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19489/2001

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STRUCT



2001

JOSE CARLOS FERNES GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CANTORAS

É COPIA FEITA DO DOCUMENTO ORIGINAL

Spencer Ballard
 January 1, 1981 at San Diego



CERTIDÃO

CERTIFICO que nesta data é iniciado o 5º volume do processo nº 19.489/2001 com suas fls. numeradas a partir do nº 7456 dos autos.

O referido é verdade e dou fé.

Aos 09 de agosto de 2001.

exs.

JOSE CARLOS ROSENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS

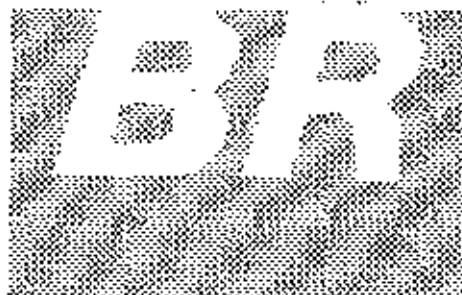
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APPENDIX F



LOADING CONDITIONS FOR WORST RISER INSTALLATION
SEQUENCES

(17 PAGES)



JOSÉ CARLOS PRADO GUSMÃO
QUEREN
DIVISÃO DE SERVIÇOS CARVORAS
COPIA FIEL DO DOCUMENTO ORIGINAL

WS 7/15/2177

Proj P36-Roncador

Client Petrobras

Date Dec-98

By AT

Ckld

Subj Riser Hang-off Loads - Stability Summary - 8 Head Conditions

Ref Ref Drg: DE-3010.38-6000-942-NBD-100 Rev P

	Total Riser Weight (Tonnes)	LCG (metres)	TCG (metres)	VCG (metres)
2xSCR & Port Risers installed	737	58.58	-27.04	6.23
2xSCR & Port and Aft risers installed	2632	83.02	-7.47	22.80
2xSCR & Port, Aft and Starboard Risers installed	4451	72.28	3.18	16.06
2xSCR & All Risers installed	5052	66.59	2.76	15.15
4xSCR & Port Risers installed	844	57.95	-34.36	6.03
4xSCR & Port and Aft risers installed	2738	81.82	-10.49	22.10
4xSCR & Port, Aft and Starboard Risers installed	4558	71.78	1.11	15.79
4xSCR & All Risers installed	5159	66.26	0.55	14.93

JOSÉ CARLOS PIMENTEL GUSHÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL



Operational Load Condition - 4 x SCRs @ 20 Deg & Port, Aft & Sbd Risers Installed									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from F.P.	TCG m from GL	VCG m	LCGmt tm	TCGmt tm	VCGmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.74	0.03	30.11	1912031	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	34016	76	10632		
Process Fresh Water	1050.4	40.35	0.00	4.40	42415	0	4622		
Fuel/sep/waste oil	2821.1	58.63	0.48	9.81	168231	-1374	27661		
Lub oil	5.6	60.77	4.31	28.60	340	24	168		
Crew & Stores	335.5	69.85	3.27	39.23	23433	1096	13182		
Proc Related loads	1733.4	80.52	11.10	45.60	139523	-19241	79043		
Below Tank Top Process loads	112.2	82.37	0.00	23.45	9231	0	2631		
Deck Loads	300.0	56.39	0.90	44.50	16937	0	13350		
Chain onboard	909.7	56.39	0.00	9.78	51238	0	8894		
Riser loads (4SCR)	4558.0	71.38	1.11	15.79	327173	5059	71971		
Mooring tension	1727.2	57.85	1.41	18.29	88417	2435	31586		
Water Ballast	11065.0	36.04	1.06	4.53	388762	11694	50144	759.5	4610.5
Displacement	56503.24	57.048	0.025	22.333	3228397	1407	1261880	759	4610
Target data	56503.24	57.048	0.025		Correction for Free Surface =				
LCG Ganstab		55.732						0.01	0.08
Mean Draught	22.0 m							22.35	22.414
								26.8	27.2
								4.45	4.79



Handwritten signature and initials.

JOSE CARLOS PRISNIEL GUSMÃO
DIRETOR
DEPARTAMENTO DE SERVIÇOS GASTRÔNOMOS
CÓPIA FIEL DO DOCUMENTO ORIGINAL

Compartment	Max Wt	%	Volume	Sp. Gr.	Weight	LCG	TDS	WCG	Inert	t cant	y cant	trans mom inertia	long mom inertia	trans resources	long resources
SW Ballast	1P	908.9	99%	877.06	1.025	899.81	9.5	872.807	8348.206	220718.30	5988.585	0	0	0.0000	0.0000
SW Ballast	1S	908.9	99%	877.06	1.025	899.81	9.5	872.807	8348.206	220718.30	5988.585	0	0	0.0000	0.0000
SW Ballast	2P	898.5	99%	868.73	1.025	890.51	6.70	813.924	6037.524	27347.41	5439.391	0	0	0.0000	0.0000
SW Ballast	2S	898.5	99%	868.73	1.025	890.51	6.70	813.924	6037.524	27347.41	5439.391	0	0	0.0000	0.0000
SW Ballast	3P	747	10%	70.33	1.025	72.15	16.71	80.68	1205.892	2228.113	32983.11	245.77	438.95	0.0043	0.0077
SW Ballast	3S	747	10%	70.33	1.025	72.15	16.71	80.68	1205.892	2228.113	32983.11	245.77	438.95	0.0043	0.0077
SW Ballast	4P	818.3	44%	346.54	1.025	357.36	18.73	224.947	2249.947	1439.961	1439.961	112.4684459	1438.961108	0.0054	0.0054
SW Ballast	4S	818.3	44%	346.54	1.025	357.36	18.73	224.947	2249.947	1439.961	1439.961	112.4684459	1438.961108	0.0054	0.0054
SW Ballast	5P	263	99%	254.02	1.025	260.27	27.21	244.978	244.978	194.72	194.72	3.36	0	0.0001	0.0001
SW Ballast	5S	263	99%	254.02	1.025	260.27	27.21	244.978	244.978	194.72	194.72	3.36	0	0.0001	0.0001
SW Ballast	6P	537	99%	518.66	1.025	531.63	1.38	531.63	531.63	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	6S	537	99%	518.66	1.025	531.63	1.38	531.63	531.63	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	7P	589.1	1%	5.55	1.025	5.69	1.38	5.69	5.69	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	7S	589.1	1%	5.55	1.025	5.69	1.38	5.69	5.69	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	11P	680.8	99%	638.24	1.025	654.19	1.38	654.19	654.19	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	11S	680.8	99%	638.24	1.025	654.19	1.38	654.19	654.19	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	13P	680.8	99%	638.24	1.025	654.19	1.38	654.19	654.19	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	13S	680.8	99%	638.24	1.025	654.19	1.38	654.19	654.19	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	16P	255.9	1%	2.50	1.025	2.56	1.38	2.56	2.56	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	16S	255.9	1%	2.50	1.025	2.56	1.38	2.56	2.56	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	17P	537	99%	518.66	1.025	531.63	1.38	531.63	531.63	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	17S	537	99%	518.66	1.025	531.63	1.38	531.63	531.63	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	18P	569	25%	128.35	1.025	131.60	1.38	131.60	131.60	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	18S	569	25%	128.35	1.025	131.60	1.38	131.60	131.60	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	19P	747	1%	7.29	1.025	7.47	1.38	7.47	7.47	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	19S	747	1%	7.29	1.025	7.47	1.38	7.47	7.47	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	20P	787.4	1%	7.68	1.025	7.87	1.38	7.87	7.87	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	20S	787.4	1%	7.68	1.025	7.87	1.38	7.87	7.87	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	21P	987.8	1%	9.84	1.025	10.06	1.38	10.06	10.06	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	21S	987.8	1%	9.84	1.025	10.06	1.38	10.06	10.06	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	22P	1094	1%	10.87	1.025	11.13	1.38	11.13	11.13	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	22S	1094	1%	10.87	1.025	11.13	1.38	11.13	11.13	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	23P	682.3	1%	6.66	1.025	6.82	1.38	6.82	6.82	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	23S	682.3	1%	6.66	1.025	6.82	1.38	6.82	6.82	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	24P	1005.3	1%	9.81	1.025	10.06	1.38	10.06	10.06	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	24S	1005.3	1%	9.81	1.025	10.06	1.38	10.06	10.06	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	25P	882.3	1%	8.66	1.025	8.82	1.38	8.82	8.82	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	25S	882.3	1%	8.66	1.025	8.82	1.38	8.82	8.82	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	26P	1005.3	1%	9.81	1.025	10.06	1.38	10.06	10.06	2731.801	2731.801	0	0	0.0000	0.0000
SW Ballast	26S	1005.3	1%	9.81	1.025	10.06	1.38	10.06	10.06	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	1P	372.2	1%	3.63	1.025	3.72	1.38	3.72	3.72	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	2P	372.2	1%	3.63	1.025	3.72	1.38	3.72	3.72	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	3S	372.2	1%	3.63	1.025	3.72	1.38	3.72	3.72	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	4S	372.2	1%	3.63	1.025	3.72	1.38	3.72	3.72	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	5P	53.5	1%	0.52	1.025	0.54	1.38	0.54	0.54	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	6P	53.5	1%	0.52	1.025	0.54	1.38	0.54	0.54	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	7S	53.5	1%	0.52	1.025	0.54	1.38	0.54	0.54	2731.801	2731.801	0	0	0.0000	0.0000
Chain Locker	6S	53.5	1%	0.52	1.025	0.54	1.38	0.54	0.54	2731.801	2731.801	0	0	0.0000	0.0000
Total															
30539															
858.9028953															
5300.60332															
11854.36															
49589.22															
0.0152															

JOSÉ CARLOS FREITAS GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTÓRIAS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Operational Load Condition - 4 x SCRs @ 20 Deg & Port & Aft Risers installed									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from FP	TCG m from CL	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.74	0.05	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	34016	76	10632		
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622		
Fuel/sew/waste oil	2821.1	59.62	0.49	9.81	168231	-1374	27651		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	335.5	69.05	3.27	39.23	23433	1096	13162		
Proc Related loads	1733.4	80.57	11.10	45.60	139573	-19241	79043		
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9331	0	2631		
Deck Loads	300.0	56.29	0.00	44.50	16917	0	13350		
Chain onboard	909.7	56.39	0.00	9.78	51398	0	8894		
Riser loads (4SCR)	2738.0	81.32	10.49	22.10	224023	-28722	60510		
Mooring tension	1727.2	57.35	1.41	18.29	99917	2435	31586		
Water Ballast	12885.0	38.55	3.33	5.06	501912	45475	65146	186.1	2407.9
Displacement	56503.24	57.048	0.025	22.396	3223397	1407	1265421	186	2408
Target data	56503.24	57.048	0.025		Correction for Free Surface* =				
LCG Genstab		55.732			corrected VCG =				
Mean Draught	22.0 m				KMT / KML =				
					GMT / GML =				

JOSÉ CARLOS PUENTE GUSMÃO
ORÇÃO
DIÁRIO DE SERVIÇOS CARTÓFIAS

É COPIA FIEL DO DOCUMENTO ORIGINAL



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D-960-NBD-903
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Component	Max wt	%	Volume	Sp. Gr.	Weight	LCG	TCG	VCG	Innet	t (mt)	v (mt)	Tana noon height	Tana noon height	long freesurface
1P SW Ballast	908.9	99%	877.86	1.025	899.81	9.5	24.47	6.72207	5543.249	22018.38	5988.045	0	0	0.0000
1S SW Ballast	908.9	99%	877.86	1.025	899.81	9.5	24.47	6.72207	5543.249	22018.38	5988.045	0	0	0.0000
2P SW Ballast	899.5	99%	868.79	1.025	890.51	8.78	-30.71	6.158346	6037.674	27347.41	5429.991	0	0	0.0000
2S SW Ballast	899.5	99%	868.79	1.025	890.51	8.78	-30.71	6.158346	6037.674	27347.41	5429.991	0	0	0.0000
3P SW Ballast	747	97%	490.04	1.025	739.53	16.71	-40.88	6.110142	12457.55	22836.63	4457.107	0	0	0.0000
3S SW Ballast	747	97%	490.04	1.025	739.53	16.71	-40.88	6.110142	12457.55	22836.63	4457.107	0	0	0.0000
4P SW Ballast	918.2	1%	7.18	1.025	7.38	13.73	30.38	0.228453	1711.05	3619.172	0	0	0.0000	
4S SW Ballast	918.2	1%	7.18	1.025	7.38	13.73	30.38	0.228453	1711.05	3619.172	0	0	0.0000	
5P SW Ballast	818.2	81%	489.98	1.025	500.23	23.07	103.62	2.825578	2418.265	5941.943	1498.98	1498.98	0.0000	
5S SW Ballast	818.2	81%	489.98	1.025	500.23	23.07	103.62	2.825578	2418.265	5941.943	1498.98	1498.98	0.0000	
6P SW Ballast	859	99%	282.31	1.025	288.84	23.35	22.84	2.900746	2789.854	5943.501	3.96	194.72	0.0000	
6S SW Ballast	859	99%	282.31	1.025	288.84	23.35	22.84	2.900746	2789.854	5943.501	3.96	194.72	0.0000	
7P SW Ballast	537	99%	518.68	1.025	531.63	31.74	31.74	5.326063	14986.65	16823.94	2943.601	0	0	0.0000
7S SW Ballast	537	99%	518.68	1.025	531.63	31.74	31.74	5.326063	14986.65	16823.94	2943.601	0	0	0.0000
8P SW Ballast	589	1%	5.53	1.025	5.69	35.18	35.18	0.247333	633.3154	1245.32	0	0	0.0000	
8S SW Ballast	589	1%	5.53	1.025	5.69	35.18	35.18	0.247333	633.3154	1245.32	0	0	0.0000	
9P SW Ballast	589	94%	590.83	1.025	584.19	36.18	36.18	5.742558	14384.68	19399.47	2472.034	66.85	581.50491	0.0103
9S SW Ballast	589	94%	590.83	1.025	584.19	36.18	36.18	5.742558	14384.68	19399.47	2472.034	66.85	581.50491	0.0103
10P SW Ballast	600.3	99%	638.24	1.025	594.73	31.38	30.93	4.525743	39403.04	20755.63	5941.551	0	0	0.0000
10S SW Ballast	600.3	99%	638.24	1.025	594.73	31.38	30.93	4.525743	39403.04	20755.63	5941.551	0	0	0.0000
11P SW Ballast	680.8	99%	638.24	1.025	684.19	31.32	30.81	4.525743	40376.73	20755.63	5941.551	0	0	0.0000
11S SW Ballast	680.8	99%	638.24	1.025	684.19	31.32	30.81	4.525743	40376.73	20755.63	5941.551	0	0	0.0000
12P SW Ballast	255.3	89%	207.83	1.025	213.19	35.75	35.75	0	11152.34	4812.33	0	0	0.0000	
12S SW Ballast	255.3	89%	207.83	1.025	213.19	35.75	35.75	0	11152.34	4812.33	0	0	0.0000	
13P SW Ballast	255.3	99%	247.16	1.025	253.34	35.13	22.23	3.840393	21577.05	5755.018	2448.2421	0	0	0.0000
13S SW Ballast	255.3	99%	247.16	1.025	253.34	35.13	22.23	3.840393	21577.05	5755.018	2448.2421	0	0	0.0000
14P SW Ballast	597.8	1%	9.64	1.025	9.86	103.97	24.48	0.063853	1026.028	241.8134	0.005884	0	0	0.0000
14S SW Ballast	597.8	1%	9.64	1.025	9.86	103.97	24.48	0.063853	1026.028	241.8134	0.005884	0	0	0.0000
20P SW Ballast	787.4	1%	7.66	1.025	7.87	38.37	38.37	0.077164	778.2377	285.59	0.006079	0	0	0.0000
20S SW Ballast	787.4	1%	7.66	1.025	7.87	38.37	38.37	0.077164	778.2377	285.59	0.006079	0	0	0.0000
21P SW Ballast	987.8	1%	9.64	1.025	9.86	103.97	24.48	0.063853	1026.028	241.8134	0.005884	0	0	0.0000
21S SW Ballast	987.8	1%	9.64	1.025	9.86	103.97	24.48	0.063853	1026.028	241.8134	0.005884	0	0	0.0000
22P SW Ballast	1094	1%	10.67	1.025	10.94	106.75	31.15	0.084848	1157.845	-340.781	0.007469	0	0	0.0000
22S SW Ballast	1094	1%	10.67	1.025	10.94	106.75	31.15	0.084848	1157.845	-340.781	0.007469	0	0	0.0000
23P SW Ballast	682.2	1%	6.66	1.025	6.82	28.02	-27.55	12.2301	181.1805	187.9737	0.84446	0	0	0.0000
23S SW Ballast	682.2	1%	6.66	1.025	6.82	28.02	-27.55	12.2301	181.1805	187.9737	0.84446	0	0	0.0000
24P SW Ballast	1005.3	1%	9.81	1.025	10.05	28	-26.33	9.182652	281.484	0.923512	0.0000	0	0	0.0000
24S SW Ballast	1005.3	1%	9.81	1.025	10.05	28	-26.33	9.182652	281.484	0.923512	0.0000	0	0	0.0000
25P SW Ballast	682.2	1%	6.66	1.025	6.82	84.76	-27.55	12.2301	578.3175	197.8737	0.84446	0	0	0.0000
25S SW Ballast	682.2	1%	6.66	1.025	6.82	84.76	-27.55	12.2301	578.3175	197.8737	0.84446	0	0	0.0000
26P SW Ballast	1005.3	1%	9.81	1.025	10.05	84.77	-26.33	9.182652	852.1829	0.923512	0.0000	0	0	0.0000
26S SW Ballast	1005.3	1%	9.81	1.025	10.05	84.77	-26.33	9.182652	852.1829	0.923512	0.0000	0	0	0.0000
27P Chain Locker	372.2	1%	3.63	1.025	3.72	28.2	-30.41	1.057287	104.9604	113.186	0.038952	0	0	0.0000
27S Chain Locker	372.2	1%	3.63	1.025	3.72	28.2	-30.41	1.057287	104.9604	113.186	0.038952	0	0	0.0000
28P Chain Locker	372.2	1%	3.63	1.025	3.72	28.2	-30.41	1.057287	104.9604	113.186	0.038952	0	0	0.0000
28S Chain Locker	372.2	1%	3.63	1.025	3.72	28.2	-30.41	1.057287	104.9604	113.186	0.038952	0	0	0.0000
45 Chain Locker	372.2	1%	3.63	1.025	3.72	84.58	-31.12	12.2372	46.28145	16.6492	0.085472	0	0	0.0000
5P Chain Locker	53.5	1%	0.52	1.025	0.54	28.31	-31.12	12.2372	14.07585	16.6492	0.085472	0	0	0.0000
6P Chain Locker	53.5	1%	0.52	1.025	0.54	28.31	-31.12	12.2372	14.07585	16.6492	0.085472	0	0	0.0000
7S Chain Locker	53.5	1%	0.52	1.025	0.54	28.31	-31.12	12.2372	14.07585	16.6492	0.085472	0	0	0.0000
8S Chain Locker	53.5	1%	0.52	1.025	0.54	28.31	-31.12	12.2372	14.07585	16.6492	0.085472	0	0	0.0000
90538					12894.87		3.59014	5.055944	501811.6	45475.11	65145.68	186.0317153	2447.50491	0.0426
Panel	12884.970					38.953								0.0033

Operational Load Condition - 4 x SCRs @ 20 Deg & Port Risers installed									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight	LCG	TCG	VCG	LCGmmt	TCGmmt	VCGmmt	I (m ⁴)	I (m ⁴)
	tonnes	from FP	m from CL	m	m	tm	tm	trans	long
Modified Lightship (Rev R)	31482.0	60.34	0.05	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	24816	76	10632		
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622		
Fuel/sew/waste oil	2821.1	59.83	-0.49	9.81	168231	-1374	27661		
Lub oil	5.6	60.77	4.31	29.60	340	24	168		
Crew & Stores	335.5	68.85	3.27	39.23	23433	1096	13162		
Proc Related loads	1733.4	80.52	11.30	45.60	139573	-19241	79043		
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9231	0	2631		
Deck Loads	300.0	56.39	0.00	44.50	16317	0	13350		
Chain onboard	909.7	56.39	0.00	9.78	51258	0	8894		
Riser loads (4SCR)	844.0	57.95	34.36	6.03	48910	-29000	5089		
Mooring tension	1727.2	57.85	1.41	18.29	99917	2435	31586		
Water Ballast	14779.0	45.81	3.10	5.22	677025	45753	77108	1712.1	11688.2
Displacement	56503.24	57.048	0.025	21.626	3223397	1407	1221963	1712	11688
Target data	56503.24	57.048	0.025			Correction for Free Surface* =		0.03	0.21
						corrected VCG =		21.66	21.833
LCG Genstab		55.732				KMT / KML =		26.8	27.2
						GMT / GML =		5.14	5.37
Mean Draught	22.0 m								

Compartment	Max Wt	%	Volume	Sp. Gr.	Weight	LCG	TCG	VCG	Inert	Imtl	v mgt	Intra from Inertia	long mom Inertia	Intra Resistance	long Resistance
1P SW Ballast	908.9	99%	877.86	1.025	899.81	9.5	24.47	6.72257	65.48 205	22018.39	5048.595	0	0	0.0009	0.0000
1S SW Ballast	908.9	99%	877.88	1.025	899.81	9.5	24.47	6.72257	65.48 205	22018.39	5048.595	0	0	0.0009	0.0000
2P SW Ballast	899.5	99%	868.79	1.025	880.51	8.78	30.71	6.159246	60.77 384	27347.41	5429.991	0	0	0.0000	0.0000
2S SW Ballast	899.5	99%	868.79	1.025	880.51	8.78	30.71	6.159246	60.77 384	27347.41	5429.991	0	0	0.0000	0.0000
3P SW Ballast	747	1%	739	1.025	757	16.71	30.48	6.10	126.5402	233 8457	0.489402	0	0	0.0000	0.0000
3S SW Ballast	747	98%	731.48	1.025	739.53	16.71	30.48	6.104482	1257.55	22838.69	4487.107	0	0	0.0000	0.0000
4P SW Ballast	818.2	1%	810	1.025	831	5.78	39.81	3.080416	111 130.04	304 7366	0.767745	0	0	0.0000	0.0000
4S SW Ballast	818.2	74%	809.02	1.025	804.57	19.78	39.81	3.080416	111 130.04	304 7366	0.767745	0	0	0.0000	0.0000
5P SW Ballast	263	98%	254.02	1.025	260.37	12.2372	22.82	2.025976	530.1 728	23833.48	2823.746	112.5	1436.348444	0.0000	0.0000
5S SW Ballast	263	98%	254.02	1.025	260.37	12.2372	22.82	2.025976	530.1 728	23833.48	2823.746	112.5	1436.348444	0.0000	0.0000
6P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
6S SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
7P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
7S SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
8P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
8S SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
9P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
9S SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
10P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
10S SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
11P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
11S SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.06	3345.2841	9.36	184.72	0.0001	0.0004
12P SW Ballast	537	99%	523.21	1.025	524.84	27.71	22.42	2.003745	714.1 654	25400.0					

JOSE CARLOS PINHEIRO GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Operational Load Condition - 2 x SCR's @ 20 Deg & Port Risers installed									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from BP m	TCG from CL m	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.74	0.05	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.57	0.19	26.37	34045	76	10632		
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622		
Fuel/sew/waste oil	2821.1	59.63	0.49	9.81	168231	-1374	27661		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	335.5	69.85	3.27	39.23	23433	1096	13162		
Proc Related loads	1733.4	80.52	11.10	45.69	139573	-19241	79043		
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9231	0	2631		
Deck Loads	300.0	56.39	0.08	44.50	16917	0	13350		
Chain onboard	909.7	56.39	0.00	9.78	51298	0	8894		
Riser loads (2xSCR)	737.0	58.08	27.04	6.23	43476	-19928	4592		
Mooring tension	1727.2	57.85	1.41	18.29	99917	2435	31586		
Water Ballast	14886.0	45.85	2.46	5.15	682459	36682	76610	2670.5	14985.7
Displacement	56503.24	57.048	0.025	21.609	3223397	1407	1220967	2671	14986
Target data	56503.24	57.048	0.025		Correction for Free Surface* =			0.05	0.27
					corrected VCG =			21.66	21.874
LCG Genstab		55.732			KMT / KML =			26.8	27.2
					GMT / GML =			5.14	5.33
Mean Draught	22.0 m								

COPIA DO DOCUMENTO ORIGINAL
 JOSE CARLOS PEREIRA GUSATO
 DIRETOR DE SERVIÇOS PORTUÁRIOS
 SUPERINTENDENTE



[illegible]

JOSE CARLOS FERNANDES GUSMÃO
DEPUTADO
DIVISÃO DE SERVIÇOS CARTORÁRIOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Operational Load Condition - 2 x SCRs @ 20 Deg & Port & Aft Risers installed Worst Case Scenario - Maximum Loads - Based on Weight Control Report R											
Item	Weight tonnes	LCG from FP	TCG from GL	VCG from RB	LCGmmt from RB	TCGmmt from RB	VCGmmt from RB	I (m ⁴) trans	I (m ⁴) long		
Modified Lightship (Rev R)	31482.0	60.74	0.05	30.11	1912091	1637	948017				
Potable Water tanks	403.2	84.37	0.19	26.37	34016	76	10632				
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622				
Fuel/sep/waste oil	2821.1	59.63	-0.49	9.81	158231	-1374	27661				
Lub oil	5.6	60.77	4.31	29.60	340	24	166				
Crew & Stores	335.5	69.55	3.27	39.23	23433	1096	13162				
Proc Related loads	1733.4	80.52	11.10	45.60	139573	-18241	79043				
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9231	0	2631				
Deck Loads	300.0	56.33	0.00	44.50	16917	0	13350				
Chain onboard	909.7	56.35	0.00	3.76	51298	0	8894				
Riser loads (2xSCR)	2632.0	83.07	-7.47	22.80	218540	-19661	60010				
Mooring tension	1727.2	57.85	1.41	18.29	33917	2435	31586				
Water Ballast	12991.0	39.05	2.80	4.11	502395	36415	53352	2424.1	13198.8		
Displacement	56503.24	57.048	0.025	22.178	3223397	1407	1253127	2424	13199		
Target data	56503.24	57.048	0.025								
LCG Genstab		55.732									
Mean Draught	22.0 m										
Correction for Free Surface = 0.04 corrected VCG = 22.22 KMT / KML = 26.8 GMT / GML = 4.58											



JOSE CARLOS PEREIRA GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAS

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Component	Max Wt	%	Volume	Sp. Gr.	Weight	LCG	TCG	VCG	Inertia	V. Cent	Trans mom. inertia	Long mom. Inertia	Trans Resources	Long Inertia
1P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	24.47	6.72907	85.49.305	22018.38	5398.585	0	0.0000	0.0000
2P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	34.47	6.72907	85.49.305	22018.38	5398.585	0	0.0000	0.0000
3P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
4P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
5P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
6P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
7P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
8P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
9P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
10P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
11P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
12P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
13P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
14P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
15P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
16P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
17P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
18P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
19P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
20P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
21P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
22P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
23P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
24P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
25P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
26P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
28P SW Ballast	908.9	98%	877.86	1.025	899.81	9.5	30.71	6.16248	80.87.624	27347.41	5429.951	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2	31.12	12.23772	14.07585	16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	372.2									

JOSE CARLOS PEREIRA GUSMAO
DEPUTADO
DIVISAO DE SERVICOS CARTORARIOS

É CÓPIA FIEL DO DOCUMENTO ORIGINAL:

P36 Roncador Field

Operating (T=22)

Weight Report

Operational Load Condition - 2 x SCRs @ 20 Deg & Port, Aft & Starboard Risers installed									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight	LCG	TCG	VCG	LCGmmt	TCGmmt	VCGmmt	I (m ⁴)	I (m ⁴)
	tonnes	from FP	m from CL	m	tm	tm	tm	trans	long
Modified Lightship (Rev R)	31482.0	60.74	0.35	30.11	1812091	1837	948017		
Potable Water tanks	403.2	84.37	0.19	28.37	34016	76	10632		
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622		
Fuel/sep/waste oil	2821.1	59.63	-0.49	6.81	168291	-1374	27661		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	335.5	69.85	3.27	39.23	23433	1096	13162		
Proc Related loads	1733.4	80.52	-11.10	45.60	139573	-19241	79043		
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9231	0	2631		
Deck Loads	300.0	56.39	0.00	44.50	16917	0	13350		
Chain onboard	909.7	56.39	0.00	9.78	51298	0	8894		
Riser loads (2xSCR)	4451.0	72.28	3.18	16.06	321218	14154	71483		
Mooring tension	1727.2	57.05	1.41	18.29	99317	2435	31586		
Water Ballast	11172.0	36.18	0.25	4.17	404217	2599	46575	1883.7	12776.9
Displacement	56503.24	57.048	0.025	22.261	3223397	1407	1257823	1884	12777
Target data	56503.24	57.048	0.025		Correction for Free Surface* =			0.03	0.23
					corrected VCG =			22.29	22.487
LCG Genstab		55.732			KMT / KML =			26.8	27.2
					GMT / GML =			4.51	4.71
Mean Draught	22.0 m								

E COPY FILED BY DOCUMENTATION

DIRETORIO DE SEGURANCA

JOSE CARLOS FERREIRA GUSMÃO



Compartiment	Max Wt	%	Volume	Stk Gr.	Weight	LCG	TGS	VOG	I met	t met	v met	trans met height	long met height	trans free surface	long free surface
SW Ballast	1P	904.9	877.86	1.025	899.81	8.5	-24.47	6.722607	8549.205	22016.39	5985.585	0	0	0.0000	0.0000
SW Ballast	1S	806.9	877.86	1.025	899.81	9.5	24.47	6.722607	8549.205	22016.39	5985.585	0	0	0.0000	0.0000
SW Ballast	2P	883.5	868.78	1.025	860.51	6.78	-31.71	6.155246	5037.594	27347.41	5425.931	0	0	0.0000	0.0000
SW Ballast	2S	883.5	868.78	1.025	860.51	6.78	30.71	6.155246	5037.594	27347.41	5425.931	0	0	0.0000	0.0000
SW Ballast	3P	747	267.47	1.025	274.15	16.71	-30.80	1.754812	1581.166	178.5625	183.75	217.27	0	0.0000	0.0000
SW Ballast	3S	747	267.47	1.025	274.15	16.71	30.80	1.754812	1581.166	178.5625	183.75	217.27	0	0.0000	0.0000
SW Ballast	4P	818.2	273.13	1.025	268.11	13.73	-28.68	2.289413	3929.224	10716.607	113.4039	1437.017951	0	0.0000	0.0000
SW Ballast	4S	818.2	273.13	1.025	268.11	13.73	28.68	2.289413	3929.224	10716.607	113.4039	1437.017951	0	0.0000	0.0000
SW Ballast	5P	263	254.02	1.025	251.53	22.73	-22.82	2.942594	1498.853	5947.843	274.135	184.72	0	0.0000	0.0000
SW Ballast	5S	263	254.02	1.025	251.53	22.73	22.82	2.942594	1498.853	5947.843	274.135	184.72	0	0.0000	0.0000
SW Ballast	6P	597	518.66	1.025	531.83	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	6S	597	518.66	1.025	531.83	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	7P	569.1	277.01	1.025	263.35	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	7S	569.1	277.01	1.025	263.35	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	8P	597	518.66	1.025	531.83	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	8S	597	518.66	1.025	531.83	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	9P	597	518.66	1.025	531.83	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	9S	597	518.66	1.025	531.83	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	10P	597	518.66	1.025	531.83	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	10S	597	518.66	1.025	531.83	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	11P	680.8	638.24	1.025	638.24	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	11S	680.8	638.24	1.025	638.24	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	12P	680.8	638.24	1.025	638.24	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	12S	680.8	638.24	1.025	638.24	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	13P	680.8	638.24	1.025	638.24	25.94	-35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	13S	680.8	638.24	1.025	638.24	25.94	35.74	5.209003	1498.853	1687.353	3741.601	0	0	0.0000	0.0000
SW Ballast	14P	255.9	177.11	1.025	181.54	18.51	-22.72	1.373391	3940.034	20155.65	255.9402	66.87	0	0.0000	0.0000
SW Ballast	14S	255.9	177.11	1.025	181.54	18.51	22.72	1.373391	3940.034	20155.65	255.9402	66.87	0	0.0000	0.0000
SW Ballast	15P	255.9	177.11	1.025	181.54	18.51	-22.72	1.373391	3940.034	20155.65	255.9402	66.87	0	0.0000	0.0000
SW Ballast	15S	255.9	177.11	1.025	181.54	18.51	22.72	1.373391	3940.034	20155.65	255.9402	66.87	0	0.0000	0.0000
SW Ballast	16P	537	214.73	1.025	220.16	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	16S	537	214.73	1.025	220.16	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	17P	537	214.73	1.025	220.16	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	17S	537	214.73	1.025	220.16	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	18P	589	173.07	1.025	172.39	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	18S	589	173.07	1.025	172.39	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	19P	747	45.05	1.025	45.05	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	19S	747	45.05	1.025	45.05	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	20P	787.4	80.14	1.025	80.14	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	20S	787.4	80.14	1.025	80.14	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	21P	587.8	28.20	1.025	28.20	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	21S	587.8	28.20	1.025	28.20	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	22P	1084	17.38	1.025	17.38	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	22S	1084	17.38	1.025	17.38	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	23P	682.3	6.66	1.025	6.66	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	23S	682.3	6.66	1.025	6.66	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	24P	1003.3	9.81	1.025	9.81	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	24S	1003.3	9.81	1.025	9.81	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	25P	682.3	6.66	1.025	6.66	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	25S	682.3	6.66	1.025	6.66	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	26P	1005.3	9.81	1.025	9.81	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
SW Ballast	26S	1005.3	9.81	1.025	9.81	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
Chain Locker	1P	372.2	3.63	1.025	3.63	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
Chain Locker	1S	372.2	3.63	1.025	3.63	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
Chain Locker	2P	372.2	3.63	1.025	3.63	24.33	-24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
Chain Locker	2S	372.2	3.63	1.025	3.63	24.33	24.33	1.373391	1508.119	4733.332	150.13	0	0	0.0000	0.0000
Chain Locker	3P	53.5	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	3S	53.5	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	4P	53.5	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	4S	53.5	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	5P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	5S	305.88	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	6P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	6S	305.88	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	7P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	7S	305.88	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	8P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	8S	305.88	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	9P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	9S	305.88	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	10P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	10S	305.88	0.52	1.025	0.54	26.31	31.12	12.23772	14.07585	18.6402	0.065472	0	0	0.0000	0.0000
Chain Locker	11P	305.88	0.52	1.025	0.54	26.31	-31.12	12.23772	14.07585	1					

Operational Load Condition - 2 x SCRs @ 20 Deg & All Risers installed									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from FP m	TCG from CL m	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.74	0.05	85.11	1312091	1637	948017		
Potable Water tanks	403.2	84.37	0.19	28.37	34036	76	10632		
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622		
Fuel/sep/waste oil	2821.1	59.63	-0.49	9.81	168231	-1374	27661		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	335.5	69.85	3.27	39.23	23433	1096	13162		
Proc Related loads	1733.4	80.52	-11.10	45.60	139373	-19241	79043		
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9231	0	2631		
Deck Loads	300.0	56.39	0.00	44.50	16817	0	13350		
Chain onboard	909.7	56.39	0.00	9.78	51298	0	8894		
Riser loads (2xSCR)	5052.0	66.59	2.76	15.15	336413	13944	76538		
Mooring tension	1727.2	57.85	1.41	18.29	99917	2435	31586		
Water Ballast	10571.0	36.83	0.27	4.32	389522	2810	45619	2293.6	13711.8
Displacement	56503.24	57.048	0.025	22.334	3223397	1407	1261923	2294	13712
Target data	56503.24	57.048	0.025		Correction for Free Surface* =			0.04	0.24
					corrected VCG =			22.37	22.576
LCG Genstab		55.732			KMT / KML =			26.8	27.2
					GMT / GML =			4.43	4.62
Mean Draught	22.0 m								

APPENDIX G



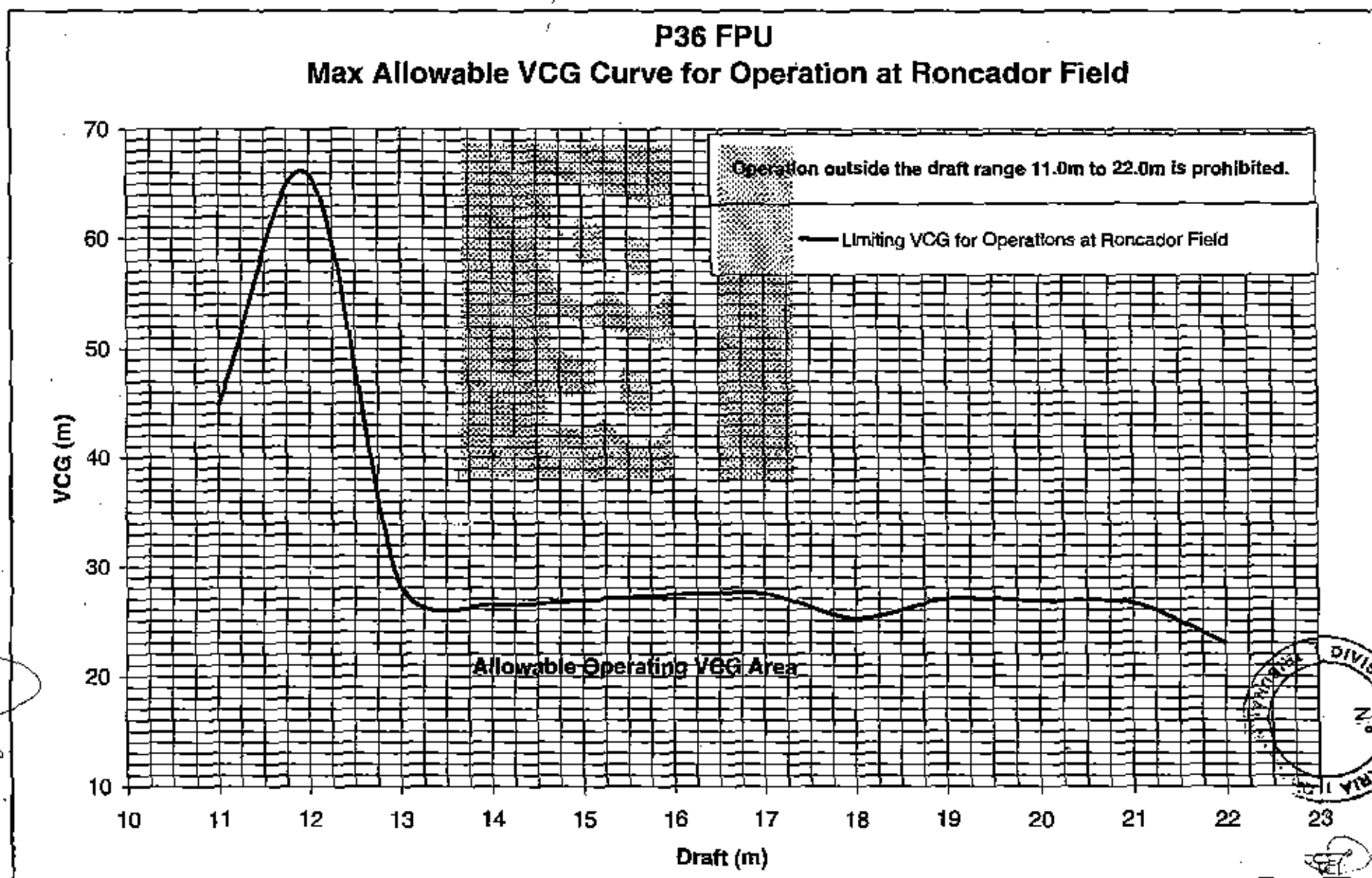
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ALLOWABLE KG CURVES

(1 PAGES)

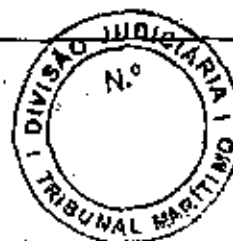


JOSÉ CARLOS PIMENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTÓGRAFOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL:



E COPY/TEL DO DOCUMENTO ORIGINAL.

