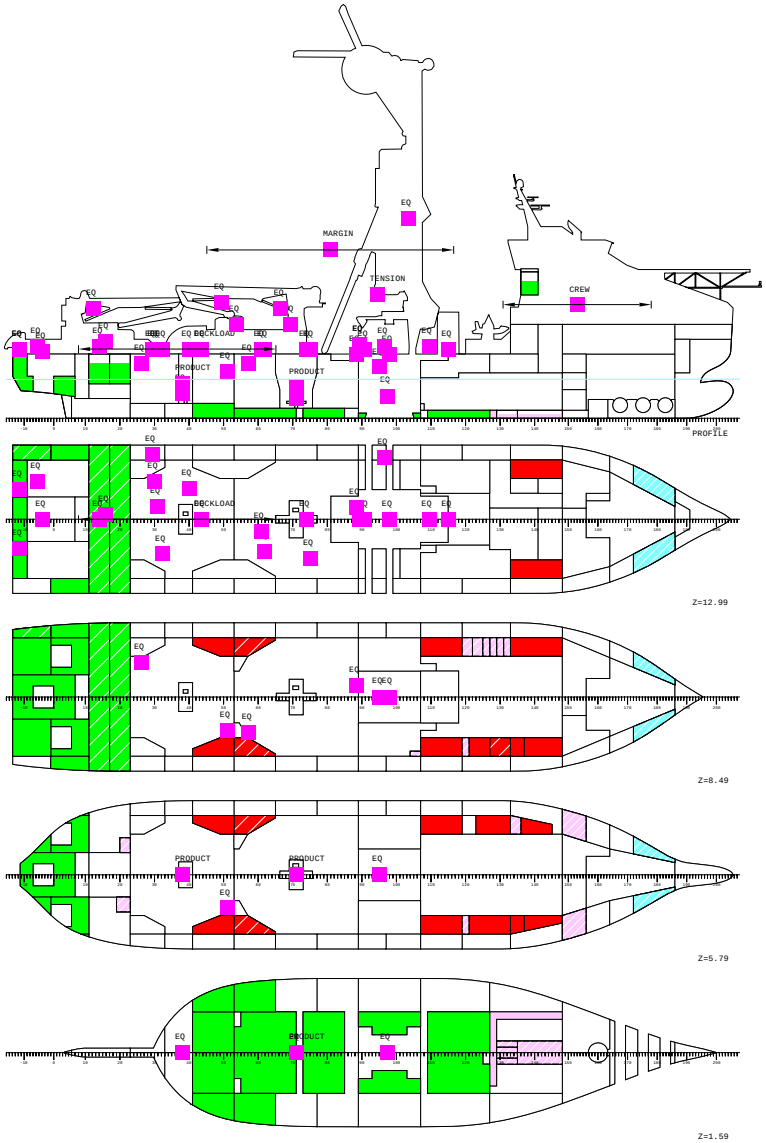
1.1 LOADING CASE LC03, BALLAST DEPARTURE - WITHOUT PAYLOAD



FLOATING POSITION

Draught fwd	(moulded)	7.910	m
Draught aft	(moulded)	7.859	m
Draught mean (moulded)		7.885	m
Trim		0.051	m
KM above BL		15.72	m
GM0 (solid)		2.89	m
Free surface correction		1.29	m
GM (fluid)		1.60	m
Trimming moment		1923	tonm
Density of sea water		1.025	t/m3
Heel		0.0	deg (Stbd-side)

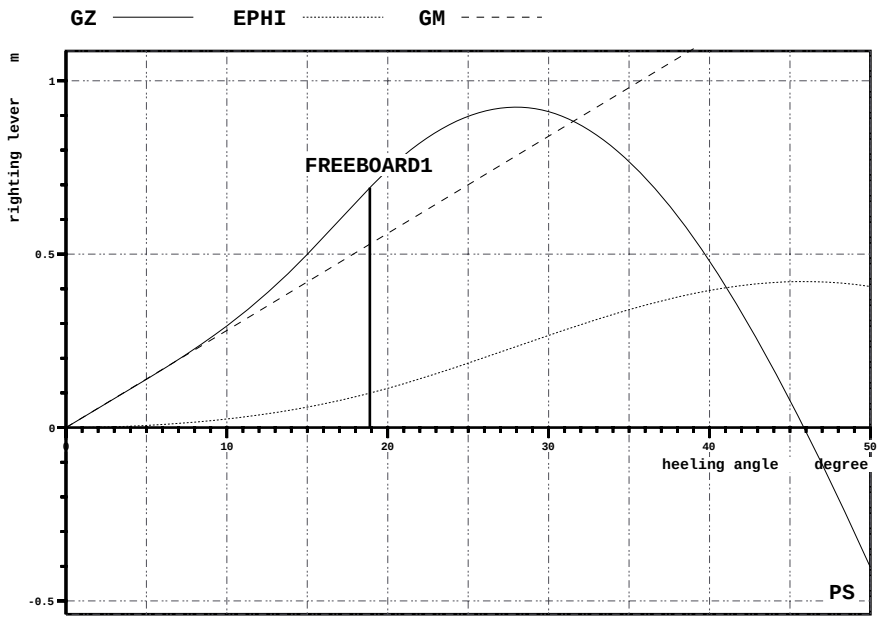
LIQUID LOADS	Volume m3	Vol.percen %	Weight t	LCG m	TCG m	VCG m	Frsm tm
Fuel oil, RHO = 0.850							
71 71 FO	329.6	98.0	280.2	97.70	10.03	8.37	38.4
72 72 FO	299.5	98.0	254.6	98.39	-9.98	8.42	38.4
73 73 FO	102.6	98.0	87.2	88.95	10.08	3.72	25.6
74 74 FO	123.7	98.0	105.2	88.24	-10.09	3.71	30.7
75 75 FO	229.9	98.0	195.4	78.50	10.12	5.32	30.7
76 76 FO	229.9	98.0	195.4	78.50	-10.12	5.32	30.7
79 79 FO	210.5	98.0	178.9	39.76	10.44	6.98	19.6
80 80 FO	210.5	98.0	178.9	39.76	-10.44	6.98	19.6
81 81 FO	217.8	98.0	185.1	32.88	10.41	7.41	21.0
82 82 FO	217.8	98.0	185.1	32.88	-10.41	7.41	21.0
91 91 FO SETTLING	69.6	98.0	59.2	93.87	-10.01	5.60	0.0
92 92 FO SERVICE 1	51.4	98.0	43.7	90.40	-10.12	7.47	15.4
93 93 FO SERVICE 2	51.4	98.0	43.7	86.20	-10.13	7.47	15.4
123 123 FO EMGEN	5.6	98.0	4.7	97.28	4.34	37.42	0.0
Fuel oil	2349.9		1997.4	70.23	-0.69	6.85	306.5
Fresh water, RHO = 1.000							
03 03 FW	86.6	50.1	86.6	120.86	5.29	6.93	94.9
04 04 FW	86.6	50.1	86.6	120.86	-5.29	6.93	94.9
Fresh water	173.3		173.3	120.86	0.00	6.93	189.7
Miscellaneous, RHO = 1.025							
100 100 LUB OIL 5	13.1	50.0	13.4	85.85	10.12	6.65	0.0
101 101 LUB OIL 6	13.1	50.0	13.4	83.75	10.12	6.65	0.0
103 103 CROSSOVER	63.7	100.0	65.3	92.51	4.01	0.81	0.0
104 104 BILGE HOLDING	33.5	50.0	34.3	98.45	0.00	0.40	78.6
105 105 FO DRAIN	4.1	50.0	4.3	91.80	1.71	0.40	0.0
106 106 DIRTY OIL	3.6	50.0	3.7	91.80	0.54	0.40	0.0
107 107 FW COOLING	3.6	50.0	3.7	91.80	-0.54	0.40	0.0
108 108 SLUDGE	4.1	50.0	4.3	91.80	-1.71	0.40	0.0
109 109 SLUDGE	8.0	50.0	8.2	88.30	-7.50	1.93	0.0
111 111 SPARE	8.7	50.0	9.0	83.40	-10.12	6.65	0.0
112 112 HYDR OIL	3.5	50.0	3.6	73.25	-11.50	6.65	0.0
113 113 DIRTY/SLUDGE OIL	7.8	50.0	8.0	14.10	-6.00	5.58	0.0
114 114 HYDR OIL	5.9	50.0	6.0	14.45	6.00	5.58	0.0
115 115 HYDR OIL	3.4	50.0	3.5	-4.80	5.25	9.47	0.0
116 116 HYDR OIL	3.4	50.0	3.5	-4.80	3.75	9.47	0.0
117 117 HYDR OIL	3.4	50.0	3.5	-4.80	-5.25	9.47	0.0
89 89 SEWAGE	37.6	50.0	38.6	105.38	9.18	2.99	33.8
90 90 SEWAGE	37.6	50.0	38.6	105.38	-9.18	2.99	33.8
94 94 BILGE SETTLING	10.8	50.0	11.1	83.40	-10.13	2.65	0.0
95 95 CLEAN OIL	13.9	50.0	14.2	93.52	9.87	2.91	0.0
96 96 LUB OIL 1	8.7	50.0	9.0	91.80	10.12	6.65	0.0
97 97 LUB OIL 2	8.7	50.0	9.0	90.40	10.12	6.65	0.0
98 98 LUB OIL 3	8.7	50.0	9.0	89.00	10.12	6.65	0.0
99 99 LUB OIL 4	8.7	50.0	9.0	87.60	10.12	6.65	0.0
110 SLUDGE	4.0	50.0	4.1	86.20	-7.50	1.92	0.0
Miscellaneous	322.1		330.1	87.82	2.13	3.26	146.1
Water ballast, RHO = 1.025							
31 31 WB/DW/ROLL RED	518.0	70.0	530.9	13.40	0.00	9.10	9492.5
32 32 WB/DW/ROLL RED	516.4	70.0	529.3	9.20	0.00	9.11	9492.5
33 33 WB/DW	132.4	100.0	135.7	3.37	13.38	10.01	0.0
34 34 WB/DW	132.4	100.0	135.7	3.37	-13.38	10.01	17.4
35 35 WB/DW	103.1	94.0	105.7	-4.32	13.36	10.36	17.4
37 37 WB/DW	210.4	100.0	215.7	-5.27	8.06	8.92	271.8
38 38 WB/DW	210.4	100.0	215.7	-5.27	-8.06	8.92	271.8
39 39 WB/DW	392.8	100.0	402.6	-2.74	0.00	8.02	736.7

LIQUID LOADS	Volume m3	Vol.percen %	Weight t	LCG m	TCG m	VCG m	Frsm tm
47 47 WB/DW	163.0	100.0	167.1	82.00	4.13	0.80	0.0
48 48 WB/DW	157.8	100.0	161.8	81.82	-4.22	0.80	0.0
50 50 WB/DW	191.2	100.0	196.0	67.91	0.00	0.77	0.0
55 55 WB/DW	135.8	100.0	139.2	54.70	4.12	1.00	0.0
56 56 WB/DW	135.8	100.0	139.2	54.70	-4.12	1.00	0.0
57 57 WB/DW	80.0	100.0	82.0	40.90	10.97	1.24	0.0
58 58 WB/DW	80.0	100.0	82.0	40.90	-10.97	1.24	0.0
59 59 WB/DW	193.4	100.0	198.2	43.08	4.00	1.01	0.0
60 60 WB/DW	193.4	100.0	198.2	43.08	-4.00	1.01	0.0
61 61 WB/DW	83.0	100.0	85.1	32.76	10.79	2.07	0.0
62 62 WB/DW	83.0	100.0	85.1	32.76	-10.79	2.07	0.0
63 63 WB/DW	174.9	100.0	179.3	32.46	3.96	1.70	0.0
64 64 WB/DW	174.9	100.0	179.3	32.46	-3.96	1.70	0.0
70 70 WB/DW/ROLL RED	287.1	60.0	294.3	96.35	0.00	26.40	7910.4
87 87 WB/DW	126.1	100.0	129.2	4.33	7.94	6.80	0.0
88 88 WB/DW	126.1	100.0	129.2	4.33	-7.94	6.80	0.0
Water ballast	4601.6		4716.6	28.63	0.30	6.85	28210.6

MASS LOADS	Weight t	LCG m	TCG m	VCG m
CREW & STORES	100.0	106.00	0.00	23.00
2 50t SB crane	300.0	8.00	-13.40	22.20
3 50t PS crane	150.0	46.00	13.40	22.20
5 10t tensioner	10.0	34.00	0.00	23.50
11 2x15t Loadout winch	32.0	-2.20	0.00	13.50
13+14 2x37t Loadout tens	336.0	10.50	1.00	15.50
19 2x30t spooling winch	42.0	51.20	0.00	14.00
27 15t Carousel winch	8.0	35.20	-6.70	9.50
29 3x10t table winch	45.0	61.30	2.40	13.00
33 50t Initiation winch	25.0	76.00	0.00	14.50
34 Pipelay tower	2423.0	71.90	0.00	40.40
35 2500t Carousel	320.0	49.10	0.00	4.00
36 1500t Carousel	240.0	26.00	0.00	5.00
39 VLS Control Room	16.0	67.00	12.50	14.50
41 Moonpool hatches	100.0	68.00	0.00	13.00
42 2x15t Stor. winch A&R	570.0	67.50	0.00	4.50
43 400kW HPU	21.0	66.00	0.00	10.40
44 2xControl Cabin tensi	12.0	9.30	0.00	14.50
40 Pipelay spare	30.0	80.00	0.00	14.00
4 Platform carousel-towe	20.0	37.00	0.00	19.00
7 Heavy rigging support	15.0	20.00	13.20	14.00
8a 4.7m radius deflector	2.0	22.00	-7.00	14.00
8b side plate	0.5	42.70	-6.50	14.00
8c 4.7m radius hatch def	2.0	21.00	2.50	14.00
8d 4.7m radius hatch def	2.0	27.40	6.30	14.00
8e 4.7m radius hatch def	2.0	42.00	-2.50	14.00
8f 4.7m radius hatch def	2.0	52.00	-8.00	14.00
9 34t Aft carrousel gutt	5.0	-7.00	6.00	14.00
10 34t Fwd carrousel gut	5.0	-7.00	-6.00	14.00
12 Platform for aft caro	5.0	-3.30	7.60	14.50
16 2xCarousel hatch	60.0	30.00	0.00	14.00
20 Boom rest	30.0	48.00	0.00	19.00
21b 4.7 radius Carousel	5.0	20.50	7.60	14.00
23 2x20t Pull in platfor	6.0	62.00	0.00	15.00
24 2x20t Pull in gutter	6.0	62.00	0.00	15.00
25 2x20t winch for pull	30.0	63.00	0.00	14.00
28a 15t Car. Davit Hoist	7.0	39.50	-7.20	11.00
28b 15t Car. Davit Hoist	7.0	17.80	6.90	11.00

MASS LOADS	Weight t	LCG m	TCG m	VCG m
EQ. MARGIN	243.5	56.00	-0.24	34.08
TOTAL	5235.0	57.02	-0.23	26.08

Lightweight	10870.0	75.77	0.03	10.53
Deadweight	12452.4	50.09	-0.04	14.84
Total weight	23322.4	62.06	-0.01	12.83



