



UNIVERSIDADE DA CORUÑA

Ferry para navegación en Lago Ontario

15-05

CUADERNO 5: Situaciones de carga.



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DEPARTAMENTO DE INGENIERÍA NAVAL Y OCEÁNICA

PROYECTO NÚMERO 15-05

TIPO DE BUQUE: FERRY PARA NAVEGACION EN LAGO ONTARIO CANADÁ.

CLASIFICACIÓN, COTA Y REGLAMENTOS DE APLICACIÓN: ABS, USCG, SOLAS, MARPOL. ZONA ECA, ICE CLASS (LOW LEVEL).

CARACTERÍSTICAS DE LA CARGA: 399 PAX EN ASIENTOS, 6 TRAILERS Y 24 TURISMOS SIMULTÁNEAMENTE o 60 TURISMOS SOLO.

VELOCIDAD Y AUTONOMÍA: 13 NUDOS, 85% MCR, 10 % MM. SIETE DIAS DE OPERACIÓN. EL PERFIL DE LA NAVEGACION SERA DEFINIDO POR EL ALUMNO EN LA ZONA DE NAVEGACION PREVISTA EN EL LAGO ONTARIO A LA VISTA DE LAS CIUDADES DE CONEXION Y DE LOS BUQUES ALLI EXISTENTES.

SISTEMAS Y EQUIPOS DE CARGA / DESCARGA: RAMPAS DE PROA Y POPA.

PROPULSIÓN: DUAL FUEL.

TRIPULACIÓN Y PASAJE: 399 PAX MAS 7 TRIPULANTES.

Ferrol, marzo de 2016

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1.- Introducción

El objetivo de este Cuaderno es el conocimiento de las situaciones de carga en las que va a operar el buque proyecto, como también la estabilidad del propio buque. Por lo tanto, se evaluará la estabilidad en cada situación de carga considerada cuando se navegue sin avería alguna. Además, se realizarán los análisis pertinentes relacionados con la estabilidad cuando este haya sufrido una avería.

Para llevar a cabo sendos análisis será necesario seguir los reglamentos y convenios referentes a la estabilidad de buques. Para abordar el análisis de estabilidad intacta será necesario guiarse por el Código de Estabilidad Intacta de 2008 de la IMO (1) y también por las directrices de la USCG que aparecen en el Code of Federal Regulations (CFR) (2) y (3). En cuanto a la estabilidad en averías, habrá que seguir las prescripciones de la MSC (216)82 (4) de la IMO y lo referente sobre este tema que se pueda extraer de la USCG y el Gobierno canadiense.

Si se analizan las directrices de la US Cost Guard (2) para todos los barcos en general, se puede comprobar lo siguiente:

(d) A vessel that complies with
§170.165 of this part need not comply
with §§170.170 and 170.173 of this part.

170.170 y 170.173 son las dos reglas que aparecen en Maxsurf en estabilidad intacta para barcos en general según la USCG. Ahora se verá que es el 170.165:

**§ 170.165 International Code on Intact
Stability.**

Es decir, el cumplimiento del Código de Estabilidad Intacta, exime del cumplimiento de las reglas marcadas por la USCG, en lo relativo a estabilidad en estado intacto.

Además, para buques de pasaje en particular (3), la USCG dictamina lo siguiente:

(d) Unless permitted otherwise, a passenger vessel constructed on or after January 1, 2009, and issued a SOLAS Passenger Ship Safety Certificate must meet the applicable requirements of IMO Res. MSC.216(82) (incorporated by reference, see §171.012), instead of the requirements of this part. For the purposes of this section, the applicable requirements of IMO Res. MSC.216(82) are equivalent to the requirements of this part when applied to such vessels.

Es decir, la estabilidad en estado intacto y en averías referida a buques de pasaje según la USCG, no tiene que ser cumplida si se cumple la MSC (216)82 (4) de la IMO.

Además, la USCG establece un *Alternate Compliance Program* (5) entre ABS y la USCG que dictamina lo siguiente para buques menores de 90 metros:

Cite: 3-3-1/3.1 Intact Stability

Intact stability for cargo and passenger vessels is to comply with the applicable parts of Subchapter S. It has been determined that IMO Resolution MSC.267(85), "International Code on Intact Stability, 2008" (2008 IS Code) is equivalent to the intact stability requirements of Subchapter S. Where the intact stability requirements contained in IMO Resolution MSC.267 (85) are used, the Regulations contained in Subparts B, Lifting, and E, Towing, of Subchapter S are also to be satisfied, where applicable. All recommendations that appear in the 2008 IS Code on Intact Stability are required and considered mandatory.

Como conclusión, para la estabilidad, tanto en estado intacto como en averías, se seguirán las prescripciones que dictaminan la IMO, el Código de Estabilidad Intacta de 2008 (1) y el Convenio SOLAS (6). Además, para la estabilidad en averías se tendrá en cuenta los requerimientos de Gobierno canadiense, ya que, algunos, son más estrictos que los prescritos por el SOLAS.

2.- Estabilidad en estado intacto

El buque proyectado deberá cumplir una serie de criterios que asegurarán su estabilidad en caso de no existir avería alguna en el buque.

2.1.- Criterios generales

Los criterios generales que deberá cumplir el buque proyecto corresponden con la resolución MSC 267/85 (7) (Parte “A”, Capítulo 2, Apartado 2.2) de la IMO, teniéndose que cumplir en estas los siguientes criterios:

- *El área bajo la curva de brazos adrizantes (curva de brazos GZ) no será inferior a 0,055 metro-radián hasta un ángulo de escora $\varphi = 30^\circ$ ni inferior a 0,09 metro-radián hasta $\varphi = 4^\circ$, o hasta el ángulo de inundación descendente φ_f si éste es inferior a 40° . Además, el área bajo la curva de brazos adrizantes (curva de brazos GZ) entre los ángulos de escora de 30° y 40° , o entre 30° y φ_f si este ángulo es inferior a 40° , no será inferior a 0,03 metro-radián.*
- *El brazo adrizante GZ será como mínimo de 0,2 m a un ángulo de escora igual o superior a 30° .*
- *El brazo adrizante máximo corresponderá a un ángulo de escora no inferior a 25° . Si esto no es posible, podrán aplicarse, a reserva de lo que apruebe la Administración, criterios basados en un nivel de seguridad equivalente.*
- *La altura metacéntrica inicial GM_0 no será inferior a 0,15 m.*

A parte de estos criterios generales, de aplicación a la gran mayoría de los barcos, por ser el buque proyectado un buque de pasaje se le deberá aplicar el criterio de pasajeros a una banda y el de virada. Por el hecho de tener una gran superficie lateral expuesta también será de aplicación el criterio de viento.

Para cada situación de carga, las cuales se definirán posteriormente a la enumeración de todos los criterios que deben ser cumplidos, habrá que realizar todos los cálculos pertinentes. Se adjuntarán los resultados que el programa *Maxsurf* devuelva.

Los valores que pide *Maxsurf* para cada criterio son los siguientes:

2.1.1.- IMO roll back angle

El valor del área del *skag* es el siguiente:

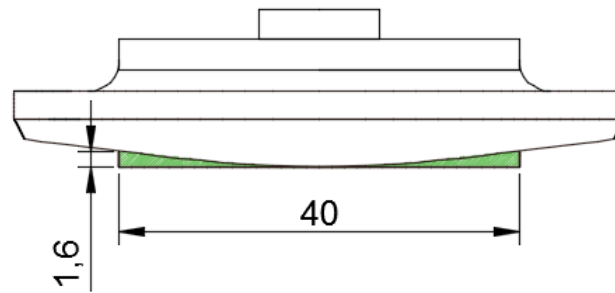


Figura 1.- Dimensiones del área del skeg.

A través del comando de medición de áreas de *AutoCad*, se establece que es 25,236 m². La superficie mojada, que se utilizará posteriormente (en el Cuaderno 6) es de 39,924 m².

NOTA: El valor del factor k se puede verificar en los resultados de cada situación de carga, en el resumen del criterio de *IMO roll back angle*.

Criterion Details				
		267(85) Ch2 - General Criteria 2.3: IMO roll back angle	Value	Units
1	<input type="checkbox"/>	L, length on waterline, user spec.	59,245	m
2	<input checked="" type="checkbox"/>	L, Stability calculated		m
3	<input type="checkbox"/>	B, moulded breadth, user spec.	17,800	m
4	<input checked="" type="checkbox"/>	B, Stability calculated		m
5	<input type="checkbox"/>	d, mean moulded draft, user spec.	0,000	m
6	<input checked="" type="checkbox"/>	d, Stability calculated		m
7	<input type="checkbox"/>	GMf, fluid corrected metacentric height, user spec.	1,273	m
8	<input checked="" type="checkbox"/>	GMf, Stability calculated		m
9	<input type="checkbox"/>	VCG, centre of gravity above zero point, user spec.	5,705	m
10	<input checked="" type="checkbox"/>	VCG, Stability calculated		m
11	<input type="checkbox"/>	CB, block coefficient, user spec.	0,717	
12	<input checked="" type="checkbox"/>	CB, Stability calculated		
13	<input type="checkbox"/>	Ak, keel area, user spec.	25,236	m ²
14	<input type="checkbox"/>	Method for k factor	Tabulated value for k	
15	<input type="checkbox"/>	Evaluates to	17,8	deg

Figura 2.- Datos del criterio IMO roll back angle.

2.1.2.- Area de 0° a 30°

		267(85) Ch2 - General Criteria 2.2.1: Area 0 to 30	Value	Units
1	<input type="checkbox"/>	from the greater of		
2	<input checked="" type="checkbox"/>	spec. heel angle	0,0	deg
3	<input type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	spec. heel angle	30,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input type="checkbox"/>	angle of max. GZ		deg
9	<input type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	immersion angle of	DeckEdge	deg
11	<input checked="" type="checkbox"/>	angle of vanishing stability		deg
12	<input type="checkbox"/>	shall not be less than (>=)	0,0550	m.rad

Figura 3.- Datos del criterio de área de 0° a 30°.

2.1.3.- Area de 0° a 40°

		267(85) Ch2 - General Criteria 2.2.1: Area 0 to 40	Value	Units
1	<input type="checkbox"/>	from the greater of		
2	<input checked="" type="checkbox"/>	spec. heel angle	0,0	deg
3	<input type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	spec. heel angle	40,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input type="checkbox"/>	angle of max. GZ		deg
9	<input checked="" type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	immersion angle of	DeckEdge	deg
11	<input checked="" type="checkbox"/>	angle of vanishing stability		deg
12	<input type="checkbox"/>	shall not be less than (>=)	0,0900	m.rad

Figura 4.- Datos del criterio de área de 0° a 40°.

2.1.4.- Area de 30° a 40°

		267(85) Ch2 - General Criteria 2.2.1: Area 30 to 40	Value	Units
1	<input type="checkbox"/>	from the greater of		
2	<input checked="" type="checkbox"/>	spec. heel angle	30,0	deg
3	<input type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	spec. heel angle	40,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input type="checkbox"/>	angle of max. GZ		deg
9	<input checked="" type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	immersion angle of	DeckEdge	deg
11	<input checked="" type="checkbox"/>	angle of vanishing stability		deg
12	<input type="checkbox"/>	shall not be less than (>=)	0,0300	m.rad

Figura 5.- Datos del criterio de área de 30° a 40°.

2.1.5.- Máximo GZ a 30°

Criterion Details				
		267(85) Ch2 - General Criteria 2.2.2: Max GZ at 30 or greater	Value	Units
1	<input type="checkbox"/>	in the range from the greater of		
2	<input checked="" type="checkbox"/>	spec. heel angle	30,0	deg
3	<input type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	spec. heel angle	90,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input checked="" type="checkbox"/>	angle of max. GZ		deg
9	<input type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	shall not be less than (>=)	0,200	m

Figura 6.- Datos del criterio de máximo GZ a 30° o superior.

2.1.6.- Ángulo de GZ máximo

Criterion Details				
		267(85) Ch2 - General Criteria 2.2.3: Angle of maximum GZ	Value	Units
1	<input type="checkbox"/>	limited by first GZ peak angle		deg
2	<input type="checkbox"/>	limited by first downflooding angle		deg
3	<input type="checkbox"/>	shall not be less than (>=)	25,0	deg

Figura 7.- Datos del criterio de ángulo de GZ máximo.

2.1.7.- GM inicial

Criterion Details				
		267(85) Ch2 - General Criteria 2.2.4: Initial GMT	Value	Units
1	<input checked="" type="checkbox"/>	spec. heel angle	0,0	deg
2	<input type="checkbox"/>	angle of equilibrium		deg
3	<input type="checkbox"/>	Select calculation from list		
4	<input type="checkbox"/>	shall not be less than (>=)	0,150	m

Figura 8.- Datos del criterio de GM inicial.

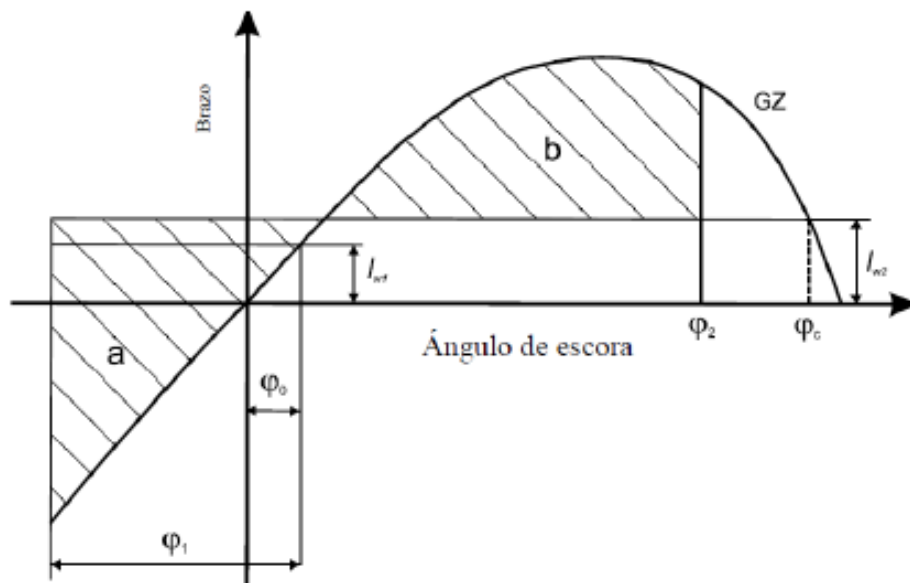
2.1.8.- Criterio de viento

Este criterio se puede encontrar en la resolución MSC 267/85 (Parte “A”, Capítulo 2, Apartado 2.3), en el cual se dispone que habrá que demostrar la aptitud del buque para resistir los efectos combinados del viento de través y del balance, del modo siguiente:

- se someterá el buque a la presión de un viento constante que actúe perpendicularmente al plano de crujía, lo que dará como resultado el correspondiente brazo escorante ($lw1$);
- se supondrá que a partir del ángulo de equilibrio resultante ($\varphi 0$), el buque se balancea por la acción de las olas hasta alcanzar un ángulo de balance ($\varphi 1$) a barlovento. El ángulo de escora provocado por un viento constante ($\varphi 0$) no deberá ser superior a 16° o al 80 % del ángulo de inmersión del borde de la cubierta, si este ángulo es menor;
- a continuación se someterá al buque a la presión de una ráfaga de viento que dará como resultado el correspondiente brazo escorante ($lw2$); y

en estas circunstancias, el área b debe ser igual o superior al área a , como se indica en la ilustración 1.

Ilustración 1



donde los ángulos de la figura 2.3.1 se definen del modo siguiente:

φ_0 = ángulo de escora provocado por un viento constante

φ_1 = ángulo de balance a barlovento debido a la acción de las olas (véanse 2.3.1.2, 2.3.4 y la nota a pie de página)

φ_2 = ángulo de inundación descendente (φ_f), o 50, o φ_c , tomando de estos valores el menor,

siendo:

φ_f = ángulo de escora al que se sumergen las aberturas del casco, superestructuras o casetas que no puedan cerrarse de modo estanco a la intemperie. Al aplicar este criterio no hará falta considerar abiertas las pequeñas aberturas por las que no pueda producirse inundación progresiva.

φ_c = ángulo de la segunda intersección entre la curva de brazos escorantes l_{w2} y la de brazos GZ.

Los brazos escorantes l_{w1} y l_{w2} provocados por el viento, a que se hace referencia en 2.3.1.1 y 2.3.1.3, son valores constantes a todos los ángulos de inclinación y se calcularán del modo siguiente:

$$l_{w1} = \frac{P * A * Z}{1000 * g * \Delta}$$

$$l_{w2} = 1,5 * l_{w1}$$

dónde:

P = presión del viento de 504 Pa. El valor de P utilizado para los buques en servicio restringido podrá reducirse a reserva de que lo apruebe la Administración.

A = área lateral proyectada de la parte del buque y de la cubertada que quede por encima de la flotación (m^2)

Z = distancia vertical desde el centro del área A hasta el centro del área lateral de la obra viva, o aproximadamente hasta el punto medio del calado medio (m).

g = aceleración debida a la gravedad de $9,81 m/s^2$.

El ángulo de balance (φ_1) se calculará del modo siguiente:

$$\varphi_1 = 109 * k * X1 * X2 * \sqrt{r * s}$$

dónde:

$X1$ = factor indicado en el cuadro 2.3.4-1

$X2$ = factor indicado en el cuadro 2.3.4-2

k = factor que corresponde a lo siguiente:

$k = 1,0$ respecto de un buque de pantoque redondo que no tenga quillas de balance ni quilla de barra

$k = 0,7$ respecto de un buque de pantoque quebrado

k = el valor que se indica en el cuadro 2.3.4-3 respecto de un buque con quillas de balance, quilla de barra o ambas

$$r = 0,73 + 0,6 OG/d$$

dónde:

$$OG = KG - d$$

d = calado medio de trazado del buque (m)

s = factor indicado en el cuadro 2.3.4-4, donde T es el periodo natural de balance del buque. Si no se dispone de información suficiente, puede utilizarse la siguiente aproximación

$$\text{Período de balance: } T = \frac{2 \cdot C \cdot B}{\sqrt{GM}} \text{ (s)}$$

dónde:

$$C = 0,373 + 0,023(B/d) - 0,043(L_{wl}/100)$$

Los símbolos que aparecen en los cuadros 2.3.4-1, 2.3.4-2, 2.3.4-3 y 2.3.4-4 y en la fórmula del periodo de balance tienen los siguientes significados:

L_{wl} = eslora en la flotación del buque (m)

B = manga de trazado del buque (m)

d = calado medio de trazado del buque (m)

CB = coeficiente de bloque (-)

A_k = área total de las quillas de balance o área de la proyección lateral de la quilla de barra, o suma de estas áreas (m²)

GM = altura metacéntrica corregida por el efecto de superficie libre (m).

Cuadro I - X1

B/d	X_1
$\leq 2,4$	1,0
2,5	0,98
2,6	0,96
2,7	0,95
2,8	0,93
2,9	0,91
3,0	0,90
3,1	0,88
3,2	0,86
3,4	0,82
$\geq 3,5$	0,80

Cuadro II - X2

C_B	X_2
$\leq 0,45$	0,75
0,50	0,82
0,55	0,89
0,60	0,95
0,65	0,97
$\geq 0,70$	1,00

Cuadro III - k

$\frac{A_k \times 100}{L_{wl} \times B}$	k
0	1,0
1,0	0,98
1,5	0,95
2,0	0,88
2,5	0,79
3,0	0,74
3,5	0,72
$\geq 4,0$	0,70

Cuadro IV - factor s

T	s
≤ 6	0,100
7	0,098
8	0,093
12	0,065
14	0,053
16	0,044
18	0,038
≥ 20	0,035

El criterio de viento también se calcula para cada situación de carga por separado, ya que dependiendo del calado con el que navegue el buque, el área lateral cambiará. El programa *Maxsurf* realiza automáticamente los cálculos relativos al área lateral hasta donde se tiene definido el buque en el programa. Se tiene definido el buque hasta la cubierta principal y también las zonas estancas a cada banda, hasta una altura de 9,73 metros.

A continuación, se muestra el área total por encima de la cubierta principal.

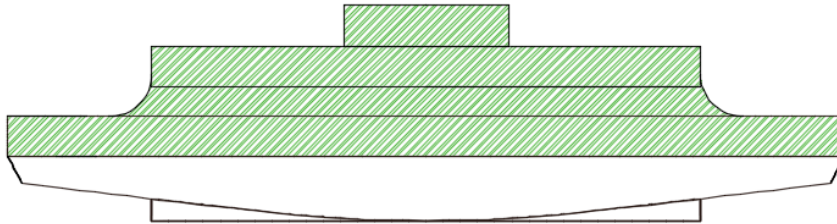


Figura 9.- Área total expuesta por encima de cubierta.

Ahora, se muestra el área que habrá que introducir en el criterio de *Maxsurf*.

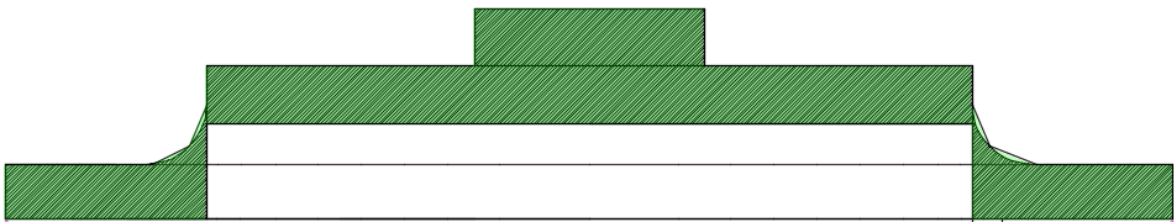


Figura 10.- Área que no tiene definida el programa y que habrá que introducir.

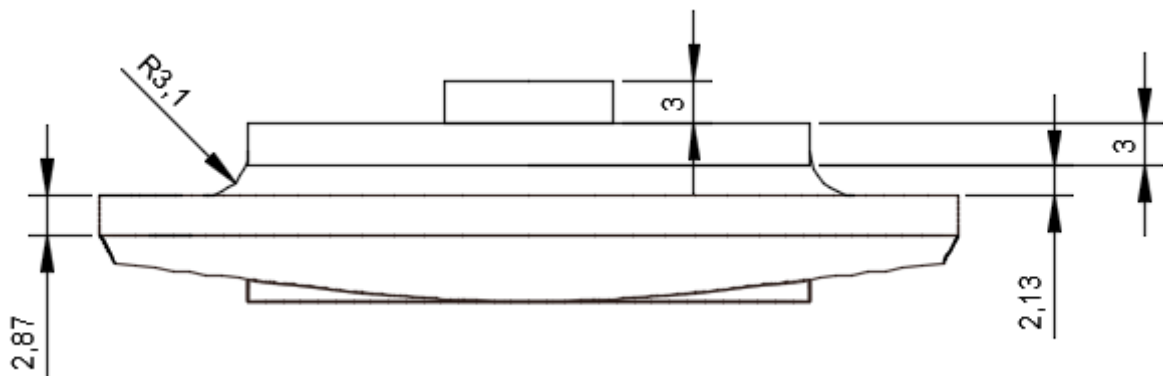


Figura 11.- Medidas necesaria para el cálculo del área.

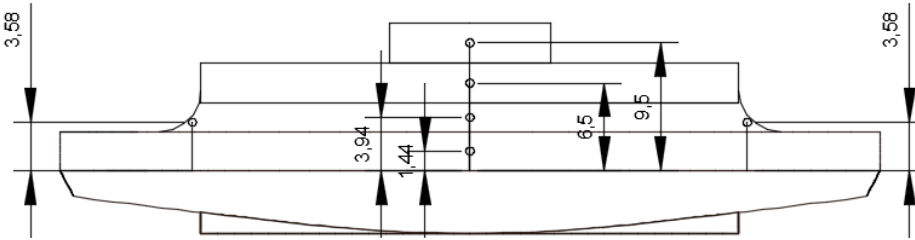


Figura 12.- Centros de gravedad necesarios para el cálculo del centroide.

$$\begin{aligned} \text{Área}_{\text{centroide}} &= (2,87 * 10,5) * 2 + 40 * 3 + 12 * 3 + (3,1^2 - \pi * 3,1/4) * 2 \\ &= 60,27 + 120 + 36 + 4,14 = 220,41 \text{ m}^2 \end{aligned}$$

$$y_{\text{centroide}} = \frac{60,27 * 1,435 + 120 * 6,5 + 36 * 9,5 + 4,14 * 3,58}{220,41} = 5,55 \text{ m}$$

A este valor habría que sumarle el puntal a la cubierta principal (4,73 m) lo que daría una altura de 10,28 m sobre LB.

Ahora se muestran los valores que se introducen en *Maxsurf*:

267(85) Ch2 - General Criteria		Value	Units
2.3: Severe wind and rolling			
1	<input type="checkbox"/> Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$		
2	<input type="checkbox"/> constant: a =	0,99966	
3	<input type="checkbox"/> wind model	Pressure	
4	<input type="checkbox"/> wind pressure: P =	504,0	Pa
5	<input checked="" type="checkbox"/> area centroid height (from zero point): h =	10,280	m
6	<input type="checkbox"/> total area: A =	150,000	m ²
7	<input checked="" type="checkbox"/> additional area: A =	220,410	m ²
8	<input type="checkbox"/> height of lateral resistance: H =	0,000	m
9	<input type="checkbox"/> H = mean draft / 2		m
10	<input checked="" type="checkbox"/> H = vert. centre of projected lat. u'water area		m
11	<input type="checkbox"/> H = waterline		m
12	<input type="checkbox"/> cosine power: n =	0	
13	<input type="checkbox"/> gust ratio	1,5	
14	<input type="checkbox"/> Area2 integrated to the lesser of		
15	<input type="checkbox"/> roll back angle from equilibrium (with steady heel arm)	25,0	deg
16	<input checked="" type="checkbox"/> 2.3: IMO roll back angle	not calculated	deg
17	<input type="checkbox"/> roll back to equilibrium (ignoring heel arm)		deg
18	<input type="checkbox"/> Area 1 upper integration range, to the lesser of:		
19	<input checked="" type="checkbox"/> spec. heel angle	50,0	deg
20	<input type="checkbox"/> angle of first GZ peak		deg
21	<input type="checkbox"/> angle of max. GZ		deg
22	<input type="checkbox"/> angle of max. GZ above gust heel arm		deg
23	<input checked="" type="checkbox"/> first downflooding angle		deg

24	<input checked="" type="checkbox"/>	angle of vanishing stability (with gust heel ar		deg
25	<input type="checkbox"/>	Angle for GZ(max) in GZ ratio, the lesser of:		
26	<input type="checkbox"/>	spec. heel angle	180,0	deg
27	<input type="checkbox"/>	angle of first GZ peak		deg
28	<input checked="" type="checkbox"/>	angle of max. GZ		deg
29	<input type="checkbox"/>	first downflooding angle		deg
30	<input type="checkbox"/>	Select required angle for angle of steady hee	DeckEdgeImmersionAngle	
31	<input type="checkbox"/>	Include GZ reduction: $GZ' = GZ - B \cos^m(\rho)$		
32	<input type="checkbox"/>	B =	0,000	m
33	<input type="checkbox"/>	m =	1	
34	<input type="checkbox"/>	Criteria:		
35	<input checked="" type="checkbox"/>	Angle of steady heel shall not be great	16,0	deg
36	<input checked="" type="checkbox"/>	Angle of steady heel / Deck edge imme	80,00	%
37	<input checked="" type="checkbox"/>	Area1 / Area2 shall not be less than (\geq)	100,00	%
38	<input type="checkbox"/>	GZ(equilibrium) / GZ(max) shall be less	0,00	%
39	<input type="checkbox"/>	Area 1 shall not be less than (\geq)	0,0000	m.rad

Figura 13.- Datos del criterio de viento.

2.2.-Criterios especiales

Los criterios especiales por ser buque de pasaje se encuentran en MSC 267/85 (Parte “A”, Capítulo 2, Apartado 3.1):

- *el ángulo de escora producido por la aglomeración de pasajeros en una banda no excederá de 10.*
- *Se supondrá una masa mínima de 75 kg por pasajero.*
- *La altura del centro de gravedad de los pasajeros se supondrá igual a:*
 - *1 m por encima del nivel de cubierta estando los pasajeros de pie. Si es necesario, se tendrán en cuenta la brusca y el arrufo de la cubierta; y*
 - *0,3 m por encima de los asientos estando los pasajeros sentados.*
- *Se supondrá que los pasajeros y su equipaje se encuentran en los espacios destinados normalmente para ellos.*
- *Al comprobar el cumplimiento de los criterios se supondrá que los pasajeros sin equipaje están distribuidos de modo que se produzca la combinación más desfavorable de momento escorante y/o de altura metacéntrica inicial que puedan darse en la práctica. A este respecto, no será necesario tomar un valor superior a cuatro personas por metro cuadrado.*

- Además, el ángulo de escora debido a una maniobra de giro no excederá de 10° si se calcula utilizando la fórmula siguiente:

$$M_R = 0,02 \frac{V_0^2}{L} \Delta (KG - \frac{d}{2})$$

dónde:

M_R = momento escorante, en (kNm)

V_0 = velocidad de servicio, en (m/s)

L = eslora en la flotación del buque, en (m)

Δ = desplazamiento, en (t)

d = calado medio, en (m)

KG = altura del centro de gravedad sobre la línea de base, en (m)

2.2.1.- Criterio de virada

Para el criterio de virada introducimos los siguientes valores en el Maxsurf:

Criterion Details				
		3.1 Passenger Ships 3.1.2: Turn: angle of equilibrium	Value	Units
1	<input type="checkbox"/>	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$		
2	<input type="checkbox"/>	constant: a =	1,02	
3	<input type="checkbox"/>	vessel speed: v =	13,000	kn
4	<input type="checkbox"/>	turn radius: R =	0,000	m
5	<input checked="" type="checkbox"/>	turn radius, R, as percentage of Lwl	510,00	%
6	<input type="checkbox"/>	Vertical lever: h =	0,000	m
7	<input type="checkbox"/>	h = KG		m
8	<input checked="" type="checkbox"/>	h = KG - mean draft / 2		m
9	<input type="checkbox"/>	h = KG - vert. centre of projected lat. u'water		m
10	<input type="checkbox"/>	cosine power: n =	0	
11	<input type="checkbox"/>	shall not be greater than (<=)	10,0	deg

Figura 14.- Datos del criterio de virada.

2.2.2.- Criterio de pasaje a una banda

En todas las situaciones se supone que el pasaje va al completo y se sitúa en la cubierta superior, se supondrán 400 pasajeros para distribuirlos de forma simétrica y facilitar el cálculo. Además, se evita situar las balsas salvavidas para facilitar el cálculo y además guardar un margen, ya que la distribución resultante da un brazo más desfavorable. Esta cubierta tiene la forma que se puede ver en el siguiente croquis. En él también se puede comprobar la situación en la que todos los pasajeros se desplazan hacia la misma banda. Se toma como referencia que en 1 m^2 caben 4 personas, por eso se supone que cada persona ocupa $0,25 \text{ m}^2$ ($0,5\text{m} \times 0,5\text{m}$).

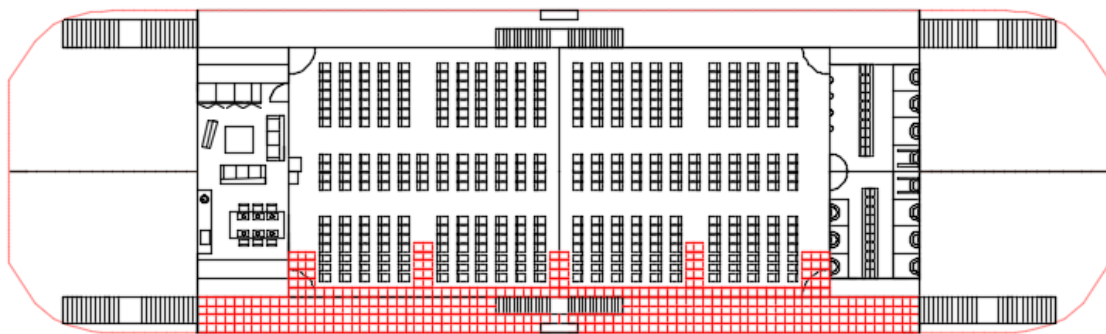


Figura 15.- Croquis pasajeros a una banda.

Se justificarán los centros de gravedad para una popa, los de proa serán iguales ya que la distribución es simétrica.

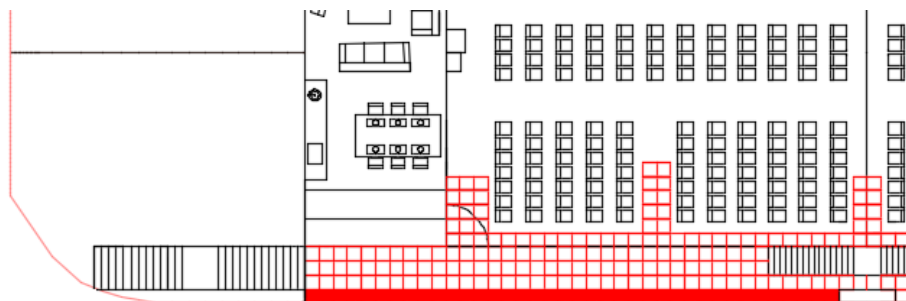


Figura 16.- Justificación pasajeros a una banda 1.

La zona coloreada serían 38 personas, que crearían un brazo longitudinal de 0,25 metros hasta el costado.

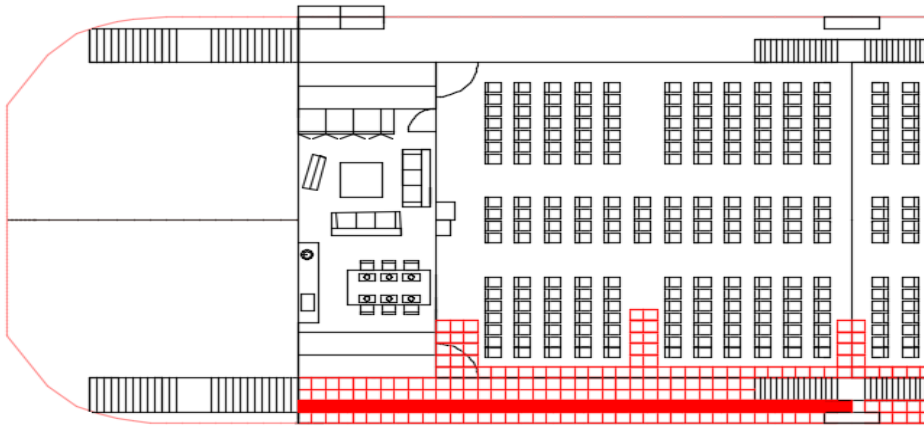


Figura 17.- Justificación pasajeros a una banda 2.

La zona coloreada serían 40 personas que crearían un brazo longitudinal de 0,75 m.

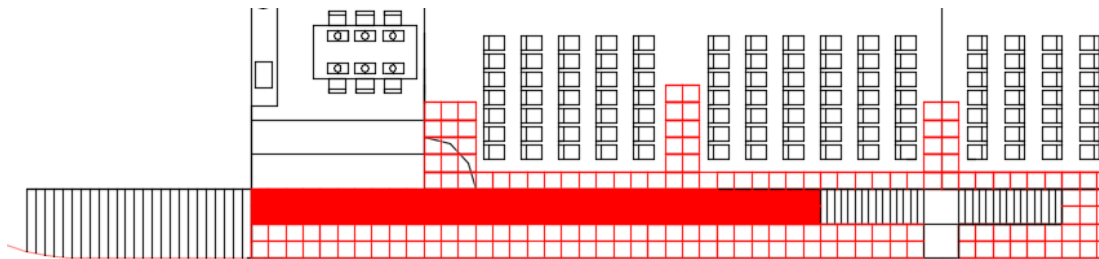


Figura 18.- Justificación pasajeros a una banda 3.

La zona coloreada serían 66 personas que crearían un brazo longitudinal de 1,5 metros hasta el costado.

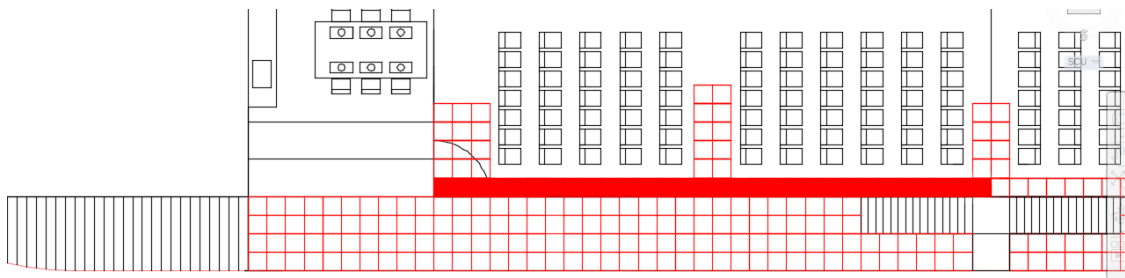


Figura 19.- Justificación pasajeros a una banda 4.

La zona coloreada serían 30 personas que crearían un brazo longitudinal de 2,25 metros hasta el costado.

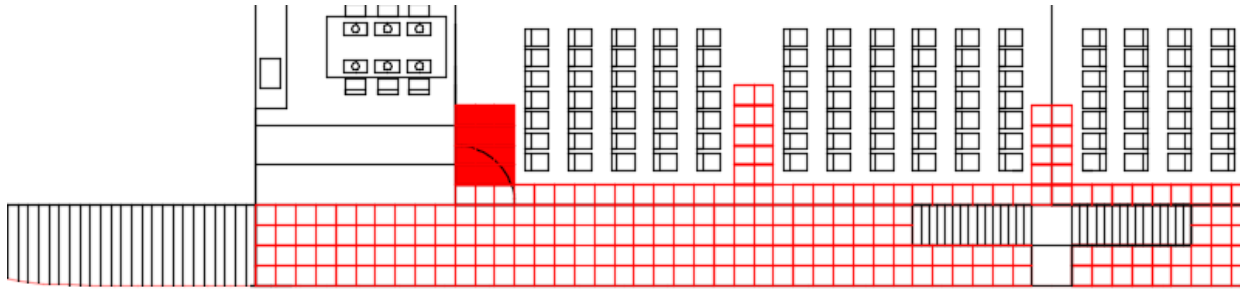


Figura 20.- Justificación pasajeros a una banda 5.

Serían 12 personas las cuales crearían un brazo longitudinal de 3,5 metros hasta el costado.

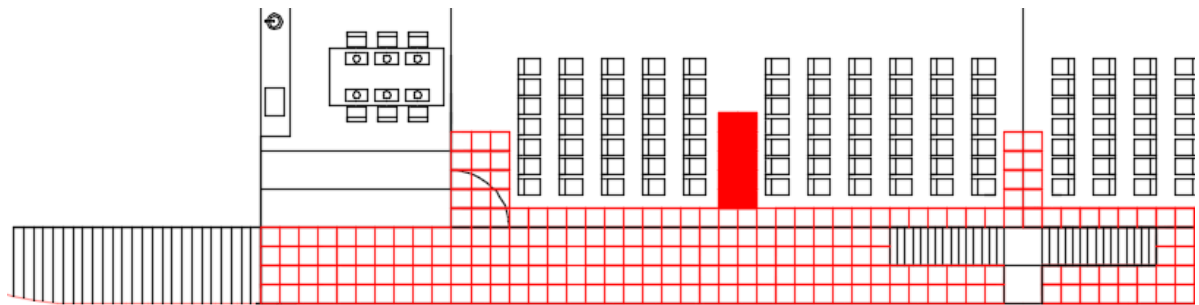


Figura 21.- Justificación pasajeros a una banda 6.

En la zona marcada se situarían 10 personas. El brazo longitudinal existente sería de 3,75 metros.

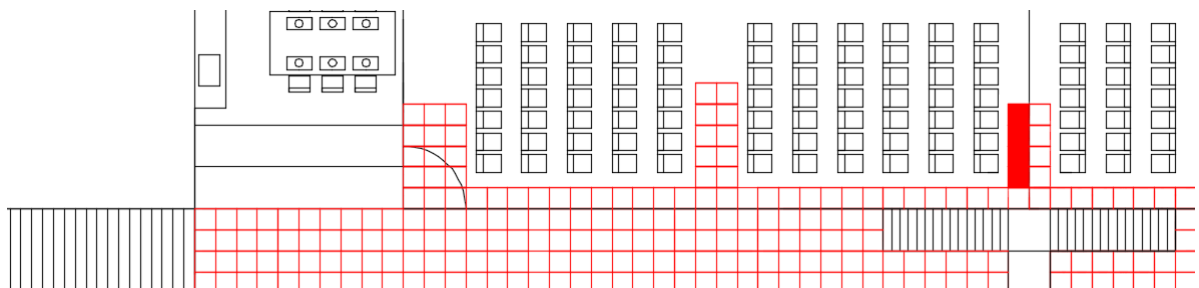


Figura 22.- Justificación pasajeros a una banda 7.

Por último, esas 4 personas, crearían un brazo longitudinal de 3,5 metros hasta el costado.

El centro de gravedad de la distribución sería:

$$y_{centroide} = \left(\frac{38 * 0,25 + 40 * 0,75 + (66) * 1,5 + (30) * 2,25 + (12 + 4) * 3,5 + (10 * 3,75)}{(38 + 40 + 66 + 30 + 16 + 10) * 0,25} \right) * 0,25 = \frac{74,75}{50} = 1,4975$$

El brazo transversal que crean los pasajeros es de:

$$\frac{17,8}{2} - 1,4975 = 7,40 \text{ m desde crujía}$$

Se supondrá que cada pasajero pueda llevar un bulto o maleta de, a lo sumo, 25 kg. La situación más desfavorable será que todos porten el peso máximo.

En el *Maxsurf* introducimos:

		3.1 Passenger Ships		
		3.1.1: Passenger crowding: angle of equilibrium	Value	Units
1	<input type="checkbox"/>	Pass. crowding arm = nPass M / disp. D cos^n(phi)		
2	<input type="checkbox"/>	number of passengers: nPass =	399	
3	<input type="checkbox"/>	passenger mass: M =	0,100	tonne
4	<input type="checkbox"/>	distance from centre line: D =	7,400	m
5	<input type="checkbox"/>	cosine power: n =	0	
6	<input type="checkbox"/>	shall not be greater than (<=)	10,0	deg

Figura 23.- Datos sobre pasajeros a una banda en *Maxsurf*.

2.3.- Corrección por superficies libres

Si en un buque, un tanque está parcialmente lleno, la superficie del líquido que contiene permanecerá paralela a la flotación, para cualquier escora. Esto hace que al escorarse el buque, haya un traslado de pesos dentro del tanque que modifica la posición del centro de gravedad del mismo. Si el tanque estuviera lleno, esto no ocurriría, pues no habría modificación de la posición de su centro de gravedad y, en realidad, la carga en él contenida podría estudiarse como un bloque sólido.

La presencia de superficies libres provoca pérdida de estabilidad, con la disminución del GM y del GZ.

Lo referente a la corrección de superficies libres se puede encontrar en la resolución MSC 267/85 (Parte "B", Capítulo 3, Apartado 3.1)

El efecto de superficie libre deberá tenerse en cuenta siempre que el nivel de llenado de un tanque sea inferior al 98 % del nivel de llenado total. No será necesario considerar el efecto de superficie libre cuando un tanque esté nominalmente lleno, es decir, cuando su nivel de llenado sea igual o superior al 98 %.

3.1.1 Los tanques que se tienen en cuenta al determinar la corrección por superficie libre quedan comprendidos en una de las dos categorías siguientes:

- .1 tanques con niveles de llenado fijos (por ejemplo: cargas líquidas, lastre de agua). La corrección por superficie libre se determina con arreglo al nivel de llenado real de cada tanque; o*
- .2 tanques con niveles de llenado variables (por ejemplo, líquidos consumibles, tales como fueloil, gasoil, agua dulce, y también cargas líquidas y lastre de agua durante las operaciones de trasvase de líquidos). Salvo por lo autorizado en 3.1.5 y 3.1.6, la corrección por superficie libre es el valor máximo alcanzable entre los límites de llenado previstos para cada tanque que sea compatible con cualquier instrucción de funcionamiento.*

3.1.2 No será necesario incluir en la corrección los tanques pequeños que cumplan la condición dada por la fórmula siguiente, que corresponde a una inclinación de 30°:

$$M_{fs} / \Delta_{min} < 0,01 \text{ m}$$

Siendo Δ_{min} = peso en rosca del buque

El valor de M_{fs} para cada tanque se puede deducir de la fórmula:

$$M_{f.s.} = vbyk\sqrt{\delta}$$

dónde:

M_{fs} es el momento por superficie libre a una inclinación de 30°, en (t).

v es la capacidad total del tanque, en (m).

b es la anchura máxima del tanque, en (m).

y es el peso específico del líquido contenido en el tanque, en (t/m³).

δ es igual a $\frac{v}{bth}$ (coeficiente de bloque del tanque).

h es la altura máxima del tanque, en (m).

l es la longitud máxima del tanque, en (m).

k es un coeficiente adimensional que se obtiene según la relación de b/h .

$$k = \frac{\sin \theta}{12} \left(1 + \frac{\tan^2 \theta}{2} \right) \times \frac{b}{h} ; \text{siendo } \cot \theta \geq b/h$$

$$k = \frac{\cos \theta}{8} \left(1 + \frac{\tan \theta}{b/h} \right) - \frac{\cos \theta}{12 \times (b/h)^2} \left(1 + \frac{\cot^2 \theta}{2} \right) ; \text{siendo } \cot \theta \leq b/h$$

Si se aplica este criterio sobre superficies libres a los tanques del buque proyectado, tenemos lo siguiente:

Name	Type	Intact P.	Damage P.	S. grav.	Fluid type	Bound. S.	Aft	Fore	F. Port	F. Stbd	F. Top	F. Bott	A. Port	A. Stbd	A. Top	A. Bott.
Cámara de máquinas	Compartment	85	85			none	-6	6	-4,5	4,5	4,73	1,3	DITTO	DITTO	DITTO	DITTO
DC CM ER PP	Compartment	98	98			none	-6	0	4,5	8,9	4,73	1,3	DITTO	DITTO	DITTO	DITTO
DC CM ER PR	Compartment	98	98			none	0	6	4,5	8,9	4,73	1,3	DITTO	DITTO	DITTO	DITTO
DC CM BR PR	Compartment	98	98			none	0	6	-8,9	-4,5	4,73	1,3	DITTO	DITTO	DITTO	DITTO
DC CM BR PP	Compartment	98	98			none	-6	0	-8,9	-4,5	4,73	1,3	DITTO	DITTO	DITTO	DITTO
Diesel	Tank	98	98	0,84 Diesel		none	-6	-4,5	-8,9	8,9	1,3	0	DITTO	DITTO	DITTO	DITTO
Uso diario Diesel	Tank	98	98	0,84 Diesel		none	-6	-5	0	1	2	1,3	DITTO	DITTO	DITTO	DITTO
Sedimentación Diesel	Tank	98	98	0,84 Diesel		none	-6	-5	-1	0	2	1,3	DITTO	DITTO	DITTO	DITTO
Tanque de lodos	Tank	98	98	0,84 Diesel		none	-4,5	-4	-4	-2	1,3	0	DITTO	DITTO	DITTO	DITTO
Almacén Aceite	Tank	98	98	0,92 Lube Oil		none	-4,5	-4	-1	0	1,3	0	DITTO	DITTO	DITTO	DITTO
Aceite sucio	Tank	98	98	0,92 Lube Oil		none	-4,5	-4	-2	-1	1,3	0	DITTO	DITTO	DITTO	DITTO
Agua dulce	Tank	98	98	1 Fresh Water		none	1,5	6	-8,9	8,9	1,3	0	DITTO	DITTO	DITTO	DITTO
Agua técnica	Tank	98	98	1 Fresh Water		none	-4,5	-4	0	3	1,3	0	DITTO	DITTO	DITTO	DITTO
Aguas negras	Tank	98	98	1 Fresh Water		none	-3	0	-8,9	8,9	1,3	0	DITTO	DITTO	DITTO	DITTO
Local hélice PR	Compartment	85	85			none	23	27	-8,9	8,9	4,73	0	DITTO	DITTO	DITTO	DITTO
Local hélice PP	Compartment	85	85			none	-27	-23	-8,9	8,9	4,73	0	DITTO	DITTO	DITTO	DITTO
Comp. PR (caja de cadenas)	Compartment	85	85			none	27	30,5	-8,9	8,9	4,73	0	DITTO	DITTO	DITTO	DITTO
Comp. PP (caja de cadenas)	Compartment	85	85			none	-30,5	-27	-8,9	8,9	4,73	0	DITTO	DITTO	DITTO	DITTO
Tanque de comp. PR ER	Tank	98	98	1 Fresh Water		none	20	23	2,5	8,9	4,73	0	DITTO	DITTO	DITTO	DITTO
Tanque de comp. PR BR	Tank	98	98	1 Fresh Water		none	20	23	-8,9	-2,5	4,73	0	DITTO	DITTO	DITTO	DITTO
Tanque de comp. PP ER	Tank	98	98	1 Fresh Water		none	-23	-20	2,5	8,9	4,73	0	DITTO	DITTO	DITTO	DITTO
Tanque de comp. PP BR	Tank	98	98	1 Fresh Water		none	-23	-20	-8,9	-2,5	4,73	0	DITTO	DITTO	DITTO	DITTO
Tanque LNG PR	Tank	98	98	1 Custom 1		none	20	22	-4	4	11,73	9,73	DITTO	DITTO	DITTO	DITTO
Tanque LNG PP	Tank	98	98	1 Custom 1		none	-22	-20	-4	4	11,73	9,73	DITTO	DITTO	DITTO	DITTO
Espacio vacío PR 1	Compartment	98	98			none	6	12	-4,5	4,5	4,73	1,92	DITTO	DITTO	DITTO	1,3
DC PR 1 ER	Compartment	98	98			none	6	12	4,5	8,9	4,73	1,92	DITTO	DITTO	DITTO	1,3
DC PR 1 BR	Compartment	98	98			none	6	12	-8,9	-4,5	4,73	1,92	DITTO	DITTO	DITTO	1,3
Espacio vacío PR 2	Compartment	98	98			none	12	20	-4,5	4,5	4,73	2,7	DITTO	DITTO	DITTO	1,92
DC PR 2 ER	Compartment	98	98			none	12	20	4,5	8,9	4,73	2,7	DITTO	DITTO	DITTO	1,92
DC PR 2 BR	Compartment	98	98			none	12	20	-8,9	-4,5	4,73	2,7	DITTO	DITTO	DITTO	1,92
Espacio vacío PP 1	Compartment	98	98			none	-12	-6	-4,5	4,5	4,73	1,3	DITTO	DITTO	DITTO	1,92
DC PP 1 ER	Compartment	98	98			none	-12	-6	4,5	8,9	4,73	1,3	DITTO	DITTO	DITTO	1,92
DC PP 1 BR	Compartment	98	98			none	-12	-6	-8,9	-4,5	4,73	1,3	DITTO	DITTO	DITTO	1,92
Espacio vacío PP 2	Compartment	98	98			none	-20	-12	-4,5	4,5	4,73	1,92	DITTO	DITTO	DITTO	2,7
DC PP 2 ER	Compartment	98	98			none	-20	-12	4,5	8,9	4,73	1,92	DITTO	DITTO	DITTO	2,7
DC PP 2 BR	Compartment	98	98			none	-20	-12	-8,9	-4,5	4,73	1,92	DITTO	DITTO	DITTO	2,7
Espacio vacío TC PR	Compartment	98	98			none	20	23	-2,5	2,5	4,73	3,1	DITTO	DITTO	DITTO	2,7
Espacio vacío TC PP	Compartment	98	98			none	-23	-20	-2,5	2,5	4,73	2,7	DITTO	DITTO	DITTO	3,1
DF PR 1	Compartment	98	98			none	6	12	-8,9	8,9	1,92	0,68	DITTO	DITTO	1,12	0,19
DF PR 2	Compartment	98	98			none	12	20	-8,9	8,9	2,7	1,6	DITTO	DITTO	1,92	0,68
DF PP 1	Compartment	98	98			none	-12	-6	-8,9	8,9	1,12	0,19	DITTO	DITTO	1,92	0,68
DF PP 2	Compartment	98	98			none	-20	-12	-8,9	8,9	1,92	0,68	DITTO	DITTO	2,7	1,6
DF TC PR	Compartment	98	98			none	20	23	-8,9	8,9	3	0	DITTO	DITTO	2,7	1,96
DF TC PP	Compartment	98	98			none	-23	-20	-8,9	8,9	2,7	1,96	DITTO	DITTO	3	0
DF CM	Compartment	98	98			none	-6	6	-8,9	8,9	1,3	0,19	DITTO	DITTO	DITTO	DITTO
Zona estancia cubierta ER	Compartment	98	98			none	-20	20	6,9	8,9	9,73	4,73	DITTO	DITTO	DITTO	DITTO
Zona estancia cubierta BR	Compartment	98	98			none	-20	20	-8,9	-6,9	9,73	4,73	DITTO	DITTO	DITTO	DITTO

Tabla 1.- Tanques del buque proyecto.