JOSE CARLOS FARIAS GILSON
750.713
DIVISÃO DE NAVEGAÇÃO E OPERAÇÕES



APPENDIX H

22.0M OPERATING/SURVIVAL CONDITION

RESULTS SUMMARY

(CRITICAL GZ FOR EACH CASE ATTACHED)

(23 PAGES)



JOSE CARLOS MARINEL GUERAO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS
É COPIA FIEL DO DOCUMENTO ORIGINAL:



Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve abt)
VCG (abt)
Genstab Run ID

Stability Analysis Results
Operational/Survival - Intact
 22.00 m
 56503 mT
 57.05 m
 0.03 m
 22.41 m
 I110

WS No
Project
Client
Date
By
Checked

7/16/2177
 P36 Roncador
 Petrómac
 16-Jan-1999
 MSE

Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	Area Ratio	δ VCG
0	90	0.0	3.78	99.99	23.40	19.61	11.37	2.02	1.40
10	80	0.0	3.93	99.99	22.56	18.62	11.25	2.05	1.30
20	70	0.0	4.29	99.99	21.38	17.09	11.10	1.89	1.16
30	60	0.0	4.65	99.99	19.81	15.16	10.98	1.79	0.87
40	50	0.0	4.80	99.99	18.02	13.21	10.89	1.79	0.77
50	40	0.0	4.63	99.99	17.34	12.70	10.88	1.88	0.84
60	30	0.0	4.18	99.99	17.64	13.35	10.95	2.24	1.14
70	20	0.0	3.64	99.99	19.33	15.69	11.05	3.01	1.65
80	10	0.0	3.20	99.99	20.77	17.58	11.16	3.77	2.26
90	0	0.0	3.03	99.99	22.91	19.89	11.22	4.91	2.60
270	180	0.0	2.97	99.99	22.74	19.77	11.78	5.05	2.83
280	170	0.0	3.14	99.99	20.84	17.80	11.72	3.87	2.29
290	160	0.0	3.64	99.99	19.22	15.64	11.02	3.09	1.69
300	150	0.0	4.12	99.99	17.44	13.62	11.51	2.30	1.18
310	140	0.0	4.57	99.99	17.25	12.68	11.44	1.92	0.88
320	130	0.0	4.78	99.99	18.00	13.24	11.38	1.78	0.80
330	120	0.0	4.61	99.99	19.81	15.19	11.40	1.81	0.90
340	110	0.0	4.28	99.99	21.43	17.44	11.48	1.91	1.20
350	100	0.0	3.92	99.99	22.68	18.76	11.47	2.08	1.35

Minimum Increase in Allowable VCG = 0.77
 Maximum Allowable VCG = 23.18

JOSE CARLOS DE ALENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

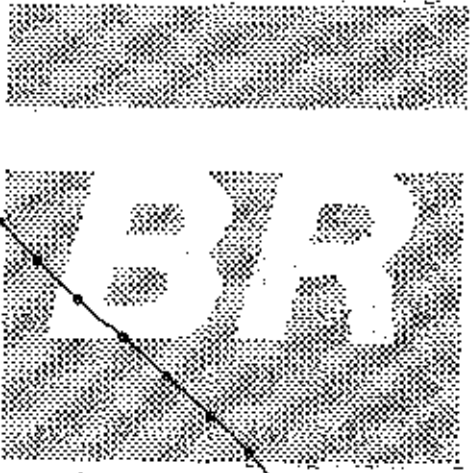
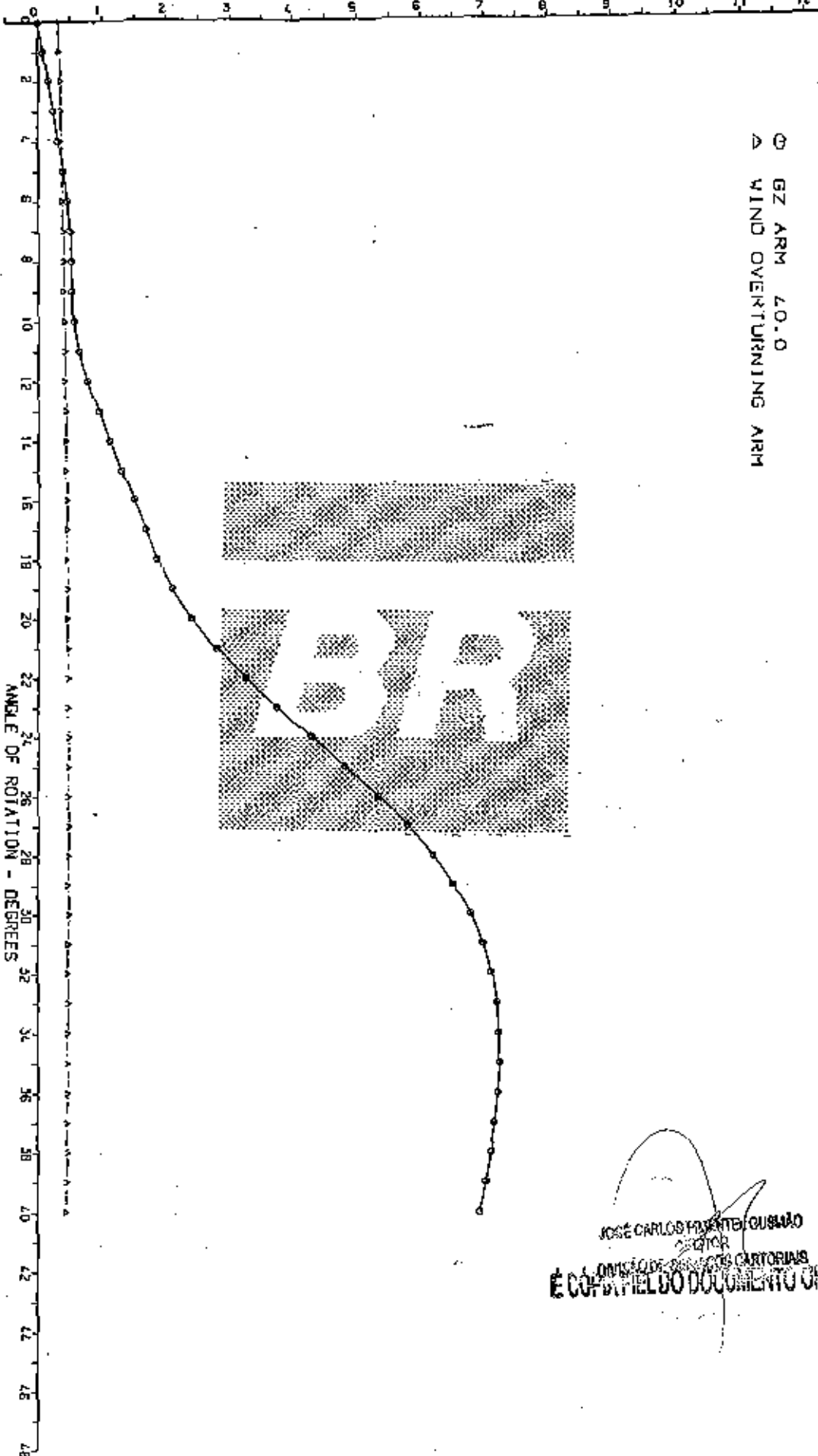


138

P-36 STABILITY ANALYSIS REV C JAN 99 - Intact Case T=22.0m
INTACT CASE HEEL AXIS = 40.0

● GZ ARM 40.0
▲ WIND OVERTURNING ARM

RIGHTING ARM - METRES



JOSÉ CARLOS FERNANDES GUSMÃO
DIRETOR
E COPIA FIEL DO DOCUMENTO ORIGINAL

NOBLE DENTON

23.FEB.1999

TIME 13.55.54

NO. 1

WS No
 Project
 Client
 Date
 By
 Checked

7/15/2177
 P36 Roncador
 Petromec
 18-Jan-1999
 MSE



135

Title Stability Analysis Results
Condition Operational/Survival
Draft 22.00 m
Displacement 56503 mT
LCG (from FP) 67.05 m
TCG (+ve stbd) 0.03 m
VCG (abl) 22.41 m

Description	Genstab ID	Max Allowable VCG	Comments
Intact Condition Vessel Intact	I110	23.18	
Damaged Condition Columns			
Base Oil Tank N1	D127	23.042	
Void Space 32 Stbd 5 (subdivided)	D126	23.682	Formerly part of VS32 Stbd 1
Fairlead Boxes & Extensions			
Void Space 46S	D124	23.492	
Void Space 45S	D125	23.462	
Void Space 65S (modified)	D128	23.512	Formerly part of VS 46aS
Void Space 64S (modified)	D129	23.552	Formerly part of VS 45aS
Void Space 46aS (modified)	D130	23.662	
Void Space 45aS (modified)	D131	23.622	
Accidental Flooding Lower Hull			
S.W. Bal Tk 21s	A131	-	
S.W. Bal Tk 22s	A132	-	

* Values superseded by modifications to tanks

Limiting KG 23.04 m for damage to Base Oil Tank
 Actual KG 22.41 m
 Stability Margin 0.63 m for weight control report R

JOSE CARLOS MARTELL GUSMÃO
 OFFICER
 DEPARTAMENTO DE ENFERMAGEM E SANTARIAS

É CÓPIA FIEL DO DOCUMENTO ORIGINAL

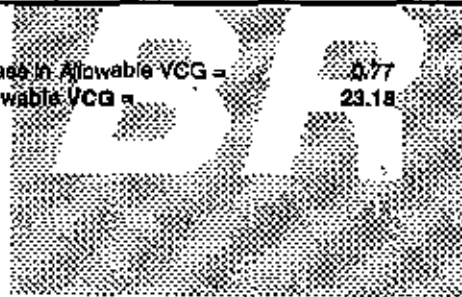
Title Stability Analysis Results
Condition Operational/Survival - Intact
Draft 22.00 m
Displacement 86503 mT
LCG (from FP) 67.05 m
TCG (+ve abt) 0.03 m
VCG (abt) 22.41 m
Genstab Run ID 1110

WS No 7/15/2177
Project 236 Roncador
Client Petromec
Date 16-Jan-1999
By MSE
Checked



Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	Area Ratio	δ VCG
0	90	0.0	3.78	99.99	23.40	19.61	11.37	2.02	1.40
10	80	0.0	3.93	99.99	22.56	18.62	11.25	2.05	1.30
20	70	0.0	4.29	99.99	21.38	17.09	11.10	1.89	1.16
30	60	0.0	4.65	99.99	19.81	15.16	10.98	1.79	0.87
40	50	0.0	4.60	99.99	18.02	13.21	10.69	1.78	0.77
50	40	0.0	4.63	99.99	17.34	12.70	10.88	1.88	0.84
60	30	0.0	4.18	99.99	17.54	13.35	10.95	2.24	1.14
70	20	0.0	3.64	99.99	19.33	15.69	11.05	3.01	1.65
80	10	0.0	3.20	99.99	20.77	17.66	11.16	3.77	2.26
90	0	0.0	3.03	99.99	22.91	19.89	11.22	4.91	2.60
270	180	0.0	2.97	99.99	22.74	19.77	11.78	5.05	2.63
280	170	0.0	3.14	99.99	20.64	17.60	11.72	3.87	2.29
290	160	0.0	3.59	99.99	19.22	15.84	11.62	3.09	1.89
300	150	0.0	4.12	99.99	17.44	13.32	11.51	2.30	1.18
310	140	0.0	4.57	99.99	17.25	12.68	11.44	1.92	0.86
320	130	0.0	4.75	99.99	15.00	13.24	11.38	1.78	0.60
330	120	0.0	4.61	99.99	13.61	15.19	11.40	1.81	0.90
340	110	0.0	4.28	99.99	21.41	17.14	11.48	1.91	1.20
350	100	0.0	3.92	99.99	22.68	18.76	11.47	2.08	1.35

Minimum increase in Allowable VCG = 0.77
 Maximum Allowable VCG = 23.18



JOSE CARLOS PEREIRA GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

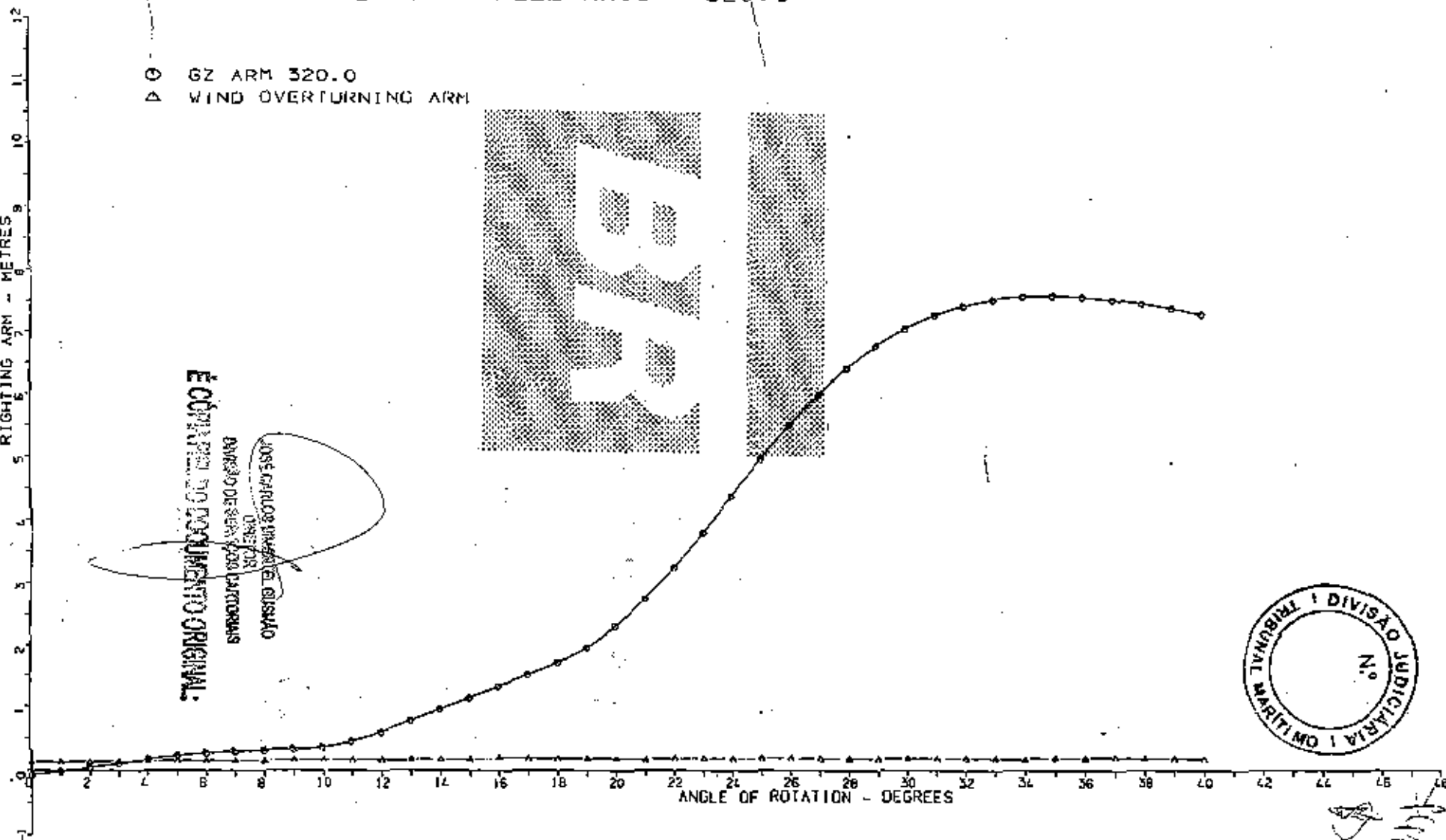
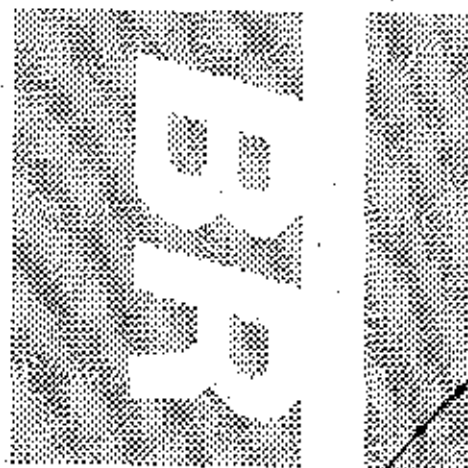
P-36 STABILITY ANALYSIS REV C JAN 99 -. Damage to VS 46S T=22.0m
DAMAGED STABILITY HEEL AXIS = 320.0

○ GZ ARM 320.0
△ WIND OVERTURNING ARM

RIGHTING ARM - METRES

É COMPARADO AO DOCUMENTO ORIGINAL.

JOSÉ CARLOS UNZUELO OLIVIA
DISEÑADOR
ENFERMERO DE BARRIO PARA CARABAS



Title Stability Analysis Results
Condition Operational/Survival - Damaged
Draft 22.00 m
Displacement 56503 mT
LCG (from FP) 57.05 m
TCG (+ve stbd) 0.03 m
VCG (abl) 22.41 m
Genstab Run ID d125
Space Damaged Void Space 455

DIVISÃO JUDICIÁRIA
 N.º
 7/15/21
 836 Roncador
 Client: Promec
 Date: 18-Jan-1999
 By: MSE
 Checked:

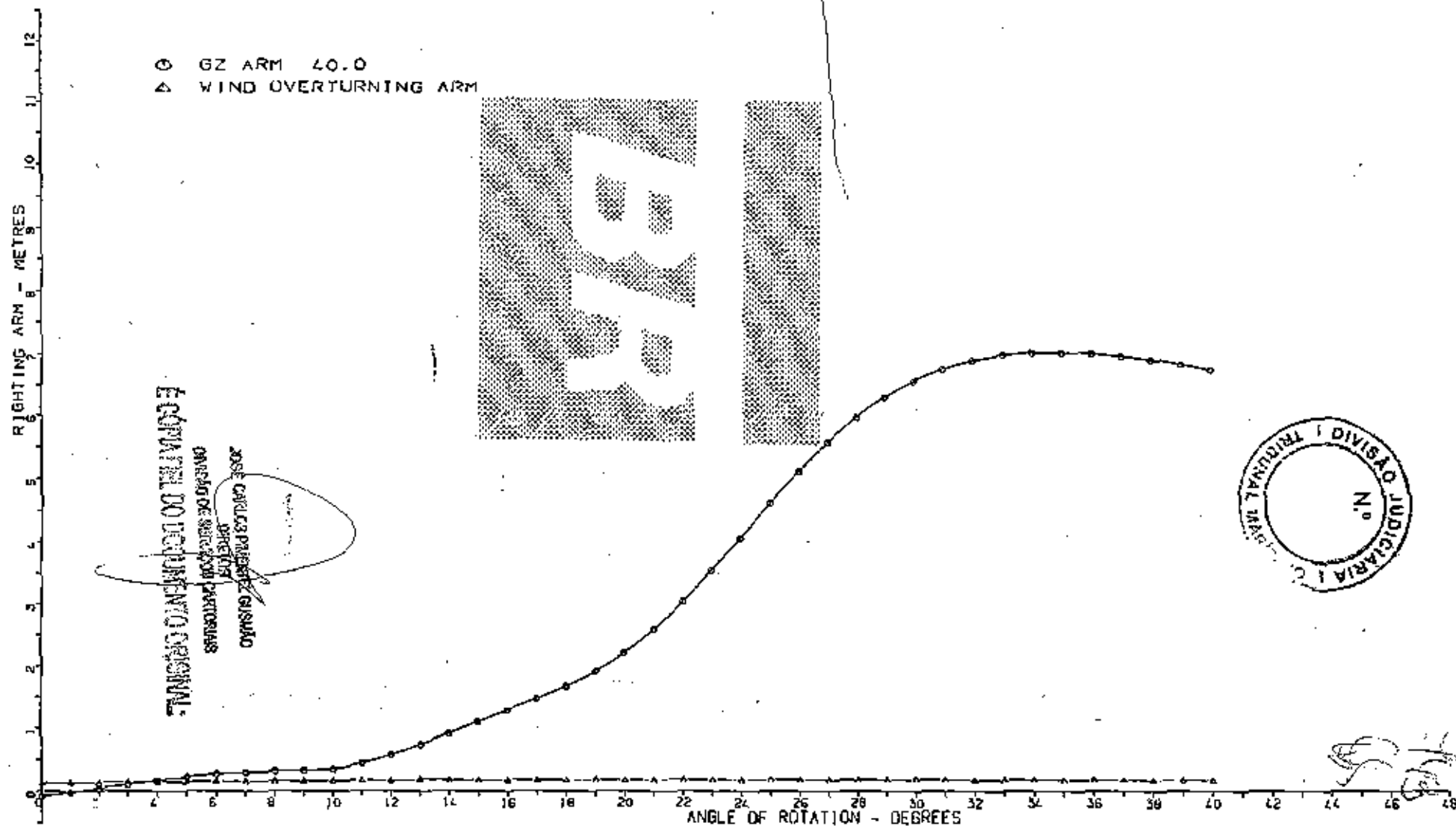
Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	Δ VCG
0	90	0.00	2.46	99.99	22.93	20.47	11.26	5.00	1.85
10	80	1.01	2.76	99.99	22.17	19.41	11.20	6.00	1.53
20	70	1.15	3.12	99.99	21.04	17.92	11.12	6.00	1.29
30	60	1.25	3.44	99.99	19.35	16.91	11.05	7.00	1.12
40	50	1.31	3.61	99.99	17.85	14.24	10.99	9.00	1.05
50	40	1.32	3.57	99.99	17.24	13.67	10.99	8.00	1.09
60	30	1.29	3.33	99.99	17.34	14.01	11.03	6.00	1.25
70	20	1.23	2.96	99.99	19.09	16.13	11.09	6.00	1.53
80	10	1.12	2.60	99.99	20.46	17.85	11.16	6.00	1.94
90	0	0.00	2.33	99.99	22.34	20.01	11.20	4.00	2.41
270	180	0.00	0.29	99.99	22.75	22.49	11.70	2.00	3.66
280	170	0.00	0.43	99.99	20.64	20.21	11.87	2.00	3.46
290	160	0.00	0.73	99.99	19.22	18.49	11.64	3.00	3.02
300	150	0.00	1.08	99.99	17.26	16.18	11.61	3.00	2.64
310	140	0.00	1.42	99.99	16.98	15.54	11.55	4.00	2.38
320	130	0.00	1.70	99.99	16.10	16.40	11.50	4.00	2.19
330	120	0.00	1.93	99.99	16.96	18.03	11.41	4.00	2.13
340	110	0.00	2.10	99.99	21.58	19.48	11.35	4.00	2.15
350	100	0.00	2.26	99.99	22.87	20.62	11.30	4.00	2.06

Minimum Increase in Allowable VCG = 1.09
 Maximum Allowable VCG = 23.462

JOSÉ CARLOS MENDIL GUSMÃO
 DIRETOR
 DEPARTAMENTO DE SERVIÇOS CARTORIAIS
 E COPIAS DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 -
DAMAGED STABILITY HEEL AXIS = 40.0

Damage to VS 45S T=22.0m



Title Stability Analysis Results
Condition Operational/Survival - Damaged
Draft 22.00 m
Displacement 56503 mT
LCG (from FP) 57.05 m
TCG (+ve s/bd) 0.03 m
VCG (abi) 22.41 m
Genstab Run ID d126
Space Damaged Void Space 32 S/bd 3 (New Subdivided Compartment)

WS No. 7/15/2177
 Project P36 Roncador
 Client Petrobras
 Date 18/09/1999
 By MSE
 Checked

Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	1.86	99.99	23.11	21.24	11.64	4.00	2.03
10	80	0.00	1.79	99.99	22.71	20.93	11.60	4.00	2.39
20	70	0.00	1.77	99.99	21.52	19.74	11.55	4.00	2.30
30	60	0.00	1.75	99.99	19.98	18.21	11.50	4.00	2.23
40	50	0.00	1.69	99.99	18.07	16.38	11.48	4.00	2.20
50	40	0.00	1.54	99.99	17.21	15.67	11.48	4.00	2.37
60	30	0.00	1.33	99.99	17.60	16.16	11.51	4.00	2.60
70	20	0.00	1.09	99.99	19.33	18.24	11.54	3.00	2.96
80	10	0.00	0.88	99.99	20.77	19.86	11.58	3.00	3.44
90	0	0.00	0.78	99.99	22.91	22.13	11.61	3.00	3.63
270	180	0.00	1.68	99.99	22.21	20.62	11.96	4.00	2.72
280	170	0.00	1.85	99.99	20.35	18.49	11.92	4.00	2.22
290	160	0.00	2.11	99.99	19.02	16.90	11.87	4.00	1.80
300	150	0.00	2.37	99.99	17.25	14.87	11.82	5.00	1.51
310	140	0.00	2.55	99.99	17.15	14.60	11.82	5.00	1.38
320	130	0.00	2.59	99.99	17.80	15.22	11.81	5.00	1.27
330	120	0.00	2.48	99.99	19.34	16.86	11.73	5.00	1.32
340	110	0.00	2.27	99.99	21.01	18.74	11.69	5.00	1.48
350	100	0.00	2.02	99.99	22.22	20.20	11.64	4.00	1.75

Minimum increase in Allowable VCG = 1.27
 Maximum Allowable VCG = 23.662

JOSÉ CARLOS PINHEIRO GUSMÃO
 DIRETOR
 DIVISÃO DE PROJEÇÃO E CÁLCULO
 É CONSIDERADO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage VS 32 Stbd 3 T=22.0m
 DAMAGED STABILITY HEEL AXIS = 320.0

○ GZ ARM 320.0
 ▲ WIND OVERTURNING ARM

RIGHTING ARM - METRES

BR



É COPIA DO DOCUMENTO ORIGINAL



ANGLE OF ROTATION - DEGREES

NOBLE DENTON

23.FEB.1999

TIME 11.55.46

NOBLE DENTON

Title Stability Analysis Results
Condition Operational/Survival - Damaged
Draft 22.00 m
Displacement 65503 mT
LCG (from FP) 57.05 m
TCG (+ve stbd) 0.03 m
VCG (abl) 22.41 m
Genstab Run ID d127
Space Damaged Base Oil Tank N1

N° 7/152/77
 Project P38 Remador
 Client Petromex
 Date 18 Jan 1999
 By TRIBUNAL
 Checked

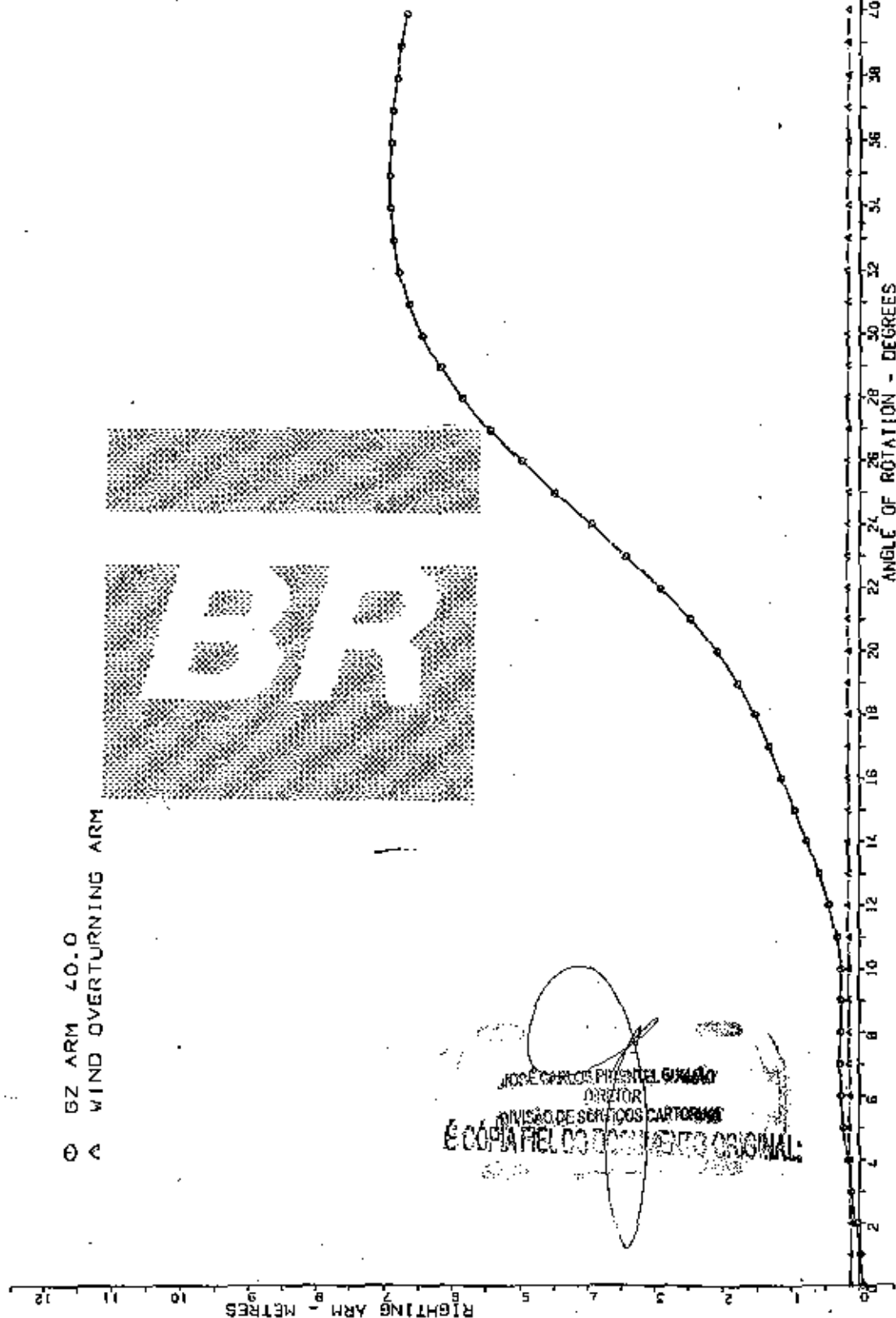
Heel Axis	Wind Heading	Angle of Loil	Angle of Stale Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	SVCG
0	90	0.00	2.30	99.99	22.56	20.26	11.29	5.00	1.39
10	80	0.00	2.57	99.99	21.83	19.26	11.23	5.00	1.09
20	70	0.00	2.91	99.99	20.69	17.79	11.16	8.00	0.86
30	60	1.02	3.22	99.99	18.95	15.73	11.08	7.00	0.70
40	50	1.07	3.39	99.99	17.70	14.32	11.02	11.00	0.63
50	40	1.08	3.34	99.99	17.13	13.79	11.01	11.00	0.69
60	30	1.06	3.11	99.99	17.16	14.05	11.06	6.00	0.87
70	20	0.00	2.76	99.99	18.88	16.12	11.12	5.00	1.09
80	10	0.00	2.41	99.99	20.21	17.60	11.19	5.00	1.45
90	0	0.00	2.16	99.99	21.58	19.80	11.23	4.00	1.95
270	180	0.00	0.45	99.99	22.74	22.28	11.75	2.00	3.66
280	170	0.00	0.60	99.99	20.64	20.04	11.72	3.00	3.46
290	160	0.00	0.86	99.99	19.22	18.37	11.69	3.00	3.00
300	150	0.00	1.17	99.99	17.25	16.08	11.65	3.00	2.63
310	140	0.00	1.46	99.99	16.34	15.48	11.60	4.00	2.38
320	130	0.50	1.70	99.99	18.07	16.38	11.54	4.00	2.18
330	120	0.00	1.88	99.99	19.96	16.08	11.45	4.00	2.13
340	110	0.00	2.01	99.99	21.60	19.60	11.39	4.00	2.17
350	100	0.00	2.13	99.99	22.90	20.77	11.34	4.00	1.71

Minimum Increase in Allowable VCG = 0.63
 Maximum Allowable VCG = 21.042

JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAIS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage Base OLL Tank N1T=22.0m
DAMAGED STABILITY HEEL AXIS = 40.0

○ GZ ARM 40.0
△ WIND OVERTURNING ARM



JOSE CARLOS PIRES DEL GUAYO
DIRETOR
DIVISÃO DE SERVIÇOS CARTÓGRAFOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL



Title Stability Analysis Results
Condition Operational/Survival - Damaged
Draft 22.00 m
Displacement 56503 mT
LCG (from FP) 57.05 m
TCG (+ve stbd) 0.03 m
VCG (abl) 22.41 m
Genetab Run ID d128
Space Damaged Void Space 85S

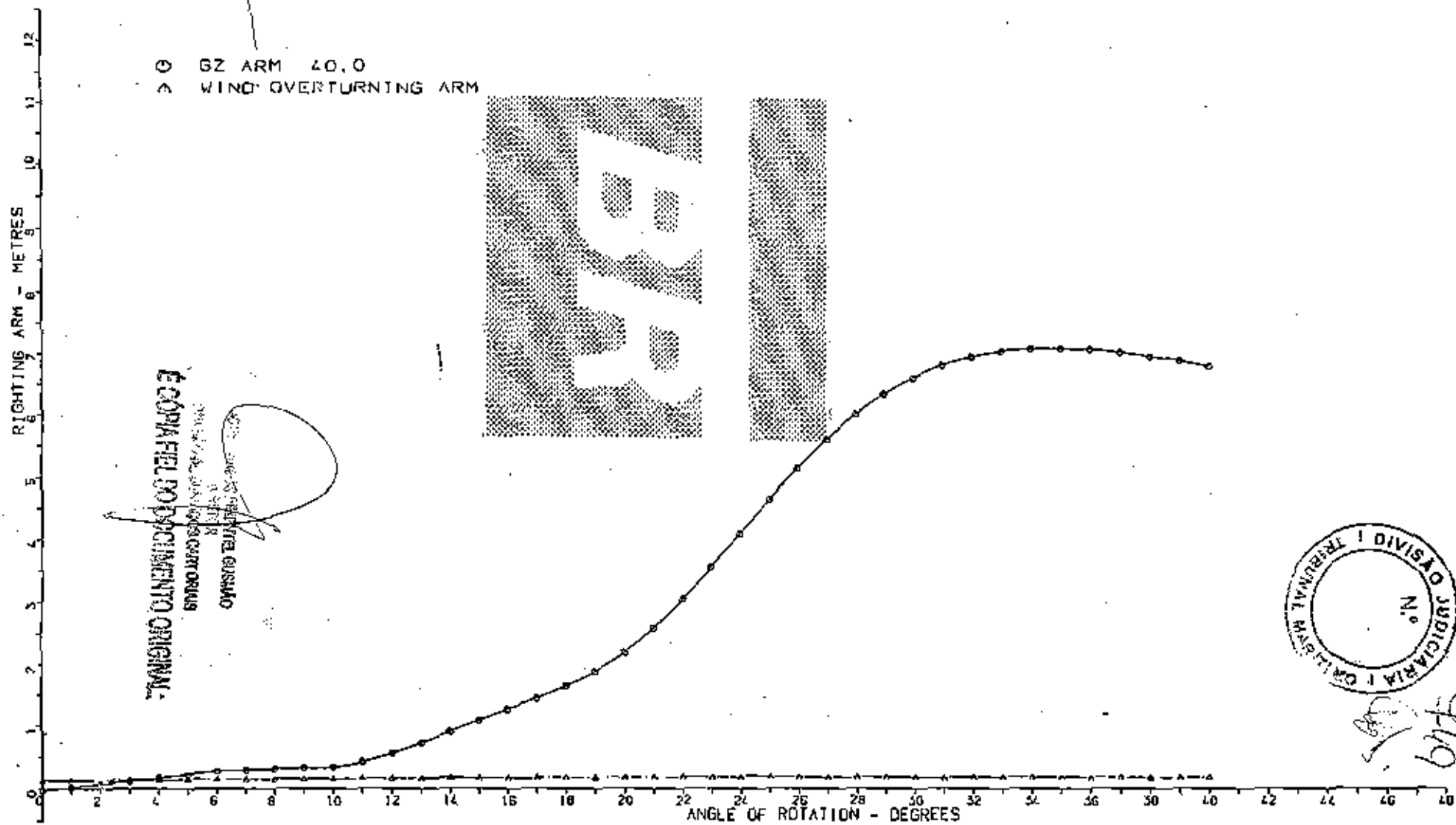
WS No 7/15/2177
 Project B36. Puncador
 Client Petromac
 Date 16-Jan-1999
 By MSE
 Checked