INTACT STABILITY CRITERIA

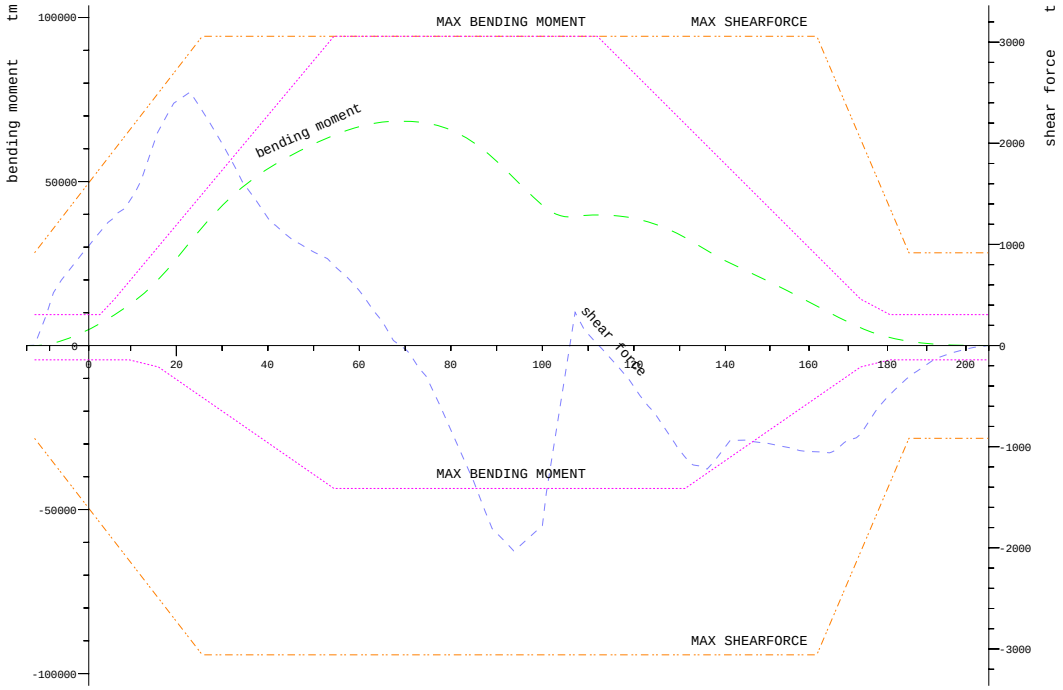
RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
V.AREA15-30	Area depending on GZ curve top	0.057	0.233	mrad	OK	0.309
V.AREA3040	Area under GZ curve between 30 and 40 deg	0.030	0.130	mrad	OK	0.571
V.GZ0.2	Min. GZ > 0.2	0.200	0.911	m	OK	0.183
V.POSMAX15	Top of GZ curve at least 15 degrees	15.000	27.978	deg	OK	-0.587
V.GM0.15	GM > 0.15 m	0.150	1.605	m	OK	0.150
V.IMOWEATHER	IMO weather criterion	1.000	3.980		OK	0.398
MINGM.PROB	Min GM from probabilistic dam calc	1.530	1.605	m	OK	1.530

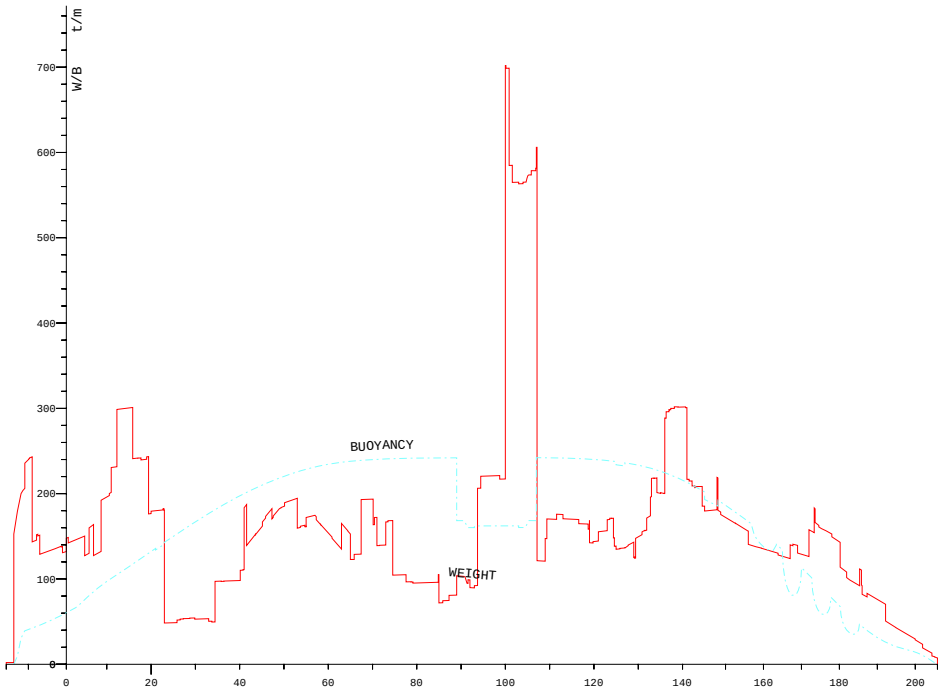
EFFECT OF FREE SURFACES

TANK ID	TANK NAME	FILL %	FRSM tm	GMCORR m	EXPLANATION
03	03 FW	50.1	94.85	-0.004	Maximum effect
04	04 FW	50.1	94.85	-0.004	Maximum effect
104	104 BILGE HOLDING	50.0	78.58	-0.003	Real moment
31	31 WB/DW/ROLL RED	70.0	9492.52	-0.407	Real moment
32	32 WB/DW/ROLL RED	70.0	9492.52	-0.407	Real moment
37	37 WB/DW	100.0	271.79	-0.012	Maximum effect
38	38 WB/DW	100.0	271.79	-0.012	Maximum effect
39	39 WB/DW	100.0	736.70	-0.032	Maximum effect
70	70 WB/DW/ROLL RED	60.0	7910.44	-0.339	Real moment
71	71 FO	98.0	38.44	-0.002	Maximum effect
72	72 FO	98.0	38.44	-0.002	Maximum effect
73	73 FO	98.0	25.62	-0.001	Real moment
74	74 FO	98.0	30.74	-0.001	Real moment
76	76 FO	98.0	30.75	-0.001	Real moment
89	89 SEWAGE	50.0	33.76	-0.001	Real moment
90	90 SEWAGE	50.0	33.76	-0.001	Real moment
01	01 WB/DW	0.0	1142.23	-0.049	Maximum effect
TOTAL			29848.54	-1.280	

Tanks not listed have free surface correction less than 0.001 m.

			X		Frame
Shear force (min)	-2029.2	t	65.00	m	93.71
Shear force (max)	2506.3	t	15.50	m	23.00
Max. rel. shear force	88.9	%	13.00	m	19.43
Sagging moment	-0.2	tm	137.41	m	205.35
Hogging moment	68400.1	tm	47.84	m	69.21
Max. rel. bending moment	79.9	%	21.25	m	31.21





1 LOADING CASE SUMMARY

CASE	TEXT
C01.2	Harbour departure, 2500+1500t product
OPERATION_50%	Operation start departure, 540t tension, 2500+1500t product - no payload

CASE	name	
DISP	total displacement	t
DW	deadweight	t
T	draught, moulded	m
TR	trim	m
HEEL	heeling angle	degree
GM0	uncorrected GM	m
GMCORR	GM correction	m
GM	metacentric height	m
KGCOR	corrected KG	m

Draught, trim, heel and stability

CASE	DISP	DW	T	TR	HEEL	GM0	GMCORR	GM	KGCOR
	t	t	m	m	degree	m	m	m	m
C01.2	25651.4	14781.4	8.500	-0.049	0.0	3.361	-0.093	3.268	11.999
OPERATION_50%	21818.6	10948.6	7.474	0.000	0.0	2.188	-0.088	2.100	13.974

Deadweight distribution for tanks

CASE	WB	FW	MIS	FO
	t	t	t	t
C01.2	354.2	1513.8	330.1	1778.3
OPERATION_50%	744.0	720.1	330.1	879.5

Deadweight distribution for mass loads

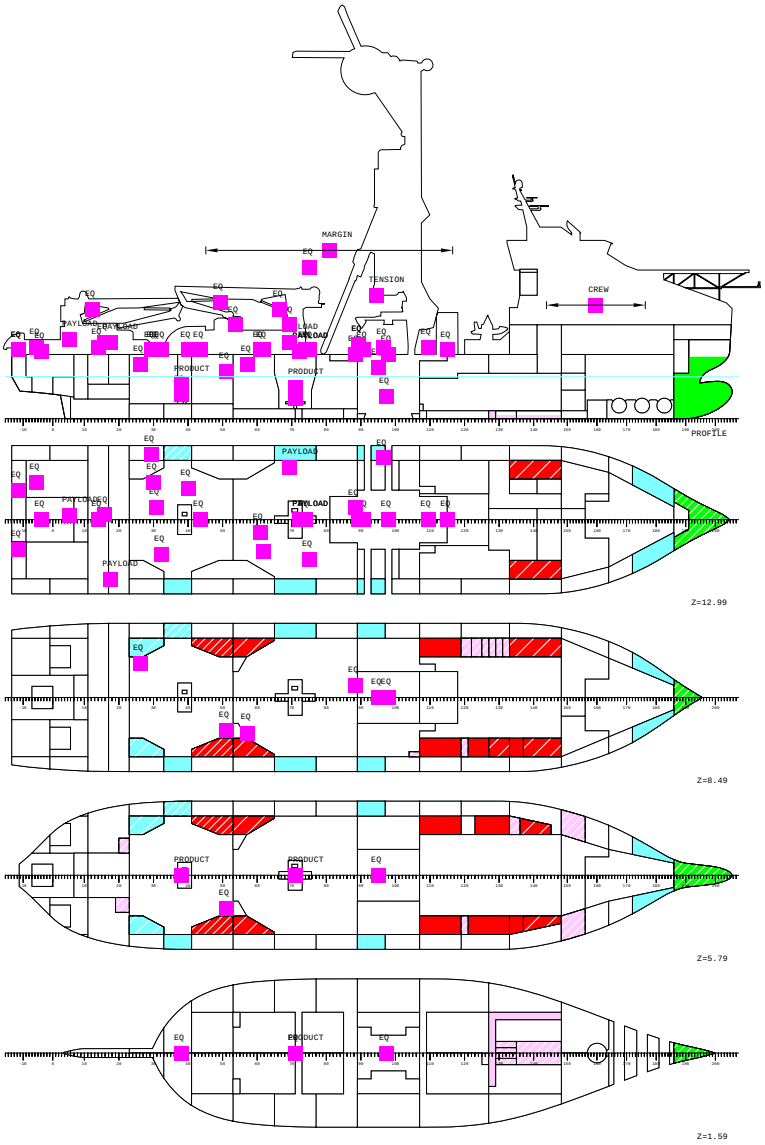
CASE	CREW	EQ	MARGIN	PAYLOAD	PRODUCT	DECKLOAD	TENSION
	t	t	t	t	t	t	t
C01.2	100.0	4891.5	243.5	1570.0	4000.0	0.0	0.0
OPERATION_50%	100.0	4891.5	243.5	0.0	2000.0	500.0	540.0

Longitudinal strength values

BMMAX= max. bending moment;
SHMAX= max. shear force;

CASE	BMMAX	BMMIN	SHMAX	SHMIN
	tm	tm	t	t
C01.2	46176	-4032	2890	-1739
OPERATION_50%	40491	0	1091	-1225

1.1 LOADING CASE C01.2, HARBOUR DEPARTURE, 2500+1500T PRODUCT



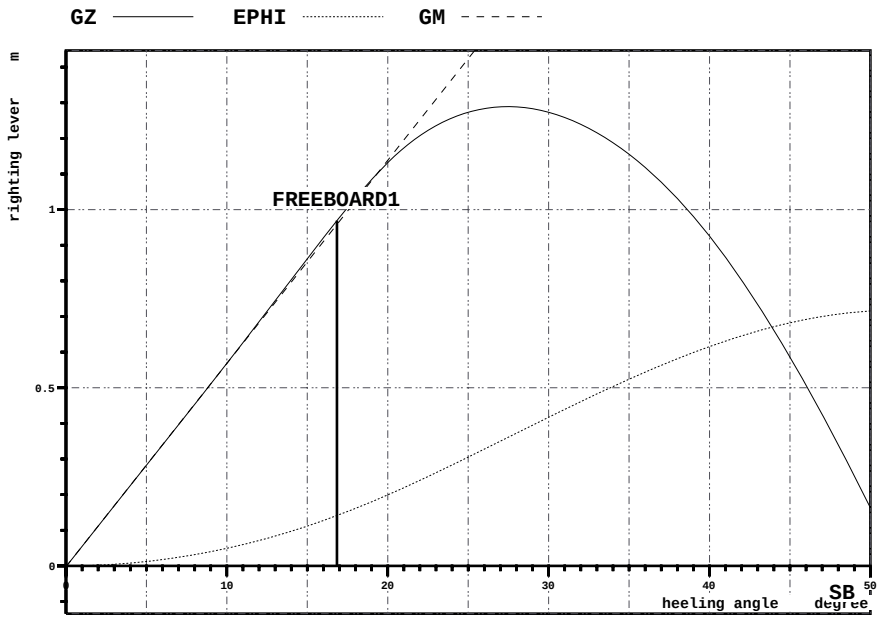
FLOATING POSITION			
Draught fwd	(moulded)	8.476	m
Draught aft	(moulded)	8.524	m
Draught mean (moulded)		8.500	m
Trim		-0.049	m
KM above BL		15.27	m
GM0 (solid)		3.36	m
Free surface correction		0.09	m
GM (fluid)		3.27	m
Trimming moment		-1869	tonm
Density of sea water		1.025	t/m3
Heel		0.0	deg (Stbd-side)