Nombre	Volumen	98% Volumen	Intact	Damage	S. gravity	Fluid	Aft	Fore	Port	Stbd	Top	Bottom
Diesel	12,702	12,448	98	98	0,84	Diesel	-6	-4,5	-8,9	8,9	1,3	0
Uso diario Diesel	0,686	0,672	98	98	0,84	Diesel	-6	-5	0	1	2	1,3
Sedimentación Diesel	0,686	0,672	98	98	0,84	Diesel	-6	-5	-1	0	2	1,3
Tanque de lodos	0,739	0,724	98	98	0,84	Diesel	-4,5	-4	-4	-2	1,3	0
Almacén Aceite	0,56	0,549	98	98	0,92	Lube Oil	-4,5	-4	-1	0	1,3	0
Aceite sucio	0,484	0,474	98	98	0,92	Lube Oil	-4,5	-4	-2	-1	1,3	0
Agua dulce	41,959	41,120	98	98	1	Fresh Wat	1,5	6	-8,9	8,9	1,3	0
Agua técnica	1,451	1,422	98	98	1	Fresh Wat	-4,5	-4	0	3	1,3	0
Aguas negras	30,383	29,775	98	98	1	Fresh Wat	-3	0	-8,9	8,9	1,3	0
T. de compensación PR ER	10,257	10,052	98	98	1	Fresh Wat	20	23	3	8,9	4,73	0
T. de compensación PR BR	10,257	10,052	98	98	1	Fresh Wat	20	23	-8,9	-3	4,73	0
T. de compensación PP ER	10,257	10,052	98	98	1	Fresh Wat	-23	-20	3	8,9	4,73	0
T. de compensación PP BR	10,257	10,052	98	98	1	Fresh Wat	-23	-20	-8,9	-3	4,73	0
Tanque LNG PR	24,335	23,848	98	98	0,45	LNG	20	22	-4	4	11,73	9,73
Tanque LNG PP	24,335	23,848	98	98	0,45	LNG	-22	-20	-4	4	11,73	9,73

b	l	h	Cb	b/h	30º en rad	cot 30º	k	Rosca	$v*b*ro*k*raiz(Cb)$	$v*b*ro*k*raiz(Cb)/rosca$	Valor mínimo	Corrige??
17,8	1,5	1,3	0,359	13,692	0,524	1,732	0,112	1094	12,467	0,011	0,0100	SI
1	1	0,7	0,960	1,429	0,524	1,732	0,069	1094	0,038	0,000	0,0100	NO
1	1	0,7	0,960	1,429	0,524	1,732	0,069	1094	0,038	0,000	0,0100	NO
2	0,5	1,3	0,557	1,538	0,524	1,732	0,075	1094	0,068	0,000	0,0100	NO
1	0,5	1,3	0,844	0,769	0,524	1,732	0,037	1094	0,017	0,000	0,0100	NO
1	0,5	1,3	0,730	0,769	0,524	1,732	0,037	1094	0,014	0,000	0,0100	NO
17,8	4,5	1,3	0,395	13,692	0,524	1,732	0,112	1094	51,448	0,047	0,0100	SI
3	0,5	1,3	0,729	2,308	0,524	1,732	0,101	1094	0,370	0,000	0,0100	NO
17,8	3	1,3	0,429	13,692	0,524	1,732	0,112	1094	38,826	0,035	0,0100	SI
5,9	3	4,73	0,120	1,247	0,524	1,732	0,061	1094	1,246	0,001	0,0100	NO
5,9	3	4,73	0,120	1,247	0,524	1,732	0,061	1094	1,246	0,001	0,0100	NO
5,9	3	4,73	0,120	1,247	0,524	1,732	0,061	1094	1,246	0,001	0,0100	NO
5,9	3	4,73	0,120	1,247	0,524	1,732	0,061	1094	1,246	0,001	0,0100	NO
8	2	2	0,745	4,000	0,524	1,732	0,113	1094	8,346	0,008	0,0100	NO
8	2	2	0,745	4,000	0,524	1,732	0,113	1094	8,346	0,008	0,0100	NO

Tabla 2.- Corrección por superficies libres.

Por lo que se observa los únicos tanques que necesitan corrección por superficies libres son los de diésel, aguas negras y agua dulce.

Las correcciones por superficies libres se introducen en *Maxsurf* de la siguiente manera:

Es necesario que los tanques que no vayan a corregir tengan un *Total FSM* que sea igual a 0. Este *Total FSM* es el momento total por superficie libre.

A los tanques que corrigen se les pondrá un criterio de corrección IMO A.749. El programa *Maxsurf*, por defecto, calcula el momento total de superficie libre del tanque, que se adjuntará en cada condición de carga.

2.4.- Condiciones de carga

Las condiciones de carga para buques de pasaje las cuales estará obligado a cumplir el buque proyecto corresponden con las que dicta la resolución MSC 267/85 (Parte “B”, Capítulo 3, Apartado 3.4) de la IMO:

- Buque en la condición de salida a plena carga, con la totalidad de provisiones y combustible y de pasajeros con su equipaje.
- Buque en la condición de llegada a plena carga, con la totalidad de pasajeros con su equipaje, pero con solo el 10% de provisiones y combustible.
- Buque sin carga pero con la totalidad de provisiones y combustible y de pasajeros con su equipaje.
- Buque en las mismas condiciones que en el punto anterior, pero solo con el 10% de provisiones y combustible.

La condición de máxima carga para el buque proyectado será la mayor de las dos siguientes, 6 camiones + 24 turismos o 60 turismos:

-1ª opción: $6 \cdot 26 + 24 \cdot 2,5 + 406 \cdot 0,1 = 256,6$ toneladas

-2ª opción: $60 \cdot 2,5 + 406 \cdot 0,1 = 190,6$ toneladas

Cabe destacar que siempre se lleva el total de pasajeros y tripulación (406 personas).

La condición de máxima carga será con 6 camiones y 24 turismos. La condición en la que se llevan 60 turismos es una condición operativa del buque, por lo que también es recomendable estudiarla. Por lo tanto, las condiciones que se estudiarán para el buque proyecto serán las siguientes:

- Salida de puerto con 6 camiones + 24 turismos (Plena carga) y 100% de consumos.
- Llegada a puerto con 6 camiones + 24 turismos (Plena carga) y 10% de consumos.
- Salida de puerto sin carga y 100% de consumos.
- Llegada a puerto sin carga y 10% de consumos.
- Salida de puerto con 60 turismos y 100% de consumos.
- Llegada a puerto con 60 turismos y 10% de consumos.

Antes de comenzar el análisis de cada una de las condiciones de carga es necesario justificar ciertos valores que se suponen en cada una de ellas:

- Se supone un peso medio por persona de 75 kg y un bulto de, como máximo 25 kg.
- No se llevan víveres ni comida ya que no se considera necesario para viajes de 20 o 25 minutos; excepto unas máquinas expendedoras, que se sitúan en la cubierta de pasajeros. Su centro de gravedad se sitúa un metro por encima de cubierta.

-Los centros de gravedad de tripulación, pasajeros y coches y camiones son los siguientes:

·Tripulación: se toman 70 centímetros sobre la cubierta del puente (se supone que van sentados) para el KG, ya que sería más desfavorable que si fuesen en la cubierta de pasajeros. En cuanto al XG se supone 0.

·Pasajeros: se toman 70 centímetros sobre la cubierta de pasajeros (también se supone que van sentados) para el KG. En cuanto al XG se considera 0 igualmente.

·Coches y camiones: se toma 1 metro por encima de la cubierta para coches y 2 metros por encima de cubierta para camiones, para el KG. Para el XG, se toman 0. Se puede comprobar en el Cuaderno 1 que se disponen de forma simétrica.

Antes de comenzar el análisis, se comentará en que unidades está cada valor, ya que, en las hojas de *Excel* se han omitido para ahorrar espacio en las celdas y permitir una visión más clara de las mismas.

- *Sounding, Long. Arm, Transv. Arm y Vert. Arm* se miden en metros.

- *Unit Mass y Total Mass* se miden en toneladas.

- *Unit Volume y Total Volume* se miden en metros cúbicos.

- La columna denominada como *Margin*, en los resultados sobre estabilidad, tanto intacta como en averías se muestra en porcentaje.

Para cada condición de carga se presentan:

- Pesos y llenado de tanques.

- Criterios en estabilidad intacta (se presentan en dos imágenes).

- Curva de GM y GZ.

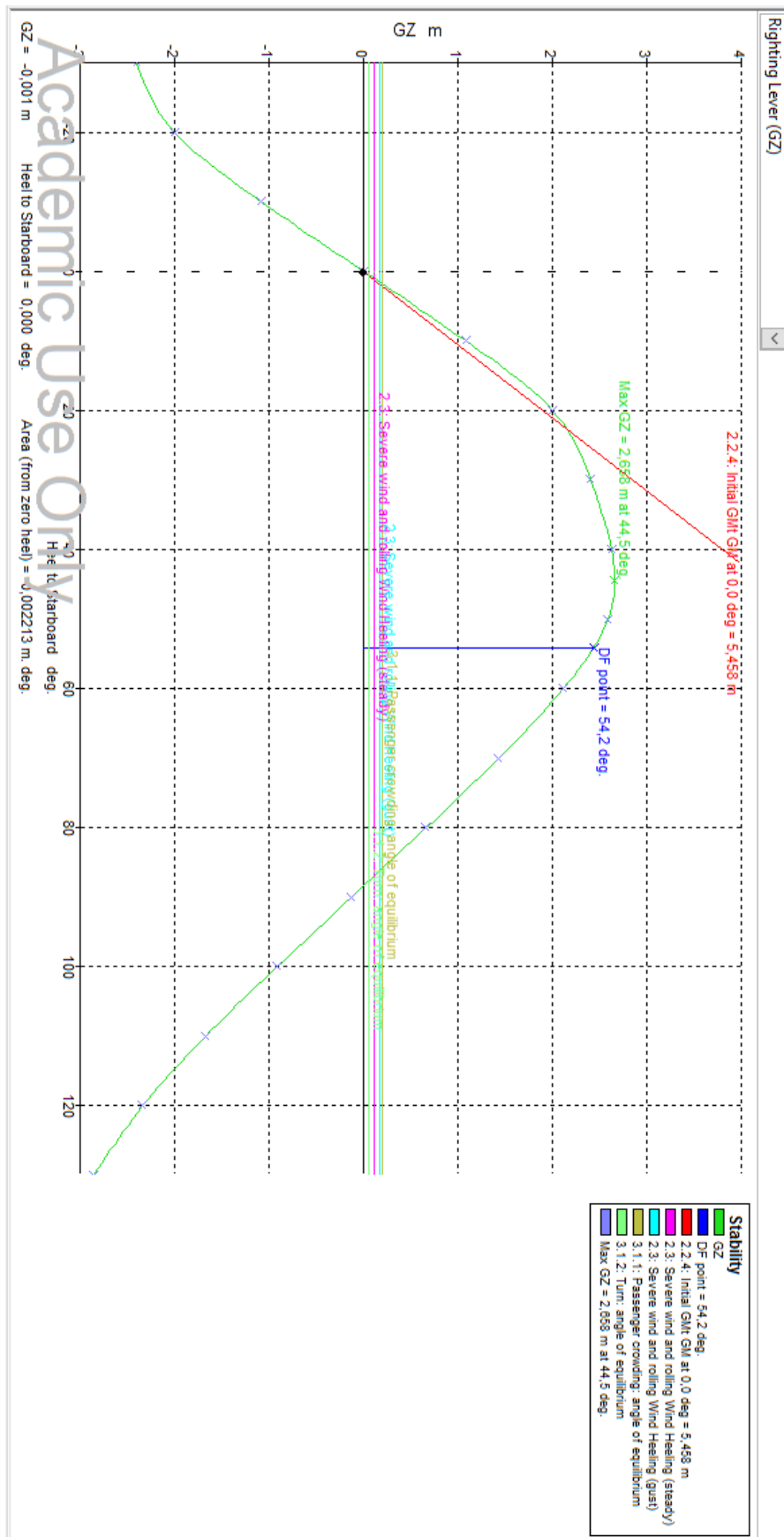
2.4.1.- Situación de carga 1: Salida de puerto a plena carga, 100% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	0		9,5	0			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	0		5,77	0			0	0	9,73	0	User Specified
Hielo cubierta del puente	0		12,24	0			0	0	12,73	0	User Specified
Hielo cubierta encima puente	0		4,32	0			0	0	15,73	0	User Specified
Hielo lateral	0		6,31	0			0	0	10,28	0	User Specified
Total Hielo				0			0	0	0	0	
Coches	24		2,5	60			0	0	5,73	0	User Specified
Camiones	6		26	156			0	0	6,73	0	User Specified
Total Carga				216			0	0	6,452	0	
Diesel	100%	1,3	10,731	10,731	12,775	12,775	-5,234	0	0,9	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	93,408	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	1,3	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	1,3	42,085	42,085	42,085	42,085	3,656	0	0,879	399,192	IMO A.749(18)
Agua técnica	100%	1,3	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	399,192	
Aguas negras	0%	0	30,405	0	30,405	0	-1,5	0	0	302,062	IMO A.749(18)
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	302,062	
Tanque de comp. PR ER	50%	1,876	23,445	11,722	23,445	11,722	21,362	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,876	23,445	11,722	23,445	11,722	21,362	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,876	23,445	11,722	23,445	11,722	-21,362	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,876	23,445	11,722	23,445	11,722	-21,362	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0	0	3,202	0	
Tanque LNG PR	100%	1,999	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,999	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1502,966	232,336	153,818	0,289	0,001	5,418	794,662	
FS correction									0,529		
VCG fluid									5,947		

Draft Amidships m	3,488
Displacement t	1503
Heel deg	0,0
Draft at FP m	3,560
Draft at AP m	3,416
Draft at LCF m	3,482
Trim (+ve by stern) m	-0,145
WL Length m	59,681
Beam max extents on WL m	16,717
Wetted Area m ²	923,230
Waterpl. Area m ²	778,234
Prismatic coeff. (Cp)	0,562
Block coeff. (Cb)	0,426
Max Sect. area coeff. (Cm)	0,771
Waterpl. area coeff. (Cwp)	0,780
LCB from zero pt. (+ve fwd) m	0,299
LCF from zero pt. (+ve fwd) m	0,126
KB m	2,314
KG fluid m	5,947
BMt m	9,091
BML m	113,311
GMt corrected m	5,458
GML m	109,678
KMt m	11,405
KML m	115,624
Immersion (TPc) tonne/cm	7,782
MTc tonne.m	30,095
RM at 1deg = GMt.Disp.sin(1) tonne.m	143,176
Max deck inclination deg	0,1514
Trim angle (+ve by stern) deg	-0,1514

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated		59,681 m			
	B, Stability calculated		17,8 m			
	d, Stability calculated		3,488 m			
	GMf, Stability calculated		5,458 m			
	VCG, Stability calculated		5,947 m			
	CB, Stability calculated		0,426			
	Ak, keel area, user spec.		25,236 m²			
	Method for k factor	Tabulated value for k				
	Evaluates to		17,8 deg			
	Intermediate values					
	B / d				5,104	
	100 Ak / L / B				2,376	
	C		IMO units		0,465	
	T		s		7,081	
	OG, Centre of gravity above WL		m		2,459	
	X1		IMO units		0,8	
	X2		IMO units		0,75	
	k tabulated		IMO units		0,812	
	r		IMO units		1,153	
	s		IMO units		0,098	
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle		0 deg		0	
	to the lesser of					
	spec. heel angle		30 deg		30	
	angle of vanishing stability		88,4 deg			
	shall not be less than (>=)		0,055 m.rad		0,7589 Pass	1279,89
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle		0 deg		0	
	to the lesser of					
	spec. heel angle		40 deg		40	
	first downflooding angle		54,2 deg			
	angle of vanishing stability		88,4 deg			
	shall not be less than (>=)		0,09 m.rad		1,1997 Pass	1233,06
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle		30 deg		30	
	to the lesser of					
	spec. heel angle		40 deg		40	
	first downflooding angle		54,2 deg			
	angle of vanishing stability		88,4 deg			
	shall not be less than (>=)		0,03 m.rad		0,4408 Pass	1369,3
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle		30 deg		30	
	to the lesser of					
	spec. heel angle		90 deg			
	angle of max. GZ		44,5 deg		44,5	
	shall not be less than (>=)		0,2 m		2,658 Pass	1229
	Intermediate values					
	angle at which this GZ occurs		deg		44,5	

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass	
	shall not be less than (>=)	25 deg	44,5	Pass	78,18
267(85) Ch2 - General Criteria	2.2.4: Initial GMt			Pass	
	spec. heel angle	0 deg			
	shall not be less than (>=)	0,15 m	5,458	Pass	3538,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: a =	0,99966			
	wind pressure: P =	504 Pa			
	area centroid height (from zero point): h =	10,28 m			
	additional area: A =	220,41 m ²			
	H = vert. centre of projected lat. u'water area	1,904 m			
	cosine power: n =	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	17,8 (-16,8)	deg	-16,8	
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg		50	
	first downflooding angle	54,2 deg			
	angle of vanishing stability (with gust heel arm)	86,3 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	44,5 deg		44,5	
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:				Pass
	Angle of steady heel shall not be greater than (<=)	16 deg		1	Pass
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80 %		12,67	Pass
	Area1 / Area2 shall not be less than (>=)	100 %		480,92	Pass
	Intermediate values				
	Model windage area	m ²		302,038	
	Model windage area centroid height (from zero point)	m		6,533	
	Total windage area	m ²		522,448	
	Total windage area centroid height (from zero point)	m		8,114	
Heel arm amplitude	m		0,111		
Equilibrium angle with gust heel arm	deg		1,5		
Deck edge immersion angle	deg		8,1		
Area1 (under GZ), from 1,5 to 50,0 deg.	m.rad		1,6584		
Area1 (under HA), from 1,5 to 50,0 deg.	m.rad		0,1407		
Area1, from 1,5 to 50,0 deg.	m.rad		1,5177		
Area2 (under GZ), from -16,8 to 1,5 deg.	m.rad		-0,2624		
Area2 (under HA), from -16,8 to 1,5 deg.	m.rad		0,0532		
Area2, from -16,8 to 1,5 deg.	m.rad		0,3156		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n \text{Pass} M / \text{disp.} D \cos^n(\phi)$				
	number of passengers: nPass =	399			
	passenger mass: M =	0,1 tonne			
	distance from centre line: D =	7,405 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg		1,8	Pass
	Intermediate values				
Heel arm amplitude	m		0,197		
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: a =	1,02			
	vessel speed: v =	13 kn			
	turn radius, R, as percentage of Lwl	510 %			
	h = KG - mean draft / 2	3,674 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg		0,5	Pass
Intermediate values					
Heel arm amplitude	m		0,056		



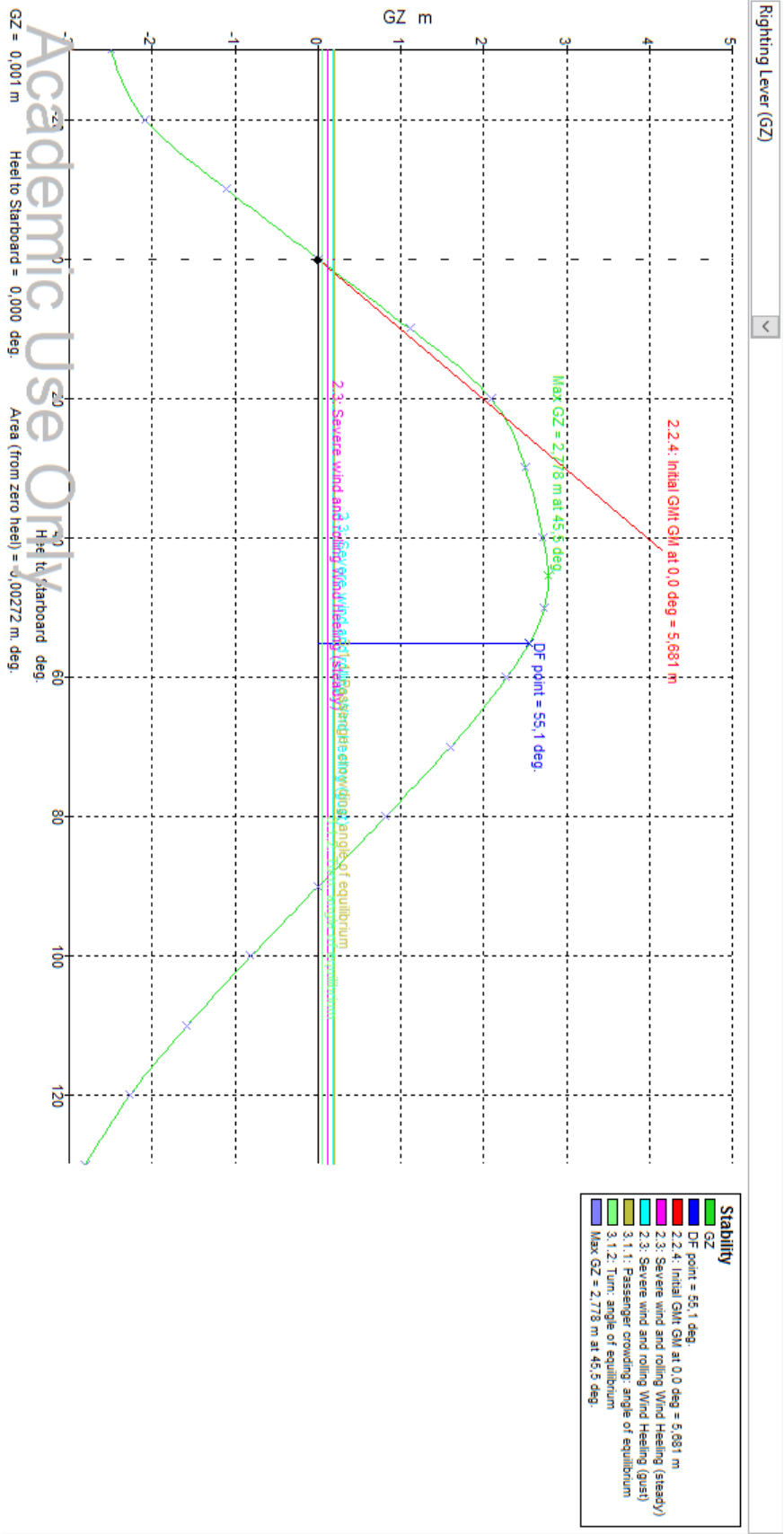
2.4.2.- Situación de carga 2: Llegada a puerto a plena carga, 100% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	0		9,5	0			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	0		5,77	0			0	0	9,73	0	User Specified
Hielo cubierta del puente	0		12,24	0			0	0	12,73	0	User Specified
Hielo cubierta encima puente	0		4,32	0			0	0	15,73	0	User Specified
Hielo lateral	0		6,31	0			0	0	10,28	0	User Specified
Total Hielo				0			0	0	0	0	
Coches	24		2,5	60			0	0	5,73	0	User Specified
Camiones	6		26	156			0	0	6,73	0	User Specified
Total Carga				216			0	0	6,452	0	
Diesel	0,33%	0,084	10,731	0,035	12,775	0,042	-5,25	0	0,042	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	10%		11,883	1,188	14,147	1,414	-5,493	0	1,602	93,408	
Tanque de lodos	90%	0,845	0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0	User Specified
Total Diesel Usado	90%		0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0	
Almacen Aceite	10%	0,258	0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0	User Specified
Total Aceite Para Usar	10%		0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0	
Aceite sucio	90%	0,977	0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0	User Specified
Total Aceite Usado	90%		0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0	
Agua dulce	10%	0,447	42,085	4,209	42,085	4,209	3,456	0	0,309	399,192	IMO A.749(18)
Agua técnica	10%	0,376	1,459	0,146	1,459	0,146	-4,245	0,607	0,265	0	User Specified
Total Agua Para Usar	10%		43,544	4,354	43,544	4,354	3,198	0,02	0,308	399,192	
Aguas negras	90%	1,228	30,405	27,365	30,405	27,365	-1,497	0	0,814	302,062	IMO A.749(18)
Total Agua Sucia	90%		30,405	27,365	30,405	27,365	-1,497	0	0,814	302,062	
Tanque de comp. PR ER	50%	1,876	23,445	11,722	23,445	11,722	21,362	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,876	23,445	11,722	23,445	11,722	21,362	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,876	23,445	11,722	23,445	11,722	-21,362	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,876	23,445	11,722	23,445	11,722	-21,362	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0	0	3,202	0	
Tanque LNG PR	10%	0,31	24,335	2,433	24,335	2,433	20,999	0,002	9,915	0	User Specified
Tanque LNG PP	10%	0,31	24,335	2,433	24,335	2,433	-20,999	0,002	9,915	0	User Specified
Total LNG	10%		48,669	4,867	48,669	4,867	0	0,002	9,915	0	
Total Loadcase				1437,133	232,336	86,048	0,218	-0,001	5,32	794,662	
FS correction									0,553		
VCG fluid									5,873		

Draft Amidships m	3,401
Displacement t	1437
Heel deg	0,0
Draft at FP m	3,454
Draft at AP m	3,348
Draft at LCF m	3,397
Trim (+ve by stern) m	-0,106
WL Length m	59,591
Beam max extents on WL m	16,643
Wetted Area m ²	910,235
Waterpl. Area m ²	770,142
Prismatic coeff. (Cp)	0,555
Block coeff. (Cb)	0,422
Max Sect. area coeff. (Cm)	0,768
Waterpl. area coeff. (Cwp)	0,777
LCB from zero pt. (+ve fwd) m	0,225
LCF from zero pt. (+ve fwd) m	0,093
KB m	2,262
KG fluid m	5,873
BMt m	9,292
BML m	116,319
GMt corrected m	5,681
GML m	112,708
KMt m	11,554
KML m	118,581
Immersion (TPc) tonne/cm	7,701
MTc tonne.m	29,571
RM at 1deg = GMt.Disp.sin(1) tonne.m	142,492
Max deck inclination deg	0,1111
Trim angle (+ve by stern) deg	-0,1111

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated		59,591 m			
	B, Stability calculated		17,8 m			
	d, Stability calculated		3,401 m			
	GMf, Stability calculated		5,681 m			
	VCG, Stability calculated		5,873 m			
	CB, Stability calculated		0,422			
	Ak, keel area, user spec.		25,236 m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to		17,9 deg			
	Intermediate values					
	B / d				5,234	
	100 Ak / L / B				2,379	
	C			IMO units	0,468	
	T			s	6,986	
	OG, Centre of gravity above WL			m	2,472	
	X1			IMO units	0,8	
	X2			IMO units	0,75	
k tabulated			IMO units	0,812		
r			IMO units	1,166		
s			IMO units	0,098		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle		0 deg		0	
	to the lesser of					
	spec. heel angle		30 deg		30	
	angle of vanishing stability		90,1 deg			
shall not be less than (>=)		0,055 m.rad		0,7884	Pass	1333,46
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle		0 deg		0	
	to the lesser of					
	spec. heel angle		40 deg		40	
	first downflooding angle		55,1 deg			
	angle of vanishing stability		90,1 deg			
shall not be less than (>=)		0,09 m.rad		1,2456	Pass	1283,99
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle		30 deg		30	
	to the lesser of					
	spec. heel angle		40 deg		40	
	first downflooding angle		55,1 deg			
	angle of vanishing stability		90,1 deg			
shall not be less than (>=)		0,03 m.rad		0,4572	Pass	1423,89
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle		30 deg		30	
	to the lesser of					
	spec. heel angle		90 deg			
	angle of max. GZ		45,5 deg		45,5	
	shall not be less than (>=)		0,2 m		2,778	Pass
Intermediate values						
angle at which this GZ occurs			deg	45,5		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass		
	shall not be less than (\geq)	25 deg	45,5	Pass	81,82	
267(85) Ch2 - General Criteria	2.2.4: Initial GMt			Pass		
	spec. heel angle	0 deg				
	shall not be less than (\geq)	0,15 m	5,681	Pass	3687,33	
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass		
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$					
	constant: a =	0,99966				
	wind pressure: P =	504 Pa				
	area centroid height (from zero point): h =	10,28 m				
	additional area: A =	220,41 m ²				
	H = vert. centre of projected lat. u'water area	1,854 m				
	cosine power: n =	0				
	gust ratio	1,5				
	Area2 integrated to the lesser of					
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	17,9 (-16,9)	deg	-16,9		
	Area 1 upper integration range, to the lesser of:					
	spec. heel angle	50 deg		50		
	first downflooding angle	55,1 deg				
	angle of vanishing stability (with gust heel arm)	87,9 deg				
	Angle for GZ(max) in GZ ratio, the lesser of:					
	angle of max. GZ	45,5 deg		45,5		
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle				
	Criteria:				Pass	
	Angle of steady heel shall not be greater than (\leq)	16 deg		1	Pass	93,46
Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq)	80 %		11,95	Pass	85,06	
Area1 / Area2 shall not be less than (\geq)	100 %		479,55	Pass	379,55	
Intermediate values						
Model windage area		m ²	307,206			
Model windage area centroid height (from zero point)		m	6,481			
Total windage area		m ²	527,616			
Total windage area centroid height (from zero point)		m	8,068			
Heel arm amplitude		m	0,117			
Equilibrium angle with gust heel arm		deg	1,6			
Deck edge immersion angle		deg	8,8			
Area1 (under GZ), from 1,6 to 50,0 deg.		m.rad	1,7249			
Area1 (under HA), from 1,6 to 50,0 deg.		m.rad	0,1486			
Area1, from 1,6 to 50,0 deg.		m.rad	1,5763			
Area2 (under GZ), from -16,9 to 1,6 deg.		m.rad	-0,272			
Area2 (under HA), from -16,9 to 1,6 deg.		m.rad	0,0567			
Area2, from -16,9 to 1,6 deg.		m.rad	0,3287			
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass		
	Pass. crowding arm = $n_{Pass} M / \text{disp.} D \cos^n(\phi)$					
	number of passengers: n_{Pass} =	399				
	passenger mass: M =	0,1 tonne				
	distance from centre line: D =	7,405 m				
	cosine power: n =	0				
	shall not be greater than (\leq)	10 deg		1,8	Pass	81,53
Intermediate values						
Heel arm amplitude		m	0,206			
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass		
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$					
	constant: a =	1,02				
	vessel speed: v =	13 kn				
	turn radius, R, as percentage of Lwl	510 %				
	h = KG - mean draft / 2	3,619 m				
	cosine power: n =	0				
	shall not be greater than (\leq)	10 deg		0,5	Pass	95,12
Intermediate values						
Heel arm amplitude		m	0,055			



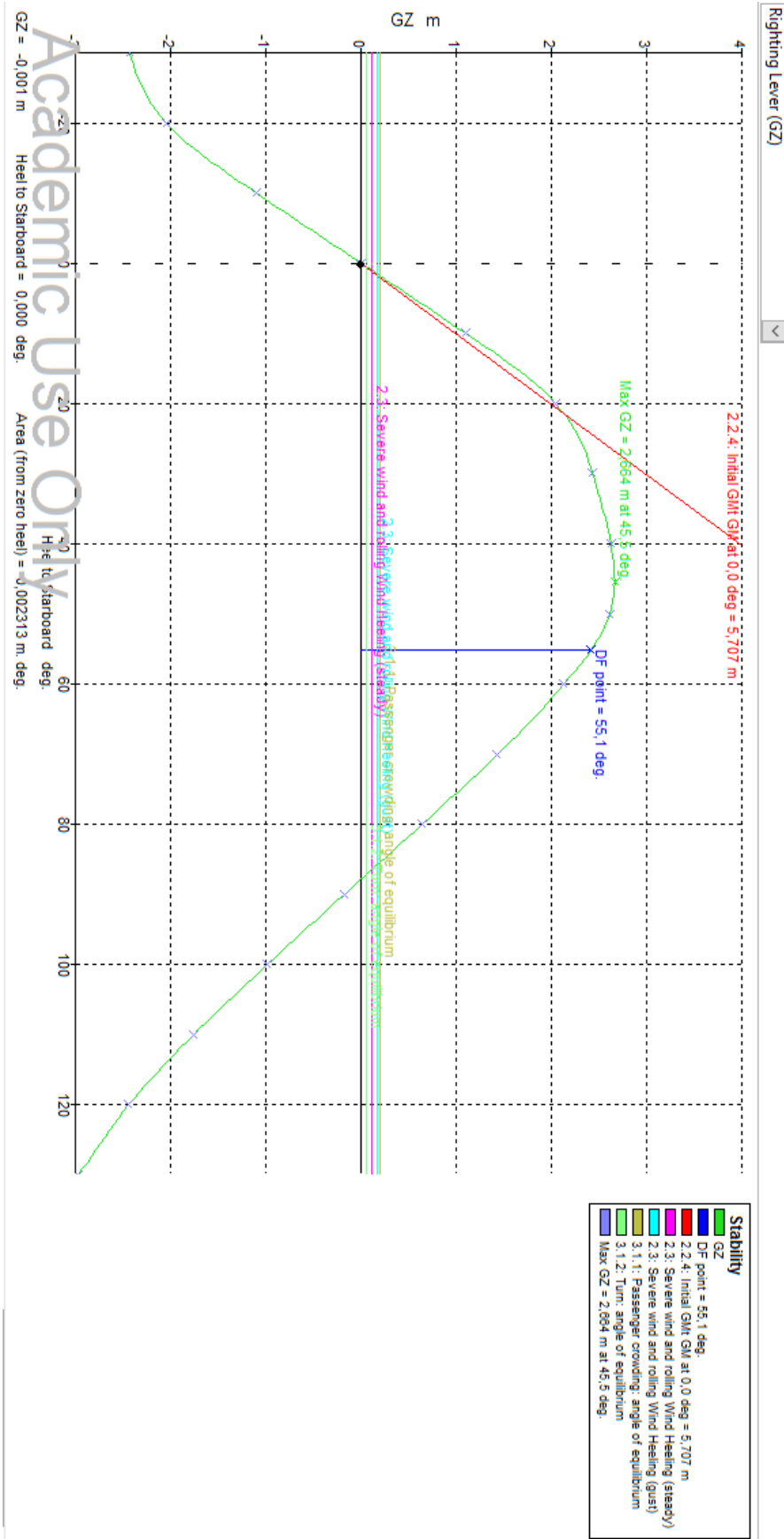
2.4.3.- Situación de carga 3: Salida de puerto 100% coches, 100% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	0		9,5	0			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	0		5,77	0			0	0	9,73	0	User Specified
Hielo cubierta del puente	0		12,24	0			0	0	12,73	0	User Specified
Hielo cubierta encima puente	0		4,32	0			0	0	15,73	0	User Specified
Hielo lateral	0		6,31	0			0	0	10,28	0	User Specified
Total Hielo				0			0	0	0	0	
Coches	60		2,5	150			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				150			0	0	5,73	0	
Diesel	100%	0,99	10,731	10,731	12,775	12,775	-5,234	0	0,9	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,39	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,39	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	93,408	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	0,986	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	0,97	42,085	42,085	42,085	42,085	3,656	0	0,879	399,192	IMO A.749(18)
Agua técnica	100%	0,986	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	399,192	
Aguas negras	0%	0	30,405	0	30,405	0	-0,02	0	0	301,721	User Specified
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	301,721	
Tanque de comp. PR ER	50%	1,493	23,445	11,722	23,445	11,722	21,363	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,493	23,445	11,722	23,445	11,722	21,363	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,608	23,445	11,722	23,445	11,722	-21,36	3,835	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,608	23,445	11,722	23,445	11,722	-21,36	-3,835	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,002	0	3,202	0	
Tanque LNG PR	100%	1,616	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,729	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1436,966	232,336	153,818	0,302	0,001	5,295	794,321	
FS correction									0,553		
VCG fluid									5,848		

Draft Amidships m	3,403
Displacement t	1437
Heel deg	0,0
Draft at FP m	3,476
Draft at AP m	3,329
Draft at LCF m	3,397
Trim (+ve by stern) m	-0,147
WL Length m	59,591
Beam max extents on WL m	16,643
Wetted Area m ²	910,155
Waterpl. Area m ²	770,113
Prismatic coeff. (Cp)	0,555
Block coeff. (Cb)	0,420
Max Sect. area coeff. (Cm)	0,768
Waterpl. area coeff. (Cwp)	0,777
LCB from zero pt. (+ve fwd) m	0,312
LCF from zero pt. (+ve fwd) m	0,129
KB m	2,262
KG fluid m	5,848
BMt m	9,292
BML m	116,320
GMt corrected m	5,707
GML m	112,734
KMt m	11,554
KML m	118,581
Immersion (TPc) tonne/cm	7,701
MTc tonne.m	29,575
RM at 1deg = GMt.Disp.sin(1) tonne.m	143,118
Max deck inclination deg	0,1539
Trim angle (+ve by stern) deg	-0,1539

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,59	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,403	m			
	GMf, Stability calculated	5,707	m			
	VCG, Stability calculated	5,848	m			
	CB, Stability calculated	0,42				
	Ak, keel area, user spec.	25,236	m^2			
	Method for k factor	Tabulated value for k				
	Evaluates to	17,9	deg			
	Intermediate values					
	B / d			5,231		
	100 Ak / L / B			2,379		
	C		IMO units	0,468		
	T		s	6,97		
	OG, Centre of gravity above WL		m	2,445		
	X1		IMO units	0,8		
	X2		IMO units	0,75		
	k tabulated		IMO units	0,812		
r		IMO units	1,161			
s		IMO units	0,098			
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
	angle of vanishing stability	87,8	deg			
shall not be less than (>=)	0,055	m.rad	0,774	Pass	1307,19	
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	55,1	deg			
	angle of vanishing stability	87,8	deg			
shall not be less than (>=)	0,09	m.rad	1,2164	Pass	1251,6	
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	55,1	deg			
	angle of vanishing stability	87,8	deg			
shall not be less than (>=)	0,03	m.rad	0,4425	Pass	1374,87	
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	45,5	deg	45,5		
	shall not be less than (>=)	0,2	m	2,664	Pass	1232
Intermediate values						
angle at which this GZ occurs		deg	45,5			

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass	
	shall not be less than (\geq)	25 deg	45,5	Pass	81,82
267(85) Ch2 - General Criteria	2.2.4: Initial GMt			Pass	
	spec. heel angle	0 deg			
	shall not be less than (\geq)	0,15 m	5,707	Pass	3704,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: a =	0,99966			
	wind pressure: P =	504 Pa			
	area centroid height (from zero point): h =	10,28 m			
	additional area: A =	220,41 m ²			
	H = vert. centre of projected lat. u'water area	1,854 m			
	cosine power: n =	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	17,9 (-16,8) deg	-16,8		
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg	50		
	first downflooding angle	55,1 deg			
	angle of vanishing stability (with gust heel arm)	85,7 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	45,5 deg	45,5		
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:			Pass	
	Angle of steady heel shall not be greater than (\leq)	16 deg	1,1	Pass	93,29
	Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq)	80 %	12,39	Pass	84,51
	Area1 / Area2 shall not be less than (\geq)	100 %	469,56	Pass	369,56
	Intermediate values				
	Model windage area	m ²	307,117		
	Model windage area centroid height (from zero point)	m	6,482		
	Total windage area	m ²	527,527		
	Total windage area centroid height (from zero point)	m	8,069		
	Heel arm amplitude	m	0,117		
	Equilibrium angle with gust heel arm	deg	1,6		
	Deck edge immersion angle	deg	8,7		
	Area1 (under GZ), from 1,6 to 50,0 deg.	m.rad	1,6762		
	Area1 (under HA), from 1,6 to 50,0 deg.	m.rad	0,1485		
	Area1, from 1,6 to 50,0 deg.	m.rad	1,5277		
	Area2 (under GZ), from -16,8 to 1,6 deg.	m.rad	-0,2688		
	Area2 (under HA), from -16,8 to 1,6 deg.	m.rad	0,0566		
	Area2, from -16,8 to 1,6 deg.	m.rad	0,3253		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n_{\text{Pass}} M / \text{disp.} D \cos^n(\phi)$				
	number of passengers: $n_{\text{Pass}} =$	399			
	passenger mass: M =	0,1 tonne			
	distance from centre line: D =	7,405 m			
	cosine power: n =	0			
	shall not be greater than (\leq)	10 deg	1,9	Pass	81,27
	Intermediate values				
	Heel arm amplitude	m	0,206		
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: a =	1,02			
	vessel speed: v =	13 kn			
	turn radius, R, as percentage of Lwl	510 %			
	h = KG - mean draft / 2	3,594 m			
	cosine power: n =	0			
	shall not be greater than (\leq)	10 deg	0,5	Pass	94,9
	Intermediate values				
	Heel arm amplitude	m	0,055		



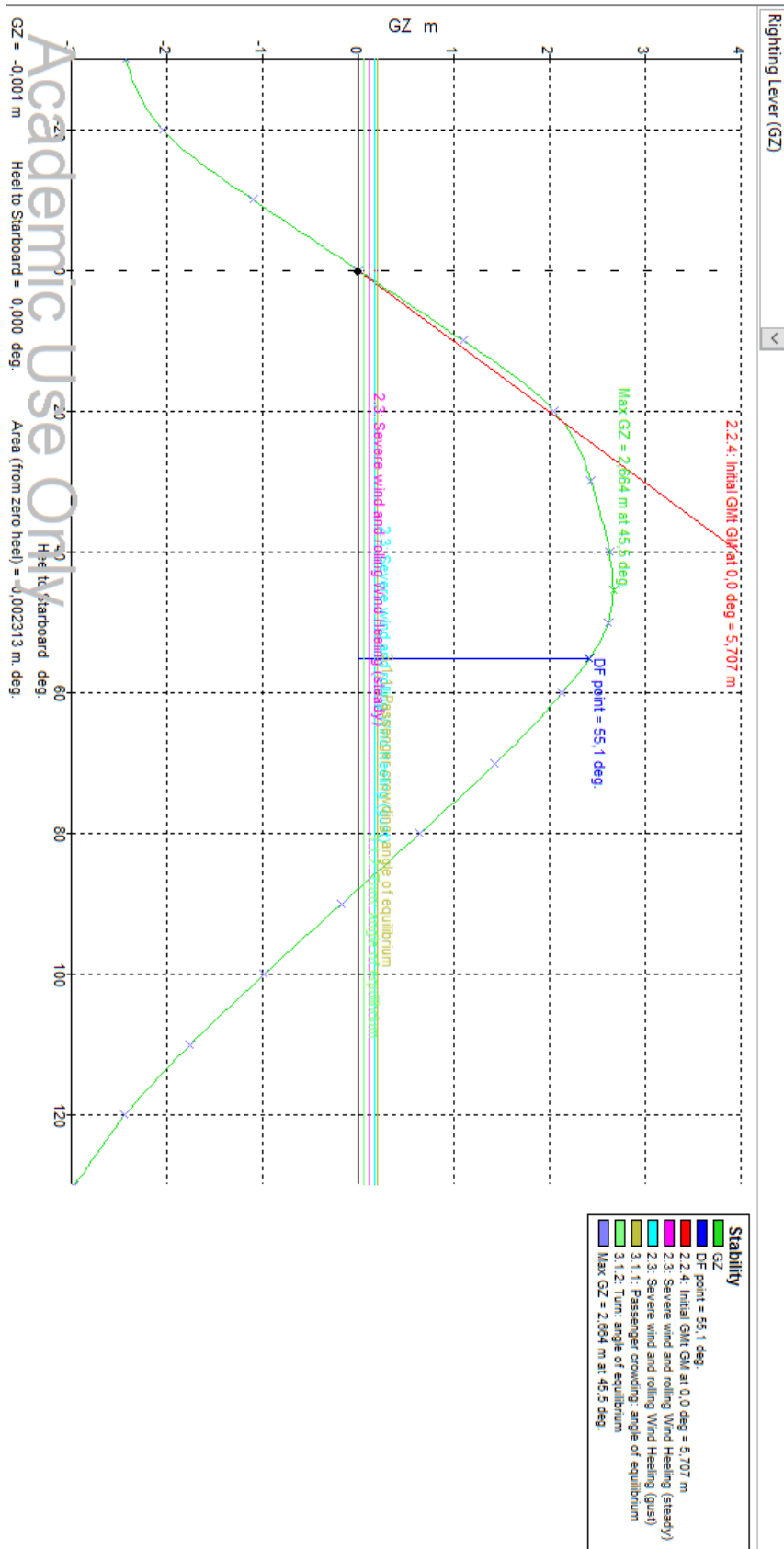
2.4.4.- Situación de carga 4: Llegada a puerto 100% coches, 10% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	0		9,5	0			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	0		5,77	0			0	0	9,73	0	User Specified
Hielo cubierta del puente	0		12,24	0			0	0	12,73	0	User Specified
Hielo cubierta encima puente	0		4,32	0			0	0	15,73	0	User Specified
Hielo lateral	0		6,31	0			0	0	10,28	0	User Specified
Total Hielo				0			0	0	0	0	
Coches	60		2,5	150			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				150			0	0	5,73	0	
Diesel	100%	1,3	10,731	10,731	12,775	12,775	-5,234	0	0,9	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	93,408	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	1,3	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	1,3	42,085	42,085	42,085	42,085	3,656	0	0,879	399,192	IMO A.749(18)
Agua técnica	100%	1,3	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	399,192	
Aguas negras	0%	0	30,405	0	30,405	0	-1,5	0	0	301,721	User Specified
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	301,721	
Tanque de comp. PR ER	50%	1,876	23,445	11,722	23,445	11,722	21,362	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,876	23,445	11,722	23,445	11,722	21,362	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,876	23,445	11,722	23,445	11,722	-21,362	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,876	23,445	11,722	23,445	11,722	-21,362	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0	0	3,202	0	
Tanque LNG PR	100%	1,999	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,999	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1436,966	232,336	153,818	0,302	0,001	5,295	794,321	
FS correction									0,553		
VCG fluid									5,848		

Draft Amidships m	3,403
Displacement t	1437
Heel deg	0,0
Draft at FP m	3,476
Draft at AP m	3,329
Draft at LCF m	3,397
Trim (+ve by stern) m	-0,147
WL Length m	59,591
Beam max extents on WL m	16,643
Wetted Area m ²	910,155
Waterpl. Area m ²	770,113
Prismatic coeff. (Cp)	0,555
Block coeff. (Cb)	0,420
Max Sect. area coeff. (Cm)	0,768
Waterpl. area coeff. (Cwp)	0,777
LCB from zero pt. (+ve fwd) m	0,312
LCF from zero pt. (+ve fwd) m	0,129
KB m	2,262
KG fluid m	5,848
Bmt m	9,292
BML m	116,320
GMt corrected m	5,707
GML m	112,734
KMt m	11,554
KML m	118,581
Immersion (TPc) tonne/cm	7,701
MTc tonne.m	29,575
RM at 1deg = GMt.Disp.sin(1) tonne.m	143,118
Max deck inclination deg	0,1539
Trim angle (+ve by stern) deg	-0,1539

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,59	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,403	m			
	GMf, Stability calculated	5,707	m			
	VCG, Stability calculated	5,848	m			
	CB, Stability calculated	0,42				
	Ak, keel area, user spec.	25,236	m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to	17,9	deg			
	Intermediate values					
	B / d			5,231		
	100 Ak / L / B			2,379		
	C		IMO units	0,468		
	T		s	6,97		
	OG, Centre of gravity above WL		m	2,445		
	X1		IMO units	0,8		
	X2		IMO units	0,75		
	k tabulated		IMO units	0,812		
	r		IMO units	1,161		
	s		IMO units	0,098		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
	angle of vanishing stability	87,8	deg			
	shall not be less than (>=)	0,055	m.rad	0,774	Pass	1307,19
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	55,1	deg			
	angle of vanishing stability	87,8	deg			
	shall not be less than (>=)	0,09	m.rad	1,2164	Pass	1251,6
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	55,1	deg			
	angle of vanishing stability	87,8	deg			
	shall not be less than (>=)	0,03	m.rad	0,4425	Pass	1374,87
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	45,5	deg	45,5		
	shall not be less than (>=)	0,2	m	2,664	Pass	1232
	Intermediate values					
	angle at which this GZ occurs		deg	45,5		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass	
	shall not be less than (>=)	25 deg	45,5	Pass	81,82
267(85) Ch2 - General Criteria	2.2.4: Initial GMT			Pass	
	spec. heel angle	0 deg			
	shall not be less than (>=)	0,15 m	5,707	Pass	3704,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: a =	0,99966			
	wind pressure: P =	504 Pa			
	area centroid height (from zero point): h =	10,28 m			
	additional area: A =	220,41 m ²			
	H = vert. centre of projected lat. u'water area	1,854 m			
	cosine power: n =	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	17,9 (-16,8) deg		-16,8	
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg		50	
	first downflooding angle	55,1 deg			
	angle of vanishing stability (with gust heel arm)	85,7 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	45,5 deg		45,5	
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:				Pass
	Angle of steady heel shall not be greater than (<=)	16 deg		1,1	Pass
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80 %		12,39	Pass
	Area1 / Area2 shall not be less than (>=)	100 %		469,56	Pass
	Intermediate values				
	Model windage area	m ²		307,117	
	Model windage area centroid height (from zero point)	m		6,482	
	Total windage area	m ²		527,527	
	Total windage area centroid height (from zero point)	m		8,069	
Heel arm amplitude	m		0,117		
Equilibrium angle with gust heel arm	deg		1,6		
Deck edge immersion angle	deg		8,7		
Area1 (under GZ), from 1,6 to 50,0 deg.	m.rad		1,6762		
Area1 (under HA), from 1,6 to 50,0 deg.	m.rad		0,1485		
Area1, from 1,6 to 50,0 deg.	m.rad		1,5277		
Area2 (under GZ), from -16,8 to 1,6 deg.	m.rad		-0,2688		
Area2 (under HA), from -16,8 to 1,6 deg.	m.rad		0,0566		
Area2, from -16,8 to 1,6 deg.	m.rad		0,3253		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n_{\text{Pass}} M / \text{disp.} D \cos^n(\phi)$				
	number of passengers: n _{Pass} =	399			
	passenger mass: M =	0,1 tonne			
	distance from centre line: D =	7,405 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg		1,9	Pass
	Intermediate values				
Heel arm amplitude	m		0,206		
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: a =	1,02			
	vessel speed: v =	13 kn			
	turn radius, R, as percentage of Lwl	510 %			
	h = KG - mean draft / 2	3,594 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg		0,5	Pass
	Intermediate values				
	Heel arm amplitude	m		0,055	