Heel Axis	Wind Heading	Angle of Loll	Angle of Stall to Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DP Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.41	99.99	23.02	20.82	11.35	6.00	1.80
10	80	0.00	2.65	99.99	22.26	19.61	11.29	5.00	1.67
20	70	0.00	2.97	99.99	21.13	18.16	11.21	6.00	1.31
30	60	0.00	3.22	99.99	19.52	16.30	11.16	7.00	1.15
40	50	0.00	3.32	99.99	17.89	14.57	11.09	7.00	1.10
50	40	0.00	3.19	99.99	17.20	14.01	11.10	7.00	1.17
60	30	0.00	2.88	99.99	17.23	14.38	11.15	6.00	1.33
70	20	0.00	2.43	99.99	19.00	16.67	11.23	5.00	1.63
80	10	0.00	2.02	99.99	20.38	18.35	11.30	4.00	2.10
90	0	0.00	1.74	99.99	22.24	20.50	11.38	4.00	2.81
270	180	0.00	0.89	99.99	22.71	21.82	11.90	3.00	3.66
280	170	0.00	0.94	99.99	20.64	19.70	11.84	3.00	3.46
290	160	0.00	1.18	99.99	19.22	18.07	11.82	3.00	2.99
300	150	0.00	1.41	99.99	18.98	15.57	11.77	4.00	2.57
310	140	0.00	1.65	99.99	18.92	15.27	11.73	4.00	2.23
320	130	0.00	1.89	99.99	18.08	16.19	11.61	4.00	2.01
330	120	0.00	2.06	99.99	19.93	17.87	11.52	5.00	1.90
340	110	0.00	2.17	99.99	21.53	19.36	11.45	5.00	1.92
350	100	0.00	2.28	99.99	22.82	20.55	11.40	5.00	1.87

Minimum Increase in Allowable VCG = 1.10
 Maximum Allowable VCG = 23.512

É COPIA FIEL DO DOCUMENTO ORIGINAL
 DIRETORIA DE SEGURANÇA
 DEPARTAMENTO DE CONTABILIDADE

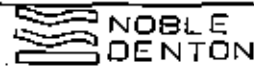
P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS65S T=22.0m
DAMAGED STABILITY HEEL AXIS = 40.0



NOBLE DENTON

23.FEB.1999

TIME 11.51.06



Title Stability Analysis Results
 Condition Operational/Survival - Damaged
 Draft 22.00 m
 Displacement 56503 mT
 LCG (from FP) 67.05 m
 TCG (+ve abt) 0.03 m
 VCG (abt) 22.41 m
 Genlab Run ID d129
 Space Damaged Void Space 64S

DIVISÃO JUDICIAL
 N.º
 7/15/2177
 P36 Remador
 Petromec
 Date 18-Jan-1999
 By MSE
 Checked

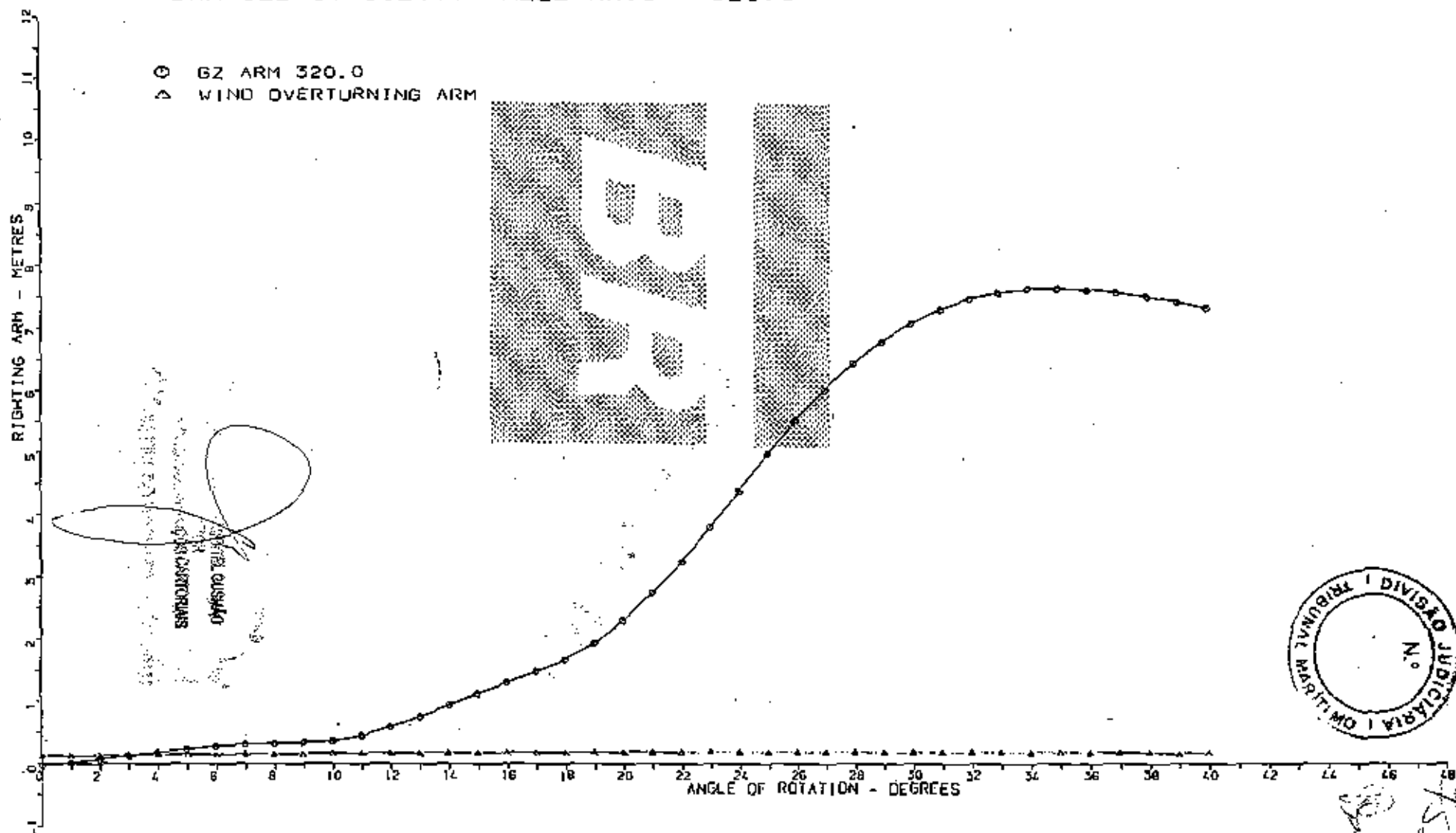
Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.39	99.99	23.24	20.85	11.58	5.00	1.81
10	80	0.00	2.26	99.99	22.67	20.41	11.54	6.00	1.87
20	70	0.00	2.18	99.99	21.50	19.32	11.50	5.00	1.91
30	60	0.00	2.08	99.99	19.96	17.68	11.46	5.00	1.86
40	50	0.00	1.92	99.99	18.10	16.18	11.44	4.00	1.99
50	40	0.00	1.70	99.99	17.00	15.30	11.45	4.00	2.18
60	30	0.00	1.46	99.99	17.09	15.63	11.48	4.00	2.53
70	20	0.00	1.21	99.99	19.33	18.13	11.52	3.00	2.95
80	10	0.00	1.00	99.99	20.77	19.77	11.66	3.00	3.44
90	0	0.00	0.96	99.99	22.88	21.83	11.80	3.00	3.82
270	180	0.00	1.68	99.99	22.14	20.48	11.92	4.00	2.65
280	170	0.00	1.96	99.99	20.27	18.31	11.87	4.00	2.14
290	160	0.00	2.36	99.99	18.91	16.54	11.79	5.00	1.69
300	150	0.00	2.79	99.99	17.13	14.34	11.72	6.00	1.36
310	140	0.00	3.13	99.99	17.12	13.99	11.65	7.00	1.19
320	130	0.00	3.28	99.99	17.88	14.61	11.61	7.00	1.14
330	120	0.00	3.17	99.99	19.54	16.37	11.64	7.00	1.18
340	110	0.00	2.94	99.99	21.14	18.21	11.83	6.00	1.33
350	100	0.00	2.62	99.99	22.36	19.74	11.59	5.00	1.59

Minimum Increase in Allowable VCG = 1.14
 Maximum Allowable VCG = 23.552

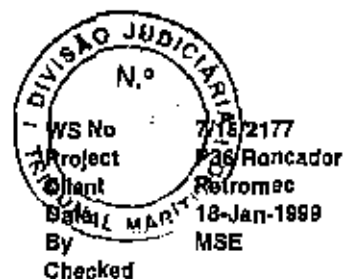
JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAS

CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS 64S T=22.0m
DAMAGED STABILITY HEEL AXIS = 320.0



Title Stability Analysis Results
Condition Operational/Survival - Damaged
Draft 22.00 m
Displacement 56503 mT
LCG (from FP) 57.06 m
TCG (+ve stbd) 0.03 m
VCG (abl) 22.41 m
Genstab Run ID d130
Space Damaged Void Space 46aS (Modified)

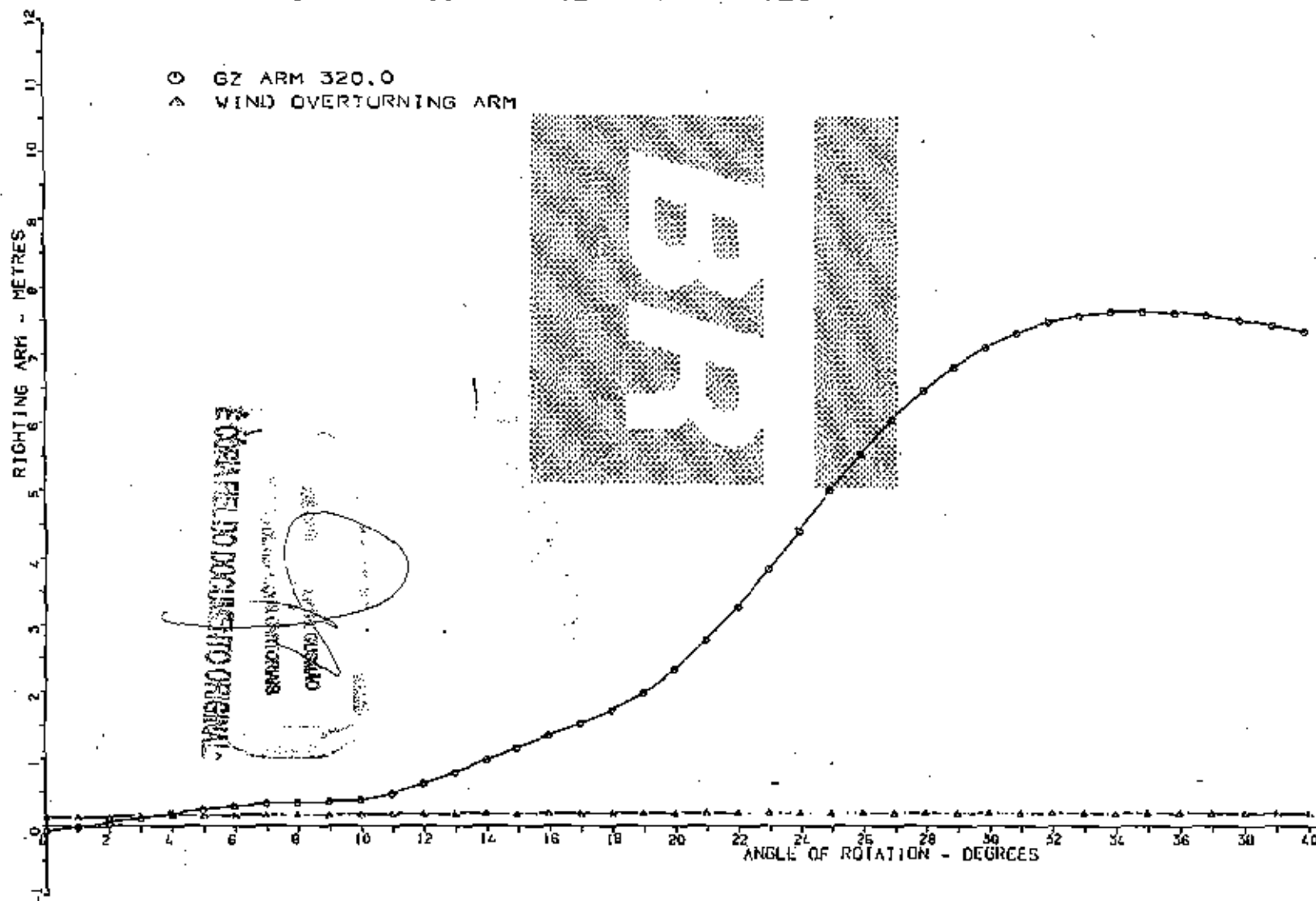


Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.46	99.99	23.24	20.78	11.60	5.00	1.96
10	80	0.00	2.30	99.99	22.69	20.40	11.57	5.00	2.09
20	70	0.00	2.18	99.99	21.52	19.34	11.52	4.00	2.10
30	60	0.00	2.04	99.99	19.97	17.93	11.49	4.00	2.04
40	50	0.00	1.83	99.99	18.11	16.28	11.45	4.00	2.12
50	40	0.00	1.57	99.99	17.05	15.48	11.46	4.00	2.26
60	30	0.00	1.24	99.99	17.27	16.02	11.48	3.00	2.58
70	20	0.00	0.90	99.99	19.33	18.43	11.53	3.00	2.96
80	10	0.00	0.61	99.99	20.77	20.16	11.57	2.00	3.44
90	0	0.00	0.44	99.99	22.91	22.47	11.60	2.00	3.63
270	180	0.00	2.09	99.99	22.21	20.12	11.81	4.00	2.69
280	170	0.00	2.38	99.99	20.36	18.00	11.77	4.00	2.22
290	160	0.02	2.72	99.99	19.00	16.28	11.71	5.00	1.78
300	150	1.11	3.09	99.99	17.23	14.15	11.64	6.00	1.46
310	140	1.16	3.34	99.99	17.18	13.82	11.81	6.00	1.29
320	130	1.18	3.43	99.99	17.87	14.45	11.57	7.00	1.25
330	120	1.13	3.30	99.99	19.61	16.20	11.59	6.00	1.30
340	110	1.06	3.04	99.99	21.13	18.09	11.64	6.00	1.45
350	100	0.00	2.72	99.99	22.35	19.63	11.63	5.00	1.71

Minimum Increase in Allowable VCG = 1.25
 Maximum Allowable VCG = 23.662

JOSE CARLOS MARCEL GUSMÃO
 OFICIAL
 DIVISÃO DE SERVIÇOS CARTORIAS
 É COPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS 46aS T=22.0m
DAMAGED STABILITY HEEL AXIS = 320.0



Title Stability Analysis Results
 Condition Operational/Survival - Damaged
 Draft 22.00 m
 Displacement 56603 mT
 LCG (from FP) 57.05 m
 TCG (+ve stbd) 0.03 m
 VCG (abi) 22.41 m
 Genstab Run ID d131
 Space Damaged Void Space 458 (Modified)

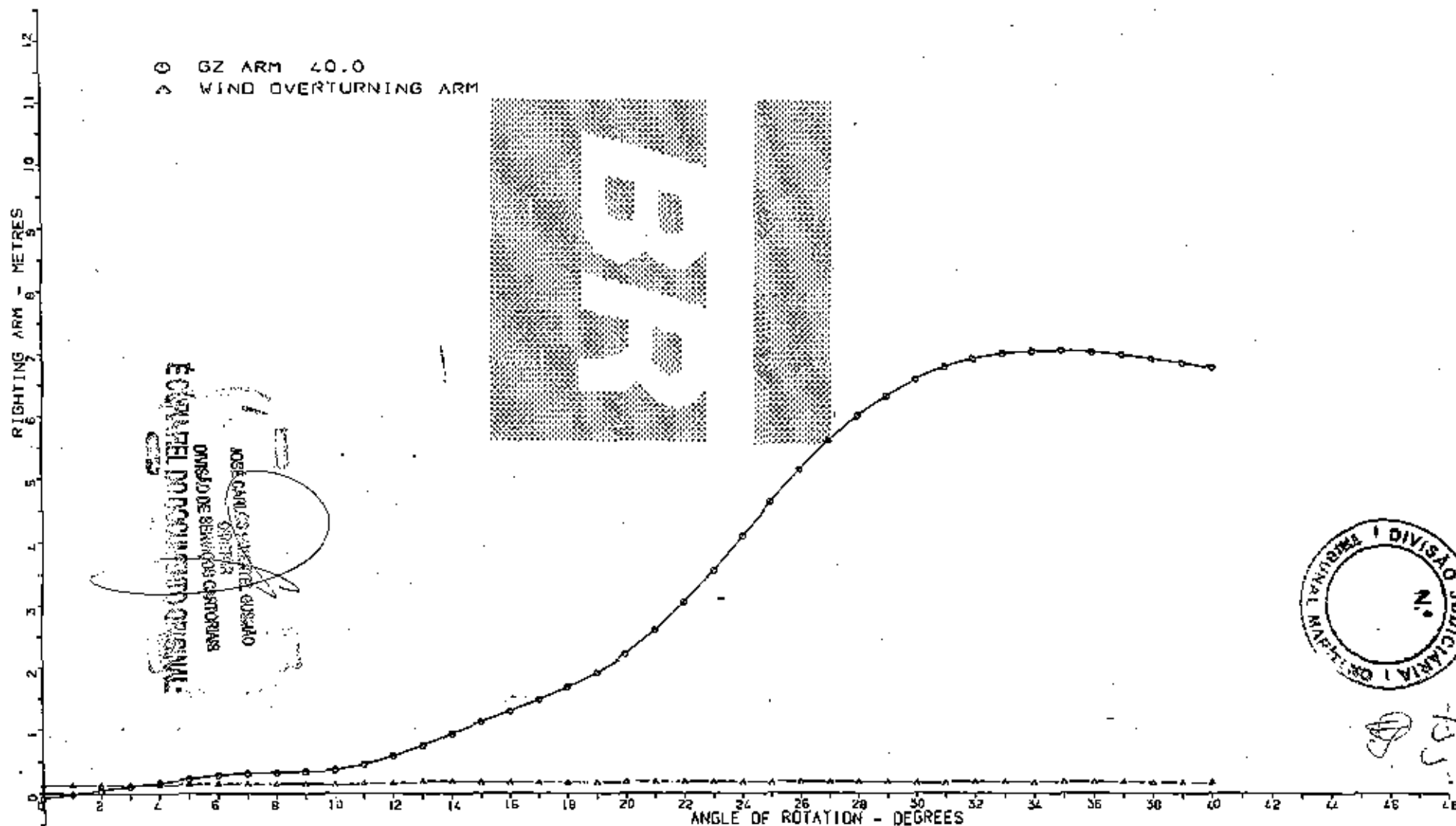
759
 105
 N.º
 7/16/21
 P36 Roncador
 Client P36 Roncador
 Date 18-Jan-1999
 By MSE
 Checked

Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.47	99.99	23.00	20.52	11.29	5.00	1.95
10	80	0.00	2.74	99.99	22.25	19.51	11.24	5.00	1.69
20	70	1.09	3.07	99.99	21.12	18.05	11.18	6.00	1.43
30	60	1.17	3.35	99.99	19.49	16.14	11.09	6.00	1.26
40	50	1.21	3.48	99.99	17.89	14.42	11.04	7.00	1.21
50	40	1.20	3.40	99.99	17.24	13.84	11.04	7.00	1.27
60	30	1.18	3.15	99.99	17.34	14.19	11.06	6.00	1.43
70	20	1.08	2.78	99.99	19.10	16.32	11.14	6.00	1.73
80	10	0.00	2.42	99.99	20.47	18.05	11.21	4.00	2.16
90	0	0.00	2.15	99.99	22.37	20.22	11.25	4.00	2.64
270	180	0.00	0.38	99.99	22.75	22.37	11.73	2.00	3.66
280	170	0.00	0.85	99.99	20.84	20.09	11.70	2.00	3.47
290	160	0.00	0.85	99.99	19.22	18.36	11.67	3.00	3.01
300	150	0.00	1.13	99.99	17.17	15.98	11.64	3.00	2.81
310	140	0.00	1.52	99.99	16.96	15.44	11.59	4.00	2.34
320	130	0.00	1.79	99.99	16.09	16.29	11.53	4.00	2.14
330	120	0.00	2.01	99.99	19.94	17.93	11.44	4.00	2.08
340	110	0.00	2.18	99.99	21.85	19.39	11.38	4.00	2.09
350	100	0.00	2.29	99.99	22.84	20.55	11.34	5.00	2.09

Minimum Increase in Allowable VCG = 1.21
 Maximum Allowable VCG = 23.622

JOSÉ CARLOS DIAZ TEL CUMALO
 DIRETOR
 DIVISÃO DE SERVIÇOS CANTONIAIS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS45aS T=22.0m
DAMAGED STABILITY HEEL AXIS = 40.0



Title
 Condition
 Draft
 Displacement
 LCG (from FP)
 TCG (+ve stbd)
 VCG (abl)
 Genstab Run ID
 Space Damaged

Stability Analysis Results
 Operational/Survival - Accidental Flooding
 22.00 m
 56603 mT
 57.05 m
 0.03 m
 22.41 m
 a131
 SW Ballast Tank 21S

DIVISÃO JUDICIÁRIA
 N.º
 WS No 7/15/2009
 Project P30-Roadador
 Client Páramac
 Date 18-Jan-1999
 By MSE
 Checked

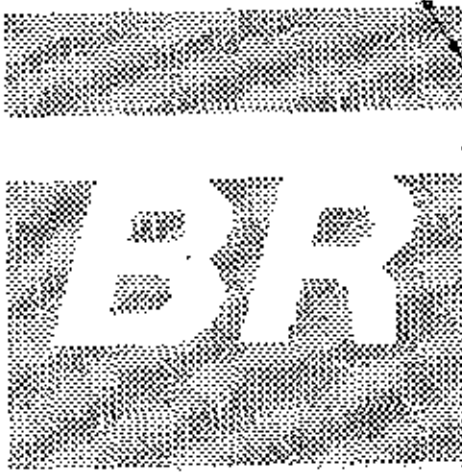
Heel Axis	Angle of Loll	Angle of Vanishing Stability	Positive Stability Range beyond Angle of Loll
0	7.48	>40°	32.51
10	9.13	>40°	30.87
20	10.48	>40°	29.62
30	11.51	>40°	28.49
40	12.20	>40°	27.80
50	12.51	>40°	27.48
60	12.48	>40°	27.54
70	12.03	>40°	27.97
80	11.28	>40°	28.72
90	10.17	>40°	29.83
270	0.00	>40°	40.00
280	0.01	>40°	40.00
290	0.05	>40°	40.00
300	0.20	>40°	40.00
310	0.50	>40°	40.00
320	0.00	>40°	40.00
330	1.38	>40°	38.82
340	3.56	>40°	36.44
360	5.62	>40°	34.38

JOSE CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORÁRIOS
 CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Accld Flooding Tk 21S T=22.0m
 ACCIDENTAL FLOODING HEEL AXIS = 50.0

Ø GZ ARM 50.0

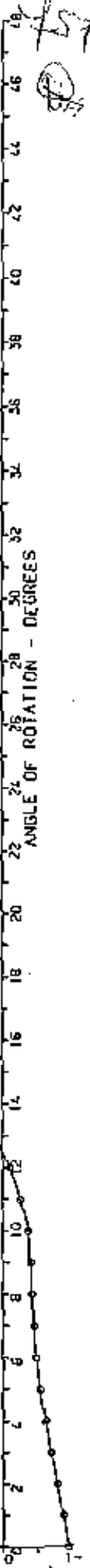
RIGHTING ARM - METRES



JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTÓGRAFOS
 CÓPIA FIEL DO DOCUMENTO ORIGINAL



ANGLE OF ROTATION - DEGREES



Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve stbd)
VCG (abf)
Genstab Run ID
Space Damaged

Stability Analysis Results
Operational/Survival - Accidental Flooding
22.00 m
56603 mT
57.03 m
0.03 m
22.41 m
a132
SW Ballast Tank 22S

WS No
Project
Client
Date
By
Checked



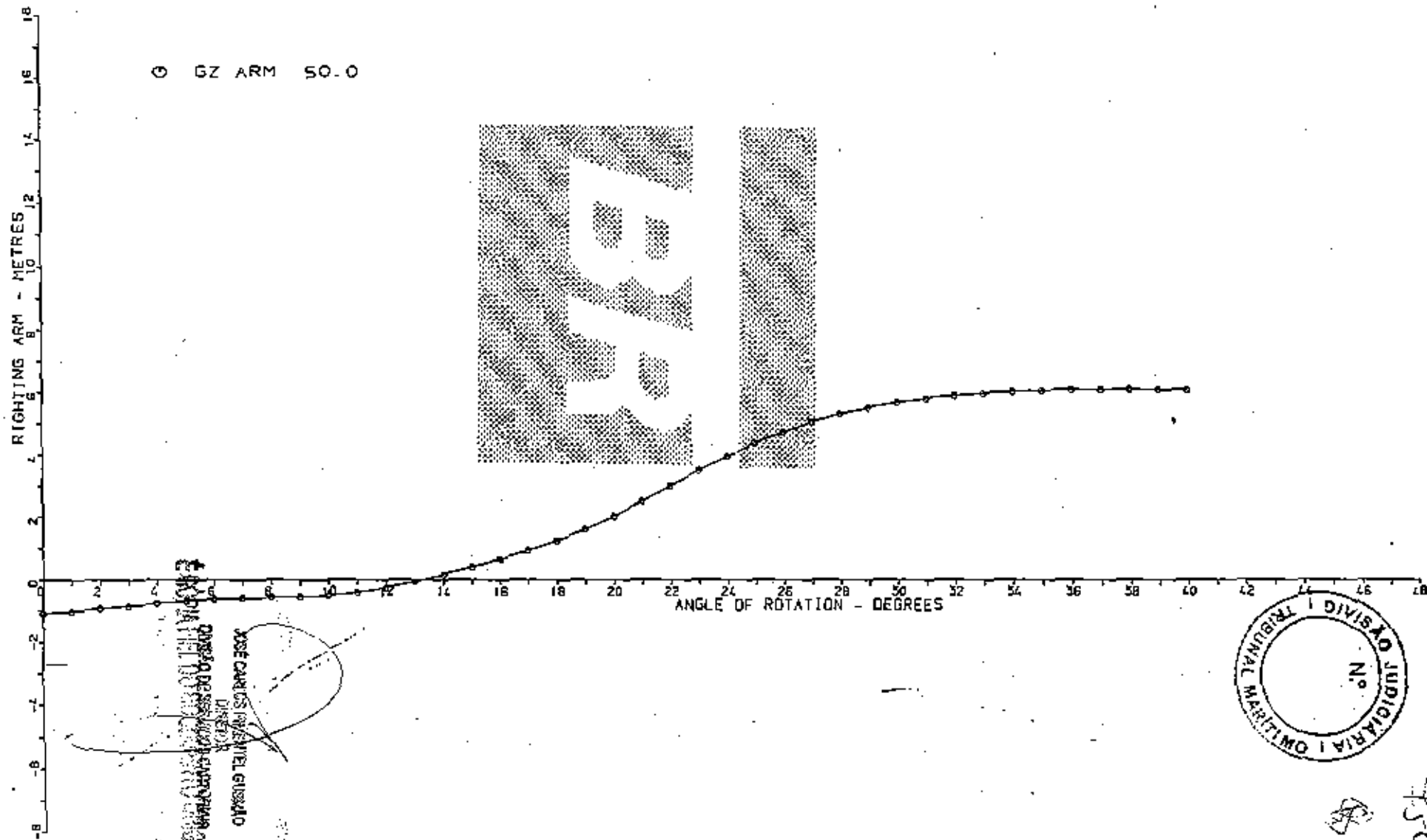
Heel Axis	Angle of Loft	Angle of Vanishing Stability	Positive Stability Range beyond Angle of Loft
0	8.64	>40°	31.36
10	10.26	>40°	29.74
20	11.58	>40°	28.44
30	12.61	>40°	27.49
40	13.10	>40°	26.90
50	13.28	>40°	26.72
60	13.09	>40°	26.91
70	12.48	>40°	27.52
80	11.55	>40°	28.45
90	10.24	>40°	29.76
270	0.00	>40°	40.00
280	0.00	>40°	40.00
290	0.00	>40°	40.00
300	0.00	>40°	40.00
310	0.00	>40°	40.00
320	0.00	>40°	40.00
330	2.36	>40°	37.64
340	4.63	>40°	35.37
350	6.74	>40°	33.26



JOSÉ CARLOS FIVENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTOGRAFICOS
É COPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Acc'd Flooding TK 22S T=22.0m
ACCIDENTAL FLOODING HEEL AXIS = 50.0

Ⓢ GZ ARM 50.0



NOBLE DENTON

23.FEB.1999

TIME 11.31.52



APPENDIX I



18.0M OPERATING/INSPECTION CONDITION

RESULTS SUMMARY

(CRITICAL GZ FOR EACH CASE ATTACHED)

(23 PAGES)



JOSÉ CARLOS PINHEIRO GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL



WS No 7/15/2177
 Project P36 Rencador
 Client Petromac
 Date 18-Jan-1999
 By MSE
 Checked

Title Stability Analysis Results
Condition Inspection of Fairleads
Draft 18.00 m
Displacement 50390 mT
LCG (from FP) 57.12 m
TCG (+ve stbd) 0.03 m
VCG (ab/) 24.56 m

Description	Genstab ID	Max Allowable VCG	Comments
Intact Condition			
Vessel Intact	I210	27.61	
Damaged Condition			
Columns			
Base Oil Tank N1	D227	29.13	Subdivide compartment
Void Space 32 Stbd 3 (subdivided)	D228	29.66	Formerly part of VS32 Stbd 1
Fairlead Boxes & Extensions			
Void Space 46S	D224	29.46	
Void Space 45S	D225	29.34	
Void Space 65S (modified)	D228	25.25	Formerly part of VS 46aS
Void Space 64S (modified)	D229	25.23	Formerly part of VS 45aS
Void Space 46aS (modified)	D230	29.52	
Void Space 45aS (modified)	D231	29.42	
Accidental Flooding			
Lower Hull			
S.W. Bal Tk 21s	A231	-	
S.W. Bal Tk 22s	A232	-	

* Values superceeded by modifications to tanks

Limiting KG 25.23 m Void Space 64S
 Actual KG 24.56 m
 Stability Margin 0.67 m

JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve abtd)
VCG (abl)
Genstab Run ID

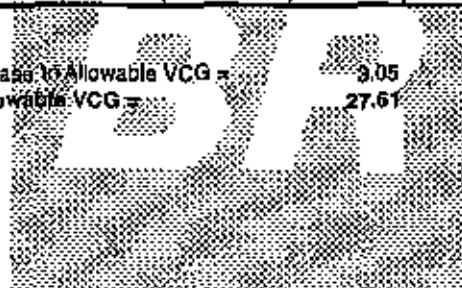
Stability Analysis Results
Inspection - Inlact
 18.00 m
 50390 mT
 57.12 m
 0.03 m
 24.55 m
 I210

WS No
 Project
 Client
 Date
 By
 Checked



Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	Area Ratio	δ VCG
0	90	0.0	8.34	99.99	25.80	17.48	14.71	3.11	4.72
10	80	0.0	8.24	99.99	25.04	16.80	14.65	2.90	4.61
20	70	0.0	7.95	99.99	23.94	16.99	14.56	2.68	3.05
30	60	0.0	7.55	99.99	22.52	14.98	14.48	2.58	4.82
40	50	0.0	7.07	99.99	20.91	13.84	14.43	2.68	5.55
50	40	0.0	6.58	99.99	19.80	13.22	14.45	3.04	7.02
60	30	0.0	6.23	99.99	20.39	14.16	14.50	3.74	8.84
70	20	0.0	6.04	99.99	21.18	15.11	14.55	4.56	9.81
80	10	0.0	5.82	99.99	22.46	16.84	14.61	5.70	11.18
90	0	0.0	5.75	99.99	25.91	20.16	14.68	7.54	12.59
270	180	0.0	5.80	99.99	25.63	19.82	15.19	7.79	13.19
280	170	0.0	5.78	99.99	22.33	18.55	15.16	8.92	11.70
290	160	0.0	6.01	99.99	21.04	15.03	15.10	4.75	10.28
300	150	0.0	6.26	99.99	20.27	14.08	15.02	3.91	9.07
310	140	0.0	6.52	99.99	19.62	13.10	14.98	3.19	7.44
320	130	0.0	7.02	99.99	20.77	13.75	14.80	2.79	6.13
330	120	0.0	7.80	99.99	22.52	15.02	14.71	2.89	5.22
340	110	0.0	7.91	99.99	24.08	16.17	14.66	2.78	4.85
350	100	0.0	8.23	99.99	25.32	17.09	14.68	3.01	4.76

Minimum Increase to Allowable VCG = 3.05
 Maximum Allowable VCG = 27.61

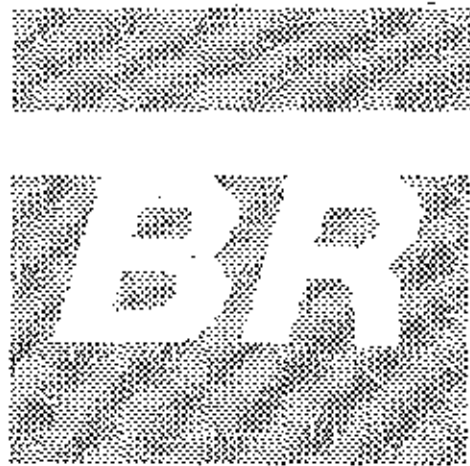


É Cópia Fiel do Documento Original

P-36 STABILITY ANALYSIS REV C JAN 99 - Intact Case T=18.0m
 INTACT CASE HEEL AXIS = 10.0

○ GZ ARM 10.0
 △ WIND OVERTURNING ARM

RIGHTING ARM - METRES



É CÓPIA DEL DO DOCUMENTO ORIGINAL:
 JOSÉ CARLOS DE AVELAR GUSMÃO
 DIRETOR
 DIVISÃO DE REGISTRO E CERTIFICADO

ANGLE OF ROTATION - DEGREES

NOBLE DENTON

TIME 15.10.48

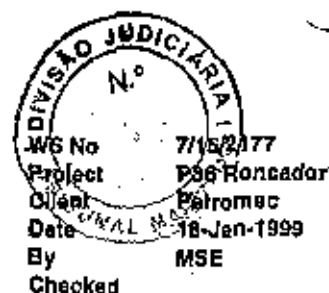
23.FEB.1999

NOBLE DENTON

163

Title
 Condition
 Draft
 Displacement
 LCG (from FP)
 TCG (+ve athd)
 VCG (abl)
 Genlab Run ID
 Space Damaged

Stability Analysis Results
 Inspection - Damaged
 18.00 m
 50390 mT
 57.12 m
 0.03 m
 24.58 m
 D224
 Void Space 465