LIQUID LOADS	Volume m3	Vol.percen %	Weight t	LCG m	TCG m	VCG m	Frsm tm
Fuel oil, RHO = 0.850							
71 71 FO	329.6	98.0	280.2	97.70	10.03	8.37	38.4
72 72 FO	299.5	98.0	254.6	98.39	-9.98	8.42	38.4
73 73 FO	102.6	98.0	87.2	88.95	10.08	3.72	25.6
74 74 FO	123.7	98.0	105.2	88.24	-10.09	3.71	30.7
75 75 FO	229.9	98.0	195.4	78.50	10.12	5.32	30.7
76 76 FO	229.9	98.0	195.4	78.50	-10.12	5.32	30.7
79 79 FO	210.5	98.0	178.9	39.76	10.44	6.98	19.6
80 80 FO	210.5	98.0	178.9	39.76	-10.44	6.98	19.6
81 81 FO	88.9	40.0	75.6	32.88	10.41	4.80	21.0
82 82 FO	88.9	40.0	75.6	32.88	-10.41	4.80	21.0
91 91 FO SETTLING	69.6	98.0	59.2	93.87	-10.01	5.60	0.0
92 92 FO SERVICE 1	51.4	98.0	43.7	90.40	-10.12	7.47	15.4
93 93 FO SERVICE 2	51.4	98.0	43.7	86.20	-10.13	7.47	15.4
123 123 FO EMGEN	5.6	98.0	4.7	97.28	4.34	37.42	0.0
Fuel oil	2092.1		1778.3	74.83	-0.77	6.56	306.5
Fresh water, RHO = 1.000							
03 03 FW	169.4	98.0	169.4	121.14	5.87	9.11	94.9
04 04 FW	169.4	98.0	169.4	121.14	-5.87	9.11	94.9
17 17 FW	177.8	98.0	177.8	64.53	13.49	7.11	0.0
18 18 FW	177.8	98.0	177.8	64.53	-13.49	7.11	0.0
21 21 FW	174.3	98.0	174.3	49.10	13.50	9.33	18.5
22 22 FW	174.3	98.0	174.3	49.10	-13.50	9.33	18.5
27 27 FW	41.1	26.0	41.1	25.48	13.23	4.49	12.1
28 28 FW	155.1	98.0	155.1	25.35	-13.43	8.06	12.3
83 83 FW	137.4	73.0	137.4	18.61	10.35	6.33	21.7
84 84 FW	137.4	73.0	137.4	18.61	-10.35	6.33	21.7
Fresh water	1513.8		1513.8	60.24	-1.02	7.95	294.6
Miscellaneous, RHO = 1.025							
100 100 LUB OIL 5	13.1	50.0	13.4	85.85	10.12	6.65	0.0
101 101 LUB OIL 6	13.1	50.0	13.4	83.75	10.12	6.65	0.0
103 103 CROSSOVER	63.7	100.0	65.3	92.51	4.01	0.81	0.0
104 104 BILGE HOLDING	33.5	50.0	34.3	98.45	0.00	0.40	78.6
105 105 FO DRAIN	4.1	50.0	4.3	91.80	1.71	0.40	0.0
106 106 DIRTY OIL	3.6	50.0	3.7	91.80	0.54	0.40	0.0
107 107 FW COOLING	3.6	50.0	3.7	91.80	-0.54	0.40	0.0
108 108 SLUDGE	4.1	50.0	4.3	91.80	-1.71	0.40	0.0
109 109 SLUDGE	8.0	50.0	8.2	88.30	-7.50	1.93	0.0
111 111 SPARE	8.7	50.0	9.0	83.40	-10.12	6.65	0.0
112 112 HYDR OIL	3.5	50.0	3.6	73.25	-11.50	6.65	0.0
113 113 DIRTY/SLUDGE OIL	7.8	50.0	8.0	14.10	-6.00	5.58	0.0
114 114 HYDR OIL	5.9	50.0	6.0	14.45	6.00	5.58	0.0
115 115 HYDR OIL	3.4	50.0	3.5	-4.80	5.25	9.47	0.0
116 116 HYDR OIL	3.4	50.0	3.5	-4.80	3.75	9.47	0.0
117 117 HYDR OIL	3.4	50.0	3.5	-4.80	-5.25	9.47	0.0
89 89 SEWAGE	37.6	50.0	38.6	105.38	9.18	2.99	33.8
90 90 SEWAGE	37.6	50.0	38.6	105.38	-9.18	2.99	33.8
94 94 BILGE SETTLING	10.8	50.0	11.1	83.40	-10.13	2.65	0.0
95 95 CLEAN OIL	13.9	50.0	14.2	93.52	9.87	2.91	0.0
96 96 LUB OIL 1	8.7	50.0	9.0	91.80	10.12	6.65	0.0
97 97 LUB OIL 2	8.7	50.0	9.0	90.40	10.12	6.65	0.0
98 98 LUB OIL 3	8.7	50.0	9.0	89.00	10.12	6.65	0.0
99 99 LUB OIL 4	8.7	50.0	9.0	87.60	10.12	6.65	0.0
110 SLUDGE	4.0	50.0	4.1	86.20	-7.50	1.92	0.0
Miscellaneous	322.1		330.1	87.82	2.13	3.26	146.1

LIQUID LOADS	Volume m3	Vol.percen %	Weight t	LCG m	TCG m	VCG m	Frsm tm
Water ballast, RHO = 1.025							
01 01 WB/DW	345.6	59.0	354.2	129.74	0.00	6.55	321.5

MASS LOADS	Weight t	LCG m	TCG m	VCG m
CREW & STORES	100.0	110.00	0.00	23.00
2 50t SB crane	300.0	8.00	-13.40	22.20
3 50t PS crane	150.0	46.00	13.40	22.20
5 10t tensioner	10.0	34.00	0.00	23.50
11 2x15t Loadout winch	32.0	-2.20	0.00	13.50
13+14 2x37t Loadout tens	336.0	10.50	1.00	15.50
19 2x30t spooling winch	42.0	51.20	0.00	14.00
27 15t Carousel winch	8.0	35.20	-6.70	9.50
29 3x10t table winch	45.0	61.30	2.40	13.00
33 50t Initiation winch	25.0	76.00	0.00	14.50
34 PIPELAY TOWER (BRIDGE	2423.0	52.10	0.00	30.70
35 2500t Carousel	320.0	49.10	0.00	4.00
36 1500t Carousel	240.0	26.00	0.00	5.00
39 VLS Control Room	16.0	67.00	12.50	14.50
41 Moonpool hatches	100.0	68.00	0.00	13.00
42 2x15t Stor. winch A&R	570.0	67.50	0.00	4.50
43 400kW HPU	21.0	66.00	0.00	10.40
44 2xControl Cabin tensi	12.0	9.30	0.00	14.50
40 Pipelay spare	30.0	80.00	0.00	14.00
4 Platform carousel-towe	20.0	37.00	0.00	19.00
7 Heavy rigging support	15.0	20.00	13.20	14.00
8a 4.7m radius deflector	2.0	22.00	-7.00	14.00
8b side plate	0.5	42.70	-6.50	14.00
8c 4.7m radius hatch def	2.0	21.00	2.50	14.00
8d 4.7m radius hatch def	2.0	27.40	6.30	14.00
8e 4.7m radius hatch def	2.0	42.00	-2.50	14.00
8f 4.7m radius hatch def	2.0	52.00	-8.00	14.00
9 34t Aft carrousel gutt	5.0	-7.00	6.00	14.00
10 34t Fwd carrousel gut	5.0	-7.00	-6.00	14.00
12 Platform for aft caro	5.0	-3.30	7.60	14.50
16 2xCarousel hatch	60.0	30.00	0.00	14.00
20 Boom rest	30.0	48.00	0.00	19.00
21b 4.7 radius Carousel	5.0	20.50	7.60	14.00
23 2x20t Pull in platfor	6.0	62.00	0.00	15.00
24 2x20t Pull in gutter	6.0	62.00	0.00	15.00
25 2x20t winch for pull	30.0	63.00	0.00	14.00
28a 15t Car. Davit Hoist	7.0	39.50	-7.20	11.00
28b 15t Car. Davit Hoist	7.0	17.80	6.90	11.00
EQ. MARGIN	243.5	56.00	-0.24	34.08
Project equipment	120.0	50.00	0.00	13.50
Buoyancy Rack	700.0	3.35	0.85	16.10
Petrobras Storage 1	450.0	48.00	10.50	15.50
Petrobras Storage 2	200.0	11.60	-12.20	15.50
Rigging	100.0	50.00	0.00	13.50
Carousel Product Aft	1500.0	26.00	0.00	7.00
Carousel Product Fore	2500.0	49.10	0.00	6.40
TOTAL	10805.0	41.64	0.15	15.16

Lightweight	10870.0	75.77	0.03	10.53
Deadweight	14781.4	50.68	-0.04	12.92
Total weight	25651.4	61.31	-0.01	11.91



INTACT STABILITY CRITERIA

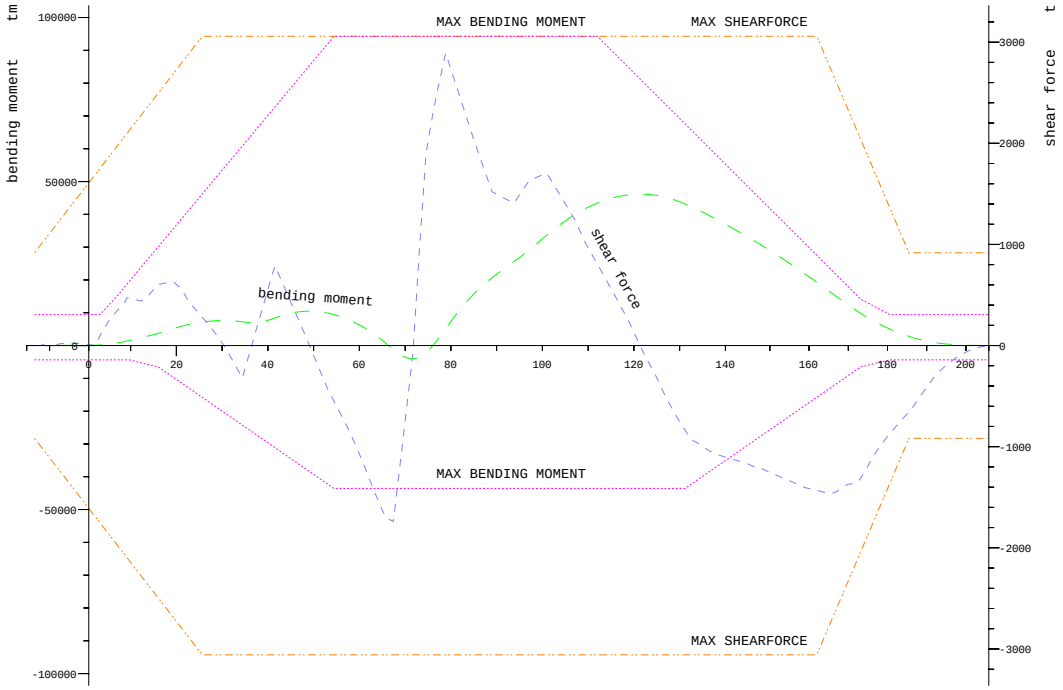
RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
V.AREA15-30	Area depending on GZ curve top	0.058	0.360	mrad	OK	0.934
V.AREA3040	Area under GZ curve between 30 and 40 deg	0.030	0.198	mrad	OK	1.547
V.GZ0.2	Min. GZ > 0.2	0.200	1.273	m	OK	1.122
V.POSMAX15	Top of GZ curve at least 15 degrees	15.000	27.460	deg	OK	-0.084
V.GM0.15	GM > 0.15 m	0.150	3.268	m	OK	0.150
V.IMOWEATHER	IMO weather criterion	1.000	3.293		OK	1.095
MINGM.PROB	Min GM from probabilistic dam calc	1.600	3.268	m	OK	1.600

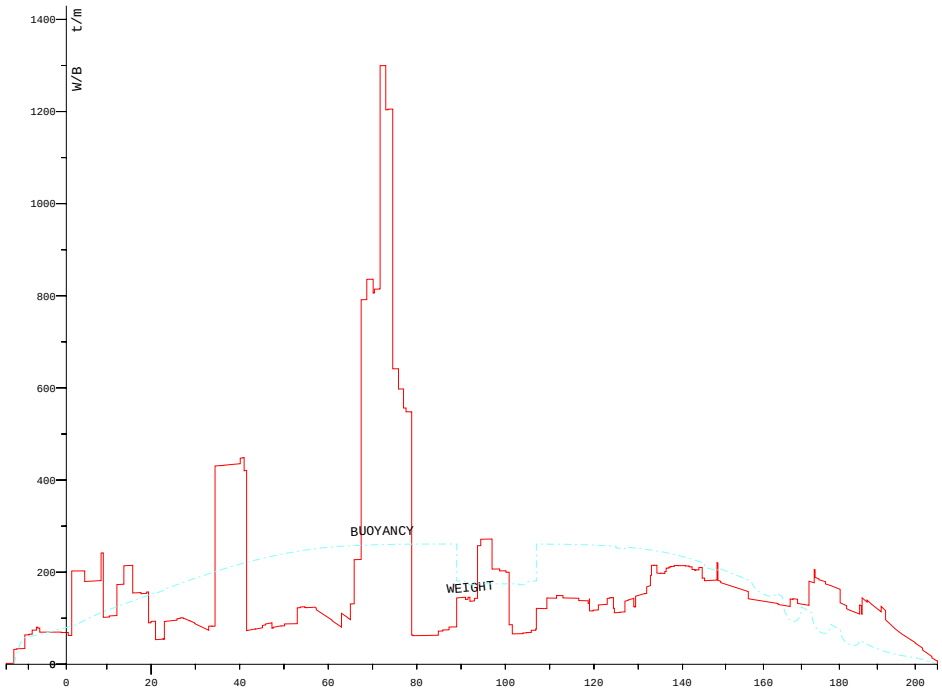
EFFECT OF FREE SURFACES

TANK ID	TANK NAME	FILL %	FRSM tm	GMCORR m	EXPLANATION
01	01 WB/DW	59.0	321.47	-0.013	Real moment
03	03 FW	98.0	94.85	-0.004	Maximum effect
04	04 FW	98.0	94.85	-0.004	Maximum effect
104	104 BILGE HOLDING	50.0	78.58	-0.003	Real moment
71	71 FO	98.0	38.44	-0.001	Maximum effect
72	72 FO	98.0	38.44	-0.001	Maximum effect
74	74 FO	98.0	30.74	-0.001	Real moment
75	75 FO	98.0	30.75	-0.001	Real moment
76	76 FO	98.0	30.75	-0.001	Real moment
89	89 SEWAGE	50.0	33.76	-0.001	Real moment
90	90 SEWAGE	50.0	33.76	-0.001	Real moment
37	37 WB/DW	0.0	271.79	-0.011	Maximum effect
38	38 WB/DW	0.0	271.79	-0.011	Maximum effect
39	39 WB/DW	0.0	736.70	-0.029	Maximum effect
TOTAL			2106.67	-0.082	

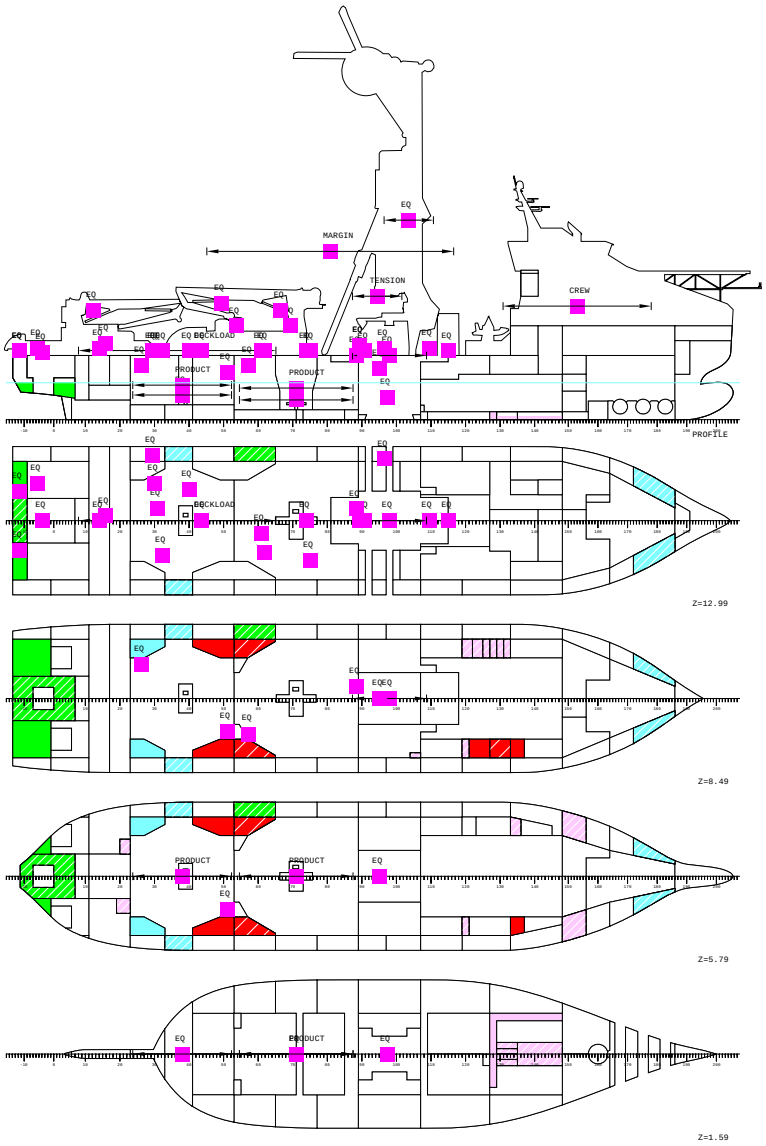
Tanks not listed have free surface correction less than 0.001 m.