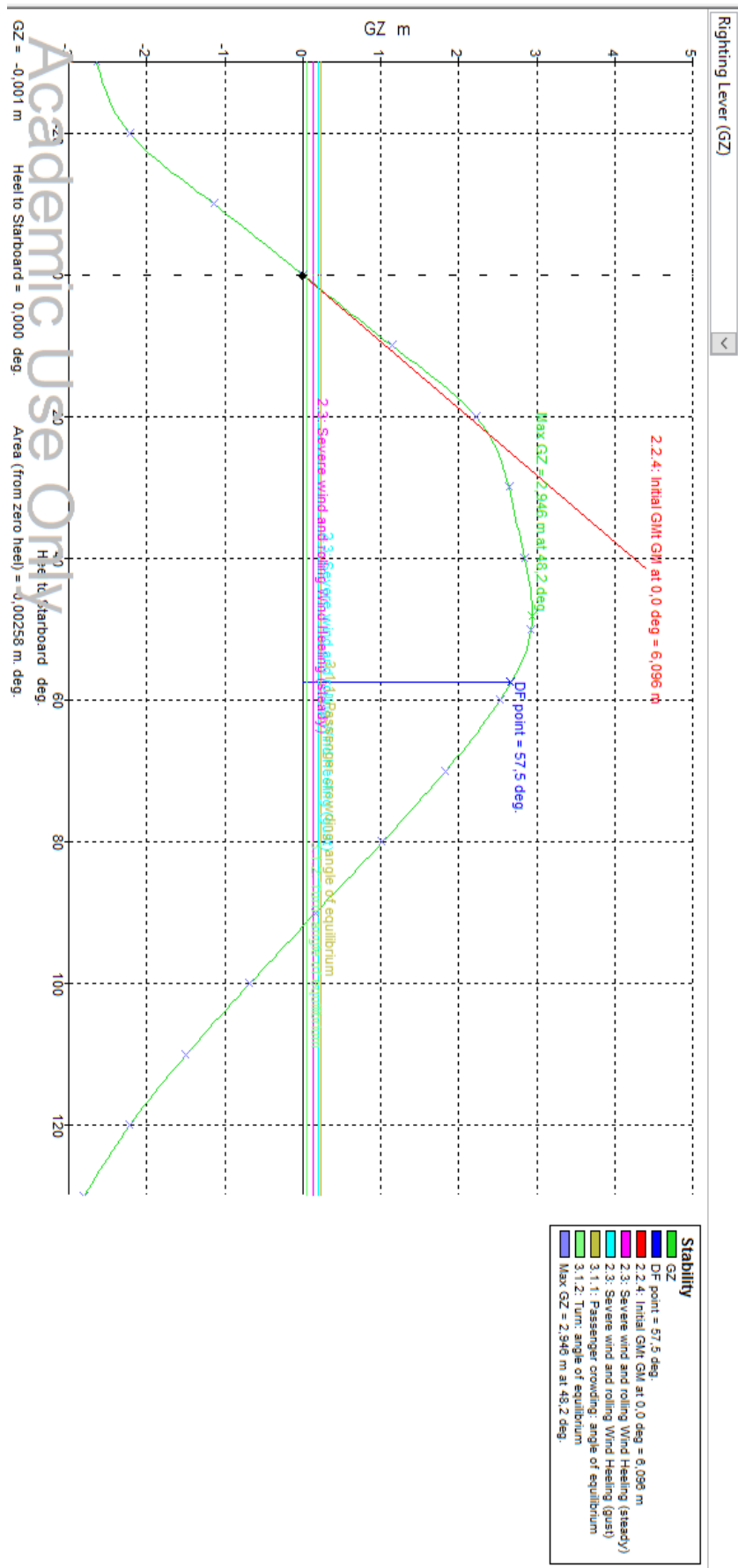
2.4.5.- Situación de carga 5: Salida de puerto sin carga, 100% consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	0		9,5	0			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	0		5,77	0			0	0	9,73	0	User Specified
Hielo cubierta del puente	0		12,24	0			0	0	12,73	0	User Specified
Hielo cubierta encima puente	0		4,32	0			0	0	15,73	0	User Specified
Hielo lateral	0		6,31	0			0	0	10,28	0	User Specified
Total Hielo				0			0	0	0	0	
Coches	0		2,5	0			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				0			0	0	0	0	
Diesel	100%	1,188	10,731	10,731	12,775	12,775	-5,234	0	0,9	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,588	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,588	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	93,408	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	1,184	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	1,167	42,085	42,085	42,085	42,085	3,656	0	0,879	399,192	IMO A.749(18)
Agua técnica	100%	1,184	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	399,192	
Aguas negras	0%	0	30,405	0	30,405	0	-0,02	0	0	302,062	IMO A.749(18)
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	302,062	
Tanque de comp. PR ER	50%	1,687	23,445	11,722	23,445	11,722	21,364	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,687	23,445	11,722	23,445	11,722	21,364	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,807	23,445	11,723	23,445	11,723	-21,36	3,835	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,807	23,445	11,723	23,445	11,723	-21,36	-3,835	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,002	0	3,202	0	
Tanque LNG PR	100%	1,811	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,928	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1286,966	232,336	153,818	0,337	0,001	5,244	794,662	
FS correction									0,617		
VCG fluid									5,862		

Draft Amidships m	3,206
Displacement t	1287
Heel deg	0,0
Draft at FP m	3,282
Draft at AP m	3,129
Draft at LCF m	3,199
Trim (+ve by stern) m	-0,153
WL Length m	59,382
Beam max extents on WL m	16,453
Wetted Area m ²	878,898
Waterpl. Area m ²	750,692
Prismatic coeff. (Cp)	0,540
Block coeff. (Cb)	0,405
Max Sect. area coeff. (Cm)	0,763
Waterpl. area coeff. (Cwp)	0,768
LCB from zero pt. (+ve fwd) m	0,348
LCF from zero pt. (+ve fwd) m	0,147
KB m	2,141
KG fluid m	5,862
Bmt m	9,816
BML m	124,024
GMt corrected m	6,096
GML m	120,303
KMt m	11,957
KML m	126,164
Immersion (TPc) tonne/cm	7,507
MTc tonne.m	28,265
RM at 1deg = GMt.Disp.sin(1) tonne.m	136,917
Max deck inclination deg	0,1605
Trim angle (+ve by stern) deg	-0,1605

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,382	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,206	m			
	GMf, Stability calculated	6,096	m			
	VCG, Stability calculated	5,862	m			
	CB, Stability calculated	0,405				
	Ak, keel area, user spec.	25,236	m^2			
	Method for k factor	Tabulated value for k				
	Evaluates to	18,4	deg			
	Intermediate values					
	B / d			5,553		
	100 Ak / L / B			2,388		
	C		IMO units	0,475		
	T		s	6,852		
	OG, Centre of gravity above WL		m	2,656		
	X1		IMO units	0,8		
	X2		IMO units	0,75		
	k tabulated		IMO units	0,81		
	r		IMO units	1,227		
	s		IMO units	0,098		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
	angle of vanishing stability	91,9	deg			
	shall not be less than (>=)	0,055	m.rad	0,8302	Pass	1409,45
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	57,5	deg			
	angle of vanishing stability	91,9	deg			
	shall not be less than (>=)	0,09	m.rad	1,3092	Pass	1354,65
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	57,5	deg			
	angle of vanishing stability	91,9	deg			
	shall not be less than (>=)	0,03	m.rad	0,479	Pass	1496,54
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	48,2	deg	48,2		
	shall not be less than (>=)	0,2	m	2,946	Pass	1373
	Intermediate values					
	angle at which this GZ occurs		deg	48,2		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass	
	shall not be less than (>=)	25 deg	48,2	Pass	92,73
267(85) Ch2 - General Criteria	2.2.4: Initial GMt			Pass	
	spec. heel angle	0 deg			
	shall not be less than (>=)	0,15 m	6,096	Pass	3964
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: a =	0,99966			
	wind pressure: P =	504 Pa			
	area centroid height (from zero point): h =	10,28 m			
	additional area: A =	220,41 m ²			
	H = vert. centre of projected lat. u'water area	1,74 m			
	cosine power: n =	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	18,4 (-17,2) deg		-17,2	
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg		50	
	first downflooding angle	57,5 deg			
	angle of vanishing stability (with gust heel arm)	89,6 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	48,2 deg		48,2	
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:				Pass
	Angle of steady heel shall not be greater than (<=)	16 deg		1,2	Pass
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80 %		12,27	Pass
	Area1 / Area2 shall not be less than (>=)	100 %		457,83	Pass
	Intermediate values				
	Model windage area	m ²		318,836	
	Model windage area centroid height (from zero point)	m		6,365	
	Total windage area	m ²		539,246	
	Total windage area centroid height (from zero point)	m		7,965	
	Heel arm amplitude	m		0,134	
	Equilibrium angle with gust heel arm	deg		1,8	
	Deck edge immersion angle	deg		9,9	
	Area1 (under GZ), from 1,8 to 50,0 deg.	m.rad		1,8145	
	Area1 (under HA), from 1,8 to 50,0 deg.	m.rad		0,1691	
	Area1, from 1,8 to 50,0 deg.	m.rad		1,6455	
Area2 (under GZ), from -17,2 to 1,8 deg.	m.rad		-0,2927		
Area2 (under HA), from -17,2 to 1,8 deg.	m.rad		0,0667		
Area2, from -17,2 to 1,8 deg.	m.rad		0,3594		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n_{\text{Pass}} M / \text{disp.} D \cos^n(\phi)$				
	number of passengers: $n_{\text{Pass}} =$	399			
	passenger mass: M =	0,1 tonne			
	distance from centre line: D =	7,405 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg		2,1	Pass
	Intermediate values				
	Heel arm amplitude	m		0,23	
	3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass
Turn arm: $a v^2 / (R g) h \cos^n(\phi)$					
constant: a =		1,02			
vessel speed: v =		13 kn			
turn radius, R, as percentage of Lwl		510 %			
h = KG - mean draft / 2		3,641 m			
cosine power: n =		0			
shall not be greater than (<=)		10 deg		0,5	Pass
Intermediate values					
Heel arm amplitude		m		0,056	



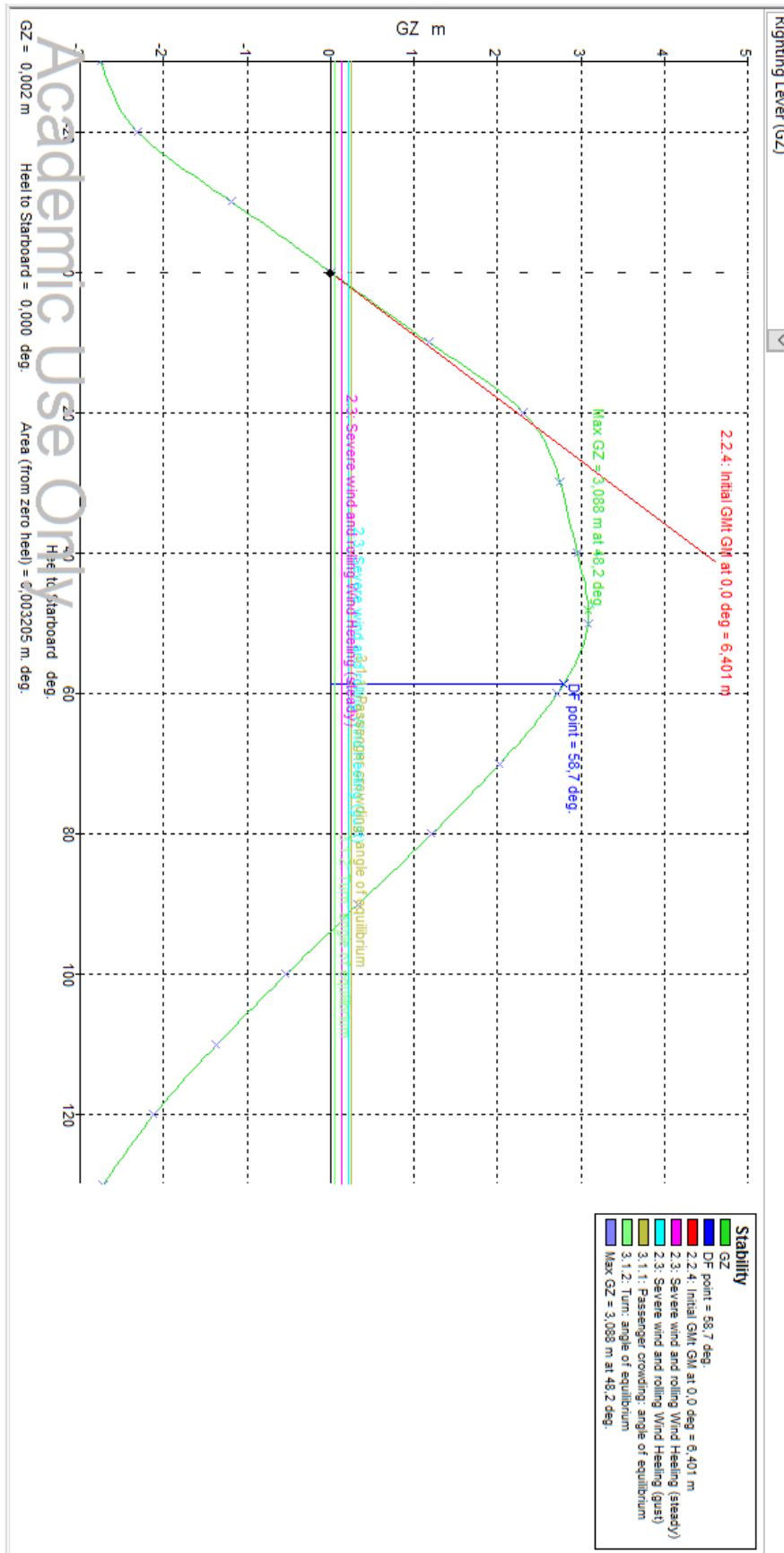
2.4.6.- Situación de carga 6: Llegada a puerto sin carga, 10% consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	0		9,5	0			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	0		5,77	0			0	0	9,73	0	User Specified
Hielo cubierta del puente	0		12,24	0			0	0	12,73	0	User Specified
Hielo cubierta encima puente	0		4,32	0			0	0	15,73	0	User Specified
Hielo lateral	0		6,31	0			0	0	10,28	0	User Specified
Total Hielo				0			0	0	0	0	
Coches	0		2,5	0			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				0			0	0	0	0	
Diesel	0,33%	0,054	10,731	0,035	12,775	0,042	-5,245	0	0,042	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,672	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,672	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	10%		11,883	1,188	14,147	1,414	-5,492	0	1,602	93,408	
Tanque de lodos	90%	0,813	0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0	User Specified
Total Diesel Usado	90%		0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0	
Almacen Aceite	10%	0,226	0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0	User Specified
Total Aceite Para Usar	10%		0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0	
Aceite sucio	90%	0,945	0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0	User Specified
Total Aceite Usado	90%		0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0	
Agua dulce	10%	0,398	42,085	4,209	42,085	4,209	3,473	0	0,309	399,192	IMO A.749(18)
Agua técnica	10%	0,344	1,459	0,146	1,459	0,146	-4,244	0,607	0,265	0	User Specified
Total Agua Para Usar	10%		43,544	4,354	43,544	4,354	3,215	0,02	0,308	399,192	
Aguas negras	90%	1,19	30,405	27,365	30,405	27,365	-1,495	0	0,814	302,062	IMO A.749(18)
Total Agua Sucia	90%		30,405	27,365	30,405	27,365	-1,495	0	0,814	302,062	
Tanque de comp. PR ER	50%	1,791	23,445	11,722	23,445	11,722	21,363	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,791	23,445	11,722	23,445	11,722	21,363	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,88	23,445	11,722	23,445	11,722	-21,36	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,88	23,445	11,722	23,445	11,722	-21,36	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,001	0	3,202	0	
Tanque LNG PR	10%	0,225	24,335	2,433	24,335	2,433	21,001	0,002	9,915	0	User Specified
Tanque LNG PP	10%	0,312	24,335	2,433	24,335	2,433	-20,997	0,002	9,915	0	User Specified
Total LNG	10%		48,669	4,867	48,669	4,867	0,002	0,002	9,915	0	
Total Loadcase				1221,133	232,336	86,048	0,257	-0,002	5,119	794,662	
FS correction									0,651		
VCG fluid									5,77		

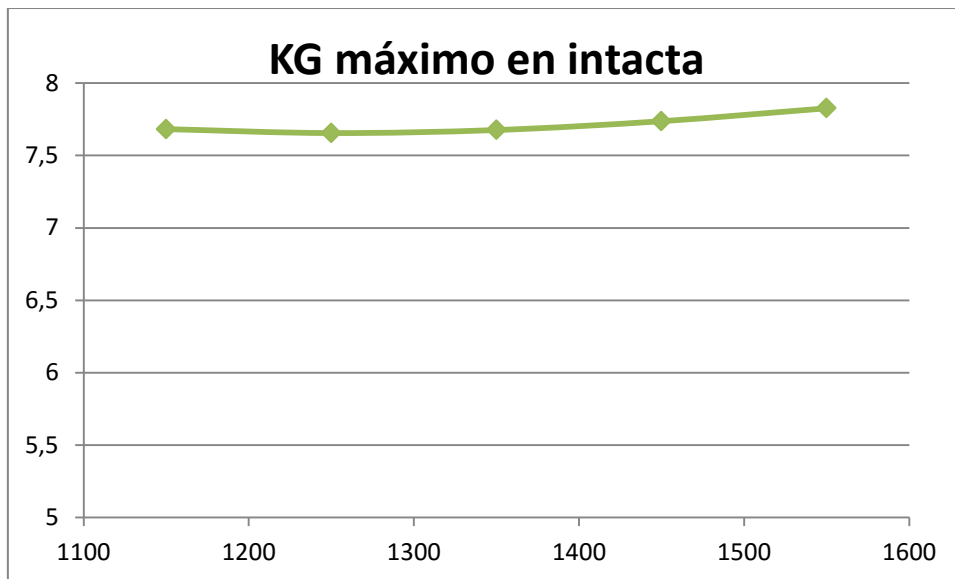
Draft Amidships m	3,116
Displacement t	1221
Heel deg	0,0
Draft at FP m	3,172
Draft at AP m	3,059
Draft at LCF m	3,111
Trim (+ve by stern) m	-0,113
WL Length m	59,289
Beam max extents on WL m	16,365
Wetted Area m ²	864,588
Waterpl. Area m ²	741,470
Prismatic coeff. (Cp)	0,532
Block coeff. (Cb)	0,399
Max Sect. area coeff. (Cm)	0,760
Waterpl. area coeff. (Cwp)	0,764
LCB from zero pt. (+ve fwd) m	0,264
LCF from zero pt. (+ve fwd) m	0,131
KB m	2,086
KG fluid m	5,770
BMt m	10,085
BML m	127,645
GMt corrected m	6,401
GML m	123,961
KMt m	12,172
KML m	129,731
Immersion (TPc) tonne/cm	7,415
MTc tonne.m	27,635
RM at 1deg = GMt.Disp.sin(1) tonne.m	136,427
Max deck inclination deg	0,1184
Trim angle (+ve by stern) deg	-0,1184

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,289	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,116	m			
	GMf, Stability calculated	6,401	m			
	VCG, Stability calculated	5,77	m			
	CB, Stability calculated	0,399				
	Ak, keel area, user spec.	25,236	m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to	18,5	deg			
	Intermediate values					
	B / d			5,713		
	100 Ak / L / B			2,391		
	C		IMO units	0,479		
	T		s	6,738		
	OG, Centre of gravity above WL		m	2,654		
	X1		IMO units	0,8		
	X2		IMO units	0,75		
	k tabulated		IMO units	0,81		
	r		IMO units	1,241		
	s		IMO units	0,099		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
	angle of vanishing stability	93,8	deg			
	shall not be less than (>=)	0,055	m.rad	0,864	Pass	1470,84
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	58,7	deg			
	angle of vanishing stability	93,8	deg			
	shall not be less than (>=)	0,09	m.rad	1,3628	Pass	1414,26
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	58,7	deg			
	angle of vanishing stability	93,8	deg			
	shall not be less than (>=)	0,03	m.rad	0,4989	Pass	1562,84
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	48,2	deg	48,2		
	shall not be less than (>=)	0,2	m	3,088	Pass	1444
	Intermediate values					
	angle at which this GZ occurs		deg	48,2		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass	
	shall not be less than (\geq)	25 deg	48,2	Pass	92,73
267(85) Ch2 - General Criteria	2.2.4: Initial GMT			Pass	
	spec. heel angle	0 deg			
	shall not be less than (\geq)	0,15 m	6,401	Pass	4167,33
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: $a =$	0,99966			
	wind pressure: $P =$	504 Pa			
	area centroid height (from zero point): $h =$	10,28 m			
	additional area: $A =$	220,41 m ²			
	$H =$ vert. centre of projected lat. u'water area	1,686 m			
	cosine power: $n =$	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	18,5 (-17,3) deg		-17,3	
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg		50	
	first downflooding angle	58,7 deg			
	angle of vanishing stability (with gust heel arm)	91,4 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	48,2 deg		48,2	
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:				Pass
	Angle of steady heel shall not be greater than (\leq)	16 deg		1,2	Pass
	Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq)	80 %		11,5	Pass
	Area1 / Area2 shall not be less than (\geq)	100 %		453,87	Pass
	Intermediate values				
	Model windage area	m ²		324,175	
	Model windage area centroid height (from zero point)	m		6,312	
	Total windage area	m ²		544,585	
	Total windage area centroid height (from zero point)	m		7,918	
	Heel arm amplitude	m		0,143	
	Equilibrium angle with gust heel arm	deg		1,8	
	Deck edge immersion angle	deg		10,6	
	Area1 (under GZ), from 1,8 to 50,0 deg.	m.rad		1,8908	
	Area1 (under HA), from 1,8 to 50,0 deg.	m.rad		0,18	
Area1, from 1,8 to 50,0 deg.	m.rad		1,7108		
Area2 (under GZ), from -17,3 to 1,8 deg.	m.rad		-0,3054		
Area2 (under HA), from -17,3 to 1,8 deg.	m.rad		0,0715		
Area2, from -17,3 to 1,8 deg.	m.rad		0,3769		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n_{Pass} M / \text{disp. } D \cos^n(\phi)$				
	number of passengers: $n_{Pass} =$	399			
	passenger mass: $M =$	0,1 tonne			
	distance from centre line: $D =$	7,405 m			
	cosine power: $n =$	0			
	shall not be greater than (\leq)	10 deg		2,1	Pass
Intermediate values					
Heel arm amplitude	m		0,242		
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: $a =$	1,02			
	vessel speed: $v =$	13 kn			
	turn radius, R , as percentage of L_{wl}	510 %			
	$h = KG - \text{mean draft} / 2$	3,562 m			
	cosine power: $n =$	0			
	shall not be greater than (\leq)	10 deg		0,5	Pass
Intermediate values					
Heel arm amplitude	m		0,055		



2.5.- Curvas de KG máximo en estado intacto



Posteriormente, se realizarán las curvas de KG máximo en averías (tanto en el análisis probabilístico como en el determinístico) y en navegación con hielo en cubierta.

3.- Estabilidad en averías

El estudio de la estabilidad de un buque se basa en considerar que el buque está intacto, como se ha realizado en el punto anterior. Pero cabe, también, la posibilidad de que el buque sufra una avería que produzca una inundación. Que el buque cumpla de forma notoria la estabilidad sin averías no quiere decir que la tenga que cumplir cuando se produce alguna avería o inundación. Debido a ello, se realizarán dos análisis, uno probabilístico y otro determinístico de cómo responderá el buque proyectado a las averías.

Ambos análisis son requeridos por el SOLAS (Parte B-1 del Capítulo II) (6). Indagando en la reglamentación aplicable a los buques canadienses, en *Consolidated Regulations of Canada* (CRC) 1431 (8) existen unas condiciones más desfavorables para el análisis determinístico que las que establece el SOLAS. Se analizarán ambas en el estudio determinístico.

3.1.- Análisis probabilístico

Para el análisis probabilístico se seguirán las directrices del convenio SOLAS (Parte B-1 Capítulo II, Reglas 6 y 7) (6) que se basa en el concepto probabilista de la flotabilidad y la estabilidad.

Lo que se busca es aumentar la probabilidad de conservación de la flotabilidad y estabilidad en caso de avería.

El principal parámetro de medida de la probabilidad es:

$$A \geq R$$

Siendo R el índice de compartimentado requerido, función de la eslora de compartimentado y del número de personas a bordo.

Siendo A el índice de compartimentado obtenido, el cual depende de la suma de los coeficientes de subdivisión a tres calados.

Para poder calcular el parámetro A, tenemos que estudiar tres situaciones de carga diferentes:

1.- La situación de máxima carga, que para el buque proyecto es la de *Salida de puerto a plena carga con 100% de consumos*.

2.- La situación de mínima carga, que para el buque proyecto es la de *Llegada a puerto sin carga y con 10% de consumos*.

3.- Una situación de carga parcial, que se definirá a continuación.

Las dos primeras situaciones de carga, se han definido perfectamente en la estabilidad sin averías a través del programa *Maxsurf*.

La situación de carga parcial se define a partir de las otras dos. Primeramente, se definirá su calado:

$$d_p = d_l + 0,6 * (d_s - d_l)$$

Siendo d_s y d_l los calados de la *Salida de puerto a plena carga con 100% de consumos* y de la *Llegada a puerto sin carga y con 10% de consumos*.

$$d_s = 3,488 \text{ m}$$

$$d_p = 3,339 \text{ m}$$

$$d_l = 3,116 \text{ m}$$

Estas tres situaciones de carga son:

-Máxima carga

Item Name	Quantity	Sounding m	Unit Mass tonne	Total Mass tonne	Unit Volume m ³	Total Volume m ³	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
Lightship	1		1503,000	1503,000			0,000	0,000	7,784	0,000	User Specifie
Total Loadgroup				1503,000	0,000	0,000	0,000	0,000	7,784	0,000	
FS correction									0,000		
VCG fluid									7,784		

Figura 24.- Condición de máxima carga.

Para esta situación de carga, el brazo longitudinal se toma a asiento igual a cero, por lo que, como el buque es simétrico proa-popa, será igual a cero. El brazo transversal se supone igual a cero. El brazo vertical se obtiene de la curva de KG máximo en estabilidad intacta. En caso de no cumplimiento de los criterios en avería, lo primero que habría que hacer sería reducir el KG.

-Carga parcial

Item Name	Quantity	Sounding m	Unit Mass tonne	Total Mass tonne	Unit Volume m ³	Total Volume m ³	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
Lightship	1		1393,000	1393,000			0,000	0,000	7,702	0,000	User Specific
Total Loadgroup				1393,000	0,000	0,000	0,000	0,000	7,702	0,000	
FS correction									0,000		
VCG fluid									7,702		

Figura 25.- Condición de carga parcial.

Para esta situación de carga, el brazo longitudinal se toma a asiento igual a cero, por lo que, como el buque es simétrico proa-popa, será igual a cero. El brazo transversal se supone igual a cero. El brazo vertical se obtiene de la curva de KG máximo en estabilidad intacta. En caso de no cumplimiento de los criterios en avería, lo primero que habría que hacer sería reducir el KG.

-Mínima carga

Item Name	Quantity	Sounding m	Unit Mass tonne	Total Mass tonne	Unit Volume m ³	Total Volume m ³	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
Lightship	1		1221,000	1221,000			0,127	0,000	7,663	0,000	User Specific
Total Loadgroup				1221,000	0,000	0,000	0,127	0,000	7,663	0,000	
FS correction									0,000		
VCG fluid									7,663		

Figura 26.- Condición de mínima carga.

Para esta situación de carga, el brazo longitudinal se toma igual a cero al asiento en la situación de *Llegada a puerto sin carga y con 10% de consumos*, ya que así lo establece el convenio. El brazo transversal se supone igual a cero. El brazo vertical se obtiene de la curva de KG máximo en estabilidad intacta. En caso de no cumplimiento de los criterios en avería, lo primero que habría que hacer sería reducir el KG.

Una vez analizadas las tres condiciones de carga, se calcula el índice de compartimentado.

$$R = 1 - \frac{5000}{L_s + 2,5 * N + 15,225}$$

Siendo L_s la eslora de compartimentado dada en metros y N el número de personas a bordo, diferenciando entre el número de personas con plaza en bote (N_1) y el personal restante (N_2):

$$L_s = 61 \text{ m}$$

$$N_1 = 0$$

$$N_2 = 406$$

$$N = N_1 + 2 * N_2 = 812$$

$$R = 0,71125$$

El índice de compartimentado obtenido (A) se obtiene de sumar los índices parciales de las tres situaciones de carga:

$$A = 0,4 * A_s + 0,4 * A_p + 0,2 * A_l$$

Siendo cada índice parcial el sumatorio de los resultados de todos los caso de avería que se tomarán en consideración utilizando la siguiente fórmula:

$$A = \sum p_i * s_i$$

Dónde:

i representa cada uno de los compartimentos o grupo de compartimentos considerados.

p_i representa la probabilidad de que sólo se inunde el compartimento o el grupo de compartimentos considerados, sin atender al compartimentado horizontal.

s_i representa la probabilidad de que el buque conserve la flotabilidad después que se haya inundado el compartimento o el grupo de compartimentos considerados, teniendo en cuenta los efectos del compartimentado horizontal.

Para el caso de los buques de pasaje se cumplirá lo siguiente:

$$A_i > 0,9 * R$$

Para el buque proyecto:

$$A_i > 0,64012$$

A continuación, se muestran los valores introducidos en el programa *Maxsurf*.

Item	Value	Units
Probabilistic damage		
Resolution -- MSC.216(82) or MSC.19(58)	MSC.216(82)	
Do automatic combinations of vertical damage ?	Yes	
Loadcases		
Deepest subdivision draft (summer loadline) Loadcase	Máxima carga	draft: 3,482 m
Partial subdivision draft Loadcase	Carga parcial	draft: 3,339 m
Light service draft Loadcase	Mínima carga	draft: 3,113 m
Vessel parameters		
Type -- Cargo or Passenger	Passenger	
Lifeboat capacity N_1	0	
Permitted max. num. of persons in excess of N_1: N_2	406	
Subdivision length L_s	61 m	
Aft terminal of L_s	-30,5 m	
Fwd terminal of L_s	30,5 m	
Mid L_s	0 m	
Intact displacement at subdivision draft (Mínima carga)	1221,003 t	
max. moulded breadth at or below deepest subdivision draft: B	16,655 m	
max. number of adjacent zones to consider	3	
min. probability (p.r.v) of damage to consider	0,0001	
max. trim angle to consider	40 deg	
Limit longitudinal extent of damage? (I_max=60,000; J_max=0,30303)	Limit	
Limit vertical extent of damage?	Limit	
max. vertical extent of damage	15,982 m	
Damaged side -- Starboard or Port	Starboard	
Zone 1 located at bow or stern?	Stern	
MSC.216(82) -- Required subdivision index		
Pax ships: $R = 1 - 5000 / (L_s + 2.5 N + 15225)$	0,71125	
Reduction factor for R	1	
Required subdivision index (appying reduction factor)	0,71125	
Factor of R for required subdivision index for each loadcase	0,9	
Required subdivision index for each loadcase	0,64012	
Constants		
J_max -- MSC.216(82) formulation	0,30303	
J_kn	0,15152	
p_k	0,91667	
I_max	60 m	
L_star	260 m	
Vessel specific calcs (zone independent)		
J_m_star	0,30303	
J_k_star	0,15152	
J_m	0,30303	
J_k	0,15152	
Probability distribution coefficients		
b_0	11	
b_11	-65,34	
b_12	11	
b_21	-7,26	
b_22	2,2	

Figura 27.- Datos del análisis probabilístico introducidos en Maxsurf.

Los valores que aparecen debajo de los factores de subdivisión son constantes que define el convenio.

El siguiente paso será definir las zonas en las que se divide el buque proyecto para este análisis probabilístico. Las zonas se han dispuesto entre mamparos estancos transversales.

Name	Aft m	Fwd m	Length m	Centre m
Zone 1	-30,500	-27,000	3,500	-28,750
Zone 2	-27,000	-23,000	4,000	-25,000
Zone 3	-23,000	-20,000	3,000	-21,500
Zone 4	-20,000	-12,000	8,000	-16,000
Zone 5	-12,000	-6,000	6,000	-9,000
Zone 6	-6,000	0,000	6,000	-3,000
Zone 7	0,000	6,000	6,000	3,000
Zone 8	6,000	12,000	6,000	9,000
Zone 9	12,000	20,000	8,000	16,000
Zone 10	20,000	23,000	3,000	21,500
Zone 11	23,000	27,000	4,000	25,000
Zone 12	27,000	30,500	3,500	28,750

Figura 28.- Zonas para el análisis probabilístico.

Así quedan dispuestas respecto al buque:

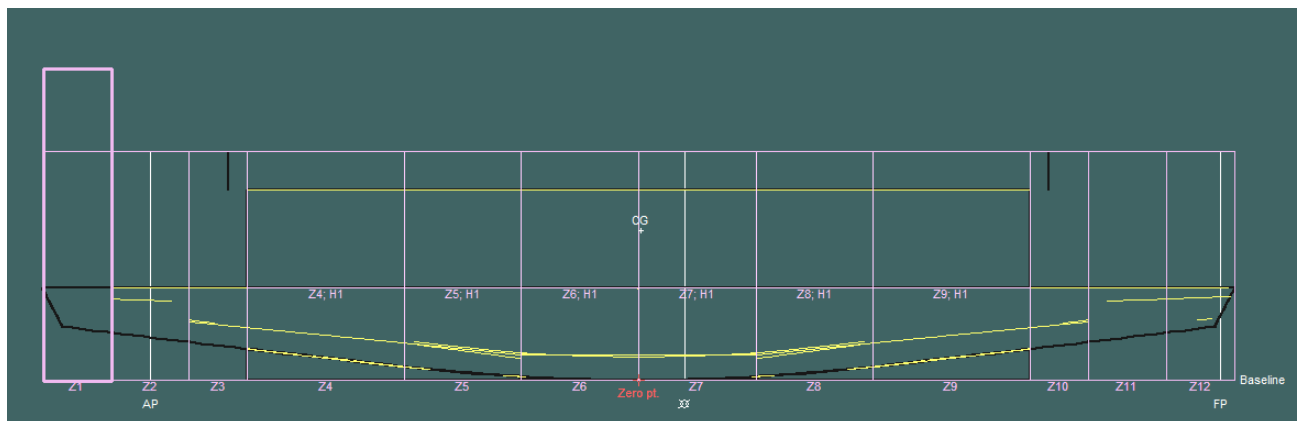


Figura 29.- Croquis de las zonas.

Seguidamente, se introducen las b , que son la distancia, medida en el centro de cada zona, desde la flotación de máxima carga hasta los mamparos longitudinales. El valor de *Shell half-beam*, será una b medida hasta crujía, para cada zona. Se muestran las b para una zona adyacente.

Zones	Shell half-beam m	Num. L.B	b 1 m
<i>1 adjacent zone</i>			
Zone 1, 1	2,388	0	n/a
Zone 2, 1	4,156	0	n/a
Zone 3, 1	5,490	1	2,990
Zone 4, 1	7,041	1	2,541
Zone 5, 1	8,119	1	3,619
Zone 6, 1	8,336	1	3,836
Zone 7, 1	8,336	1	3,836
Zone 8, 1	8,119	1	3,619
Zone 9, 1	7,041	1	2,541
Zone 10, 1	5,490	1	2,990
Zone 11, 1	4,156	0	n/a
Zone 12, 1	2,388	0	n/a

Figura 30.- Valores del parámetro b.

En el siguiente croquis se muestran, en la parte de estribor (la de debajo de la imagen) los valores de *Shell half-beam* para cada compartimento. En la parte superior, el costado de babor del buque, se muestran las *b* para los mamparos longitudinales estancos. Las cotas están en metros.

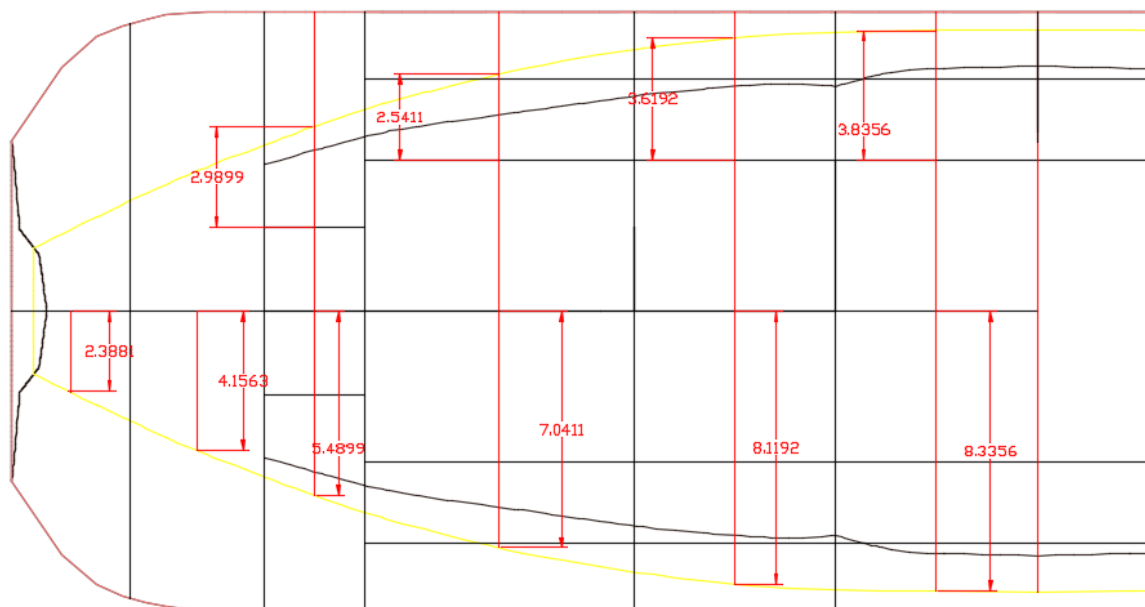


Figura 31.- Justificación del parámetro b en la popa del buque (sería simétrico a proa).
Se adjunta en el Anexo II.

También será necesario introducir en *Maxsurf* las cubiertas, esto es, el compartimentado vertical del buque que se encuentre por encima de la flotación de máxima carga. En el caso del buque proyecto, solo se dispone de la cubierta de carga rodada que divide la zona bajo cubierta de las zonas estancas en cubierta definidas en el Cuaderno 4. Se introducen los datos de la siguiente manera:

Zones	Num. Decks	H 1 m
<i>1 adjacent zone</i>		
Zone 1, 1	0	n/a
Zone 2, 1	0	n/a
Zone 3, 1	0	n/a
Zone 4, 1	1	4,730
Zone 5, 1	1	4,730
Zone 6, 1	1	4,730
Zone 7, 1	1	4,730
Zone 8, 1	1	4,730
Zone 9, 1	1	4,730
Zone 10, 1	0	n/a
Zone 11, 1	0	n/a
Zone 12, 1	0	n/a

Figura 32.- Valores para las cubiertas.

Por último, se determina cuál será la permeabilidad de cada espacio susceptible de inundación. Para asignar las permeabilidades, el SOLAS establece el siguiente criterio:

Spaces	Permeability
Appropriated to stores	0,6
Occupied by accommodation	0,95
Occupied by machinery	0,85
Void spaces	0,95
Intended for liquids	0 or 0,95

Tabla 3.- Tabla de permeabilidades. Fuente: (6).

Name	Type	Deepest subdivision draft Permeability %	Partial subdivision draft Permeability %	Light service draft Permeability %
Cámara de máquinas	Compartment	85	85	85
DC CM ER PP	Compartment	95	95	95
DC CM ER PR	Compartment	95	95	95
DC CM BR PR	Compartment	95	95	95
DC CM BR PP	Compartment	95	95	95
Diesel	Tank	95	95	95
Uso diario Diesel	Tank	95	95	95
Sedimentación Diesel	Tank	95	95	95
Tanque de lodos	Tank	95	95	95
Almacén Aceite	Tank	95	95	95
Aceite sucio	Tank	95	95	95
Agua dulce	Tank	95	95	95
Agua técnica	Tank	95	95	95
Aguas negras	Tank	95	95	95
Local hélice PR	Compartment	85	85	85
Local hélice PP	Compartment	85	85	85
Comp. PR (caja de cadenas)	Compartment	85	85	85
Comp. PP (caja de cadenas)	Compartment	85	85	85
Tanque de comp. PR ER	Tank	95	95	95
Tanque de comp. PR BR	Tank	95	95	95
Tanque de comp. PP ER	Tank	95	95	95
Tanque de comp. PP BR	Tank	95	95	95
Tanque LNG PR	Tank	95	95	95
Tanque LNG PP	Tank	95	95	95
Espacio vacío PR 1	Compartment	95	95	95
DC PR 1 ER	Compartment	95	95	95
DC PR 1 BR	Compartment	95	95	95
Espacio vacío PR 2	Compartment	95	95	95
DC PR 2 ER	Compartment	95	95	95
DC PR 2 BR	Compartment	95	95	95
Espacio vacío PP 1	Compartment	95	95	95
DC PP 1 ER	Compartment	95	95	95
DC PP 1 BR	Compartment	95	95	95
Espacio vacío PP 2	Compartment	95	95	95
DC PP 2 ER	Compartment	95	95	95
DC PP 2 BR	Compartment	95	95	95
Espacio vacío TC PR	Compartment	95	95	95
Espacio vacío TC PP	Compartment	95	95	95
DF PR 1	Compartment	95	95	95
DF PR 2	Compartment	95	95	95
DF PP 1	Compartment	95	95	95
DF PP 2	Compartment	95	95	95
DF TC PR	Compartment	95	95	95
DF TC PP	Compartment	95	95	95
DF CM	Compartment	95	95	95
Zona estanca cubierta ER	Compartment	95	95	95
Zona estanca cubierta BR	Compartment	95	95	95

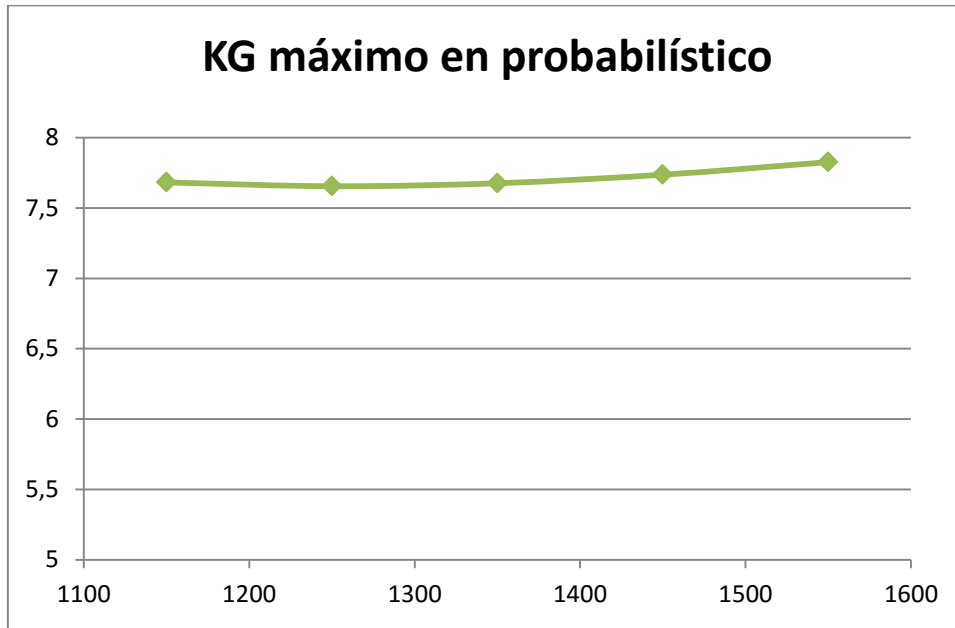
Tabla 4.- Permeabilidades para el buque proyecto.

Una vez introducidos todos estos datos, se puede llevar a cabo el análisis probabilístico. El análisis al completo se adjunta como Anexo I. Los resultados obtenidos son los siguientes:

Máxima carga	0,928609	0,640125	Pass
Carga parcial	0,965311	0,640125	Pass
Mínima carga	0,974373	0,640125	Pass
TOTAL	0,952443	0,71125	Pass

Figura 33.- Resultados análisis probabilístico.

3.1.1.- Curva de KG máximo del análisis probabilístico



La curva de KG máximo del análisis probabilístico es la misma que la de estado intacto.

3.2.- Análisis determinístico

Para abordar el análisis determinístico se toman como referencia tanto (6) como (8). Ambos convenios son muy parecidos, pero en cuanto a temas de extensiones transversales de avería, que puede que sea el parámetro más importante de este análisis, la Administración canadiense tiene un valor de $0,2*B$ y el SOLAS solo establece una penetración de $0,1*B$ del casco hacia adentro. Por tanto, se tomará el valor más restrictivo.

En cuanto a la eslora de inundación, será la que marca (8), ya que también es más restrictiva, tendrá un valor de $0,03*L + 3$ m, lo que es igual a 4,83 m. Frente a la de (6) que se establece como 1,83 m. En ambos convenios se pide que se aplique esta avería a dos compartimentos adyacentes a lo sumo. Se presenta un croquis con la penetración para cada compartimento y las averías supuestas:

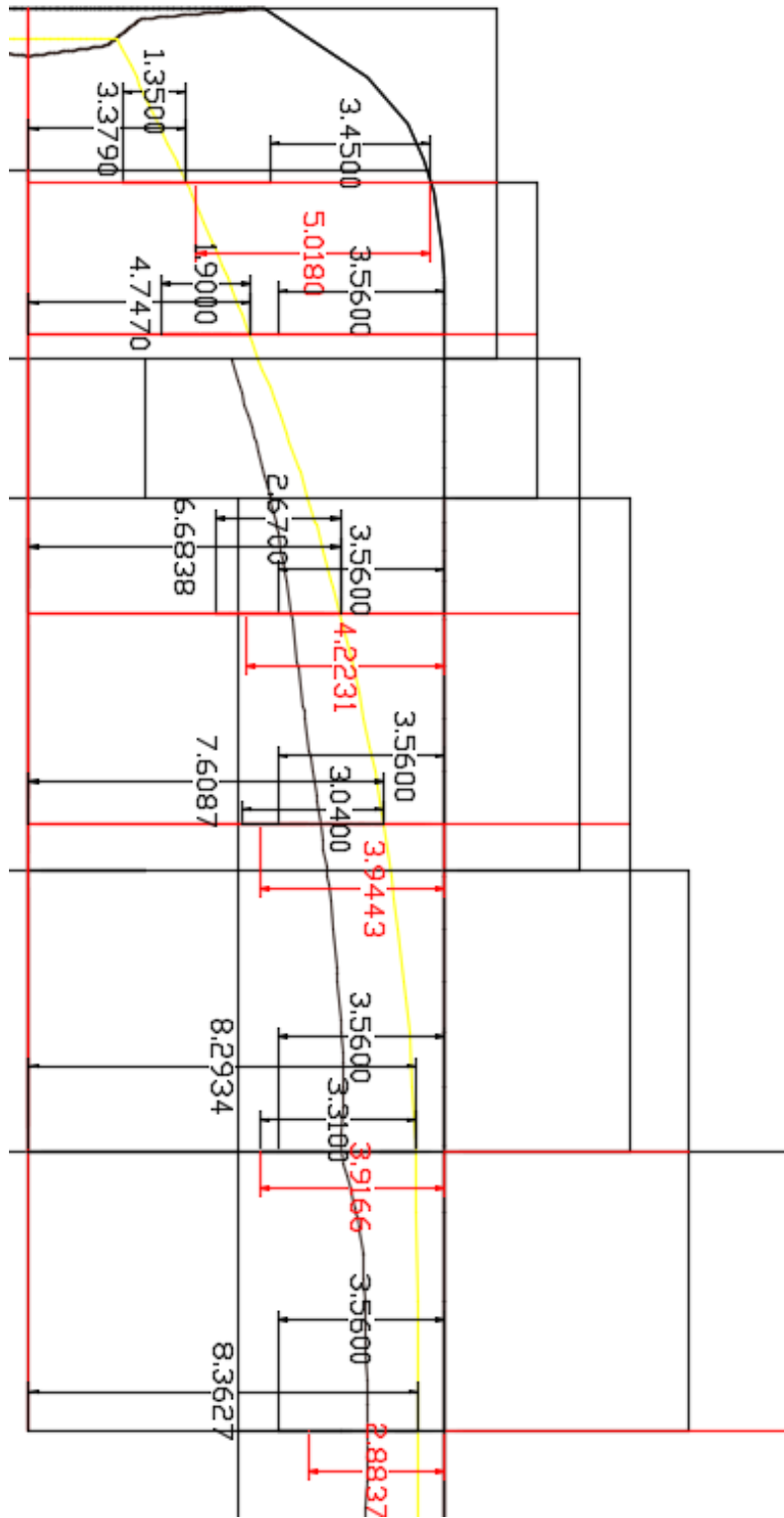


Figura 34.- Justificación penetración transversal. Se adjunta en el Anexo II. Cada avería será tal que inunde los compartimentos que estén dentro de cada escalón con la penetración transversal (marcada en rojo) correspondiente.

Se adjunta también qué compartimento se avería en cada una de las 6 averías que se analizarán.

Room	Intact	avería 1	avería 2	avería 3	avería 4	avería 5	avería 6
Cámara de máquinas							
DC CM ER PP						✓	✓
DC CM ER PR							✓
DC CM BR PR							
DC CM BR PP							
Diesel							
Uso diario Diesel							
Sedimentación Diesel							
Tanque de lodos							
Almacén Aceite							
Aceite sucio							
Agua dulce							
Agua técnica							
Aguas negras							
Local hélice PR							
Local hélice PP		✓	✓				
Comp. PR (caja de cadenas)							
Comp. PP (caja de cadenas)		✓					
Tanque de comp. PR ER							
Tanque de comp. PR BR							
Tanque de comp. PP ER			✓	✓			
Tanque de comp. PP BR							
Tanque LNG PR							
Tanque LNG PP							
Espacio vacío PR 1							
DC PR 1 ER							
DC PR 1 BR							
Espacio vacío PR 2							
DC PR 2 ER							
DC PR 2 BR							
Espacio vacío PP 1							
DC PP 1 ER					✓	✓	
DC PP 1 BR							
Espacio vacío PP 2							
DC PP 2 ER				✓	✓		
DC PP 2 BR							
Espacio vacío TC PR							
Espacio vacío TC PP							
DF PR 1							
DF PR 2							
DF PP 1					✓	✓	
DF PP 2				✓	✓	✓	
DF TC PR							
DF TC PP			✓	✓			
DF CM						✓	✓
Zona estancia cubierta ER				✓	✓	✓	✓

Figura 35.- Averías en Maxsurf.

En cuanto a los criterios aplicables, los del convenio SOLAS son más restrictivos, por lo que si se cumplen estos, también se cumplirán los de la administración canadiense. En el CRC 1431 se establece que después de una inundación de uno o dos compartimentos habrá que cumplir lo siguiente:

- En caso de inundación asimétrica, la altura metacéntrica será positiva.
- En caso de inundación asimétrica, la escora no será mayor de 7°. En casos especiales se puede elevar hasta 15°.
- En caso de inundación asimétrica, no se sumergirá la línea de margen.

Cabe resaltar que se ha abordado el análisis determinístico utilizando las condiciones de carga realizadas para el análisis probabilístico. En un primer momento, no se cumplió el análisis determinístico, ya que se utilizaron los KG resultantes de la estabilidad intacta, que habían sido adecuados para el análisis probabilístico. Por lo tanto, se han bajado gradualmente para que todas las averías cumplan los criterios que se introducen a continuación. La variación de los KG en cada situación de carga es la siguiente:

$$KG_s inicial = 7,784 m \rightarrow KG_s final = 7 m$$

$$KG_p inicial = 7,702 m \rightarrow KG_p final = 7,15 m$$

$$KG_l inicial = 7,663 m \rightarrow KG_l final = 7,35 m$$

El SOLAS establece los siguientes criterios a cumplir:

3.2.1.- Estabilidad residual

SOLAS, II-1/8			Value	Units
8.2.3.1: Range of residual positive stability				
1	<input type="checkbox"/>	from the greater of		
2	<input type="checkbox"/>	spec. heel angle	0,0	deg
3	<input checked="" type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	first downflooding angle		deg
6	<input type="checkbox"/>	immersion angle of	Marginline	deg
7	<input checked="" type="checkbox"/>	angle of vanishing stability		deg
8	<input type="checkbox"/>	shall not be less than (>=)	15,0	deg

Figura 36.- Datos de la estabilidad residual.

Según el SOLAS: “La curva de brazos adrizantes residuales positivos abarcará una gama mínima de 15° más allá del ángulo de equilibrio.”

3.2.2.- Área bajo la curva de GZ residual

		SOLAS, II-1/8 8.2.3.2: Area under residual GZ curve	Value	Units
1	<input type="checkbox"/>	from the greater of		
2	<input type="checkbox"/>	spec. heel angle	0,0	deg
3	<input checked="" type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	spec. heel angle	27,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input type="checkbox"/>	angle of max. GZ		deg
9	<input checked="" type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	immersion angle of	DeckEdge	deg
11	<input checked="" type="checkbox"/>	angle of vanishing stability		deg
12	<input type="checkbox"/>	shall not be less than (>=)	0,0150	m.rad

Figura 37.- Datos del área bajo la curva de GZ residual.

Según el SOLAS: “El área bajo la curva de brazos adrizantes será de, al menos, 0,015 m*rad”

El *spected heel angle* puede variar de 22° a 27°, dependiendo si se coge uno o dos compartimentos en la avería. Como en este análisis se utilizarán 2, se utiliza el ángulo de 27°.

3.2.3.- GZ máximo residual

		SOLAS, II-1/8 8.2.3.3: Maximum residual GZ (method 2 - manual calc.)	Value	Units
1	<input type="checkbox"/>	in the range from the greater of		
2	<input checked="" type="checkbox"/>	spec. heel angle	27,0	deg
3	<input checked="" type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	to the lesser of		
5	<input checked="" type="checkbox"/>	spec. heel angle	27,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input checked="" type="checkbox"/>	angle of max. GZ		deg
9	<input checked="" type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	shall not be less than (>=)	0,100	m

Figura 38.- Datos del máximo GZ residual.

Se establece que el máximo GZ residual no será menor de 0,1 m.