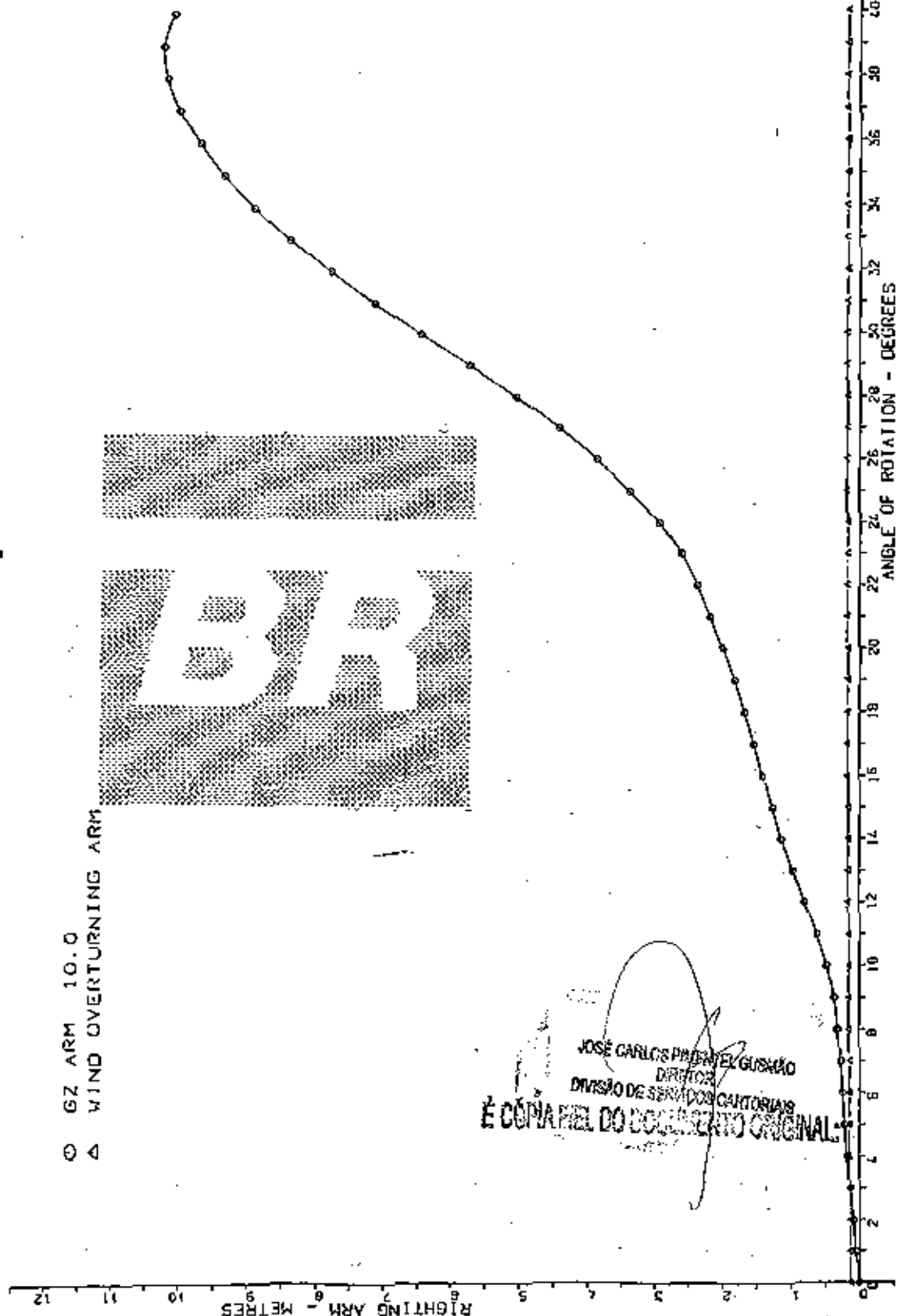
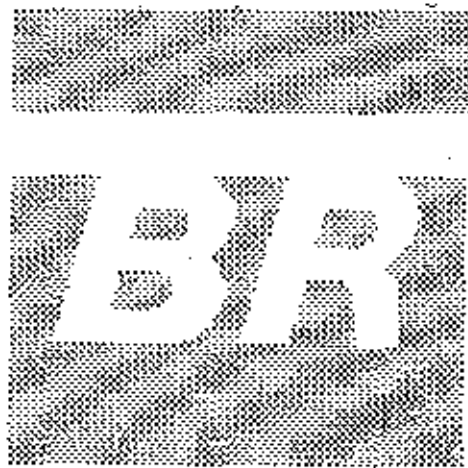
Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	M/n DF Clearance	IMO Damaged Ratio	Δ VCG
0	90	0.00	3.16	99.99	25.92	22.78	15.52	8.00	4.95
10	80	0.00	2.86	99.99	25.12	22.16	15.43	8.00	4.90
20	70	0.00	3.05	99.99	23.98	20.93	15.34	8.00	5.07
30	60	0.00	3.19	99.99	22.50	19.31	15.27	8.00	5.57
40	50	0.00	3.24	99.99	20.79	17.55	15.21	7.00	6.48
50	40	0.00	3.10	99.99	19.32	16.22	15.21	7.00	8.08
60	30	0.00	2.78	99.99	20.39	17.61	15.25	6.00	9.96
70	20	0.00	2.40	99.99	21.16	18.76	15.32	6.00	10.95
80	10	0.00	2.09	99.99	22.45	20.36	15.39	5.00	12.13
90	0	0.00	1.97	99.99	25.01	23.93	15.43	5.00	13.37
270	180	0.00	2.60	99.99	24.81	22.21	15.80	6.00	12.87
280	170	0.00	3.00	99.99	22.04	19.04	15.70	6.00	11.46
290	160	0.00	3.76	99.99	20.87	17.10	15.63	7.00	10.13
300	150	0.00	4.77	99.99	19.11	15.34	15.33	7.00	9.07
310	140	0.00	5.20	99.99	18.54	14.34	15.26	7.00	7.60
320	130	0.00	5.38	99.99	20.69	15.31	15.20	8.00	6.45
330	120	0.00	5.22	99.99	22.42	17.19	15.22	8.00	5.68
340	110	0.00	4.43	99.99	23.93	19.51	15.39	8.00	5.17
350	100	0.00	3.60	99.99	25.11	21.52	15.57	8.00	4.94

Minimum Increase in Allowable VCG = 4.90
 Maximum Allowable VCG = 29.460

JOSE CARLOS PINHEIRO GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS GASTRONÔMICOS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS 46S T=18.0m
 DAMAGED CASE HEEL AXIS = 10.0

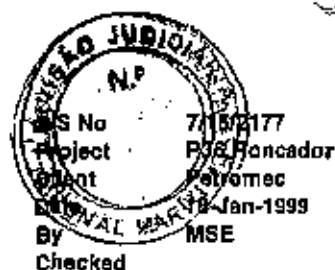
○ GZ ARM 10.0
 ▲ WIND OVERTURNING ARM



465

JOSÉ CARLOS PRUDENTE GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORÁRIOS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Title Stability Analysis Results
 Condition Inspection - Damaged
 Draft 18.00 m
 Displacement 80390 mT
 LCG (from FP) 57.12 m
 TCG (+ve stbd) 0.03 m
 VCG (abl) 24.56 m
 Genstab Run ID D225
 Space Damaged Void Space 4SS

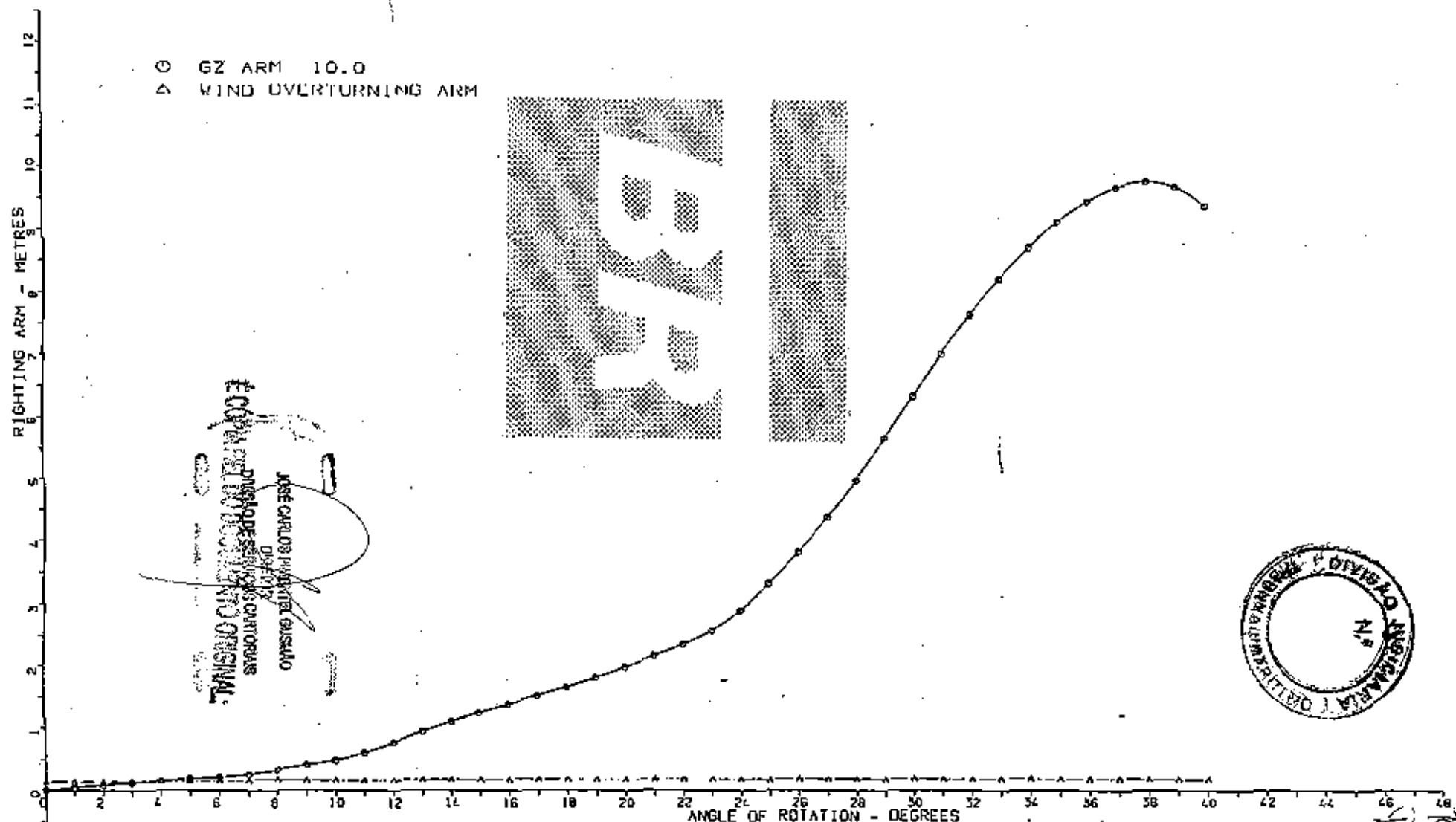


Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DP Clearance	IMO Damaged Ratio	Δ VCG
0	90	0.00	3.13	99.99	25.53	22.40	15.35	8.00	4.87
10	80	0.00	3.56	99.99	24.84	21.28	15.21	8.00	4.78
20	70	0.00	4.31	99.99	23.79	18.48	15.02	8.00	4.93
30	60	0.00	5.16	99.99	22.42	17.28	14.80	8.00	5.31
40	50	0.00	5.40	99.99	20.84	15.44	14.70	8.00	6.98
50	40	0.00	5.19	99.99	19.72	14.53	14.73	7.00	7.22
60	30	0.00	4.68	99.99	20.22	15.56	14.81	7.00	8.65
70	20	0.00	3.87	99.99	20.97	17.30	15.00	7.00	9.67
80	10	0.00	2.91	99.99	22.15	19.24	15.17	8.00	10.94
90	0	0.00	2.51	99.99	25.02	22.52	15.27	8.00	12.29
270	180	0.00	2.04	99.99	25.83	23.59	15.97	5.00	13.97
280	170	0.00	2.15	99.99	22.33	20.18	15.93	5.00	12.68
290	160	0.00	2.45	99.99	21.04	18.69	15.86	8.00	11.43
300	150	0.00	2.84	99.99	20.27	17.44	15.79	8.00	10.39
310	140	0.00	3.15	99.99	19.08	15.83	16.75	7.00	8.47
320	130	0.00	3.28	99.99	20.67	17.38	15.70	7.00	6.90
330	120	0.00	3.22	99.99	22.52	19.30	15.69	7.00	5.82
340	110	0.00	3.09	99.99	24.13	21.03	15.56	8.00	5.24
350	100	0.00	2.86	99.99	25.41	22.44	15.50	8.00	5.02

Minimum Increase in Allowable VCG = 4.78
 Maximum Allowable VCG = 29.340

JOSÉ CARLOS FREIRE GUSMÃO
 DIRETOR
 DEPARTAMENTO DE SERVIÇOS CATASTRAIS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS 45S T=18.0m
DAMAGED CASE HEEL AXIS = 10.0



Title Stability Analysis Results
 Condition Inspection - Damaged
 Draft 18.00 m
 Displacement 50890 mT
 LCG (from FP) 57.12 m
 TCG (+ve stbd) 0.03 m
 VCG (abi) 24.58 m
 Genstab Run ID D226
 Space Damaged Void Space 32 Stbd 3 (New Subdivided Compartment)

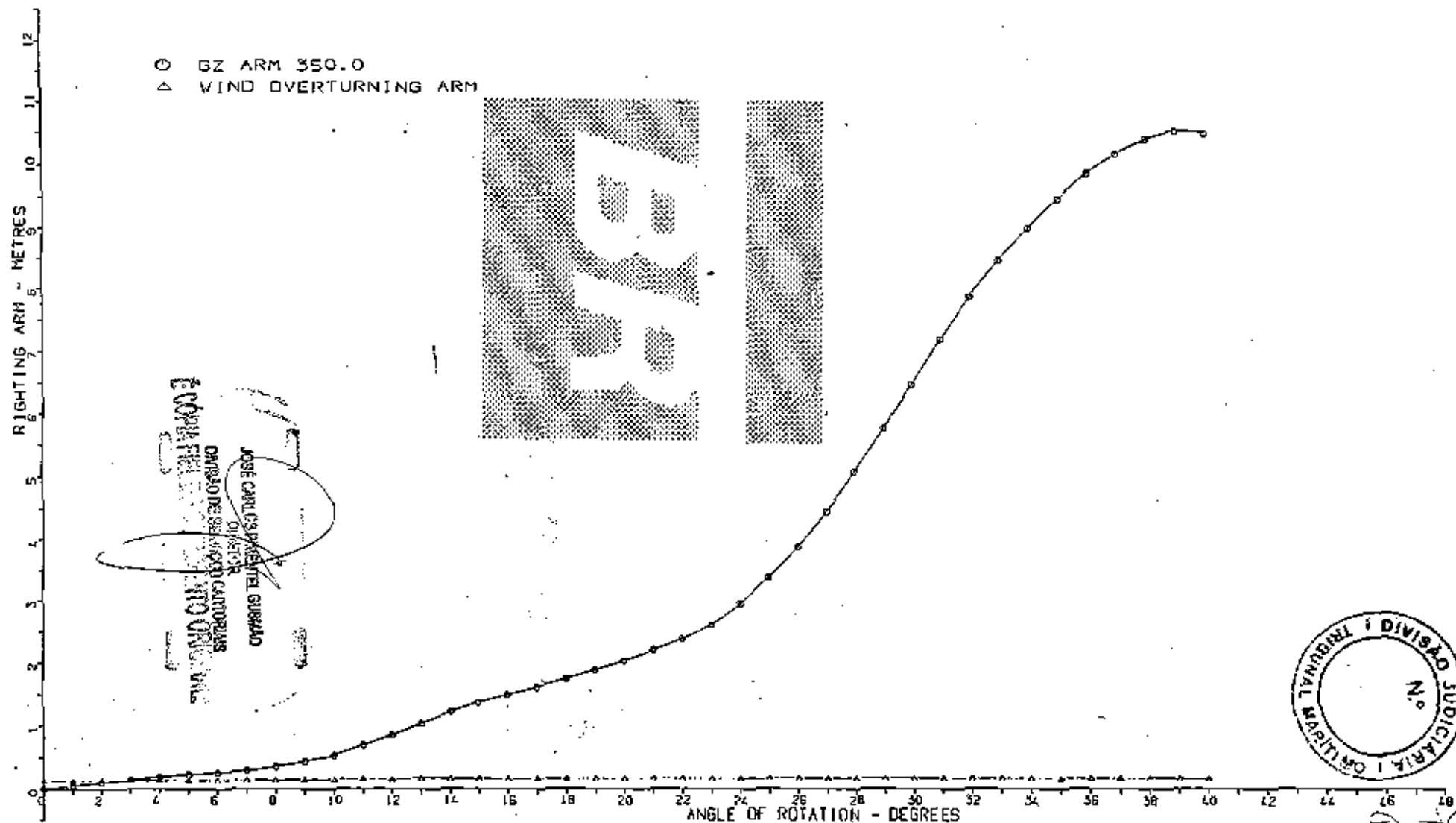
N.º
 7/15/2177
 P36 Encador
 Client Ratomac
 Date 18-Jan-1999
 By MSE
 Checked

Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.56	99.99	25.91	23.33	15.62	7.00	5.11
10	80	0.00	2.68	99.99	26.11	22.44	15.43	7.00	5.10
20	70	0.00	2.91	99.99	23.97	21.06	15.34	7.00	5.34
30	60	0.00	3.15	99.99	22.50	19.34	15.27	7.00	5.89
40	50	0.00	3.24	99.99	20.81	17.57	15.21	7.00	6.78
50	40	0.00	3.10	99.99	19.60	16.50	15.21	7.00	8.39
60	30	0.00	2.78	99.99	20.39	17.61	15.25	6.00	9.98
70	20	0.00	2.40	99.99	21.15	18.75	15.32	6.00	10.95
80	10	0.00	2.09	99.99	22.45	20.36	15.39	5.00	12.13
90	0	0.00	1.97	99.99	25.91	23.93	15.43	5.00	13.37
270	180	0.00	2.04	99.99	24.84	22.81	15.97	6.00	12.79
280	170	0.00	2.18	99.99	23.06	19.91	15.93	6.00	11.45
290	160	0.00	2.48	99.99	20.88	18.39	15.85	8.00	10.23
300	150	0.00	2.95	99.99	20.12	17.17	15.76	7.00	9.24
310	140	0.00	3.38	99.99	19.54	16.15	15.69	7.00	7.89
320	130	0.00	3.52	99.99	20.67	17.15	15.64	7.00	6.74
330	120	0.00	3.31	99.99	22.40	19.09	15.67	8.00	5.91
340	110	0.00	2.94	99.99	23.92	20.97	15.65	8.00	5.35
350	100	0.00	2.69	99.99	25.10	22.41	15.58	8.00	5.10

Minimum Increase in Allowable VCG = 5.10
 Maximum Allowable VCG = 29.680

JOSÉ CARLOS PAVENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORARIAS
 É CÓPIA DO VOTO ORIGINAR

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage VS 32 Stbd 3 T=18.0m
DAMAGED CASE HEEL AXIS = 350.0



Title Stability Analysis Results
 Condition Inspection - Damaged
 Draft 18.00 m
 Displacement 50390 mT
 LCG (from FP) 57.12 m
 TCG (+ve stbd) 0.03 m
 VCG (abl) 24.56 m
 Genstab Run ID D227
 Space Damaged Base Oil Tank N1

WS No
 Project
 Client
 Date
 By
 Checked

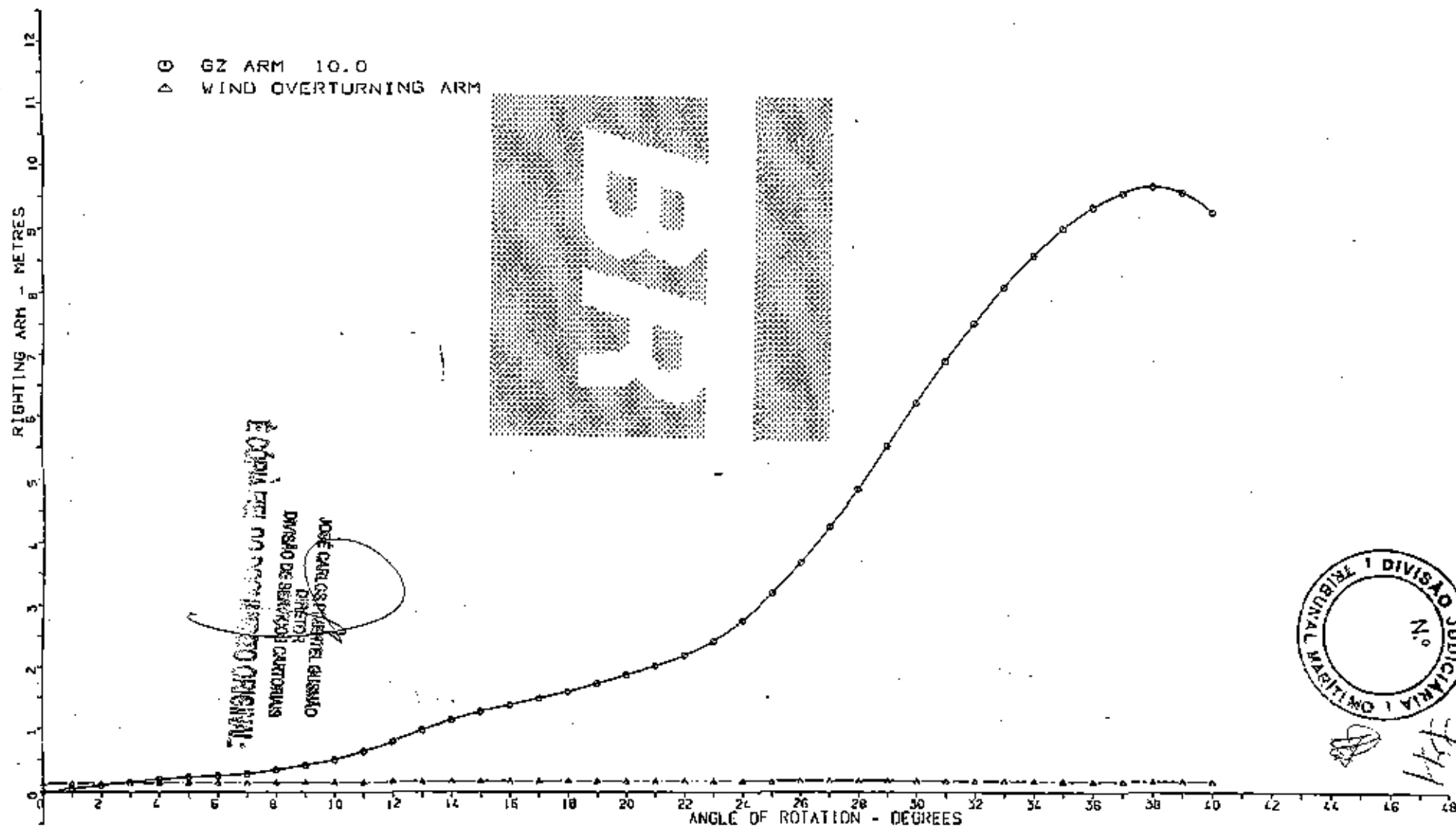


Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.58	99.99	25.33	22.75	15.52	7.00	4.61
10	80	0.00	2.68	99.99	24.69	22.01	15.43	8.00	4.57
20	70	0.00	2.92	99.99	23.68	20.76	15.34	8.00	4.73
30	60	0.00	3.27	99.99	22.32	19.05	15.24	8.00	5.11
40	50	0.00	3.53	99.99	20.75	17.22	15.14	7.00	5.78
50	40	0.00	3.36	99.99	19.62	16.26	15.15	7.00	6.93
60	30	0.00	2.87	99.99	20.05	17.18	15.23	7.00	8.19
70	20	0.00	2.43	99.99	20.83	18.40	15.31	6.00	9.17
80	10	0.00	2.09	99.99	21.95	19.89	15.39	6.00	10.33
90	0	0.00	1.87	99.99	24.57	22.60	15.49	5.00	11.62
270	180	0.00	2.04	99.99	25.83	23.59	15.97	5.00	13.97
280	170	0.00	2.16	99.99	23.33	20.18	15.93	5.00	12.68
290	160	0.00	2.45	99.99	21.34	18.59	15.85	6.00	11.43
300	150	0.00	2.84	99.99	20.27	17.43	15.79	6.00	10.39
310	140	0.00	3.15	99.99	19.11	15.98	15.75	7.00	8.62
320	130	0.00	3.28	99.99	20.69	17.30	15.70	7.00	6.97
330	120	0.00	3.18	99.99	22.48	19.30	15.70	7.00	5.84
340	110	0.00	2.93	99.99	24.12	21.19	15.85	7.00	5.15
350	100	0.00	2.69	99.99	25.42	22.73	15.56	7.00	4.84

Minimum Increase in Allowable VCG = 4.67
 Maximum Allowable VCG = 29.130

JOSÉ CARLOS MENTEL GUSMÃO
 DIVISÃO DE SERVIÇOS CARTÓGRAFOS
 É COPIA FIEL DO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage Base OLL Tank N1T=18.0m
DAMAGED CASE HEEL AXIS = 10.0



Title Stability Analysis Results
 Condition Inspection - Damaged
 Draft 18.00 m
 Displacement 50390 mT
 LCG (from FP) 57.12 m
 TCG (+ve stbd) 0.03 m
 VCG (abi) 24.58 m
 Genstab Run ID D228
 Space Damaged Void Space 658

WS No 7/15/2177
 Project 236 Repetidor
 Client Valonac
 Date 18-Jan-1999
 By MSE
 Checked



Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.58	99.99	25.59	23.00	15.52	8.00	1.09
10	80	0.00	2.68	99.99	24.88	22.21	15.43	8.00	0.91
20	70	0.00	2.91	99.99	23.82	20.91	15.34	8.00	0.69
30	60	0.00	3.19	99.99	22.43	19.25	15.26	8.00	5.28
40	50	0.00	3.31	99.99	20.83	17.52	15.20	8.00	5.91
50	40	0.00	3.13	99.99	19.64	16.52	15.20	7.00	7.16
60	30	0.00	2.79	99.99	20.11	17.33	15.25	7.00	8.69
70	20	0.00	2.40	99.99	20.91	18.62	15.32	6.00	9.74
80	10	0.00	2.09	99.99	22.08	19.99	15.39	5.00	11.04
90	0	0.00	1.97	99.99	24.92	22.95	15.49	5.00	12.39
270	180	0.00	2.04	99.99	25.63	23.69	15.97	6.00	13.97
280	170	0.00	2.15	99.99	22.33	20.18	15.93	5.00	12.66
290	160	0.00	2.35	99.99	21.04	18.59	15.86	6.00	11.43
300	150	0.00	2.84	99.99	20.25	17.41	15.79	6.00	10.38
310	140	0.00	3.15	99.99	19.10	16.95	15.75	7.00	8.31
320	130	0.00	3.28	99.99	20.67	17.39	15.70	7.00	6.84
330	120	0.00	3.18	99.99	22.51	18.33	15.70	7.00	5.71
340	110	0.00	2.93	99.99	24.11	21.18	15.65	7.00	5.16
350	100	0.00	2.69	99.99	25.37	22.69	15.58	7.00	1.22

Minimum Increase in Allowable VCG = 0.69
 Maximum Allowable VCG = 25.254

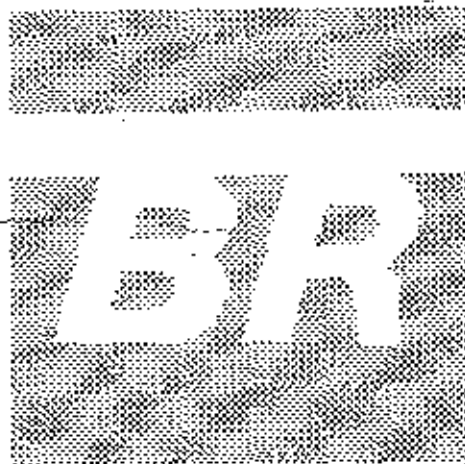
JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORARIOS

É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS65S T=18.0m
 DAMAGED CASE HEEL AXIS = 20.0

○ GZ ARM 20.0
 △ WIND OVERTURNING ARM

RIGHTING ARM - METRES



713

JOS CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS GANTORIAS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

ANGLE OF ROTATION - DEGREES

NOBLE DENTON

23. FEB. 1999

TIME 15.28.16

NOBLE DENTON

Title Stability Analysis Results
Condition Inspection - Damaged
Draft 18.00 m
Displacement 60390 mT
LCG (from FP) 57.12 m
TCG (+ve stbd) 0.03 m
VCG (abl) 24.56 m
Genstab Run ID D229
Space Damaged Void Space 64S

N.º
 71502377
 Project N° 68 Roncador
 Client Petromec
 Date 18-Jan-1999
 By MSE
 Checked

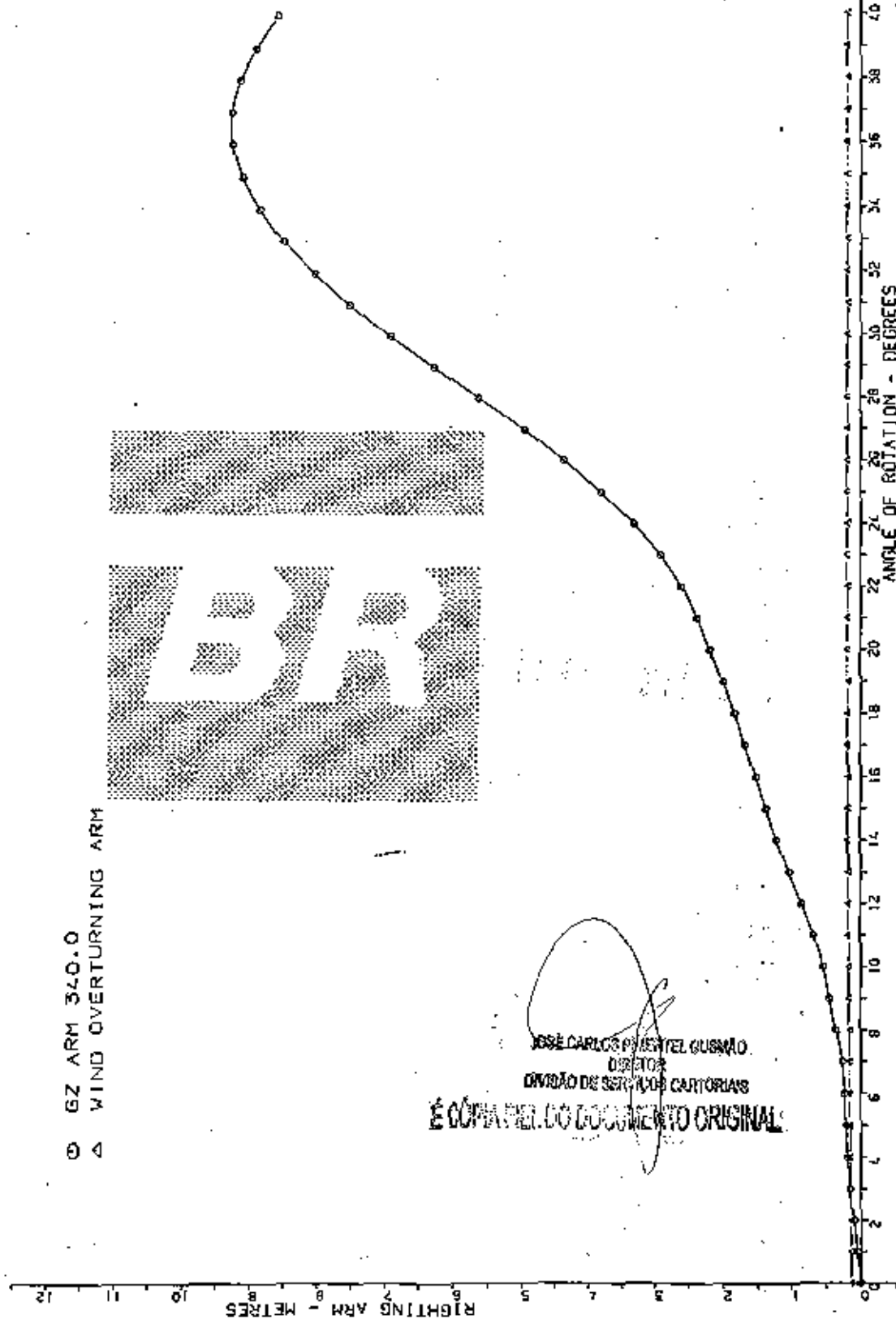
Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	δ VCG
0	90	0.00	2.58	99.99	25.87	23.29	15.52	8.00	1.08
10	80	0.00	2.68	99.99	26.09	22.42	15.43	8.00	1.21
20	70	0.00	2.91	99.99	23.97	21.05	15.34	7.00	4.98
30	60	0.00	3.16	99.99	22.50	19.35	15.27	7.00	5.43
40	50	0.00	3.24	99.99	20.80	17.56	15.21	7.00	6.21
50	40	0.00	3.10	99.99	19.32	16.22	15.21	7.00	7.87
60	30	0.00	2.78	99.99	20.35	17.57	15.25	6.00	9.94
70	20	0.00	2.40	99.99	21.15	18.75	15.32	6.00	10.95
80	10	0.00	2.09	99.99	22.45	20.36	15.39	6.00	12.13
90	0	0.00	1.97	99.99	25.91	23.93	15.43	5.00	13.37
270	180	0.00	2.64	99.99	24.71	22.67	15.97	5.00	12.97
280	170	0.00	2.15	99.99	21.98	19.83	15.93	5.00	11.55
290	160	0.00	2.45	99.99	20.82	18.37	15.86	6.00	10.20
300	150	0.00	2.84	99.99	20.02	17.19	15.79	7.00	9.11
310	140	0.00	3.19	99.99	19.47	16.29	15.74	7.00	7.56
320	130	0.00	3.36	99.99	20.69	17.32	15.66	8.00	6.38
330	120	0.00	3.22	99.99	22.44	19.21	15.69	8.00	5.61
340	110	0.00	2.95	99.99	28.98	21.03	16.85	8.00	0.67
350	100	0.00	2.69	99.99	25.16	22.47	16.58	8.00	0.91

Minimum Increase in Allowable VCG = 0.67
 Maximum Allowable VCG = 25.230

JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTÓGRAFOS
 CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS 64S T=18.0m
DAMAGED CASE HEEL AXIS = 340.0

○ GZ ARM 340.0
△ WIND OVERTURNING ARM



JOSE CARLOS PIMENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTÓGRAFICOS
É Cópia fiel do documento original



Title Stability Analysis Results
Condition Inspection - Damaged
Draft 18.00 m
Displacement 50390 mT
LCG (from FP) 57.12 m
TCG (+ve stbd) 0.03 m
VCG (abl) 24.56 m
Genstab Run ID D230
Space Damaged Void Space 46aS (Modified)

N.º
 7/15/2177
 Project 886 Roncador
 Client Patromec
 Date 18-Jan-1999
 By MSE
 Checked

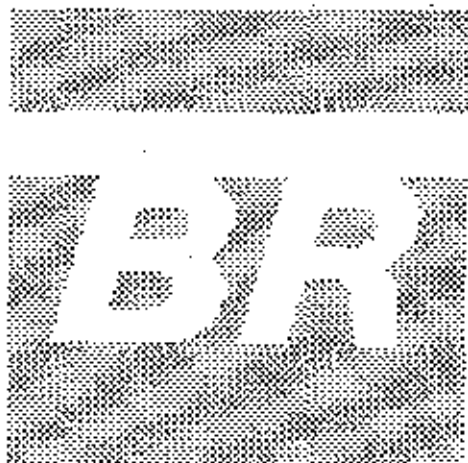
Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	Δ VCG
0	90	0.00	3.27	99.99	25.89	22.62	15.51	8.00	5.01
10	80	0.00	3.12	99.99	25.11	21.99	15.44	9.00	4.96
20	70	0.00	3.14	99.99	23.98	20.84	15.39	8.00	5.13
30	60	0.00	3.24	99.99	22.51	19.27	15.25	8.00	5.80
40	50	0.00	3.24	99.99	20.81	17.57	15.21	7.00	6.43
50	40	0.00	3.10	99.99	19.37	16.27	15.21	7.00	8.00
60	30	0.00	2.78	99.99	20.39	17.61	15.25	8.00	9.95
70	20	0.00	2.40	99.99	21.15	18.75	15.32	6.00	10.95
80	10	0.00	2.09	99.99	22.45	20.36	15.39	5.00	12.13
90	0	0.00	1.97	99.99	25.91	23.93	15.43	5.00	13.37
270	180	0.00	2.51	99.99	24.87	22.35	15.62	6.00	13.04
280	170	0.00	2.91	99.99	22.06	19.15	15.72	8.00	11.85
290	160	0.00	3.68	99.99	20.88	17.20	15.55	7.00	10.32
300	150	0.00	4.89	99.99	20.11	15.43	15.35	7.00	9.26
310	140	0.00	5.20	99.99	19.54	14.34	15.26	7.00	7.76
320	130	0.00	5.45	99.99	20.70	15.26	15.19	8.00	6.57
330	120	0.00	6.32	99.99	22.44	17.12	15.20	8.00	5.78
340	110	0.00	4.51	99.99	23.96	19.46	15.38	8.00	5.25
350	100	0.00	3.12	99.99	25.18	21.43	15.55	8.00	5.02

Minimum Increase in Allowable VCG = 4.96
 Maximum Allowable VCG = 29.520

JOSE CARLOS PINHEIRO GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORARIOS
 ESCRITÓRIO DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS 46aS T=18.0m
DAMAGED CASE HEEL AXIS = 10.0 -

○ GZ ARM 10.0
△ WIND OVERTURNING ARM



RIGHTING ARM - METRES

JOSÉ CARLOS PREZTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTÓGRAFOS
É CÓPIA DO DOCUMENTO ORIGINAL



ANGLE OF ROTATION - DEGREES

NOBLE DENTON

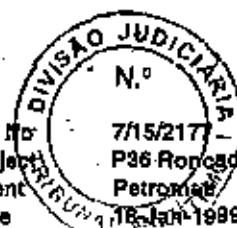
TIME 15.37.16

23.FEB.1999

NOBLE DENTON

Title Stability Analysis Results
Condition Inspection - Damaged
Draft 18.00 m
Displacement 60390 mT
LCG (from FP) 57.12 m
TCG (+ve stbd) 0.03 m
VCG (abl) 24.58 m
Genstab Run ID D231
Space Damaged Void Space 45S (Modified)

WS No 7/15/2177
 Project P36 Rongador
 Client Petrobras
 Date 18-Jan-1999
 By MSE
 Checked



Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	Δ VCG
0	90	0.00	3.25	99.99	25.59	22.34	15.33	8.00	4.86
10	80	0.00	3.68	99.99	24.88	21.20	16.20	8.00	4.88
20	70	0.00	4.45	99.99	23.82	19.38	15.00	8.00	5.02
30	60	0.00	5.28	99.99	22.44	17.16	14.79	8.00	6.42
40	50	0.00	5.46	99.99	20.85	15.39	14.70	8.00	8.09
50	40	0.00	5.17	99.99	19.71	14.54	14.73	7.00	7.37
60	30	0.00	4.58	99.99	20.22	15.63	14.83	7.00	6.83
70	20	0.00	3.58	99.99	20.98	17.39	15.02	7.00	9.88
80	10	0.00	2.82	99.99	22.18	19.34	15.19	6.00	11.14
90	0	0.00	2.42	99.99	25.08	22.68	15.29	6.00	12.46
270	180	0.00	2.04	99.99	25.83	23.59	16.97	5.00	13.97
280	170	0.00	2.15	99.99	22.39	20.18	15.93	5.00	12.68
290	160	0.00	2.45	99.99	21.04	18.59	15.86	6.00	11.43
300	150	0.00	2.84	99.99	20.27	17.43	15.79	6.00	10.39
310	140	0.00	3.15	99.99	19.16	16.00	15.75	7.00	8.42
320	130	0.00	3.28	99.99	20.66	17.40	15.70	7.00	6.66
330	120	0.00	3.28	99.99	22.52	19.24	15.68	8.00	5.88
340	110	0.00	3.15	99.99	24.12	20.87	15.57	8.00	5.31
350	100	0.00	3.12	99.99	25.39	22.27	15.43	9.00	5.08

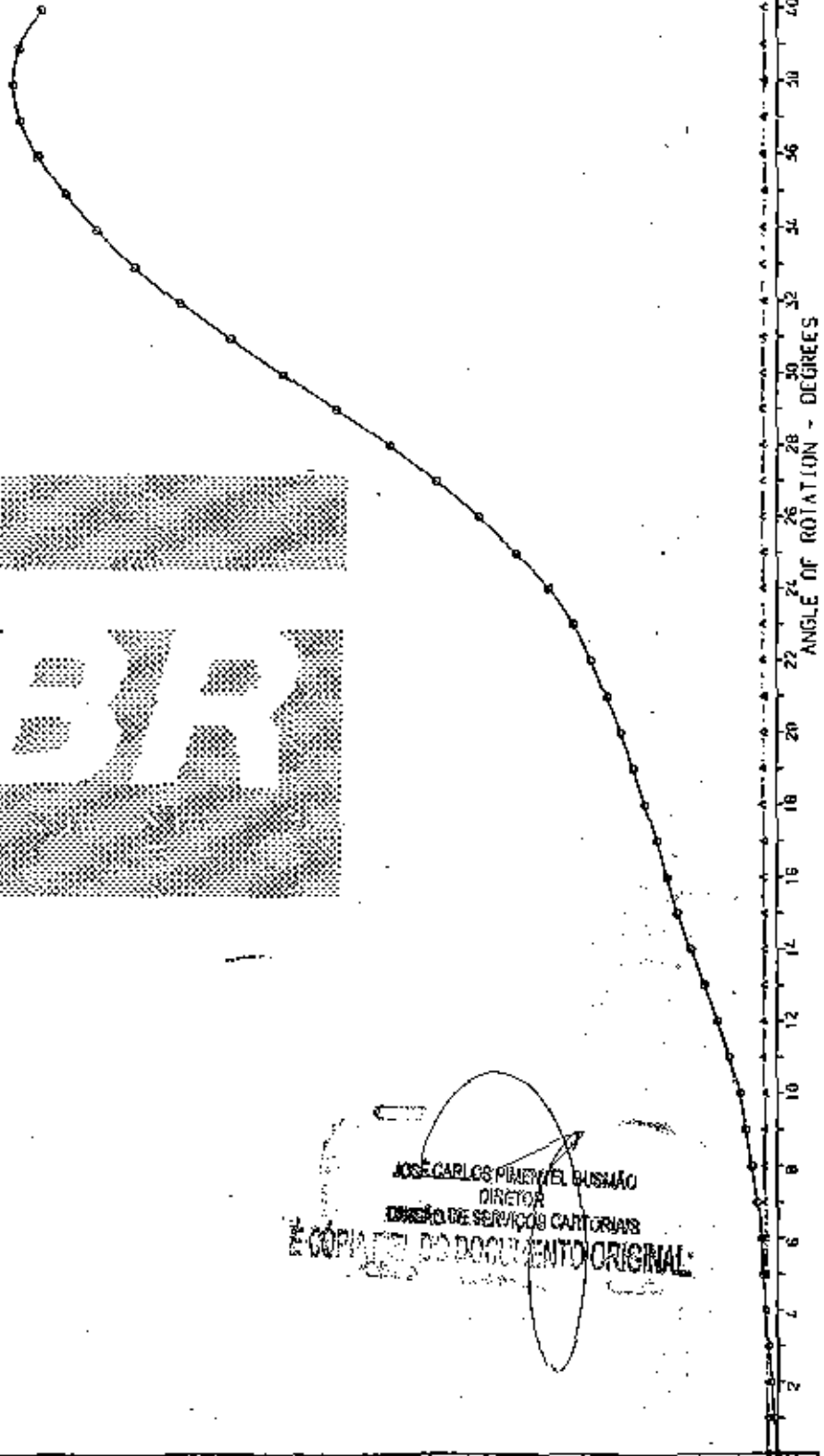
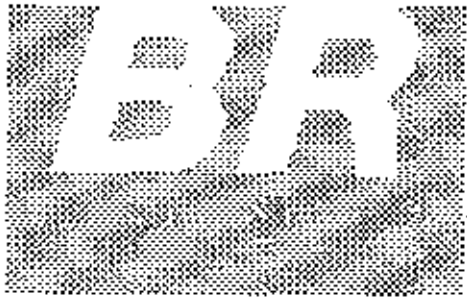
Minimum Increase in Allowable VCG = 4.86
 Maximum Allowable VCG = 29.420

JOSÉ CARLOS PIMENTEL GUARÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORÁRIOS
 É CÓPIA DEL DO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to VS45a\$ T=18.0m
 DAMAGED CASE HEEL AXIS = 10.0

○ GZ ARM 10.0
 △ WIND OVERTURNING ARM

RIGHTING ARM - METRES



JOSE CARLOS PIETRELL BUSMÃO
 DIRETOR
 DEPARTAMENTO DE SERVIÇOS CARTOGRAFICOS
 E Cópia do Documento Original



Title Stability Analysis Results
 Condition Inspection - Accidental Flooding
 Draft 19.00 m
 Displacement 50390 mT
 LCG (from FP) 57.12 m
 TCG (+ve abtd) 0.03 m
 VCG (abtd) 24.56 m
 Genstab Run ID A231
 Space Damaged SW Ballast Tank 219

N.º 7/15/2177
 Project P38 Roncador
 Client Patromar
 Date 18-Jan-1999
 By
 Checked

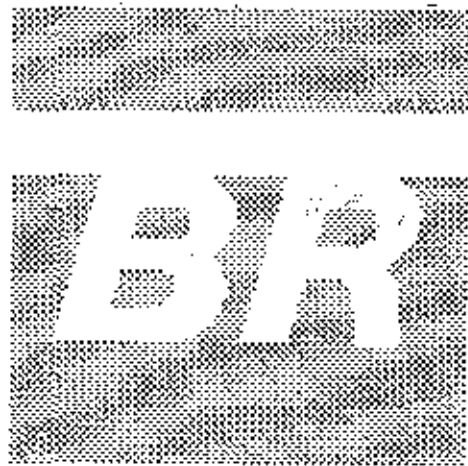
Heel Axis	Angle of Loll	Angle of Vanishing Stability	Positive Stability Range beyond Angle of Loll
0	4.26	>40°	35.74
10	5.56	>40°	34.44
20	6.88	>40°	33.32
30	7.61	>40°	32.39
40	8.31	>40°	31.68
50	8.74	>40°	31.26
60	8.92	>40°	31.08
70	8.83	>40°	31.17
80	8.48	>40°	31.52
90	7.88	>40°	32.12
270	0.00	>40°	40.00
280	0.00	>40°	40.00
290	0.00	>40°	40.00
300	0.00	>40°	40.00
310	0.00	>40°	40.00
320	0.00	>40°	40.00
330	0.00	>40°	40.00
340	1.30	>40°	38.70
350	2.83	>40°	37.17

JOSÉ CARLOS FRANTZEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CATORNAB
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Accld Flooding Tk 215 T=18.0m
 ACCIDENTAL FLOODING HEEL AXIS = 60.0

© GZ ARM 60.0

RIGHTING ARM - METRES



JOSE CARLOS ZENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTÓGRAFOS

É CÓPIA FIEL DO DOCUMENTO ORIGINAL



ANGLE OF ROTATION - DEGREES

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

181

NOBLE DENTON

23.FEB.1999

TIME 15:40.43

NOBLE DENTON

Title
 Condition
 Draft
 Displacement
 LCG (from FP)
 TCG (+ve std)
 VCG (abl)
 Genstab Run ID
 Space Damaged

Stability Analysis Results
 Inspection - Accidental Flooding
 18.00 m
 50380 mT
 57.12 m
 0.03 m
 24.55 m
 A232
 SW Ballast Tank 22S

DIVISÃO JUDICIÁRIA
 Nº
 7/15/2177
 P36 Ronador
 Petróleo
 Date
 01/08/1999
 By
 MSL
 Checked

Heel Axis	Angle of Loll	Angle of Vanishing Stability	Positive Stability Range beyond Angle of Loll
0	5.61	>40°	34.39
10	8.85	>40°	33.15
20	7.87	>40°	32.13
30	8.68	>40°	31.34
40	9.18	>40°	30.82
50	9.44	>40°	30.56
60	9.40	>40°	30.60
70	9.08	>40°	30.92
80	8.50	>40°	31.50
90	7.88	>40°	32.32
270	0.00	>40°	40.00
280	0.00	>40°	40.00
290	0.00	>40°	40.00
300	0.00	>40°	40.00
310	0.00	>40°	40.00
320	0.00	>40°	40.00
330	1.01	>40°	38.98
340	2.64	>40°	37.36
350	4.19	>40°	35.81

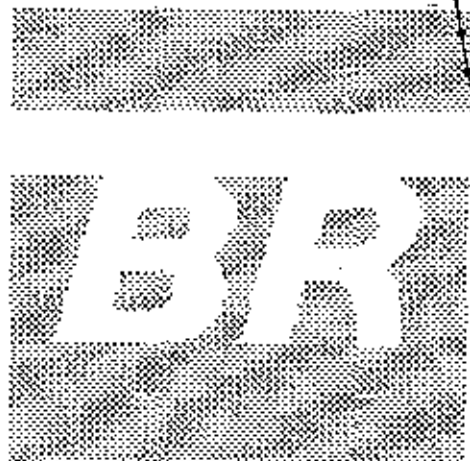


JOSÉ CARLOS MARCEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL

P-36 STABILITY ANALYSIS REV C JAN 99 - Accld Flooding TK 22S T=18.0m
 ACCIDENTAL FLOODING HEEL AXIS = 50.0

◇ GZ ARM 50.0

RIGHTING ARM - METRES



1



JOSE CARLOS PINHEIRO GUSMAO
 DIRETOR
 DIVISAO DE SERVICOS CARTORIAS
 É COPIA DO DOCUMENTO ORIGINAL

ANGLE OF ROTATION - DEGREES

NOBLE DENTON

TIME 15.41.26

23.FEB.1999

NOBLE DENTON



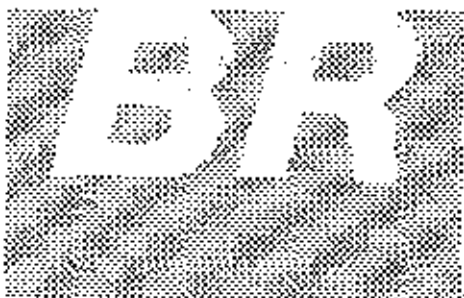
APPENDIX J

11.0M TRANSIT CONDITION

RESULTS SUMMARY

(CRITICAL GZ FOR EACH CASE ATTACHED)

(19 PAGES)



JOSE CARLOS DE MENTAL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS

VALER DO DOCUMENTO ORIGINAL

WS No
Project
Client
Date
By
Checked

7/15/2177
P36 Roncador
Petromac
18-Jan-1999
MSE



Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve stbd)
VCG (abl)

Stability Analysis Results
Transit Condition
11.00 m
37063 mT
57.18 m
0.02 m
27.08 m

Description	Genstab ID	Max Allowable VCG	Comments
Intact Condition Vessel Intact	I310	50.26	
Damaged Condition Lower Hull			
S.W. Bal Tk 1s	D320	47.441	
S.W. Bal Tk 4s	D321	48.061	
S.W. Bal Tk 13s	D322	48.181	
S.W. Bal Tk 18s	D323	48.401	
S.W. Bal Tk 20s	D324	48.001	
S.W. Bal Tk 21s	D325	47.691	
S.W. Bal Tk 22s	D326	46.931	
S.W. Bal Tk 18s & C/L 10S	D327	44.901	

* Values superseded by modifications to tanks

Limiting KG 44.90 m S.W. Bal Tk 18s & C/L 10S
Actual KG 27.08 m
Stability Margin 17.82 m

JOSE CARLOS MARTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTÓGRAFOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Title
 Condition
 Draft
 Displacement
 LCG (from FP)
 TCG (+ve side)
 VCG (abi)
 Genstab Run ID

11.00 m
 37083 mt
 57.18 m
 0.02 m
 27.08 m
 1310

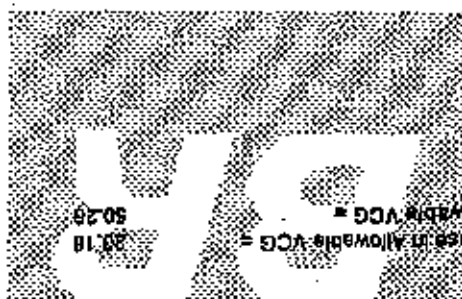
Stability Analysis Results
 Transit Condition - Intact
 WS No
 Project
 Client
 Date
 By
 Checked

18-Jan-1999
 MSE



Heel Axis	Wind	Heading	Angle of Loll	Angle of Heel	Angle of 2nd Int	Angle of DF	Range of Stability	Min DF	Area Ratio	3 VCG
0	90	0.0	0.54	99.99	30.37	29.83	22.75	22.75	12.85	23.18
10	80	0.0	0.55	99.99	29.43	27.88	22.76	22.76	11.81	23.26
20	70	0.0	0.67	99.99	27.69	27.12	22.74	22.74	10.72	23.78
30	60	0.0	0.57	99.99	27.39	26.82	22.73	22.73	9.92	24.97
40	50	0.0	0.54	99.99	27.14	26.60	22.73	22.73	9.63	27.00
50	40	0.0	0.48	99.99	26.73	26.26	22.73	22.73	9.99	29.70
60	30	0.0	0.40	99.99	26.16	25.76	22.74	22.74	11.12	33.62
70	20	0.0	0.32	99.99	25.56	25.22	22.76	22.76	13.13	37.98
80	10	0.0	0.27	99.99	25.22	24.96	22.77	22.77	15.83	40.64
90	0	0.0	0.25	99.99	25.34	25.08	22.78	22.78	18.25	41.88
270	180	0.0	0.24	99.99	35.94	35.70	22.84	22.84	20.31	40.85
280	170	0.0	0.26	99.99	25.19	24.93	22.84	22.84	16.33	40.22
290	160	0.0	0.32	99.99	25.36	25.04	22.83	22.83	13.57	38.46
300	150	0.0	0.40	99.99	25.94	25.54	22.82	22.82	11.50	34.68
310	140	0.0	0.48	99.99	26.55	26.07	22.80	22.80	10.32	30.78
320	130	0.0	0.54	99.99	27.00	26.48	22.79	22.79	9.94	27.85
330	120	0.0	0.57	99.99	27.29	26.72	22.78	22.78	10.19	25.56
340	110	0.0	0.57	99.99	27.70	27.13	22.77	22.77	10.95	24.15
350	100	0.0	0.55	99.99	28.74	28.19	22.76	22.76	12.02	23.44

Minimum Increase in Allowable VCG = 33.18
 Maximum Allowable VCG = 50.25



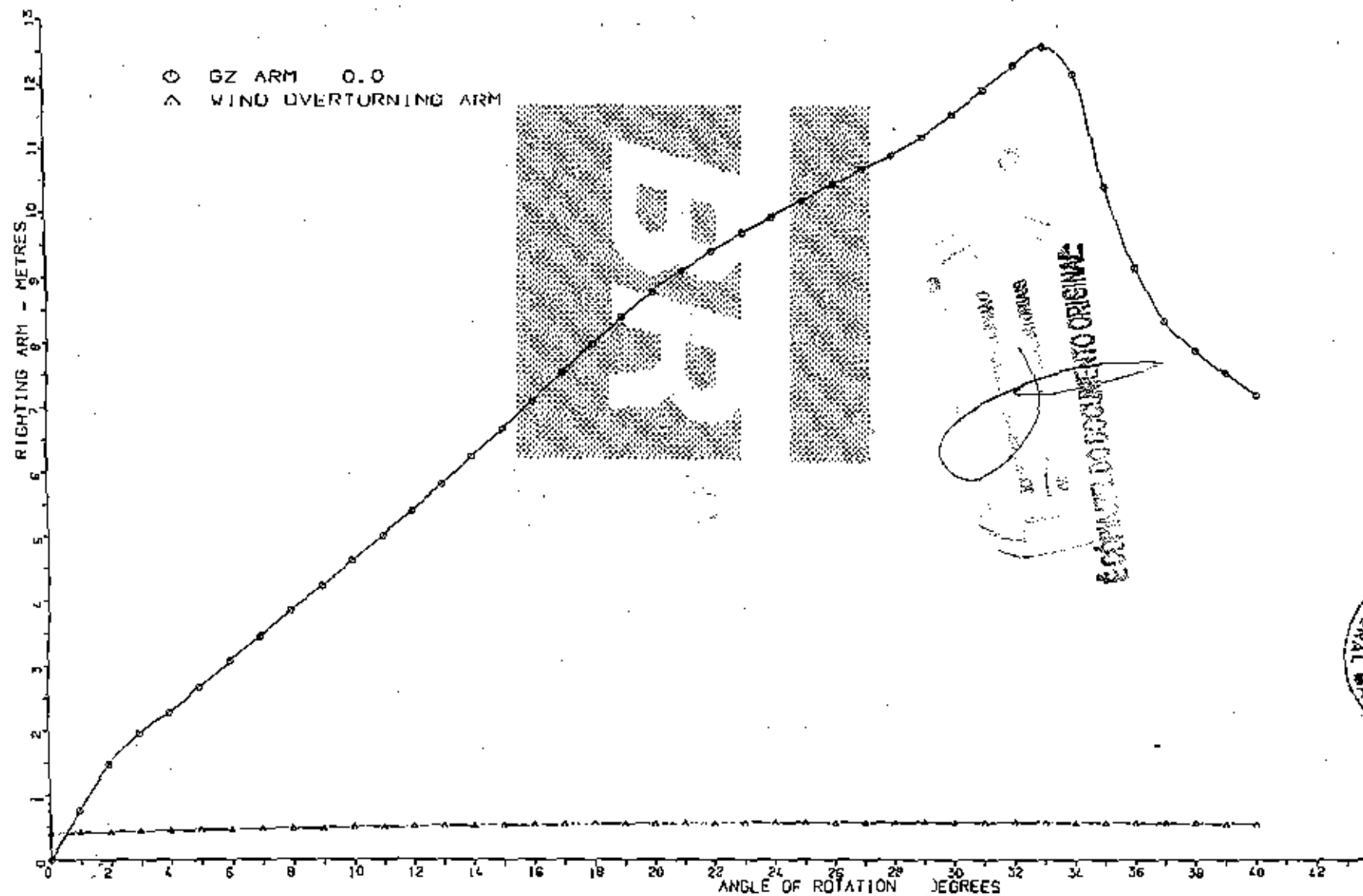
JOSE CARLOS PRATTEL GUSMAN
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTOGRAFICOS
 É COPIA FIEL DO DOCUMENTO ORIGINAL

Stability Analysis

11m_jos.xls 1310

PL-301038-1320-960-NBD-908 Rev B

P-36 STABILITY ANALYSIS REV C JAN 99 - Transit Intact Case T=11.0m
 INTACT CASE HEEL AXIS = 0.0



ESTADO DO DOCUMENTO ORIGINAL



Stability Analysis

JOSE CARLOS PERAZTEL GUZMAN
DIRETOR
DIVISAO DE SERVICOS CANTONIAIS
E COPIA DO DOCUMENTO ORIGINAL

Minimum Increase in Allowable VCG = 20.38
Maximum Allowable VCG = 47.441

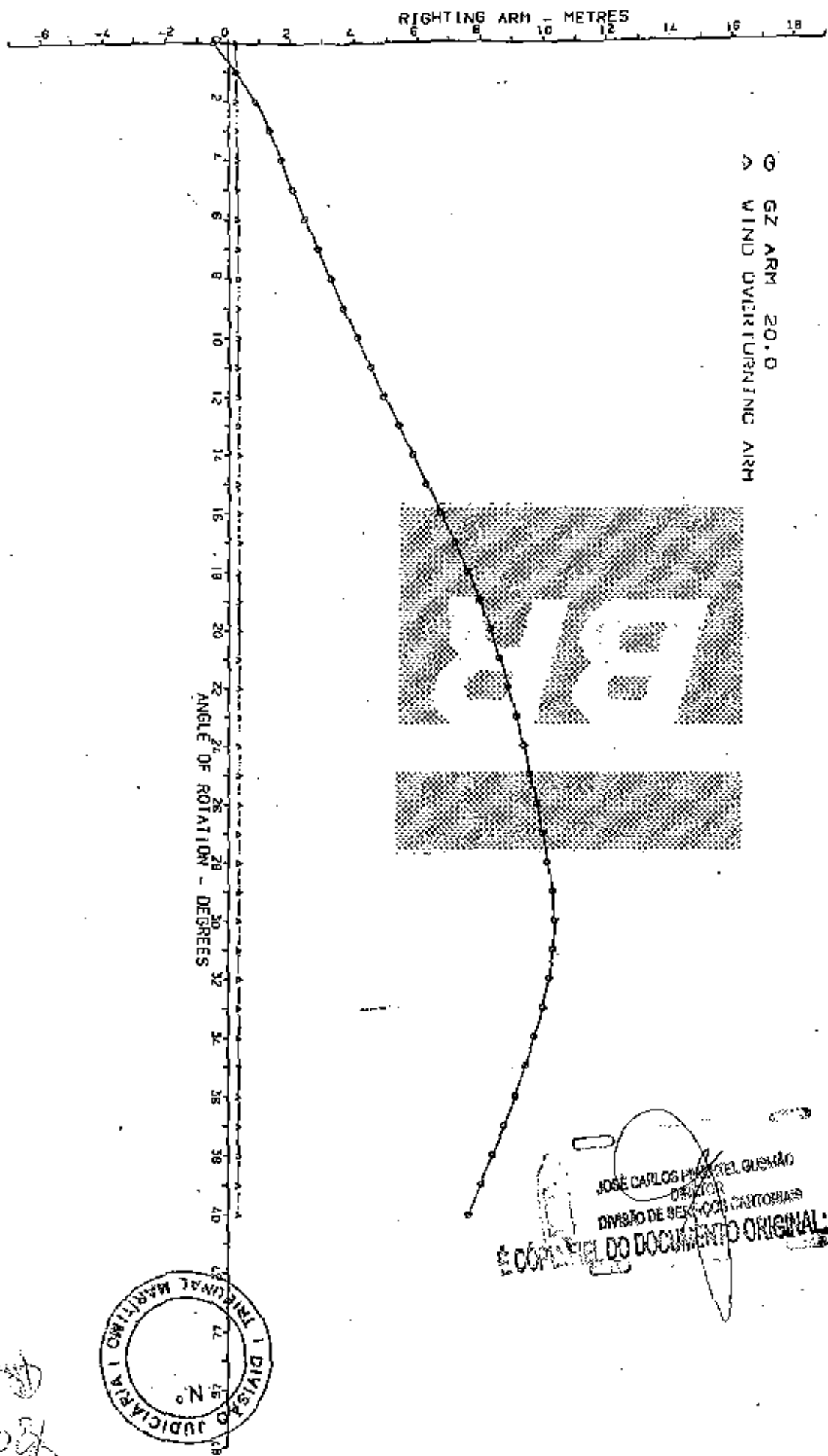
Heel Axis	Wind Heading	Angle of Loll	Angle of Static Wind	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO	5 VCG
0	90	1.14	1.54	99.99	26.81	27.27	22.41	2.00	21.20
10	80	0.00	1.80	99.99	29.40	28.10	22.41	2.00	21.36
20	70	0.00	1.04	99.98	27.79	26.75	22.41	2.00	20.98
30	60	0.00	0.75	99.99	26.80	26.06	22.41	2.00	23.44
40	50	0.00	0.44	99.99	26.19	25.75	22.42	1.00	27.47
50	40	0.00	0.12	99.99	25.84	25.82	22.43	1.00	32.52
60	30	0.00	99.99	99.99	25.69	99.99	99.99	99.99	
70	20	0.00	99.99	99.99	25.26	99.99	99.99	99.99	
80	10	0.00	99.99	99.99	25.08	99.99	99.99	99.99	
90	0	0.00	99.99	99.99	25.30	99.99	99.99	99.99	
160	180	1.16	1.36	99.99	25.48	24.12	22.47	2.00	30.82
170	170	1.32	1.85	99.99	24.80	23.04	22.46	2.00	29.14
180	160	1.56	1.77	99.99	24.95	23.18	22.45	3.00	27.25
190	150	1.58	1.55	99.99	25.52	23.57	22.44	3.00	25.40
200	140	1.81	2.09	99.99	26.09	24.00	22.42	3.00	23.87
210	130	1.61	2.13	99.99	26.46	24.33	22.41	3.00	22.70
220	120	1.58	2.08	99.98	26.89	24.51	22.41	3.00	21.84
230	110	1.48	1.88	99.99	27.01	25.06	22.41	3.00	21.09
240	100	1.32	1.75	99.99	27.84	25.88	22.41	3.00	21.02

Stability Analysis Results	Condition	Drift	Displacement	LCG (from RP)	TCG (+ve s/bd)	VCG (abi)	Genstab Run ID	Space Damaged
11.00 m			37063 mT	67.18 m	0.02 m	27.09 m	4320	S.W., Bat Tk 19
Transit Condition - Damaged								

[illegible]

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW TK 1S T=11.0m
 DAMAGED CASE HEEL AXIS = 20.0

○ GZ ARM 20.0
 ▲ WIND OVERTURNING ARM



JOSÉ CARLOS MARCEL GUSMÃO
 DIRETOR
 DIVISÃO DE SELO E CARTOMINAS
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NOBLE DENTON

23.FEB.1999

TIME 10 00 --

NOBLE

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DIVISÃO DE SERVIÇOS
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Minimum Increase in Allowable VCG = 20.98
Maximum Allowable VCG = 49.00

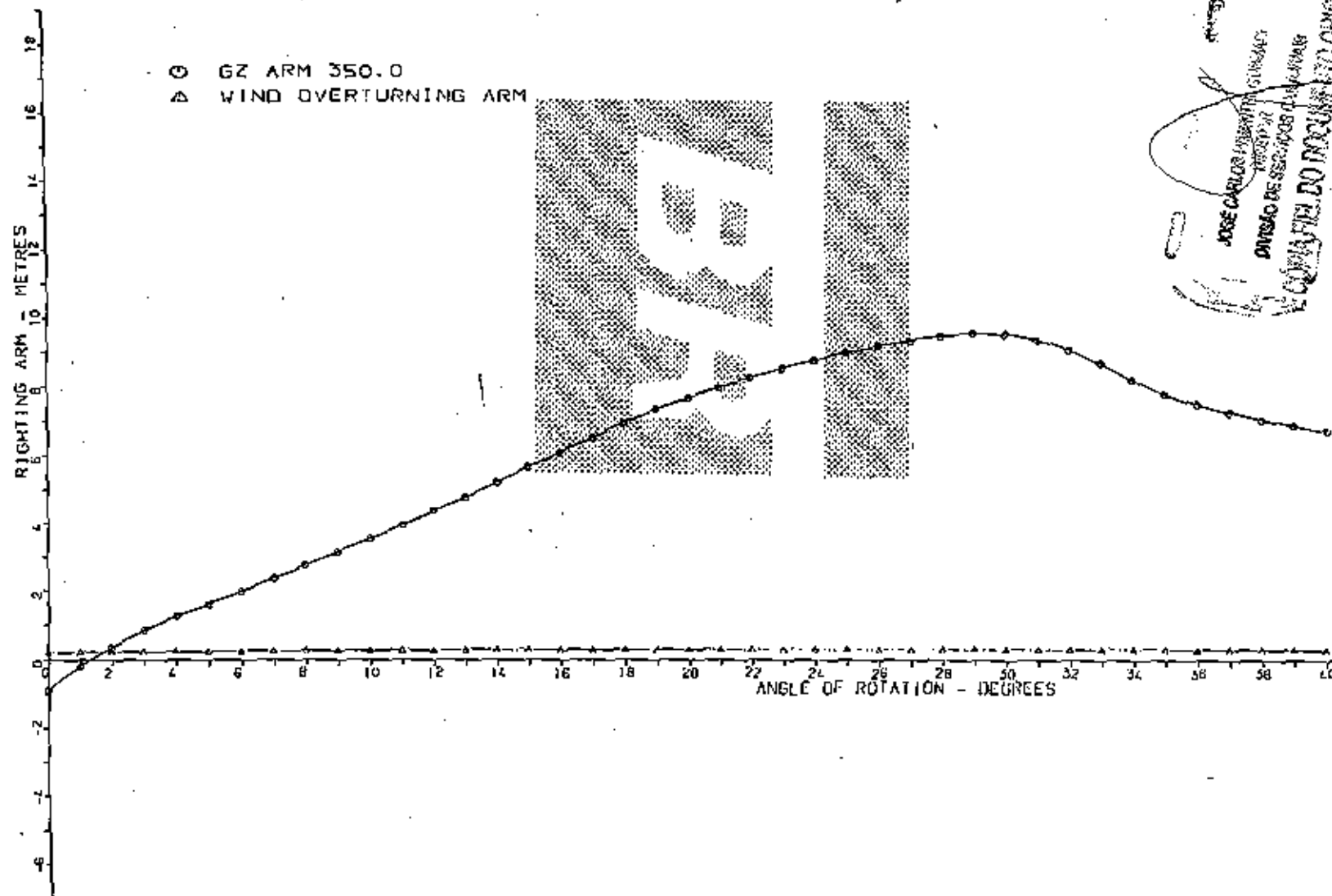
Heel Axis	Wind	Heading	Angle of Lull	Angle of Static Wind	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	VCG
0	90	1.21	1.61	99.99	29.32	27.70	22.45	3.00	21.11	21.11
10	80	1.05	1.44	99.99	29.16	27.72	22.45	2.00	21.40	21.40
20	70	0.90	1.24	99.99	27.75	26.52	22.44	2.00	22.20	22.20
30	60	0.66	0.96	99.99	26.93	25.95	22.46	2.00	23.61	23.61
40	50	0.00	0.71	99.99	26.99	25.66	22.46	2.00	24.70	24.70
50	40	0.00	0.43	99.99	25.97	25.54	22.47	1.00	30.36	30.36
60	30	0.00	0.14	99.99	25.30	25.16	22.47	1.00	36.25	36.25
70	20	0.00	0.00	99.99	24.60	24.08	22.51	2.00	32.65	32.65
80	10	0.00	0.00	99.99	24.35	23.37	22.49	2.00	31.20	31.20
90	0	0.00	0.00	99.99	23.86	22.50	22.44	3.00	21.17	21.17
100	100	1.34	1.34	99.99	27.96	26.18	22.45	3.00	20.98	20.98



WS No
Project
Client
Date
By
Checked

Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve abtd)
VCG (abtd)
Generator Run ID
Space Damaged
Stability Analysis Results
Transit Condition - Damaged
11.00 m
37083 mt
57.18 m
0.02 m
27.08 m
d321
S.W. Bal Tk 4a

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW Tk 4S T=11.0m
DAMAGED CASE HEEL AXIS = 350.0



JOSE CARLOS HENRIQUEZ GONCALVES
PROFESSOR
DIVISAO DE SERVICOS DE ENFERMAGEM
COPIA FIEL DO DOCUMENTO ORIGINAL



Handwritten signature and initials.

JOSÉ CARLOS PINHEIRO
DIRETOR
DIVISÃO DE BELOHORIZONTE
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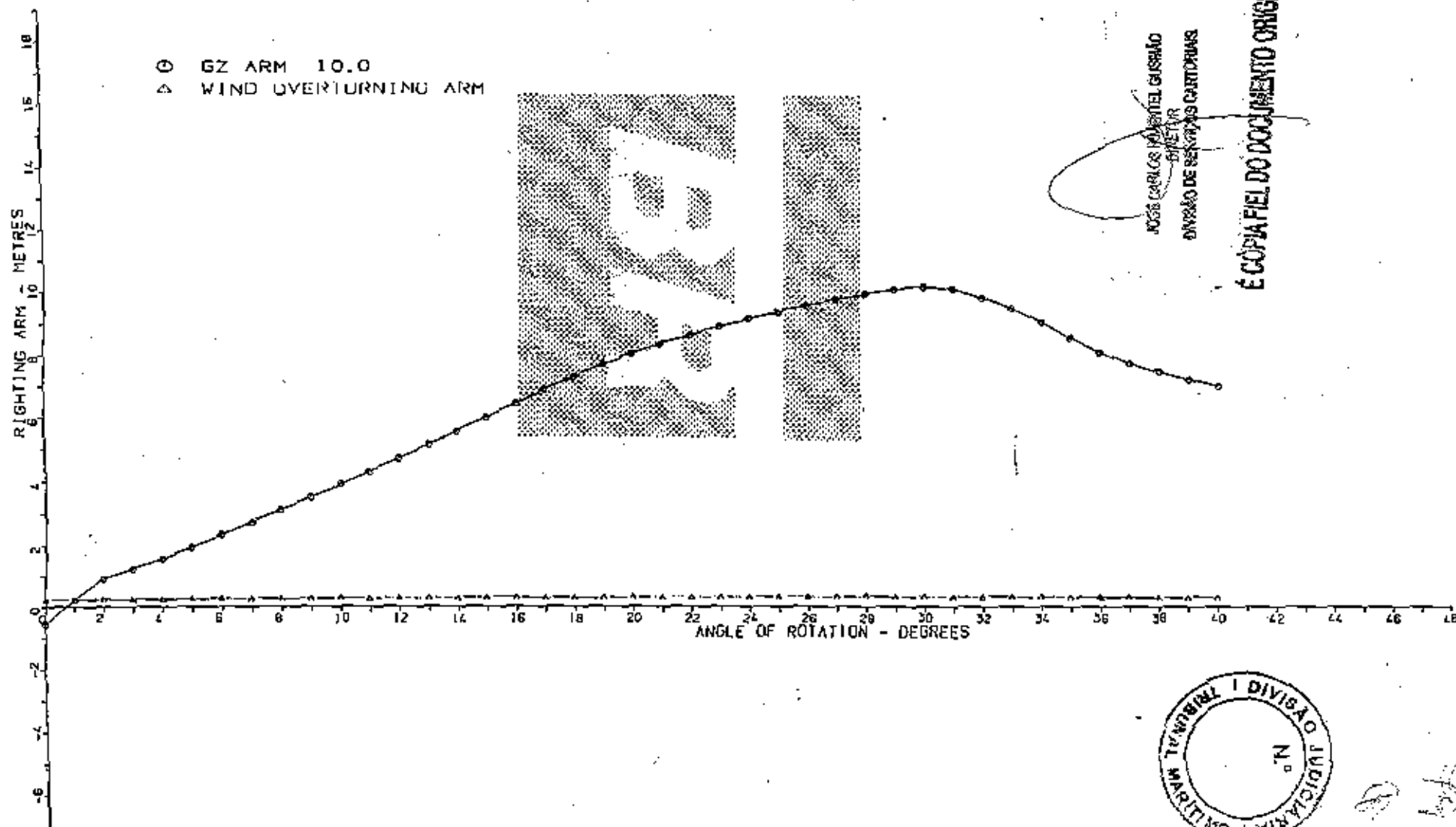
Minimum Increase Allowable VCG = 19.08
Maximum Allowable VCG = 45.161

Heel Axis	Wind	Angle of Loll	Angle of Static Wind	Angle of Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio
0	90	0.00	1.02	99.99	29.99	29.99	28.97	22.50	2.00
10	80	0.00	1.03	99.99	29.34	29.34	27.32	22.50	2.00
20	70	0.00	1.01	99.99	27.50	27.50	26.49	22.49	2.00
30	60	0.00	0.96	99.99	27.06	27.06	26.10	22.49	2.00
40	50	0.00	0.88	99.99	26.77	26.77	25.89	22.49	2.00
50	40	0.00	0.76	99.99	26.34	26.34	25.67	22.49	2.00
60	30	0.00	0.63	99.99	25.71	25.71	25.08	22.49	1.00
70	20	0.00	0.49	99.99	25.01	25.01	24.53	22.49	1.00
80	10	0.00	0.34	99.99	24.60	24.60	24.16	22.50	1.00
90	0	0.00	0.19	99.99	24.94	24.94	24.76	22.51	1.00
270	180	0.00	0.99	99.99	25.52	25.52	26.43	22.54	1.00
280	170	0.00	0.92	99.99	24.44	24.44	24.20	22.54	1.00
290	160	0.00	0.80	99.99	24.79	24.79	24.36	22.53	1.00
300	150	0.00	0.65	99.99	25.48	25.48	24.91	22.53	1.00
310	140	0.00	0.48	99.99	26.13	26.13	26.44	22.53	1.00
320	130	0.00	0.32	99.99	26.59	26.59	26.77	22.52	2.00
330	120	0.00	0.22	99.99	26.96	26.96	26.04	22.51	2.00
340	110	0.00	0.08	99.99	27.67	27.67	26.60	22.61	2.00
350	100	0.00	0.00	99.99	28.77	28.77	27.76	22.50	2.00
360	90	0.00	0.00	99.99	29.99	29.99	28.97	22.50	2.00

Title
Stability Analysis Results
Trenk Condition - Damaged
Draft 11.00 m
37083 mt
57.18 m
0.02 m
27.09 m
d322
S.W. Bal TK 13s
Condition
Displacement
LCG (from FP)
TCG (+ve abtd)
VCG (abtd)
Genstab Run ID
Space Damaged

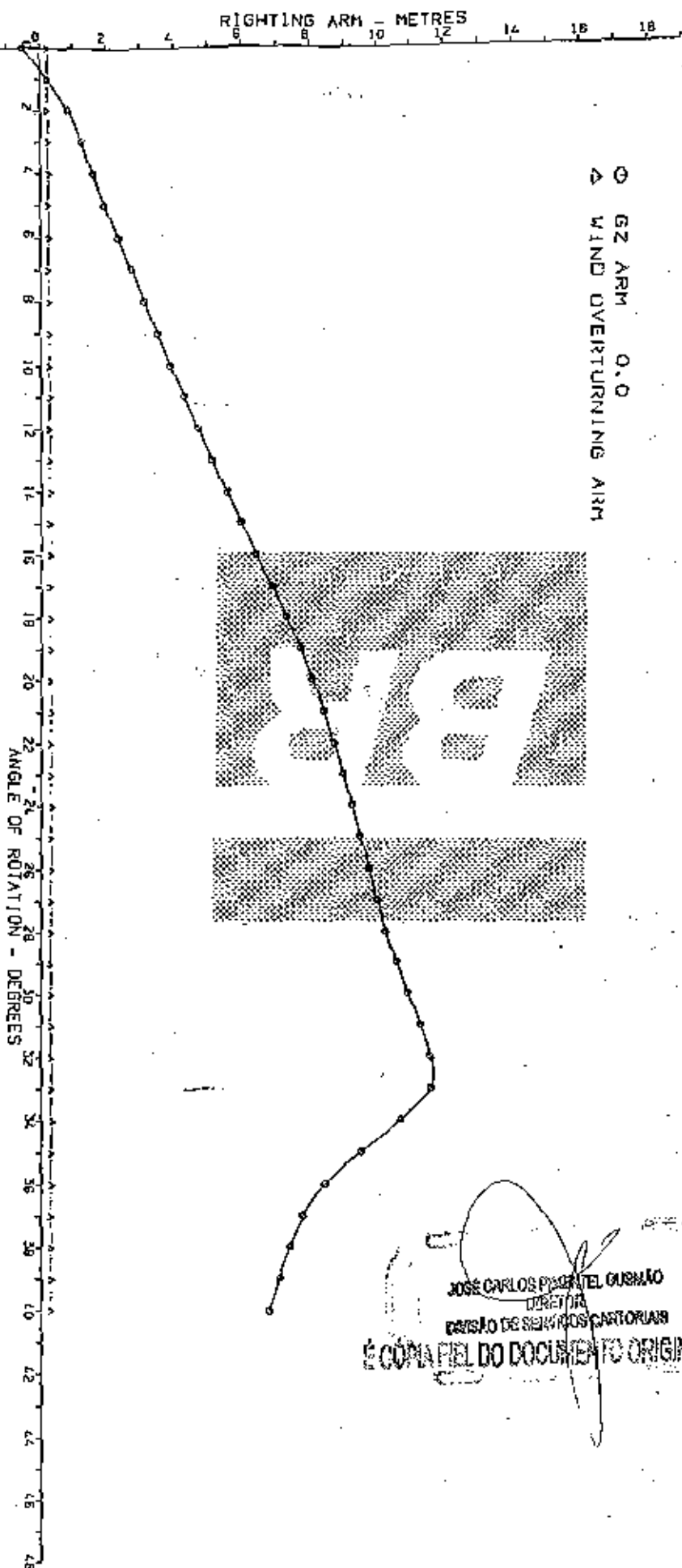
Checked
BY
Date
Client
Project
W/S No
Nº
DIVISÃO JUDICIAL
7/15/2017
18-Jan-1999
MSE

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW Tk 13s T=11.0m
DAMAGED CASE HEEL AXIS = 10.0



P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW Tk 18s T=11.0m
 DAMAGED CASE HEEL AXIS = 0.0

○ GZ ARM 0.0
 ▲ WIND OVERTURNING ARM



JOSÉ CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DEPARTAMENTO DE SEGUROS E CARTÓGRAFIA
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL



NOBLE DENTON

23.FEB.1999

TIME 16.24.43

NOBLE

JOSE CARLOS PINHEIRO GUERATO
DISC 17
DIRETOR DE SERVIÇOS CARCEIRIAIS
É Cópia fiel do documento original.