			X		Frame
Shear force (min)	-1739.0	t	46.60	m	67.43
Shear force (max)	2890.3	t	54.60	m	78.86
Max. rel. shear force	94.5	%	54.60	m	78.86
Sagging moment	-4032.1	tm	49.60	m	71.71
Hogging moment	46175.8	tm	84.31	m	121.30
Max. rel. bending moment	70.3	%	109.24	m	158.40





1.2 LOADING CASE OPERATION_50%, OPERATION START DEPARTURE, 540T TENSION, 2500+1500T PRODUCT - NO PAYLO

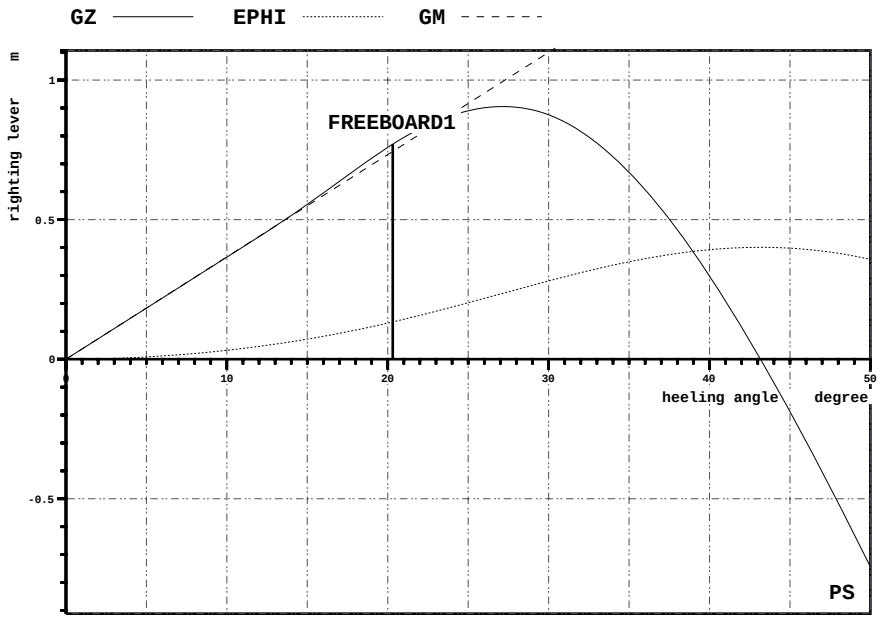


FLOATING POSITION			
Draught fwd	(moulded)	7.474	m
Draught aft	(moulded)	7.474	m
Draught mean (moulded)		7.474	m
Trim		0.000	m
KM above BL		16.07	m
GM0 (solid)		2.19	m
Free surface correction		0.09	m
GM	(fluid)	2.10	m
Trimming moment		-8	tonm
Density of sea water		1.025	t/m3
Heel		0.0	deg (Stbd-side)

LIQUID LOADS	Volume m3	Vol.percen %	Weight t	LCG m	TCG m	VCG m	Frsm tm
Fuel oil, RHO = 0.850							
79 79 FO	210.5	98.0	178.9	39.76	10.44	6.98	19.6
80 80 FO	210.5	98.0	178.9	39.76	-10.44	6.98	19.6
81 81 FO	217.8	98.0	185.1	32.88	10.41	7.41	21.0
82 82 FO	217.8	98.0	185.1	32.88	-10.41	7.41	21.0
91 91 FO SETTLING	69.6	98.0	59.2	93.87	-10.01	5.60	0.0
92 92 FO SERVICE 1	51.4	98.0	43.7	90.40	-10.12	7.47	15.4
93 93 FO SERVICE 2	51.4	98.0	43.7	86.20	-10.13	7.47	15.4
123 123 FO EMGEN	5.6	98.0	4.7	97.28	4.34	37.42	0.0
Fuel oil	1034.7		879.5	45.64	-1.66	7.28	111.8
Fresh water, RHO = 1.000							
03 03 FW	112.3	65.0	112.3	120.97	5.51	7.68	94.9
04 04 FW	112.3	65.0	112.3	120.97	-5.51	7.68	94.9
27 27 FW	63.3	40.0	63.3	25.42	13.33	5.21	12.3
28 28 FW	63.3	40.0	63.3	25.42	-13.33	5.21	12.3
83 83 FW	184.4	98.0	184.4	18.59	10.35	7.44	21.7
84 84 FW	184.4	98.0	184.4	18.59	-10.35	7.44	21.7
Fresh water	720.1		720.1	51.74	0.00	7.13	257.8
Miscellaneous, RHO = 1.025							
100 100 LUB OIL 5	13.1	50.0	13.4	85.85	10.12	6.65	0.0
101 101 LUB OIL 6	13.1	50.0	13.4	83.75	10.12	6.65	0.0
103 103 CROSSOVER	63.7	100.0	65.3	92.51	4.01	0.81	0.0
104 104 BILGE HOLDING	33.5	50.0	34.3	98.45	0.00	0.40	78.6
105 105 FO DRAIN	4.1	50.0	4.3	91.80	1.71	0.40	0.0
106 106 DIRTY OIL	3.6	50.0	3.7	91.80	0.54	0.40	0.0
107 107 FW COOLING	3.6	50.0	3.7	91.80	-0.54	0.40	0.0
108 108 SLUDGE	4.1	50.0	4.3	91.80	-1.71	0.40	0.0
109 109 SLUDGE	8.0	50.0	8.2	88.30	-7.50	1.93	0.0
111 111 SPARE	8.7	50.0	9.0	83.40	-10.12	6.65	0.0
112 112 HYDR OIL	3.5	50.0	3.6	73.25	-11.50	6.65	0.0
113 113 DIRTY/SLUDGE OIL	7.8	50.0	8.0	14.10	-6.00	5.58	0.0
114 114 HYDR OIL	5.9	50.0	6.0	14.45	6.00	5.58	0.0
115 115 HYDR OIL	3.4	50.0	3.5	-4.80	5.25	9.47	0.0
116 116 HYDR OIL	3.4	50.0	3.5	-4.80	3.75	9.47	0.0
117 117 HYDR OIL	3.4	50.0	3.5	-4.80	-5.25	9.47	0.0
89 89 SEWAGE	37.6	50.0	38.6	105.38	9.18	2.99	33.8
90 90 SEWAGE	37.6	50.0	38.6	105.38	-9.18	2.99	33.8
94 94 BILGE SETTLING	10.8	50.0	11.1	83.40	-10.13	2.65	0.0
95 95 CLEAN OIL	13.9	50.0	14.2	93.52	9.87	2.91	0.0
96 96 LUB OIL 1	8.7	50.0	9.0	91.80	10.12	6.65	0.0
97 97 LUB OIL 2	8.7	50.0	9.0	90.40	10.12	6.65	0.0
98 98 LUB OIL 3	8.7	50.0	9.0	89.00	10.12	6.65	0.0
99 99 LUB OIL 4	8.7	50.0	9.0	87.60	10.12	6.65	0.0
110 SLUDGE	4.0	50.0	4.1	86.20	-7.50	1.92	0.0
Miscellaneous	322.1		330.1	87.82	2.13	3.26	146.1
Water ballast, RHO = 1.025							
23 23 WB/DW	108.4	40.1	111.1	40.72	13.48	4.25	19.0
37 37 WB/DW	210.4	100.0	215.7	-5.27	8.06	8.92	271.8
38 38 WB/DW	210.4	100.0	215.7	-5.27	-8.06	8.92	271.8
39 39 WB/DW	196.6	50.1	201.5	-0.70	0.00	6.41	736.7
Water ballast	725.8		744.0	2.83	2.01	7.54	1299.3

MASS LOADS	Weight t	LCG m	TCG m	VCG m
CREW & STORES	100.0	106.00	0.00	23.00
DECKLOAD	500.0	30.00	0.00	14.00
2 50t SB crane	300.0	8.00	-13.40	22.20
3 50t PS crane	150.0	46.00	13.40	22.20
5 10t tensioner	10.0	34.00	0.00	23.50
11 2x15t Loadout winch	32.0	-2.20	0.00	13.50
13+14 2x37t Loadout tens	336.0	10.50	1.00	15.50
19 2x30t spooling winch	42.0	51.20	0.00	14.00
27 15t Carousel winch	8.0	35.20	-6.70	9.50
29 3x10t table winch	45.0	61.30	2.40	13.00
33 50t Initiation winch	25.0	76.00	0.00	14.50
34 Pipelay tower	2423.0	71.90	0.00	40.40
35 2500t Carousel	320.0	49.10	0.00	4.00
36 1500t Carousel	240.0	26.00	0.00	5.00
39 VLS Control Room	16.0	67.00	12.50	14.50
41 Moonpool hatches	100.0	68.00	0.00	13.00
42 2x15t Stor. winch A&R	570.0	67.50	0.00	4.50
43 400kW HPU	21.0	66.00	0.00	10.40
44 2xControl Cabin tensi	12.0	9.30	0.00	14.50
40 Pipelay spare	30.0	80.00	0.00	14.00
4 Platform carousel-towe	20.0	37.00	0.00	19.00
7 Heavy rigging support	15.0	20.00	13.20	14.00
8a 4.7m radius deflector	2.0	22.00	-7.00	14.00
8b side plate	0.5	42.70	-6.50	14.00
8c 4.7m radius hatch def	2.0	21.00	2.50	14.00
8d 4.7m radius hatch def	2.0	27.40	6.30	14.00
8e 4.7m radius hatch def	2.0	42.00	-2.50	14.00
8f 4.7m radius hatch def	2.0	52.00	-8.00	14.00
9 34t Aft carrousel gutt	5.0	-7.00	6.00	14.00
10 34t Fwd carrousel gut	5.0	-7.00	-6.00	14.00
12 Platform for aft caro	5.0	-3.30	7.60	14.50
16 2xCarousel hatch	60.0	30.00	0.00	14.00
20 Boom rest	30.0	48.00	0.00	19.00
21b 4.7 radius Carousel	5.0	20.50	7.60	14.00
23 2x20t Pull in platfor	6.0	62.00	0.00	15.00
24 2x20t Pull in gutter	6.0	62.00	0.00	15.00
25 2x20t winch for pull	30.0	63.00	0.00	14.00
28a 15t Car. Davit Hoist	7.0	39.50	-7.20	11.00
28b 15t Car. Davit Hoist	7.0	17.80	6.90	11.00
EQ. MARGIN	243.5	56.00	-0.24	34.08
Carousel Product Aft	750.0	26.00	0.00	7.00
Carousel Product Fore	1250.0	49.10	0.00	6.40
TENSION	540.0	65.50	0.00	25.00
TOTAL	8275.0	51.93	-0.15	20.58

Lightweight	10870.0	75.77	0.03	10.53
Deadweight	10948.6	49.16	-0.04	17.22
Total weight	21818.6	62.42	-0.01	13.89



INTACT STABILITY CRITERIA

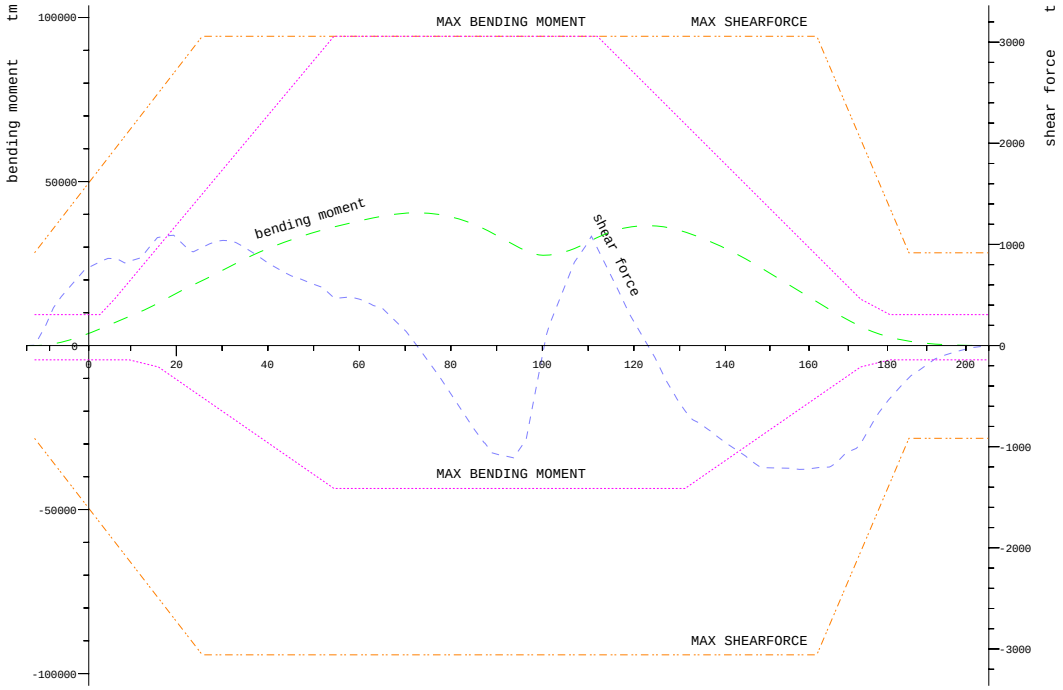
RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
V.AREA15-30	Area depending on GZ curve top	0.058	0.236	mrad	OK	0.697
V.AREA3040	Area under GZ curve between 30 and 40 deg	0.030	0.112	mrad	OK	1.210
V.GZ0.2	Min. GZ > 0.2	0.200	0.876	m	OK	0.748
V.POSMAX15	Top of GZ curve at least 15 degrees	15.000	27.168	deg	OK	-0.119
V.GM0.15	GM > 0.15 m	0.150	2.100	m	OK	0.150
V.IMOWEATHER	IMO weather criterion	1.000	2.299		OK	1.097
MINGM.PROB	Min GM from probabilistic dam calc	1.555	2.100	m	OK	1.555

