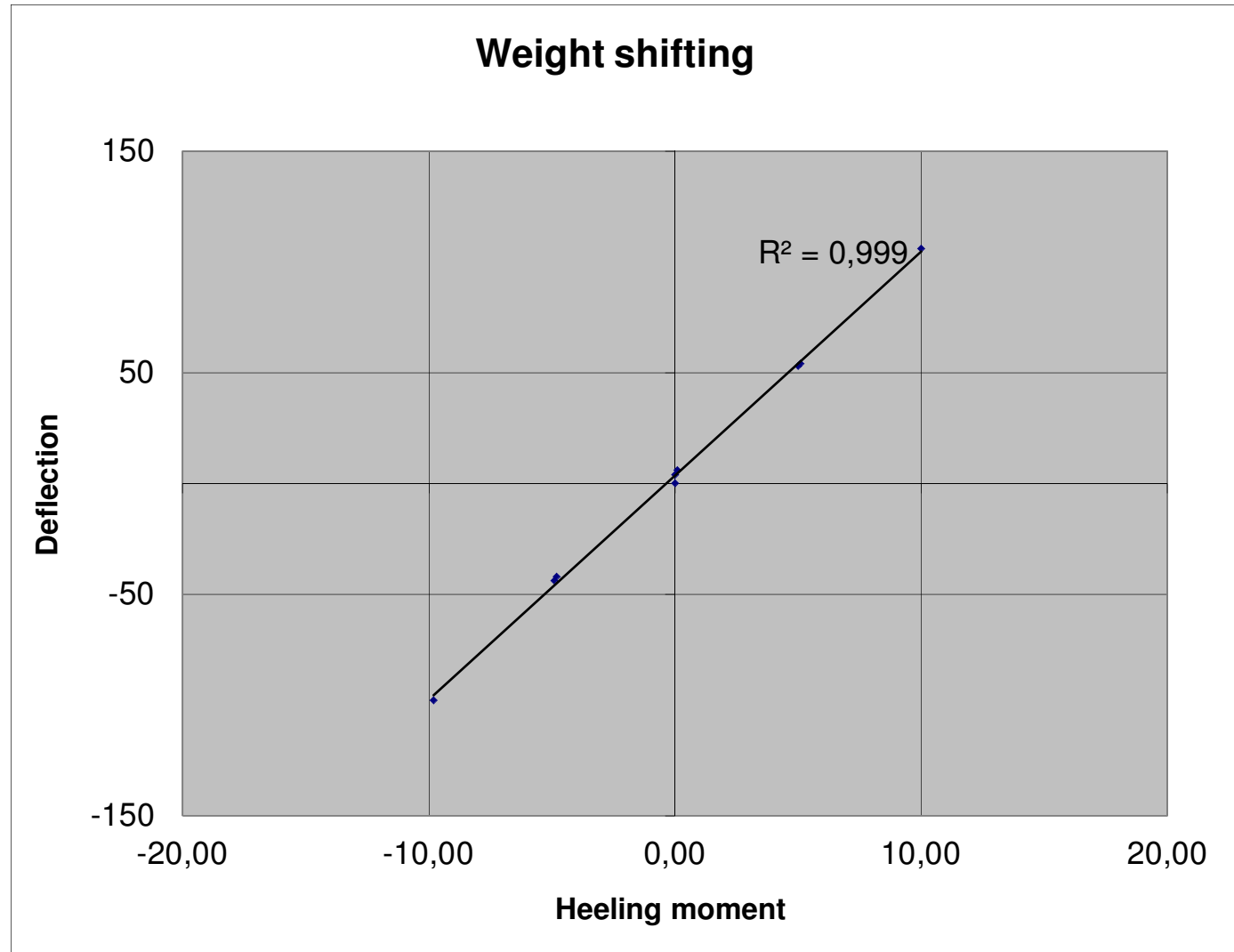
	forecast	moment	deflection
1	3,546	0,00	0
2	54,142	5,00	53
3	104,737	10,00	106
4	55,154	5,10	54
5	4,558	0,10	6
6	-45,025	-4,80	-42
7	-95,621	-9,80	-98
8	-46,037	-4,90	-44
9	3,546	0,00	4

GM- based on regression analyze

max 2027,359 200
min -2020,266 -200

sum 4047,625 400

Pendulun 3332 mm
disp 511,0 t
GM 0,644 m



	forecast	moment	deflection
1	4,004	0,00	0
2	46,604	5,00	45
3	89,203	10,00	90
4	47,456	5,10	48
5	4,856	0,10	6
6	-36,892	-4,80	-35
7	-79,491	-9,80	-81
8	-37,744	-4,90	-36
9	4,004	0,00	5

GM- based on regression analyze

max 1707,990 200
min -1699,982 -200

sum 3407,973 400

Pendulun 2701 mm
disp 511,0 t
GM 0,620 m