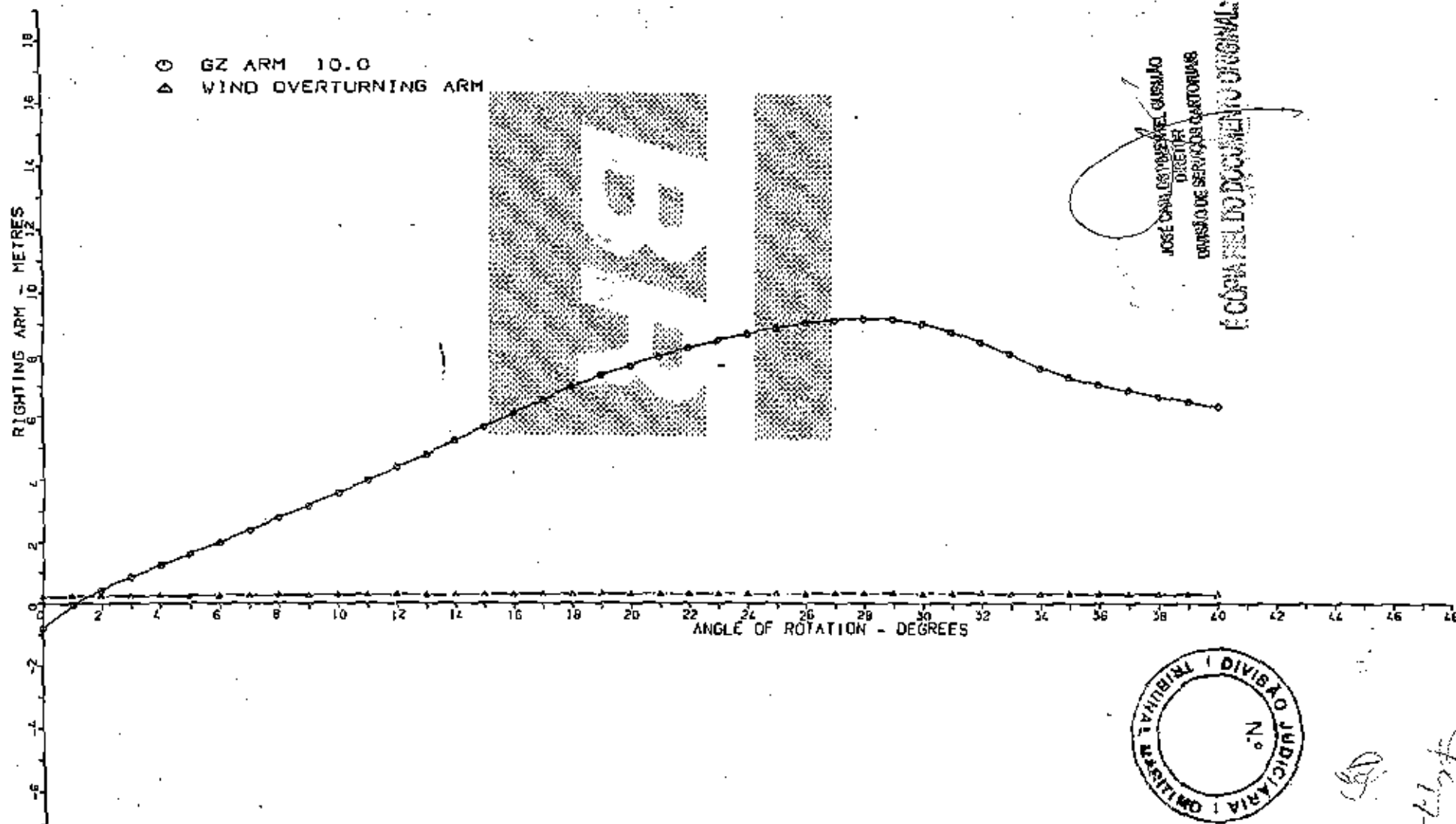
Minimum increase in Allowable VCG = 20.92
Maximum Allowable VCG = 48.003

Heel Axis	Wind	Heading	Angle of Roll	Angle of Static Wind	Angle of Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	M/O Damaged	8 VCG
0	90		1.08	1.48	99.99	28.88	27.99	22.29	2.00	21.03	
10	90		1.17	1.62	99.99	27.77	26.15	22.27	3.00	20.92	
20	70		1.26	1.73	99.99	27.24	25.51	22.28	3.00	20.99	
30	60		1.29	1.78	99.99	26.96	25.17	22.25	3.00	21.59	
40	50		1.27	1.76	99.99	26.74	24.97	22.24	3.00	22.81	
50	40		1.20	1.67	99.99	26.36	24.68	22.24	3.00	24.33	
60	30		1.09	1.49	99.99	25.75	24.27	22.26	2.00	26.35	
70	20		0.60	1.25	99.99	25.05	23.80	22.29	2.00	29.00	
80	10		0.00	1.01	99.99	24.46	23.45	22.33	2.00	31.00	
90	0		0.00	0.83	99.99	24.63	23.79	22.32	1.00	33.76	
270	180		0.00	89.99	89.99	30.27	89.99	89.99	89.99		
280	170		0.00	89.99	89.99	29.41	89.99	89.99	89.99		
290	160		0.00	89.99	89.99	28.48	89.99	89.99	89.99		
300	150		0.00	89.99	89.99	27.17	89.99	22.38	1.00	37.25	
310	140		0.00	0.48	89.99	25.86	26.41	22.37	1.00	31.57	
320	130		0.00	0.70	89.99	26.27	26.57	22.35	2.00	25.78	
330	120		0.00	0.88	99.99	26.85	26.92	22.34	2.00	24.27	
340	110		0.00	1.13	99.99	27.81	29.66	22.32	2.00	22.40	
350	100		0.00	1.32	89.99	29.50	28.17	22.30	2.00	21.74	

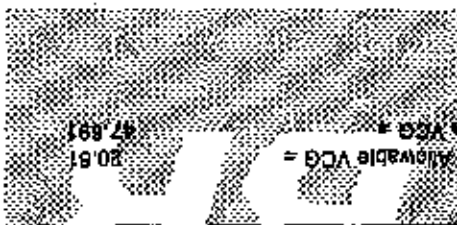
Title	
Condition	Draft
Displacement	37083 mT
LCG (from FP)	57.16 m
TCC (+ve side)	0.02 m
VCG (abf)	27.08 m
Gensab Run ID	d324
Spare Damaged	S.W., Bai TK 20e

N.º
 DIVISÃO JUDICIÁRIA -
 MS No
 7180/77
 P.º. Honorário
 C.º. Honorário
 18-Jan-1989
 MSE
 Checked
 By
 Date

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW Tk 20s T=11.0m
DAMAGED CASE HEEL AXIS = 10.0



JOSÉ CARLOS PUENTE GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAS
É CÓPIA DO DOCUMENTO ORIGINAL



Minimum Increase in Allowable VCG = 80.51
Maximum Allowable VCG = 47.891

Heel Axis	Wind	Heading	Angle of Loll	Angle of Static Wind	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IMO Damaged Ratio	Δ VCG
0	90	1.09	1.65	99.99	28.34	26.79	22.10	3.00	21.13	21.13
10	80	1.27	1.76	99.99	27.42	25.65	22.09	3.00	20.70	20.70
20	70	1.40	1.94	99.99	26.88	25.05	22.08	3.00	20.61	20.61
30	60	1.48	2.05	99.99	26.76	24.71	22.06	3.00	21.02	21.02
40	50	1.52	2.08	99.99	26.60	24.52	22.06	3.00	21.86	21.86
50	40	1.51	2.01	99.99	26.28	24.27	22.07	3.00	22.90	22.90
60	30	1.48	1.87	99.99	25.76	23.88	22.09	3.00	24.48	24.48
70	20	1.38	1.68	99.99	25.12	23.44	22.11	3.00	26.55	26.55
80	10	1.21	1.46	99.99	24.59	23.13	22.13	2.00	28.55	28.55
90	0	1.02	1.23	99.99	24.55	23.02	22.15	2.00	30.63	30.63
180	270	0.00	99.99	99.99	35.84	99.99	99.99	99.99	99.99	99.99
170	280	0.00	99.99	99.99	35.07	99.99	99.99	99.99	99.99	99.99
160	290	0.00	99.99	99.99	35.06	99.99	99.99	99.99	99.99	99.99
150	300	0.00	99.99	99.99	35.44	99.99	99.99	99.99	99.99	99.99
140	310	0.00	99.99	99.99	26.70	25.52	22.20	1.00	93.36	93.36
130	320	0.00	99.99	99.99	26.00	25.51	22.17	1.00	28.06	28.06
120	330	0.00	99.99	99.99	26.69	25.90	22.15	2.00	24.92	24.92
110	340	0.00	99.99	99.99	27.88	26.82	22.14	2.00	22.74	22.74
100	350	0.00	99.99	99.99	28.67	28.68	22.12	2.00	21.80	21.80



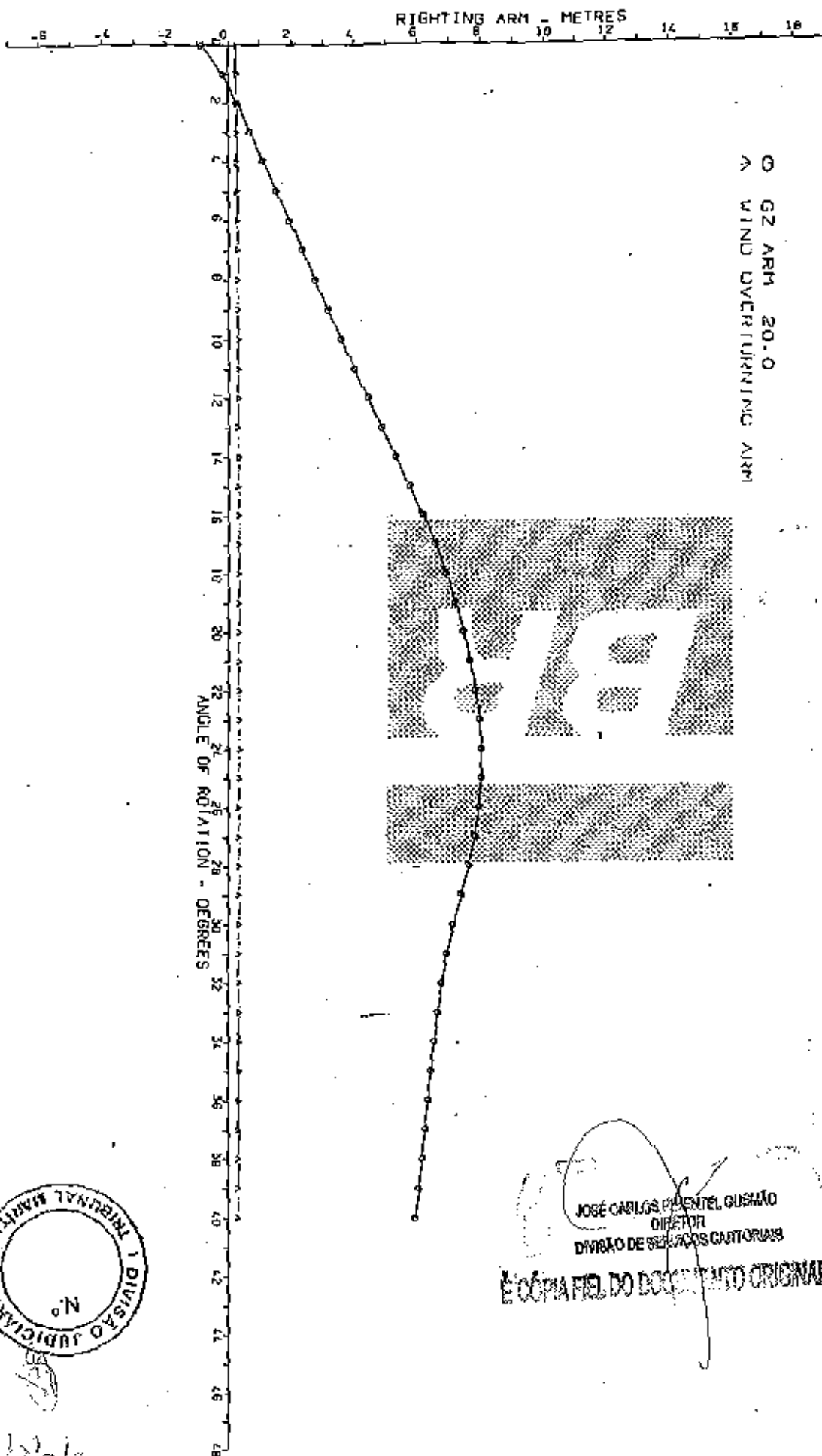
WS No
Project
Client
Date
By
Checked

7/5/217
P36 Roncador
Pelromos
16-Jan-1999
MSB

Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve side)
VCG (abi)
Generated Run ID
Space Damaged
Stability Analysis Results
Transit Condition - Damaged
11.00 m
37083 mT
57.18 m
0.02 m
27.08 m
4325
S.W. Bal Tk 21a

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW Tk 21s T=11.0m
 DAMAGED CASE HEEL AXIS = 20.0

○ GZ ARM 20.0
 △ WIND OVERTURNING ARM



JOSÉ CARLOS PUENTE GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTÓGRAFOS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL



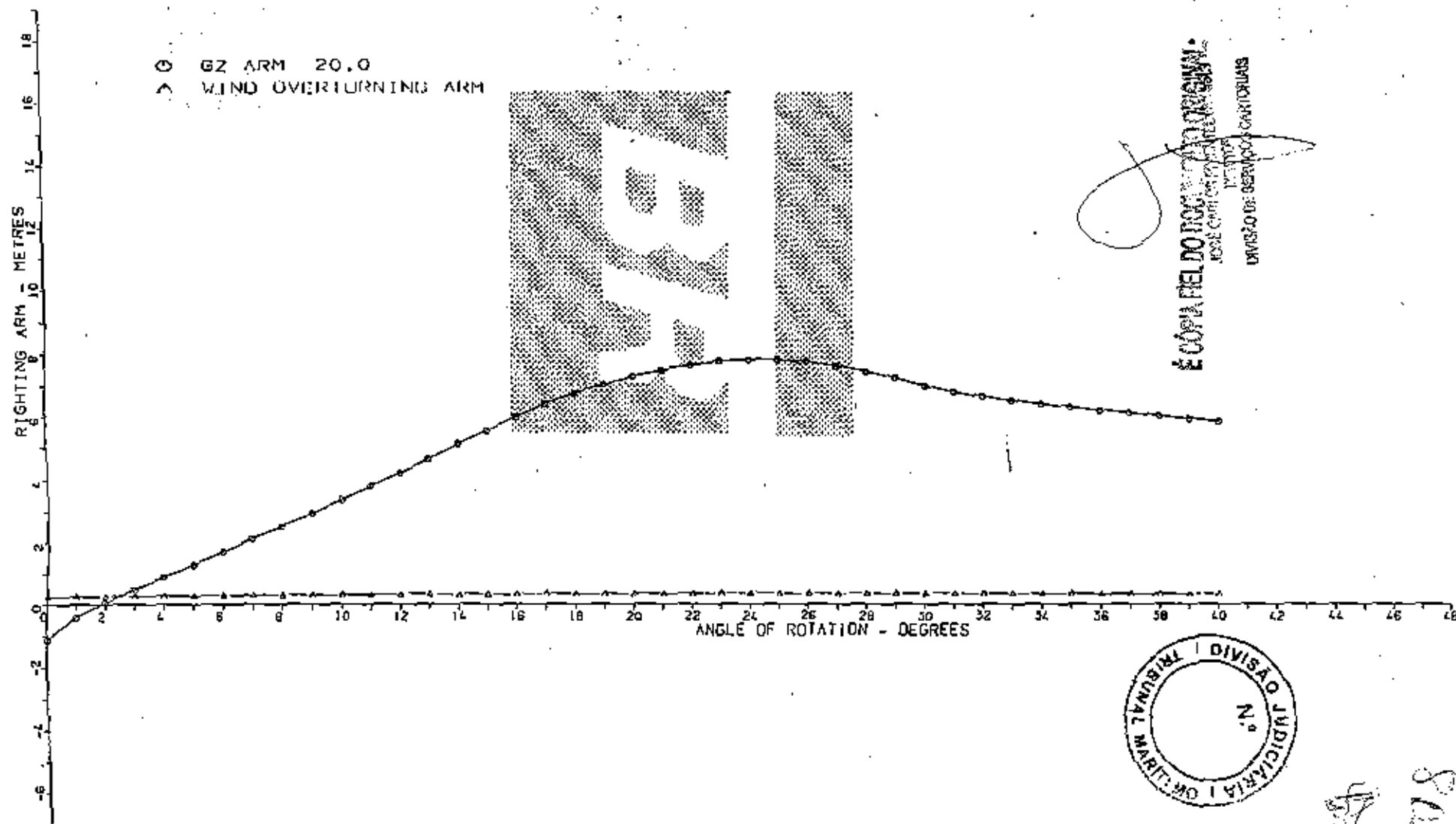
NCBLE DENTON

23.FEB.1999

TIME 16.27 07

NORIE

P-36 STABILITY ANALYSIS REV C JAN 99 - Damage to SW Tk 22s T=11.0m
DAMAGED CASE HEEL AXIS = 20.0



É Cópia Fiel do Documento Original
JOSÉ CARLOS DE MOURA
19/02/99
DIVISÃO DE SERVIÇOS GERAIS



JOSE CARLOS PIMENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS GASTOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL



Minimum Increase in Allowable VCG = 17.82
Maximum Allowable VCG = 44.901

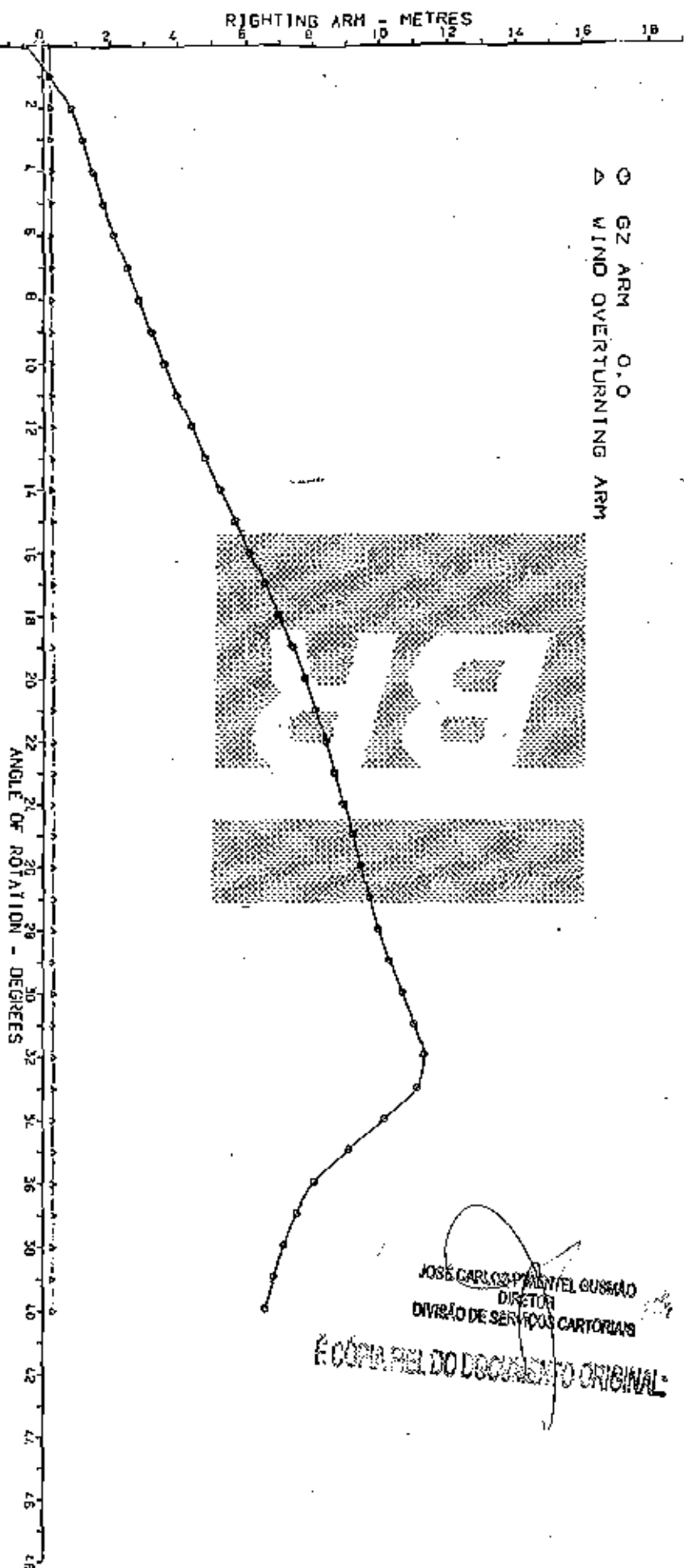
Heel Axis	Wind	Heading	Angle of Loll	Angle of Static Wind Heel	Angle of 2nd Int	DF Angle	Range of Stability	Min DF Clearance	IHO Damaged Ratio	3 VCG
0	90	0.00	1.00	99.99	29.17	29.16	22.50	2.00	17.82	21.04
10	80	0.00	1.07	99.99	27.94	28.88	22.49	2.00	21.21	21.94
20	70	0.00	1.11	99.99	27.92	28.21	22.48	2.00	21.21	21.94
30	60	0.00	1.12	99.99	26.96	26.87	22.48	2.00	21.94	23.33
40	50	0.00	1.06	99.99	26.73	25.68	22.48	2.00	23.33	25.09
50	40	0.00	0.96	99.99	26.92	25.37	22.50	2.00	25.09	27.44
60	30	0.00	0.84	99.99	25.71	24.87	22.50	2.00	27.44	30.33
70	20	0.00	0.72	99.99	24.59	24.28	22.50	1.00	30.33	33.71
80	10	0.00	0.59	99.99	24.40	23.81	22.50	1.00	33.71	36.84
90	0	0.00	0.46	99.99	24.59	24.14	22.51	1.00	36.84	
270	180	0.00	99.99	99.99	26.03	99.99	99.99	99.99		
280	170	0.00	99.99	99.99	24.34	99.99	99.99	99.99		
290	160	0.00	99.99	99.99	24.62	24.48	22.54	1.00	40.61	36.23
300	150	0.00	99.99	99.99	25.29	24.97	22.54	1.00	36.23	31.21
310	140	0.00	0.48	99.99	25.92	25.44	22.53	1.00	31.21	26.49
320	130	0.00	0.84	99.99	26.84	25.70	22.52	1.00	26.49	22.99
330	120	0.00	0.72	99.99	25.87	26.10	22.51	2.00	22.99	20.47
340	110	0.00	0.87	99.99	27.73	26.86	22.51	2.00	20.47	16.82
350	100	0.00	0.94	99.99	29.26	28.32	22.51	2.00	16.82	

Title
Condition
Draft
Displacement
LCG (from FP)
TCG (+ve atbd)
VCG (abv)
Genstab Run ID
327
S.W. Bal TK 18s & CL 10s

WS Nº 1 DIVISÃO JUDICIÁRIA Nº
715/2017
Procedimento 236.930-000
Client
Date 18-Jan-1999
By MSE
Checked

P-36 STABILITY ANALYSIS REV C SEP 98 - Damage SW Tk 18s & F/L Box
 DAMAGED CASE HEEL AXIS = 0.0

○ GZ ARM 0.0
 ▲ WIND OVERTURNING ARM



JOSE CARLOS PIMENTEL GUSMÃO
 DIRETOR
 DIVISÃO DE SERVIÇOS CARTORIAS
 É CÓPIA FIEL DO DOCUMENTO ORIGINAL



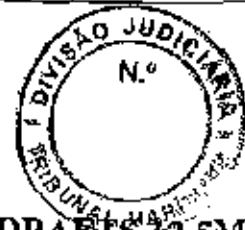
NOBLE DENTON

23. FEB. 1999

TIME 16.28.37

NOBLE DENTON

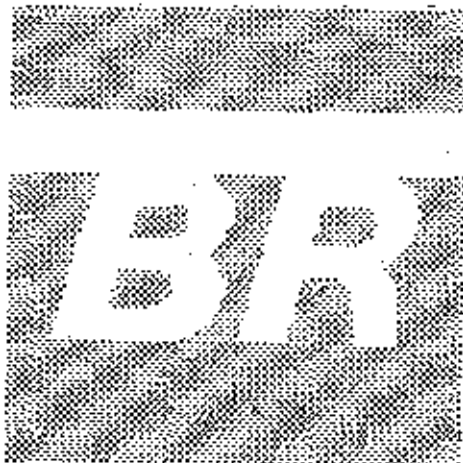
APPENDIX K



LOADING CONDITIONS FOR TRANSITION DRAFTS 12.5M → 22.0M

(10 PAGES)

COPIA FIEL DO DOCUMENTO ORIGINAL
DIVISÃO DE SERVIÇOS CARTOGRAFICOS
DIRETOR
JOSE CARLOS MARINTEL GUIMARÃES



P36 Roncador Field

Transition 12.5m

Stability Analysis

COPIA DEL DOCUMENTO ORIGINAL
DEPARTAMENTO DE INGENIERIA
JOSÉ CARLOS PIMENTEL OLIVEIRA

Transition 12.5m Tanks									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from FP m	TCG m from Gb	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship	31482.0	60.74	0.05	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	34016	76	10332		
Process Fresh Water	0.0	40.34	0.00	4.40	0	0	0		
Fuel/sew/waste oil	631.1	52.34	-0.33	4.96	33031	-209	3129		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	67.0	48.06	12.51	40.56	3220	838	2717		
Proc Related loads	0.0	0.00	0.00	0.00	0	0	0		
Deck Loads	300.0	35.31	3.68	44.15	10742	1104	13245		
Chain onboard	1364.6	56.39	0.00	9.78	76949	0	13341		
Riser loads	0.0	64.25	2.90	15.55	0	0	0		
Mooring tension	0.0	56.39	0.00	18.29	0	0	0		
Water Ballast	7654.6	43.06	-0.34	3.61	329606	-2607	27628	1680	6237
Displacement	41908.12	57.268	0.0206	24.312	2399994	863.306	1018877	1680	6237
Target data	41908.12	57.268	0.0206			Correction for Free Surface* =		0.04	0.15
						corrected VCG =		24.35	24.461
	Genstab	55.5080				KMT / KML =		28.8	34.3
						GMT / GML =		4.45	9.84
Mean Draught	12.5 m								



JOSE CARLOS PASINTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS
E Cópia fiel do documento original

PDS Formador Field

12.5m tanks

Shallow Analysis

Compartiment	Use wt	%	Volume	Sp. Gr.	Weight	LCG	TCG	VEG	Inert	Inert	V inert	Wash main berth	Long main berth	Trans free surface	Long free surface
SW Ballast	1P	1%	7.900000	1.025	8.1001	9.5	24.47	0.000000	77.71004	-200.157	0.00018	0	0	0	0
SW Ballast	1S	41%	338.4398	1.025	375.5999	8.5	24.47	0	2538.180	9190.927	0	177.23	538.1877404	0.0045314	0.01282067
SW Ballast	2P	44%	368.6208	1.025	388.9457	6.78	30.71	2.507406	2700.781	-1228.2	512.8815	289.15	811.2712964	0.00889918	0.01353033
SW Ballast	2S	42%	387.1845	1.025	376.9744	6.78	30.71	2.700454	2551.010	-1158.48	434.7298	288.15	811.27	0.00889918	0.01353033
SW Ballast	3P	1%	7.287805	1.025	7.447	18.71	30.88	0.000000	124.8237	-230.8738	0.004429	0	0	0	0
SW Ballast	3S	1%	7.287805	1.025	7.447	18.71	30.88	0.000000	124.8237	-230.8738	0.004429	0	0	0	0
SW Ballast	4P	93%	790.2815	1.025	810.018	16.07	30.88	0.117594	1174.55	-2489.8	1332.839	0	0	0	0
SW Ballast	4S	67%	626.6874	1.025	650.0841	10.73	30.88	0.244444	1252.864	-2018.081	1380.219	112.486894	1436.254331	0.00384941	0.004288208
SW Ballast	5P	1%	2.585804	1.025	2.63	22.31	30.88	0.000000	73.8273	-80.0768	0.000000	0	0	0	0
SW Ballast	5S	1%	2.585804	1.025	2.63	22.31	30.88	0.000000	73.8273	-80.0768	0.000000	0	0	0	0
SW Ballast	6P	1%	5.238004	1.025	5.37	28.10	30.88	0.000000	151.3809	-170.443	0.000000	0	0	0	0
SW Ballast	6S	1%	5.238004	1.025	5.37	28.10	30.88	0.000000	151.3809	-170.443	0.000000	0	0	0	0
SW Ballast	7P	98%	548.8672	1.025	563.408	25.34	30.88	0.000000	1517.824	-2038.71	1377.358	0	0	0	0
SW Ballast	7S	98%	548.8672	1.025	563.408	25.34	30.88	0.000000	1517.824	-2038.71	1377.358	0	0	0	0
SW Ballast	11P	30%	637.6723	1.025	653.6147	51.06	30.88	4.522483	3332.57	-2013.9	3708.287	187.02	801.72	0.00448242	0.014958077
SW Ballast	11S	92%	638.2881	1.025	654.182	51.06	30.88	4.522483	3340.04	-2015.06	3671.951	0	0	0	0
SW Ballast	13P	98%	658.2381	1.025	674.182	61.72	30.88	4.522483	4057.78	-2015.67	3831.531	0	0	0	0
SW Ballast	13S	98%	658.2381	1.025	674.182	61.72	30.88	4.522483	4057.78	-2015.67	3831.531	0	0	0	0
SW Ballast	16P	1%	2.485805	1.025	2.539	28.10	30.88	0.000000	73.8273	-80.0768	0.000000	0	0	0	0
SW Ballast	16S	1%	2.485805	1.025	2.539	28.10	30.88	0.000000	73.8273	-80.0768	0.000000	0	0	0	0
SW Ballast	17P	1%	5.238004	1.025	5.37	28.10	30.88	0.000000	151.3809	-170.443	0.000000	0	0	0	0
SW Ballast	17S	1%	5.238004	1.025	5.37	28.10	30.88	0.000000	151.3809	-170.443	0.000000	0	0	0	0
SW Ballast	18P	38%	213.4754	1.025	214.6123	85.34	30.88	2.573007	1632.1946	-170.443	0.000000	68.85	581.878785	0.001585165	0.013879788
SW Ballast	18S	38%	213.4754	1.025	214.6123	85.34	30.88	2.573007	1632.1946	-170.443	0.000000	68.85	581.878785	0.001585165	0.013879788
SW Ballast	19P	54%	394.8283	1.025	404.8878	98.07	30.88	2.189408	1728.85	-2816.83	3902.182	0	0	0	0
SW Ballast	19S	54%	394.8283	1.025	404.8878	98.07	30.88	2.189408	1728.85	-2816.83	3902.182	0	0	0	0
SW Ballast	20P	51%	370.0131	1.025	379.2554	98.07	30.88	2.189408	1728.85	-2816.83	3902.182	0	0	0	0
SW Ballast	20S	51%	370.0131	1.025	379.2554	98.07	30.88	2.189408	1728.85	-2816.83	3902.182	0	0	0	0
SW Ballast	21P	1%	7.081951	1.025	7.174	98.28	30.88	0.000000	1171.12	-187.974	0.000000	0	0	0	0
SW Ballast	21S	1%	7.081951	1.025	7.174	98.28	30.88	0.000000	1171.12	-187.974	0.000000	0	0	0	0
SW Ballast	22P	1%	8.637073	1.025	8.878	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	22S	1%	8.637073	1.025	8.878	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	23P	1%	10.67317	1.025	10.94	108.75	30.88	0.000000	1167.845	-340.781	0.000000	0	0	0	0
SW Ballast	23S	1%	10.67317	1.025	10.94	108.75	30.88	0.000000	1167.845	-340.781	0.000000	0	0	0	0
SW Ballast	24P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	24S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	25P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	25S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	26P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	26S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	27P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	27S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	28P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	28S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	29P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	29S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	30P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	30S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	31P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	31S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	32P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	32S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	33P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	33S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	34P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	34S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	35P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	35S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	36P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	36S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	37P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	37S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	38P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	38S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	39P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	39S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	40P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	40S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	41P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	41S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	42P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	42S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	43P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	43S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	44P	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000	0	0	0	0
SW Ballast	44S	1%	8.007805	1.025	8.228	103.87	30.88	0.000000	1028.028	-241.813	0.000000				

P36 Roncador Field

Transition 14.5m

Stability Analysis

Transition 14.5m Tanks									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from FP m	TCG from GL m	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship	31482.0	60.72	0.05	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	34016	76	10632		
Process Fresh Water	0.0	40.34	0.00	4.40	0	0	0		
Fuel/sepfwaste oil	631.1	52.34	-0.33	4.96	33031	-209	3129		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	67.0	48.06	12.51	40.56	3220	838	2717		
Proc Related loads	0.0	0.00	0.00	0.00	0	0	0		
Deck Loads	300.0	35.81	3.68	44.15	10742	1104	13245		
Chain onboard	1364.6	56.39	0.00	9.78	76949	0	13341		
Riser loads	0.0	64.25	2.90	15.55	0	0	0		
Mooring tension	0.0	56.39	0.00	18.29	0	0	0		
Water Ballast	10954.7	47.09	-0.23	5.17	515884	-2539	56593	1543	4833
Displacement	45208.23	57.2080	0.0206	23.178	2586272	931.289	1047842	1543	4833
Target data	45208.23	57.208	0.0206			Correction for Free Surface* =		0.03	0.11
						corrected VCG =		23.21	23.285
	Genstab	55.5680				KMT / KML =		27	27.9
						GMT / GML =		3.79	4.61
Mean Draught	14.5 m								

JOSE CARLOS PIENDEL GUSSAO
 DIRETOR
 DE SERVIÇOS TÉCNICOS
 E CORREL DO DOCUMENTO ORIGINAL



DESARROLLO DE SERVICIOS CARTORARIOS

ප්‍රජා මාතෘකා පිටි

145m Barrels

Stability Analysis

[illegible]

Transition from Transit Draft to Installation Draft									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from FP	TCG m from CL	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.74	0.65	30.11	1912651	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	34076	76	10632		
Process Fresh Water	0.0	40.34	0.00	4.40	0	0	0		
Fuel/sep/waste oil	631.1	52.34	0.33	4.96	33081	-209	3129		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	67.0	48.06	12.51	40.56	3220	838	2717		
Proc Related loads	0.0	80.52	11.10	45.60	0	0	0		
Below Tank Top Process loads	0.0	82.27	0.00	23.45	0	0	0		
Deck Loads	300.0	95.81	3.68	44.15	10742	1104	13245		
Chain onboard	1364.6	56.39	0.00	9.78	76949	0	13341		
Riser loads (4SCR)	0.0	64.25	2.90	15.55	0	0	0		
Mooring tension	0.0	56.39	0.00	18.29	0	0	0		
Water Ballast	19182.6	51.10	0.11	5.40	980171	-2140	103534	2031.3	9775.2
Displacement	53436.09	57.088	0.025	20.488	3050559	1331	1094783	2031	9775
Target data	53436.09	57.088	0.025		Correction for Free Surface* =			0.04	0.18
LCG Genstab		55.692					corrected VCG =	20.53	20.671
Mean Draught	20.0 m						KMT / KML =	27.1	27.6
							GMT / GML =	6.57	6.93



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Stability Analysis

Completion	Max Wt	%	Volume	SP GR	WGR	LOG	TGC	VGC	IRREL	1 BENT	2 BENT	IRMS FROM BENT	IRMS FROM INFLU	Units	Pressure	Flow	Flow
SW Bldg	12	99%	808.9	1.025	699.81	9.5	4.47	6.72297	85.48.205	-620.18.4	5988.585	0	0	0	0.0000	0.0000	0.0000
SW Bldg	15	99%	920.9	1.025	699.81	8.5	24.47	6.72297	85.48.205	-620.18.4	5988.585	0	0	0	0.0000	0.0000	0.0000
SW Bldg	28	99%	888.5	1.025	690.51	6.78	30.71	6.1582.45	60.7.15.4	-2734.7.4	5429.991	0	0	0	0.0000	0.0000	0.0000
SW Bldg	28	99%	888.5	1.025	690.51	6.78	30.71	6.1582.45	60.7.15.4	-2734.7.4	5429.991	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.56	-228.76.2	4487.107	0	0	0	0.0000	0.0000	0.0000
SW Bldg	3P	88%	747	1.025	738.63	18.71	40.88	6.10	12.287.								

Lebedev, M.

P36 Roncador Field

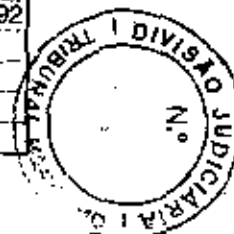
Installation (T=22)

Weight Report

Pre Mooring Installation Condition Draft = 22.0m
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R

Item	Weight tonnes	LCG from FP	TCG m from CL	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.73	0.05	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.37	0.19	26.37	34016	76	10632		
Process Fresh Water	0.0	40.84	0.00	4.40	0	0	0		
Fuel/sep/waste oil	631.1	52.34	0.33	4.96	33031	-209	3129		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	67.0	48.06	12.51	40.56	3220	838	2717		
Proc Related loads	0.0	80.52	11.10	45.63	0	0	0		
Below Tank Top Process loads	0.0	82.27	0.00	23.45	0	0	0		
Deck Loads	300.0	35.81	2.88	44.15	10742	1104	13245		
Chain onboard	1364.6	56.33	0.00	9.78	76949	0	13341		
Riser loads (4SCR)	0.0	64.25	2.90	18.55	0	0	0		
Mooring tension	0.0	56.39	0.00	18.29	0	0	0		
Water Ballast	22249.7	51.82	0.00	6.48	1153008	-2063	144491	4202.7	10179.5
Displacement	56503.24	57.048	0.025	20.100	3223397	1407	1135740	4203	10180
Target data	56503.24	57.048	0.025			Correction for Free Surface* =		0.07	0.18
						corrected VCG =		20.17	20.281
LCG Genstab		55.732				KMT / KML =		26.8	27.2
						GMT / GML =		6.63	6.92
Mean Draught	22.0 m								

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Compartment	Max Wt	%	Volume	Sp. Gr.	Weight	LOG	TSG	VCG	Juvel	Leant	v mlt	trans mem Merits	long mem Merits	trans free surface	long free surface
1P SW Ballast	908.9	99%	877.88	1.025	899.81	9.5	-24.47	6.72607	8548.205	-22018.4	5988.585	0	0	0.0000	0.0000
1S SW Ballast	908.9	99%	877.88	1.025	899.81	9.5	-24.47	6.72607	8548.205	-22018.4	5988.585	0	0	0.0000	0.0000
2P SW Ballast	899.5	98%	868.47	1.025	868.47	6.76	-30.71	6.157072	6305.405	-27337.4	5424.056	718.67	280.85	0.0050	0.0127
2S SW Ballast	899.5	98%	868.47	1.025	868.47	6.76	-30.71	6.157072	6305.405	-27337.4	5424.056	718.67	280.85	0.0050	0.0127
3P SW Ballast	747	99%	721.49	1.025	739.53	18.71	-30.66	6.101492	12057.55	-22667.7	4467.107	0	0	0.0000	0.0000
3S SW Ballast	747	99%	721.49	1.025	739.53	18.71	-30.66	6.101492	12057.55	-22667.7	4467.107	0	0	0.0000	0.0000
4P SW Ballast	818.2	99%	798.97	1.025	809.72	13.71	-30.66	6.101492	12057.55	-22667.7	4467.107	112.53	0	0.0000	0.0000
4S SW Ballast	818.2	99%	798.97	1.025	809.72	13.71	-30.66	6.101492	12057.55	-22667.7	4467.107	112.53	0	0.0000	0.0000
5P SW Ballast	283	99%	254.02	1.025	260.37	22.71	-30.66	6.101492	12057.55	-22667.7	4467.107	112.53	0	0.0000	0.0000
5S SW Ballast	283	99%	254.02	1.025	260.37	22.71	-30.66	6.101492	12057.55	-22667.7	4467.107	112.53	0	0.0000	0.0000
6P SW Ballast	537	98%	518.68	1.025	531.63	30.74	-30.66	6.101492	14986.65	-18937.94	2743.601	0	0	0.0000	0.0000
6S SW Ballast	537	98%	518.68	1.025	531.63	30.74	-30.66	6.101492	14986.65	-18937.94	2743.601	0	0	0.0000	0.0000
7P SW Ballast	589.1	99%	549.67	1.025	563.41	25.74	-30.66	6.101492	15178.23	-20386.33	3376.585	0	0	0.0000	0.0000
7S SW Ballast	589.1	99%	549.67	1.025	563.41	25.74	-30.66	6.101492	15178.23	-20386.33	3376.585	0	0	0.0000	0.0000
11P SW Ballast	680.6	98%	638.24	1.025	654.19	30.81	-30.66	6.101492	35172.22	-50155.7	3394.578	0	66.85	0.0012	0.0169
11S SW Ballast	680.6	98%	638.24	1.025	654.19	30.81	-30.66	6.101492	35172.22	-50155.7	3394.578	0	66.85	0.0012	0.0169
13P SW Ballast	680.6	98%	638.24	1.025	654.19	30.81	-30.66	6.101492	35172.22	-50155.7	3394.578	0	0	0.0000	0.0000
13S SW Ballast	680.6	98%	638.24	1.025	654.19	30.81	-30.66	6.101492	35172.22	-50155.7	3394.578	0	0	0.0000	0.0000
16P SW Ballast	285.8	98%	247.16	1.025	253.34	32.72	-30.66	6.101492	40376.73	-55311.551	3631.551	0	0	0.0000	0.0000
16S SW Ballast	285.8	98%	247.16	1.025	253.34	32.72	-30.66	6.101492	40376.73	-55311.551	3631.551	0	0	0.0000	0.0000
18S SW Ballast	285.9	99%	271.68	1.025	283.31	25.74	-30.66	6.101492	4753.34	-6753.34	749.451	0	0	0.0000	0.0000
17P SW Ballast	537	99%	518.68	1.025	531.63	30.74	-30.66	6.101492	21577.05	-28331.918	3432.421	0	0	0.0000	0.0000
17S SW Ballast	537	99%	518.68	1.025	531.63	30.74	-30.66	6.101492	21577.05	-28331.918	3432.421	0	0	0.0000	0.0000
18P SW Ballast	589	98%	549.57	1.025	563.31	25.74	-30.66	6.101492	44865.27	-60730.34	3341.801	0	0	0.0000	0.0000
18S SW Ballast	589	98%	549.57	1.025	563.31	25.74	-30.66	6.101492	44865.27	-60730.34	3341.801	0	0	0.0000	0.0000
19P SW Ballast	747	99%	721.46	1.025	739.53	30.81	-30.66	6.101492	48384.53	-65397.998	3977.598	0	0	0.0000	0.0000
19S SW Ballast	747	99%	721.46	1.025	739.53	30.81	-30.66	6.101492	48384.53	-65397.998	3977.598	0	0	0.0000	0.0000
20P SW Ballast	787.4	98%	759.51	1.025	778.61	30.81	-30.66	6.101492	71040.85	-95393.65	4467.107	0	0	0.0000	0.0000
20S SW Ballast	787.4	98%	759.51	1.025	778.61	30.81	-30.66	6.101492	71040.85	-95393.65	4467.107	0	0	0.0000	0.0000
21P SW Ballast	987.8	89%	966.84	1.025	980.98	103.67	-24.48	4.202916	62421.62	-1471.153	1539.648	195.18	0	0.0000	0.0000
21S SW Ballast	987.8	89%	966.84	1.025	980.98	103.67	-24.48	4.202916	62421.62	-1471.153	1539.648	195.18	0	0.0000	0.0000
22P SW Ballast	1084	1%	10.67	1.025	10.94	108.75	-31.15	0.068458	1167.845	3440.781	0.007489	0.0035	0	0.0000	0.0131
22S SW Ballast	1084	1%	10.67	1.025	10.94	108.75	-31.15	0.068458	1167.845	3440.781	0.007489	0.0035	0	0.0000	0.0000
23P SW Ballast	882.3	89%	859.00	1.025	875.48	28.02	-27.55	15.9638	18926.87	-18609.4	10675.41	0	0	0.0000	0.0000
23S SW Ballast	882.3	89%	859.00	1.025	875.48	28.02	-27.55	15.9638	18926.87	-18609.4	10675.41	0	0	0.0000	0.0000
24P SW Ballast	1005.3	1%	9.81	1.025	10.05	28	-26.23	8.182852	281.484	284.695	0.23152	0	0	0.0000	0.0000
24S SW Ballast	1005.3	1%	9.81	1.025	10.05	28	-26.23	8.182852	281.484	284.695	0.23152	0	0	0.0000	0.0000
25P SW Ballast	682.3	98%	659.00	1.025	675.48	84.78	-27.55	15.9638	57253.43	-78509.39	10875.41	0	0	0.0000	0.0000
25S SW Ballast	682.3	98%	659.00	1.025	675.48	84.78	-27.55	15.9638	57253.43	-78509.39	10875.41	0	0	0.0000	0.0000
26P SW Ballast	1005.3	23%	228.46	1.025	232.06	84.77	-26.35	10.04095	16673.81	6110.78	537.9869	1681.13	0.0294	0.0000	0.0000
26S SW Ballast	1005.3	23%	228.46	1.025	232.06	84.77	-26.35	10.04095	16673.81	6110.78	537.9869	1681.13	0.0294	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	3.72	84.56	-30.41	1.057287	104.9604	-113.156	0.03952	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	3.72	84.56	-30.41	1.057287	104.9604	-113.156	0.03952	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	3.72	84.56	-30.41	1.057287	104.9604	-113.156	0.03952	0	0	0.0000	0.0000
Chain Locker	372.2	1%	3.63	1.025	3.72	84.56	-30.41	1.057287	104.9604	-113.156	0.03952	0	0	0.0000	0.0000
Chain Locker	52.5	1%	0.52	1.025	0.54	26.31	-31.12	12.23772	46.26145	-16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	52.5	1%	0.52	1.025	0.54	26.31	-31.12	12.23772	46.26145	-16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	52.5	1%	0.52	1.025	0.54	26.31	-31.12	12.23772	46.26145	-16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	52.5	1%	0.52	1.025	0.54	26.31	-31.12	12.23772	46.26145	-16.8492	0.065472	0	0	0.0000	0.0000
Chain Locker	30538				22249.74	56.47	-31.12	12.23772	46.26145	-16.8492	0.065472	0	0	0.0000	0.0000
						51.800	-0.09274	6.494055	1152996	-2063.47	144481	4302.27	10179.51477	0.0744	0.1602
						61.821	-0.0967								
						22248.740									

JOSE CARLOS MARINHO
DIRETOR
DEPARTAMENTO DE SEGURANÇA PATRIMONIAL

JOSE CARLOS PASINTEL QUISAO

1

.....

Loadcase.xls

FILE-2010-38-1320-980-4450-908
15/03/09 10:01

Transition from Operation Draft (22m) to Inspection Draft (18m) Draft = 20.0m									
Worst Case Scenario - Maximum Loads - Based on Weight Control Report R									
Item	Weight tonnes	LCG from FP	TCG m from CL	VCG m	LCGmmt tm	TCGmmt tm	VCGmmt tm	I (m ⁴) trans	I (m ⁴) long
Modified Lightship (Rev R)	31482.0	60.74	0.36	30.11	1912091	1637	948017		
Potable Water tanks	403.2	84.27	0.19	26.27	34016	76	10632		
Process Fresh Water	1050.4	40.38	0.00	4.40	42415	0	4622		
Fuel/sep/waste oil	2821.1	59.63	-0.49	9.81	168231	-1374	27661		
Lub oil	5.6	60.77	4.31	29.60	340	24	166		
Crew & Stores	335.5	69.85	3.27	39.23	23433	1096	13162		
Proc Related loads	1733.4	80.52	11.10	45.60	138573	-19241	79043		
Below Tank Top Process loads	112.2	82.27	0.00	23.45	9231	0	2831		
Deck Loads	300.0	56.39	0.00	44.50	16917	0	13350		
Chain onboard	909.7	58.39	0.00	9.78	51298	0	8894		
Riser loads (4SCR)	5158.0	66.26	0.95	14.83	341789	4900	77009		
Mooring tension	1727.2	57.85	1.41	18.29	99317	2435	31586		
Water Ballast	7397.8	28.57	1.59	4.87	211229	11777	36005	231.8	3246.0
Displacement	53436.09	57.088	0.025	23.444	3050560	1331	1252780	232	3246
Target data	53436.09	57.088	0.025		Correction for Free Surface* =			0.00	0.06
					corrected VCG =			23.45	23.505
LCG Genstab		55.692			KMT / KML =			27.1	27.6
					GMT / GML =			3.65	4.09
Mean Draught	20.0 m								

JOSE CARLOS PREZENTEL OLIVEIRA

DIRETOR

DIVISAO DE SEGURANCA E CARTOGRAFIA

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RL-3010.38-1320-00-NBD-903

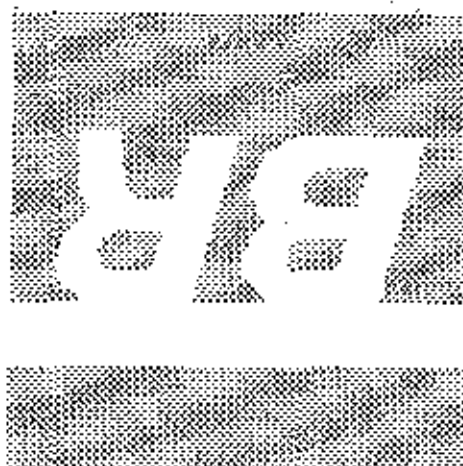
APPENDUM 1

SUMMARY OF INTERNAL SUBDIVISION

OF

P36 TO MEET REQUIREMENTS OF IMO/RINA

(4 PAGES)



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DIVISÃO DE SERVIÇOS CARTORARIOS
É Cópia do Documento Original:



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C

1 SUMMARY

As a result of the continuing increase in lightship weight, modifications to process content, and operational requirements for the unit to meet all the stability requirements of RINA, IMO and Brasoil additional subdivision of a number of compartments is required.

Upon completion of the subdivision work described below the unit should have an adequate stability margin for operations at the Roncador field provided that there is no further increase in lightship or operational loads.

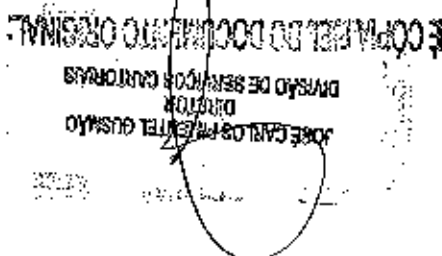
2 VOID SPACE 32 STBD 1 & PORT 1

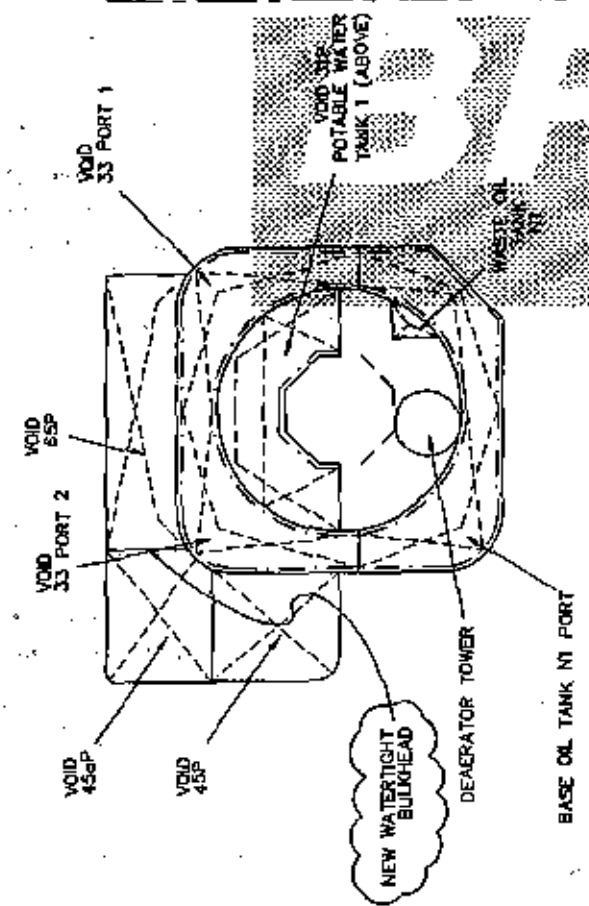
This compartment is located on the forward columns from El. 19.812m up to 30.480m. The compartment requires to be split into two. This is best achieved by making the forward longitudinal bulkhead watertight, as shown on the attached drawing. Subject to survey and final engineering calculations this should be relatively straight forward to close and reinforce. Additional bilge drainage and vent pipes will be needed along with water detection sensors.

3 SUBDIVISION OF VS46A / VS45A PORT & STBD

This compartment is the part of the new fairlead box extension. On the capacity plans and as shown on the attached sketch the compartments have been designated as VS45a/VS46a and VS64/VS65, however, they are currently separated by a non-watertight bulkhead. To meet the stability requirements this watertight bulkhead must be closed as shown on the attached sketch.

The design of the bulkhead was such that it could become an watertight boundary if necessary. Therefore only the manway needs to be changed to a manhole and a small work platform added. Additional bilge drainage and vent pipes will be needed along with water detection sensors.





BASE OIL TANK
N1 STBD

WASTE OIL
TANK
N1

NEW WATERTIGHT
BULKHEAD

DEAERATOR TOWER

VOID 31S
POTABLE WATER
TANK 1 (ABOVE)

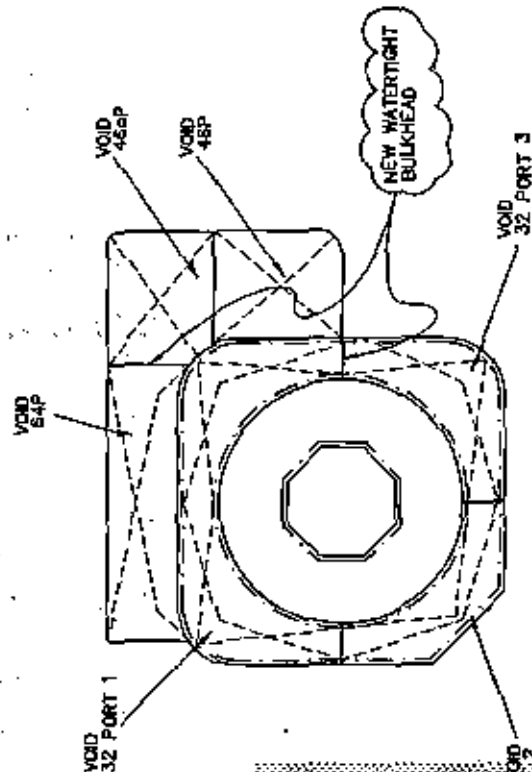
VOID 33 STBD 1

VOID 33 STBD 2

VOID 55S

VOID 45S

VOID 45LS

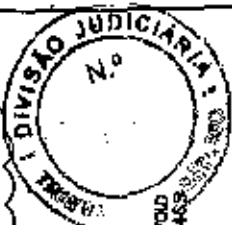


FWD

VOID 32 STBD 2

VOID 32 STBD 3

NEW WATERTIGHT
BULKHEAD



VOID 46S

VOID 46LS

VOID 32 STBD 1

VOID 64S

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CÓPIA FIEL DO DOCUMENTO ORIGINAL

SUBDIVISION OF COLUMNS & FAIRLEAD BOX EXTENSIONS

ELEVATION BETWEEN 19812 & 30458 ABL

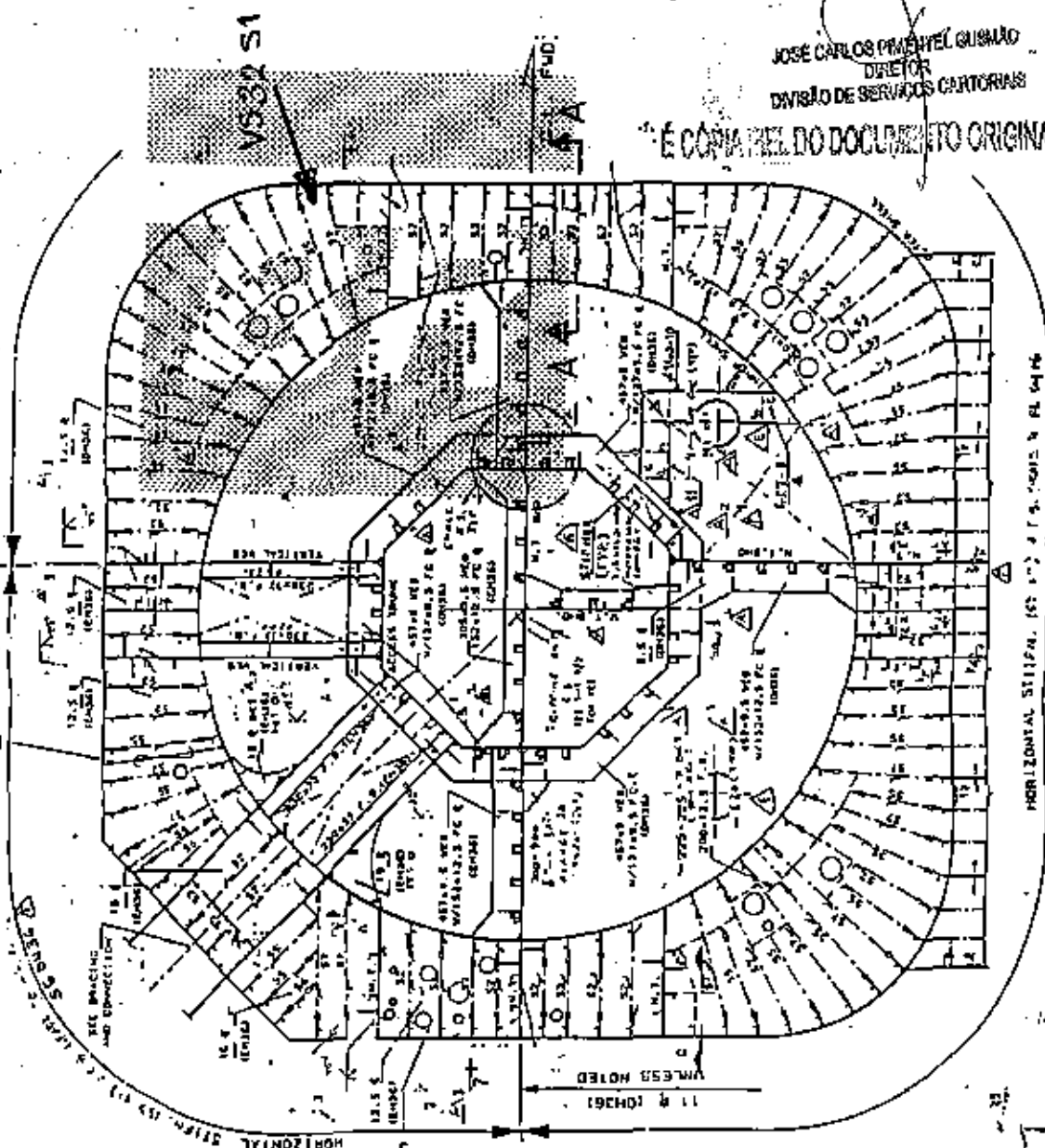
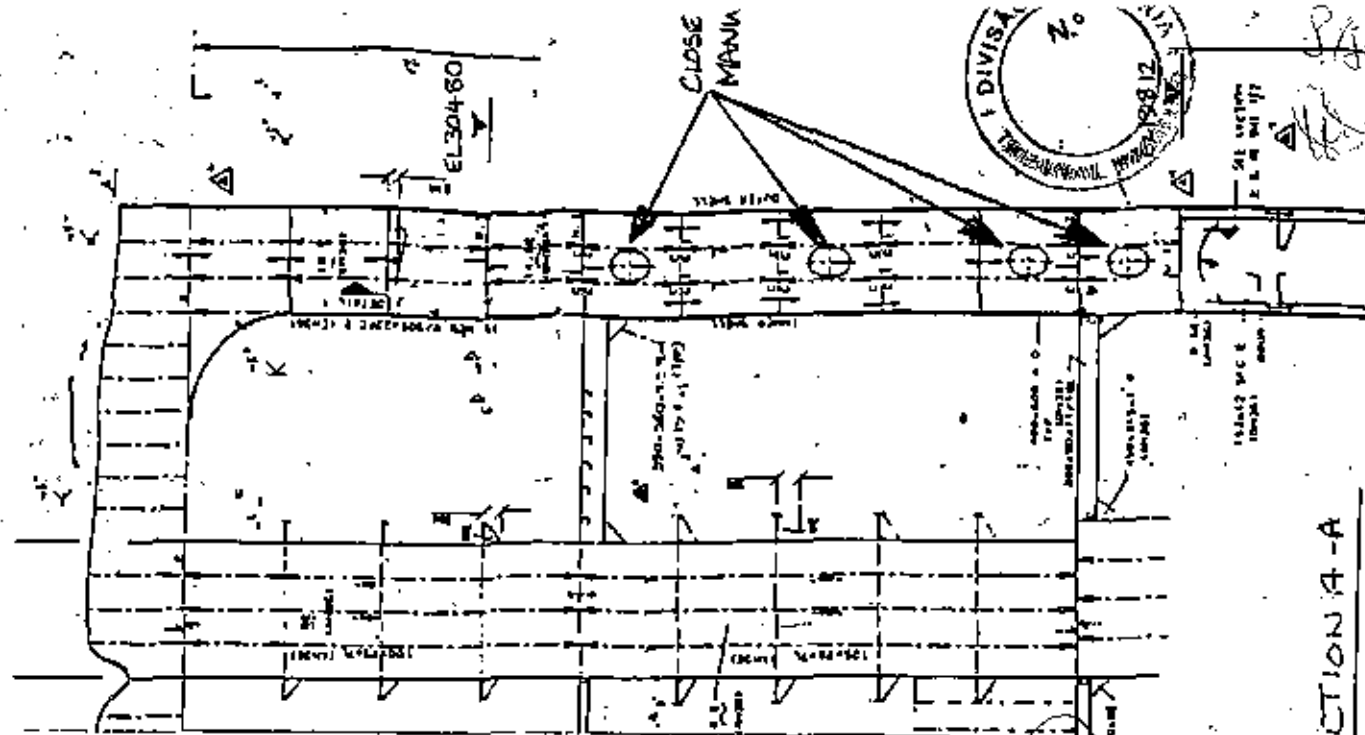
STABILITY ANALYSIS

RI-3010A.3B-1320-960-NBD-906 - REV 8

MODIFICATION TO FWD COLUMN

DETAILS

A-A



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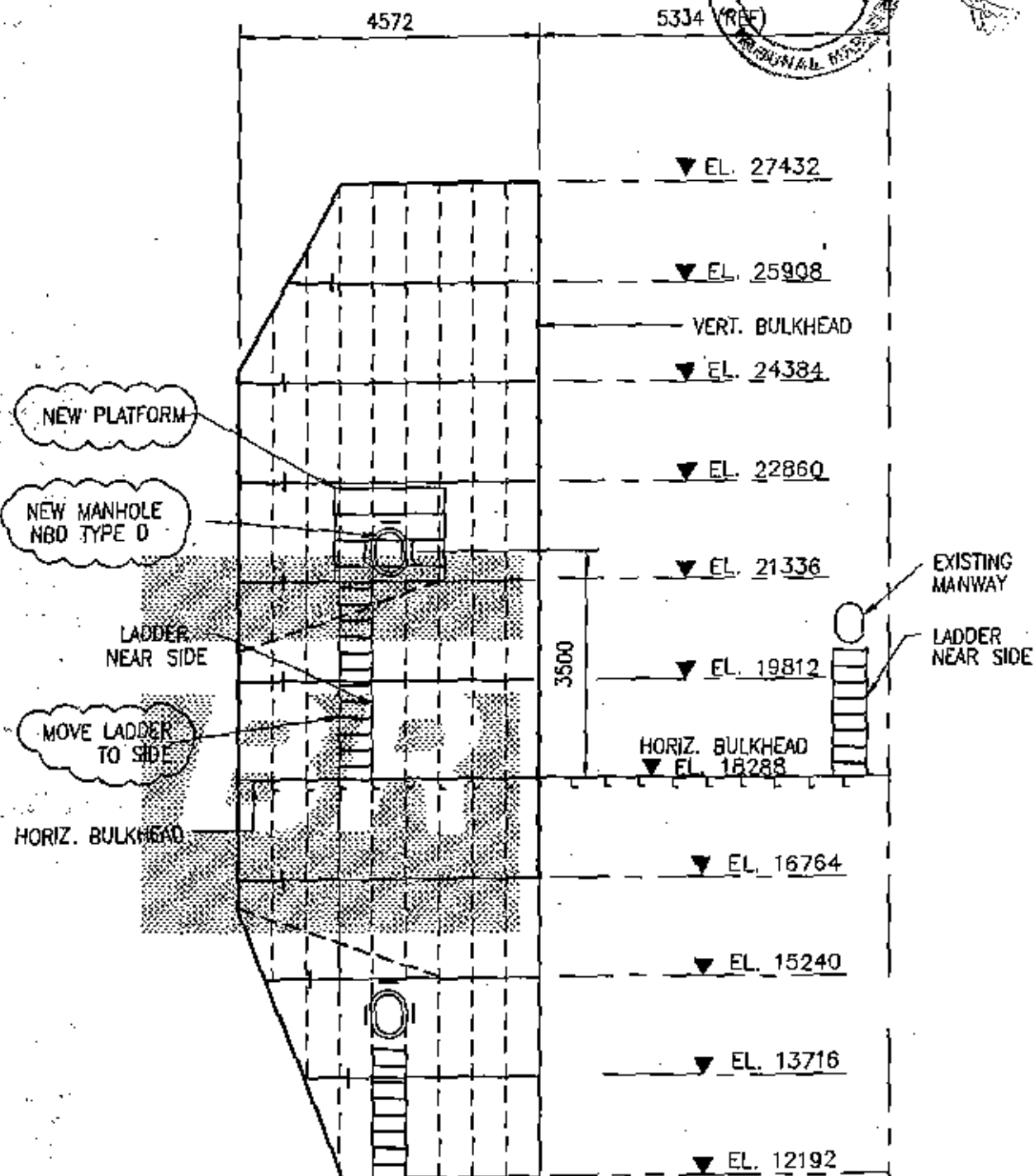
SECTION A-A

PLAN AT 19812 A.B.L.

SIBD. FWD. COLUMN SHOWN-PORT. SIMILAR



COLUMN



MODIFICATION TO BULKHEAD BETWEEN
VS 46a & 64 (PORT & STBD)
(VS 45a & 65 SIMILAR)

LOOKING AFT
(TYP. 4 LOCS.)

JOSÉ CARLOS FERREIRA GUSMÃO
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L:\RONCADOR\CAO\DRAWINGS\STAB_REP\VS462.DWG

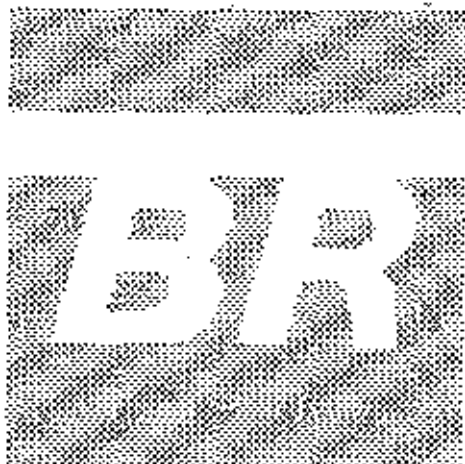
ADDENDUM 2



HYDROSTATIC & CROSS CURVES; WORST ANGLE INCLINATION

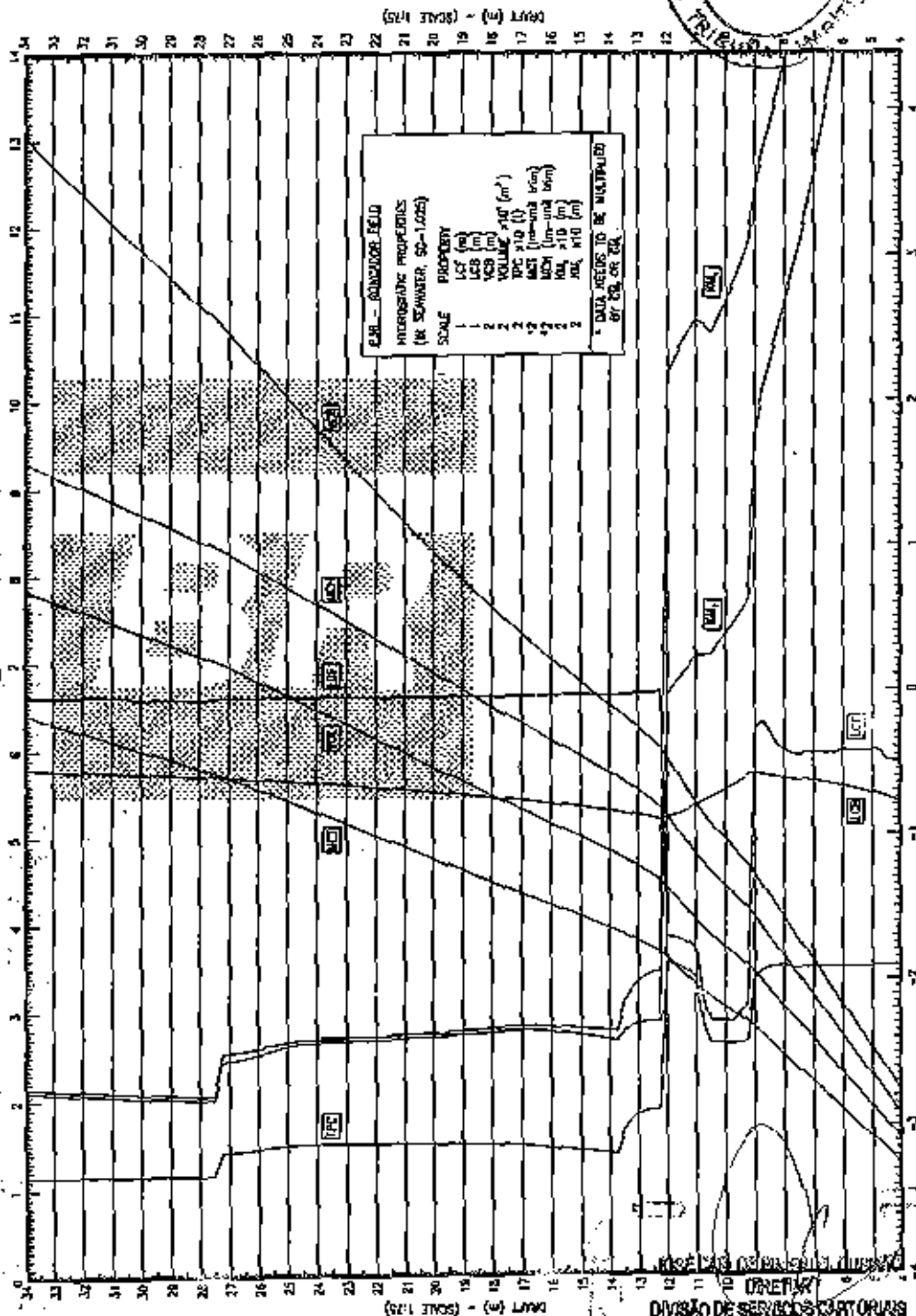
(FOR INFORMATION ONLY)

(5 PAGES)



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SCALE 1 - VOLUME PER UNIT PERIOD
SCALE 125



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UNIDADE

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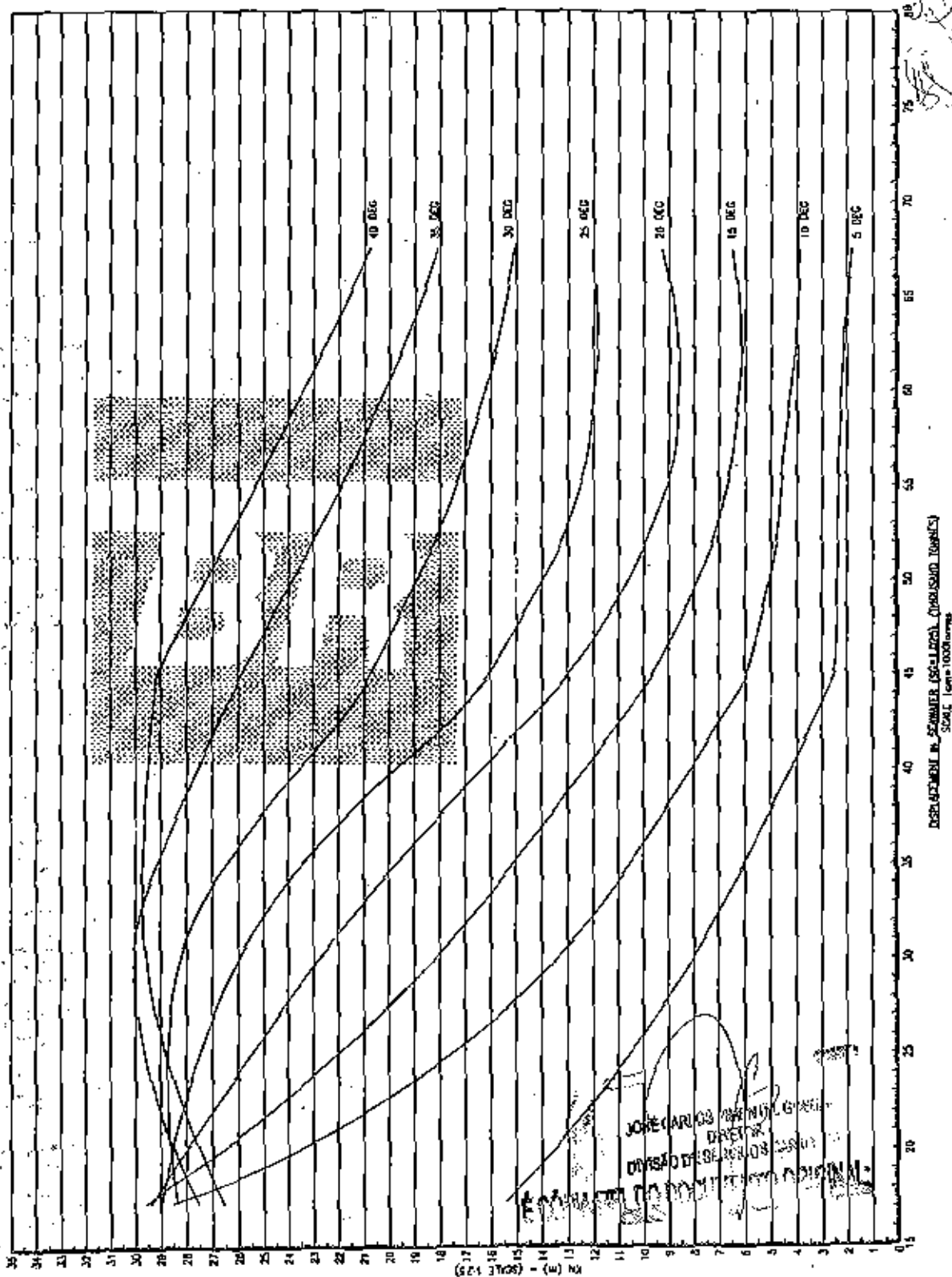
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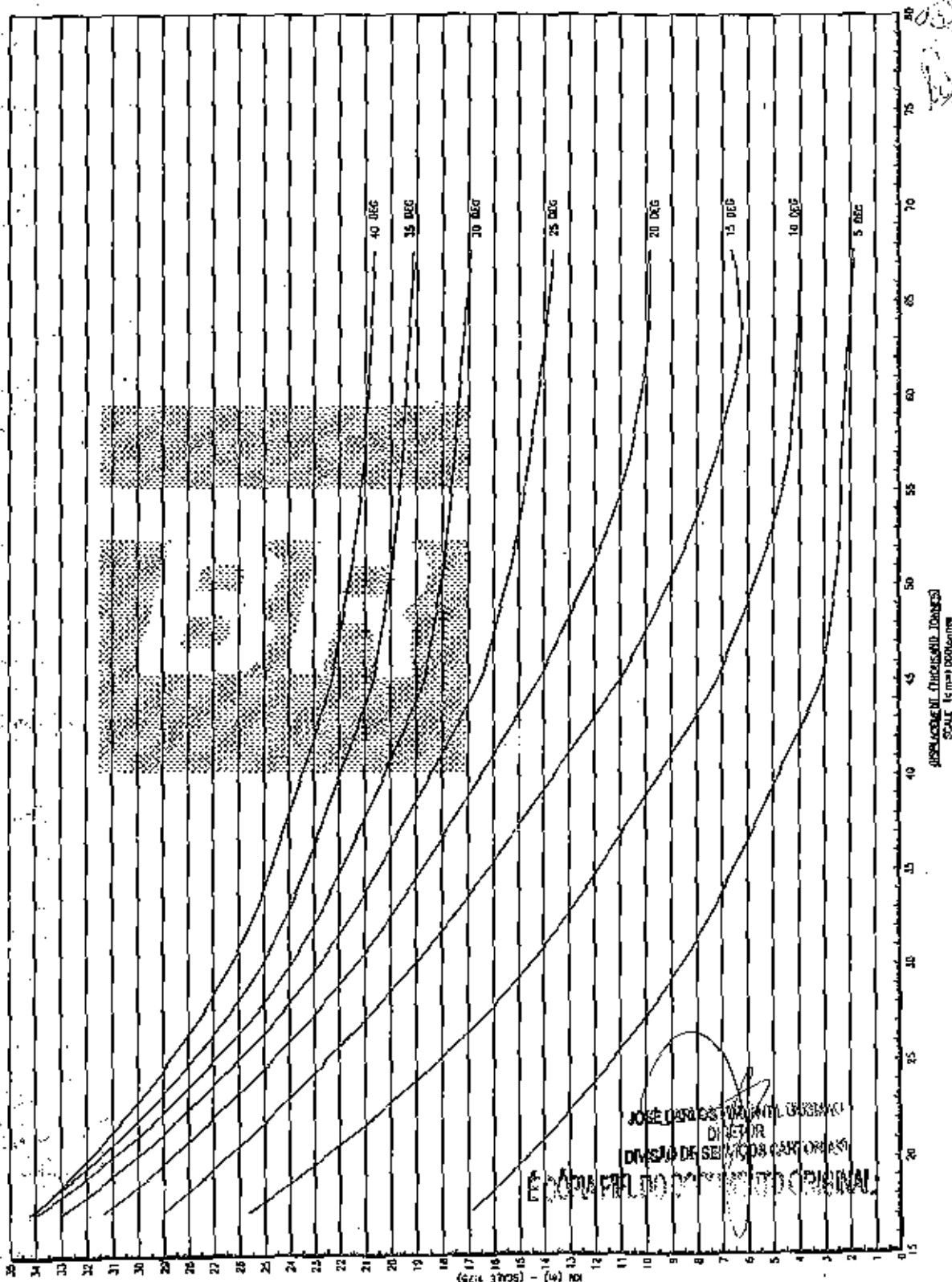
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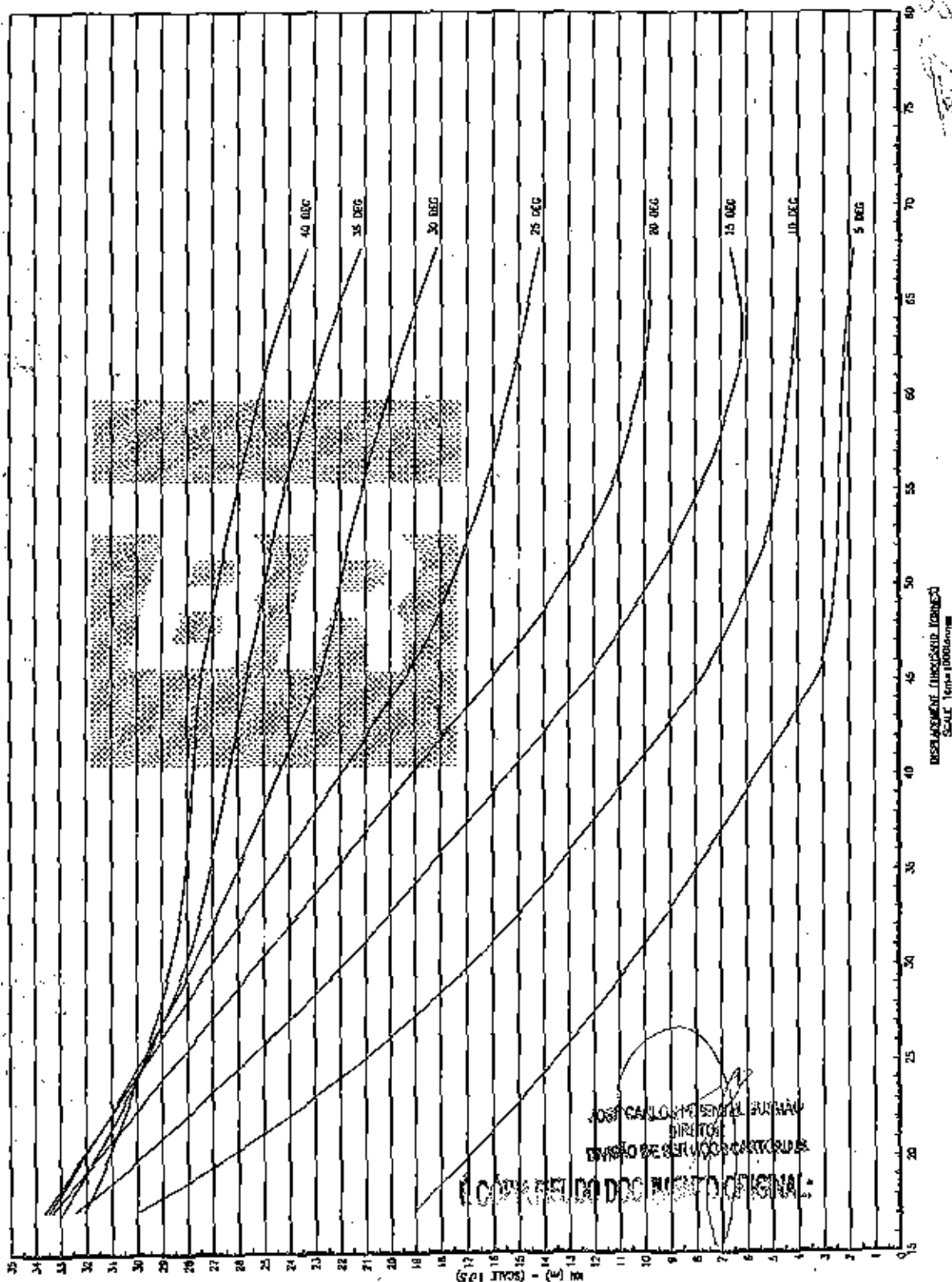
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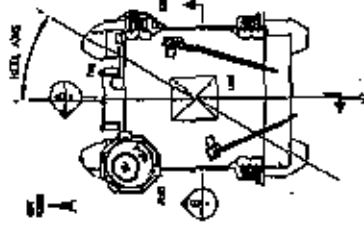
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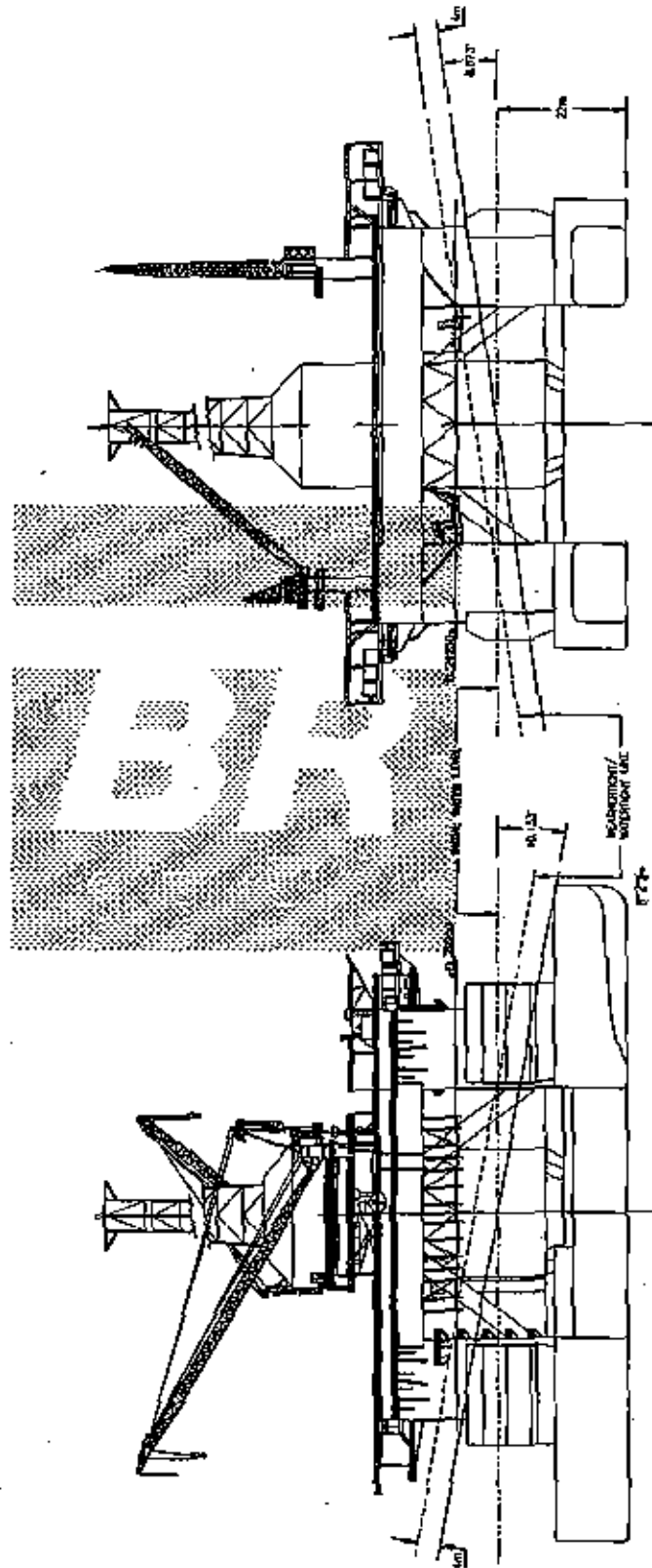
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GENERAL NOTES

1. BASED ON RESULTS FROM STABILITY ANALYSIS
 (DOC. NO. 8-310-20-1120-100-400)
 -REV. 8

2. DAMAGED COMPARTMENTS REPORTED ARE
 ACCORDING TO DAMAGE SURVEY. INCE THE
 THE WORST CASE TO BE AVOIDED.



WORST CASE HEEL ANGLE
 DAMAGE TO SW BALLAST TANK 22
 $T_{200} = 22.78m$ (AFTER DAMAGE)

JOSE CARLOS PIAZZI TEL GUSMAO
 DIRECTOR
 DIVISAO DE SERVICOS CARTOGRAFICOS

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WORST CASE TRIM ANGLE
 DAMAGE TO SW BALLAST TANK 22
 $T_{200} = 22.78m$ (AFTER DAMAGE)

INCLINATION OF UNIT
 WORST DAMAGE
 CONDITION

DE-310-20-1120-100-400-01

ADDENDUM 3

CROSS FLOODING OF BASE OIL TANKS DURING ESD

(2 PAGES)



JOSÉ CARLOS PIENDEL GUSMÃO
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É CÓPIA FIEL DO DOCUMENTO ORIGINAL



1 INTRODUCTION

Following discussions with AMEC/Petromec it has been confirmed that the Base Oil tank N1 Port & Stbd will be used as emergency dump for the separators (Ref P&ID AMK-398 Rev E). The valves XV65002 & XV65004, connecting these two tanks will be normally closed. Therefore it is correct to consider the tanks to be damaged singularly.

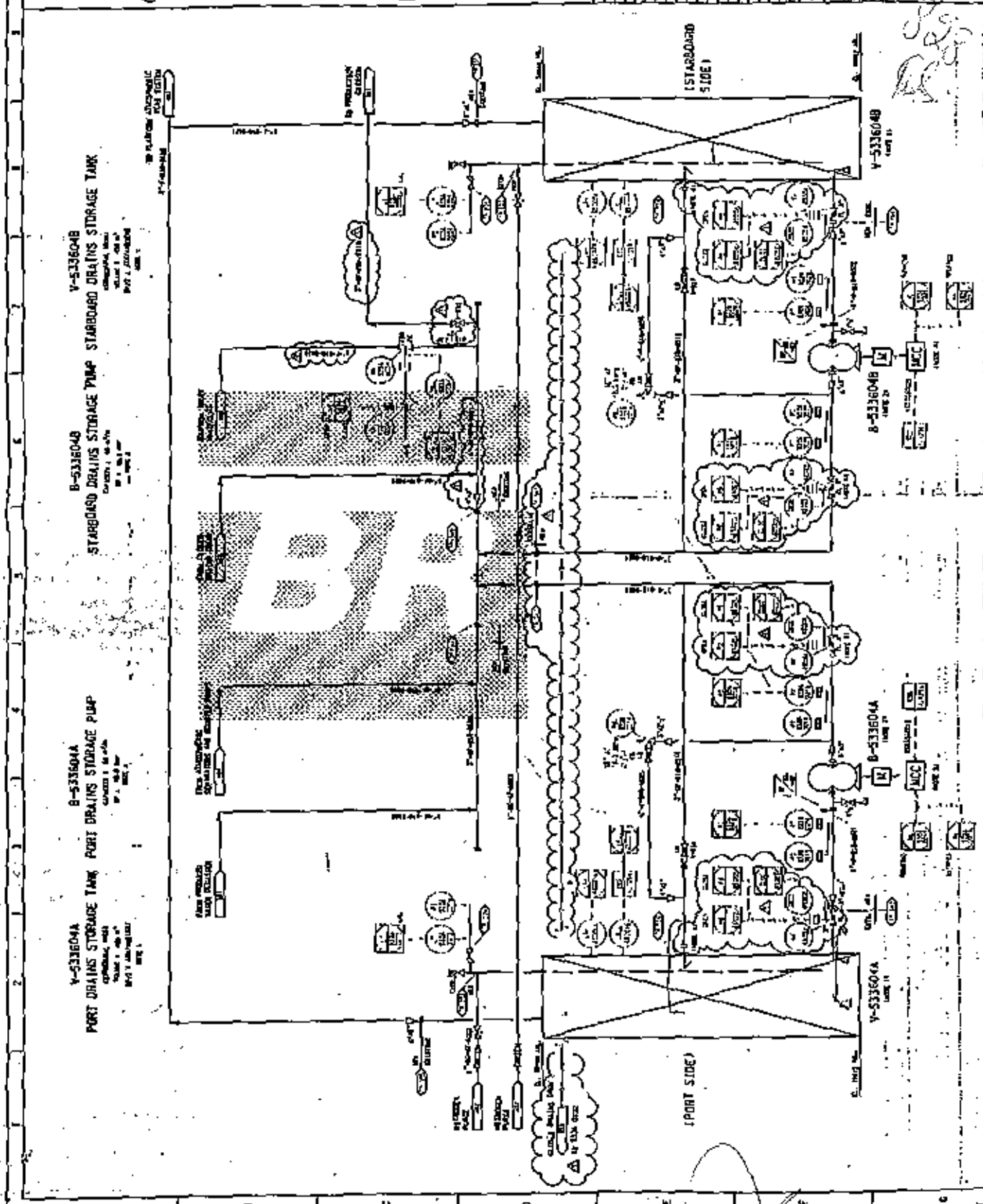
2 RESULTS

In the event of emergency dump the valves will be open which would mean a condition whereby if damage to the unit occurred both tanks should be considered flooded. Normally this would be classed as a temporary condition, however an analysis has been performed to demonstrate that there is no significant loss of stability in this condition. The results of the analysis for simultaneous flooding of are summarised below

Heel Axis (Deg)	Angle of Loll (Deg)	1 st Intercept (Deg)	2 nd Intercept (Deg)	Angle @ MO Dam. Ratio >2 (Deg)	DF Angle (Deg)	DF Clear. (m)	Allow KG (m)
50	1.4	3.7	>40	11°	17.16	10.76	22.99

From the above results it can be seen that the allowable VCG will decrease by 5cm from that reported in the main body of the report, which is insignificant.

JOSE CARLOS VALENTE GUERAO
DIRETOR
DIRETOR DE SERVIÇOS CARTORARIOS
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829 293
G. B. 1

MOD. 1 Bis

N.º 53/1999

ITALIANA E DELLA NAVIGAZIONE

DI NAPOLI

IONALITA'

el Registro Internazionale)

Legge

JOSE CARLOS PARENTI GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS

È COPIA DEL DOCUMENTO ORIGINAL

Napoli

PETRONAS - TRENTASRI

all'anno 1995 avverte le seguenti dimensioni:

di poppa.

tra fra gli orti superiori interni alla suola 1.

no hanno coperto da una cella che misce gli orti superiori della

Metri	Cent.
112	98
77	71

PROCURADOR
MUNICIPAL

JOSE CARLOS PIMENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS GASTRONÔMICOS

ÉCOLE DE LA MARINE
DOCUMENTO ORIGINAL



REPUBBLICA ITALIANA
MINISTERO DEI TRASPORTI E DELLE COMUNICAZIONI

DIREZIONE MARITTIMA DI ... NA

ATTO DI NAZIONALIZZAZIONE

(per le navi iscritte nella I o II sez. del Registro)

In nome della



Il Direttore Marittimo di ... Na

Dichiaro che la piattaforma sommergibile denominata "PETRO
al pontone e con ... alber ... costruita a Genova - Sestri Ponente nell'a
Lunghezza massima, dall'avanti della ruota di prova, sotto al compresso alla fuscia posteriore dell'orlo di p
Larghezza massima fuori fianciamo. (Per le navi, che non hanno coperta, misurata alla ordinata maestra p



MOD. I Bis



N.° 53/1999

REPUBBLICA ITALIANA

MINISTERO DEI TRASPORTI E DELLA NAVIGAZIONE

MARITTIMA DI NAPOLI

CERTIFICATO DI NAZIONALITÀ

nella I o II sez. del Registro Internazionale)

Pubblicazione della Legge

JOSE CARLOS MARENTES GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORARIOS

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Marittimo di Napoli

denominato a "PETROBRAS - TRENTASRI"

a Genova - Sestri Pon nell'anno 1995 avente le seguenti dimensioni:

lunghezza, misurata alla linea perpendicolare dell'orlo di poppa.

larghezza, misurata alla ordinata massima fra gli orli superiori interni alla suola.

profondità dei madrieri (Per le navi, che non hanno coperta, da una retta che unisce gli orli superiori della coperta alla massima media delle traverse).

Metri	Cent.
112	78
27	71
11	88

Dichiaro che la piattaforma sommergibile denominata "PETA"
a ponti e con alberi costruita a Genova - Sestri Pon. nell'
Lunghezza massima, dall'avanti della ruota di prova, sotto al bompresso, alla faccia posteriore dell'arco di p
Larghezza massima fuori fasciame. (Per le navi che non hanno coperta, misurata alla ordinata maestra)
Profondità misurata alla sezione maestra del ponte della sterna alla gola dei martiri. (Per le navi che non ha
notte alla gola dei martiri o accanto al perimetro della dotta, la grossezza media delle cerelle
Stimata secondo le norme fissate dal D.P.R. n. 46 del 2.2.1984
Lorda di tonnellate di registro trentaquattro mila quattrocentottantotto
netta di tonnellate diecimilatrecentoquarantaghiattro e centesimi
come da certificato di stampra annesso al processo verbale compilato dalla Capitaneria
il 24 agosto 1995

Munita di apparato motore tipo elettrico WK 300 VB-16
della potenza di cavalli ass. KW 9.000 (2.250 x 4) indovuti
di proprietà della "SOCIETA' ARMAMENTO NAVI APPOGGIO S.P.A." con sede in Roma all

è autorizzata a ad innalzare la Bandiera Italiana

La suddetta nave, quale appartenente alla Marina Mercantile italiana
riconoscimento e della protezione accordati alle navi italiane.

Per tutti gli effetti rilascia il presente atto di nazionalità, per cambio

Napoli, 18 agosto 1999.

JOSÉ CARLOS PINHEIRO GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAIS

É COPIA DO DOCUMENTO ORIGINAL

Marittimo di Napoli

denominat a "PETROBRAS - TRENTASRI"

Genova - Scatoli Pon. nell'anno 1995 avente le seguenti dimensioni:

Metri	Cent.
112	78
77	71
11	68

sa, alla faccia posteriore dell'orlo di poppa.

sta, misurata alla ordinata maestra fra gli orli superiori interni alla suola.

da dei maduri (Per le navi che non hanno coperta da una retta che misce gli orli superiori della edotta la grossa media della suola).

R. n. 46 del 2.2.1984

trecento e mezzo

o incantesimi

compilato dalla Capitaneria di Porto di Genova

e dichiarat a della

di tonnellata (34.481 e / 100)

di tonnellata (10.344 e / 100)

terico WK 300 VH-16

diventi

nominati

asbruito a Olanda - 1992

S.P.A. n° con sede in Roma alla Via Jenner n° 136

Italiana

Marina Mercantile italiana, è nelle condizioni di godere dei diritti dei
navi italiane.

di nazionalità, per cambio del nome.

p. Il Direttore Marittimo

G.A. (CP) Francesco DONATO t.a.

C.V. (CP) Maurizio SOTTO DI SANTOLO

JOSÉ CARLOS FRIEDEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS

JOSÉ CARLOS FRIEDEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS

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propriedade - Inscrição e resolução de hipotecas navais

JOSÉ CARLOS MENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS
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Capo Sezione
MANCONI

Dichiarazioni di armatore/gestore ai sensi del comma 1,
lett b) dell'art. 143 Cod. Nav.

Dichiarazione di armatore Rep.
85/NA del 18.04.2000 ore
09.59 ALT con dichiarazione di
armatore resa 13.01.2000 debi-
tamente autenticata società
Petroleo Brasileiro S.A.
Petrobras sedente Rio de Janei-
ro - Brasile Via Repubblica do
Chile 65 Assume esercizio
armatoriale piattaforma Petro-
bras trentasei n.86 prima se-
zione registro internazionale
Napoli ALT C.V. (CP) firmato:
Agostino Izzo.
Rio de Janeiro, 18-05-2000.

Il Console
Leonardo Benigni

ROSE CARLOS RUIZ TEL GUEBÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL

Porto d'iscrizione della nave

Iscritt. nella 178. Sezione del Registro Internazionale del
 porto di Napoli al n. 66 in data
30 novembre 1998



Il Comandante del Porto

IL CAPO SEZIONE

(02) (02) 8000 0000

Variations successive

JOSÉ CARLOS DIMENTEL CUSMAO
 DIRECTOR
 DIVISÃO DE SERVIÇOS CARTORIAIS

È COPIA FIDELIO DOCUMENTO ORIGINALE

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Annotazioni Varie

JOSE CARLOS PIMENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTOGRAFICOS
É COPIA FIEL DO DOCUMENTO ORIGINAL

Variazioni relative alla proprietà

Inscrizione e risoluzione di ipoteche navali

del
Ipoteca navale rep.n. 171/NA del 8.7.1927 ore 10.35. Con atto a rogito notaio Luca Amato di Roma del 2.7.1927 rep. 9282/2178 la società SANA Armamento Navi Appoggio S.p.A. con sede in Roma Via Edoardo Jenner 136 ha consentito iscrizione di Ipoteca navale di terzo grado sulla piattaforma Spirit of Columbus matr. 1521 di Napoli per la complessiva somma di USD trecentomilioni a favore Petroleum Inc. con sede in Treple Isle Building Wickham Cay Tortola Isola Vergini Britanniche elettivamente domiciliata in Napoli presso Studio Avv. Caterina Montagna di Piazza Margherita 32 Il Capo Sezione C.F.(CP) F.to Giovanni Lombardi.

Ipoteca Navale Rep.n. 125/55 della Capitaneria di Porto di Genova del 5.8.1925 a favore Arab Banking Corporation (B.S.C.) Filiale di Londra con sede in 1/5 Moorgate London EC2R 6A13 ed elettivamente dom.ta c/o Banco di Napoli Spa Via Toledo 177/178 e contro SANA Società Armamento Navi Appoggio Spa con sede in Roma Via Jenner 136. In virtù dell'atto del notaio Rosetta Gessaga di Genova del 14.7.1920 e dell'addendum a rogito dello stesso notaio in data 11.7.1925 è stata costituita ipoteca navale di 1° grado a favore del predetto Istituto bancario sulla unità retrodescritta per la complessiva somma di dollari USA centenoveantamili e equivalenti a lire italiane duecentotrentaquattro miliardi ottantamili. Il Capo Sezione T.V.(CP) F.to Enzo

Ipoteca navale di 2° grado Rep.n. 130/55 del 5.8.1925 della Capitaneria di Porto di Genova a favore Sestri Cantiere Navale Spa con sede in Genova Sestri Via Selimmi 47/R e contro SANA Società Armamento Navi Appoggio Spa con sede in Roma Via Jenner 136. Con atto a rogito notaio Rosetta Gessaga di Genova del 4.8.1925 è stata costituita ipoteca navale di 2° grado sull'unità retrodescritta per l'importo complessivo di lire duecentenoveantatremilardiottocentomilioni a favore del predetto cantiere. Il Capo Sezione T.V.(CP) F.to Enzo MENCONI

Ipoteca navale Rep.n. 172/NA del 8.7.1927 ore 10.40 Con atto a rogito notaio Luca Amato di Roma del 2.7.1927 rep. 9283/2179 la soc. SANA Società Armamento Navi Appoggio Spa con sede in Roma Via Jenner 136 ha consentito iscrizione di ipoteca a navale di quarto grado per la complessiva somma di lire trecentotrentamiliardi sulla piattaforma Spirit of Columbus matr. 1521 di Napoli a favore Oil Field Developments Ltd con sede in Londra Three Quays - Lower Thames Street elettivamente dom.ta in Napoli presso Studio Avv. Caterina Montagna di Piazza Margherita 32. Il Capo Sezione C.F.(CP) F.to Giovanni Lombardi

Ipoteca navale rep.n. 173/NA del 8.7.1927 ore 10.45. Con atto rep. 180/84 di costituzione di ipoteca in data 2.7.1927 e successivo atto integrativo rep. 181/85 in data 4.7.1927 al rogiti notaio Ma

Porto d'iscrizione della nave

Iscritta nella 11^a Sezione del Registro Internazionale del
 porto di Napoli al n. 66 in data
30 novembre 1998



Il Comandante del Porto

IL CAPO STAZIONE
 (SE) (SE) *[Signature]*

Variazioni successive

[Signature]
 JOSE CARLOS PIMENTEL GIBRANI
 DIRETOR
 DIVISAO DE SERVICIOS CARTEIRAS

È COMPRESO NEL DOCUMENTO ORIGINALE

Ipoteca Navi
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 del 2.7.1997
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 Lombardi .

Ipoteca Nav
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 Capo Sezio
 MARCONI

Variazioni relative alla proprietà - Inscrizioni

segue Rep.n. 103/NA-- rina Varle
si in Arsoli la società SANTA So
cietà Armamento Navi Appoggio S.
p.a. con sede in Roma Via Jenner
136 ha consentito iscrizione di
ipoteca navale di 5° grado per la
complessiva somma di dollari USA
cinquecentomilioni sulla piastra
forma Spirit of Columbus matr. 12
24 di Napoli a favore Braspetro
Oil Services Company con sede in
Bank America Trust and Banking
Corp. (Cayman) Ltd. P.O. Box 1002
GT-Grand Cayman - Cayman Islands
B.W.I. elettivamente dom.ta in Na
poli Elia Via Calabritto n. 20.

Il Capo Sezione C/F. (CP) F.to
Giovanni LOMBARDI



11/11/73 SEZIONE

(TCE) CP 11/11/73

JOSE CARLOS PRIETEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORIAS

É COPIA DO DOCUMENTO ORIGINAL

Dichiarazioni di armatore/gestore ai sensi del comma 1,
lett b) dell'art 143 Cod. Nav.

Dichiarazione di armatore. Rep.
85/NA del 18.04.2000 ore
09.59 ALT con dichiarazione di
armatore resa 13.01.2000 debi-
tamente autenticata società
Petroleo Brasileiro S.A.
Petrobras sedente Rio de Janei-
ro - Brasile Via Republica do
Chile 66 Assume esercizio
armatoriale piattaforma Petro-
bras trentasei n.66 prima ac-
ziò la registro internazionale
Napoli ALT C.V. (CP) firmato:
Agostino Izzo.
Rio de Janeiro, 18-05-2000.

Il Console
Leonardo Bencini

JOSÉ CARLOS FERNANDES GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS
É CÓPIA FIEL DO DOCUMENTO ORIGINAL

comma 1,

Annotazioni Varie

JOSÉ CARLOS PRASTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CATHOLICOS

É CÓPIA FEL DO DOCUMENTO ORIGINAL.

JOSÉ CARLOS PIMENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CONTÁBIL

É CÓPIA FIEL DO DOCUMENTO ORIGINAL.

JOSÉ CARLOS PUENTE GUERRA
DIRETOR
DIVISÃO DE SERVIÇOS CARTORARIAS
CÓPIA DO DOCUMENTO ORIGINAL



CERTIDÃO

CERTIFICO que nesta data foi encerrado o 5º volume do processo nº 19.489/2001 com suas fls. nº 830A dos autos.

O referido é verdade e dou fé.

Aos 09 de agosto de 2001.

RPB.

JOSÉ CARLOS PIAGENTEL GUSMÃO
DIRETOR
DIVISÃO DE SERVIÇOS CARTORÁRIOS

É CÓPIA FIEL DO DOCUMENTO ORIGINAL.

PROCESSO Nº 12.489/2001 (EMBARCAÇÃO P-36)

Relatório de Fitas VHS

Nº da Fita	Descrição
00001	Coluna Fumaça - Sistema Resfriadora 15/03/01
00002	Sistema de Abastecimento de Combustível - Sistema Ancoragem - Coluna e Reservatório
00003	Sistema de Abastecimento de Combustível
00004	Embarcação P-36 - Parte Inicial 20/03/01
00005	Embarcação P-36 - P-36 Adernada - 17/03/01 às 12 hs
00006	Embarcação P-36 - P-36 Adernada - 16/03/01 às 9 hs
00007	Embarcação P-36 - P-36 Adernada - 16/03/01 às 16 hs
00008	Embarcação P-36 - P-36 Adernada - 18/03/01 às 11 hs
00009	Embarcação P-36 - P-36 Inclinação - 15/03/01 às 16 hs
00010	Embarcação P-36 - P-36 Adernada - 15/03/01 às 15 hs
00011	Embarcação P-36 - Margulhador Trabalhando - 19/03/01 às 14 hs
00012	Embarcação P-36 - P-36 Inclinação - 15/03/01 às 8 hs
00013	Embarcação P-36 - P-36 Inclinação - 15/03/01 às 6:40 hs - 19' Fumaça Preta
00014	Embarcação P-36 - P-36 Inclinação - 15/03/01 às 7:40 hs
00015	Embarcação P-36 - P-36 Inclinação - 15/03/01 às 10 hs
00016	Embarcação P-36 - Margulhador Trabalhando - 18/03/01 às 12:45 hs
00017	Embarcação P-36 - P-36 a 1356 m - 20/03/01 às 21:27 hs
00018	Embarcação P-36 - P-36 a 1356 m
00019	Embarcação P-36 - P-36 a 1356 m
00020	Embarcação P-36 - P-36 a 1356 m
00021	Embarcação P-36 - P-36 a 1356 m
00022	Embarcação P-36 - P-36 a 1356 m
00023	Embarcação P-36 - P-36 a 1356 m
00024	Embarcação P-36 - P-36 a 1356 m
00025	Embarcação P-36 - P-36 a 1356 m
00026	Embarcação P-36 - P-36 a 1356 m
00027	Embarcação P-36 - P-36 a 1356 m
00028	Embarcação P-36 - P-36 a 1356 m
00029	Embarcação P-36 - P-36 a 1356 m
00030	Embarcação P-36 - P-36 a 1356 m

JOSE CARLOS PIMENTEL GUIMARÃES
DIRETOR
DIVISÃO DE SERVIÇOS CAMPO DE

COPIA DO DOCUMENTO ORIGINAL