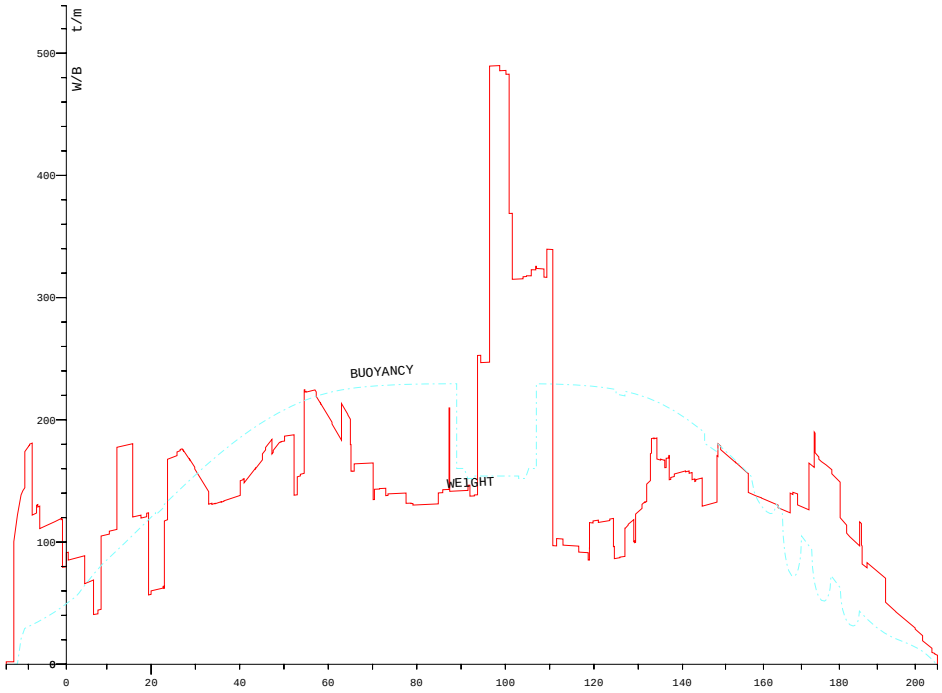
EFFECT OF FREE SURFACES

TANK ID	TANK NAME	FILL %	FRSM tm	GMCORR m	EXPLANATION
03	03 FW	65.0	94.85	-0.004	Maximum effect
04	04 FW	65.0	94.85	-0.004	Maximum effect
104	104 BILGE HOLDING	50.0	78.58	-0.004	Real moment
37	37 WB/DW	100.0	271.79	-0.012	Maximum effect
38	38 WB/DW	100.0	271.79	-0.012	Maximum effect
39	39 WB/DW	50.1	736.70	-0.034	Maximum effect
89	89 SEWAGE	50.0	33.76	-0.002	Real moment
90	90 SEWAGE	50.0	33.76	-0.002	Real moment
71	71 FO	0.0	38.44	-0.002	Maximum effect
72	72 FO	0.0	38.44	-0.002	Maximum effect
TOTAL			1692.97	-0.078	

Tanks not listed have free surface correction less than 0.001 m.

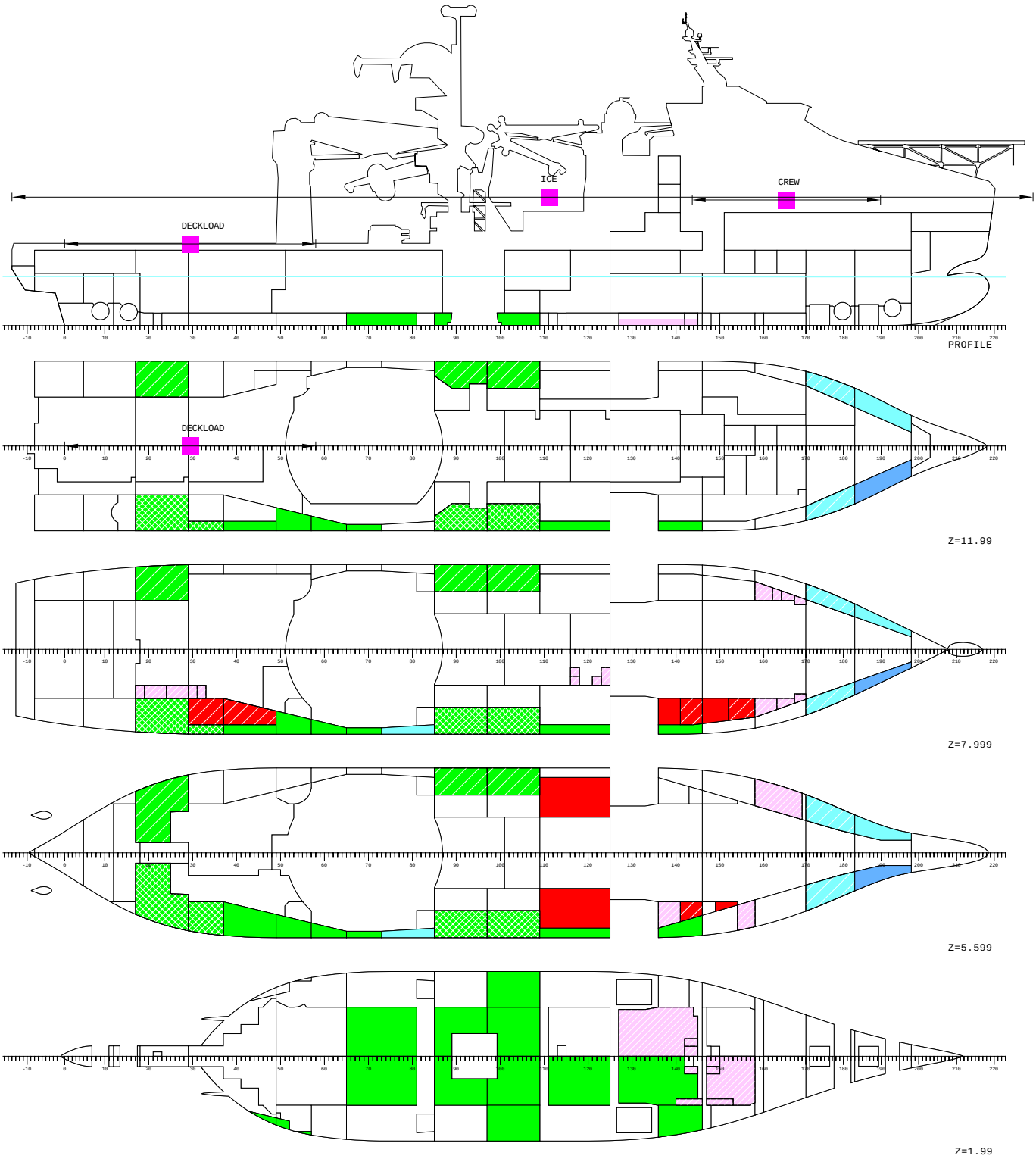
			X		Frame
Shear force (min)	-1225.0	t	109.00	m	158.00
Shear force (max)	1090.7	t	13.00	m	19.43
Max. rel. shear force	48.2	%	-0.60	m	-1.00
Sagging moment	-				
Hogging moment	40491.1	tm	50.00	m	72.29
Max. rel. bending moment	53.8	%	99.68	m	143.25





16.12 LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

16.12.1 LOADING CONDITION PREPARED FOR CRANE LIFTING OPERATION (BEFORE LIFTING)



LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

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

Draught mean (moulded)		7.756	m
Draught fwd	(moulded)	7.720	m
Draught aft	(moulded)	7.793	m
Trim		-0.073	m
KM above BL		13.21	m
GM0 (solid)		2.76	m
Free surface correction		-0.16	m
GM (fluid)		2.60	m
Trimming moment		-2668	tonm
Density of sea water		1.025	t/m3
Heel		0.0	deg

LIQUID LOADS	Volume m3	Weight t	LCG m	TCG m	VCG m	Frsm tm
Fuel oil	953.3	810.3	70.26	-4.78	5.68	1067.6
Fresh water	511.6	511.6	111.72	-1.23	7.33	113.6
Miscellaneous	318.5	326.5	94.55	-0.61	2.62	691.1
Technical fresh water	124.5	124.5	129.93	-4.53	7.95	54.8
Water ballast	3116.9	3194.9	59.24	-1.23	4.08	1331.1
TOTAL	5024.8	4967.7	70.53	-1.85	4.68	3258.3

MASS LOADS	Weight t	LCG m	TCG m	VCG m
Crew	100.0	115.00	0.00	20.00
Deckload	2400.0	20.00	0.00	13.00
Ice	223.6	77.20	0.03	20.45
TOTAL	2723.6	28.18	0.00	13.87
Lightweight	13246.9	73.49	0.69	11.91
Deadweight	7691.3	55.53	-1.19	7.93
Total weight	20938.2	66.89	0.00	10.45

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

LOADS IN TANKS

Tank ID	Tank Name	Fill %	Weight t	LCG m	TCG m	VCG m	FSM tm	GMcorr m
Fuel oil (Density=0.85)								
92	92 FO	98.0	104.7	22.50	-9.88	8.42	29	0.001
91	91 FO	98.0	120.4	29.06	-10.35	8.39	23	0.001
87	87 FO	0.0	0.0	72.90	0.00	3.80	576	0.028
85	85 FO	98.0	207.4	81.30	8.85	3.76	194	0.009
86	86 FO	98.0	207.4	81.30	-8.85	3.76	194	0.009
84	84 FO SERVICE	98.0	32.4	96.35	-9.90	6.92	18	0.001
83	83 FO SETTLING	98.0	59.5	99.79	-9.54	5.45	18	0.001
81	81 FO SETTLING	98.0	45.4	104.01	-9.37	6.18	16	0.001
80	80 FO SERVICE	98.0	30.2	107.84	-9.43	6.92	0	0.000
133	133 FO EMGEN	98.0	3.0	108.89	0.81	36.27	0	0.000
Total of Fuel oil			810.3	70.26	-4.78	5.68	1068	0.051
Fresh water (Density=1)								
20	20 FW	98.0	92.8	54.98	-12.87	6.51	0	0.000
05	05 FW	98.0	147.2	121.91	7.34	7.32	29	0.001
06	06 FW	98.0	147.2	121.91	-7.34	7.32	29	0.001
03	03 FW	98.0	124.5	129.93	4.53	7.95	55	0.003
Total of Fresh water			511.6	111.72	-1.23	7.33	114	0.005
Miscellaneous (Density=1.025)								
117	117 THR. OIL	50.0	3.8	12.00	-6.75	6.35	0	0.000
116	116 HYDR OIL	50.0	9.6	14.45	-6.75	6.35	0	0.000
115	115 WASTE OIL	50.0	9.6	17.95	-6.75	6.35	0	0.000
114	114 STERN TUBE OIL	50.0	3.8	20.40	-6.75	6.35	0	0.000
113	113 MAIN GEAR OIL	50.0	3.8	21.80	-6.75	6.35	0	0.000
111	111 HO	50.0	2.7	81.30	-3.60	6.27	0	0.000
112	112 HO	50.0	2.7	81.30	-5.00	6.27	0	0.000
110	110 SPARE HYDR OIL	50.0	2.7	84.80	-5.00	6.27	0	0.000
109	109 WASTE OIL	50.0	5.3	86.20	-4.30	6.27	0	0.000
53	53 UREA	50.0	90.0	94.26	3.95	0.50	424	0.020
100	100 LO ME	50.0	23.3	96.27	-9.65	2.90	15	0.001
106	106 SLUDGE	50.0	4.2	99.49	-7.30	0.50	0	0.000
104	104 DRAIN OIL	50.0	2.5	99.85	2.20	0.50	0	0.000
105	105 FO DRAIN	50.0	3.4	99.85	0.80	0.50	0	0.000
130	130 FW COOL DROP	50.0	2.5	99.85	-2.20	0.50	0	0.000
101	101 FO DRAIN	50.0	3.4	103.35	-0.80	0.50	0	0.000
102	102 DRAIN OIL	50.0	2.5	103.35	-2.20	0.50	0	0.000
103	103 SLUDGE	50.0	4.0	104.32	-7.29	0.58	0	0.000
48	48 BILGE HOLDING	50.0	49.0	106.54	-3.76	0.52	213	0.010
121	121 BILGE SETTLING	50.0	16.5	108.60	-9.35	3.14	0	0.000
99	99 THR OIL	50.0	9.5	111.31	9.07	6.28	0	0.000
98	98 LO	50.0	11.3	111.60	-9.02	6.28	0	0.000
97	97 THR OIL	50.0	3.3	113.47	8.69	6.28	0	0.000
120	120 SEWAGE	50.0	43.4	113.66	7.83	3.19	39	0.002
96	96 LO	50.0	4.8	114.72	-8.47	6.27	0	0.000
95	95 THR OIL	50.0	3.3	115.14	8.39	6.27	0	0.000
93	93 FOOD WASTE	50.0	2.8	117.12	7.69	6.27	0	0.000

Tank ID	Tank Name	Fill %	Weight t	LCG m	TCG m	VCG m	FSM tm	GMcorr m
94	94 SPARE LO	50.0	2.8	117.12	-7.69	6.27	0	0.000
Total of Miscellaneous			326.5	94.55	-0.61	2.62	691	0.033
Technical fresh water (Density=1)								
04	04 TFW	98.0	124.5	129.93	-4.53	7.95	55	0.003
Water ballast (Density=1.025)								
32	32 WB/A.H.	19.0	73.0	15.31	-5.59	4.59	554	0.026
31	31 WB/A.H.	81.0	311.0	15.48	9.05	7.15	554	0.026
30	30 WB	5.4	5.5	23.60	-8.74	3.40	0	0.000
28	28 WB	100.0	180.5	29.50	-11.59	6.27	0	0.000
26	26 WB	100.0	161.0	36.29	-11.92	7.23	0	0.000
24	24 WB	100.0	92.3	41.73	-12.61	7.09	0	0.000
22	22 WB	100.0	56.1	47.70	-13.00	7.01	0	0.000
67	67 WB	100.0	175.5	50.50	3.90	1.00	0	0.000
68	68 WB	100.0	175.5	50.50	-3.90	1.00	0	0.000
65	65 WB	100.0	86.2	62.43	4.93	1.03	0	0.000
66	66 WB	100.0	86.2	62.43	-4.93	1.03	0	0.000
18	18 WB/A.H.	19.0	65.6	63.10	-11.35	2.90	56	0.003
17	17 WB/A.H.	81.0	279.7	63.12	11.36	5.86	56	0.003
15	15 WB/A.H.	81.0	293.9	71.50	11.35	6.05	56	0.003
16	16 WB/A.H.	19.0	68.9	71.50	-11.35	2.95	56	0.003
59	59 WB	100.0	92.6	71.50	10.55	1.03	0	0.000
60	60 WB	100.0	92.6	71.50	-10.55	1.03	0	0.000
61	61 WB	100.0	117.3	71.90	4.14	1.01	0	0.000
62	62 WB	100.0	117.3	71.90	-4.14	1.01	0	0.000
14	14 WB	100.0	168.8	81.30	-12.75	7.00	0	0.000
58	58 WB	100.0	153.6	82.00	-3.90	1.00	0	0.000
54	54 WB	100.0	174.9	94.14	-3.85	1.00	0	0.000
52	52 WB	100.0	48.2	97.83	-9.68	1.15	0	0.000
12	12 WB	100.0	118.6	98.26	-12.39	6.69	0	0.000
Total of Water ballast			3194.9	59.24	-1.23	4.08	1331	0.064
TOTAL LOADS IN TANKS			4967.7	70.53	-1.85	4.68	3258	0.156