3.2.4.- *GZ máximo*

		SOLAS, II-1/8 8.2.4.a Maximum GZ (intermediate stages)	Value	Units
1	<input type="checkbox"/>	<i>in the range from the greater of</i>		
2	<input checked="" type="checkbox"/>	spec. heel angle	27,0	deg
3	<input checked="" type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	<i>to the lesser of</i>		
5	<input type="checkbox"/>	spec. heel angle	27,0	deg
6	<input type="checkbox"/>	spec. angle above equilibrium	0,0	deg
7	<input type="checkbox"/>	angle of first GZ peak		deg
8	<input checked="" type="checkbox"/>	angle of max. GZ		deg
9	<input type="checkbox"/>	first downflooding angle		deg
10	<input type="checkbox"/>	shall be greater than (>)	0,050	m

Figura 39.- Datos del GZ máximo.

Se establece que el GZ máximo en etapas intermedias será como mínimo de 0,05 m.

3.2.5.- *Rango de estabilidad positiva*

		SOLAS, II-1/8 8.2.4.b Range of positive stability (intermediate stages)	Value	Units
1	<input type="checkbox"/>	<i>from the greater of</i>		
2	<input checked="" type="checkbox"/>	spec. heel angle	27,0	deg
3	<input checked="" type="checkbox"/>	angle of equilibrium		deg
4	<input type="checkbox"/>	<i>to the lesser of</i>		
5	<input type="checkbox"/>	first downflooding angle		deg
6	<input type="checkbox"/>	immersion angle of	Marginline	deg
7	<input checked="" type="checkbox"/>	angle of vanishing stability		deg
8	<input type="checkbox"/>	shall be greater than (>)	12,0	deg

Figura 40.- Datos del rango de estabilidad positiva.

(6) establece que el ángulo de estabilidad positiva deberá ser mayor de 12°.

3.2.6.- *GM residual con inundación simétrica*

		SOLAS, II-1/8 8.6.1 Residual GM with symmetrical flooding	Value	Units
1	<input checked="" type="checkbox"/>	spec. heel angle	0,0	deg
2	<input type="checkbox"/>	angle of equilibrium		deg
3	<input type="checkbox"/>	Select calculation from list		
4	<input type="checkbox"/>	shall not be less than (>=)	0,050	m

Figura 41.- *Datos del GM residual con inundación simétrica.*

Con inundación simétrica el GM no deberá ser menor de 0,05 m.

3.2.7.- *Ángulo de escora para inundación asimétrica*

		SOLAS, II-1/8 8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based	Value	Units
1	<input type="checkbox"/>	the angle of	Heel	
2	<input type="checkbox"/>	shall not be greater than (<=)	7,0	deg

Figura 42.- *Datos del ángulo de escora para inundación asimétrica.*

El SOLAS establece 7° para un compartimento o 12° si se inundan dos o más compartimentos. El CRC 1431 canadiense establece 7° que se pueden elevar a 15° en determinados casos sin especificar uno o dos compartimentos averiados.

Se establecerán 7° como valor más restrictivo.

3.2.8.- *Inmersión de la línea de margen*

		SOLAS, II-1/8 8.6.3: Margin line immersion - GZ based (EquilAngle ratio)	Value	Units
1	<input type="checkbox"/>	spec. heel angle	27,0	deg
2	<input type="checkbox"/>	angle of margin line immersion		deg
3	<input type="checkbox"/>	angle of deck edge immersion		deg
4	<input checked="" type="checkbox"/>	first flooding angle of the	Marginline	deg
5	<input type="checkbox"/>	angle of first GZ peak		deg
6	<input type="checkbox"/>	angle of max. GZ		deg
7	<input type="checkbox"/>	angle of vanishing stability		deg
8	<input type="checkbox"/>	shall be less than (<)	100,00	%

Figura 43.- *Datos de la inmersión de la línea de margen.*

No se deberá sumergir la línea de margen en ninguna situación.

A continuación, se comenzará con la aplicación de las averías a cada condición de carga.

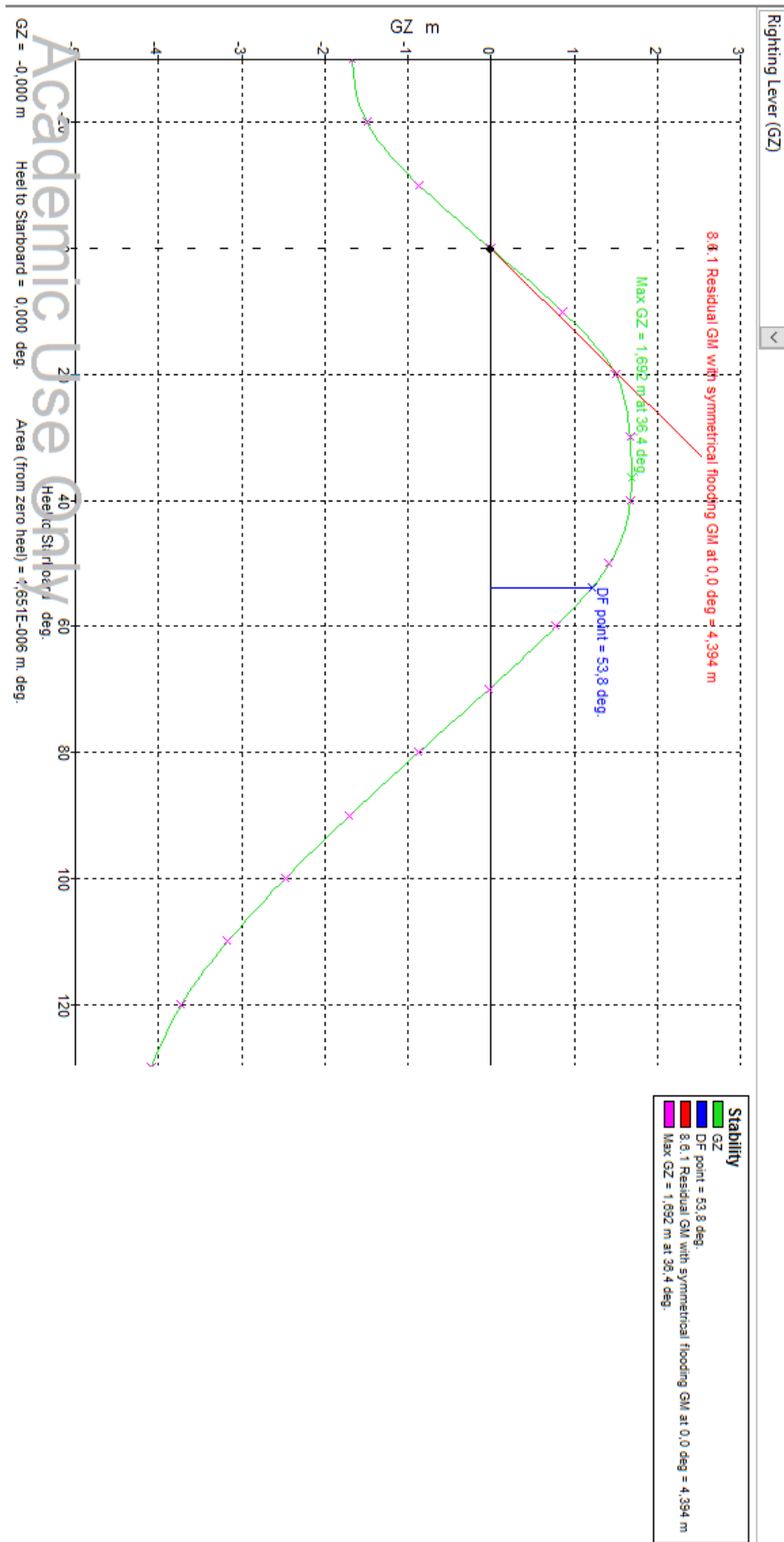
Para cada avería de cada situación de carga (Máxima carga, Carga parcial y Mínima Carga) se muestran lo siguiente:

- Características hidrostáticas.
- Cumplimiento de los criterios.
- Curva de GZ y GM.

3.2.9.- *Avería 1. Máxima carga*

Draft Amidships m	3,517
Displacement t	1503
Heel deg	0,0
Draft at FP m	3,346
Draft at AP m	3,688
Draft at LCF m	3,525
Trim (+ve by stern) m	0,342
WL Length m	59,736
Beam max extents on WL m	16,761
Wetted Area m ²	931,203
Waterpl. Area m ²	739,655
Prismatic coeff. (Cp)	0,551
Block coeff. (Cb)	0,410
Max Sect. area coeff. (Cm)	0,772
Waterpl. area coeff. (Cwp)	0,739
LCB from zero pt. (+ve fwd) m	-0,031
LCF from zero pt. (+ve fwd) m	1,215
KB m	2,325
KG fluid m	7,000
BMt m	9,070
BML m	99,658
GMt corrected m	4,394
GML m	94,983
KMt m	11,394
KML m	101,981
Immersion (TPc) tonne/cm	7,397
MTc tonne.m	26,062
RM at 1deg = GMt.Disp.sin(1) tonne.m	115,269
Max deck inclination deg	0,3578
Trim angle (+ve by stern) deg	0,3578

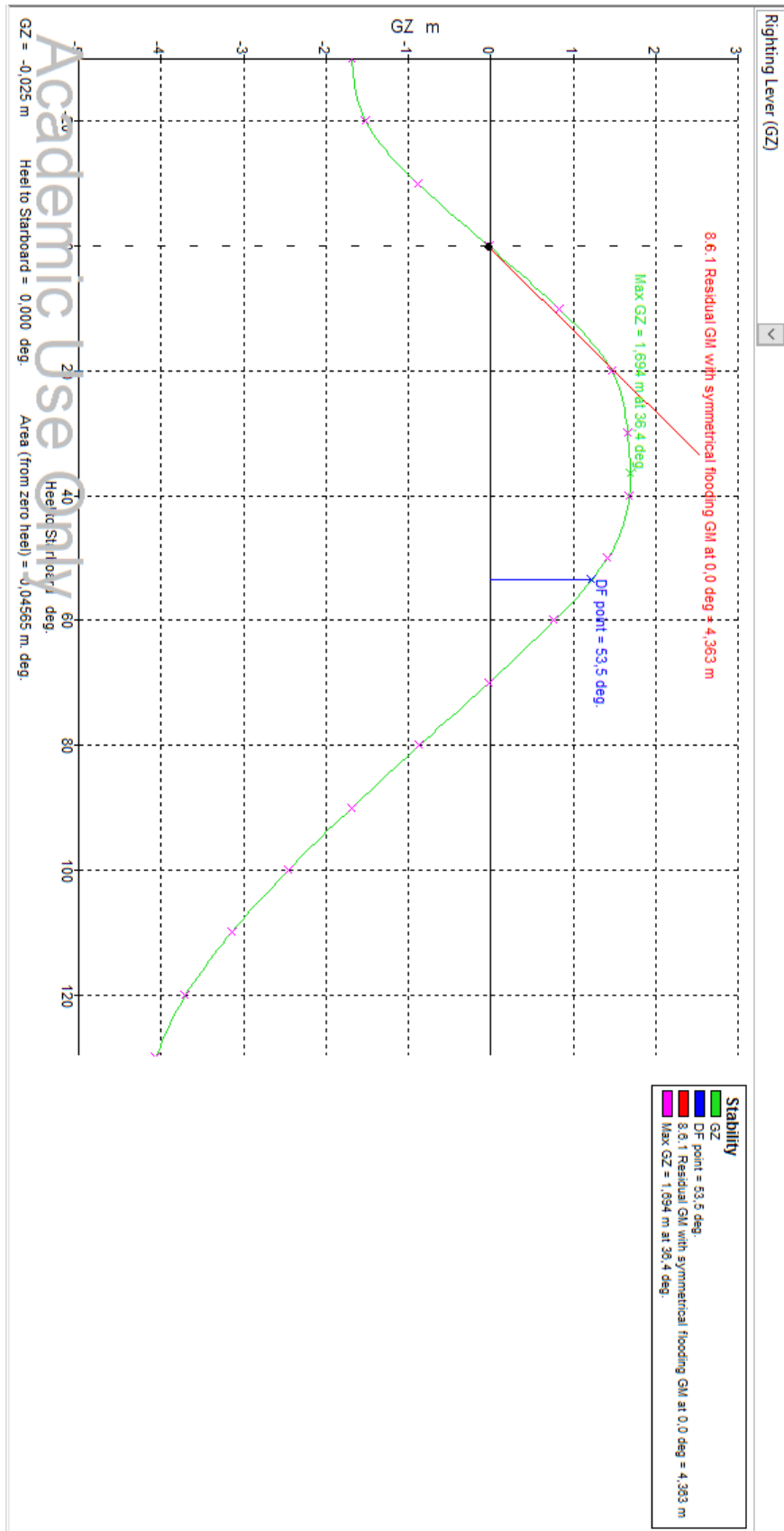
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium		0 deg	0		
	to the lesser of					
	first downflooding angle	53,8	deg	53,8		
	angle of vanishing stability	69,7	deg			
	shall not be less than (\geq)	15	deg	53,8	Pass	258,52
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium		0 deg	0		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	53,8	deg			
	angle of vanishing stability	69,7	deg			
	shall not be less than (\geq)	0,015	m.rad	0,4825	Pass	3117
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium		0 deg			
	to the lesser of					
	angle of max. GZ	36,4	deg	36,4		
	shall be greater than ($>$)	0,05	m	1,692	Pass	3284
	Intermediate values					
	angle at which this GZ occurs		deg	36,4		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium		0 deg			
	to the lesser of					
	angle of vanishing stability	69,7	deg	69,7		
	shall be greater than ($>$)	12	deg	42,7	Pass	255,97
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle		0 deg			
	shall not be less than (\geq)	0,05	m	4,394	Pass	8688
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)		7 deg	0	Pass	100
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)		7 deg	0	Pass	100
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)		0 m	0,931	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline		7 deg	7		
	shall be less than ($<$)		100 %	0	Pass	100
	Intermediate values					
	Equilibrium angle		deg	0		



3.2.10.- Avería 2. Máxima carga

Draft Amidships m	3,532
Displacement t	1503
Heel deg	0,3
Draft at FP m	3,320
Draft at AP m	3,743
Draft at LCF m	3,543
Trim (+ve by stern) m	0,423
WL Length m	59,765
Beam max extents on WL m	16,777
Wetted Area m ²	934,129
Waterpl. Area m ²	745,640
Prismatic coeff. (Cp)	0,547
Block coeff. (Cb)	0,405
Max Sect. area coeff. (Cm)	0,772
Waterpl. area coeff. (Cwp)	0,744
LCB from zero pt. (+ve fwd) m	-0,039
LCF from zero pt. (+ve fwd) m	0,883
KB m	2,337
KG fluid m	7,000
BMt m	9,028
BML m	102,993
GMt corrected m	4,364
GML m	98,329
KMt m	11,364
KML m	105,325
Immersion (TPc) tonne/cm	7,456
MTc tonne.m	26,980
RM at 1deg = GMt.Disp.sin(1) tonne.m	114,481
Max deck inclination deg	0,5221
Trim angle (+ve by stern) deg	0,4422

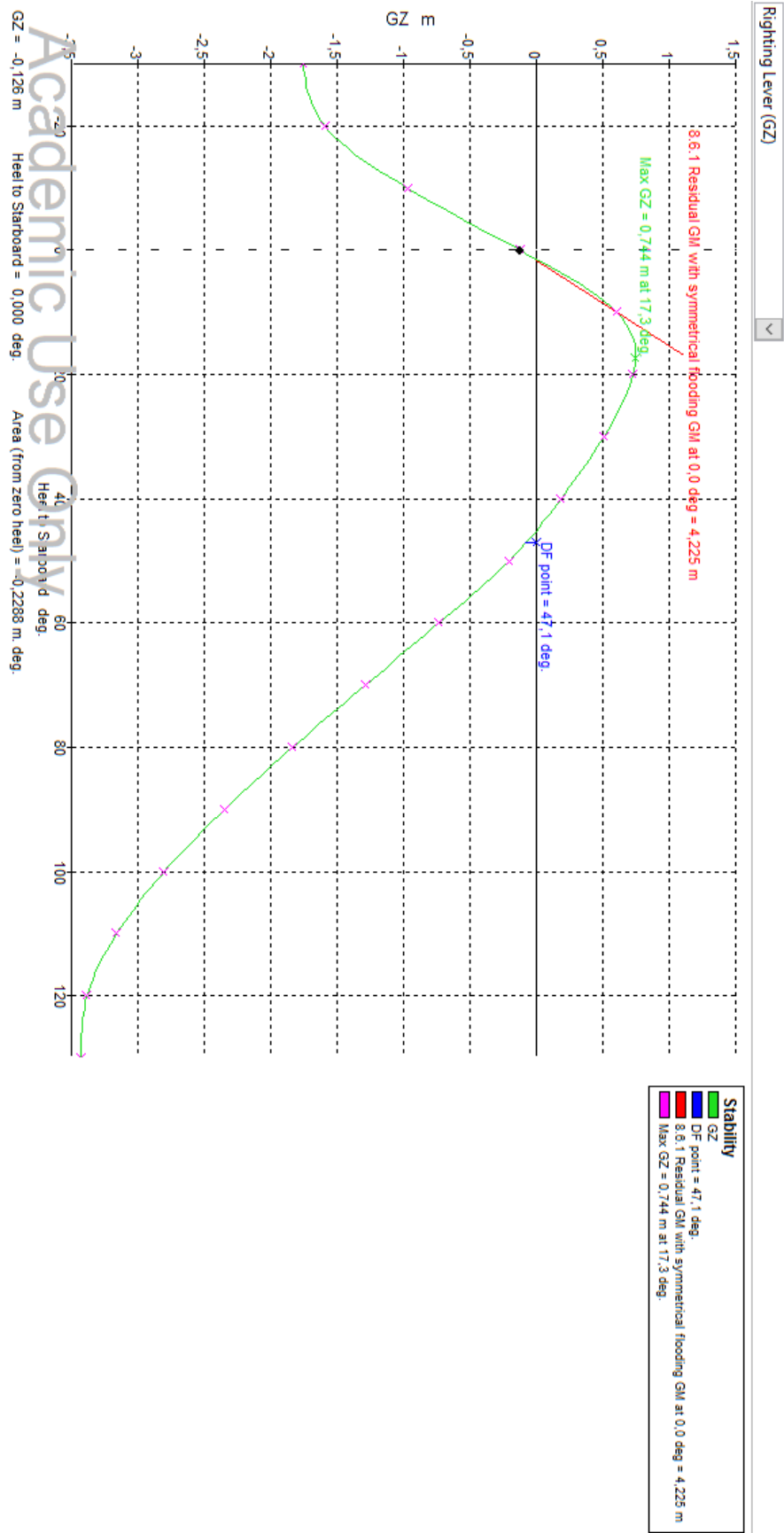
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	0,3	deg	0,3		
	to the lesser of					
	first downflooding angle	53,5	deg	53,5		
	angle of vanishing stability	69,7	deg			
	shall not be less than (>=)	15	deg	53,2	Pass	254,5
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	0,3	deg	0,3		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	53,5	deg			
	angle of vanishing stability	69,7	deg			
	shall not be less than (>=)	0,015	m.rad	0,4682	Pass	3021,41
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	0,3	deg			
	to the lesser of					
	angle of max. GZ	36,4	deg	36,4		
	shall be greater than (>)	0,05	m	1,694	Pass	3288
	Intermediate values					
	angle at which this GZ occurs		deg	36,4		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	0,3	deg			
	to the lesser of					
	angle of vanishing stability	69,7	deg	69,7		
	shall be greater than (>)	12	deg	42,7	Pass	255,97
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,363	Pass	8626
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	0,3	Pass	96,03
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	0,3	Pass	95,93
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	0,846	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	6,5	deg	6,5		
	shall be less than (<)	100	%	4,41	Pass	95,59
	Intermediate values					
	Equilibrium angle		deg	0,3		



3.2.11.- Avería 3. Máxima carga

Draft Amidships m	3,599
Displacement t	1503
Heel deg	1,7
Draft at FP m	3,275
Draft at AP m	3,922
Draft at LCF m	3,625
Trim (+ve by stern) m	0,647
WL Length m	59,905
Beam max extents on WL m	16,854
Wetted Area m ²	949,477
Waterpl. Area m ²	760,133
Prismatic coeff. (Cp)	0,530
Block coeff. (Cb)	0,385
Max Sect. area coeff. (Cm)	0,773
Waterpl. area coeff. (Cwp)	0,753
LCB from zero pt. (+ve fwd) m	-0,054
LCF from zero pt. (+ve fwd) m	0,185
KB m	2,415
KG fluid m	7,000
BMt m	8,816
BML m	110,547
GMt corrected m	4,228
GML m	105,960
KMt m	11,226
KML m	112,904
Immersion (TPc) tonne/cm	7,601
MTc tonne.m	29,076
RM at 1deg = GMt.Disp.sin(1) tonne.m	110,918
Max deck inclination deg	1,8586
Trim angle (+ve by stern) deg	0,6772

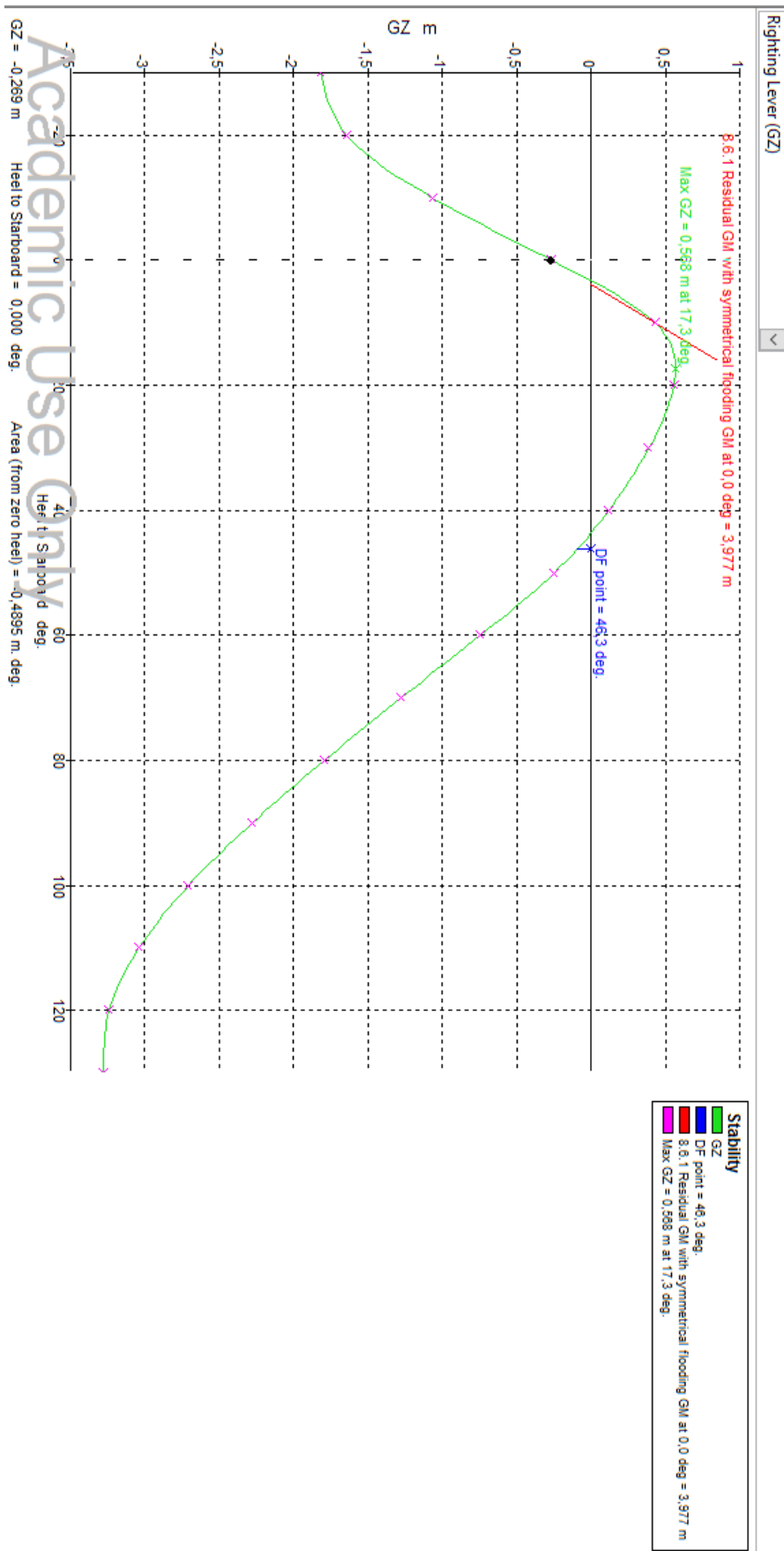
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	1,4	deg	1,4		
	to the lesser of					
	first downflooding angle	47,1	deg			
	angle of vanishing stability	45,1	deg	45,1		
	shall not be less than (>=)	15	deg	43,6	Pass	190,77
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	1,4	deg	1,4		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	47,1	deg			
	angle of vanishing stability	45,1	deg			
	shall not be less than (>=)	0,015	m.rad	0,2553	Pass	1602,14
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	1,4	deg			
	to the lesser of					
	angle of max. GZ	17,3	deg			
	shall be greater than (>)	0,05	m	0,589	Pass	1078
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	1,4	deg			
	to the lesser of					
	angle of vanishing stability	45,1	deg	45,1		
	shall be greater than (>)	12	deg	18,1	Pass	50,49
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,225	Pass	8350
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	1,7	Pass	75,27
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	1,4	Pass	79,39
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	0,468	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	4,9	deg	4,9		
	shall be less than (<)	100	%	29,32	Pass	70,68
	Intermediate values					
	Equilibrium angle		deg	1,4		



3.2.12.- Avería 4. Máxima carga

Draft Amidships m	3,680
Displacement t	1503
Heel deg	3,8
Draft at FP m	3,303
Draft at AP m	4,057
Draft at LCF m	3,720
Trim (+ve by stern) m	0,753
WL Length m	60,081
Beam max extents on WL m	16,958
Wetted Area m ²	989,454
Waterpl. Area m ²	776,973
Prismatic coeff. (Cp)	0,511
Block coeff. (Cb)	0,370
Max Sect. area coeff. (Cm)	0,774
Waterpl. area coeff. (Cwp)	0,763
LCB from zero pt. (+ve fwd) m	-0,058
LCF from zero pt. (+ve fwd) m	-0,547
KB m	2,517
KG fluid m	7,000
BMt m	9,094
BML m	123,623
GMt corrected m	4,601
GML m	119,130
KMt m	11,591
KML m	125,863
Immersion (TPc) tonne/cm	7,770
MTc tonne.m	32,687
RM at 1deg = GMt.Disp.sin(1) tonne.m	120,693
Max deck inclination deg	3,8370
Trim angle (+ve by stern) deg	0,7879

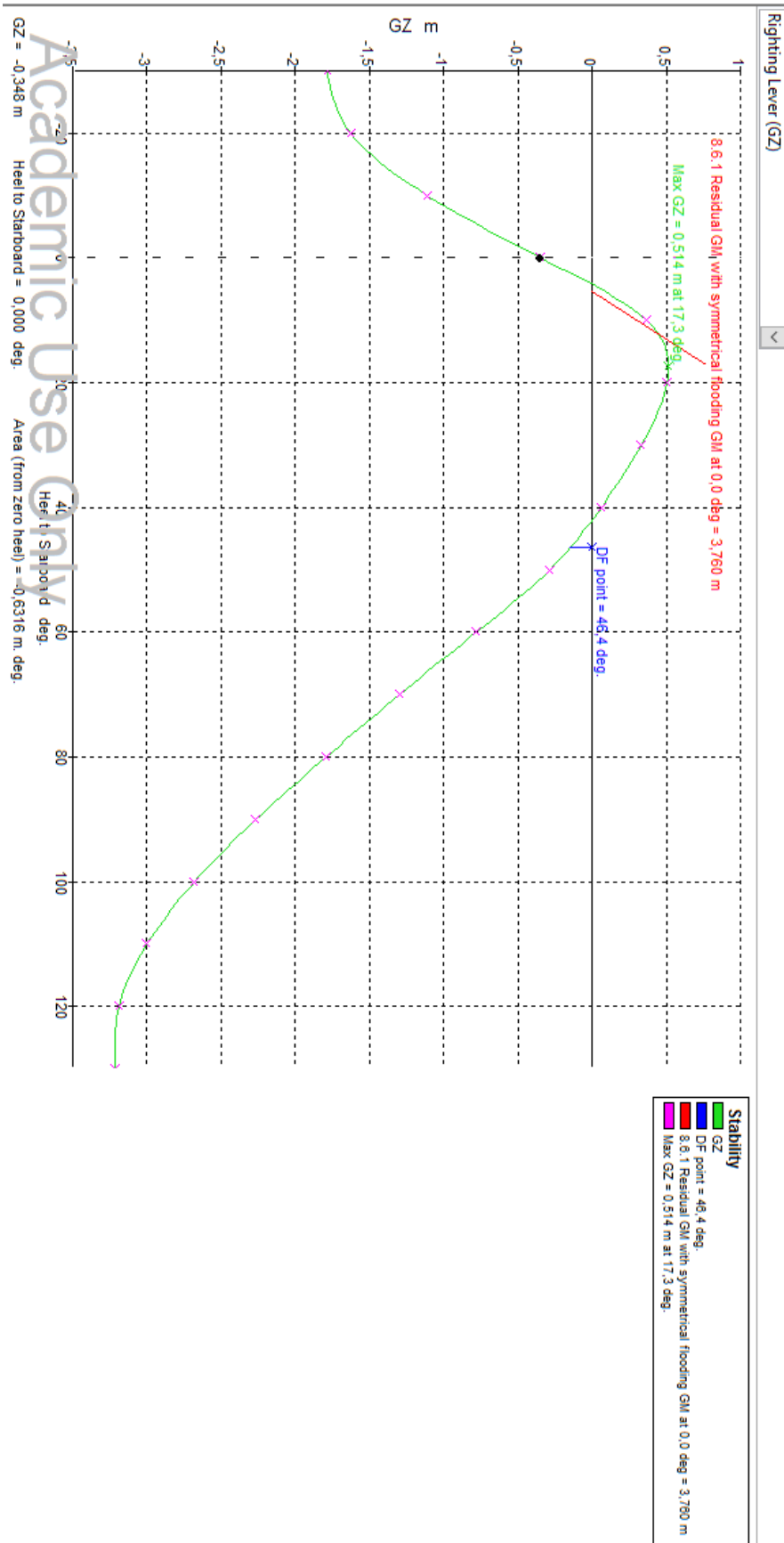
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	3,3	deg	3,3		
	to the lesser of					
	first downflooding angle	46,3	deg			
	angle of vanishing stability	43,6	deg	43,6		
	shall not be less than (\geq)	15	deg	40,3	Pass	168,82
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	3,3	deg	3,3		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	46,3	deg			
	angle of vanishing stability	43,6	deg			
	shall not be less than (\geq)	0,015	m.rad	0,1832	Pass	1121,35
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	3,3	deg			
	to the lesser of					
	angle of max. GZ	17,3	deg			
	shall be greater than ($>$)	0,05	m	0,454	Pass	808
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	3,3	deg			
	to the lesser of					
	angle of vanishing stability	43,6	deg	43,6		
	shall be greater than ($>$)	12	deg	16,6	Pass	38,52
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (\geq)	0,05	m	3,977	Pass	7854
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)	7	deg	3,8	Pass	46,35
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)	7	deg	3,3	Pass	52,87
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)	0	m	0,043	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	4,1	deg	4,1		
	shall be less than ($<$)	100	%	81,21	Pass	18,79
	Intermediate values					
	Equilibrium angle		deg	3,3		



3.2.13.- Avería 5. Máxima carga

Draft Amidships m	3,676
Displacement t	1503
Heel deg	5,0
Draft at FP m	3,511
Draft at AP m	3,842
Draft at LCF m	3,693
Trim (+ve by stern) m	0,330
WL Length m	60,101
Beam max extents on WL m	16,965
Wetted Area m ²	984,924
Waterpl. Area m ²	779,836
Prismatic coeff. (Cp)	0,514
Block coeff. (Cb)	0,387
Max Sect. area coeff. (Cm)	0,776
Waterpl. area coeff. (Cwp)	0,765
LCB from zero pt. (+ve fwd) m	-0,029
LCF from zero pt. (+ve fwd) m	-0,336
KB m	2,522
KG fluid m	7,000
BMt m	9,234
BML m	125,748
GMt corrected m	4,739
GML m	121,252
KMt m	11,721
KML m	127,789
Immersion (TPc) tonne/cm	7,798
MTc tonne.m	33,269
RM at 1deg = GMt.Disp.sin(1) tonne.m	124,297
Max deck inclination deg	5,0118
Trim angle (+ve by stern) deg	0,3456

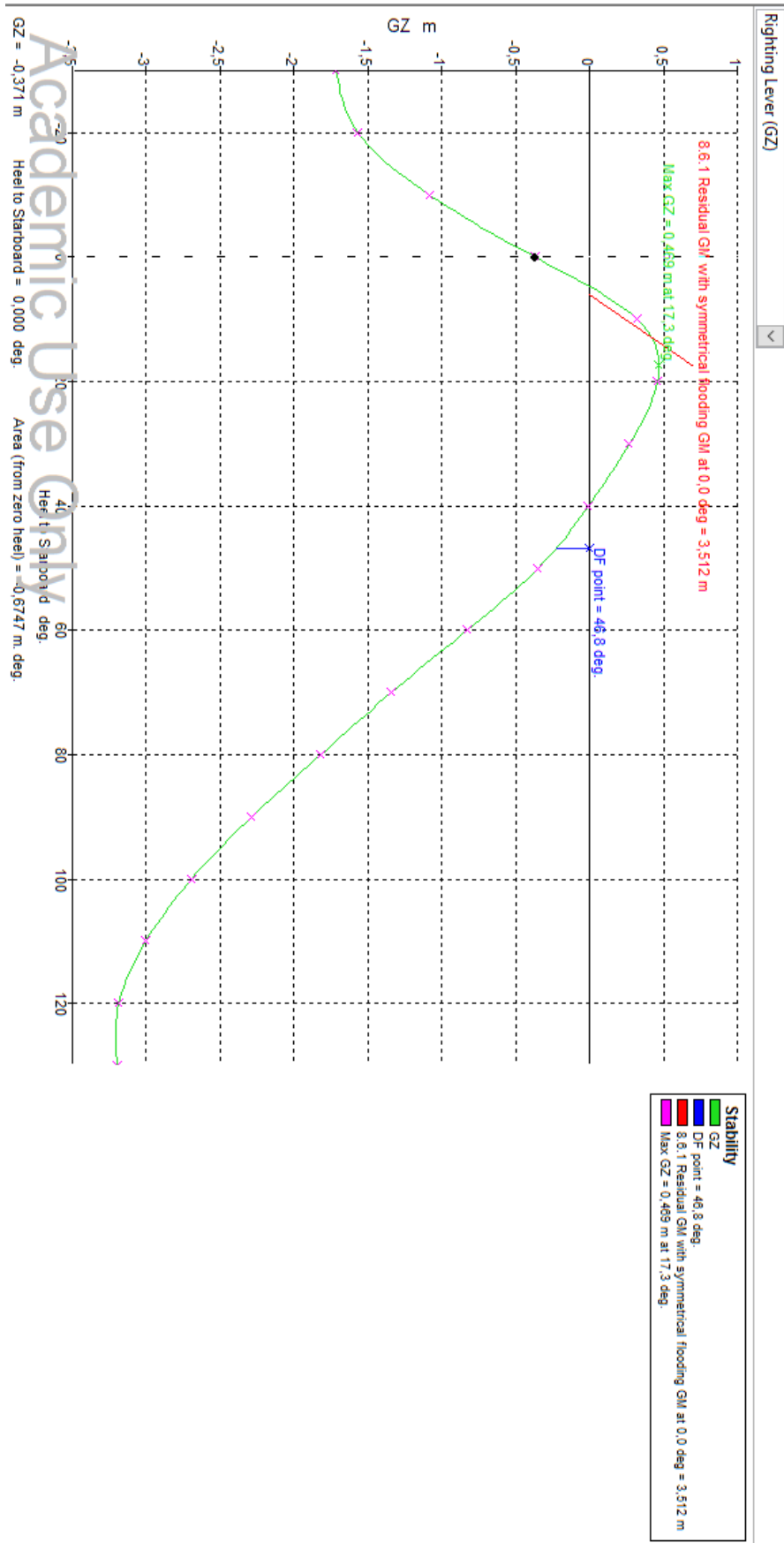
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	4,3	deg	4,3		
	to the lesser of					
	first downflooding angle	46,4	deg			
	angle of vanishing stability	42	deg	42		
	shall not be less than (\geq)	15	deg	37,7	Pass	151,43
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	4,3	deg	4,3		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	46,4	deg			
	angle of vanishing stability	42	deg			
	shall not be less than (\geq)	0,015	m.rad	0,1595	Pass	963,08
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,3	deg			
	to the lesser of					
	angle of max. GZ	17,3	deg			
	shall be greater than ($>$)	0,05	m	0,397	Pass	694
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,3	deg			
	to the lesser of					
	angle of vanishing stability	42	deg	42		
	shall be greater than ($>$)	12	deg	15	Pass	24,79
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (\geq)	0,05	m	3,76	Pass	7420
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)	7	deg	5	Pass	28,57
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)	7	deg	4,3	Pass	39,13
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)	0	m	0,077	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	5,6	deg	5,6		
	shall be less than ($<$)	100	%	75,98	Pass	24,02
	Intermediate values					
	Equilibrium angle		deg	4,3		



3.2.14.- Avería 6. Máxima carga

Draft Amidships m	3,641
Displacement t	1503
Heel deg	5,6
Draft at FP m	3,636
Draft at AP m	3,645
Draft at LCF m	3,641
Trim (+ve by stern) m	0,009
WL Length m	60,069
Beam max extents on WL m	16,935
Wetted Area m ²	975,499
Waterpl. Area m ²	773,196
Prismatic coeff. (Cp)	0,523
Block coeff. (Cb)	0,405
Max Sect. area coeff. (Cm)	0,776
Waterpl. area coeff. (Cwp)	0,760
LCB from zero pt. (+ve fwd) m	-0,002
LCF from zero pt. (+ve fwd) m	-0,019
KB m	2,462
KG fluid m	7,000
BMt m	9,081
BML m	124,319
GMt corrected m	4,521
GML m	119,759
KMt m	11,500
KML m	126,188
Immersion (TPc) tonne/cm	7,732
MTc tonne.m	32,859
RM at 1deg = GMt.Disp.sin(1) tonne.m	118,596
Max deck inclination deg	5,5999
Trim angle (+ve by stern) deg	0,0093

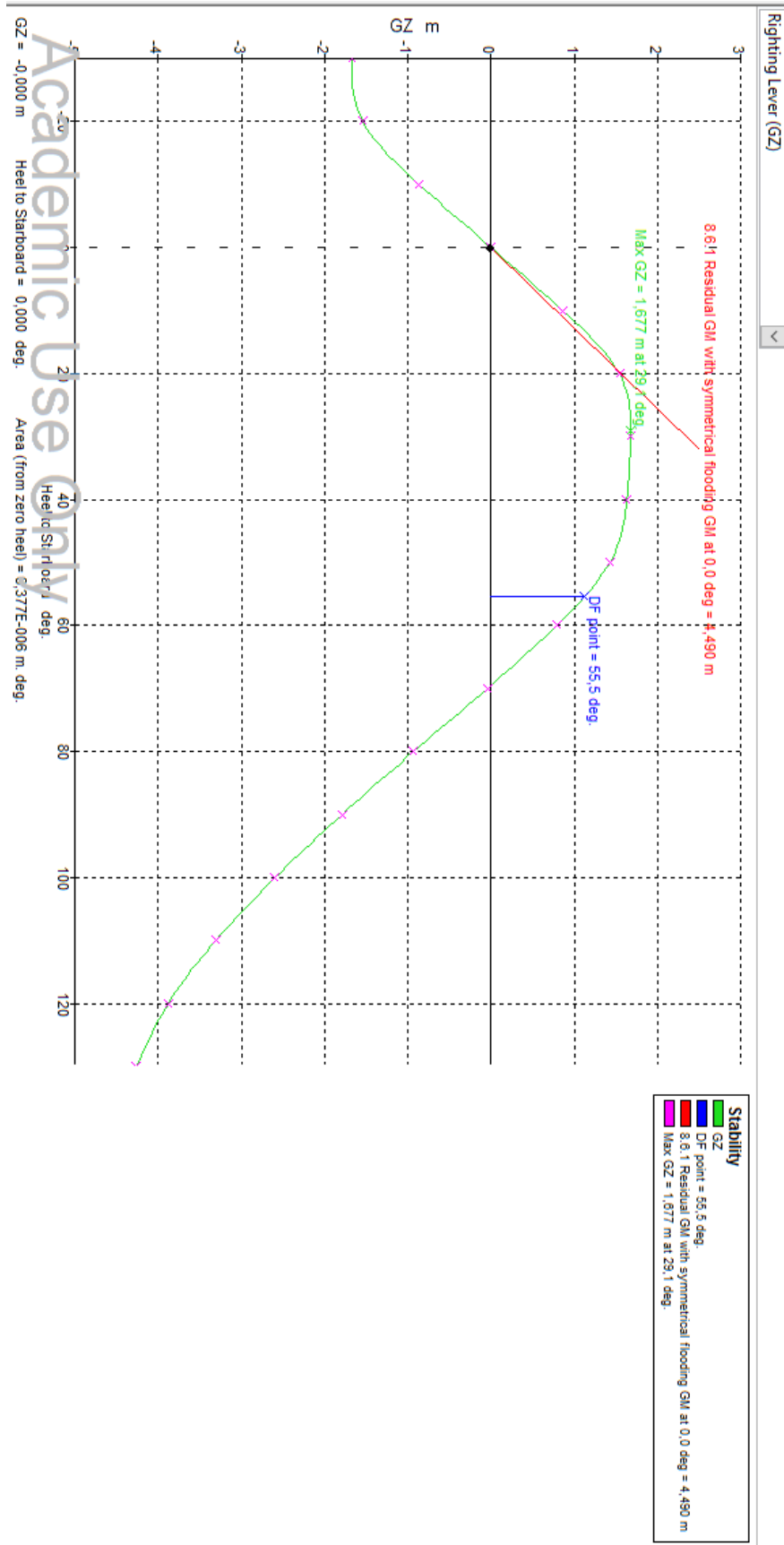
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	4,8	deg	4,8		
	to the lesser of					
	first downflooding angle	46,8	deg			
	angle of vanishing stability	39,7	deg	39,7		
	shall not be less than (>=)	15	deg	34,9	Pass	132,96
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	4,8	deg	4,8		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	46,8	deg			
	angle of vanishing stability	39,7	deg			
	shall not be less than (>=)	0,015	m.rad	0,1413	Pass	841,97
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,8	deg			
	to the lesser of					
	angle of max. GZ	17,3	deg			
	shall be greater than (>)	0,05	m	0,34	Pass	580
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,8	deg			
	to the lesser of					
	angle of vanishing stability	39,7	deg	39,7		
	shall be greater than (>)	12	deg	12,7	Pass	5,8
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	3,512	Pass	6924
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	5,6	Pass	20
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	4,8	Pass	32,11
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	0,16	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	6,8	deg	6,8		
	shall be less than (<)	100	%	69,91	Pass	30,09
	Intermediate values					
	Equilibrium angle		deg	4,8		



3.2.15.- Avería 1. Carga parcial

Draft Amidships m	3,369
Displacement t	1393
Heel deg	0,0
Draft at FP m	3,225
Draft at AP m	3,512
Draft at LCF m	3,375
Trim (+ve by stern) m	0,287
WL Length m	59,575
Beam max extents on WL m	16,630
Wetted Area m ²	907,578
Waterpl. Area m ²	727,611
Prismatic coeff. (Cp)	0,542
Block coeff. (Cb)	0,403
Max Sect. area coeff. (Cm)	0,768
Waterpl. area coeff. (Cwp)	0,734
LCB from zero pt. (+ve fwd) m	-0,028
LCF from zero pt. (+ve fwd) m	1,196
KB m	2,236
KG fluid m	7,150
Bmt m	9,404
BML m	104,455
Gmt corrected m	4,490
GML m	99,541
KMt m	11,640
KML m	106,690
Immersion (TPc) tonne/cm	7,276
MTc tonne.m	25,314
RM at 1deg = Gmt.Disp.sin(1) tonne.m	109,153
Max deck inclination deg	0,2999
Trim angle (+ve by stern) deg	0,2999

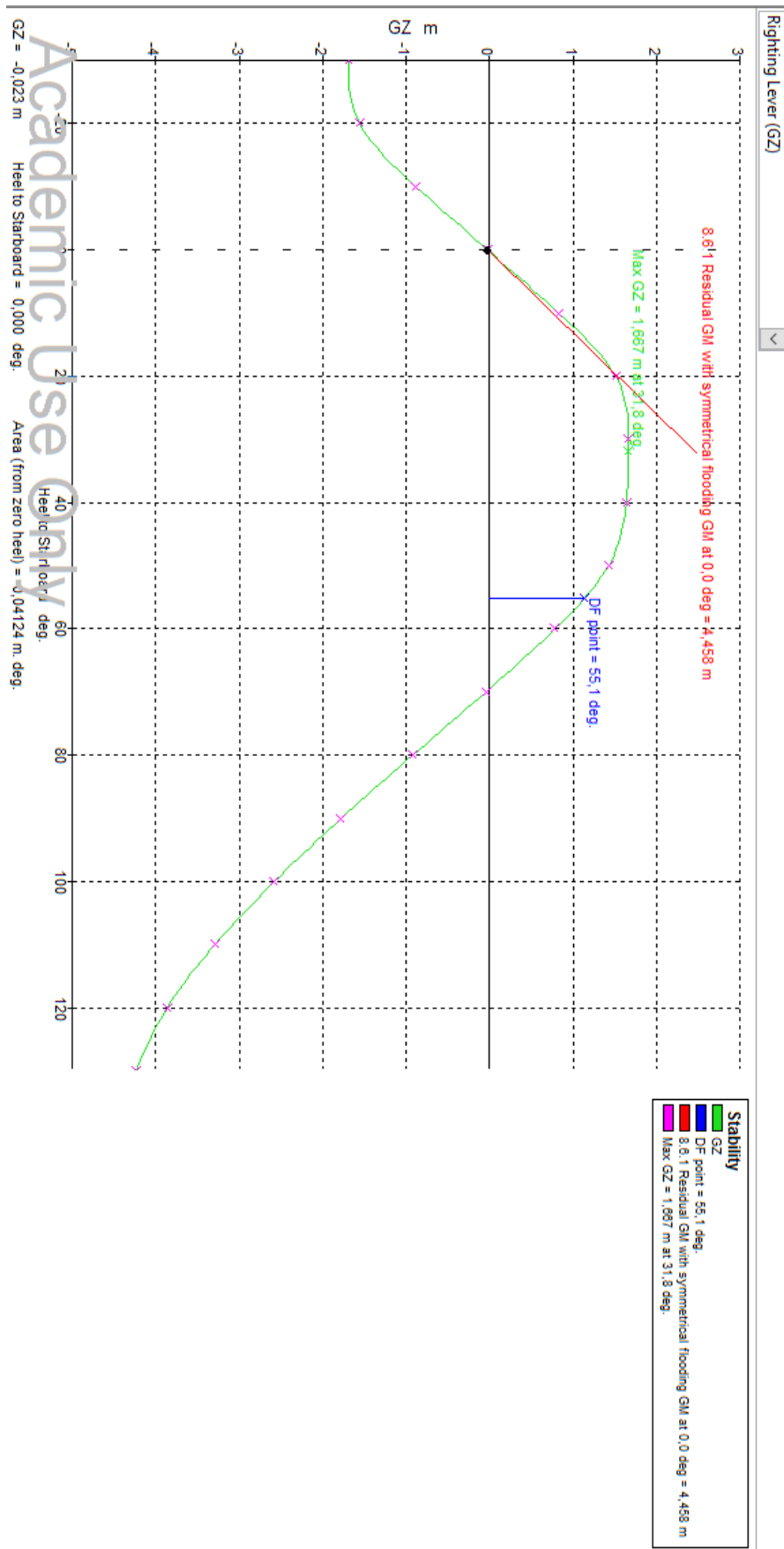
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	0 deg		0		
	to the lesser of					
	first downflooding angle	55,5 deg		55,5		
	angle of vanishing stability	69,5 deg				
	shall not be less than (\geq)	15 deg		55,5	Pass	269,79
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	0 deg		0		
	to the lesser of					
	spec. heel angle	27 deg		27		
	first downflooding angle	55,5 deg				
	angle of vanishing stability	69,5 deg				
	shall not be less than (\geq)	0,015 m.rad		0,4905	Pass	3169,87
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27 deg		27		
	angle of equilibrium	0 deg				
	to the lesser of					
	angle of max. GZ	29,1 deg		29,1		
	shall be greater than ($>$)	0,05 m		1,677	Pass	3254
	Intermediate values					
	angle at which this GZ occurs		deg	29,1		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27 deg		27		
	angle of equilibrium	0 deg				
	to the lesser of					
	angle of vanishing stability	69,5 deg		69,5		
	shall be greater than ($>$)	12 deg		42,5	Pass	254,11
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0 deg				
	shall not be less than (\geq)	0,05 m		4,49	Pass	8880
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)	7 deg		0	Pass	100
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)	7 deg		0	Pass	100
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)	0 m		1,113	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	8,2 deg		8,2		
	shall be less than ($<$)	100 %		0	Pass	100
	Intermediate values					
	Equilibrium angle		deg	0		



3.2.16.- Avería 2. Carga parcial

Draft Amidships m	3,384
Displacement t	1393
Heel deg	0,2
Draft at FP m	3,192
Draft at AP m	3,576
Draft at LCF m	3,394
Trim (+ve by stern) m	0,384
WL Length m	59,610
Beam max extents on WL m	16,647
Wetted Area m ²	910,665
Waterpl. Area m ²	732,803
Prismatic coeff. (Cp)	0,537
Block coeff. (Cb)	0,396
Max Sect. area coeff. (Cm)	0,768
Waterpl. area coeff. (Cwp)	0,738
LCB from zero pt. (+ve fwd) m	-0,038
LCF from zero pt. (+ve fwd) m	0,883
KB m	2,247
KG fluid m	7,150
BMt m	9,362
BML m	107,643
GMt corrected m	4,459
GML m	102,739
KMt m	11,609
KML m	109,886
Immersion (TPc) tonne/cm	7,328
MTc tonne.m	26,127
RM at 1deg = GMt.Disp.sin(1) tonne.m	108,403
Max deck inclination deg	0,4693
Trim angle (+ve by stern) deg	0,4015