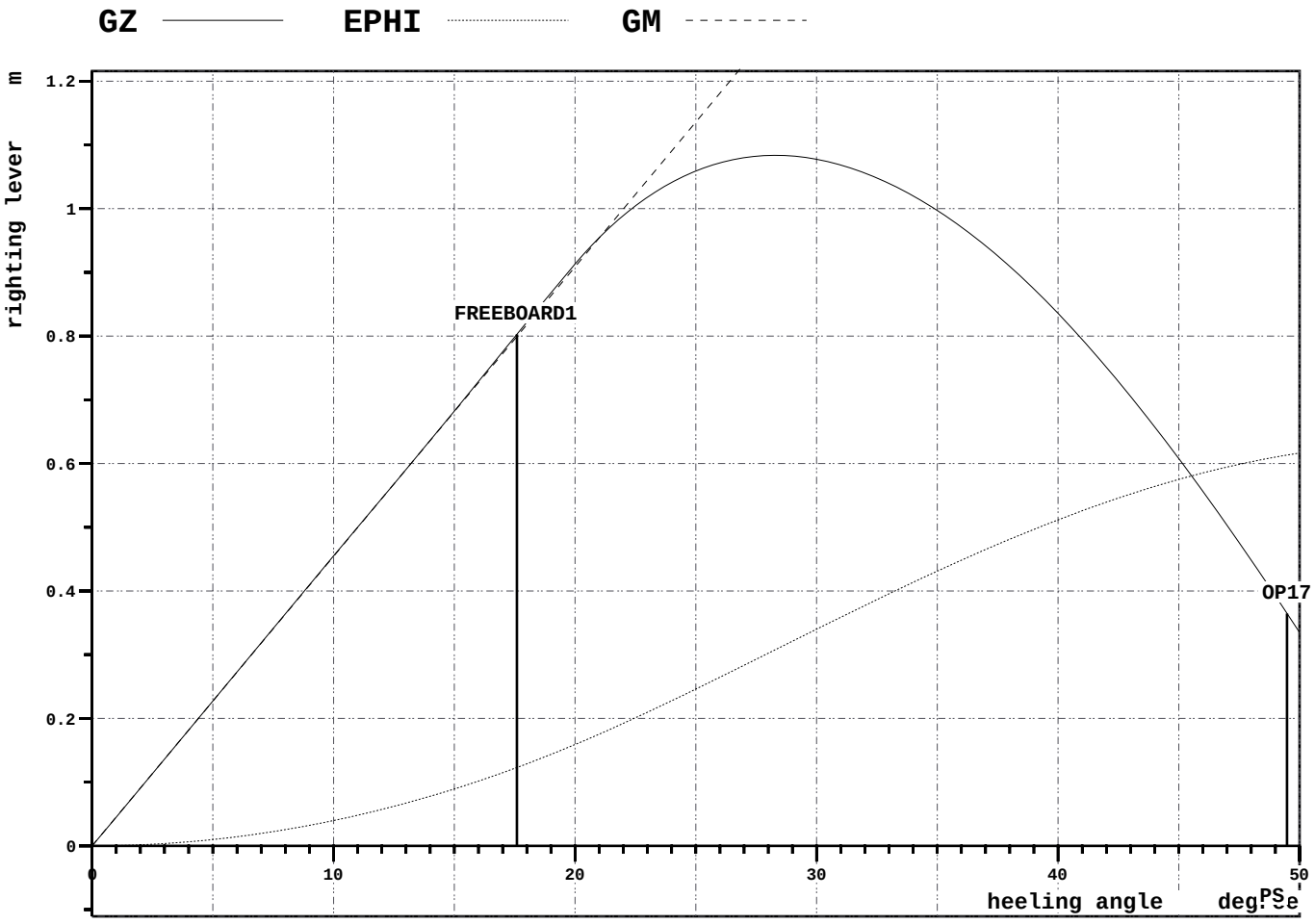
LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

EFFECT OF FREE SURFACES

Tank ID	Tank Name	Purp	Fill %	FSM tm	GMcorr m	Explanation
03	03 FW	FW	98.0	54.8	0.003	Maximum effect
04	04 TFW	TFW	98.0	54.8	0.003	Maximum effect
05	05 FW	FW	98.0	29.4	0.001	Real moment
06	06 FW	FW	98.0	29.4	0.001	Real moment
100	100 LO ME	MIS	50.0	15.1	0.001	Real moment
120	120 SEWAGE	MIS	50.0	39.2	0.002	Real moment
15	15 WB/A.H.	WB	81.0	55.9	0.003	Maximum effect
16	16 WB/A.H.	WB	19.0	55.9	0.003	Maximum effect
17	17 WB/A.H.	WB	81.0	55.9	0.003	Maximum effect
18	18 WB/A.H.	WB	19.0	55.9	0.003	Maximum effect
31	31 WB/A.H.	WB	81.0	553.8	0.026	Maximum effect
32	32 WB/A.H.	WB	19.0	553.8	0.026	Maximum effect
48	48 BILGE HOLDING	MIS	50.0	213.3	0.010	Real moment
53	53 UREA	MIS	50.0	423.5	0.020	Real moment
81	81 FO SETTLING	FO	98.0	15.8	0.001	Real moment
83	83 FO SETTLING	FO	98.0	17.6	0.001	Real moment
84	84 FO SERVICE	FO	98.0	18.0	0.001	Real moment
85	85 FO	FO	98.0	194.4	0.009	Real moment
86	86 FO	FO	98.0	194.4	0.009	Real moment
87	87 FO	FO	0.0	575.9	0.028	Maximum effect
91	91 FO	FO	98.0	22.7	0.001	Real moment
92	92 FO	FO	98.0	28.8	0.001	Real moment
TOTAL				3258.3	0.156	

Tanks not listed have free surface correction less than 0.001 m.

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE



GZ-VALUES

HEEL degree	GZ m	EPHI rad*m	MS m	T m	TR m
0.0	0.000	0.000	0.000	7.756	-0.073
1.0	0.045	0.000	0.000	7.755	-0.070
3.0	0.136	0.004	0.000	7.742	-0.055
5.0	0.227	0.010	0.000	7.717	-0.025
10.0	0.455	0.040	0.003	7.600	0.101
15.0	0.682	0.089	0.008	7.410	0.258
20.0	0.913	0.159	0.023	7.149	0.439
30.0	1.077	0.340	-0.224	6.591	0.352
40.0	0.836	0.512	-0.838	5.909	-0.263
50.0	0.335	0.617	-1.659	4.991	-1.213

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

INTACT STABILITY CRITERIA

RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
V.AREA15-30	Area depending on GZ curve top	0.057	0.308	mrad	OK	0.793
V.AREA3040	Area under GZ curve between 30 and 40 deg	0.030	0.172	mrad	OK	1.176
V.GZ0.2	Min. GZ > 0.2	0.200	1.077	m	OK	0.848
V.POSMAX15	Top of GZ curve at least 15 degrees	15.000	28.299	deg	OK	-0.061
V.GM0.15	GM > 0.15 m	0.150	2.603	m	OK	0.150
V.IMOWEATHER	IMO weather criterion	1.000	4.983		OK	0.792
IMOWEATHER2	Heeling angle due to steady wind	14.134	2.333	deg	OK	0.406
MINGM.PROB	Min GM from probabilistic dam calc	1.712	2.603	m	OK	1.712

EXTERNAL FLOODING OPENINGS - INTACT CALCULATIONS

NAME	OTYPE	X	Y	Z	IMMA	IMMR	REDPD
OP11	UNPROTECTED	101.60	5.000	24.000	*******	16.259	0.091
OP12	UNPROTECTED	105.10	-5.000	24.000	*******	16.261	0.091
OP13	UNPROTECTED	96.70	1.800	30.000	*******	22.257	0.036
OP14	UNPROTECTED	96.70	-1.800	30.000	*******	22.257	0.036
OP15	UNPROTECTED	86.20	9.200	24.000	*******	16.252	0.164
OP16	UNPROTECTED	86.20	-9.200	24.000	*******	16.252	0.164
OP17	UNPROTECTED	36.50	10.965	21.000	49.5	13.227	0.195
OP18	UNPROTECTED	36.50	-10.965	21.000	-49.5	13.227	0.195
OP19	UNPROTECTED	51.90	5.000	17.500	*******	9.735	0.090
OP20	UNPROTECTED	51.90	-5.000	17.500	*******	9.735	0.090
OP11B	UNPROTECTED	101.60	-5.000	24.000	*******	16.259	0.091
OP12B	UNPROTECTED	105.10	5.000	24.000	*******	16.261	0.091
OP13B	UNPROTECTED	96.70	-1.800	30.000	*******	22.257	0.036
OP14B	UNPROTECTED	96.70	1.800	30.000	*******	22.257	0.036

EXTERNAL FLOODING OPENINGS - DAMAGE CALCULATIONS

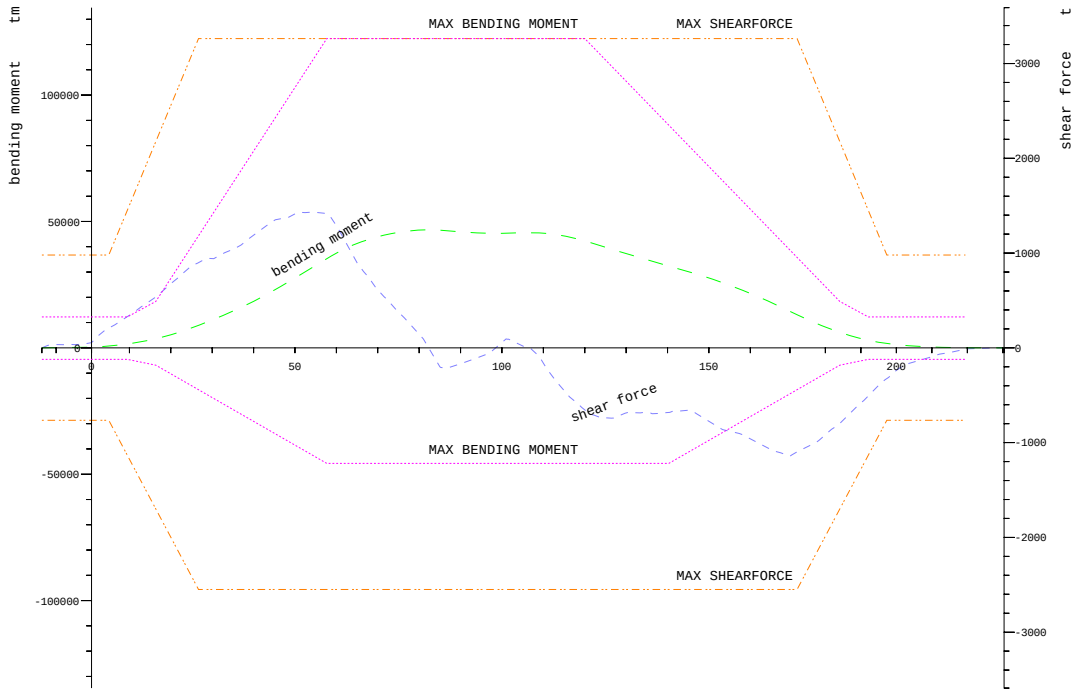
NAME	OTYPE	X	Y	Z	IMMA	IMMR	REDPD
OP01	WEATHERTIGHT	-8.10	13.500	12.600	21.3	4.805	0.238
OP02	WEATHERTIGHT	-8.10	-13.500	12.600	-21.3	4.805	0.238
OP03	WEATHERTIGHT	41.40	13.500	12.600	20.7	4.830	0.238
OP04	WEATHERTIGHT	41.40	-13.500	12.600	-20.7	4.830	0.238
OP05	WEATHERTIGHT	86.90	13.500	12.600	20.1	4.852	0.238
OP06	WEATHERTIGHT	86.90	-13.500	12.600	-20.1	4.852	0.238
OP07	WEATHERTIGHT	98.10	13.500	18.450	38.6	10.708	0.238
OP08	WEATHERTIGHT	98.10	-13.500	18.450	-38.6	10.708	0.238
OP09	WEATHERTIGHT	135.50	7.700	18.450	*******	10.726	0.137
OP10	WEATHERTIGHT	135.50	-7.700	18.450	*******	10.726	0.137
OP11	UNPROTECTED	101.60	5.000	24.000	*******	16.259	0.091
OP12	UNPROTECTED	105.10	-5.000	24.000	*******	16.261	0.091
OP13	UNPROTECTED	96.70	1.800	30.000	*******	22.257	0.036
OP14	UNPROTECTED	96.70	-1.800	30.000	*******	22.257	0.036
OP15	UNPROTECTED	86.20	9.200	24.000	*******	16.252	0.164
OP16	UNPROTECTED	86.20	-9.200	24.000	*******	16.252	0.164
OP17	UNPROTECTED	36.50	10.965	21.000	49.5	13.227	0.195
OP18	UNPROTECTED	36.50	-10.965	21.000	-49.5	13.227	0.195
OP19	UNPROTECTED	51.90	5.000	17.500	*******	9.735	0.090
OP20	UNPROTECTED	51.90	-5.000	17.500	*******	9.735	0.090

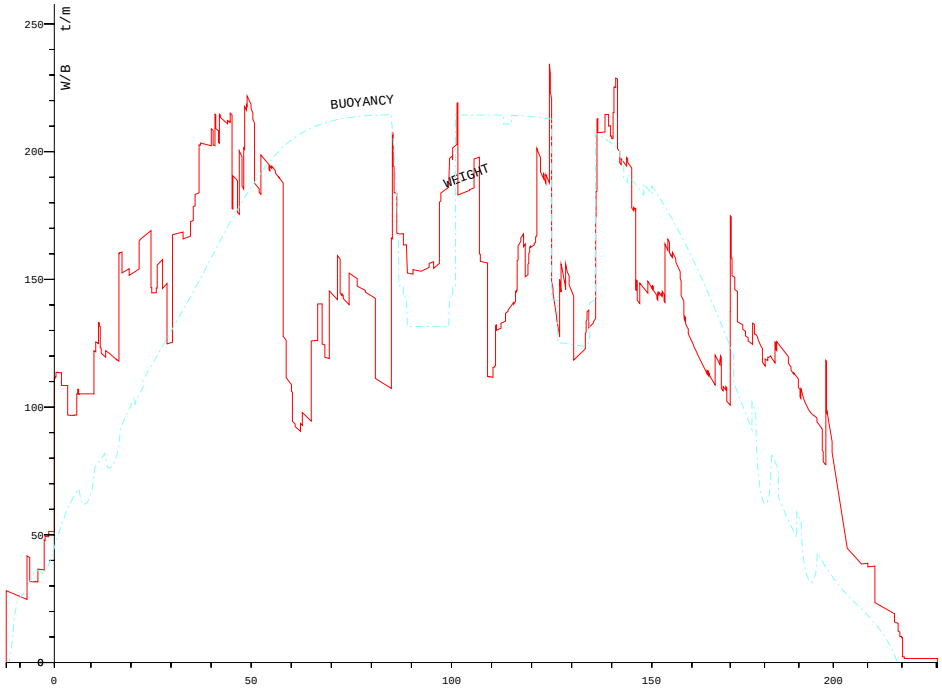
NAME	OTYPE	X	Y	Z	IMMA	IMMR	REDPD
OP11B	UNPROTECTED	101.60	-5.000	24.000	*******	16.259	0.091
OP12B	UNPROTECTED	105.10	5.000	24.000	*******	16.261	0.091
OP13B	UNPROTECTED	96.70	-1.800	30.000	*******	22.257	0.036
OP14B	UNPROTECTED	96.70	1.800	30.000	*******	22.257	0.036

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

LONGITUDINAL STRENGTH

			X		Frame
Shear force (min)	-1143.4	t	118.10	m	170.00
Shear force (max)	1430.9	t	35.00	m	50.85
Max. rel. shear force	47.0	%	126.50	m	184.00
Sagging moment	-				
Hogging moment	46755.7	tm	56.80	m	82.00
Max. rel. bending moment	39.3	%	110.77	m	159.10





LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

DAMAGE STABILITY CRITERIA WITH ACTUAL TANK FILLING

DAM	STAGE	PHASE	RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
D16	1	EQ	V.PROGR.A469	No progr. flooding	19.422	0.000	deg	OK	-0.150
D16	1	EQ	V.MAXHEEL.A469	Maximum heel	15.000	0.000	deg	OK	-0.112
D16	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.631	deg	OK	-0.051
D16	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.942	m	OK	0.140
DP01	1	EQ	V.PROGR.A469	No progr. flooding	19.908	0.232	deg	OK	0.134
DP01	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.232	deg	OK	0.146
DP01	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.085	deg	OK	0.293
DP01	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.853	m	OK	0.427
DP02	1	EQ	V.PROGR.A469	No progr. flooding	20.068	0.592	deg	OK	0.148
DP02	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.592	deg	OK	0.165
DP02	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.010	deg	OK	0.366
DP02	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.862	m	OK	0.436
DP03	1	EQ	V.PROGR.A469	No progr. flooding	20.188	1.670	deg	OK	0.269
DP03	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.670	deg	OK	0.345
DP03	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.330	deg	OK	0.545
DP03	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.866	m	OK	0.522
DP04	1	EQ	V.PROGR.A469	No progr. flooding	19.850	2.192	deg	OK	0.398
DP04	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	2.192	deg	OK	0.441
DP04	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	46.038	deg	OK	0.755
DP04	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.824	m	OK	0.679
DP05	1	EQ	V.PROGR.A469	No progr. flooding	19.859	2.632	deg	OK	0.292
DP05	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	2.632	deg	OK	0.359
DP05	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	46.075	deg	OK	0.686
DP05	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.883	m	OK	0.563
DP05_L	1	EQ	V.PROGR.A469	No progr. flooding	19.906	2.040	deg	OK	0.238
DP05_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	2.040	deg	OK	0.295
DP05_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	46.814	deg	OK	0.598
DP05_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.884	m	OK	0.511
DP06	1	EQ	V.PROGR.A469	No progr. flooding	19.599	1.201	deg	OK	-0.016
DP06	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.201	deg	OK	0.011
DP06	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.525	deg	OK	0.309
DP06	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.943	m	OK	0.271
DP06_L	1	EQ	V.PROGR.A469	No progr. flooding	19.941	1.257	deg	OK	0.114
DP06_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.257	deg	OK	0.158
DP06_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.878	deg	OK	0.418
DP06_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.902	m	OK	0.393
DP07	1	EQ	V.PROGR.A469	No progr. flooding	19.933	0.089	deg	OK	0.033
DP07	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.089	deg	OK	0.053
DP07	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.124	deg	OK	0.160
DP07	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.883	m	OK	0.317
DP07_L	1	EQ	V.PROGR.A469	No progr. flooding	20.395	0.986	deg	OK	0.269
DP07_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.986	deg	OK	0.306
DP07_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.014	deg	OK	0.472
DP07_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.836	m	OK	0.545

DAM	STAGE	PHASE	RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
DP08	1	EQ	V.PROGR.A469	No progr. flooding	20.458	1.203	deg	OK	0.290
DP08	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.203	deg	OK	0.332
DP08	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.797	deg	OK	0.529
DP08	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.836	m	OK	0.569
DP08_L	1	EQ	V.PROGR.A469	No progr. flooding	20.452	1.168	deg	OK	0.284
DP08_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.168	deg	OK	0.326
DP08_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.832	deg	OK	0.506
DP08_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.837	m	OK	0.561
DP09	1	EQ	V.PROGR.A469	No progr. flooding	19.406	1.270	deg	OK	0.030
DP09	1	EQ	V.MAXHEEL.A469	Maximum heel	15.000	1.270	deg	OK	0.113
DP09	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.822	deg	OK	0.352
DP09	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.934	m	OK	0.305
DP09_L	1	EQ	V.PROGR.A469	No progr. flooding	19.843	1.303	deg	OK	0.129
DP09_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.303	deg	OK	0.175
DP09_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.975	deg	OK	0.434
DP09_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.898	m	OK	0.406
DP10	1	EQ	V.PROGR.A469	No progr. flooding	19.915	0.000	deg	OK	-0.170
DP10	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.000	deg	OK	-0.155
DP10	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.405	deg	OK	-0.094
DP10	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.949	m	OK	0.122
DP11	1	EQ	V.PROGR.A469	No progr. flooding	19.503	2.545	deg	OK	0.297
DP11	1	EQ	V.MAXHEEL.A469	Maximum heel	15.000	2.545	deg	OK	0.446
DP11	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	46.781	deg	OK	0.666
DP11	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.884	m	OK	0.556
DP11_L	1	EQ	V.PROGR.A469	No progr. flooding	19.570	2.182	deg	OK	0.262
DP11_L	1	EQ	V.MAXHEEL.A469	Maximum heel	15.000	2.182	deg	OK	0.397
DP11_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.167	deg	OK	0.615
DP11_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.884	m	OK	0.526
DP12	1	EQ	V.PROGR.A469	No progr. flooding	19.809	0.744	deg	OK	0.035
DP12	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.744	deg	OK	0.066
DP12	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.716	deg	OK	0.274
DP12	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.910	m	OK	0.317
DP14	1	EQ	V.PROGR.A469	No progr. flooding	20.343	0.592	deg	OK	-0.008
DP14	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.592	deg	OK	0.023
DP14	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.049	deg	OK	0.191
DP14	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.918	m	OK	0.273
DP15	1	EQ	V.PROGR.A469	No progr. flooding	20.112	0.357	deg	OK	-0.085
DP15	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.357	deg	OK	-0.059
DP15	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.293	deg	OK	0.075
DP15	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.935	m	OK	0.197
DP15_L	1	EQ	V.PROGR.A469	No progr. flooding	20.320	0.364	deg	OK	-0.062
DP15_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.364	deg	OK	-0.037
DP15_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.248	deg	OK	0.095
DP15_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.927	m	OK	0.221
DS01	1	EQ	V.PROGR.A469	No progr. flooding	19.912	0.213	deg	OK	0.157
DS01	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.213	deg	OK	0.170
DS01	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.301	deg	OK	0.281
DS01	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.845	m	OK	0.446

DAM	STAGE	PHASE	RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
DS02	1	EQ	V.PROGR.A469	No progr. flooding	20.079	0.573	deg	OK	0.169
DS02	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.573	deg	OK	0.189
DS02	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.223	deg	OK	0.347
DS02	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.855	m	OK	0.452
DS03	1	EQ	V.PROGR.A469	No progr. flooding	20.029	1.126	deg	OK	0.204
DS03	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.126	deg	OK	0.235
DS03	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.543	deg	OK	0.451
DS03	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.864	m	OK	0.485
DS04	1	EQ	V.PROGR.A469	No progr. flooding	20.186	0.121	deg	OK	0.108
DS04	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.121	deg	OK	0.108
DS04	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.879	deg	OK	0.189
DS04	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.851	m	OK	0.421
DS05	1	EQ	V.PROGR.A469	No progr. flooding	20.243	1.171	deg	OK	0.210
DS05	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.171	deg	OK	0.256
DS05	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.829	deg	OK	0.478
DS05	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.863	m	OK	0.490
DS05_L	1	EQ	V.PROGR.A469	No progr. flooding	20.274	1.600	deg	OK	0.275
DS05_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.600	deg	OK	0.333
DS05_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.400	deg	OK	0.571
DS05_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.856	m	OK	0.551
DS06	1	EQ	V.PROGR.A469	No progr. flooding	19.895	0.762	deg	OK	-0.023
DS06	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.762	deg	OK	-0.002
DS06	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.613	deg	OK	0.230
DS06	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.929	m	OK	0.264
DS06_L	1	EQ	V.PROGR.A469	No progr. flooding	20.237	0.835	deg	OK	0.116
DS06_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.835	deg	OK	0.152
DS06_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.954	deg	OK	0.358
DS06_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.884	m	OK	0.399
DS07	1	EQ	V.PROGR.A469	No progr. flooding	19.681	2.731	deg	OK	0.353
DS07	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	2.731	deg	OK	0.423
DS07	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	46.302	deg	OK	0.677
DS07	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.875	m	OK	0.598
DS07_L	1	EQ	V.PROGR.A469	No progr. flooding	19.791	1.725	deg	OK	0.260
DS07_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.725	deg	OK	0.312
DS07_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.467	deg	OK	0.543
DS07_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.870	m	OK	0.523
DS08	1	EQ	V.PROGR.A469	No progr. flooding	19.738	1.654	deg	OK	0.276
DS08	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.654	deg	OK	0.325
DS08	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.596	deg	OK	0.543
DS08	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.860	m	OK	0.543
DS08_L	1	EQ	V.PROGR.A469	No progr. flooding	19.734	1.686	deg	OK	0.279
DS08_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.686	deg	OK	0.329
DS08_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	47.559	deg	OK	0.548
DS08_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.861	m	OK	0.545
DS09	1	EQ	V.PROGR.A469	No progr. flooding	19.904	0.976	deg	OK	0.028
DS09	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.976	deg	OK	0.061
DS09	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.504	deg	OK	0.312
DS09	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.921	m	OK	0.310

DAM	STAGE	PHASE	RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM
DS09_L	1	EQ	V.PROGR.A469	No progr. flooding	20.341	1.043	deg	OK	0.133
DS09_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.043	deg	OK	0.174
DS09_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.624	deg	OK	0.403
DS09_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.886	m	OK	0.415
DS10	1	EQ	V.PROGR.A469	No progr. flooding	19.915	0.000	deg	OK	-0.170
DS10	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.000	deg	OK	-0.155
DS10	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.405	deg	OK	-0.094
DS10	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.949	m	OK	0.122
DS11	1	EQ	V.PROGR.A469	No progr. flooding	19.838	0.403	deg	OK	0.080
DS11	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.403	deg	OK	0.112
DS11	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.219	deg	OK	0.239
DS11	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.880	m	OK	0.359
DS11_L	1	EQ	V.PROGR.A469	No progr. flooding	19.835	0.419	deg	OK	0.081
DS11_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.419	deg	OK	0.114
DS11_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.202	deg	OK	0.242
DS11_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.880	m	OK	0.362
DS12	1	EQ	V.PROGR.A469	No progr. flooding	19.724	1.093	deg	OK	0.094
DS12	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	1.093	deg	OK	0.133
DS12	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.562	deg	OK	0.327
DS12	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.904	m	OK	0.365
DS14	1	EQ	V.PROGR.A469	No progr. flooding	20.331	0.610	deg	OK	-0.032
DS14	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.610	deg	OK	0.000
DS14	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	48.831	deg	OK	0.207
DS14	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.927	m	OK	0.254
DS15	1	EQ	V.PROGR.A469	No progr. flooding	20.102	0.374	deg	OK	-0.107
DS15	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.374	deg	OK	-0.081
DS15	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.076	deg	OK	0.088
DS15	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.944	m	OK	0.180
DS15_L	1	EQ	V.PROGR.A469	No progr. flooding	20.309	0.382	deg	OK	-0.086
DS15_L	1	EQ	V.MAXHEEL.A469	Maximum heel	17.000	0.382	deg	OK	-0.060
DS15_L	1	EQ	V.RANGE.A469	Range of pos. stab	20.000	49.031	deg	OK	0.107
DS15_L	1	EQ	V.MINGZ.A469	Min. righting lever	0.100	0.937	m	OK	0.201

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

CRITICAL DAMAGE CASE WITH ACTUAL TANK FILLING

CRITICAL DAMAGE CASE : DP04
STAGE : 1
PHASE : EQ

FLOATING POSITION AND STABILITY, CRITICAL DAMAGE CASE

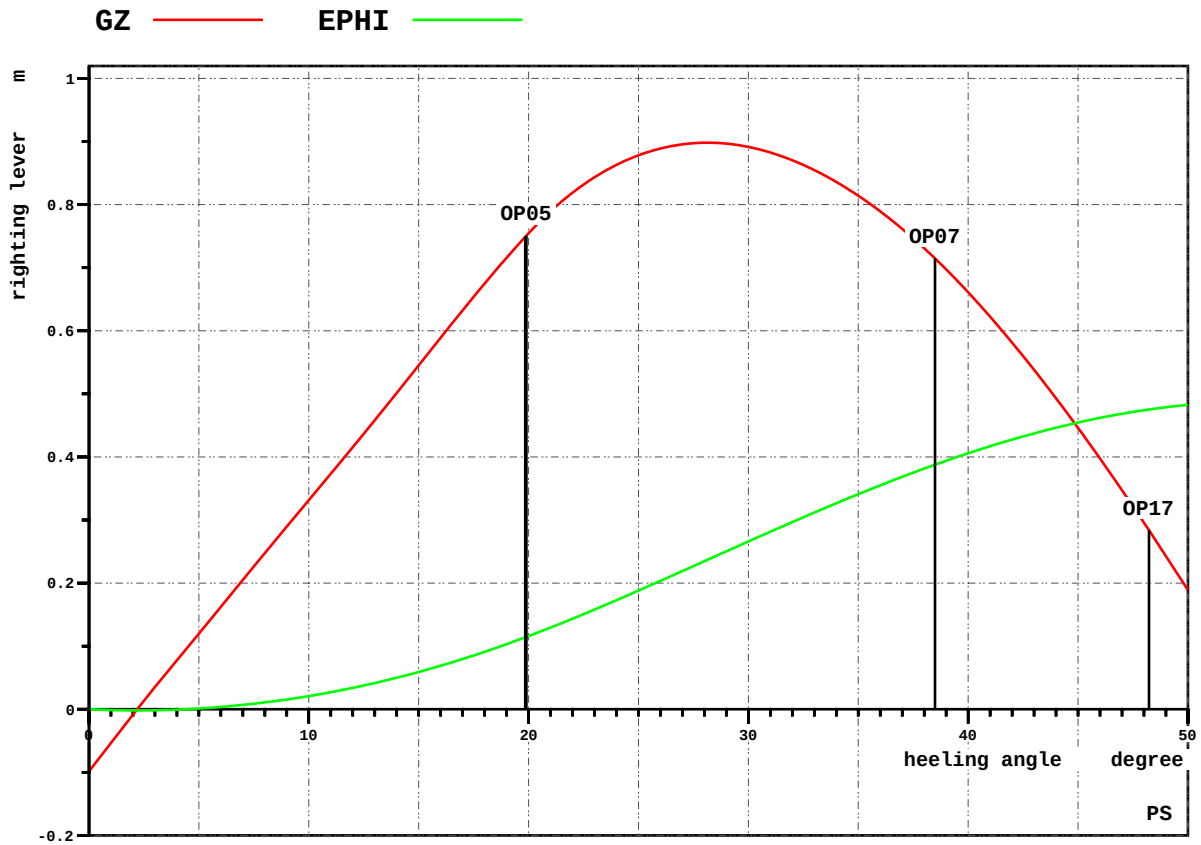
TA m	T m	TF m	TR m	HEEL degree	FRB m	RANGEF degree	GZMAXR m	AFA rad*m	GMACT m	MINGM m
7.917	7.794	7.671	-0.245	2.2	3.55	46.0	0.90	0.4771	2.534	0.755