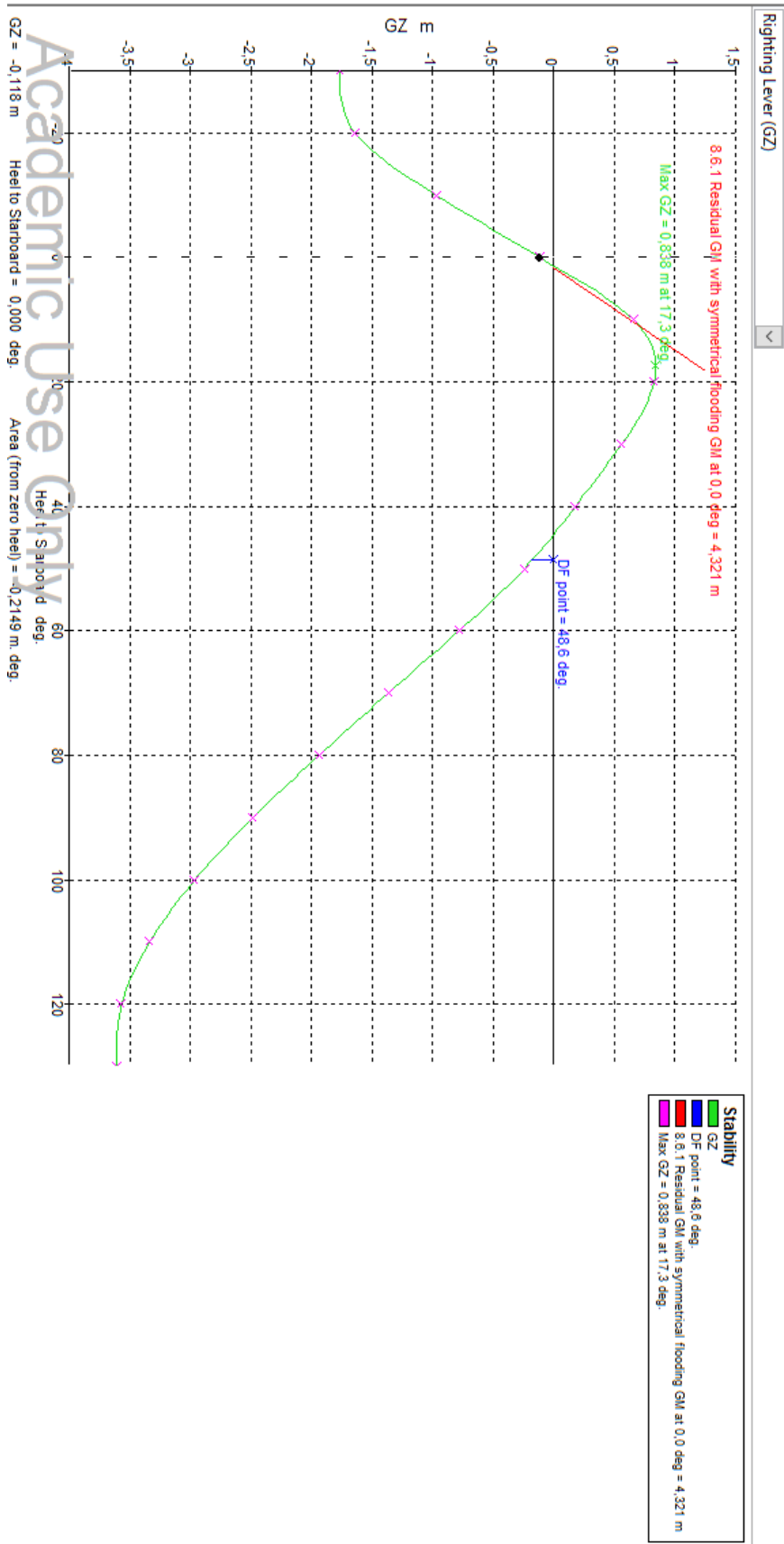
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	0,3	deg	0,3		
	to the lesser of					
	first downflooding angle	55,1	deg	55,1		
	angle of vanishing stability	69,5	deg			
	shall not be less than (>=)	15	deg	54,9	Pass	265,75
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	0,3	deg	0,3		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	55,1	deg			
	angle of vanishing stability	69,5	deg			
	shall not be less than (>=)	0,015	m.rad	0,4771	Pass	3080,55
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	0,3	deg			
	to the lesser of					
	angle of max. GZ	31,8	deg	31,8		
	shall be greater than (>)	0,05	m	1,667	Pass	3234
	Intermediate values					
	angle at which this GZ occurs		deg	31,8		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	0,3	deg			
	to the lesser of					
	angle of vanishing stability	69,5	deg	69,5		
	shall be greater than (>)	12	deg	42,5	Pass	254,27
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,458	Pass	8816
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	0,2	Pass	96,53
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	0,3	Pass	96,24
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	1,02	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	7,6	deg	7,6		
	shall be less than (<)	100	%	3,45	Pass	96,55
	Intermediate values					
	Equilibrium angle		deg	0,3		



3.2.17.- Avería 3. Carga parcial

Draft Amidships m	3,453
Displacement t	1393
Heel deg	1,6
Draft at FP m	3,134
Draft at AP m	3,772
Draft at LCF m	3,479
Trim (+ve by stern) m	0,638
WL Length m	59,741
Beam max extents on WL m	16,720
Wetted Area m ²	924,090
Waterpl. Area m ²	746,886
Prismatic coeff. (Cp)	0,520
Block coeff. (Cb)	0,375
Max Sect. area coeff. (Cm)	0,769
Waterpl. area coeff. (Cwp)	0,748
LCB from zero pt. (+ve fwd) m	-0,056
LCF from zero pt. (+ve fwd) m	0,152
KB m	2,325
KG fluid m	7,150
BMt m	9,145
BML m	115,441
GMt corrected m	4,318
GML m	110,613
KMt m	11,466
KML m	117,713
Immersion (TPc) tonne/cm	7,469
MTc tonne.m	28,132
RM at 1deg = GMt.Disp.sin(1) tonne.m	104,980
Max deck inclination deg	1,7288
Trim angle (+ve by stern) deg	0,6672

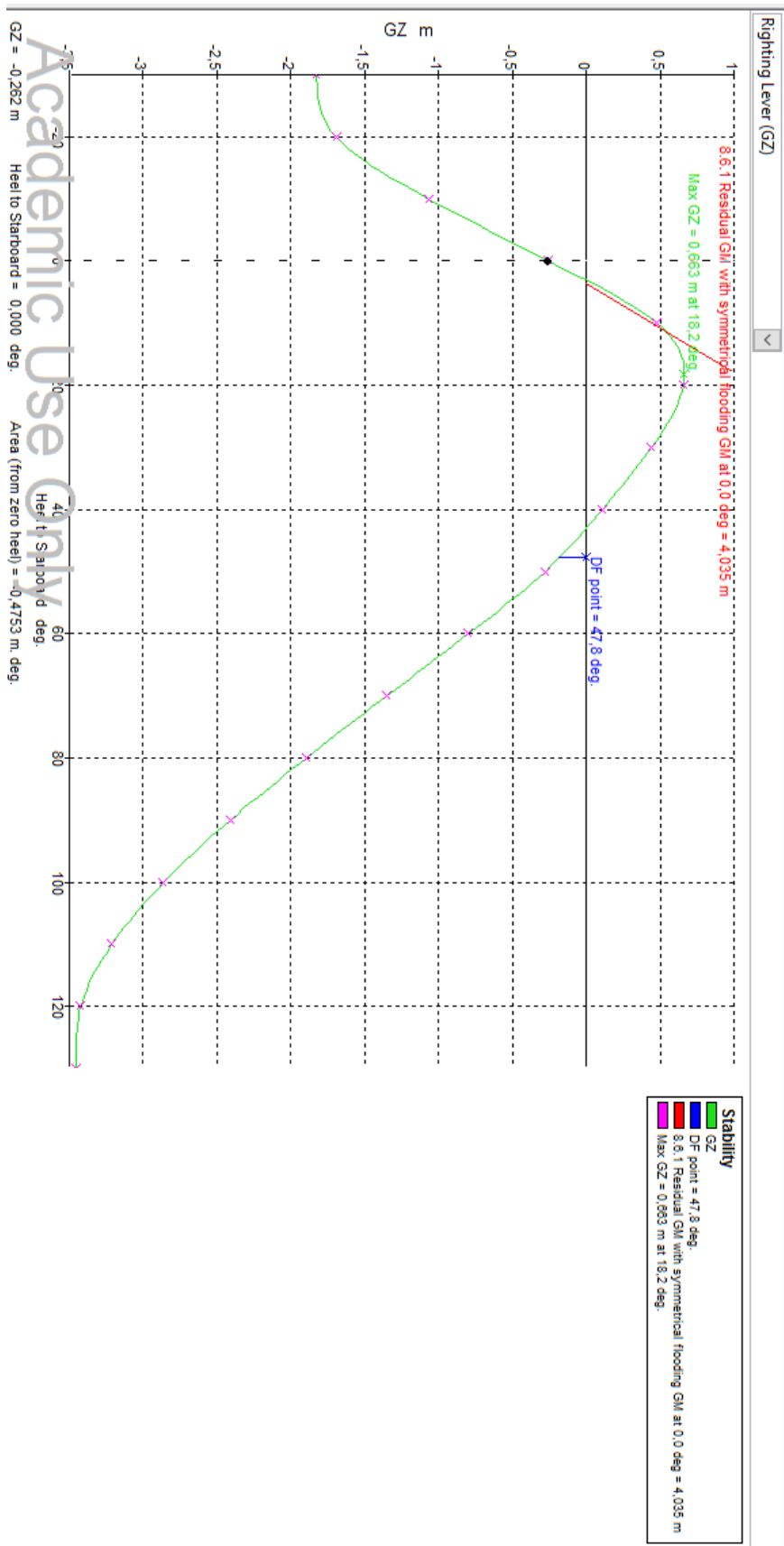
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	1,3	deg	1,3		
	to the lesser of					
	first downflooding angle	48,6	deg			
	angle of vanishing stability	44,4	deg	44,4		
	shall not be less than (>=)	15	deg	43,1	Pass	187,37
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	1,3	deg	1,3		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	48,6	deg			
	angle of vanishing stability	44,4	deg			
	shall not be less than (>=)	0,015	m.rad	0,2844	Pass	1796,23
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	1,3	deg			
	to the lesser of					
	angle of max. GZ	17,3	deg			
	shall be greater than (>)	0,05	m	0,663	Pass	1226
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	1,3	deg			
	to the lesser of					
	angle of vanishing stability	44,4	deg	44,4		
	shall be greater than (>)	12	deg	17,4	Pass	45,3
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,321	Pass	8542
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	1,6	Pass	77,21
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	1,3	Pass	81
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	0,638	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	6	deg	6		
	shall be less than (<)	100	%	22,35	Pass	77,65
	Intermediate values					
	Equilibrium angle		deg	1,3		



3.2.18.- Avería 4. Carga parcial

Draft Amidships m	3,535
Displacement t	1393
Heel deg	3,7
Draft at FP m	3,152
Draft at AP m	3,918
Draft at LCF m	3,571
Trim (+ve by stern) m	0,766
WL Length m	59,919
Beam max extents on WL m	16,822
Wetted Area m ²	951,779
Waterpl. Area m ²	750,105
Prismatic coeff. (Cp)	0,500
Block coeff. (Cb)	0,359
Max Sect. area coeff. (Cm)	0,771
Waterpl. area coeff. (Cwp)	0,744
LCB from zero pt. (+ve fwd) m	-0,066
LCF from zero pt. (+ve fwd) m	-0,176
KB m	2,428
KG fluid m	7,150
Bmt m	9,043
BML m	123,105
GMt corrected m	4,310
GML m	118,372
KMt m	11,451
KML m	125,264
Immersion (TPc) tonne/cm	7,501
MTc tonne.m	30,102
RM at 1deg = GMt.Disp.sin(1) tonne.m	104,788
Max deck inclination deg	3,7844
Trim angle (+ve by stern) deg	0,8012

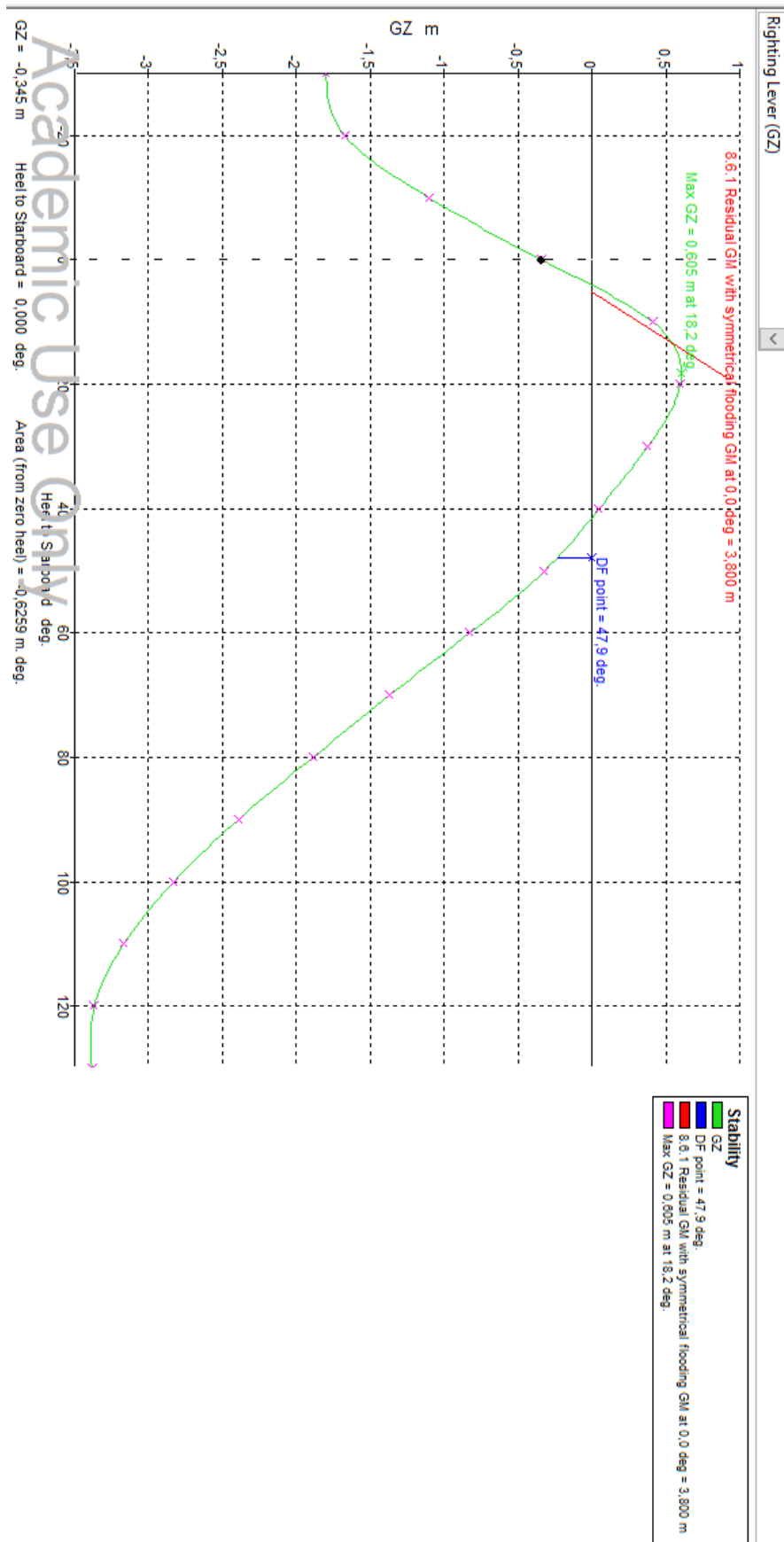
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	3,1	deg	3,1		
	to the lesser of					
	first downflooding angle	47,8	deg			
	angle of vanishing stability	43	deg	43		
	shall not be less than (>=)	15	deg	39,9	Pass	166,19
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	3,1	deg	3,1		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	47,8	deg			
	angle of vanishing stability	43	deg			
	shall not be less than (>=)	0,015	m.rad	0,2118	Pass	1311,77
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	3,1	deg			
	to the lesser of					
	angle of max. GZ	18,2	deg			
	shall be greater than (>)	0,05	m	0,526	Pass	952
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	3,1	deg			
	to the lesser of					
	angle of vanishing stability	43	deg	43		
	shall be greater than (>)	12	deg	16	Pass	33,69
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,035	Pass	7970
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	3,7	Pass	47,16
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	3,1	Pass	55,53
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	0,189	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	5,1	deg	5,1		
	shall be less than (<)	100	%	61,24	Pass	38,76
	Intermediate values					
	Equilibrium angle		deg	3,1		



3.2.19.- Avería 5. Carga parcial

Draft Amidships m	3,532
Displacement t	1393
Heel deg	5,0
Draft at FP m	3,363
Draft at AP m	3,701
Draft at LCF m	3,547
Trim (+ve by stern) m	0,338
WL Length m	59,939
Beam max extents on WL m	16,830
Wetted Area m ²	949,533
Waterpl. Area m ²	753,215
Prismatic coeff. (Cp)	0,503
Block coeff. (Cb)	0,376
Max Sect. area coeff. (Cm)	0,773
Waterpl. area coeff. (Cwp)	0,747
LCB from zero pt. (+ve fwd) m	-0,031
LCF from zero pt. (+ve fwd) m	-0,119
KB m	2,434
KG fluid m	7,150
BMt m	9,145
BML m	126,861
GMt corrected m	4,411
GML m	122,127
KMt m	11,544
KML m	128,810
Immersion (TPc) tonne/cm	7,532
MTc tonne.m	31,057
RM at 1deg = GMt.Disp.sin(1) tonne.m	107,236
Max deck inclination deg	5,0123
Trim angle (+ve by stern) deg	0,3531

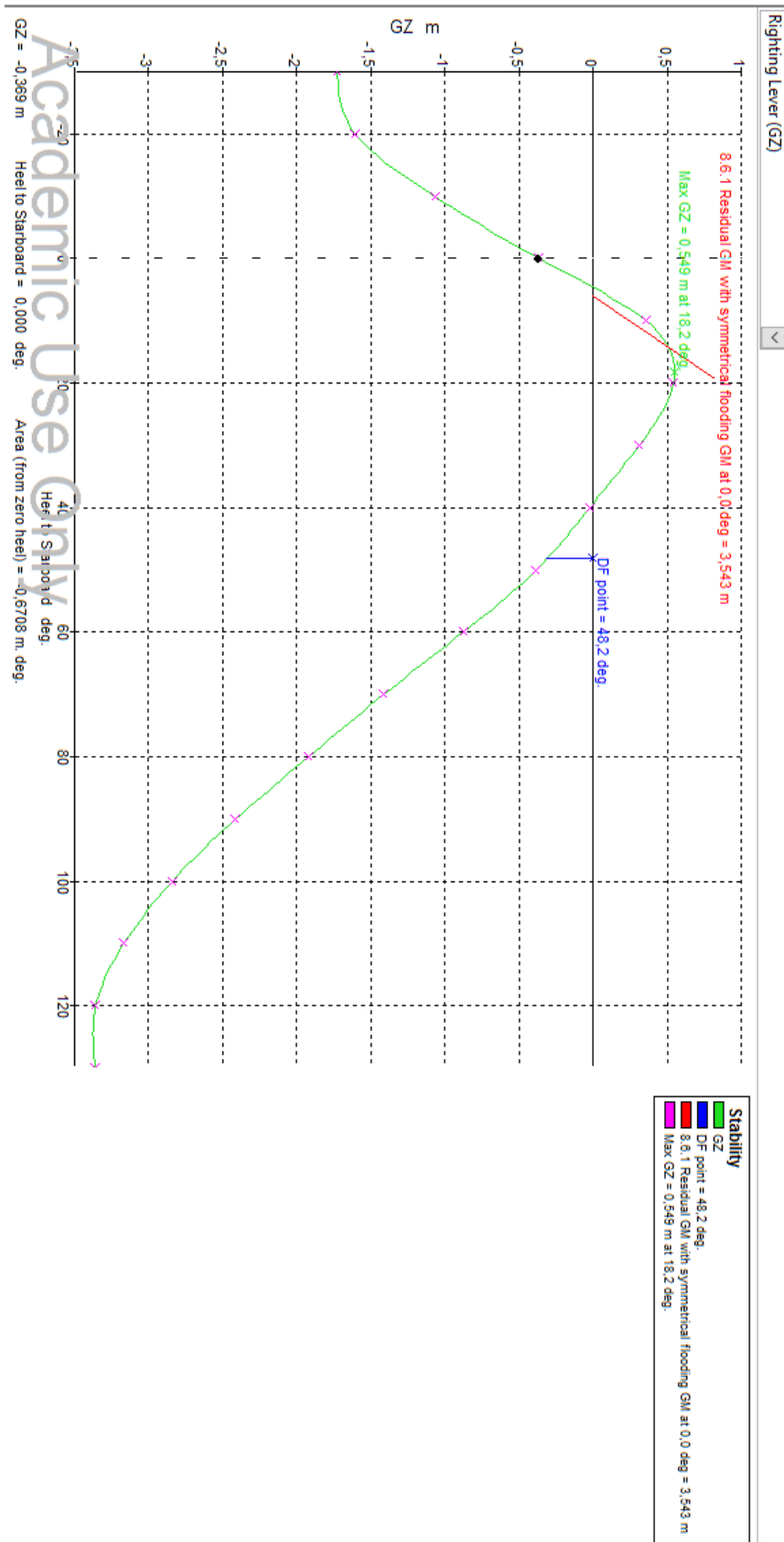
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	4,1	deg	4,1		
	to the lesser of					
	first downflooding angle	47,9	deg			
	angle of vanishing stability	41,4	deg	41,4		
	shall not be less than (\geq)	15	deg	37,3	Pass	148,71
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	4,1	deg	4,1		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	47,9	deg			
	angle of vanishing stability	41,4	deg			
	shall not be less than (\geq)	0,015	m.rad	0,1855	Pass	1136,63
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,1	deg			
	to the lesser of					
	angle of max. GZ	18,2	deg			
	shall be greater than ($>$)	0,05	m	0,465	Pass	830
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,1	deg			
	to the lesser of					
	angle of vanishing stability	41,4	deg	41,4		
	shall be greater than ($>$)	12	deg	14,4	Pass	20,17
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (\geq)	0,05	m	3,8	Pass	7500
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)	7	deg	5	Pass	28,57
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)	7	deg	4,1	Pass	41,24
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)	0	m	0,217	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	6,6	deg	6,6		
	shall be less than ($<$)	100	%	62,06	Pass	37,94
	Intermediate values					
	Equilibrium angle		deg	4,1		



3.2.20.- Avería 6. Carga parcial

Draft Amidships m	3,495
Displacement t	1393
Heel deg	5,7
Draft at FP m	3,491
Draft at AP m	3,500
Draft at LCF m	3,496
Trim (+ve by stern) m	0,009
WL Length m	59,906
Beam max extents on WL m	16,801
Wetted Area m ²	942,251
Waterpl. Area m ²	748,613
Prismatic coeff. (Cp)	0,512
Block coeff. (Cb)	0,396
Max Sect. area coeff. (Cm)	0,773
Waterpl. area coeff. (Cwp)	0,744
LCB from zero pt. (+ve fwd) m	-0,002
LCF from zero pt. (+ve fwd) m	-0,014
KB m	2,374
KG fluid m	7,150
BMt m	9,038
BML m	126,521
GMt corrected m	4,239
GML m	121,722
KMt m	11,368
KML m	128,279
Immersion (TPc) tonne/cm	7,486
MTc tonne.m	30,954
RM at 1deg = GMt.Disp.sin(1) tonne.m	103,043
Max deck inclination deg	5,6557
Trim angle (+ve by stern) deg	0,0096

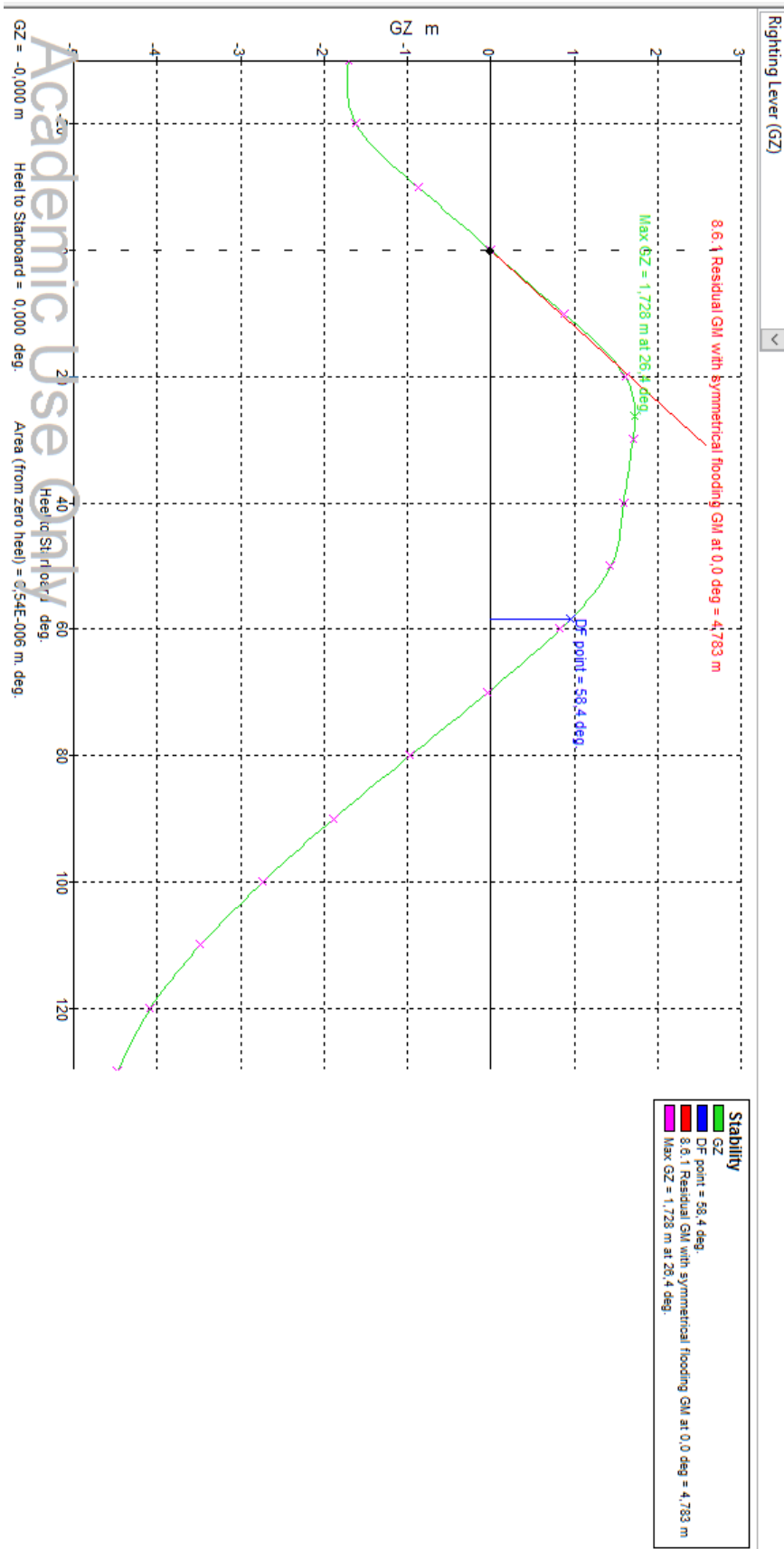
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	4,6	deg	4,6		
	to the lesser of					
	first downflooding angle	48,2	deg			
	angle of vanishing stability	39,3	deg	39,3		
	shall not be less than (\geq)	15	deg	34,7	Pass	131,14
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	4,6	deg	4,6		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	48,2	deg			
	angle of vanishing stability	39,3	deg			
	shall not be less than (\geq)	0,015	m.rad	0,1638	Pass	992,28
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,6	deg			
	to the lesser of					
	angle of max. GZ	18,2	deg			
	shall be greater than ($>$)	0,05	m	0,402	Pass	704
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,6	deg			
	to the lesser of					
	angle of vanishing stability	39,3	deg	39,3		
	shall be greater than ($>$)	12	deg	12,3	Pass	2,55
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (\geq)	0,05	m	3,543	Pass	6986
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)	7	deg	5,7	Pass	19,2
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)	7	deg	4,6	Pass	33,77
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)	0	m	0,296	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	7,8	deg	7,8		
	shall be less than ($<$)	100	%	59,44	Pass	40,56
	Intermediate values					
	Equilibrium angle		deg	4,6		



3.2.21.- *Avería 1. Mínima carga*

Draft Amidships m	3,132
Displacement t	1221
Heel deg	0,0
Draft at FP m	3,067
Draft at AP m	3,198
Draft at LCF m	3,135
Trim (+ve by stern) m	0,131
WL Length m	59,321
Beam max extents on WL m	16,392
Wetted Area m ²	869,284
Waterpl. Area m ²	707,846
Prismatic coeff. (Cp)	0,526
Block coeff. (Cb)	0,394
Max Sect. area coeff. (Cm)	0,761
Waterpl. area coeff. (Cwp)	0,728
LCB from zero pt. (+ve fwd) m	0,114
LCF from zero pt. (+ve fwd) m	1,184
KB m	2,091
KG fluid m	7,350
BMt m	10,042
BML m	113,318
GMt corrected m	4,783
GML m	108,059
KMt m	12,133
KML m	115,408
Immersion (TPc) tonne/cm	7,078
MTc tonne.m	24,089
RM at 1deg = GMt.Disp.sin(1) tonne.m	101,934
Max deck inclination deg	0,1375
Trim angle (+ve by stern) deg	0,1375

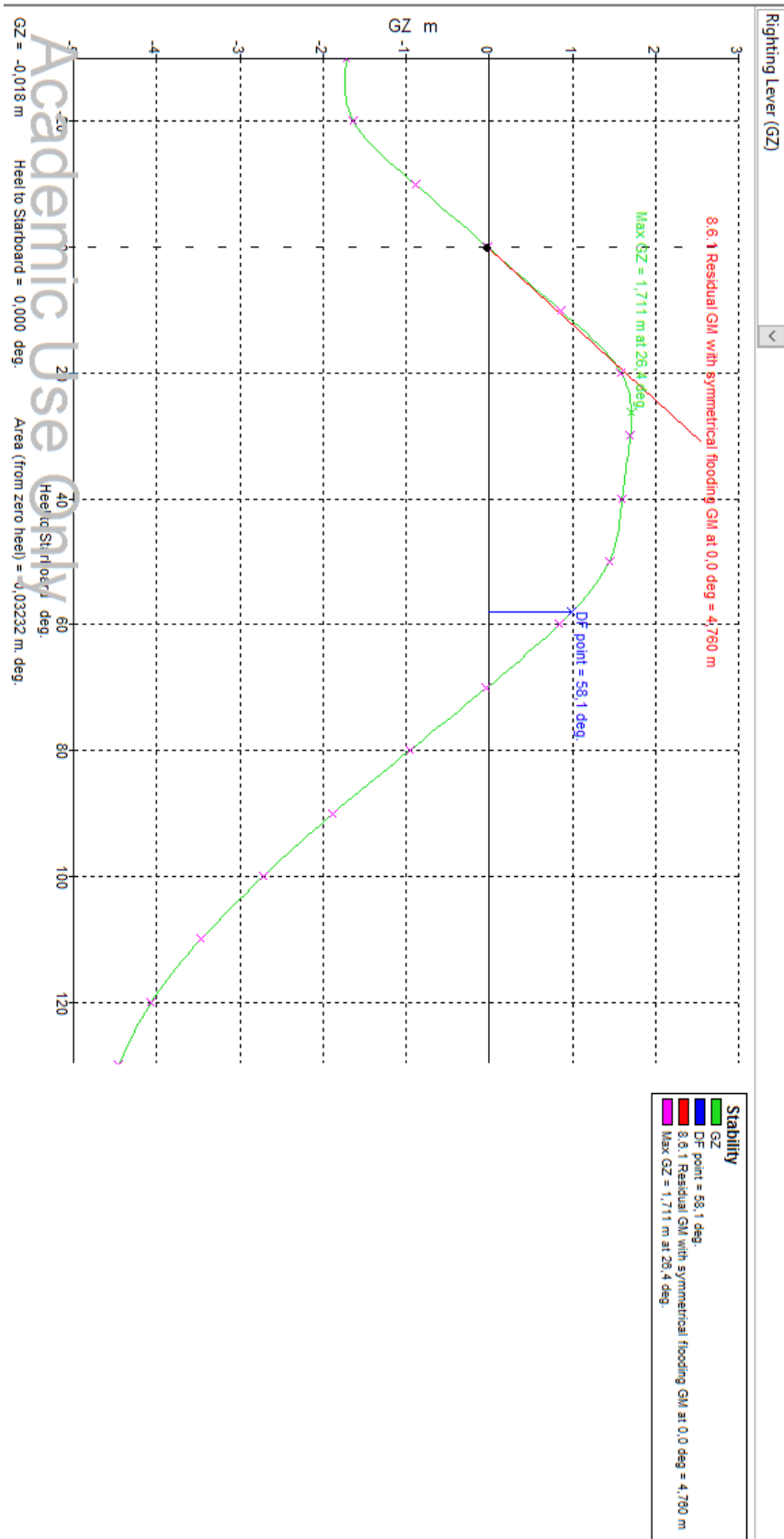
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium		0 deg	0		
	to the lesser of					
	first downflooding angle		58,4 deg	58,4		
	angle of vanishing stability		69,6 deg			
	shall not be less than (>=)		15 deg	58,4	Pass	289,49
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium		0 deg	0		
	to the lesser of					
	spec. heel angle		27 deg	27		
	first downflooding angle		58,4 deg			
	angle of vanishing stability		69,6 deg			
	shall not be less than (>=)		0,015 m.rad	0,5068	Pass	3278,53
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle		27 deg	27		
	angle of equilibrium		0 deg			
	to the lesser of					
	angle of max. GZ		26,4 deg			
	shall be greater than (>)		0,05 m	1,726	Pass	3352
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle		27 deg	27		
	angle of equilibrium		0 deg			
	to the lesser of					
	angle of vanishing stability		69,6 deg	69,6		
	shall be greater than (>)		12 deg	42,6	Pass	255,26
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle		0 deg			
	shall not be less than (>=)		0,05 m	4,783	Pass	9466
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)		7 deg	0	Pass	100
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)		7 deg	0	Pass	100
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)		0 m	1,443	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline		10,2 deg	10,2		
	shall be less than (<)		100 %	0	Pass	100
	Intermediate values					
	Equilibrium angle		deg	0		



3.2.22.- *Avería 2. Mínima carga*

1	Draft Amidships m	3,149
2	Displacement t	1221
3	Heel deg	0,2
4	Draft at FP m	3,021
5	Draft at AP m	3,277
6	Draft at LCF m	3,156
7	Trim (+ve by stern) m	0,256
8	WL Length m	59,346
9	Beam max extents on WL m	16,415
10	Wetted Area m ²	872,409
11	Waterpl. Area m ²	711,429
12	Prismatic coeff. (Cp)	0,520
13	Block coeff. (Cb)	0,385
14	Max Sect. area coeff. (Cm)	0,762
15	Waterpl. area coeff. (Cwp)	0,730
16	LCB from zero pt. (+ve fwd) m	0,101
17	LCF from zero pt. (+ve fwd) m	0,884
18	KB m	2,100
19	KG fluid m	7,350
20	BMt m	10,010
21	BML m	115,914
22	GMt corrected m	4,760
23	GML m	110,664
24	KMt m	12,110
25	KML m	118,012
26	Immersion (TPc) tonne/cm	7,114
27	MTC tonne.m	24,667
28	RM at 1deg = GMt.Disp.sin(1) tonne.m	101,437
29	Max deck inclination deg	0,3241
30	Trim angle (+ve by stern) deg	0,2677

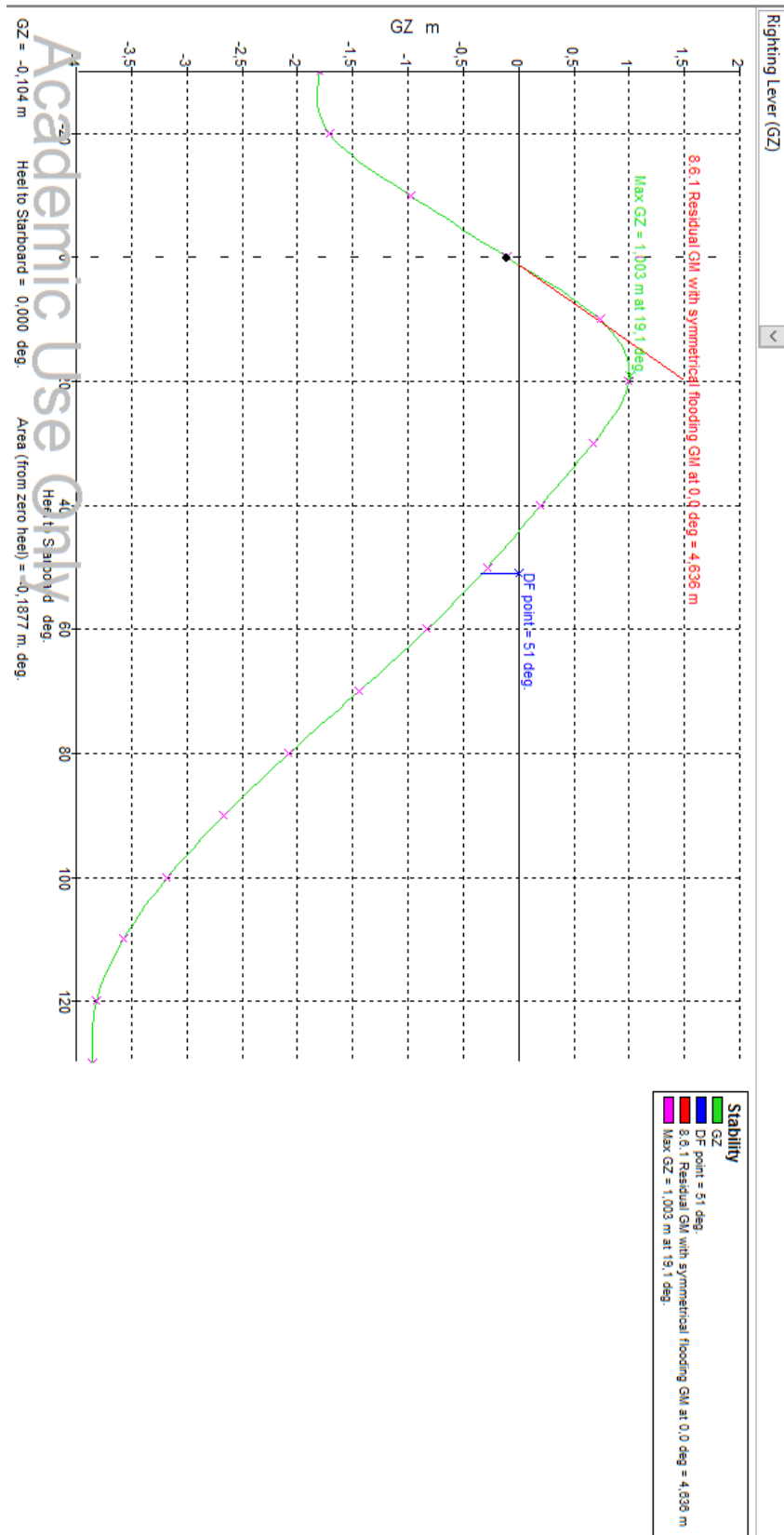
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	0,2	deg	0,2		
	to the lesser of					
	first downflooding angle	58,1	deg	58,1		
	angle of vanishing stability	69,7	deg			
	shall not be less than (>=)	15	deg	57,9	Pass	285,73
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	0,2	deg	0,2		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	58,1	deg			
	angle of vanishing stability	69,7	deg			
	shall not be less than (>=)	0,015	m.rad	0,4968	Pass	3212,29
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	0,2	deg			
	to the lesser of					
	angle of max. GZ	26,4	deg			
	shall be greater than (>)	0,05	m	1,711	Pass	3322
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	0,2	deg			
	to the lesser of					
	angle of vanishing stability	69,7	deg	69,7		
	shall be greater than (>)	12	deg	42,7	Pass	255,63
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,76	Pass	9420
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	0,2	Pass	97,39
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	0,2	Pass	97,07
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	1,337	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	9,5	deg	9,5		
	shall be less than (<)	100	%	2,16	Pass	97,84
	Intermediate values					
	Equilibrium angle		deg	0,2		



3.2.23.- Avería 3. Mínima Carga

Draft Amidships m	3,221
Displacement t	1221
Heel deg	1,3
Draft at FP m	2,938
Draft at AP m	3,505
Draft at LCF m	3,245
Trim (+ve by stern) m	0,566
WL Length m	59,469
Beam max extents on WL m	16,500
Wetted Area m ²	884,648
Waterpl. Area m ²	724,302
Prismatic coeff. (Cp)	0,501
Block coeff. (Cb)	0,360
Max Sect. area coeff. (Cm)	0,764
Waterpl. area coeff. (Cwp)	0,738
LCB from zero pt. (+ve fwd) m	0,074
LCF from zero pt. (+ve fwd) m	0,080
KB m	2,176
KG fluid m	7,350
Bmt m	9,805
BML m	123,674
GMt corrected m	4,629
GML m	118,498
KMt m	11,977
KML m	125,811
Immersion (TPc) tonne/cm	7,243
MTc tonne.m	26,414
RM at 1deg = GMt.Disp.sin(1) tonne.m	98,637
Max deck inclination deg	1,4314
Trim angle (+ve by stern) deg	0,5925

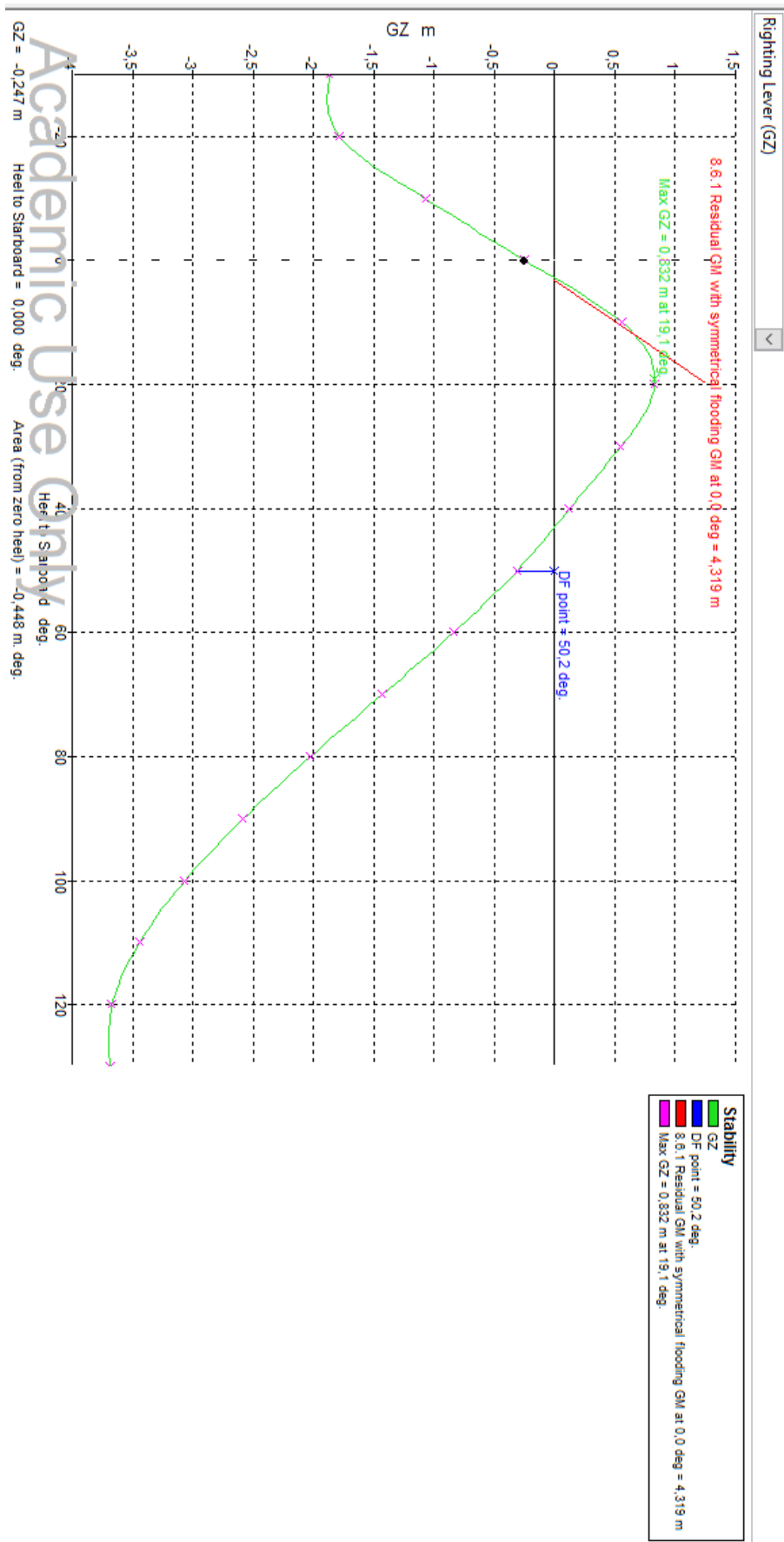
Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	1,1	deg	1,1		
	to the lesser of					
	first downflooding angle	51	deg			
	angle of vanishing stability	44,2	deg	44,2		
	shall not be less than (>=)	15	deg	43,1	Pass	187,25
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	1,1	deg	1,1		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	51	deg			
	angle of vanishing stability	44,2	deg			
	shall not be less than (>=)	0,015	m.rad	0,3338	Pass	2125,22
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	1,1	deg			
	to the lesser of					
	angle of max. GZ	19,1	deg			
	shall be greater than (>)	0,05	m	0,804	Pass	1508
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	1,1	deg			
	to the lesser of					
	angle of vanishing stability	44,2	deg	44,2		
	shall be greater than (>)	12	deg	17,2	Pass	43,47
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (>=)	0,05	m	4,636	Pass	9172
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7	deg	1,3	Pass	81,38
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7	deg	1,1	Pass	83,86
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0	m	0,947	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	7,7	deg	7,7		
	shall be less than (<)	100	%	14,7	Pass	85,3
	Intermediate values					
	Equilibrium angle		deg	1,1		



3.2.24.- Avería 4. Mínima carga

Draft Amidships m	3,302
Displacement t	1221
Heel deg	3,3
Draft at FP m	2,950
Draft at AP m	3,654
Draft at LCF m	3,333
Trim (+ve by stern) m	0,704
WL Length m	59,624
Beam max extents on WL m	16,596
Wetted Area m ²	901,271
Waterpl. Area m ²	718,451
Prismatic coeff. (Cp)	0,482
Block coeff. (Cb)	0,343
Max Sect. area coeff. (Cm)	0,766
Waterpl. area coeff. (Cwp)	0,726
LCB from zero pt. (+ve fwd) m	0,062
LCF from zero pt. (+ve fwd) m	0,003
KB m	2,278
KG fluid m	7,350
BMt m	9,400
BML m	128,171
GMt corrected m	4,320
GML m	123,090
KMt m	11,662
KML m	130,225
Immersion (TPc) tonne/cm	7,185
MTc tonne.m	27,437
RM at 1deg = GMt.Disp.sin(1) tonne.m	92,050
Max deck inclination deg	3,3891
Trim angle (+ve by stern) deg	0,7367

Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	2,8 deg		2,8		
	to the lesser of					
	first downflooding angle	50,2 deg				
	angle of vanishing stability	42,9 deg		42,9		
	shall not be less than (>=)	15 deg		40,1	Pass	167,49
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	2,8 deg		2,8		
	to the lesser of					
	spec. heel angle	27 deg		27		
	first downflooding angle	50,2 deg				
	angle of vanishing stability	42,9 deg				
	shall not be less than (>=)	0,015 m.rad		0,2608	Pass	1639,07
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27 deg		27		
	angle of equilibrium	2,8 deg				
	to the lesser of					
	angle of max. GZ	19,1 deg				
	shall be greater than (>)	0,05 m		0,664	Pass	1228
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27 deg		27		
	angle of equilibrium	2,8 deg				
	to the lesser of					
	angle of vanishing stability	42,9 deg		42,9		
	shall be greater than (>)	12 deg		15,9	Pass	32,86
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0 deg				
	shall not be less than (>=)	0,05 m		4,319	Pass	8538
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (<=)	7 deg		3,3	Pass	52,74
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (<=)	7 deg		2,8	Pass	59,73
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than (>)	0 m		0,51	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	6,8 deg		6,8		
	shall be less than (<)	100 %		41,32	Pass	58,68
	Intermediate values					
	Equilibrium angle		deg	2,8		



3.2.25.- *Avería 5. Mínima carga*

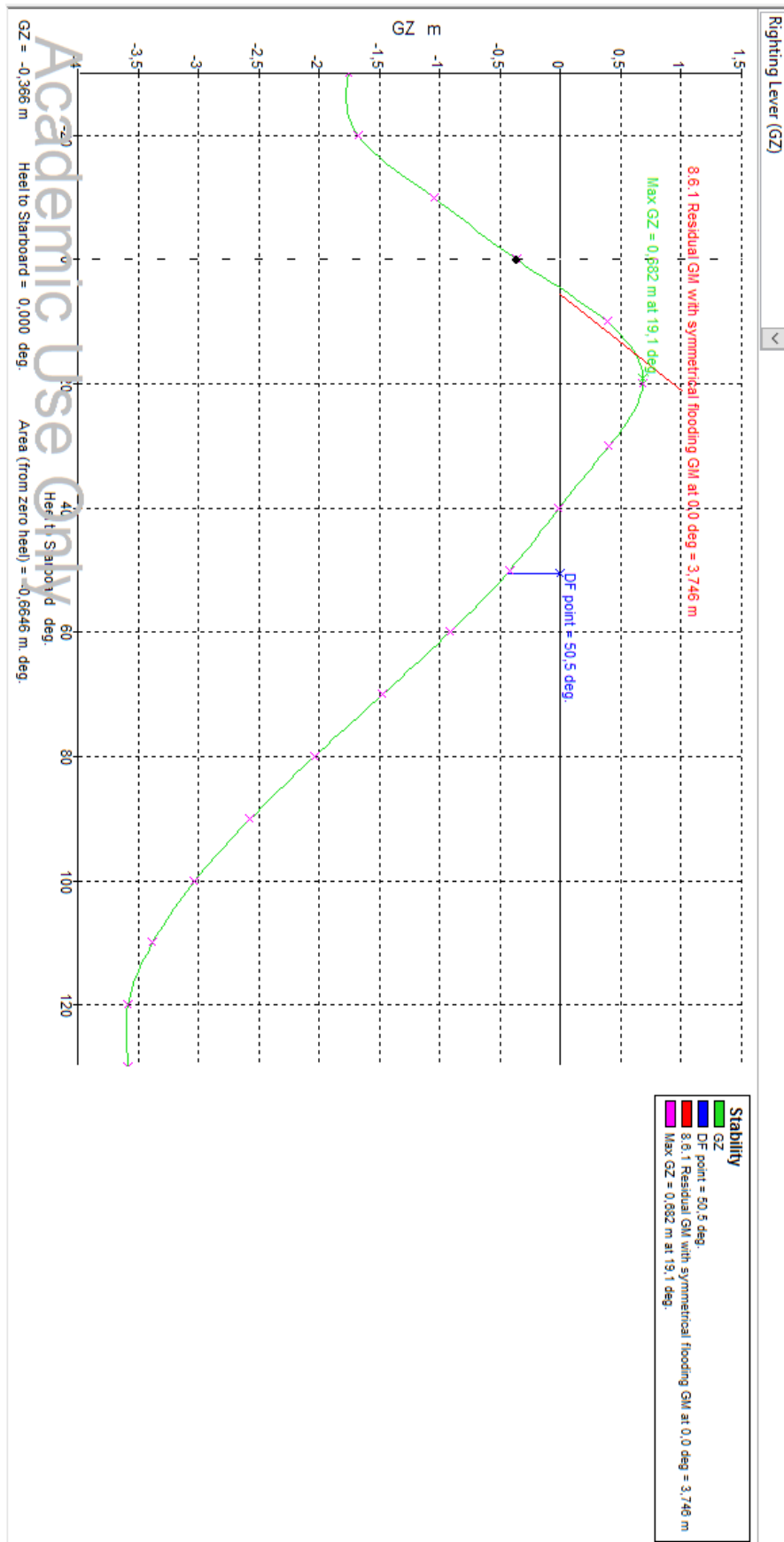
Draft Amidships m	3,300
Displacement t	1221
Heel deg	4,7
Draft at FP m	3,159
Draft at AP m	3,441
Draft at LCF m	3,312
Trim (+ve by stern) m	0,282
WL Length m	59,665
Beam max extents on WL m	16,604
Wetted Area m ²	902,388
Waterpl. Area m ²	720,737
Prismatic coeff. (Cp)	0,484
Block coeff. (Cb)	0,361
Max Sect. area coeff. (Cm)	0,768
Waterpl. area coeff. (Cwp)	0,728
LCB from zero pt. (+ve fwd) m	0,100
LCF from zero pt. (+ve fwd) m	0,068
KB m	2,288
KG fluid m	7,350
BMt m	9,353
BML m	133,704
GMt corrected m	4,274
GML m	128,625
KMt m	11,609
KML m	135,538
Immersion (TPc) tonne/cm	7,207
MTc tonne.m	28,671
RM at 1deg = GMt.Disp.sin(1) tonne.m	91,078
Max deck inclination deg	4,7225
Trim angle (+ve by stern) deg	0,2947

Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium		4 deg	4		
	to the lesser of					
	first downflooding angle		50,2 deg			
	angle of vanishing stability		41,5 deg	41,5		
	shall not be less than (\geq)		15 deg	37,6	Pass	150,37
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium		4 deg	4		
	to the lesser of					
	spec. heel angle		27 deg	27		
	first downflooding angle		50,2 deg			
	angle of vanishing stability		41,5 deg			
	shall not be less than (\geq)		0,015 m.rad	0,2265	Pass	1410,28
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle		27 deg	27		
	angle of equilibrium		4 deg			
	to the lesser of					
	angle of max. GZ		19,1 deg			
	shall be greater than ($>$)		0,05 m	0,594	Pass	1088
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle		27 deg	27		
	angle of equilibrium		4 deg			
	to the lesser of					
	angle of vanishing stability		41,5 deg	41,5		
	shall be greater than ($>$)		12 deg	14,5	Pass	21,18
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle		0 deg			
	shall not be less than (\geq)		0,05 m	4,039	Pass	7978
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)		7 deg	4,7	Pass	32,67
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)		7 deg	4	Pass	43,04
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)		0 m	0,518	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline		8,3 deg	8,3		
	shall be less than ($<$)		100 %	47,92	Pass	52,08
	Intermediate values					
	Equilibrium angle		deg	4		

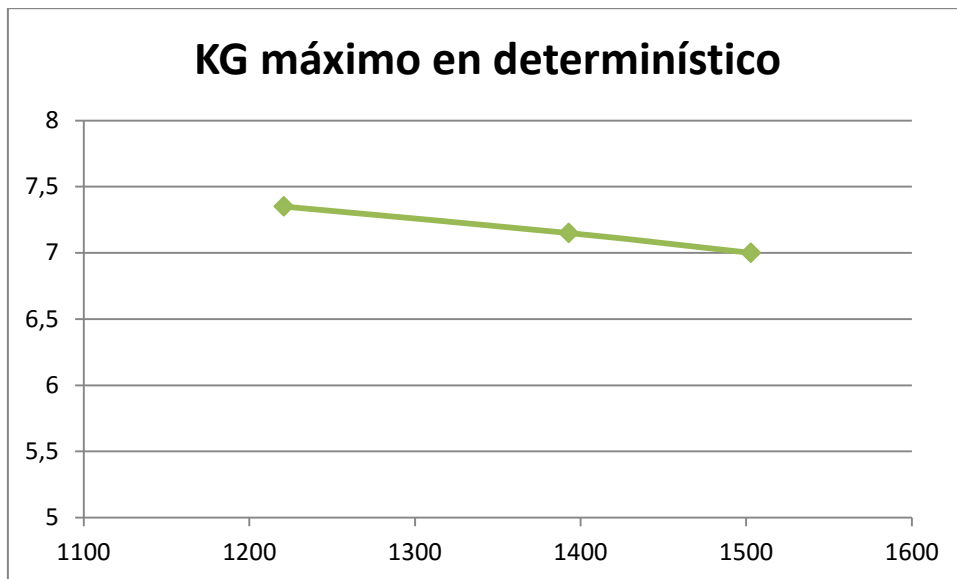
3.2.26.- *Avería 6. Mínima carga*

Draft Amidships m	3,262
Displacement t	1221
Heel deg	5,4
Draft at FP m	3,284
Draft at AP m	3,239
Draft at LCF m	3,260
Trim (+ve by stern) m	-0,046
WL Length m	59,630
Beam max extents on WL m	16,573
Wetted Area m ²	895,600
Waterpl. Area m ²	716,223
Prismatic coeff. (Cp)	0,494
Block coeff. (Cb)	0,377
Max Sect. area coeff. (Cm)	0,767
Waterpl. area coeff. (Cwp)	0,725
LCB from zero pt. (+ve fwd) m	0,133
LCF from zero pt. (+ve fwd) m	0,058
KB m	2,227
KG fluid m	7,350
BMt m	9,227
BML m	133,721
GMt corrected m	4,081
GML m	128,576
KMt m	11,412
KML m	135,351
Immersion (TPc) tonne/cm	7,162
MTc tonne.m	28,660
RM at 1deg = GMt.Disp.sin(1) tonne.m	86,961
Max deck inclination deg	5,4167
Trim angle (+ve by stern) deg	-0,0476

Code	Criteria	Value	Units	Actual	Status	Margin
SOLAS, II-1/8	8.2.3.1: Range of residual positive stability				Pass	
	from the greater of					
	angle of equilibrium	4,7	deg	4,7		
	to the lesser of					
	first downflooding angle	50,5	deg			
	angle of vanishing stability	39,7	deg	39,7		
	shall not be less than (\geq)	15	deg	35	Pass	133,45
SOLAS, II-1/8	8.2.3.2: Area under residual GZ curve				Pass	
	from the greater of					
	angle of equilibrium	4,7	deg	4,7		
	to the lesser of					
	spec. heel angle	27	deg	27		
	first downflooding angle	50,5	deg			
	angle of vanishing stability	39,7	deg			
	shall not be less than (\geq)	0,015	m.rad	0,1967	Pass	1211,68
SOLAS, II-1/8	8.2.4.a Maximum GZ (intermediate stages)				Pass	
	in the range from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,7	deg			
	to the lesser of					
	angle of max. GZ	19,1	deg			
	shall be greater than ($>$)	0,05	m	0,519	Pass	938
	Intermediate values					
	angle at which this GZ occurs		deg	27		
SOLAS, II-1/8	8.2.4.b Range of positive stability (intermediate stages)				Pass	
	from the greater of					
	spec. heel angle	27	deg	27		
	angle of equilibrium	4,7	deg			
	to the lesser of					
	angle of vanishing stability	39,7	deg	39,7		
	shall be greater than ($>$)	12	deg	12,7	Pass	5,62
SOLAS, II-1/8	8.6.1 Residual GM with symmetrical flooding				Pass	
	spec. heel angle	0	deg			
	shall not be less than (\geq)	0,05	m	3,746	Pass	7392
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - Equil based				Pass	
	the angle of	Heel				
	shall not be greater than (\leq)	7	deg	5,4	Pass	22,62
SOLAS, II-1/8	8.6.2: Heel angle at equilibrium for unsymmetrical flooding - GZ based				Pass	
	shall not be greater than (\leq)	7	deg	4,7	Pass	33,47
SOLAS, II-1/8	8.6.3: Margin line immersion - Equil based				Pass	
	the min. freeboard of the	Marginline				
	shall be greater than ($>$)	0	m	0,554	Pass	infinite
SOLAS, II-1/8	8.6.3: Margin line immersion - GZ based (EquilAngle ratio)				Pass	
	first flooding angle of the Marginline	9,3	deg	9,3		
	shall be less than ($<$)	100	%	50,25	Pass	49,75
	Intermediate values					
	Equilibrium angle		deg	4,7		



3.2.27.- Curva de KG máximo del análisis determinístico



4.- Margen de estabilidad por hielo

En el convenio SOLAS se establece que cada administración, si lo cree necesario, establecerá un margen de estabilidad debido a la formación de hielo en las cubiertas. A pesar de una incansable búsqueda, no se han encontrado normativas canadienses que especifiquen exactamente qué cantidad de hielo se debe suponer. En publicaciones como *Ice Navigation in Canadian Waters* (9), se da información relativa a las zonas de navegación y las posibles formaciones de hielo que puede haber en el mar, pero no se refiere a un margen de estabilidad por hielo.

SOLAS da un valor de referencia para buques pesqueros, que son 30 kg/m^2 para cubiertas expuestas y $7,5 \text{ kg/m}^2$ para el área lateral.

El peso que ejerce el hielo se calculará utilizando las áreas de las cubiertas y, posteriormente, se introducirá en *Maxsurf* el KG de cada cubierta.

La cubierta que cierra el puente en su parte superior tiene un área de 144 m^2 . El peso que habrá que suponer será de 4,32 toneladas. El KG sería de 15,73 m.

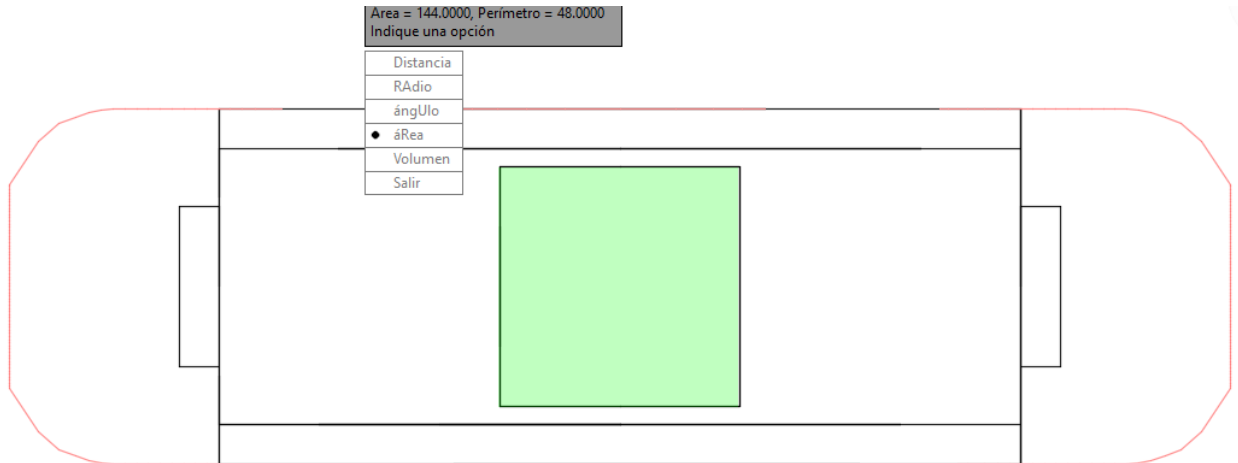


Figura 44.- Justificación área encima del puente.

La cubierta del puente, restándole el área calculada anteriormente, tendrá un área de 408 m^2 . El peso que habrá que suponer será de 12,24 t. El KG sería de 12,73 m.

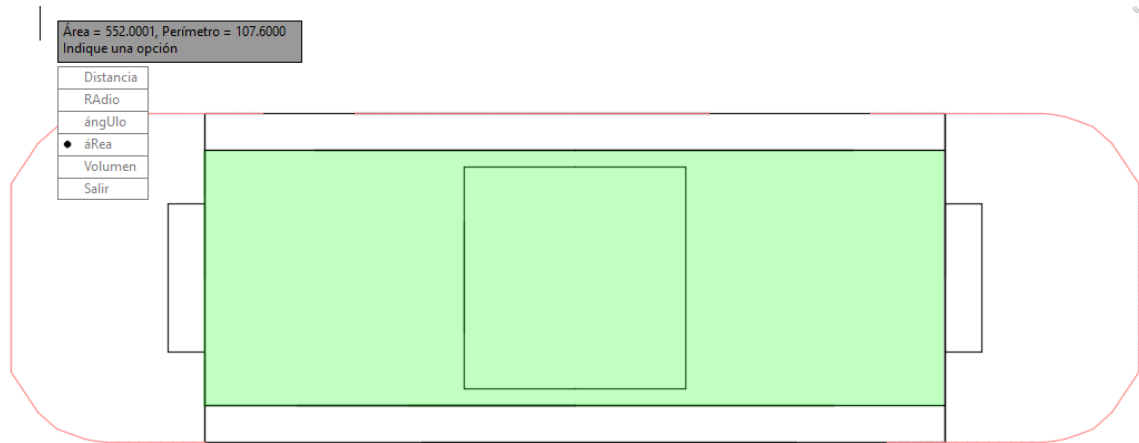


Figura 45.- Justificación área puente.

La cubierta de pasajeros, restándole el área calculada en apartados anteriores, tendrá un área de 192,23 m². El peso que habrá que suponer será de 5,77 t. El KG sería de 9,73 m.

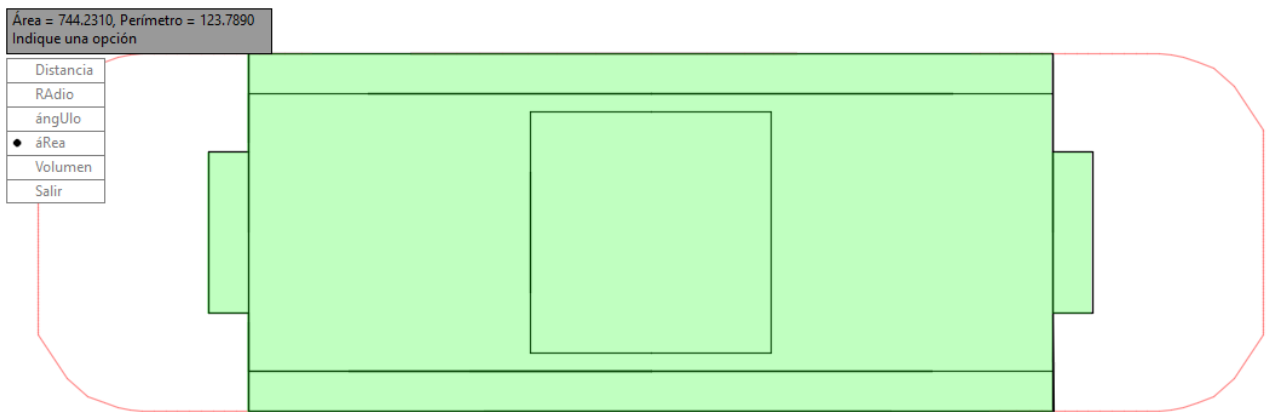


Figura 46.- Justificación área cubierta de pasajeros.

Por último, la cubierta de carga, restándole el área calculada en apartados anteriores, tendrá un área de 316,64 m². El peso que habrá que suponer será de 9,50 t. El KG sería de 4,73 m.

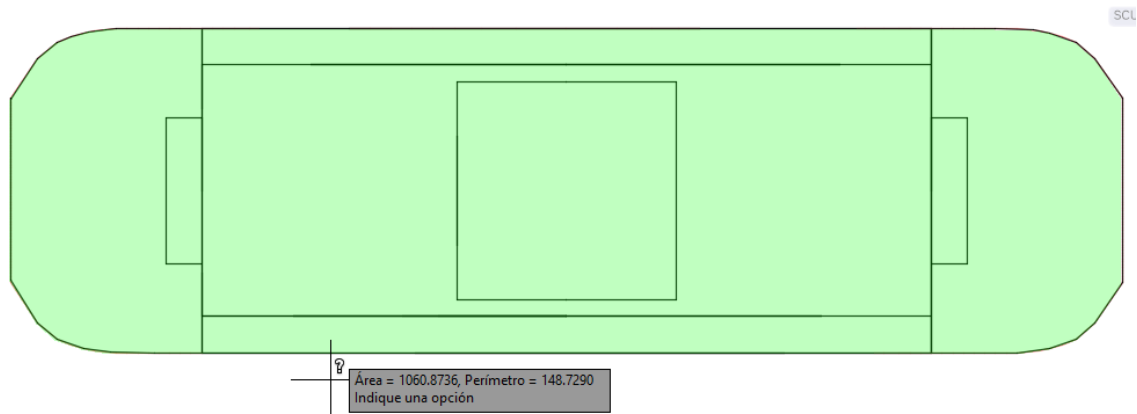


Figura 47.- Justificación área cubierta de carga rodada.

El área lateral será la que se analizó en el criterio de viento en la *Figura 14* más la que aparece en blanco en esa misma imagen, que son 40*5 metros cuadrados. Por lo tanto:

$$\text{Área lateral} = 220,41 + 200 = 420,41 \text{ m}^2$$

El peso del hielo que se forme en las zonas laterales de estribor y babor, será de 3,15 toneladas a cada banda, es decir 6,30 toneladas en total. Su centro de gravedad será el mismo que se utilizó para el criterio de viento, que fueron 10,28 m.

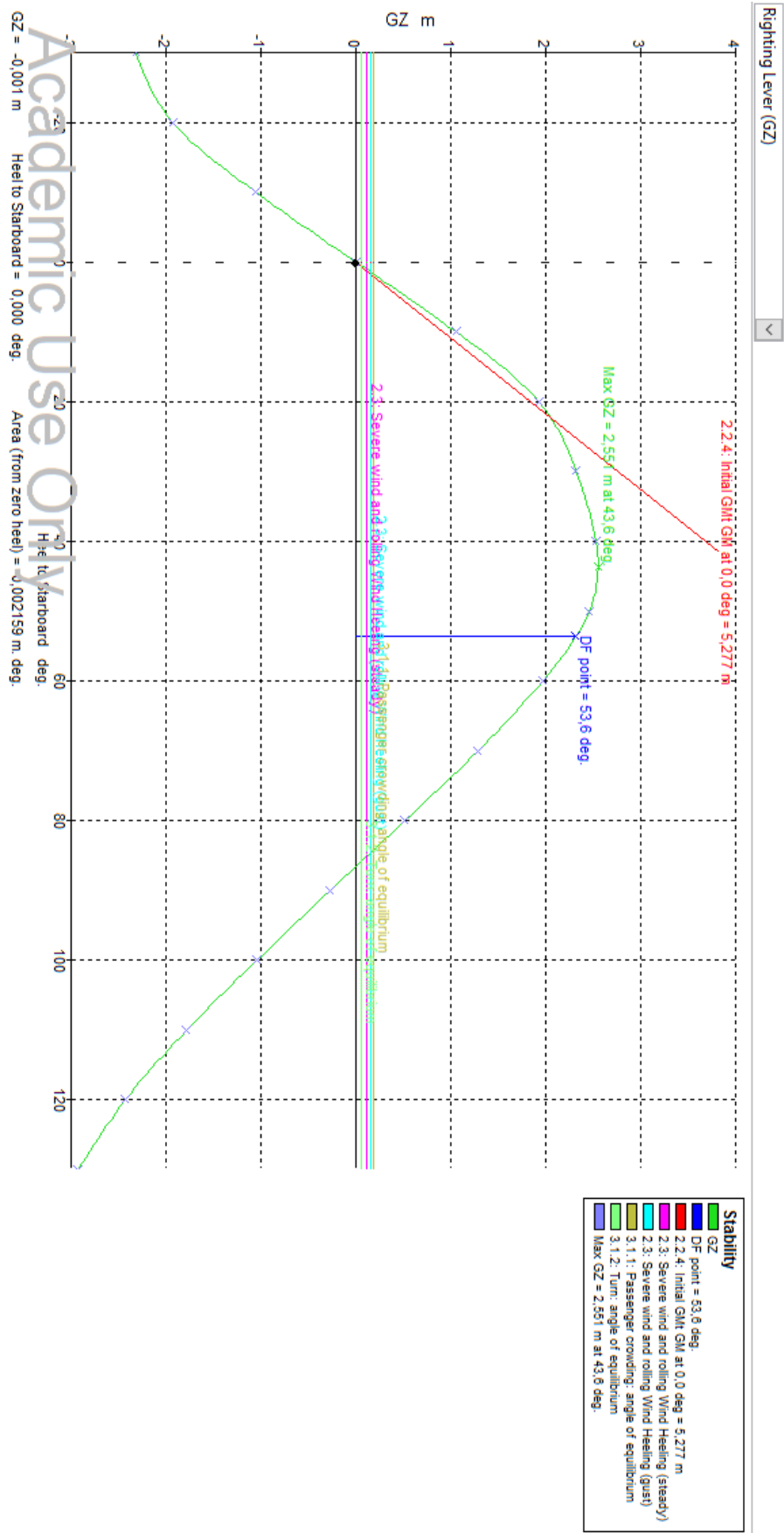
4.1.- Situación de carga 1: Salida de puerto a plena carga, 100% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volum	Total Volu	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	1		9,5	9,5			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	1		5,77	5,77			0	0	9,73	0	User Specified
Hielo cubierta del puente	1		12,24	12,24			0	0	12,73	0	User Specified
Hielo cubierta encima puente	1		4,32	4,32			0	0	15,73	0	User Specified
Hielo lateral	1		6,31	6,31			0	0	10,28	0	User Specified
Total Hielo				38,14			0	0	10,168	0	
Coches	24		2,5	60			0	0	5,73	0	User Specified
Camiones	6		26	156			0	0	6,73	0	User Specified
Total Carga				216			0	0	6,452	0	
Diesel	100%	1,3	10,731	10,731	12,775	12,775	-5,234	0	0,9	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	93,408	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	1,3	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	1,3	42,085	42,085	42,085	42,085	3,656	0	0,879	399,192	IMO A.749(18)
Agua técnica	100%	1,3	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	399,192	
Aguas negras	0%	0	30,405	0	30,405	0	-1,5	0	0	302,062	IMO A.749(18)
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	302,062	
Tanque de comp. PR ER	50%	1,876	23,445	11,722	23,445	11,722	21,362	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,876	23,445	11,722	23,445	11,722	21,362	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,876	23,445	11,722	23,445	11,722	-21,362	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,876	23,445	11,722	23,445	11,722	-21,362	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0	0	3,202	0	
Tanque LNG PR	100%	1,999	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,999	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1541,106	232,336	153,818	0,282	0,001	5,535	794,662	
FS correction									0,516		
VCG fluid									6,051		

Draft Amidships m	3,537
Displacement t	1541
Heel deg	0,0
Draft at FP m	3,608
Draft at AP m	3,465
Draft at LCF m	3,531
Trim (+ve by stern) m	-0,144
WL Length m	59,732
Beam max extents on WL m	16,759
Wetted Area m ²	930,860
Waterpl. Area m ²	782,925
Prismatic coeff. (Cp)	0,565
Block coeff. (Cb)	0,430
Max Sect. area coeff. (Cm)	0,772
Waterpl. area coeff. (Cwp)	0,782
LCB from zero pt. (+ve fwd) m	0,293
LCF from zero pt. (+ve fwd) m	0,124
KB m	2,343
KG fluid m	6,051
BMt m	8,985
BML m	111,685
GMt corrected m	5,277
GML m	107,977
KMt m	11,328
KML m	114,027
Immersion (TPc) tonne/cm	7,829
MTc tonne.m	30,380
RM at 1deg = GMt.Disp.sin(1) tonne.m	141,938
Max deck inclination deg	0,1501
Trim angle (+ve by stern) deg	-0,1501

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,732	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,537	m			
	GMf, Stability calculated	5,277	m			
	VCG, Stability calculated	6,051	m			
	CB, Stability calculated	0,43				
	Ak, keel area, user spec.	25,236	m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to	17,8	deg			
	Intermediate values					
	B / d				5,033	
	100 Ak / L / B				2,374	
	C			IMO units	0,463	
	T			s	7,176	
	OG, Centre of gravity above WL			m	2,514	
	X1			IMO units	0,8	
X2			IMO units	0,75		
k tabulated			IMO units	0,813		
r			IMO units	1,157		
s			IMO units	0,097		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
	angle of vanishing stability	86,6	deg			
shall not be less than (>=)	0,055	m.rad		0,7344	Pass	1235,3
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	53,6	deg			
	angle of vanishing stability	86,6	deg			
shall not be less than (>=)	0,09	m.rad		1,16	Pass	1188,9
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	53,6	deg			
	angle of vanishing stability	86,6	deg			
shall not be less than (>=)	0,03	m.rad		0,4256	Pass	1318,59
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	43,6	deg	43,6		
shall not be less than (>=)	0,2	m	2,551	Pass	1175,5	
	Intermediate values					
	angle at which this GZ occurs		deg	43,6		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ shall not be less than (\geq)		25 deg	43,6	Pass	74,54
267(85) Ch2 - General Criteria	2.2.4: Initial GMt spec. heel angle shall not be less than (\geq)		0 deg 0,15 m	5,277	Pass	3418
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$ constant: a = wind pressure: P = area centroid height (from zero point): h = additional area: A = H = vert. centre of projected lat. u'water area cosine power: n = gust ratio Area2 integrated to the lesser of		0,99966 504 Pa 10,28 m 220,41 m ² 1,931 m 0 1,5		Pass	
	2.3: IMO roll back angle from equilibrium (with steady heel arm) Area 1 upper integration range, to the lesser of: spec. heel angle first downflooding angle angle of vanishing stability (with gust heel arm) Angle for GZ(max) in GZ ratio, the lesser of: angle of max. GZ Select required angle for angle of steady heel ratio: Criteria: Angle of steady heel shall not be greater than (\leq) Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq) Area1 / Area2 shall not be less than (\geq) Intermediate values Model windage area Model windage area centroid height (from zero point) Total windage area Total windage area centroid height (from zero point) Heel arm amplitude Equilibrium angle with gust heel arm Deck edge immersion angle Area1 (under GZ), from 1,5 to 50,0 deg. Area1 (under HA), from 1,5 to 50,0 deg. Area1, from 1,5 to 50,0 deg. Area2 (under GZ), from -16,8 to 1,5 deg. Area2 (under HA), from -16,8 to 1,5 deg. Area2, from -16,8 to 1,5 deg.	17,8 (-16,8)	deg 50 deg 53,6 deg 84,6 deg 43,6 deg DeckEdgeImmersionAngle	-16,8 50 43,6	1 Pass	93,66 83,74 376,08
	3.1 Passenger Ships 3.1.1: Passenger crowding: angle of equilibrium Pass. crowding arm = $n_{\text{Pass}} M / \text{disp.} D \cos^n(\phi)$ number of passengers: nPass = passenger mass: M = distance from centre line: D = cosine power: n = shall not be greater than (\leq) Intermediate values Heel arm amplitude		399 0,1 tonne 7,405 m 0 10 deg m	1,8	Pass	81,99 0,192
	3.1 Passenger Ships 3.1.2: Turn: angle of equilibrium Turn arm: $a v^2 / (R g) h \cos^n(\phi)$ constant: a = vessel speed: v = turn radius, R, as percentage of Lwl h = KG - mean draft / 2 cosine power: n = shall not be greater than (\leq) Intermediate values Heel arm amplitude		1,02 13 kn 510 % 3,767 m 0 10 deg m	0,5	Pass	94,52 0,058



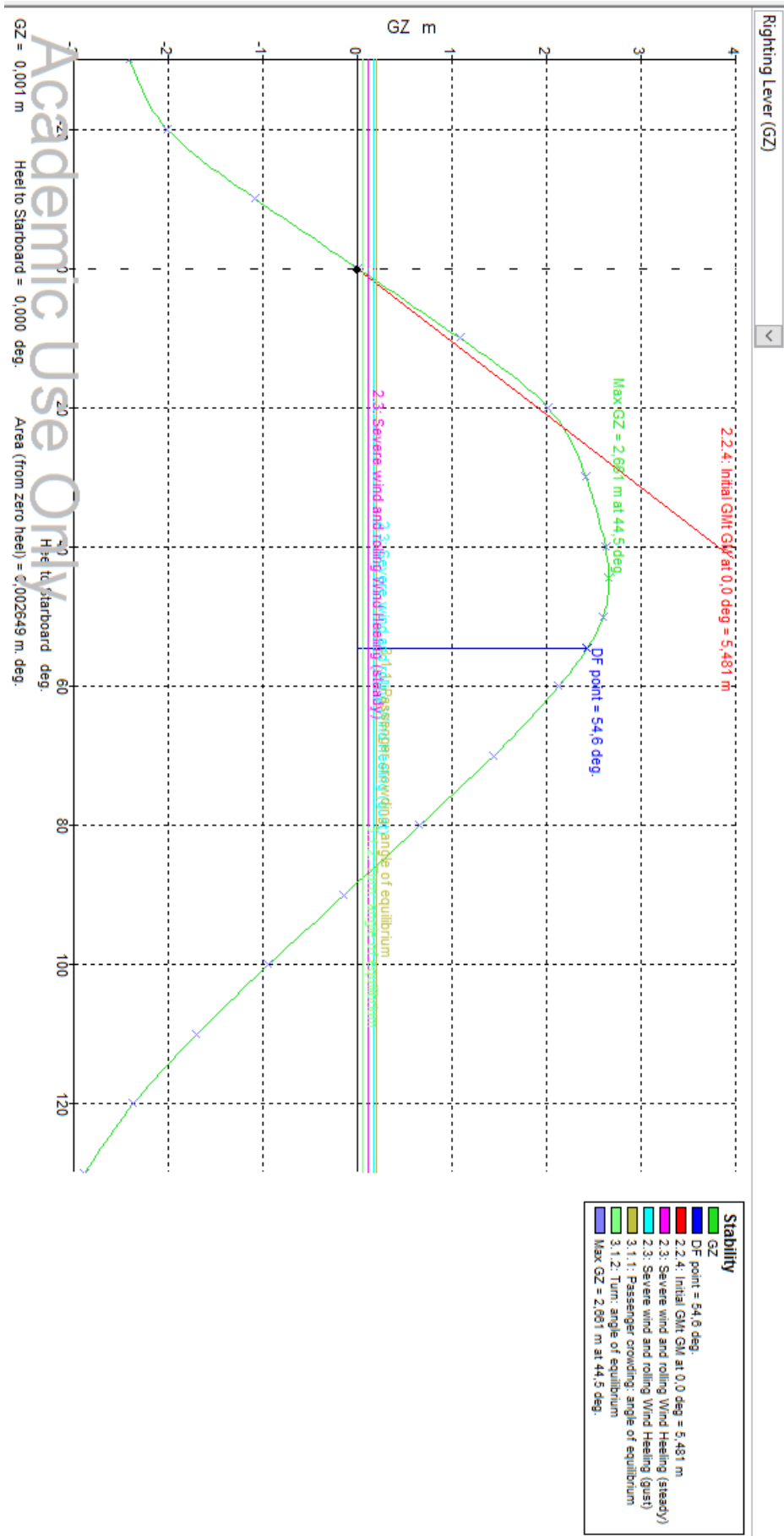
4.2.- Situación de carga 2: Llegada a puerto a plena carga, 100% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volum	Total Volum	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	1		9,5	9,5			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	1		5,77	5,77			0	0	9,73	0	User Specified
Hielo cubierta del puente	1		12,24	12,24			0	0	12,73	0	User Specified
Hielo cubierta encima puente	1		4,32	4,32			0	0	15,73	0	User Specified
Hielo lateral	1		6,31	6,31			0	0	10,28	0	User Specified
Total Hielo				38,14			0	0	10,168	0	
Coches	24		2,5	60			0	0	5,73	0	User Specified
Camiones	6		26	156			0	0	6,73	0	User Specified
Total Carga				216			0	0	6,452	0	
Diesel	0,33%	0	10,731	0,035	12,775	0,042	-5,246	0	0,042	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,336	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,336	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	10,00%		11,883	1,188	14,147	1,414	-5,492	0	1,602	93,408	
Tanque de lodos	90%	0,477	0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0	User Specified
Total Diesel Usado	90%		0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0	
Almacen Aceite	10%	0	0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0	User Specified
Total Aceite Para Usar	10%		0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0	
Aceite sucio	90%	0,609	0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0	User Specified
Total Aceite Usado	90%		0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0	
Agua dulce	10%	0,064	42,085	4,209	42,085	4,209	3,472	0	0,309	399,192	IMO A.749(18)
Agua técnica	10%	0,008	1,459	0,146	1,459	0,146	-4,244	0,607	0,265	0	User Specified
Total Agua Para Usar	10%		43,544	4,354	43,544	4,354	3,214	0,02	0,308	399,192	
Aguas negras	90%	0,855	30,405	27,365	30,405	27,365	-1,495	0	0,814	302,062	IMO A.749(18)
Total Agua Sucia	90%		30,405	27,365	30,405	27,365	-1,495	0	0,814	302,062	
Tanque de comp. PR ER	50%	1,459	23,445	11,722	23,445	11,722	21,363	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,459	23,445	11,722	23,445	11,722	21,363	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,541	23,445	11,722	23,445	11,722	-21,361	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,541	23,445	11,722	23,445	11,722	-21,361	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,001	0	3,202	0	
Tanque LNG PR	10%	0	24,335	2,433	24,335	2,433	21,001	0,002	9,915	0	User Specified
Tanque LNG PP	10%	0	24,335	2,433	24,335	2,433	-20,997	0,002	9,915	0	User Specified
Total LNG	10%		48,669	4,867	48,669	4,867	0,002	0,002	9,915	0	
Total Loadcase				1475,273	232,336	86,048	0,212	-0,001	5,445	794,662	
FS correction									0,539		
VCG fluid									5,984		

Draft Amidships m	3,451
Displacement t	1475
Heel deg	0,0
Draft at FP m	3,503
Draft at AP m	3,398
Draft at LCF m	3,446
Trim (+ve by stern) m	-0,105
WL Length m	59,643
Beam max extents on WL m	16,686
Wetted Area m ²	917,684
Waterpl. Area m ²	774,840
Prismatic coeff. (Cp)	0,559
Block coeff. (Cb)	0,425
Max Sect. area coeff. (Cm)	0,770
Waterpl. area coeff. (Cwp)	0,779
LCB from zero pt. (+ve fwd) m	0,220
LCF from zero pt. (+ve fwd) m	0,092
KB m	2,292
KG fluid m	5,984
BMt m	9,173
BML m	114,551
GMt corrected m	5,481
GML m	110,859
KMt m	11,465
KML m	116,842
Immersion (TPc) tonne/cm	7,748
MTc tonne.m	29,858
RM at 1deg = GMt.Disp.sin(1) tonne.m	141,123
Max deck inclination deg	0,1101
Trim angle (+ve by stern) deg	-0,1101

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,643	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,45	m			
	GMf, Stability calculated	5,481	m			
	VCG, Stability calculated	5,984	m			
	CB, Stability calculated	0,425				
	Ak, keel area, user spec.	25,236	m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to	17,9	deg			
	Intermediate values					
	B / d			5,159		
	100 Ak / L / B			2,377		
	C		IMO units	0,466		
	T		s	7,086		
	OG, Centre of gravity above WL		m	2,533		
	X1		IMO units	0,8		
X2		IMO units	0,75			
k tabulated		IMO units	0,812			
r		IMO units	1,17			
s		IMO units	0,098			
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
angle of vanishing stability	88,2	deg				
shall not be less than (>=)	0,055	m.rad	0,7631	Pass	1287,36	
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	54,6	deg			
	angle of vanishing stability	88,2	deg			
shall not be less than (>=)	0,09	m.rad	1,2041	Pass	1237,91	
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	54,6	deg			
	angle of vanishing stability	88,2	deg			
shall not be less than (>=)	0,03	m.rad	0,4411	Pass	1370,18	
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	44,5	deg	44,5		
shall not be less than (>=)	0,2	m	2,661	Pass	1230,5	
	Intermediate values					
	angle at which this GZ occurs		deg	44,5		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ shall not be less than (>=)		25 deg	44,5 Pass	78,18
267(85) Ch2 - General Criteria	2.2.4: Initial GMT spec. heel angle shall not be less than (>=)		0 deg 0,15 m	Pass 5,481 Pass	3554
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$ constant: a = wind pressure: P = area centroid height (from zero point): h = additional area: A = H = vert. centre of projected lat. u'water area cosine power: n = gust ratio Area2 integrated to the lesser of		0,99966 504 Pa 10,28 m 220,41 m ² 1,882 m 0 1,5	Pass	
	2.3: IMO roll back angle from equilibrium (with steady heel arm) Area 1 upper integration range, to the lesser of: spec. heel angle first downflooding angle angle of vanishing stability (with gust heel arm) Angle for GZ(max) in GZ ratio, the lesser of: angle of max. GZ Select required angle for angle of steady heel ratio: Criteria: Angle of steady heel shall not be greater than (<=) Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	17,9 (-16,9)	deg 50 deg 54,6 deg 86,1 deg 44,5 deg	-16,9 50 12,22 Pass	93,54 84,72
	Area1 / Area2 shall not be less than (>=) Intermediate values Model windage area Model windage area centroid height (from zero point) Total windage area Total windage area centroid height (from zero point) Heel arm amplitude Equilibrium angle with gust heel arm Deck edge immersion angle Area1 (under GZ), from 1,6 to 50,0 deg. Area1 (under HA), from 1,6 to 50,0 deg. Area1, from 1,6 to 50,0 deg. Area2 (under GZ), from -16,9 to 1,6 deg. Area2 (under HA), from -16,9 to 1,6 deg. Area2, from -16,9 to 1,6 deg.		DeckEdgeImmersionAngle 16 deg 80 % 100 % m ² m m ² m m deg deg m.rad m.rad m.rad m.rad m.rad m.rad	Pass 1 Pass 474,35 Pass	374,35 304,263 6,51 524,673 8,094 0,114 1,6 8,5 1,6633 0,1439 1,5193 -0,2654 0,0549 0,3203
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium Pass. crowding arm = $n_{\text{Pass}} M / \text{disp.} D \cos^n(\phi)$ number of passengers: n _{Pass} = passenger mass: M = distance from centre line: D = cosine power: n = shall not be greater than (<=) Intermediate values Heel arm amplitude		399 0,1 tonne 7,405 m 0 10 deg m	Pass 1,8 Pass	81,67
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium Turn arm: $a v^2 / (R g) h \cos^n(\phi)$ constant: a = vessel speed: v = turn radius, R, as percentage of Lwl h = KG - mean draft / 2 cosine power: n = shall not be greater than (<=) Intermediate values Heel arm amplitude		1,02 13 kn 510 % 3,72 m 0 10 deg m	Pass 0,5 Pass	94,89



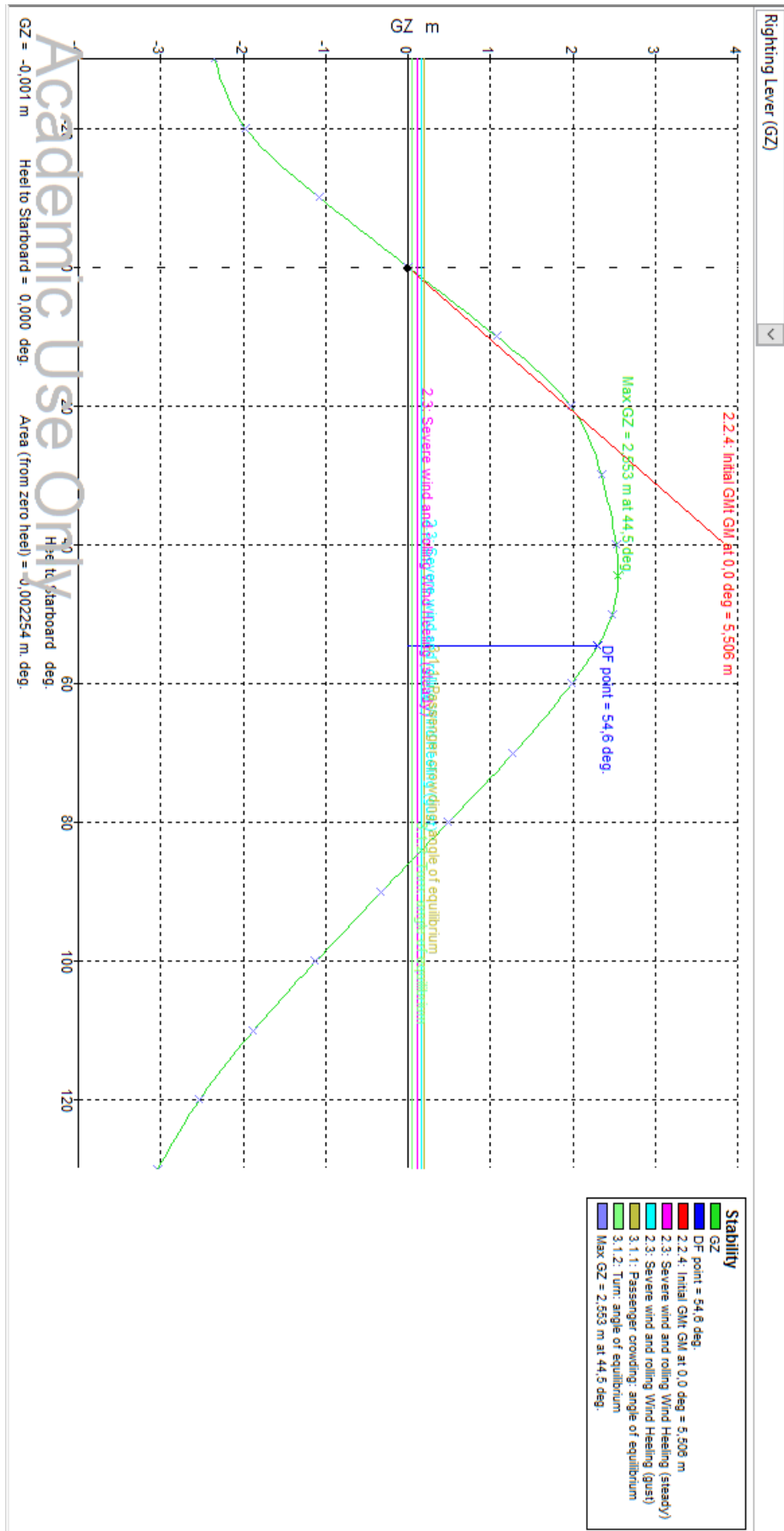
4.3.- Situación de carga 3: Salida de puerto 100% coches, 100% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volu	Total Volum	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	1		9,5	9,5			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	1		5,77	5,77			0	0	9,73	0	User Specified
Hielo cubierta del puente	1		12,24	12,24			0	0	12,73	0	User Specified
Hielo cubierta encima puente	1		4,32	4,32			0	0	15,73	0	User Specified
Hielo lateral	1		6,31	6,31			0	0	10,28	0	User Specified
Total Hielo				38,14			0	0	10,168	0	
Coches	60		2,5	150			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				150			0	0	5,73	0	
Diesel	100%	1,3	10,731	10,731	12,775	12,775	-5,234	0	0,9	16,414	IMO A.749(18)
Uso diario Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	16,414	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	1,3	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	1,3	42,085	42,085	42,085	42,085	3,656	0	0,879	68,246	IMO A.749(18)
Agua técnica	100%	1,3	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	68,246	
Aguas negras	0%	0	30,405	0	30,405	0	-1,5	0	0	301,721	User Specified
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	301,721	
Tanque de comp. PR ER	50%	1,876	23,445	11,722	23,445	11,722	21,362	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,876	23,445	11,722	23,445	11,722	21,362	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,876	23,445	11,722	23,445	11,722	-21,362	3,834	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,876	23,445	11,722	23,445	11,722	-21,362	-3,834	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0	0	3,202	0	
Tanque LNG PR	100%	1,999	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,999	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1475,106	232,336	153,818	0,294	0,001	5,421	386,38	
FS correction									0,262		
VCG fluid									5,683		

Draft Amidships m	3,452
Displacement t	1475
Heel deg	0,0
Draft at FP m	3,525
Draft at AP m	3,379
Draft at LCF m	3,446
Trim (+ve by stern) m	-0,146
WL Length m	59,643
Beam max extents on WL m	16,686
Wetted Area m ²	917,642
Waterpl. Area m ²	774,812
Prismatic coeff. (Cp)	0,559
Block coeff. (Cb)	0,424
Max Sect. area coeff. (Cm)	0,770
Waterpl. area coeff. (Cwp)	0,779
LCB from zero pt. (+ve fwd) m	0,305
LCF from zero pt. (+ve fwd) m	0,127
KB m	2,292
KG fluid m	5,959
BMt m	9,173
BML m	114,551
GMt corrected m	5,506
GML m	110,883
KMt m	11,465
KML m	116,842
Immersion (TPc) tonne/cm	7,748
MTc tonne.m	29,861
RM at 1deg = GMt.Disp.sin(1) tonne.m	141,750
Max deck inclination deg	0,1525
Trim angle (+ve by stern) deg	-0,1525

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated		59,643 m			
	B, Stability calculated		17,8 m			
	d, Stability calculated		3,452 m			
	GMf, Stability calculated		5,506 m			
	VCG, Stability calculated		5,959 m			
	CB, Stability calculated		0,424			
	Ak, keel area, user spec.		25,236 m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to		17,9 deg			
	Intermediate values					
	B / d			5,156		
	100 Ak / L / B			2,377		
	C		IMO units	0,466		
	T		s	7,069		
	OG, Centre of gravity above WL		m	2,507		
	X1		IMO units	0,8		
	X2		IMO units	0,75		
	k tabulated		IMO units	0,812		
	r		IMO units	1,166		
	s		IMO units	0,098		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle		0 deg	0		
	to the lesser of					
	spec. heel angle		30 deg	30		
	angle of vanishing stability		86,1 deg			
	shall not be less than (>=)		0,055 m.rad	0,749	Pass	1261,75
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle		0 deg	0		
	to the lesser of					
	spec. heel angle		40 deg	40		
	first downflooding angle		54,6 deg			
	angle of vanishing stability		86,1 deg			
	shall not be less than (>=)		0,09 m.rad	1,1757	Pass	1206,34
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle		30 deg	30		
	to the lesser of					
	spec. heel angle		40 deg	40		
	first downflooding angle		54,6 deg			
	angle of vanishing stability		86,1 deg			
	shall not be less than (>=)		0,03 m.rad	0,4267	Pass	1322,43
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle		30 deg	30		
	to the lesser of					
	spec. heel angle		90 deg			
	angle of max. GZ		44,5 deg	44,5		
	shall not be less than (>=)		0,2 m	2,553	Pass	1176,5
	Intermediate values					
	angle at which this GZ occurs		deg	44,5		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ			Pass	
	shall not be less than (\geq)	25 deg	44,5	Pass	78,18
267(85) Ch2 - General Criteria	2.2.4: Initial GMT			Pass	
	spec. heel angle	0 deg			
	shall not be less than (\geq)	0,15 m	5,506	Pass	3570,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: a =	0,99966			
	wind pressure: P =	504 Pa			
	area centroid height (from zero point): h =	10,28 m			
	additional area: A =	220,41 m ²			
	H = vert. centre of projected lat. u'water area	1,883 m			
	cosine power: n =	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	17,9 (-16,9)	deg	-16,9	
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg		50	
	first downflooding angle	54,6 deg			
	angle of vanishing stability (with gust heel arm)	83,9 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	44,5 deg		44,5	
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:			Pass	
	Angle of steady heel shall not be greater than (\leq)	16 deg		1,1	Pass 93,39
	Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq)	80 %		12,68	Pass 84,15
	Area1 / Area2 shall not be less than (\geq)	100 %		464	Pass 364
	Intermediate values				
	Model windage area	m ²		304,175	
	Model windage area centroid height (from zero point)	m		6,511	
	Total windage area	m ²		524,585	
	Total windage area centroid height (from zero point)	m		8,095	
	Heel arm amplitude	m		0,113	
	Equilibrium angle with gust heel arm	deg		1,6	
	Deck edge immersion angle	deg		8,3	
	Area1 (under GZ), from 1,6 to 50,0 deg.	m.rad		1,6159	
	Area1 (under HA), from 1,6 to 50,0 deg.	m.rad		0,1439	
	Area1, from 1,6 to 50,0 deg.	m.rad		1,472	
	Area2 (under GZ), from -16,9 to 1,6 deg.	m.rad		-0,2624	
	Area2 (under HA), from -16,9 to 1,6 deg.	m.rad		0,0548	
	Area2, from -16,9 to 1,6 deg.	m.rad		0,3172	
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n_{Pass} M / \text{disp. } D \cos^n(\phi)$				
	number of passengers: $n_{Pass} =$	399			
	passenger mass: M =	0,1 tonne			
	distance from centre line: D =	7,405 m			
	cosine power: n =	0			
	shall not be greater than (\leq)	10 deg		1,9	Pass 81,41
	Intermediate values				
	Heel arm amplitude	m		0,2	
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: a =	1,02			
	vessel speed: v =	13 kn			
	turn radius, R, as percentage of Lwl	510 %			
	h = KG - mean draft / 2	3,695 m			
	cosine power: n =	0			
	shall not be greater than (\leq)	10 deg		0,5	Pass 94,68
	Intermediate values				
	Heel arm amplitude	m		0,057	



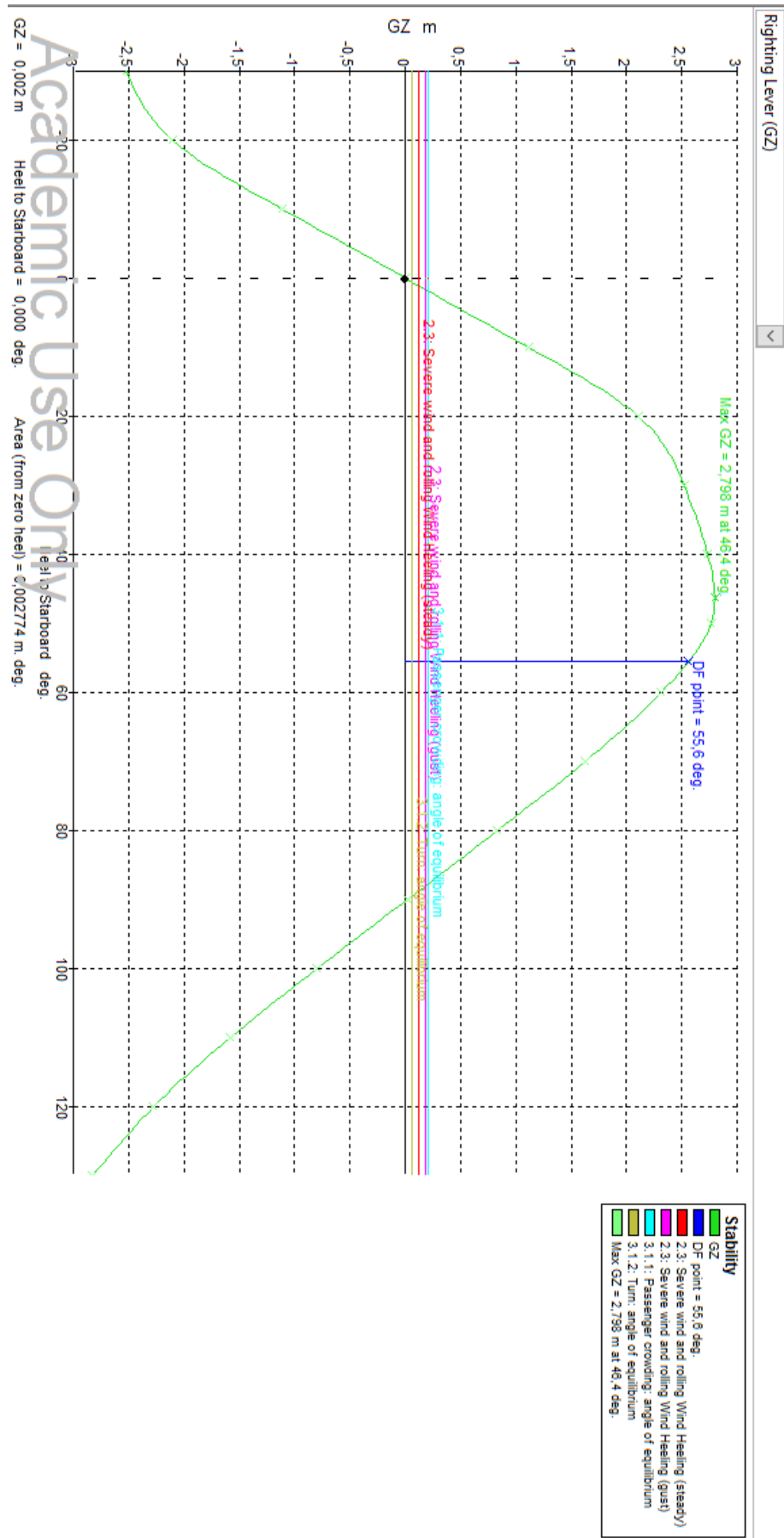
4.4.- Situación de carga 4: Llegada a puerto 100% coches, 10% de consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0
Pasajeros	399		0,1	39,9			2,5	0	10,43	0 User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0 User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0 User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0
Hielo cubierta de carga	1		9,5	9,5			0	0	4,53	0 User Specified
Hielo cubierta de pasajeros	1		5,77	5,77			0	0	9,73	0 User Specified
Hielo cubierta del puente	1		12,24	12,24			0	0	12,73	0 User Specified
Hielo cubierta encima puente	1		4,32	4,32			0	0	15,73	0 User Specified
Hielo lateral	1		6,31	6,31			0	0	10,28	0 User Specified
Total Hielo				38,14			0	0	10,168	0
Coches	60		2,5	150			0	0	5,73	0 User Specified
Camiones	0		26	0			0	0	6,73	0 User Specified
Total Carga				150			0	0	5,73	0
Diesel	0,33%	0	10,731	0,035	12,775	0,042	-5,246	0	0,042	93,408 IMO A.749(18)
Uso diario Diesel	100%	0,421	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0 User Specified
Sedimentación Diesel	100%	0,421	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0 User Specified
Total Diesel Para Usar	10,00%		11,883	1,188	14,147	1,414	-5,492	0	1,602	93,408
Tanque de lodos	90%	0,563	0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0 User Specified
Total Diesel Usado	90%		0,621	0,559	0,739	0,665	-4,249	-2,924	0,879	0
Almacen Aceite	10%	0	0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0 User Specified
Total Aceite Para Usar	10%		0,522	0,052	0,567	0,057	-4,243	-0,332	0,177	0
Aceite sucio	90%	0,695	0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0 User Specified
Total Aceite Usado	90%		0,445	0,4	0,484	0,435	-4,249	-1,485	0,756	0
Agua dulce	10%	0,149	42,085	4,209	42,085	4,209	3,473	0	0,309	399,192 IMO A.749(18)
Agua técnica	10%	0,094	1,459	0,146	1,459	0,146	-4,244	0,607	0,265	0 User Specified
Total Agua Para Usar	10%		43,544	4,354	43,544	4,354	3,214	0,02	0,308	399,192
Aguas negras	90%	0,94	30,405	27,365	30,405	27,365	-1,495	0	0,814	302,062 IMO A.749(18)
Total Agua Sucia	90%		30,405	27,365	30,405	27,365	-1,495	0	0,814	302,062
Tanque de comp. PR ER	50%	1,544	23,445	11,722	23,445	11,722	21,363	3,834	3,202	0 User Specified
Tanque de comp. PR BR	50%	1,544	23,445	11,722	23,445	11,722	21,363	-3,834	3,202	0 User Specified
Tanque de comp. PP ER	50%	1,628	23,445	11,723	23,445	11,723	-21,361	3,834	3,202	0 User Specified
Tanque de comp. PP BR	50%	1,628	23,445	11,723	23,445	11,723	-21,361	-3,834	3,202	0 User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,001	0	3,202	0
Tanque LNG PR	10%	0	24,335	2,433	24,335	2,433	21,001	0,002	9,915	0 User Specified
Tanque LNG PP	10%	0,06	24,335	2,433	24,335	2,433	-20,997	0,002	9,915	0 User Specified
Total LNG	10%		48,669	4,867	48,669	4,867	0,002	0,002	9,915	0
Total Loadcase				1409,273	232,336	86,048	0,222	-0,002	5,321	794,662
FS correction									0,564	
VCG fluid									5,885	

Draft Amidships m	3,365
Displacement t	1409
Heel deg	0,0
Draft at FP m	3,418
Draft at AP m	3,311
Draft at LCF m	3,361
Trim (+ve by stern) m	-0,107
WL Length m	59,552
Beam max extents on WL m	16,612
Wetted Area m ²	904,529
Waterpl. Area m ²	766,680
Prismatic coeff. (Cp)	0,553
Block coeff. (Cb)	0,419
Max Sect. area coeff. (Cm)	0,767
Waterpl. area coeff. (Cwp)	0,775
LCB from zero pt. (+ve fwd) m	0,230
LCF from zero pt. (+ve fwd) m	0,095
KB m	2,240
KG fluid m	5,885
BMt m	9,383
BML m	117,662
Gmt corrected m	5,738
GML m	114,017
KMt m	11,623
KML m	119,902
Immersion (TPc) tonne/cm	7,667
MTc tonne.m	29,334
RM at 1deg = Gmt.Disp.sin(1) tonne.m	141,129
Max deck inclination deg	0,1119
Trim angle (+ve by stern) deg	-0,1119

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated		59,552 m			
	B, Stability calculated		17,8 m			
	d, Stability calculated		3,365 m			
	GMf, Stability calculated		5,738 m			
	VCG, Stability calculated		5,885 m			
	CB, Stability calculated		0,419			
	Ak, keel area, user spec.		25,236 m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to		18 deg			
	Intermediate values					
	B / d				5,29	
	100 Ak / L / B				2,381	
	C			IMO units	0,469	
	T			s	6,971	
	OG, Centre of gravity above WL			m	2,52	
	X1			IMO units	0,8	
	X2			IMO units	0,75	
	k tabulated			IMO units	0,811	
r			IMO units	1,179		
s			IMO units	0,098		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle		0 deg	0		
	to the lesser of					
	spec. heel angle		30 deg	30		
	angle of vanishing stability shall not be less than (>=)		90,2 deg	0,055 m.rad	0,7944	Pass
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle		0 deg	0		
	to the lesser of					
	spec. heel angle		40 deg	40		
	first downflooding angle		55,6 deg			
	angle of vanishing stability shall not be less than (>=)		90,2 deg	0,09 m.rad	1,2541	Pass
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle		30 deg	30		
	to the lesser of					
	spec. heel angle		40 deg	40		
	first downflooding angle		55,6 deg			
	angle of vanishing stability shall not be less than (>=)		90,2 deg	0,03 m.rad	0,4597	Pass
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle		30 deg	30		
	to the lesser of					
	spec. heel angle		90 deg			
	angle of max. GZ shall not be less than (>=)		46,4 deg	0,2 m	2,798	Pass
	Intermediate values					
	angle at which this GZ occurs		deg	46,4		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ shall not be less than (>=)	25 deg	46,4	Pass	85,46
267(85) Ch2 - General Criteria	2.2.4: Initial GMt spec. heel angle shall not be less than (>=)	0 deg 0,15 m	5,738	Pass	3725,33
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.} \cos^n(\phi))$				
	constant: a =	0,99966			
	wind pressure: P =	504 Pa			
	area centroid height (from zero point): h =	10,28 m			
	additional area: A =	220,41 m ²			
	H = vert. centre of projected lat. u'water area	1,833 m			
	cosine power: n =	0			
	gust ratio	1,5			
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	18,0 (-17,0) deg	-17		
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle	50 deg	50		
	first downflooding angle	55,6 deg			
	angle of vanishing stability (with gust heel arm)	88 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ	46,4 deg	46,4		
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:			Pass	
	Angle of steady heel shall not be greater than (<=)	16 deg	1,1	Pass	93,28
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80 %	11,95	Pass	85,06
	Area1 / Area2 shall not be less than (>=)	100 %	474,66	Pass	374,66
	Intermediate values				
	Model windage area	m ²	309,367		
	Model windage area centroid height (from zero point)	m	6,459		
	Total windage area	m ²	529,777		
	Total windage area centroid height (from zero point)	m	8,049		
	Heel arm amplitude	m	0,12		
	Equilibrium angle with gust heel arm	deg	1,6		
	Deck edge immersion angle	deg	9		
	Area1 (under GZ), from 1,6 to 50,0 deg.	m.rad	1,7366		
	Area1 (under HA), from 1,6 to 50,0 deg.	m.rad	0,1521		
	Area1, from 1,6 to 50,0 deg.	m.rad	1,5845		
	Area2 (under GZ), from -17,0 to 1,6 deg.	m.rad	-0,2754		
	Area2 (under HA), from -17,0 to 1,6 deg.	m.rad	0,0584		
	Area2, from -17,0 to 1,6 deg.	m.rad	0,3338		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n \text{Pass} M / \text{disp.} D \cos^n(\phi)$				
	number of passengers: nPass =	399			
	passenger mass: M =	0,1 tonne			
	distance from centre line: D =	7,405 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg	1,9	Pass	81,13
	Intermediate values				
	Heel arm amplitude	m	0,21		
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: a =	1,02			
	vessel speed: v =	13 kn			
	turn radius, R, as percentage of Lwl	510 %			
	h = KG - mean draft / 2	3,639 m			
	cosine power: n =	0			
	shall not be greater than (<=)	10 deg	0,5	Pass	95,08
	Intermediate values				
	Heel arm amplitude	m	0,056		



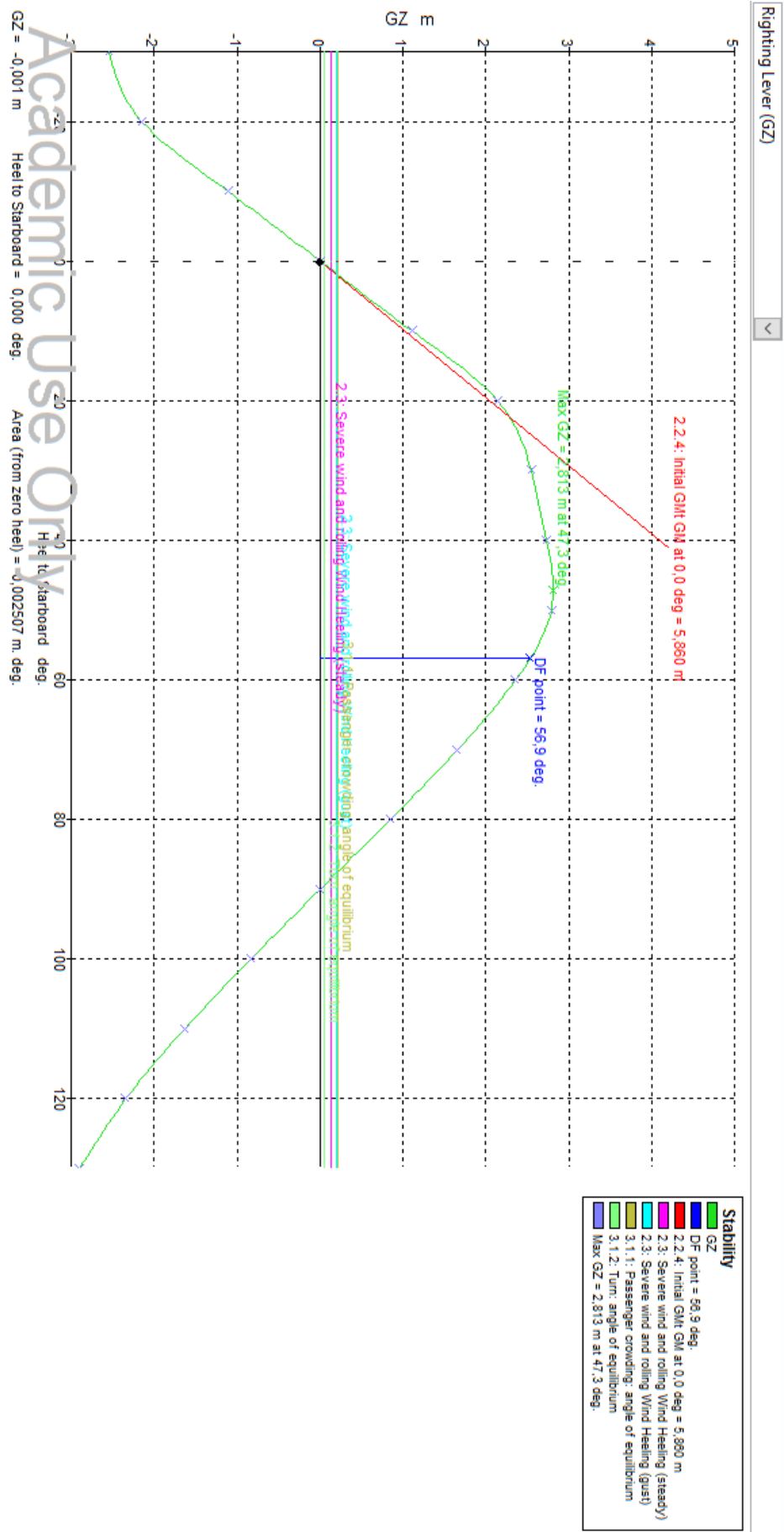
4.5.- Situación de carga 5: Salida de puerto sin carga, 100% consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volume	Total Volume	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	1		9,5	9,5			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	1		5,77	5,77			0	0	9,73	0	User Specified
Hielo cubierta del puente	1		12,24	12,24			0	0	12,73	0	User Specified
Hielo cubierta encima puente	1		4,32	4,32			0	0	15,73	0	User Specified
Hielo lateral	1		6,31	6,31			0	0	10,28	0	User Specified
Total Hielo				38,14			0	0	10,168	0	
Coches	0		2,5	0			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				0			0	0	0	0	
Diesel	100%	1,137	10,731	10,731	12,775	12,775	-5,234	0	0,9	93,408	IMO A.749(18)
Uso diario Diesel	100%	0,537	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,537	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	100%		11,883	11,883	14,147	14,147	-5,259	0	0,973	93,408	
Tanque de lodos	0%	0	0,621	0	0,739	0	-4,003	-2	0,38	0	User Specified
Total Diesel Usado	0%		0,621	0	0,739	0	0	0	0	0	
Almacen Aceite	100%	1,133	0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	User Specified
Total Aceite Para Usar	100%		0,522	0,522	0,567	0,567	-4,249	-0,483	0,719	0	
Aceite sucio	0%	0	0,445	0	0,484	0	-4,003	-1	0,225	0	User Specified
Total Aceite Usado	0%		0,445	0	0,484	0	0	0	0	0	
Agua dulce	100%	1,116	42,085	42,085	42,085	42,085	3,656	0	0,879	399,192	IMO A.749(18)
Agua técnica	100%	1,133	1,459	1,459	1,459	1,459	-4,249	1,375	0,793	0	User Specified
Total Agua Para Usar	100%		43,544	43,544	43,544	43,544	3,392	0,046	0,876	399,192	
Aguas negras	0%	0	30,405	0	30,405	0	-0,02	0	0	302,062	IMO A.749(18)
Total Agua Sucia	0%		30,405	0	30,405	0	0	0	0	302,062	
Tanque de comp. PR ER	50%	1,637	23,445	11,723	23,445	11,723	21,363	3,834	3,202	0	User Specified
Tanque de comp. PR BR	50%	1,637	23,445	11,723	23,445	11,723	21,363	-3,834	3,202	0	User Specified
Tanque de comp. PP ER	50%	1,756	23,445	11,722	23,445	11,722	-21,36	3,835	3,202	0	User Specified
Tanque de comp. PP BR	50%	1,756	23,445	11,722	23,445	11,722	-21,36	-3,835	3,202	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,002	0	3,202	0	
Tanque LNG PR	100%	1,761	24,335	24,335	24,335	24,335	21,001	0,002	10,73	0	User Specified
Tanque LNG PP	100%	1,877	24,335	24,335	24,335	24,335	-21,001	0,002	10,73	0	User Specified
Total LNG	100%		48,669	48,669	48,669	48,669	0	0,002	10,73	0	
Total Loadcase				1325,106	232,336	153,818	0,328	0,001	5,386	794,662	
FS correction									0,6		
VCG fluid									5,986		

Draft Amidships m	3,256
Displacement t	1325
Heel deg	0,0
Draft at FP m	3,332
Draft at AP m	3,180
Draft at LCF m	3,250
Trim (+ve by stern) m	-0,152
WL Length m	59,436
Beam max extents on WL m	16,504
Wetted Area m ²	887,017
Waterpl. Area m ²	755,842
Prismatic coeff. (Cp)	0,544
Block coeff. (Cb)	0,409
Max Sect. area coeff. (Cm)	0,764
Waterpl. area coeff. (Cwp)	0,771
LCB from zero pt. (+ve fwd) m	0,338
LCF from zero pt. (+ve fwd) m	0,138
KB m	2,172
KG fluid m	5,986
BMt m	9,673
BML m	121,995
GMt corrected m	5,860
GML m	118,182
KMt m	11,845
KML m	124,167
Immersion (TPc) tonne/cm	7,558
MTc tonne.m	28,590
RM at 1deg = GMt.Disp.sin(1) tonne.m	135,513
Max deck inclination deg	0,1589
Trim angle (+ve by stern) deg	-0,1589

Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated	59,436	m			
	B, Stability calculated	17,8	m			
	d, Stability calculated	3,256	m			
	GMf, Stability calculated	5,86	m			
	VCG, Stability calculated	5,986	m			
	CB, Stability calculated	0,409				
	Ak, keel area, user spec.	25,236	m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to	18,4	deg			
	Intermediate values					
	B / d			5,466		
	100 Ak / L / B			2,385		
	C		IMO units	0,473		
	T		s	6,959		
	OG, Centre of gravity above WL		m	2,729		
	X1		IMO units	0,8		
X2		IMO units	0,75			
k tabulated		IMO units	0,811			
r		IMO units	1,233			
s		IMO units	0,098			
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	30	deg	30		
	angle of vanishing stability	90	deg			
shall not be less than (>=)	0,055	m.rad	0,8027	Pass	1359,41	
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle	0	deg	0		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	56,9	deg			
	angle of vanishing stability	90	deg			
shall not be less than (>=)	0,09	m.rad	1,2636	Pass	1304,05	
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	40	deg	40		
	first downflooding angle	56,9	deg			
	angle of vanishing stability	90	deg			
shall not be less than (>=)	0,03	m.rad	0,461	Pass	1436,5	
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle	30	deg	30		
	to the lesser of					
	spec. heel angle	90	deg			
	angle of max. GZ	47,3	deg	47,3		
shall not be less than (>=)	0,2	m	2,813	Pass	1306,5	
	Intermediate values					
	angle at which this GZ occurs		deg	47,3		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ shall not be less than (\geq)		25 deg	47,3	Pass	89,09
267(85) Ch2 - General Criteria	2.2.4: Initial GMt spec. heel angle shall not be less than (\geq)		0 deg	5,86	Pass	3806,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$					
	constant: a =		0,99966			
	wind pressure: P =		504 Pa			
	area centroid height (from zero point): h =		10,28 m			
	additional area: A =		220,41 m ²			
	H = vert. centre of projected lat. u'water area		1,769 m			
	cosine power: n =		0			
	gust ratio		1,5			
	Area2 integrated to the lesser of					
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	18,4 (-17,2)	deg	-17,2		
	Area 1 upper integration range, to the lesser of:					
	spec. heel angle		50 deg	50		
	first downflooding angle		56,9 deg			
	angle of vanishing stability (with gust heel arm)		87,7 deg			
	Angle for GZ(max) in GZ ratio, the lesser of:					
	angle of max. GZ		47,3 deg	47,3		
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle				
	Criteria:				Pass	
	Angle of steady heel shall not be greater than (\leq)		16 deg	1,2	Pass	92,51
	Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq)		80 %	12,53	Pass	84,34
	Area1 / Area2 shall not be less than (\geq)		100 %	452,31	Pass	352,31
	Intermediate values					
	Model windage area		m ²	315,831		
	Model windage area centroid height (from zero point)		m	6,395		
	Total windage area		m ²	536,241		
	Total windage area centroid height (from zero point)		m	7,992		
	Heel arm amplitude		m	0,129		
	Equilibrium angle with gust heel arm		deg	1,8		
	Deck edge immersion angle		deg	9,6		
	Area1 (under GZ), from 1,8 to 50,0 deg.		m.rad	1,7473		
	Area1 (under HA), from 1,8 to 50,0 deg.		m.rad	0,1633		
	Area1, from 1,8 to 50,0 deg.		m.rad	1,584		
	Area2 (under GZ), from -17,2 to 1,8 deg.		m.rad	-0,2858		
	Area2 (under HA), from -17,2 to 1,8 deg.		m.rad	0,0644		
	Area2, from -17,2 to 1,8 deg.		m.rad	0,3502		
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium				Pass	
	Pass. crowding arm = $n_{\text{Pass}} M / \text{disp.} D \cos^n(\phi)$					
	number of passengers: $n_{\text{Pass}} =$		399			
	passenger mass: M =		0,1 tonne			
	distance from centre line: D =		7,405 m			
	cosine power: n =		0			
	shall not be greater than (\leq)		10 deg	2,1	Pass	79,43
	Intermediate values					
	Heel arm amplitude		m	0,223		
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium				Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$					
	constant: a =		1,02			
	vessel speed: v =		13 kn			
	turn radius, R, as percentage of Lwl		510 %			
	h = KG - mean draft / 2		3,758 m			
	cosine power: n =		0			
	shall not be greater than (\leq)		10 deg	0,5	Pass	94,58
	Intermediate values					
	Heel arm amplitude		m	0,058		



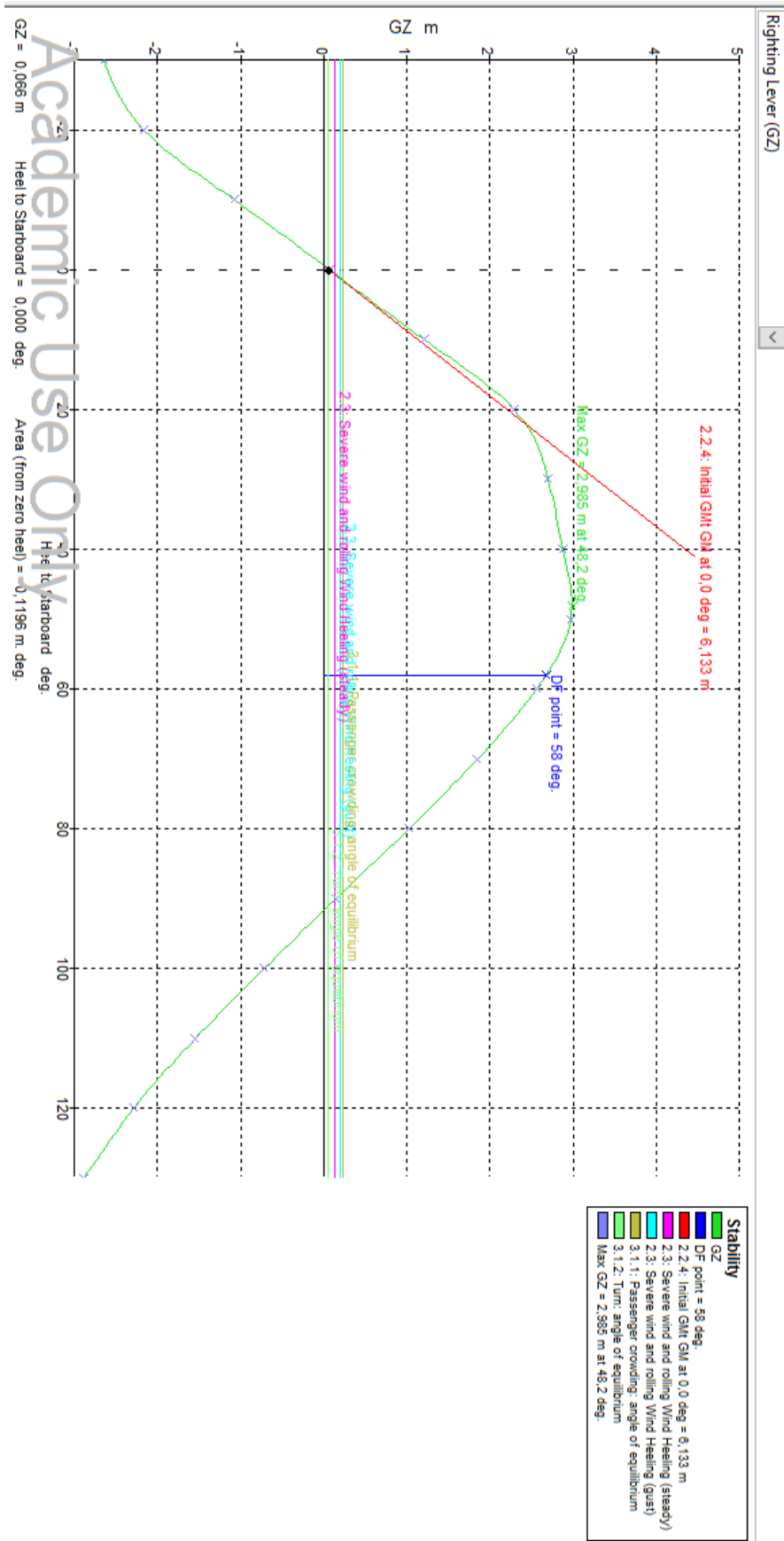
4.6.- Situación de carga 6: Llegada a puerto sin carga, 10% consumos

Item name	Quantity	Sounding	Unit Mass	Total Mass	Unit Volum	Total Volum	Long. Arm	Transv. Arm	Vert. Arm	Total FSM	FSM Type
Peso en rosca	1		1094,457	1094,457			0,235	0	5,114	0	
Pasajeros	399		0,1	39,9			2,5	0	10,43	0	User Specified
Tripulación	7		0,1	0,7			0	0	13,43	0	User Specified
Maquinas expendedoras	2		0,2	0,4			-14,75	0	10,73	0	User Specified
Total Pesos Fijos				1135,457			0,309	0	5,308	0	
Hielo cubierta de carga	1		9,5	9,5			0	0	4,53	0	User Specified
Hielo cubierta de pasajeros	1		5,77	5,77			0	0	9,73	0	User Specified
Hielo cubierta del puente	1		12,24	12,24			0	0	12,73	0	User Specified
Hielo cubierta encima puente	1		4,32	4,32			0	0	15,73	0	User Specified
Hielo lateral	1		6,31	6,31			0	0	10,28	0	User Specified
Total Hielo				38,14			0	0	10,168	0	
Coches	0		2,5	0			0	0	5,73	0	User Specified
Camiones	0		26	0			0	0	6,73	0	User Specified
Total Carga				0			0	0	0	0	
Diesel	0,33%	0	10,731	0,035	12,775	0,042	-4,934	-6,508	1,213	5,855	IMO A.749(18)
Uso diario Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	0,5	1,65	0	User Specified
Sedimentación Diesel	100%	0,7	0,576	0,576	0,686	0,686	-5,5	-0,5	1,65	0	User Specified
Total Diesel Para Usar	10,00%		11,883	1,188	14,147	1,414	-5,483	-0,194	1,637	5,855	
Tanque de lodos	90%	0,34	0,621	0,559	0,739	0,665	-4,249	-3,001	0,887	0	User Specified
Total Diesel Usado	90%		0,621	0,559	0,739	0,665	-4,249	-3,001	0,887	0	
Almacen Aceite	10%	0,565	0,522	0,052	0,567	0,057	-4,243	-0,594	0,225	0	User Specified
Total Aceite Para Usar	10%		0,522	0,052	0,567	0,057	-4,243	-0,594	0,225	0	
Aceite sucio	90%	0,896	0,445	0,4	0,484	0,435	-4,249	-1,514	0,76	0	User Specified
Total Aceite Usado	90%		0,445	0,4	0,484	0,435	-4,249	-1,514	0,76	0	
Agua dulce	10%	0	42,085	4,209	42,085	4,209	3,484	-5,151	1,021	24,257	IMO A.749(18)
Agua técnica	10%	1,077	1,459	0,146	1,459	0,146	-4,247	0,334	0,3	0	User Specified
Total Agua Para Usar	10%		43,544	4,354	43,544	4,354	3,225	-4,967	0,997	24,257	
Aguas negras	90%	1,3	30,405	27,365	30,405	27,365	-1,5	-0,602	0,83	18,267	IMO A.749(18)
Total Agua Sucia	90%		30,405	27,365	30,405	27,365	-1,5	-0,602	0,83	18,267	
Tanque de comp. PR ER	50%	2,711	23,445	11,722	23,445	11,722	21,395	3,593	3,243	0	User Specified
Tanque de comp. PR BR	50%	0,403	23,445	11,722	23,445	11,722	21,33	-4,757	3,399	0	User Specified
Tanque de comp. PP ER	50%	2,711	23,445	11,722	23,445	11,722	-21,392	3,593	3,243	0	User Specified
Tanque de comp. PP BR	50%	0,504	23,445	11,722	23,445	11,722	-21,325	-4,757	3,399	0	User Specified
Total Agua Compensación	50%		93,78	46,89	93,78	46,89	0,002	-0,582	3,321	0	
Tanque LNG PR	10%	0	24,335	2,433	24,335	2,433	21,002	-3,064	10,194	0	User Specified
Tanque LNG PP	10%	0	24,335	2,433	24,335	2,433	-21	-3,064	10,194	0	User Specified
Total LNG	10%		48,669	4,867	48,669	4,867	0,001	-3,064	10,194	0	
Total Loadcase				1259,273	232,336	86,048	0,249	-0,066	5,281	48,379	
FS correction									0,038		
VCG fluid									5,319		

Draft Amidships m	3,167
Displacement t	1259
Heel deg	0,0
Draft at FP m	3,223
Draft at AP m	3,111
Draft at LCF m	3,162
Trim (+ve by stern) m	-0,112
WL Length m	59,343
Beam max extents on WL m	16,416
Wetted Area m ²	873,118
Waterpl. Area m ²	746,978
Prismatic coeff. (Cp)	0,536
Block coeff. (Cb)	0,404
Max Sect. area coeff. (Cm)	0,762
Waterpl. area coeff. (Cwp)	0,767
LCB from zero pt. (+ve fwd) m	0,256
LCF from zero pt. (+ve fwd) m	0,113
KB m	2,118
KG fluid m	5,903
BMt m	9,926
BML m	125,604
GMt corrected m	6,141
GML m	121,819
KMt m	12,044
KML m	127,722
Immersion (TPc) tonne/cm	7,470
MTc tonne.m	28,005
RM at 1deg = GMt.Disp.sin(1) tonne.m	134,963
Max deck inclination deg	0,1169
Trim angle (+ve by stern) deg	-0,1169

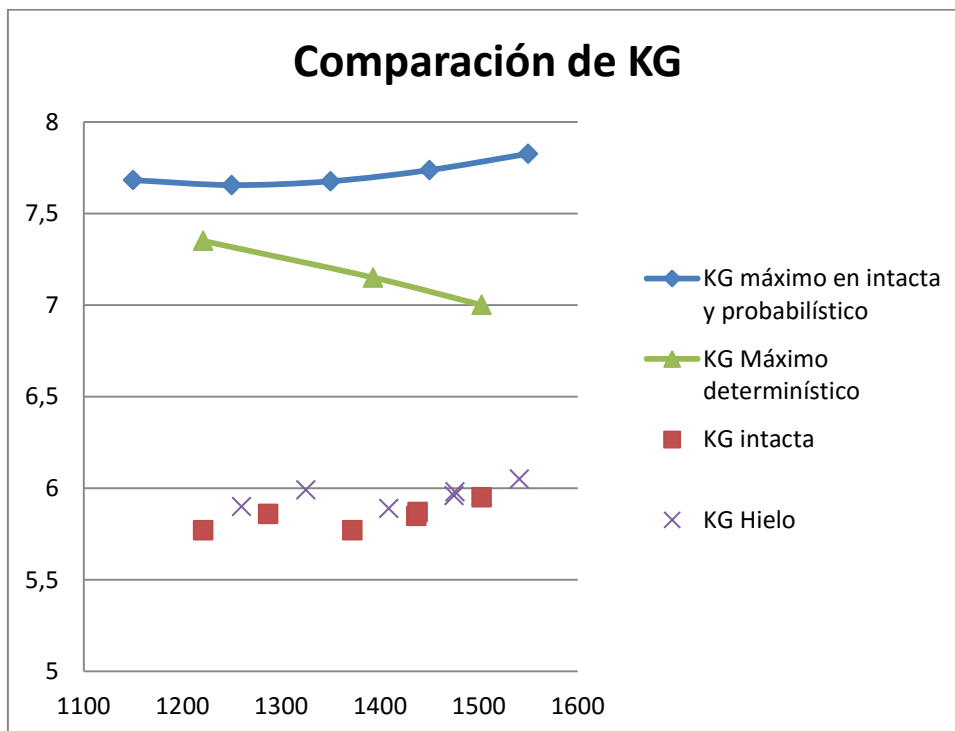
Code	Criteria	Value	Units	Actual	Status	Margin
267(85) Ch2 - General Criteria	2.3: IMO roll back angle					
	L, Stability calculated		59,343 m			
	B, Stability calculated		17,8 m			
	d, Stability calculated		3,167 m			
	GMf, Stability calculated		6,133 m			
	VCG, Stability calculated		5,912 m			
	CB, Stability calculated		0,404			
	Ak, keel area, user spec.		25,236 m ²			
	Method for k factor	Tabulated value for k				
	Evaluates to		18,6 deg			
	Intermediate values					
	B / d			5,621		
	100 Ak / L / B			2,389		
	C		IMO units	0,477		
	T		s	6,853		
	OG, Centre of gravity above WL		m	2,745		
	X1		IMO units	0,8		
	X2		IMO units	0,75		
	k tabulated		IMO units	0,81		
	r		IMO units	1,25		
	s		IMO units	0,098		
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 30				Pass	
	from the greater of					
	spec. heel angle		0 deg	0		
	to the lesser of					
	spec. heel angle		30 deg	30		
	angle of vanishing stability		91,7 deg			
	shall not be less than (>=)		0,055 m.rad	0,8653	Pass	1473,34
267(85) Ch2 - General Criteria	2.2.1: Area 0 to 40				Pass	
	from the greater of					
	spec. heel angle		0 deg	0		
	to the lesser of					
	spec. heel angle		40 deg	40		
	first downflooding angle		58 deg			
	angle of vanishing stability		91,7 deg			
	shall not be less than (>=)		0,09 m.rad	1,3532	Pass	1403,54
267(85) Ch2 - General Criteria	2.2.1: Area 30 to 40				Pass	
	from the greater of					
	spec. heel angle		30 deg	30		
	to the lesser of					
	spec. heel angle		40 deg	40		
	first downflooding angle		58 deg			
	angle of vanishing stability		91,7 deg			
	shall not be less than (>=)		0,03 m.rad	0,4878	Pass	1526,11
267(85) Ch2 - General Criteria	2.2.2: Max GZ at 30 or greater				Pass	
	in the range from the greater of					
	spec. heel angle		30 deg	30		
	to the lesser of					
	spec. heel angle		90 deg			
	angle of max. GZ		48,2 deg	48,2		
	shall not be less than (>=)		0,2 m	2,985	Pass	1392,5
	Intermediate values					
	angle at which this GZ occurs		deg	48,2		

267(85) Ch2 - General Criteria	2.2.3: Angle of maximum GZ shall not be less than (\geq)		25 deg	48,2 Pass	92,73
267(85) Ch2 - General Criteria	2.2.4: Initial GMT spec. heel angle shall not be less than (\geq)		0 deg 0,15 m	Pass 6,133 Pass	3988,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling			Pass	
	Wind arm: $a P A (h - H) / (g \text{ disp.}) \cos^n(\phi)$				
	constant: a =		0,99966		
	wind pressure: P =		504 Pa		
	area centroid height (from zero point): h =		10,28 m		
	additional area: A =		220,41 m ²		
	H = vert. centre of projected lat. u'water area		1,717 m		
	cosine power: n =		0		
	gust ratio		1,5		
	Area2 integrated to the lesser of				
	2.3: IMO roll back angle from equilibrium (with steady heel arm)	18,6 (-17,9)	deg	-17,9	
	Area 1 upper integration range, to the lesser of:				
	spec. heel angle		50 deg	50	
	first downflooding angle		58 deg		
	angle of vanishing stability (with gust heel arm)		89,3 deg		
	Angle for GZ(max) in GZ ratio, the lesser of:				
	angle of max. GZ		48,2 deg	48,2	
	Select required angle for angle of steady heel ratio:	DeckEdgeImmersionAngle			
	Criteria:			Pass	
	Angle of steady heel shall not be greater than (\leq)		16 deg	0,6 Pass	95,97
	Angle of steady heel / Deck edge immersion angle shall not be greater than (\leq)		80 %	6,27 Pass	92,16
	Area1 / Area2 shall not be less than (\geq)		100 %	460,58 Pass	360,58
	Intermediate values				
	Model windage area		m ²	321,143	
	Model windage area centroid height (from zero point)		m	6,342	
	Total windage area		m ²	541,553	
	Total windage area centroid height (from zero point)		m	7,945	
	Heel arm amplitude		m	0,138	
	Equilibrium angle with gust heel arm		deg	1,3	
	Deck edge immersion angle		deg	10,3	
	Area1 (under GZ), from 1,3 to 50,0 deg.		m.rad	1,8657	
	Area1 (under HA), from 1,3 to 50,0 deg.		m.rad	0,1756	
	Area1, from 1,3 to 50,0 deg.		m.rad	1,6901	
	Area2 (under GZ), from -17,9 to 1,3 deg.		m.rad	-0,2978	
	Area2 (under HA), from -17,9 to 1,3 deg.		m.rad	0,0691	
	Area2, from -17,9 to 1,3 deg.		m.rad	0,367	
3.1 Passenger Ships	3.1.1: Passenger crowding: angle of equilibrium			Pass	
	Pass. crowding arm = $n \text{ Pass } M / \text{ disp. } D \cos^n(\phi)$				
	number of passengers: nPass =		399		
	passenger mass: M =		0,1 tonne		
	distance from centre line: D =		7,405 m		
	cosine power: n =		0		
	shall not be greater than (\leq)		10 deg	1,5 Pass	84,86
	Intermediate values				
	Heel arm amplitude		m	0,235	
3.1 Passenger Ships	3.1.2: Turn: angle of equilibrium			Pass	
	Turn arm: $a v^2 / (R g) h \cos^n(\phi)$				
	constant: a =		1,02		
	vessel speed: v =		13 kn		
	turn radius, R, as percentage of Lwl		510 %		
	h = KG - mean draft / 2		3,697 m		
	cosine power: n =		0		
	shall not be greater than (\leq)		10 deg	-0,1 Pass	100,8
	Intermediate values				
	Heel arm amplitude		m	0,057	



Como se puede comprobar en cada situación de carga, se cumple todos los criterios de estabilidad intacta. El KG de cada situación tiene un incremento de uno 17 cm en la situación que más varía, que es la *Situación de carga 6: Llegada a puerto sin carga, 10% consumos*. Por lo tanto, están muy lejos de los KG máximos que aparecen en la curva de estabilidad intacta y el buque proyecto no sufrirá problema alguno en la navegación con hielo.

5.- Comparación de KG en todas las navegaciones del buque



Los KG que limitan la navegación del buque son los del análisis determinístico. Como se puede comprobar, todos los KG de intacta se encuentran por debajo de los de averías, por lo que el buque navegaría con seguridad. En la navegación con hielo los KG son algo más altos pero existe cierto margen hasta los KG limitantes, por lo que también sería una navegación segura.

6.- Bibliografía

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Anexo I. Resultados Análisis Probabilístico

Deepest subdivision draft (summer loadline) Loadcase			p	r	v	prv	stab range	gz max	equi	inmer	vanishing	Downflod	gx max angle	k	s int	s fin	s mo	s factor	A factor	
Deepest subdivision draft (summer loadline) Loadcase																				
Máxima carga: Z1 (stbd)	GZ curve completed successfully	Final stage*	18	0,036713	1	1	0,036713	54,1	1,304	0 8,2 (Pass)	60	54,1	24,1	1	1	1	1	1	0,036713	
Máxima carga: Z2 (stbd)	GZ curve completed successfully	Final stage*	16	0,020579	1	1	0,020579	53,9	1,293	0 7,5 (Pass)	60	53,9	25	1	1	1	1	1	0,020579	
Máxima carga: Z3; b1 (stbd)	GZ curve completed successfully	Final stage*	21,38,44	0,012007	0,727201	1	0,008732	53,3	1,288	0 4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,008732	
Máxima carga: Z3; bx (stbd)	GZ curve completed successfully	Final stage*	21,38,44	0,012007	0,272799	1	0,003276	53,3	1,288	0 4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,003276	
Máxima carga: Z4; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,070034	0,543257	0,128029	0,004871	51,3	1,246	1 7 6,0 (Pass)	60	53,1	27,7	1	1	1	1	1	0,004871	
Máxima carga: Z4; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,070034	0,543257	0,871971	0,033175	33,4	0,637	1 4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	0,033175	
Máxima carga: Z4; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					33,4	0,637	1 4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1		
Máxima carga: Z4; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	34,35,42	0,070034	0,456743	0,128029	0,004095	50,4	1,274	1 7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,004095	
Máxima carga: Z4; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,070034	0,456743	0,871971	0,027892	32,5	0,502	1 3 3,3 (Pass)	33,8	46,5	16	1	1	1	1	1	0,027892	
Máxima carga: Z4; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					32,5	0,502	1 3 3,3 (Pass)	33,8	46,5	16	1	1	1	1	1		
Máxima carga: Z5; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717738	0,128029	0,003937	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,003937	
Máxima carga: Z5; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717738	0,871971	0,026817	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,026817	
Máxima carga: Z5; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1		
Máxima carga: Z5; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,042848	0,282262	0,128029	0,001548	50,3	1,227	2 7 6,8 (Pass)	60	53	27,7	1	1	1	1	1	0,001548	
Máxima carga: Z5; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,042848	0,282262	0,871971	0,010546	50,3	1,227	2 7 6,8 (Pass)	60	53	27,7	1	1	1	1	1	0,010546	
Máxima carga: Z5; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,39					50,3	1,227	2 7 6,8 (Pass)	60	53	27,7	1	1	1	1	1		
Máxima carga: Z6; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,742992	0,128029	0,004076	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,004076	
Máxima carga: Z6; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,742992	0,871971	0,02776	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,02776	
Máxima carga: Z6; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1		
Máxima carga: Z6; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,257008	0,128029	0,00141	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,00141	
Máxima carga: Z6; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,257008	0,871971	0,009602	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,009602	
Máxima carga: Z6; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1		
Máxima carga: Z7; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,743037	0,128029	0,004076	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,004076	
Máxima carga: Z7; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,743037	0,871971	0,027762	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,027762	
Máxima carga: Z7; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1		
Máxima carga: Z7; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,256963	0,128029	0,00141	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,00141	
Máxima carga: Z7; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,256963	0,871971	0,009601	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,009601	
Máxima carga: Z7; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1		

Máxima carga: Z8; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717714	0,128029	0,003937	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,003937
Máxima carga: Z8; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717714	0,871971	0,026816	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,026816
Máxima carga: Z8; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z8; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,042848	0,282286	0,128029	0,001549	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,001549
Máxima carga: Z8; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,042848	0,282286	0,871971	0,010547	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,010547
Máxima carga: Z8; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z9; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,543257	0,128029	0,004871	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,004871
Máxima carga: Z9; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,543257	0,871971	0,033175	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,033175
Máxima carga: Z9; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z9; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,456743	0,128029	0,004095	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,004095
Máxima carga: Z9; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,456743	0,871971	0,027892	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,027892
Máxima carga: Z9; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z10; b1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,012007	0,727215	1	0,008732	53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,008732
Máxima carga: Z10; bx (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,012007	0,272785	1	0,003275	53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,003275
Máxima carga: Z11 (stbd)	GZ curve completed successfully	Final stage*		15	0,020579	1	1	0,020579	53,9	1,293	0 7,5 (Pass)	60	53,9	25	1	1	1	1	0,020579
Máxima carga: Z12 (stbd)	GZ curve completed successfully	Final stage*		17	0,036713	1	1	0,036713	54,1	1,304	0 8,2 (Pass)	60	54,1	24,1	1	1	1	1	0,036713
Máxima carga: Z1,2 (stbd)	GZ curve completed successfully	Final stage*		16,18	0,035634	1	1	0,035634	53,8	1,289	0 7,0 (Pass)	60	53,8	25,9	1	1	1	1	0,035634
Máxima carga: Z2,2; b1 (stbd)	GZ curve completed successfully	Final stage*	16,21,38,44	0,023384	0,621279	1	0,014528	52,9	1,277	0,5 6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,014528
Máxima carga: Z2,2; bx (stbd)	GZ curve completed successfully	Final stage*	16,21,38,44	0,023384	0,378721	1	0,008856	52,9	1,277	0,5 6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,008856
Máxima carga: Z3,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44	0,033182	0,526047	0,128029	0,002235	50,2	1,241	2,3 4,7 (Pass)	60	52,5	30,5	1	1	1	1	1	0,002235
Máxima carga: Z3,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,033182	0,526047	0,871971	0,01522	32	0,537	1,9 4,7 (Pass)	33,8	47,1	16	1	1	1	1	1	0,01522
Máxima carga: Z3,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					32	0,537	1,9 4,7 (Pass)	33,8	47,1	16	1	1	1	1	1	
Máxima carga: Z3,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44	0,033182	0,067717	0,128029	0,000288	48,9	1,298	2,5 1,4 (Fail)	60	51,3	33,2	1	1	1	1	0	0
Máxima carga: Z3,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,033182	0,067717	0,871971	0,001959	30,4	0,361	2,1 1,4 (Fail)	32,5	45,5	16	1	1	1	1	0	0
Máxima carga: Z3,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					30,4	0,361	2,1 1,4 (Fail)	32,5	45,5	16	1	1	1	1	0	
Máxima carga: Z3,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44	0,033182	0,406236	0,128029	0,001726	48,9	1,298	2,5 1,4 (Fail)	60	51,3	33,2	1	1	1	1	0	0
Máxima carga: Z3,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,033182	0,406236	0,871971	0,011754	30,4	0,361	2,1 1,4 (Fail)	32,5	45,5	16	1	1	1	1	0	0
Máxima carga: Z3,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					30,4	0,361	2,1 1,4 (Fail)	32,5	45,5	16	1	1	1	1	0	
Máxima carga: Z4,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*		35,42	0,049767	0,517348	0,128029	0,003296	51,3	1,246	1,7 6,0 (Pass)	60	53,1	27,7	1	1	1	1	0,003296
Máxima carga: Z4,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,049767	0,517348	0,871971	0,022451	33,4	0,637	1,4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	0,022451

Máxima carga: Z4,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					33,4	0,637	1,4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	
Máxima carga: Z4,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	34,35,42	0,049767	0,151831	0,128029	0,000967	50,4	1,274	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,000967
Máxima carga: Z4,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,049767	0,151831	0,871971	0,006589	32,5	0,502	1,3 3,3 (Pass)	33,8	46,5	16	1	1	1	1	1	0,006589
Máxima carga: Z4,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					32,5	0,502	1,3 3,3 (Pass)	33,8	46,5	16	1	1	1	1	1	
Máxima carga: Z4,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42	0,049767	0,33082	0,128029	0,002108	46,9	1,253	4 3,4 (Fail)	60	50,9	35	1	1	1	1	0	0
Máxima carga: Z4,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42,46	0,049767	0,33082	0,871971	0,014356	26,3	0,278	3,6 3,4 (Fail)	29,9	45,3	16	1	1	1	1	0	0
Máxima carga: Z4,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,34,35,39,42,46					26,3	0,278	3,6 3,4 (Fail)	29,9	45,3	16	1	1	1	1	0	
Máxima carga: Z5,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674397	0,128029	0,003897	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,003897
Máxima carga: Z5,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674397	0,871971	0,026544	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,026544
Máxima carga: Z5,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z5,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,026227	0,128029	0,000152	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000152
Máxima carga: Z5,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,026227	0,871971	0,001032	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,001032
Máxima carga: Z5,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z5,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*		26,39	0,045138	0,299376	0,128029	0,00173	50,3	1,227	2,7 6,8 (Pass)	60	53	27,7	1	1	1	1	0,00173
Máxima carga: Z5,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*		26,39	0,045138	0,299376	0,871971	0,011783	50,3	1,227	2,7 6,8 (Pass)	60	53	27,7	1	1	1	1	0,011783
Máxima carga: Z5,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage		26,39				50,3	1,227	2,7 6,8 (Pass)	60	53	27,7	1	1	1	1	1	
Máxima carga: Z6,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,700624	0,128029	0,004049	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,004049
Máxima carga: Z6,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,700624	0,871971	0,027576	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,027576
Máxima carga: Z6,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z6,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,299329	0,128029	0,00173	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,00173
Máxima carga: Z6,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,299329	0,871971	0,011781	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,011781
Máxima carga: Z6,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z7,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674372	0,128029	0,003897	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,003897
Máxima carga: Z7,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674372	0,871971	0,026543	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,026543
Máxima carga: Z7,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z7,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,026299	0,128029	0,000152	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,000152
Máxima carga: Z7,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,026299	0,871971	0,001035	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,001035
Máxima carga: Z7,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z7,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,299329	0,128029	0,00173	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,00173
Máxima carga: Z7,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,299329	0,871971	0,011781	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,011781

Máxima carga: Z7,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z8,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,517348	0,128029	0,003296		54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,003296
Máxima carga: Z8,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,517348	0,871971	0,022451		54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,022451
Máxima carga: Z8,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z8,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,151806	0,128029	0,000967		54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000967
Máxima carga: Z8,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,151806	0,871971	0,006588		54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,006588
Máxima carga: Z8,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z8,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,049767	0,330845	0,128029	0,002108		50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,002108
Máxima carga: Z8,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,049767	0,330845	0,871971	0,014357		50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,014357
Máxima carga: Z8,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z9,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,526047	0,128029	0,002235		53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,002235
Máxima carga: Z9,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,526047	0,871971	0,01522		53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,01522
Máxima carga: Z9,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	
Máxima carga: Z9,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,067731	0,128029	0,000288		53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,000288
Máxima carga: Z9,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,067731	0,871971	0,00196		53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,00196
Máxima carga: Z9,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	
Máxima carga: Z9,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,406222	0,128029	0,001726		53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,001726
Máxima carga: Z9,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,406222	0,871971	0,011753		53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,011753
Máxima carga: Z9,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	
Máxima carga: Z10,2; b1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,023384	0,621293	1	0,014528		52,9	1,276	0,5 6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,014528
Máxima carga: Z10,2; bx (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,023384	0,378707	1	0,008856		52,9	1,276	0,5 6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,008856
Máxima carga: Z11,2 (stbd)	GZ curve completed successfully	Final stage*		15,17	0,035634	1	0,035634		53,8	1,289	0 7,0 (Pass)	60	53,8	25,9	1	1	1	1	1	0,035634
Máxima carga: Z1,3; b1 (stbd)	GZ curve completed successfully	Final stage*	16,18,21,38,44	0,0115	0,574369	1	0,006605		52,7	1,276	0,5 5,4 (Pass)	60	53,2	27,7	1	1	1	1	1	0,006605
Máxima carga: Z1,3; bx (stbd)	GZ curve completed successfully	Final stage*	16,18,21,38,44	0,0115	0,425631	1	0,004895		52,7	1,276	0,5 5,4 (Pass)	60	53,2	27,7	1	1	1	1	1	0,004895
Máxima carga: Z2,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,35,38,42,44	0,019601	0,515323	0,128029	0,001293		49,4	1,256	2,5 3,0 (Pass)	60	51,9	32,3	1	1	1	1	1	0,001293
Máxima carga: Z2,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,35,38,42,44,46	0,019601	0,515323	0,871971	0,008808		30,7	0,43	2,1 3,0 (Pass)	32,8	46,4	16	1	1	1	1	1	0,008808
Máxima carga: Z2,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,35,38,42,44,46						30,7	0,43	2,1 3,0 (Pass)	32,8	46,4	16	1	1	1	1	1	
Máxima carga: Z2,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44	0,019601	0,067497	0,128029	0,000169		47,2	1,333	3,1 0,0 (Fail)	60	50,3	33,2	1	1	1	1	0	0
Máxima carga: Z2,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44,46	0,019601	0,067497	0,871971	0,001154		27	0,214	3,6 0,0 (Fail)	30,6	44,2	16	1	1	1	1	0	0
Máxima carga: Z2,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,34,35,38,42,44,46						27	0,214	3,6 0,0 (Fail)	30,6	44,2	16	1	1	1	1	0	

Máxima carga: Z2,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44	0,019601	0,41718	0,128029	0,001047	47,2	1,333	3,1 0,0 (Fail)	60	50,3	33,2	1	1	1	1	0	0
Máxima carga: Z2,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44,46	0,019601	0,41718	0,871971	0,00713	27	0,214	3,6 0,0 (Fail)	30,6	44,2	16	1	1	1	1	0	0
Máxima carga: Z2,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,34,35,38,42,44,46					27	0,214	3,6 0,0 (Fail)	30,6	44,2	16	1	1	1	1	0	
Máxima carga: Z3,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44	0,003527	0,512087	0,128029	0,000231	50,2	1,241	2,3 4,7 (Pass)	60	52,5	30,5	1	1	1	1	1	0,000231
Máxima carga: Z3,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,003527	0,512087	0,871971	0,001575	32	0,537	1,9 4,7 (Pass)	33,8	47,1	16	1	1	1	1	1	0,001575
Máxima carga: Z3,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					32	0,537	1,9 4,7 (Pass)	33,8	47,1	16	1	1	1	1	1	
Máxima carga: Z3,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,003527	0,067426	0,871971	0,000207	32	0,537	1,9 4,7 (Pass)	33,8	47,1	16	1	1	1	1	1	0,000207
Máxima carga: Z3,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					32	0,537	1,9 4,7 (Pass)	33,8	47,1	16	1	1	1	1	1	
Máxima carga: Z3,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,003527	0,084411	0,871971	0,00026	30,4	0,361	2,1 1,4 (Fail)	32,5	45,5	16	1	1	1	1	0	0
Máxima carga: Z3,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					30,4	0,361	2,1 1,4 (Fail)	32,5	45,5	16	1	1	1	1	0	
Máxima carga: Z3,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	21,26,34,35,38,39,42,44	0,003527	0,336075	0,128029	0,000152	45,3	1,283	4,8 1,5 (Fail)	60	50,1	35	1	1	1	1	0	0
Máxima carga: Z3,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,26,34,35,38,39,42,44,46	0,003527	0,336075	0,871971	0,001034	21,8	0,142	5,4 1,5 (Fail)	27,2	44,3	16	1	1	1	0,724429	0	0
Máxima carga: Z3,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,26,34,35,38,39,42,44,46					21,8	0,142	5,4 1,5 (Fail)	27,2	44,3	16	1	1	1	0,724429	0	
Máxima carga: Z4,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,009893	0,508666	0,128029	0,000644	51,3	1,246	1,7 6,0 (Pass)	60	53,1	27,7	1	1	1	1	1	0,000644
Máxima carga: Z4,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,009893	0,508666	0,871971	0,004388	33,4	0,637	1,4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	0,004388
Máxima carga: Z4,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					33,4	0,637	1,4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	
Máxima carga: Z4,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,009893	0,151838	0,128029	0,000192	51,3	1,246	1,7 6,0 (Pass)	60	53,1	27,7	1	1	1	1	1	0,000192
Máxima carga: Z4,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,009893	0,151838	0,871971	0,00131	33,4	0,637	1,4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	0,00131
Máxima carga: Z4,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					33,4	0,637	1,4 5,9 (Pass)	34,8	47,8	16,9	1	1	1	1	1	
Máxima carga: Z4,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,009893	0,026506	0,871971	0,000229	32,5	0,502	1,3 3,3 (Pass)	33,8	46,5	16	1	1	1	1	1	0,000229
Máxima carga: Z4,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					32,5	0,502	1,3 3,3 (Pass)	33,8	46,5	16	1	1	1	1	1	
Máxima carga: Z4,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42	0,009893	0,312989	0,128029	0,000396	46,9	1,253	4 3,4 (Fail)	60	50,9	35	1	1	1	1	0	0
Máxima carga: Z4,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42,46	0,009893	0,312989	0,871971	0,0027	26,3	0,278	3,6 3,4 (Fail)	29,9	45,3	16	1	1	1	1	0	0
Máxima carga: Z4,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,34,35,39,42,46					26,3	0,278	3,6 3,4 (Fail)	29,9	45,3	16	1	1	1	1	0	
Máxima carga: Z5,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,662625	0,128029	0,000757	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000757
Máxima carga: Z5,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,662625	0,871971	0,005154	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,005154
Máxima carga: Z5,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z5,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,026464	0,871971	0,000206	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000206
Máxima carga: Z5,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z5,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,008921	0,310863	0,128029	0,000355	50,3	1,227	2,7 6,8 (Pass)	60	53	27,7	1	1	1	1	1	0,000355

Máxima carga: Z5,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,008921	0,310863	0,871971	0,002418	50,3	1,227	2,7 6,8 (Pass)	60	53	27,7	1	1	1	1	1	0,002418
Máxima carga: Z5,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,39					50,3	1,227	2,7 6,8 (Pass)	60	53	27,7	1	1	1	1	1	
Máxima carga: Z6,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,6626	0,128029	0,000757	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000757
Máxima carga: Z6,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,6626	0,871971	0,005154	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,005154
Máxima carga: Z6,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z6,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,026489	0,871971	0,000206	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000206
Máxima carga: Z6,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z6,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,008921	0,310863	0,128029	0,000355	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,000355
Máxima carga: Z6,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,008921	0,310863	0,871971	0,002418	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,002418
Máxima carga: Z6,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z7,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,508666	0,128029	0,000644	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000644
Máxima carga: Z7,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,508666	0,871971	0,004388	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,004388
Máxima carga: Z7,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z7,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,151813	0,128029	0,000192	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,000192
Máxima carga: Z7,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,151813	0,871971	0,00131	54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	0,00131
Máxima carga: Z7,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					54,2	1,308	0 8,5 (Pass)	60	54,2	24,1	1	1	1	1	1	
Máxima carga: Z7,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,009893	0,026579	0,871971	0,000229	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,000229
Máxima carga: Z7,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z7,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,009893	0,312942	0,128029	0,000396	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,000396
Máxima carga: Z7,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,009893	0,312942	0,871971	0,0027	50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	0,0027
Máxima carga: Z7,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					50,4	1,273	1,7 3,3 (Pass)	60	52,1	31,4	1	1	1	1	1	
Máxima carga: Z8,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,512087	0,128029	0,000231	53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,000231
Máxima carga: Z8,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,512087	0,871971	0,001575	53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,001575
Máxima carga: Z8,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	
Máxima carga: Z8,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,067441	0,871971	0,000207	53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,000207
Máxima carga: Z8,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	
Máxima carga: Z8,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,084372	0,871971	0,00026	53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	0,00026
Máxima carga: Z8,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					53,3	1,288	0,4 7,4 (Pass)	60	53,8	25	1	1	1	1	1	
Máxima carga: Z8,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,28,29,37,40,43	0,003527	0,3361	0,128029	0,000152	48,8	1,297	2,4 1,4 (Fail)	60	51,3	33,2	1	1	1	1	0	0
Máxima carga: Z8,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,28,29,37,40,43	0,003527	0,3361	0,871971	0,001034	48,8	1,297	2,4 1,4 (Fail)	60	51,3	33,2	1	1	1	1	0	0

Máxima carga: Z8,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,28,29,37,40,43					48,8	1,297	2,4	1,4 (Fail)	60	51,3	33,2	1	1	1	1	0		
Máxima carga: Z9,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,515323	0,128029	0,001293	52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,001293	
Máxima carga: Z9,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,515323	0,871971	0,008808	52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,008808	
Máxima carga: Z9,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	15,19,23,37,43					52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1		
Máxima carga: Z9,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,067511	0,128029	0,000169	52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,000169	
Máxima carga: Z9,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,067511	0,871971	0,001154	52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,001154	
Máxima carga: Z9,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	15,19,23,37,43					52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1		
Máxima carga: Z9,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,417166	0,128029	0,001047	52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,001047	
Máxima carga: Z9,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,417166	0,871971	0,00713	52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1	0,00713	
Máxima carga: Z9,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	15,19,23,37,43					52,9	1,276	0,5	6,0 (Pass)	60	53,4	26,8	1	1	1	1	1		
Máxima carga: Z10,3; b1 (stbd)	GZ curve completed successfully	Final stage*	15,17,19,23,37,43	0,0115	0,574383	1	0,006605	52,7	1,276	0,5	5,4 (Pass)	60	53,2	27,7	1	1	1	1	1	0,006605	
Máxima carga: Z10,3; bx (stbd)	GZ curve completed successfully	Final stage*	15,17,19,23,37,43	0,0115	0,425617	1	0,004895	52,7	1,276	0,5	5,4 (Pass)	60	53,2	27,7	1	1	1	1	1	0,004895	
Attained partial Index As							0,976027													0,928609	0,640125 Pass

Partial subdivision draft Loadcase																				
Carga parcial: Z1 (stbd)	GZ curve completed successfully	Final stage*		18	0,036713	1	1	0,036713	55,8	1,428	0 9,3 (Pass)	60	55,8	25	1	1	1	1	1	0,036713
Carga parcial: Z2 (stbd)	GZ curve completed successfully	Final stage*		16	0,020579	1	1	0,020579	55,6	1,418	0 8,6 (Pass)	60	55,6	25	1	1	1	1	1	0,020579
Carga parcial: Z3; b1 (stbd)	GZ curve completed successfully	Final stage*	21,38,44		0,012007	0,727201	1	0,008732	55,1	1,413	0 4 8,5 (Pass)	60	55,5	25	1	1	1	1	1	0,008732
Carga parcial: Z3; bx (stbd)	GZ curve completed successfully	Final stage*	21,38,44		0,012007	0,272799	1	0,003276	55,1	1,413	0 4 8,5 (Pass)	60	55,5	25	1	1	1	1	1	0,003276
Carga parcial: Z4; b1; H1 (stbd)	GZ curve completed successfully	Final stage*		35,42	0,070034	0,543257	0,142664	0,005428	53,2	1,368	1,6 7,0 (Pass)	60	54,7	26,8	1	1	1	1	1	0,005428
Carga parcial: Z4; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46		0,070034	0,543257	0,857336	0,032618	36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	0,032618
Carga parcial: Z4; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46						36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	
Carga parcial: Z4; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	34,35,42		0,070034	0,456743	0,142664	0,004563	52,3	1,386	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,004563
Carga parcial: Z4; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46		0,070034	0,456743	0,857336	0,027424	36,3	0,68	1,4 4,4 (Pass)	37,7	48,1	16,9	1	1	1	1	1	0,027424
Carga parcial: Z4; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46						36,3	0,68	1,4 4,4 (Pass)	37,7	48,1	16,9	1	1	1	1	1	
Carga parcial: Z5; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,717738	0,142664	0,004387	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004387
Carga parcial: Z5; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,717738	0,857336	0,026366	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,026366
Carga parcial: Z5; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z5; bx; H1 (stbd)	GZ curve completed successfully	Final stage*		26,39	0,042848	0,282262	0,142664	0,001725	52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	0,001725
Carga parcial: Z5; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*		26,39	0,042848	0,282262	0,857336	0,010369	52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	0,010369
Carga parcial: Z5; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage		26,39					52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	
Carga parcial: Z6; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,742992	0,142664	0,004542	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004542
Carga parcial: Z6; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,742992	0,857336	0,027294	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,027294
Carga parcial: Z6; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z6; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,257008	0,142664	0,001571	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,001571
Carga parcial: Z6; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,257008	0,857336	0,009441	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,009441
Carga parcial: Z6; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z7; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,743037	0,142664	0,004542	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004542
Carga parcial: Z7; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,743037	0,857336	0,027296	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,027296
Carga parcial: Z7; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z7; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,256963	0,142664	0,001571	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,001571
Carga parcial: Z7; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,256963	0,857336	0,00944	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,00944
Carga parcial: Z7; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z8; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,042848	0,717714	0,142664	0,004387	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004387

Carga parcial: Z8; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717714	0,857336	0,026366	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,026366
Carga parcial: Z8; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z8; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,042848	0,282286	0,142664	0,001726	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,001726
Carga parcial: Z8; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,042848	0,282286	0,857336	0,01037	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,01037
Carga parcial: Z8; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	
Carga parcial: Z9; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,543257	0,142664	0,005428	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,005428
Carga parcial: Z9; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,543257	0,857336	0,032618	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,032618
Carga parcial: Z9; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z9; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,456743	0,142664	0,004563	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004563
Carga parcial: Z9; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,456743	0,857336	0,027424	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,027424
Carga parcial: Z9; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z10; b1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,012007	0,727215	1	0,008732	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,008732
Carga parcial: Z10; bx (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,012007	0,272785	1	0,003275	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,003275
Carga parcial: Z11 (stbd)	GZ curve completed successfully	Final stage*		15	0,020579	1	1	0,020579	55,6	1,418	0 8,6 (Pass)	60	55,6	25	1	1	1	1	0,020579
Carga parcial: Z12 (stbd)	GZ curve completed successfully	Final stage*		17	0,036713	1	1	0,036713	55,8	1,428	0 9,3 (Pass)	60	55,8	25	1	1	1	1	0,036713
Carga parcial: Z12 (stbd)	GZ curve completed successfully	Final stage*		16,18	0,035634	1	1	0,035634	55,5	1,414	0 8,3 (Pass)	60	55,5	25	1	1	1	1	0,035634
Carga parcial: Z2,2; b1 (stbd)	GZ curve completed successfully	Final stage*	16,21,38,44	0,023384	0,621279	1	0,014528	54,7	1,4	0 4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,014528
Carga parcial: Z2,2; bx (stbd)	GZ curve completed successfully	Final stage*	16,21,38,44	0,023384	0,378721	1	0,008856	54,7	1,4	0 4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,008856
Carga parcial: Z3,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44	0,033182	0,526047	0,142664	0,00249	52,1	1,359	2,1 5,7 (Pass)	60	54,3	28,6	1	1	1	1	1	0,00249
Carga parcial: Z3,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,033182	0,526047	0,857336	0,014965	35,7	0,709	1,8 5,6 (Pass)	37,5	48,7	16,9	1	1	1	1	1	0,014965
Carga parcial: Z3,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					35,7	0,709	1,8 5,6 (Pass)	37,5	48,7	16,9	1	1	1	1	1	
Carga parcial: Z3,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44	0,033182	0,067717	0,142664	0,000321	50,9	1,405	2,3 2,6 (Pass)	60	53,2	33,2	1	1	1	1	1	0,000321
Carga parcial: Z3,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,033182	0,067717	0,857336	0,001926	35	0,541	1,9 2,6 (Pass)	36,9	47,1	16,9	1	1	1	1	1	0,001926
Carga parcial: Z3,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					35	0,541	1,9 2,6 (Pass)	36,9	47,1	16,9	1	1	1	1	1	
Carga parcial: Z3,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44	0,033182	0,406236	0,142664	0,001923	50,9	1,405	2,3 2,6 (Pass)	60	53,2	33,2	1	1	1	1	1	0,001923
Carga parcial: Z3,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,033182	0,406236	0,857336	0,011557	35	0,541	1,9 2,6 (Pass)	36,9	47,1	16,9	1	1	1	1	1	0,011557
Carga parcial: Z3,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					35	0,541	1,9 2,6 (Pass)	36,9	47,1	16,9	1	1	1	1	1	
Carga parcial: Z4,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*		35,42	0,049767	0,517348	0,142664	0,003673	53,2	1,368	1,6 7,0 (Pass)	60	54,7	26,8	1	1	1	1	0,003673
Carga parcial: Z4,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,049767	0,517348	0,857336	0,022074	36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	0,022074
Carga parcial: Z4,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	

Carga parcial: Z4,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	34,35,42	0,049767	0,151831	0,142664	0,001078	52,3	1,386	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,001078
Carga parcial: Z4,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,049767	0,151831	0,857336	0,006478	36,3	0,68	1,4 4,4 (Pass)	37,7	48,1	16,9	1	1	1	1	1	0,006478
Carga parcial: Z4,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					36,3	0,68	1,4 4,4 (Pass)	37,7	48,1	16,9	1	1	1	1	1	
Carga parcial: Z4,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42	0,049767	0,33082	0,142664	0,002349	48,8	1,366	3,9 4,5 (Pass)	60	52,6	37,7	1	1	1	1	1	0,002349
Carga parcial: Z4,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42,46	0,049767	0,33082	0,857336	0,014115	31,3	0,456	3,5 4,5 (Pass)	34,8	46,9	16,9	1	1	1	1	1	0,014115
Carga parcial: Z4,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,34,35,39,42,46					31,3	0,456	3,5 4,5 (Pass)	34,8	46,9	16,9	1	1	1	1	1	
Carga parcial: Z5,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674397	0,142664	0,004343	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004343
Carga parcial: Z5,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674397	0,857336	0,026098	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,026098
Carga parcial: Z5,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z5,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,026227	0,142664	0,000169	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000169
Carga parcial: Z5,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,026227	0,857336	0,001015	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,001015
Carga parcial: Z5,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z5,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,045138	0,299376	0,142664	0,001928	52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	0,001928
Carga parcial: Z5,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,045138	0,299376	0,857336	0,011585	52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	0,011585
Carga parcial: Z5,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,39					52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	
Carga parcial: Z6,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,700624	0,142664	0,004512	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004512
Carga parcial: Z6,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,700624	0,857336	0,027113	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,027113
Carga parcial: Z6,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z6,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,299329	0,142664	0,001928	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,001928
Carga parcial: Z6,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,299329	0,857336	0,011584	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,011584
Carga parcial: Z6,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z7,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674372	0,142664	0,004343	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004343
Carga parcial: Z7,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674372	0,857336	0,026097	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,026097
Carga parcial: Z7,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z7,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,026299	0,142664	0,000169	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,000169
Carga parcial: Z7,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,026299	0,857336	0,001018	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,001018
Carga parcial: Z7,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	
Carga parcial: Z7,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,299329	0,142664	0,001928	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,001928
Carga parcial: Z7,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,299329	0,857336	0,011584	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,011584
Carga parcial: Z7,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	

Carga parcial: Z8,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,517348	0,142664	0,003673	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,003673
Carga parcial: Z8,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,517348	0,857336	0,022074	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,022074
Carga parcial: Z8,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z8,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,151806	0,142664	0,001078	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,001078
Carga parcial: Z8,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,151806	0,857336	0,006477	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,006477
Carga parcial: Z8,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z8,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,049767	0,330845	0,142664	0,002349	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,002349
Carga parcial: Z8,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,049767	0,330845	0,857336	0,014116	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,014116
Carga parcial: Z8,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	
Carga parcial: Z9,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,526047	0,142664	0,00249	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,00249
Carga parcial: Z9,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,526047	0,857336	0,014965	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,014965
Carga parcial: Z9,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	
Carga parcial: Z9,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,067731	0,142664	0,000321	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,000321
Carga parcial: Z9,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,067731	0,857336	0,001927	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,001927
Carga parcial: Z9,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	
Carga parcial: Z9,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,406222	0,142664	0,001923	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,001923
Carga parcial: Z9,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,406222	0,857336	0,011556	55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,011556
Carga parcial: Z9,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					55,1	1,412	0 4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	
Carga parcial: Z10,2; b1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,023384	0,621293	1	0,014528	54,7	1,399	0 4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,014528
Carga parcial: Z10,2; bx (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,023384	0,378707	1	0,008856	54,7	1,399	0 4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,008856
Carga parcial: Z11,2 (stbd)	GZ curve completed successfully	Final stage*	15,17	0,035634	1	1	0,035634	55,5	1,413	0 8,3 (Pass)	60	55,5	25	1	1	1	1	1	0,035634
Carga parcial: Z1,3; b1 (stbd)	GZ curve completed successfully	Final stage*	16,18,21,38,44	0,0115	0,574369	1	0,006605	54,6	1,398	0 4 6,7 (Pass)	60	55	26,8	1	1	1	1	1	0,006605
Carga parcial: Z1,3; bx (stbd)	GZ curve completed successfully	Final stage*	16,18,21,38,44	0,0115	0,425631	1	0,004895	54,6	1,398	0 4 6,7 (Pass)	60	55	26,8	1	1	1	1	1	0,004895
Carga parcial: Z2,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,35,38,42,44	0,019601	0,515323	0,142664	0,001441	51,4	1,366	2,3 4,1 (Pass)	60	53,7	31,4	1	1	1	1	1	0,001441
Carga parcial: Z2,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,35,38,42,44,46	0,019601	0,515323	0,857336	0,00866	34,9	0,606	1,9 4,1 (Pass)	36,9	47,9	16,9	1	1	1	1	1	0,00866
Carga parcial: Z2,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,35,38,42,44,46					34,9	0,606	1,9 4,1 (Pass)	36,9	47,9	16,9	1	1	1	1	1	
Carga parcial: Z2,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44	0,019601	0,067497	0,142664	0,000189	49,5	1,447	2,8 0,0 (Fail)	60	52,3	33,2	1	1	1	1	0	0
Carga parcial: Z2,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44,46	0,019601	0,067497	0,857336	0,001134	33,6	0,391	2,7 0,0 (Fail)	36,2	45,9	16,9	1	1	1	1	0	0
Carga parcial: Z2,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,34,35,38,42,44,46					33,6	0,391	2,7 0,0 (Fail)	36,2	45,9	16,9	1	1	1	1	0	
Carga parcial: Z2,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44	0,019601	0,41718	0,142664	0,001167	49,5	1,447	2,8 0,0 (Fail)	60	52,3	33,2	1	1	1	1	0	0

Carga parcial: Z2,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44,46	0,019601	0,41718	0,857336	0,007011	33,6	0,391	2,7 0,0 (Fail)	36,2	45,9	16,9	1	1	1	1	0	0
Carga parcial: Z2,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,34,35,38,42,44,46					33,6	0,391	2,7 0,0 (Fail)	36,2	45,9	16,9	1	1	1	1	0	
Carga parcial: Z3,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44	0,003527	0,512087	0,142664	0,000258	52,1	1,359	2,1 5,7 (Pass)	60	54,3	28,6	1	1	1	1	1	0,000258
Carga parcial: Z3,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,003527	0,512087	0,857336	0,001549	35,7	0,709	1,8 5,6 (Pass)	37,5	48,7	16,9	1	1	1	1	1	0,001549
Carga parcial: Z3,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					35,7	0,709	1,8 5,6 (Pass)	37,5	48,7	16,9	1	1	1	1	1	
Carga parcial: Z3,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,003527	0,067426	0,857336	0,000204	35,7	0,709	1,8 5,6 (Pass)	37,5	48,7	16,9	1	1	1	1	1	0,000204
Carga parcial: Z3,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					35,7	0,709	1,8 5,6 (Pass)	37,5	48,7	16,9	1	1	1	1	1	
Carga parcial: Z3,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,003527	0,084411	0,857336	0,000255	35	0,541	1,9 2,6 (Pass)	36,9	47,1	16,9	1	1	1	1	1	0,000255
Carga parcial: Z3,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					35	0,541	1,9 2,6 (Pass)	36,9	47,1	16,9	1	1	1	1	1	
Carga parcial: Z3,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	21,26,34,35,38,39,42,44	0,003527	0,336075	0,142664	0,000169	47,5	1,393	4,5 2,7 (Fail)	60	52	36,8	1	1	1	1	0	0
Carga parcial: Z3,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,26,34,35,38,39,42,44,46	0,003527	0,336075	0,857336	0,001016	29,3	0,32	4,3 2,7 (Fail)	33,6	45,9	17,8	1	1	1	1	0	0
Carga parcial: Z3,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,26,34,35,38,39,42,44,46					29,3	0,32	4,3 2,7 (Fail)	33,6	45,9	17,8	1	1	1	1	0	
Carga parcial: Z4,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,009893	0,508666	0,142664	0,000718	53,2	1,368	1,6 7,0 (Pass)	60	54,7	26,8	1	1	1	1	1	0,000718
Carga parcial: Z4,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,009893	0,508666	0,857336	0,004314	36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	0,004314
Carga parcial: Z4,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	
Carga parcial: Z4,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,009893	0,151838	0,142664	0,000214	53,2	1,368	1,6 7,0 (Pass)	60	54,7	26,8	1	1	1	1	1	0,000214
Carga parcial: Z4,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,009893	0,151838	0,857336	0,001288	36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	0,001288
Carga parcial: Z4,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					36,9	0,803	1,3 6,9 (Pass)	38,2	49,3	16,9	1	1	1	1	1	
Carga parcial: Z4,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,009893	0,026506	0,857336	0,000225	36,3	0,68	1,4 4,4 (Pass)	37,7	48,1	16,9	1	1	1	1	1	0,000225
Carga parcial: Z4,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					36,3	0,68	1,4 4,4 (Pass)	37,7	48,1	16,9	1	1	1	1	1	
Carga parcial: Z4,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42	0,009893	0,312989	0,142664	0,000442	48,8	1,366	3,9 4,5 (Pass)	60	52,6	37,7	1	1	1	1	1	0,000442
Carga parcial: Z4,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42,46	0,009893	0,312989	0,857336	0,002655	31,3	0,456	3,5 4,5 (Pass)	34,8	46,9	16,9	1	1	1	1	1	0,002655
Carga parcial: Z4,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,34,35,39,42,46					31,3	0,456	3,5 4,5 (Pass)	34,8	46,9	16,9	1	1	1	1	1	
Carga parcial: Z5,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,662625	0,142664	0,000843	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000843
Carga parcial: Z5,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,662625	0,857336	0,005068	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,005068
Carga parcial: Z5,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z5,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,026464	0,857336	0,000202	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000202
Carga parcial: Z5,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z5,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,008921	0,310863	0,142664	0,000396	52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	0,000396
Carga parcial: Z5,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,008921	0,310863	0,857336	0,002378	52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	0,002378

Carga parcial: Z5,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage		26,39					52,1	1,35	2,5 7,8 (Pass)	60	54,6	27,7	1	1	1	1	1	
Carga parcial: Z6,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,008921	0,6626	0,142664	0,000843	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000843
Carga parcial: Z6,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,008921	0,6626	0,857336	0,005068	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,005068
Carga parcial: Z6,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z6,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,008921	0,026489	0,857336	0,000203	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000203
Carga parcial: Z6,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z6,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40		0,008921	0,310863	0,142664	0,000396	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,000396
Carga parcial: Z6,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40		0,008921	0,310863	0,857336	0,002378	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,002378
Carga parcial: Z6,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	
Carga parcial: Z7,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,009893	0,508666	0,142664	0,000718	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000718
Carga parcial: Z7,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,009893	0,508666	0,857336	0,004314	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,004314
Carga parcial: Z7,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z7,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,009893	0,151813	0,142664	0,000214	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,000214
Carga parcial: Z7,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact		0,009893	0,151813	0,857336	0,001288	55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	0,001288
Carga parcial: Z7,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						55,8	1,432	0 9,6 (Pass)	60	55,8	25	1	1	1	1	1	
Carga parcial: Z7,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40		0,009893	0,026579	0,857336	0,000225	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,000225
Carga parcial: Z7,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	
Carga parcial: Z7,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40		0,009893	0,312942	0,142664	0,000442	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,000442
Carga parcial: Z7,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40		0,009893	0,312942	0,857336	0,002654	52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	0,002654
Carga parcial: Z7,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						52,2	1,384	1,6 4,4 (Pass)	60	53,9	30,5	1	1	1	1	1	
Carga parcial: Z8,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43		0,003527	0,512087	0,142664	0,000258	55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,000258
Carga parcial: Z8,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43		0,003527	0,512087	0,857336	0,001549	55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,001549
Carga parcial: Z8,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	
Carga parcial: Z8,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43		0,003527	0,067441	0,857336	0,000204	55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,000204
Carga parcial: Z8,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	
Carga parcial: Z8,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43		0,003527	0,084372	0,857336	0,000255	55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	0,000255
Carga parcial: Z8,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						55,1	1,412	0,4 8,5 (Pass)	60	55,4	25	1	1	1	1	1	
Carga parcial: Z8,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,28,29,37,40,43		0,003527	0,3361	0,142664	0,000169	50,9	1,403	2,3 2,6 (Pass)	60	53,2	33,2	1	1	1	1	1	0,000169
Carga parcial: Z8,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,28,29,37,40,43		0,003527	0,3361	0,857336	0,001016	50,9	1,403	2,3 2,6 (Pass)	60	53,2	33,2	1	1	1	1	1	0,001016
Carga parcial: Z8,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,28,29,37,40,43						50,9	1,403	2,3 2,6 (Pass)	60	53,2	33,2	1	1	1	1	1	

Carga parcial: Z9,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,515323	0,142664	0,001441	54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,001441		
Carga parcial: Z9,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,515323	0,857336	0,00866	54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,00866		
Carga parcial: Z9,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	15,19,23,37,43					54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1			
Carga parcial: Z9,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,067511	0,142664	0,000189	54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,000189		
Carga parcial: Z9,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,067511	0,857336	0,001135	54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,001135		
Carga parcial: Z9,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	15,19,23,37,43					54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1			
Carga parcial: Z9,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,417166	0,142664	0,001167	54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,001167		
Carga parcial: Z9,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,019601	0,417166	0,857336	0,00701	54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1	0,00701		
Carga parcial: Z9,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	15,19,23,37,43					54,7	1,399	0,4 7,3 (Pass)	60	55,1	25,9	1	1	1	1	1			
Carga parcial: Z10,3; b1 (stbd)	GZ curve completed successfully	Final stage*	15,17,19,23,37,43	0,0115	0,574383	1	0,006605	54,6	1,397	0,4 6,7 (Pass)	60	55	26,8	1	1	1	1	1	0,006605		
Carga parcial: Z10,3; bx (stbd)	GZ curve completed successfully	Final stage*	15,17,19,23,37,43	0,0115	0,425617	1	0,004895	54,6	1,397	0,4 6,7 (Pass)	60	55	26,8	1	1	1	1	1	0,004895		
Attained partial index Ap							0,975997												0,965311	0,640125	Pass

Light service draft Loadcase																			
Minima carga: Z1 (stbd)	GZ curve completed successfully	Final stage*	18	0,036713	1	1	0,036713	58,7	1,584	0 11,1 (Pass)	60	58,7	25	1	1	1	1	1	0,036713
Minima carga: Z2 (stbd)	GZ curve completed successfully	Final stage*	16	0,020579	1	1	0,020579	58,5	1,574	0 10,7 (Pass)	60	58,5	25	1	1	1	1	1	0,020579
Minima carga: Z3; b1 (stbd)	GZ curve completed successfully	Final stage*	21,38,44	0,012007	0,727201	1	0,008732	58,1	1,569	0,3 10,4 (Pass)	60	58,4	25,9	1	1	1	1	1	0,008732
Minima carga: Z3; bx (stbd)	GZ curve completed successfully	Final stage*	21,38,44	0,012007	0,272799	1	0,003276	58,1	1,569	0,3 10,4 (Pass)	60	58,4	25,9	1	1	1	1	1	0,003276
Minima carga: Z4; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,070034	0,543257	0,165818	0,006309	56,4	1,523	1,2 8,8 (Pass)	60	57,5	26,8	1	1	1	1	1	0,006309
Minima carga: Z4; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,070034	0,543257	0,834182	0,031738	40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	1	0,031738
Minima carga: Z4; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	1	
Minima carga: Z4; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	34,35,42	0,070034	0,456743	0,165818	0,005304	55,4	1,531	1,5 6,4 (Pass)	60	56,9	27,7	1	1	1	1	1	0,005304
Minima carga: Z4; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,070034	0,456743	0,834182	0,026683	40,1	0,948	1,4 6,3 (Pass)	41,5	50,7	17,8	1	1	1	1	1	0,026683
Minima carga: Z4; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					40,1	0,948	1,4 6,3 (Pass)	41,5	50,7	17,8	1	1	1	1	1	
Minima carga: Z5; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717738	0,165818	0,0051	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,0051
Minima carga: Z5; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717738	0,834182	0,025654	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,025654
Minima carga: Z5; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z5; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,042848	0,282262	0,165818	0,002005	55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	0,002005
Minima carga: Z5; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,042848	0,282262	0,834182	0,010089	55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	0,010089
Minima carga: Z5; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,39					55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	
Minima carga: Z6; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,742992	0,165818	0,005279	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,005279
Minima carga: Z6; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,742992	0,834182	0,026557	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,026557
Minima carga: Z6; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z6; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,257008	0,165818	0,001826	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,001826
Minima carga: Z6; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,257008	0,834182	0,009186	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,009186
Minima carga: Z6; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z7; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,743037	0,165818	0,005279	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,005279
Minima carga: Z7; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,743037	0,834182	0,026559	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,026559
Minima carga: Z7; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z7; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,256963	0,165818	0,001826	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,001826
Minima carga: Z7; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,256963	0,834182	0,009185	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,009185
Minima carga: Z7; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z8; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717714	0,165818	0,005099	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,005099

Minima carga: Z8; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,042848	0,717714	0,834182	0,025653	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,025653
Minima carga: Z8; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z8; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,042848	0,282286	0,165818	0,002006	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,002006
Minima carga: Z8; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,042848	0,282286	0,834182	0,01009	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,01009
Minima carga: Z8; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	
Minima carga: Z9; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,543257	0,165818	0,006309	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,006309
Minima carga: Z9; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,543257	0,834182	0,031738	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,031738
Minima carga: Z9; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z9; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,456743	0,165818	0,005304	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,005304
Minima carga: Z9; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,070034	0,456743	0,834182	0,026683	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,026683
Minima carga: Z9; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z10; b1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,012007	0,727215	1	0,008732	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	0,008732
Minima carga: Z10; bx (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,012007	0,272785	1	0,003275	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	0,003275
Minima carga: Z11 (stbd)	GZ curve completed successfully	Final stage*	15	0,020579	1	1	0,020579	58,5	1,573	0 10,3 (Pass)	60	58,5	25	1	1	1	1	0,020579
Minima carga: Z12 (stbd)	GZ curve completed successfully	Final stage*	17	0,036713	1	1	0,036713	58,6	1,583	0 10,9 (Pass)	60	58,6	25	1	1	1	1	0,036713
Minima carga: Z1,2 (stbd)	GZ curve completed successfully	Final stage*	16,18	0,035634	1	1	0,035634	58,4	1,57	0 10,6 (Pass)	60	58,4	25	1	1	1	1	0,035634
Minima carga: Z2,2; b1 (stbd)	GZ curve completed successfully	Final stage*	16,21,38,44	0,023384	0,621279	1	0,014528	57,8	1,557	0,3 9,5 (Pass)	60	58,1	25,9	1	1	1	1	0,014528
Minima carga: Z2,2; bx (stbd)	GZ curve completed successfully	Final stage*	16,21,38,44	0,023384	0,378721	1	0,008856	57,8	1,557	0,3 9,5 (Pass)	60	58,1	25,9	1	1	1	1	0,008856
Minima carga: Z3,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44	0,033182	0,526047	0,165818	0,002894	55,4	1,51	1,7 7,6 (Pass)	60	57,1	27,7	1	1	1	1	0,002894
Minima carga: Z3,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,033182	0,526047	0,834182	0,014561	39,7	0,959	1,5 7,4 (Pass)	41,2	51,1	17,8	1	1	1	1	0,014561
Minima carga: Z3,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					39,7	0,959	1,5 7,4 (Pass)	41,2	51,1	17,8	1	1	1	1	
Minima carga: Z3,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44	0,033182	0,067717	0,165818	0,000373	54,2	1,533	2,1 4,8 (Pass)	60	56,3	29,5	1	1	1	1	0,000373
Minima carga: Z3,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,033182	0,067717	0,834182	0,001874	39,3	0,827	1,8 4,8 (Pass)	41,1	49,9	17,8	1	1	1	1	0,001874
Minima carga: Z3,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					39,3	0,827	1,8 4,8 (Pass)	41,1	49,9	17,8	1	1	1	1	
Minima carga: Z3,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44	0,033182	0,406236	0,165818	0,002235	54,2	1,533	2,1 4,8 (Pass)	60	56,3	29,5	1	1	1	1	0,002235
Minima carga: Z3,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,033182	0,406236	0,834182	0,011245	39,3	0,827	1,8 4,8 (Pass)	41,1	49,9	17,8	1	1	1	1	0,011245
Minima carga: Z3,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					39,3	0,827	1,8 4,8 (Pass)	41,1	49,9	17,8	1	1	1	1	
Minima carga: Z4,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,049767	0,517348	0,165818	0,004269	56,4	1,523	1,2 8,8 (Pass)	60	57,5	26,8	1	1	1	1	0,004269
Minima carga: Z4,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,049767	0,517348	0,834182	0,021478	40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	0,021478
Minima carga: Z4,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	

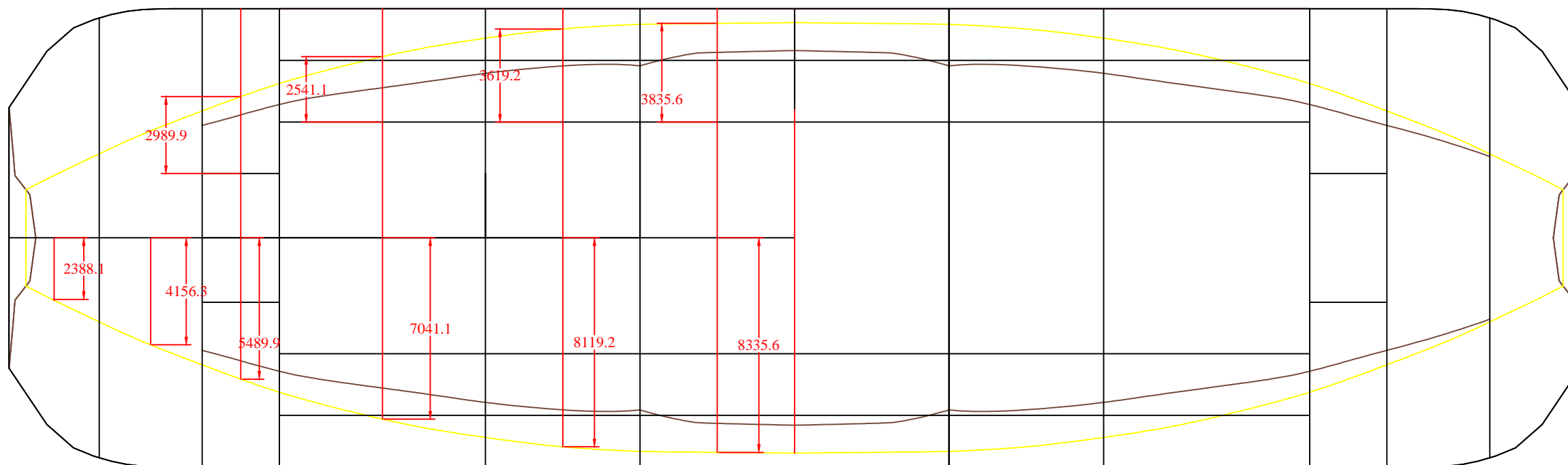
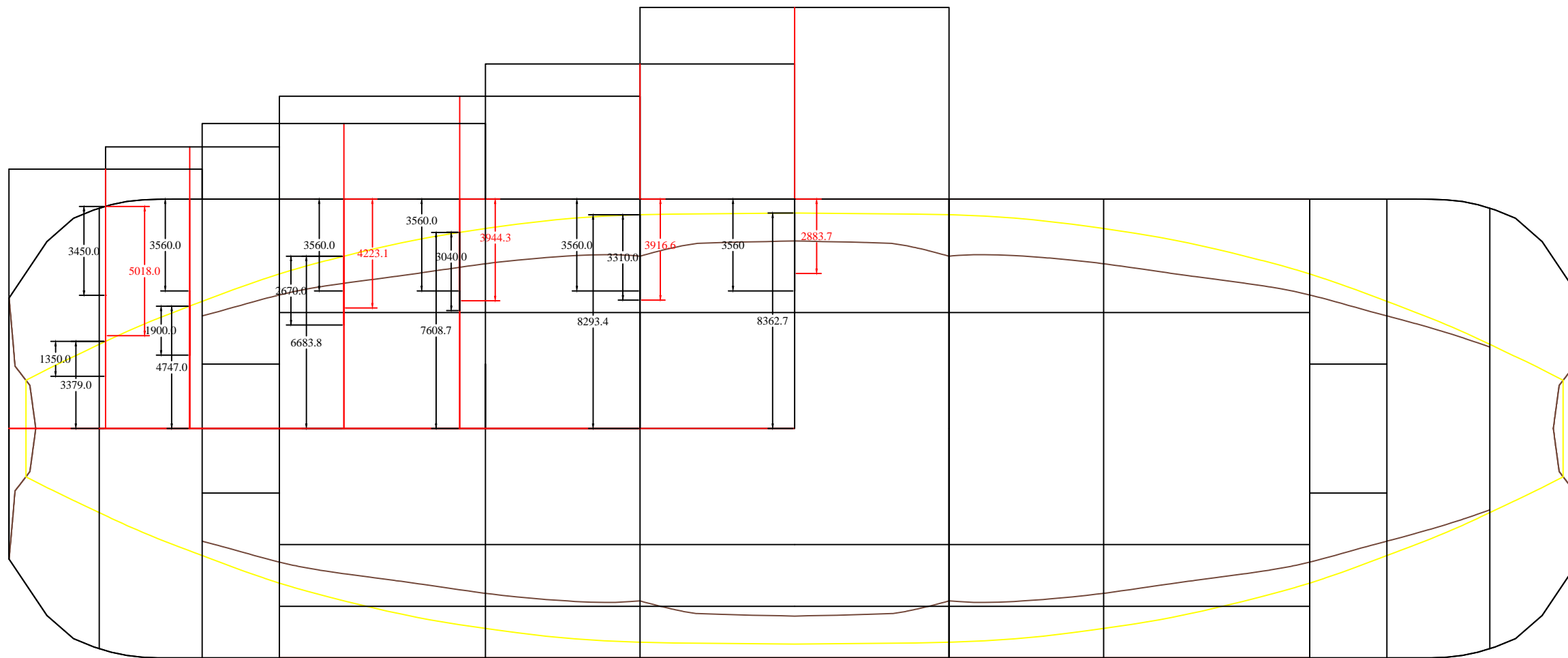
Minima carga: Z4,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	34,35,42	0,049767	0,151831	0,165818	0,001253	55,4	1,531	1,5 6,4 (Pass)	60	56,9	27,7	1	1	1	1	1	0,001253
Minima carga: Z4,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,049767	0,151831	0,834182	0,006303	40,1	0,948	1,4 6,3 (Pass)	41,5	50,7	17,8	1	1	1	1	1	0,006303
Minima carga: Z4,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					40,1	0,948	1,4 6,3 (Pass)	41,5	50,7	17,8	1	1	1	1	1	
Minima carga: Z4,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42	0,049767	0,33082	0,165818	0,00273	51,9	1,49	3,7 6,5 (Pass)	60	55,6	37,7	1	1	1	1	1	0,00273
Minima carga: Z4,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42,46	0,049767	0,33082	0,834182	0,013734	36,1	0,727	3,4 6,3 (Pass)	39,5	49,4	17,8	1	1	1	1	1	0,013734
Minima carga: Z4,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,34,35,39,42,46					36,1	0,727	3,4 6,3 (Pass)	39,5	49,4	17,8	1	1	1	1	1	
Minima carga: Z5,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674397	0,165818	0,005048	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,005048
Minima carga: Z5,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674397	0,834182	0,025393	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,025393
Minima carga: Z5,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z5,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,026227	0,165818	0,000196	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,000196
Minima carga: Z5,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,026227	0,834182	0,000988	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,000988
Minima carga: Z5,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z5,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,045138	0,299376	0,165818	0,002241	55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	0,002241
Minima carga: Z5,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,045138	0,299376	0,834182	0,011273	55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	0,011273
Minima carga: Z5,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,39					55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	
Minima carga: Z6,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,700624	0,165818	0,005244	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,005244
Minima carga: Z6,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,700624	0,834182	0,026381	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,026381
Minima carga: Z6,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z6,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,299329	0,165818	0,00224	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,00224
Minima carga: Z6,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,299329	0,834182	0,011271	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,011271
Minima carga: Z6,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z7,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674372	0,165818	0,005048	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,005048
Minima carga: Z7,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,045138	0,674372	0,834182	0,025393	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,025393
Minima carga: Z7,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z7,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,026299	0,165818	0,000197	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	0,000197
Minima carga: Z7,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,026299	0,834182	0,00099	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	0,00099
Minima carga: Z7,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	
Minima carga: Z7,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,299329	0,165818	0,00224	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	0,00224
Minima carga: Z7,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,045138	0,299329	0,834182	0,011271	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	0,011271
Minima carga: Z7,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	

Minima carga: 28,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,517348	0,165818	0,004269	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,004269
Minima carga: 28,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,517348	0,834182	0,021478	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,021478
Minima carga: 28,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: 28,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,151806	0,165818	0,001253	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,001253
Minima carga: 28,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,049767	0,151806	0,834182	0,006302	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,006302
Minima carga: 28,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: 28,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,049767	0,330845	0,165818	0,00273	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	0,00273
Minima carga: 28,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,049767	0,330845	0,834182	0,013735	55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	0,013735
Minima carga: 28,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40					55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	1	
Minima carga: 29,2; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,526047	0,165818	0,002894	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	0,002894
Minima carga: 29,2; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,526047	0,834182	0,014561	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	0,014561
Minima carga: 29,2; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	
Minima carga: 29,2; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,067731	0,165818	0,000373	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	0,000373
Minima carga: 29,2; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,067731	0,834182	0,001875	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	0,001875
Minima carga: 29,2; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	
Minima carga: 29,2; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,406222	0,165818	0,002235	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	0,002235
Minima carga: 29,2; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,033182	0,406222	0,834182	0,011244	58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	0,011244
Minima carga: 29,2; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43					58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	1	
Minima carga: 210,2; b1 (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,023384	0,621293	1	0,014528	57,7	1,554	0,3 9,1 (Pass)	60	58,1	25,9	1	1	1	1	1	0,014528
Minima carga: 210,2; bx (stbd)	GZ curve completed successfully	Final stage*	15,19,23,37,43	0,023384	0,378707	1	0,008856	57,7	1,554	0,3 9,1 (Pass)	60	58,1	25,9	1	1	1	1	1	0,008856
Minima carga: 211,2 (stbd)	GZ curve completed successfully	Final stage*	15,17	0,035634	1	1	0,035634	58,4	1,569	0 10,1 (Pass)	60	58,4	25	1	1	1	1	1	0,035634
Minima carga: 21,3; b1 (stbd)	GZ curve completed successfully	Final stage*	16,18,21,38,44	0,0115	0,574369	1	0,006605	57,7	1,553	0,3 9,2 (Pass)	60	58	25,9	1	1	1	1	1	0,006605
Minima carga: 21,3; bx (stbd)	GZ curve completed successfully	Final stage*	16,18,21,38,44	0,0115	0,425631	1	0,004895	57,7	1,553	0,3 9,2 (Pass)	60	58	25,9	1	1	1	1	1	0,004895
Minima carga: 22,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,35,38,42,44	0,019601	0,515323	0,165818	0,001675	54,8	1,507	1,9 6,2 (Pass)	60	56,7	28,6	1	1	1	1	1	0,001675
Minima carga: 22,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,35,38,42,44,46	0,019601	0,515323	0,834182	0,008426	39,2	0,873	1,7 6,1 (Pass)	40,9	50,5	17,8	1	1	1	1	1	0,008426
Minima carga: 22,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,35,38,42,44,46					39,2	0,873	1,7 6,1 (Pass)	40,9	50,5	17,8	1	1	1	1	1	
Minima carga: 22,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44	0,019601	0,067497	0,165818	0,000219	53,2	1,562	2,4 2,3 (Fail)	60	55,7	32,3	1	1	1	1	0	0
Minima carga: 22,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44,46	0,019601	0,067497	0,834182	0,001104	38,8	0,682	2,1 2,3 (Pass)	40,9	48,8	17,8	1	1	1	1	1	0,001104
Minima carga: 22,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,34,35,38,42,44,46					38,8	0,682	2,1 2,3 (Pass)	40,9	48,8	17,8	1	1	1	1	1	
Minima carga: 22,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44	0,019601	0,41718	0,165818	0,001356	53,2	1,562	2,4 2,3 (Fail)	60	55,7	32,3	1	1	1	1	0	0

Minima carga: Z2,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	16,21,34,35,38,42,44,46	0,019601	0,41718	0,834182	0,006821	38,8	0,682	2,1 2,3 (Pass)	40,9	48,8	17,8	1	1	1	1	1	0,006821
Minima carga: Z2,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	16,21,34,35,38,42,44,46					38,8	0,682	2,1 2,3 (Pass)	40,9	48,8	17,8	1	1	1	1	1	
Minima carga: Z3,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44	0,003527	0,512087	0,165818	0,0003	55,4	1,51	1,7 7,6 (Pass)	60	57,1	27,7	1	1	1	1	1	0,0003
Minima carga: Z3,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,003527	0,512087	0,834182	0,001507	39,7	0,959	1,5 7,4 (Pass)	41,2	51,1	17,8	1	1	1	1	1	0,001507
Minima carga: Z3,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					39,7	0,959	1,5 7,4 (Pass)	41,2	51,1	17,8	1	1	1	1	1	
Minima carga: Z3,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,35,38,42,44,46	0,003527	0,067426	0,834182	0,000198	39,7	0,959	1,5 7,4 (Pass)	41,2	51,1	17,8	1	1	1	1	1	0,000198
Minima carga: Z3,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,35,38,42,44,46					39,7	0,959	1,5 7,4 (Pass)	41,2	51,1	17,8	1	1	1	1	1	
Minima carga: Z3,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,34,35,38,42,44,46	0,003527	0,084411	0,834182	0,000248	39,3	0,827	1,8 4,8 (Pass)	41,1	49,9	17,8	1	1	1	1	1	0,000248
Minima carga: Z3,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,34,35,38,42,44,46					39,3	0,827	1,8 4,8 (Pass)	41,1	49,9	17,8	1	1	1	1	1	
Minima carga: Z3,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	21,26,34,35,38,39,42,44	0,003527	0,336075	0,165818	0,000197	50,9	1,514	4,1 4,8 (Pass)	60	55	38,6	1	1	1	1	1	0,000197
Minima carga: Z3,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	21,26,34,35,38,39,42,44,46	0,003527	0,336075	0,834182	0,000989	35,2	0,606	3,9 4,8 (Pass)	39,1	48,6	17,8	1	1	1	1	1	0,000989
Minima carga: Z3,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	21,26,34,35,38,39,42,44,46					35,2	0,606	3,9 4,8 (Pass)	39,1	48,6	17,8	1	1	1	1	1	
Minima carga: Z4,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,009893	0,508666	0,165818	0,000834	56,4	1,523	1,2 8,8 (Pass)	60	57,5	26,8	1	1	1	1	1	0,000834
Minima carga: Z4,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,009893	0,508666	0,834182	0,004198	40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	1	0,004198
Minima carga: Z4,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	1	
Minima carga: Z4,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	35,42	0,009893	0,151838	0,165818	0,000249	56,4	1,523	1,2 8,8 (Pass)	60	57,5	26,8	1	1	1	1	1	0,000249
Minima carga: Z4,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	35,42,46	0,009893	0,151838	0,834182	0,001253	40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	1	0,001253
Minima carga: Z4,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	35,42,46					40,6	1,037	1,1 8,6 (Pass)	41,6	51,7	17,8	1	1	1	1	1	
Minima carga: Z4,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	34,35,42,46	0,009893	0,026506	0,834182	0,000219	40,1	0,948	1,4 6,3 (Pass)	41,5	50,7	17,8	1	1	1	1	1	0,000219
Minima carga: Z4,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	34,35,42,46					40,1	0,948	1,4 6,3 (Pass)	41,5	50,7	17,8	1	1	1	1	1	
Minima carga: Z4,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42	0,009893	0,312989	0,165818	0,000513	51,9	1,49	3,7 6,5 (Pass)	60	55,6	37,7	1	1	1	1	1	0,000513
Minima carga: Z4,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,34,35,39,42,46	0,009893	0,312989	0,834182	0,002583	36,1	0,727	3,4 6,3 (Pass)	39,5	49,4	17,8	1	1	1	1	1	0,002583
Minima carga: Z4,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	26,34,35,39,42,46					36,1	0,727	3,4 6,3 (Pass)	39,5	49,4	17,8	1	1	1	1	1	
Minima carga: Z5,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,662625	0,165818	0,00098	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,00098
Minima carga: Z5,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,662625	0,834182	0,004931	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,004931
Minima carga: Z5,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z5,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,026464	0,834182	0,000197	58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	0,000197
Minima carga: Z5,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact					58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	1	
Minima carga: Z5,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,008921	0,310863	0,165818	0,00046	55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	0,00046
Minima carga: Z5,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	26,39	0,008921	0,310863	0,834182	0,002313	55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1	0,002313

Minima carga: Z5,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage		26,39					55,2	1,504	2,2 9,2 (Pass)	60	57,4	26,8	1	1	1	1	1
Minima carga: Z6,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,6626	0,165818	0,00098		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,00098
Minima carga: Z6,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,6626	0,834182	0,004931		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,004931
Minima carga: Z6,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z6,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,008921	0,026489	0,834182	0,000197		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,000197
Minima carga: Z6,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z6,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,008921	0,310863	0,165818	0,00046		55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,00046
Minima carga: Z6,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,008921	0,310863	0,834182	0,002313		55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,002313
Minima carga: Z6,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	
Minima carga: Z7,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,508666	0,165818	0,000834		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,000834
Minima carga: Z7,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,508666	0,834182	0,004198		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,004198
Minima carga: Z7,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z7,3; b2; H1 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,151813	0,165818	0,000249		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,000249
Minima carga: Z7,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	Intact	0,009893	0,151813	0,834182	0,001253		58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	0,001253
Minima carga: Z7,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	Intact						58,7	1,587	0 11,0 (Pass)	60	58,7	25	1	1	1	1	
Minima carga: Z7,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,009893	0,026579	0,834182	0,000219		55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,000219
Minima carga: Z7,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	
Minima carga: Z7,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,009893	0,312942	0,165818	0,000513		55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,000513
Minima carga: Z7,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	28,29,40	0,009893	0,312942	0,834182	0,002583		55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	0,002583
Minima carga: Z7,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	28,29,40						55,3	1,527	1,5 6,0 (Pass)	60	56,8	28,6	1	1	1	1	
Minima carga: Z8,3; b1; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,512087	0,165818	0,0003		58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	0,0003
Minima carga: Z8,3; b1; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,512087	0,834182	0,001507		58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	0,001507
Minima carga: Z8,3; b1; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	
Minima carga: Z8,3; b2; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,067441	0,834182	0,000198		58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	0,000198
Minima carga: Z8,3; b2; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	
Minima carga: Z8,3; b3; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,37,43	0,003527	0,084372	0,834182	0,000248		58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	0,000248
Minima carga: Z8,3; b3; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,37,43						58,1	1,568	0,3 10,0 (Pass)	60	58,3	25,9	1	1	1	1	
Minima carga: Z8,3; bx; H1 (stbd)	GZ curve completed successfully	Final stage*	19,23,28,29,37,40,43	0,003527	0,3361	0,165818	0,000197		54,1	1,53	2,1 4,4 (Pass)	60	56,2	30,5	1	1	1	1	0,000197
Minima carga: Z8,3; bx; Hx; Alt.1/2 (stbd)	GZ curve completed successfully	Final stage*	19,23,28,29,37,40,43	0,003527	0,3361	0,834182	0,000989		54,1	1,53	2,1 4,4 (Pass)	60	56,2	30,5	1	1	1	1	0,000989
Minima carga: Z8,3; bx; Hx; Alt.2/2 (stbd)	GZ curve completed successfully	Final stage	19,23,28,29,37,40,43						54,1	1,53	2,1 4,4 (Pass)	60	56,2	30,5	1	1	1	1	

Anexo II. Plano parámetro b análisis probabilístico y averías
supuestas análisis determinístico



Autor: Manuel Fraga Seoane	Plano: Averías supuestas y parámetro b
Proyecto: Ferry para navegación en Lago Ontario (Código 15-05)	Escala: 1:200