INFLOODED SEA WATER IN THE DAMAGED ROOMS

DAM	STAGE	PHASE	Tank ID	DES	PERM	VOL	W	XCG	YCG	ZCG
DP04	1	EQ	29	29 FW	0.95	66.1	67.8	22.73	10.62	5.38
DP04	1	EQ	128	128 VOID	0.95	0.0	0.0	-	-	-
DP04	1	EQ	27	27 FW	0.95	127.2	130.3	29.50	11.20	4.94
DP04	1	EQ	126	126 VOID	0.95	0.0	0.0	-	-	-

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

GZ-CURVE, CRITICAL DAMAGE CASE



GZ-VALUES, CRITICAL DAMAGE CASE

Initial condition : LC08
Damage case : DP04
Stage of damage : 1
Phase of stage : EQ
Azimuth : 0 deg

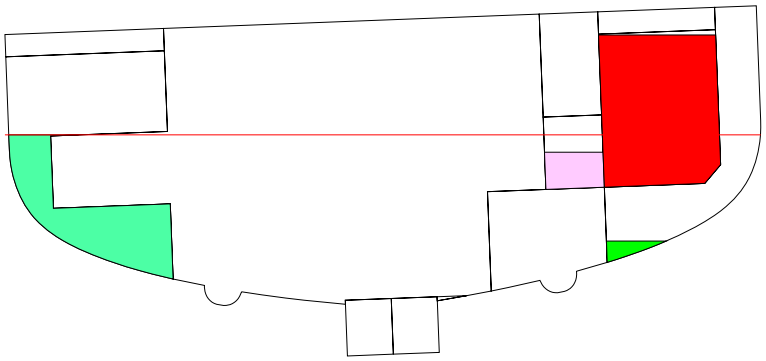
HEEL degree	GZ m	EPHI rad*m	MS m	T m	TR m
0.0	-0.098	0.000	-0.098	7.799	-0.244
1.0	-0.053	-0.001	-0.101	7.798	-0.246
3.0	0.035	-0.002	-0.109	7.789	-0.244
5.0	0.120	0.001	-0.121	7.769	-0.239
7.0	0.205	0.007	-0.131	7.737	-0.221
10.0	0.332	0.021	-0.148	7.667	-0.184
12.0	0.415	0.034	-0.158	7.606	-0.154
15.0	0.545	0.059	-0.169	7.492	-0.101
20.0	0.755	0.116	-0.189	7.250	-0.016
30.0	0.892	0.266	-0.488	6.734	-0.284
40.0	0.661	0.406	-1.112	6.093	-1.014
50.0	0.189	0.483	-1.925	5.214	-2.080

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

DAMAGE STABILITY CRITERIA WITH ACTUAL TANK FILLING, CRITICAL DAMAGE CASE

DAM	STAGE	PHASE	RCR	REQ	ATTV	UNIT	STAT	MINGM
DP04	1	EQ	V.PROGR..	19.850	2.192	deg	OK	0.398
DP04	1	EQ	V.MAXHEE.	17.000	2.192	deg	OK	0.441
DP04	1	EQ	V.RANGE..	20.000	46.038	deg	OK	0.755
DP04	1	EQ	V.MINGZ..	0.100	0.824	m	OK	0.679

FLOATING POSITION, CRITICAL DAMAGE CASE



X=#33

DAMAGE STABILITY CRITERIA SOLAS Ch II-1 Pt B-2 Reg. 15.8.4

Minimum GM-value is interpolated by trim and draught. Please refer to Ch. 14 MINIMUM GM CURVES.

RCR	TEXT	REQ	ATTV	UNIT	STAT	MINGM	MARGIN
MINGM.SOLAS	Min GM SOLAS dam calc	0.071	2.603	m	OK	0.071	2.533

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

16.12.2 CRANE HEELING MOMENT AND COUNTER BALLAST MOMENT

Crane Load Heeling Moment

Maximum permissible crane load [t]:		400	
Initial CoG position of crane load (x,y,z) [m]:	20	0	13
Operational CoG of crane load (crane tip) (x,y,z) [m]:	36.5	30.5	46
Moment from load in crane [tm]		12200	

Crane Jib Heeling Moment

Mass of crane/jib [t]:		457	
Initial CoG position of crane (x,y,z) [m]:	45.23	10.965	27.44
Operational CoG posistion of crane (x,y,z) [m]:	36.58	16.807	35.69
Moment from crane/jib [tm]		2671	

Counter Ballast Moment

Moment from counter ballast tanks:

Tank: 15 15 WB/A.H.	(11.35m * -229t)	[tm]:	-2594
Tank: 16 16 WB/A.H.	(-11.4m * 229t)	[tm]:	-2594
Tank: 31 31 WB/A.H.	(10.11m * -238t)	[tm]:	-2406
Tank: 32 32 WB/A.H.	(-10.1m * 238t)	[tm]:	-2406
Tank: 17 17 WB/A.H.	(11.36m * -218t)	[tm]:	-2472
Tank: 18 18 WB/A.H.	(-11.4m * 218t)	[tm]:	-2472
Resulting moment from counter ballast in rooms		[tm]:	-14944

Moment working during lifting (before drop of load)

Craneload (HL2)	12200
Cranejib	2671
Ballast in tanks:	-14944
Resulting moment during lifting (HL)	-73

Moment working after drop of load

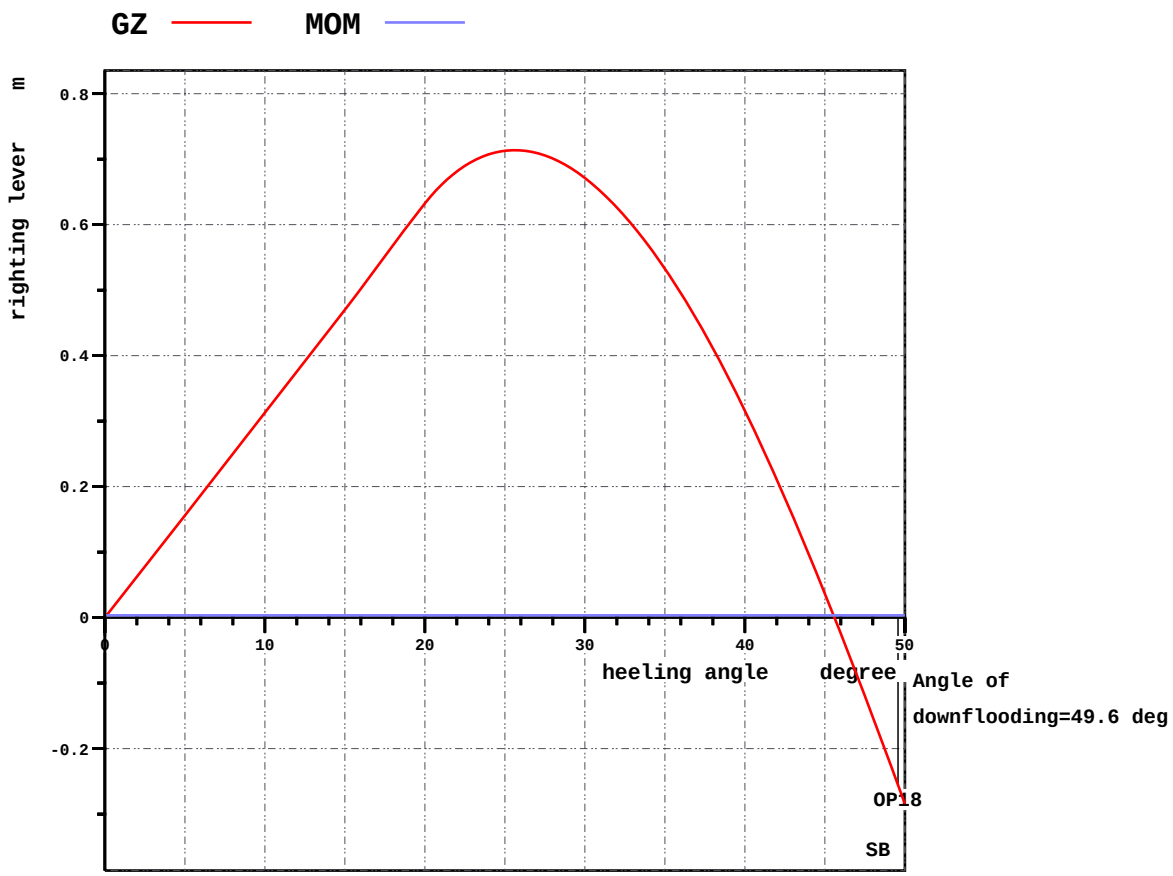
Resulting moment during lifting (HL)	-73
Drop of load moment (- crane load) (HL2)	12200
Resulting moment after drop of load (HL1)	-12273

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

16.12.3 LOADING CONDITION DURING CRANE LIFTING OPERATION (BEFORE LOAD DROP)

Crane load is placed in the highest vertical position (at crane tip). Counter ballast is transferred to obtain zero heel.

GZ curve before drop of load



FLOATING POSITION					
Draught moulded	7.761	m	KM	13.20	m
Trim	0.001	m	KG	11.26	m
Heel, PS=+	-0.1	deg			
TA	7.761	m	GM0	1.94	m
TF	7.762	m	GMCORR	-0.16	m
Trimming moment	46	tonm	GM	1.78	m

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

CHECKING STANDARD CRITERIA DURING LIFTING (BEFORE LOAD DROP)

INTACT STABILITY CRITERIA

RCR	TEXT	REQ	ATTV	UNIT	STAT
V.AREA1.	Area depending on GZ curve top	0.059	0.176	mrad	OK
V.AREA3.	Area under GZ curve between 30.	0.030	0.090	mrad	OK
V.GZ0.2	Min. GZ > 0.2	0.200	0.669	m	OK
V.POSMA.	Top of GZ curve at least 15 de.	15.000	25.626	deg	OK
V.GM0.15	GM > 0.15 m	0.150	1.780	m	OK
V.IMOWE.	IMO weather criterion	1.000	3.703		OK
IMOWEAT.	Heeling angle due to steady wi.	14.019	3.489	deg	OK
MINGM.P.	Min GM from probabilistic dam .	1.712	1.780	m	OK

DAMAGE STABILITY CRITERIA - ACTUAL TANK FILLING

Critical damage case : DP04			Draught fwd :	7.708	m
Stage :	1		Draught aft :	7.877	m
Phase :	EQ		Draught mean :	7.793	m
GM (actual) :	1.621	m	Trim :	-0.169	m
Minimum GM :	0.747	m	Heel :	3.1	deg

DAM	STAGE	PHASE	RCR	REQ	ATTV	UNIT	STAT	MINGM
DP04	1	EQ	V.PROGR..	19.844	3.136	deg	OK	0.405
DP04	1	EQ	V.MAXHEE.	17.000	3.136	deg	OK	0.445
DP04	1	EQ	V.RANGE..	20.000	39.574	deg	OK	0.747
DP04	1	EQ	V.MINGZ..	0.100	0.520	m	OK	0.689

LOADING CASE LC08, CRANE OPERATION, MID. DRAUGHT, DEPARTURE

16.12.4 LOADING CONDITION AFTER ACCIDENTAL LOAD DROP

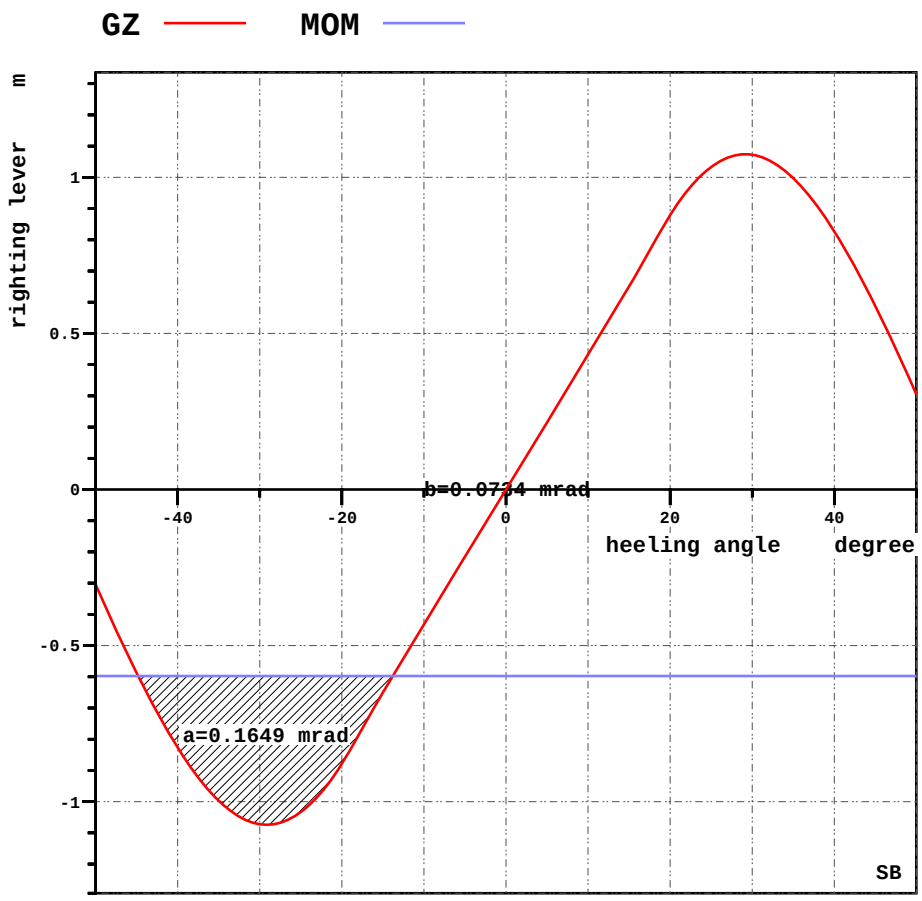
FLOATING	POSITION				
Draught moulded	7.382	m	KM	13.19	m
Trim	0.579	m	KG	10.59	m
Heel, PS=+	-13.4	deg			
TA	7.092	m	GM0	2.61	m
TF	7.671	m	GMCORR	-0.16	m
Trimming moment	20339	tonm	GM	2.45	m

CHECKING ACCIDENTAL LOAD DROP CRITERIA

RCR	TEXT	REQ	ATTV	UNIT	STAT
LIFTANGLE	Max angle after drop of load	15.00	13.80	deg	OK
LIFTAREA2	Area ratio criteria	1.40	2.25		OK

Area a > 1.4b

a = left area in graph, defined by equilibrium angle before loss of crane load and equilibrium angle after loss of crane load. Area a refers to area A1 on figure 1, DNV Rules Pt.5 Ch.7 Sec.7 D207.

b = right area in graph, defined by equilibrium angle after loss of crane load and angle of down flooding. Area b refers to area A2 on figure 1, DNV Rules Pt.5 Ch.7 Sec.7 D207.

GZ curve for changed VCG and moment from counter ballast superimposed: