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BUQUE SUPPLY AHTS 250 TPF

CUADERNO 4: CÁLCULOS DE ARQUITECTURA NAVAL

Grado Ingeniería Naval y Oceánica

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PROYECTO NÚMERO 17-10

TIPO DE BUQUE: SUPPLY AHTS

CLASIFICACIÓN, COTA Y REGLAMENTOS DE APLICACIÓN: DNV MARPOL SOLAS y los propios para este tipo de buques

CARACTERÍSTICAS DE LA CARGA: Anclas y material para apoyo a las plataformas petrolíferas así como función de remolque. 250 TPF

VELOCIDAD Y AUTONOMÍA: velocidad de servicio 15 Kn, 4500 millas

SISTEMAS Y EQUIPOS DE CARGA / DESCARGA: Los propios para este tipo de buques

PROPULSIÓN: Diésel eléctrico

TRIPULACIÓN Y PASAJE: 30 tripulantes

OTROS EQUIPOS E INSTALACIONES: Los propios para este tipo de buques

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El buque proyecto es un buque de apoyo a las plataformas petrolíferas, en concreto un AHTS que además de llevar suministros a las plataformas está especializado para el transportar anclas y elemento de fondeo para plataformas además de prestar servicio de remolque.

Posee un sistema de lucha contra incendios FIFI I, y un sistema de posicionamiento dinámico DP2, y además de los datos de la RPA, este buque para su propulsión cuenta con dos propulsores azimutales en popa, y para el posicionamiento dinámico, dos túnel thrusters y un thruster retráctil.

O buque proxecto é un buque de apoio ás plataformas petrolíferas, en concreto trátase dun AHTS, que además de levar suministros ás plataformas está especializado para transporte e manexo de anclas e elementos de fondeo para as plataformas así comoa tamén para prestar servizo de remolque.

Posée un sistema de loita contraincendios FIFI I, e un sistema de posicionamento dinámico DP2, además dos datos da RPA, este buque conta con dous propulsores acimutais en popa e en proa dous túnel thrusters e un thruster retráctil que será utilizados para o posicionamento dinámico

The Project vessel is an AHTS vessel of suport to the oil platforms that in adiction to carrying supplies to the platforms, is specualized for the transporting anchors and elements of anchor of platforms and to towing sercice.

It has a FIFI I fire-fighting sistem and DP2 dynamic positioning sistem, and in adiction, this vessel has two aft azimurhal propellers ans for dynamic positioninig, two tunnel thruster and a retactable thruster on the bow.

Las dimensiones principales del buque y la disposición general son las siguientes:

Lpp	77.56m
B(m)	20.26m
T(m)	7.71m
D(m)	9.27m
CB	0.69
CM	0.99
CP	0.7
Δ(t)	8743.54T
FN	0.28
PR(T)	4793T
POT(KW)	14400 KW
TIRO	250 TPF
Área de cubierta	605 m^2
Carga en cubierta	2000T
Capacidades de tanques	
Diesel Oil	971.712 T
Agua Tecnica	54 T
Fangos	4.83 T
Agua de perforación	455.26T
Agua Potable	67.2 T
Aceite	36.316 T
Aceite hidráulico	16.29 T
Lastre	1830 T
Brine	460.56 T
Lodos de perforación	950.35 T
Agua de suministro	663.6T
Cadenas de anclas	1091 T

Contenido

1 COMPARTIMENTADO

En este apartado se desarrollará el compartimentado del buque proyecto. El espacio que se tiene que compartimentar es aquel situado bajo la cubierta principal, volumen limitado por la carena del buque y la cubierta principal situada a una altura de 9.2 metros sobre la línea de base.

Tenemos tres maneras de hacer el compartimentado del buque, compartimentado longitudinal, transversal y vertical, y para ello debemos tener en cuenta diferentes aspectos que son los siguientes:

- Reglamentos y normativa necesaria
- La cuaderna cero irá situada en la perpendicular de popa
- Los mamparos transversales estancos irán situados sobre cuadernas, siendo una mejor opción que estos vayan sobre bulárcamas de ser posible.

1.1 COMPARTIMENTADO LONGITUDINAL

En este compartimentado en primer lugar se definirán la separación entre cuadernas y las posiciones de las bulárcamas, así como el pique de proa y popa, el local de los propulsores de proa y la cámara de máquinas.

1.1.1 Cuadernas y bulárcamas

Para la separación entre cuadernas, en el DNV no viene ningún máximo estipulado, pero basándonos en los buque de la base de datos y proyectos ya hechos se dispondrá de una separación entre cuadernas de 600mm, mientras que en el pique de proa y en el pique de popa esta separación será menor, 500mmpara estos dos compartimentos.

Las bulárcamas se situarán cada 4 cuadernas, intentando que en la medida de lo posible, los mamparos transversales coincidan con éstas.

1.1.2 Pique de popa

El pique de popa, es el primer mamparo que tiene el buque visto de popa a proa, en este caso debido a que llevamos propulsión acimutal, el pique de popa irá antes de los propulsores azimutales para protegerlos de una posible avería , por lo que en este caso irán a -4.8m de la perpendicular de popa, en la cuaderna -8.

1.1.3 Pique de proa

Para el cálculo de la posición del pique de proa seguimos las reglas que aparecen en el DNV (Pt 3 Ch2 Sec2).la distancia del pique de proa a la perpendicular de proa vendrá nombrada por Xc y definida de la siguiente manera:

$$X_c min = 0.05 \cdot L_{LL} - X_f$$

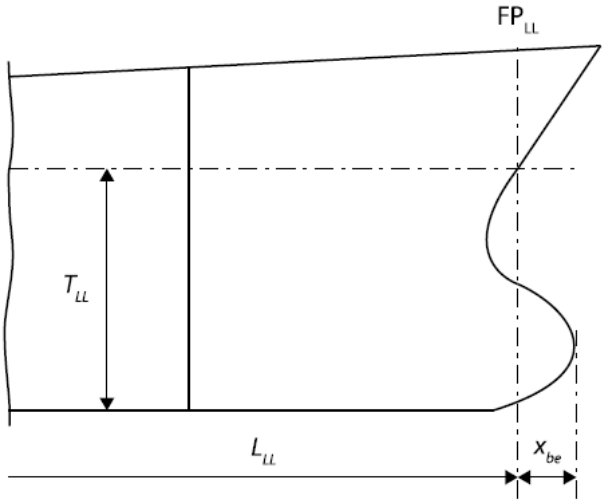
$$X_c max = 0.05 \cdot L_{LL} + 3 - X_f$$

Como el buque proyecto tiene bulbo, la distancia Xf será la mínima de:

$$X_f = 0.5 \cdot X_b$$

$$X_f = 3\ (exclusivo\ solas)$$

$$X_f = 0.015 \cdot L_{LL}$$



La eslora Lf viene definida en el DNV (Pt3 Ch1 Sec 4) como la eslora en la flotación al 96% del puntal, o bien desde la cara de proa de la roda hasta el eje de la mecha del timón para dicha flotación, en caso de que esta sea mayor

T=9.2·0.85=8.78

L1=83.26m (medido en los planos del cuaderno 3)

83.26*0.93=79.9

L2=Lpp(T(8.78)=80

$$L_{ll} = 80m$$

$$X_{be} = 4.6m$$

$$X_f = 0.5 \cdot 4.6 = 2.3m$$

$$X_f = 0.015 \cdot 80 = 1.2m$$

$$X_f = 3m\ (exclusivo\ solas)$$

Por lo tanto, Xf=1.2 y por consiguiente:

$$X_c min = 0.05 \cdot 80 - 1.2 = 2.8m$$

$$X_c max = 0.05 \cdot 80 + 3 - 1.2 = 5.8m$$

El pique de proa se hará coincidir con una bulárcama, y estará situada entre el máximo y el mínimo calculado anteriormente de la perpendicular de proa.

El pique de proa estará situad a 73.2m de la perpendicular de popa, en la cuaderna 122.

1.1.4 Espacio de cámara de máquinas

Según el solas se debe cumplir lo siguiente en cuanto al espacio d cámara de máquinas (solas capítulo II-1 regla 9):

> b) Habrá asimismo instalados un mamparo del rasel de popa, y mamparos que separen el espacio de máquinas, según éste queda definido en la Regla 2 del presente Capítulo, de los espacios de pasajeros y de carga situados a proa y a popa, y dichos mamparos serán estancos hasta al cubierta de cierre. El mamparo del rasel de proa podrá sin embargo, formar bayoneta por debajo de la cubierta de cierre, siempre que con ello no disminuya el grado de seguridad del buque en lo que respecta a compartimentado.

Además se debe de cumplir con que la mínima longitud del espacio de máquinas sea la longitud del motor más 10 metros más, y puesto que el motor elegido para el buque proyectos es un Wärsila 8V31 con una longitud de 7m, la longitud mínima de la cámara de máquinas será de 17m, y considerando el espacio de carga y el espacio para los propulsores de proa, que se explicaran en los siguientes apartados y considerando que por el tipo de buque del que se trata, este necesita una amplia cámara de máquinas, debido a que llevará tres propulsores y no 2, la longitud final de la cámara de máquinas será de 26.4m, haciendo coincidir tanto el mamparo de proa como el de popa con bulárcamas. Estas posiciones serán la bulárcama 15 y la bulárcama 26 (cuadernas 60 y 104).

1.1.5 Espacio para propulsores de proa

Este espacio irá entre el pique de proa y el mamparo de proa de la cámara de máquinas, y para conocer el espacio aproximado que necesitamos para este compartimento, es necesario conocer los diámetros de los propulsores de proa. Como ya se explicó en el cuaderno 2, estos propulsores son para la maniobrabilidad del buque y para el posicionamiento dinámico, y el buque proyecto lleva dos túnel thruster y uno retráctil. Los diámetros de estos propulsores son los siguientes:

- Diámetro de los Tunel thruster =2.18·2m
- Diámetro del retractil=2m

Con lo cual la suma de los diámetros será de 6.36m, y si consideramos que dejamos 1m entre cada propulsor, nos hacen falta 10.36 para el compartimento de los propulsores de proa, como este espacio está delimitado como ya se dejó anteriormente por el mamparo de proa de cámara de máquinas y el pique de proa, irá de la cuaderna 104 a la 122, y tendrá una longitud de 10.8m

Compartimento	Longitud	Inicio	fin	Coincidencia con bulárcama
Pique de proa	4.3	122		Si
Cámara de maquinas	26.4	60	104	Si
Pique de popa	2.2		Estampa	Si
Propulsores de proa	10.8	106	122	Si
Propulsores de popa	6m	Pique de popa	4	SI
Espacio para tanques	33.6	4	50	si

1.2 Compartimentado transversal

Para este tipo de buque no se requiere ningún compartimentado transversal específico.

Llevará doble asco en el espacio de carga, no así en el espacio de cámara de máquinas, ya que no es necesario en este espacio y así dispondremos de más manga para la cámara de máquinas, que como ya se ha dicho anteriormente esta debe de ser lo suficientemente amplia debido a las funciones del buque. El doble casco será de 1m, y será utilizado para llevar lastre y agua de perforación.

1.3 Compartimentado vertical

El compartimentado en este caso se realiza e lo largo del puntal del buque.

Lo primero a calcular será el doble fondo, que según dl DNV, su altura mínima debe ser la siguiente:

$$H = 250 + 20 \cdot B + 50 \cdot T = 250 + 20 \cdot 20.2 + 50 \cdot 7.7 = 1039mm$$

Para el buque proyecto se ha estimado una altura de doble fondo de 1500mm, 1.5m.

La cubierta principal está situada a 9.2m, pero en la zona de tanques de carga del buque se harán dos alturas, una desde el doble fondo hasta 5.5m sobre la línea de base, y otra desde 5.5m hasta 9.2m. Esto se cumple en toda la zona de carga menos en la zona del almacenamiento de las cadenas, ya que en esta zona, los cuatro tanques cilíndricos para el almacén de cadenas irán desde la cubierta principal hasta el doble fondo.

2 CAPACIDADES DE LOS TANQUES

Para hacer el estudio de las capacidades de los tanques, se debe seguir un cierto orden, comenzando por los tanques de consumos y pasando posteriormente a los tanques de carga.

2.1 Estudio de los consumos

Debemos tener en cuenta que los valores que obtengamos es este apartado deben ser parecidos a los obtenidos en los cuadernos 1 y 2.

2.1.1 Combustible MDO (marine diésel oil)

Para el cálculo del combustible necesario tenemos que tener en cuenta que el motor principal funcionará al 85% dese régimen y que la autonomía del buque proyecto es de 4500 millas.

Por lo tanto para el consumo de los motores principales tenemos que tener en cuenta que ya hemos escogido dos diésel generadores Wärsilla 7L46F de 8400kw, pero esta potencia es la que se necesita para dar el tiro y no para dar la velocidad de servicio de 15 nudos. Para calcular la autonomía, se hace con el valor de la potencia obtenida en NavCad para un velocidad de 15 nudos, de la forma siguiente.

$$BHP = \frac{EHP \cdot MM}{\eta_m \cdot \eta_{cp}} = \frac{4558.3 \cdot 1.15}{0.5 \cdot 0.97} = 10808.34$$

$$Peso = 4500 \cdot \frac{1h}{15millas} \cdot \frac{171g}{1Kw} \cdot \frac{1t}{10^6 g} \cdot 10808.34 = 554.467T$$

Para la autonomía del buque calculada mediante la velocidad de servivio se necesitan 554.467T

El combustible que necesitan los generadores de la planta eléctrica se calculará en el cuaderno 11, pero aproximadamente serán unas 300t, este valor es aproximado como ya se dijo, y sacado a partir de otros proyectos y de los buques de la base de datos.

Por lo tanto, el peso total de combustible necesario será el siguiente:

$$554.467 + 300 = 854.467T$$

- Tanques de uso diario
  Se dimensionan estos tanques para una autonomía de 24h, con lo cual la capacidad de estos tanques será la siguiente:
  $$1 \cdot \frac{24h}{1dia} \cdot \frac{171g}{1kwh} \cdot \frac{1t}{10^6 g} \cdot 10808.34 = 44.35$$
  Generadores de planta eléctrica 1 y 2 20t aproximadamente, por lo tanto
  Tanque de uso diario 44.35+20=64.35
  Esto hay que dividirlo entre dos tanques de uso diario, con lo cual quedaran dos tanques de 32.17T
- Tanques de sedimentación

Estos tanques son 2, al igual que los de uso diario y tienen que tener la misma capacidad que estos, por lo tanto los tanques de sedimentación 1 y 2 son iguales y tienen una capacidad de 32.17t cada uno.

El resto del combustible se almacenará en tanques almacén que tendrán que tener una capacidad suficiente para albergar 725.752 toneladas de MDO.

2.1.2 Cálculo del peso de aceite

De manera aproximada el peso del aceite que debe llevar e buque es del 4% del peso del combustible, por lo tanto llevaremos la siguiente cantidad de aceite:

$$854.467 \cdot 0.04 = 34.17t$$

2.1.3 Calculo peso del agua dulce

Para realizar el cálculo del peso de agua potable se ha consultado la norma UNE-EN ISO 15748-2 2003, en la que se especifica según el tipo de buque el número de litros de agua potable consumidos por persona y por día.

Tabla A.1
Valores guía para el consumo de agua potable en litros por persona/cama y día

Tipo de buque		Grupo de personas embarcado	Consumo de agua cuando esté equipado con	
			sistema de aseos de gravedad	sistema de aseos de vacío
Buque de alta mar	Carguero	Tripulante/cama	220 l	175 l
	Buque de pasaje	Pasajero/cama	270 l	225 l
	Crucero de lujo	Pasajero/cama	–	275 l
	Trasbordador con cabinas	Pasajero/cama	205 l[a]	160 l[a]
		Pasajero sin cama	100 l	55 l
	Trasbordador sin cabinas	Pasajero sin cama	150 l	105 l
		Tripulante sin cama	100 l	55 l

Teniendo en cuenta que el buque proyecto se considera un buque de carga, y que este está equipado con sistema de aseos de vacío, el peso de agua necesario será el siguiente:

$$peso = 4500 \cdot \frac{1h}{15millas} \cdot \frac{1}{24} \cdot \frac{175l}{1dia} \cdot \frac{1kg}{1l} \cdot \frac{1t}{10^3kg} = 2.18t$$

$$2.18 \cdot 30tripulantes = 65.625t$$

En cuanto al consumo de agua técnica se estima que se llevarán a bordo 50 toneladas, además de llevar una planta desalinizadora y una planta potabilizadora.

2.1.4 Aguas grises y aguas negras

Para los tanques de aguas grises y negras se estima una autonomía de tanque de 3 días, correspondiente a la estancia en puerto.

Para el cálculo de la capacidad de los tanques de almacén de aguas negras y grises se recurre a la norma UNE-EN ISO 15749-1 2005.

Tabla 2
Cantidad mínima de agua de desecho

Tipo de buque	Cantidad mínima de agua de desecho por persona y día en litros			
	Planta sin vacío		Planta con vacío	
	Aguas negras	Aguas negras y grises	Aguas negras	Aguas negras y grises
Buques de pasaje	70	230	25	185
Buques de alta mar exceptuando los de pasaje	70	180	25	135
Los buques costeros pueden conservar los valores recomendados por las autoridades responsables.				
NOTA – Estos valores son los recomendados. Hay que considera las posibles variaciones debidas a los reglamentos nacionales o a las recomendaciones de las sociedades de clasificación.				

Como ya se dijo anteriormente el buque proyecto cuenta con un sistema de vacío, por lo tanto, el consumo será de 135l por día y por persona, con lo cual el consumo es el siguiente:

$$135 \cdot 3 \cdot 30 = 12150l = 12.15t$$

2.1.5 Tanque de fangos

Para determinar la capacidad del tanque de fangos se siguen las distintas reglas del Convenio Marpol, Anexo I Reglas para prevenir la contaminación por hidrocarburos, en concreto la regla 12 de este anexo (tanques para residuos de hidrocarburo (Fangos), en la que dice:

Todos los buques de arqueo igual o superior a 400 estarán provistos de un tanque o tanques con capacidad adecuada, según el tipo de maquinaria y la duración del viaje, para recibir los residuos de hidrocarburos (fangos) que no puedan tratarse de otra forma con arreglo a las disposiciones del presente anexo

Y en la interpretación de dicha regla, Capacidad de los tanques de fangos se da una fórmula para calcular el volumen de los tanques de fangos respecto a los buques que no llevan agua de lastre en los tanques de combustible líquido:

$$V_1 = k_1 \cdot C \cdot D \ (m^3)$$

Donde:

K1=0.01 para los buques en los que se purifique el fueloil pesado destinado a la maquina principal, o 0.005 para los buques en los que se utilice diésel oil o fueloil pesado que no haya de ser purificado antes de su uso

C=consumo diario de fueloil (toneladas)

D= duración máxima del viaje entre los puertos en los que puede descarase fangos en tierra (días). A falta de datos precisos se utilizará la cifra de 30 días

Por lo tanto en el caso del buque proyecto, como los motores principales son de MDO, el valor de K1 será de 0.005

$$D = 4500millas \cdot \frac{1h}{15millas} \cdot \frac{1dia}{24h} = 12.5dias$$

$$C = 3 \cdot \frac{24h}{1dia} \cdot \frac{171g}{1kwh} \cdot \frac{1t}{10^6 g} \cdot \frac{1}{0.9443} \cdot 4800 \cdot 0.85 = 53.195t$$

$$Cgeneradores = 22t$$

$$53.195 + 22 = 75.195$$

$$V_1 = 0.005 * 75.195 \cdot 12.5 = 4.6m^3$$

Si consideramos que la densidad de los fangos es 1t/m3, el peso de los fangos de hidrocarburos será de 4.6t.

2.1.6 Aceite hidráulico

Se estima un valor aproximado de 16t con una densidad de 0.9t/m^3

2.1.7 Agua de lastre

Para hallar la cantidad de agua de lastre que necesita el buque lo primero que debemos hacer es saber cuál es el calado para el buque en rosca, que se obtiene de maxsurf y es igual a 4.276m siendo el desplazamiento en rosca 4793 toneladas.

La hélice tiene un diámetro de 4m, y por lo menos debe de estar sumergida 1m para el buen funcionamiento de esta, por lo que el calado mínimo debería ser de 5m, y para este calado, con la ayuda de maxsurf se obtiene que el desplazamiento debe ser de 5780 toneladas, por lo tanto la cantidad de lastre que debe llevar el buque para que esto se cumpla será la siguiente:

$$5780 - 4793 = 987T$$

2.1.8 Tabla resumen de consumos

			PESO	DENSIDAD	CAPACIDAD
CONSUMOS	FUELOIL	USO DIEARIO	32,17	0,84	38,3
		USO DIARIO 2	32,17	0,84	38.3
		SEDIM1	32,17	0,84	38.3
		SEDIM2	32,17	0,84	38.3
		ALMACEN	725,752	0,84	864
	ACEITE	OIL	31	0,97	30,07
		HIDRAULICO	16	0,9	14,4
	AGUA	DULCE CONSUMOS	65,625	1	65,625
		TECNICA	50	1	50
		GRISES	12,15	1	12,15
	FANGOS		5,25	1	5,25
total(t)			1034,457		

NOTA: El agua de lastre no está incluida dentro de los consumos

2.2 Estudio de la carga útil

La carga útil se calcula de la siguiente manera:

$$Carga\ util = \Delta - PR - (consumos - pertrechos - tripulacion)$$

$$Carga\ util = 8655.7 - 4793.195 - 1162.589 - 63.7 = 2636.2t$$

En la descripción del buque se establece que debe poder transportar 2000toneladas en cubierta, pero para la distribución de los tanques se considerará que lleva las 2636t bajo cubierta, y se estudiará en el cuaderno 5 si esto es viable desde el punto de vista de la estabilidad.

Tambien se debe analizar la situación en la cual el buque lleve las 2000 T sobre cubierta, y las restantes 636t en los tanques de carga.

NOMBRE	**Vol lastre**	**Capacidad de cubierta (t)**	**fresh water(m3)**	**Liquid Mud(m3)(lodos)**
Olympic octopus		900	997	534
Njord Viking	2013		1250	965
Far Samson				
Olympic Zeus	4771	2500	706	639
Olympic Hercules	3350	1550	706	545
Maersk D type		2100		
Maersk B type	1485	1700	715	

Maersk A type	2540	2500	760	600
Maersk T type		1030		
Havila Mercury	3356	1200		695
Bourbon Crown	1100	900	500	430

brine(salmuera)	**Ring chain lockers(m3)**	**Base oil**	**drill water(agua de perforacion9**	**Dry bulk**	**area de la cubierta de carga(m2)**
411			700		510
821			1270	240	
					1450
964	4·165	190			800
405	4·579				640
	2·263				750
483	2·201	230		163	680
364	2·230+2·330	224			800
	1·245+1·264				600
1023		1170		235	664
540	545			284	570

En la tabla anterior se muestran las capacidades de los tanques de los buques de la base de datos.

A continuación se muestra una tabla en la que se especifican los pesos y capacidades del buque proyecto, que irá provisto de tanques para cadenas, tanques para aguas de perforación, tanques para lodos de perforación, tanques para salmuera y tanques de agua de suministro.

Buque proyecto	Agua suministro	Agua de perforación	Lodos de perforación	Brine	cadenas	TOTAL
CU t	655	440	950	456	1085	2636
densidad	1	1,025	3	1,5	1,86	
volumen	655	429,3	316,7	304	583,3	

No se tienen en cuenta los lodos de perforación en el total, ya que cuando el buque sale de puerto cargado no lleva los lodos de perforación, si no que los recoge de la plataforma.

2.2.1 Agua de suministro

El buque contará con 4 tanques de agua de suministro para transportar 300t, debido a que la densidad del agua dulce es 1t/m3, el volumen del tanque será el siguiente:

$$V = 655/1 = 655m^3$$

2.2.2 Aguade perforación

El buque proyecto contará con 2 tanques destinados a transportar agua de perforación, que en caso de ir vacíos pueden llenarse con agua de lastre si es

necesario, el buque llevará 300toneladas de agua de perforación y debido a que la densidad de esta agua es 1.025t/m3 el volumen del tanque será el siguiente:

$$V = 440/1.025 = 429.27m^3$$

2.2.3 Lodos de perforación

El buque contará con cuatro tanques para albergar los lodos de perforación, el peso de estos lodos será de 893t, y debido a que la densidad de los lodos de perforación es de 3t/m3 tendremos un volumen de:

$$V = 950/3 = 317m^3$$

2.2.4 Salmuera

El buque contará con 4 tanques para el transporte de salmuera, y el peso de esta será de 300 t, y debido a que la densidad es de 1.5t/m3 necesitaremos un volumen de:

$$V = 456/1.5 = 304m^3$$

2.2.5 Cajas de cadenas

El espacio para llevar las cadenas de fondeo serán 4 tanques cilíndricos de 7.5 metros de altura y 5 de diámetro, el peso total será de 900 toneladas, y con una densidad aproximada de 1.86t/m3, el volumen necesario será de:

$$V = 1085/1.86 = 583.33m^3$$

2.3 Comprobación de volúmenes

En las siguientes tablas se mostrarán los tanques que se han dispuesto en el buque proyecto y las capacidades de estos, para así comprobar que cumplen con los volúmenes establecidos.

Irán dispuestos en 4 grupos, carga útil, combustible, lastre y consumos.

	Peso	Volumen
Agua Suministro1BR	42	42
Agua Suministro1ER	42	42
Agua Suministro2BR	88,2	88,2
Agua Suministro2ER	88,2	88,2
Agua suministro 3 BR	113,4	113,4
Agua suministro 3 ER	113,4	113,4
Agua suministro 4 BR	88,2	88,2
Agua suministro 4ER	88,2	88,2
Brine 1BR	72,48	48,32
BRINE 1ER	72,48	48,32
BRINE 2BR	25,2	16,8
BRINE 2ER	25,2	16,8
BRINE 3BR	12,6	8,4
BRINE 3ER	12,6	8,4
Brine	122,4	81,6
brine	122,4	81,6
Cadenas 1BR	272,443	146,475
Cadenas 1ER	272,977	146,762
Cadenas 2BR	272,443	146,475
Cadenas 2ER	272,977	146,762
Lodo1	475,174	158,391
lodo 1	475,174	158,391
Agua perforacion	145,258	145,258
agua perforacion	145,258	145,258
total carga	3460,664	2167,612

DO 1BR	72,576	86,4
DO 1ER	72,576	86,4
DO 2 BR	72,576	86,4
DO 2ER	72,576	86,4
DO 3 BR	72,576	86,4
DO 3ER	72,576	86,4
DO 4BR	77,616	92,4
DO 4ER	77,616	92,4
DO 5 BR	63,504	75,6
DO 5ER	63,504	75,6
DO 6BR	42,336	50,4
DO 6ER	42,336	50,4
UD BR	42,336	50,4
UD ER	42,336	50,4
SED BR	42,336	50,4
SED ER	42,336	50,4
total combustible	971,712	1156,8

	Peso	Volumen
Lastre 1BR	30,033	29,3
Lastre 1 ER	30,033	29,3
Lastre 2BR	61,589	60,087
Lastre 2 ER	61,589	60,087
Lastre 3 BR	67,306	65,665
Lastre 3 ER	67,306	65,665
Lastre 4BR	68,682	67,007
Lastre 4 ER	68,682	67,007
Lastre 5 BR	69,163	67,476
Lastre 5 ER	69,163	67,476
Lastre 6 BR	68,74	67,063
Lastre 6 ER	68,74	67,063
Lastre 7 BR	66,988	65,354
Lastre 7 ER	66,988	65,354

Lastre 8 BR	63,199	61,658
Lastre 8 ER	63,199	61,658
Lastre 9 BR	38,852	37,905
Lastre 9 ER	38,852	37,905
Lastre 10 BR	33,933	33,105
Lastre 10 ER	33,933	33,105
Lastre 11 BR	40,154	39,175
Lastre 11 ER	40,154	39,175
Lastre 12 BR	41,315	40,307
Lastre 12 ER	41,315	40,307
Lastre 13 BR	41,489	40,477
Lastre 13 ER	41,489	40,477
Lastre 14 BR	41,511	40,499
LAstre 14 ER	41,511	40,499
Lastre 15 BR	41,098	40,096
Lastre 15 ER	41,098	40,096
Lastre 16 BR	39,44	38,478
Lastre 16 ER	39,44	38,478
PIQUE PP	127,309	124,204
PIQUE PROA	75,694	75,694
total lastre	1829,991	1787,203

	Peso	Volumen

Aguas negras ER	4,2	4,2
Aguas negrasBR	4,2	4,2
Aguas GrisesBR	4,2	4,2
Aguas Grises BR	4,2	4,2
agua consumos1BR	33,6	33,6
agua consumos1ER	33,6	33,6
Fangos1BR	2,419	2,88
Fangos1ER	2,419	2,88
LubricanteBR	9,312	9,6
LubricanteER	9,312	9,6
Aceite1 BR	18,158	18,72
Aceite1 ER	18,158	18,72
AGUA TECNICA BR	53,358	52,056
total consumos	197,137	198,456

Carga	Peso (T)	Peso requerido
Agua de suministro	663,6	655
Brine	460,56	456
Lodos	950,348	950
Cadenas	1090,915	1085
Agua de perforación	455,266	440
DO	971,712	854,467
Lastre	1830	987
aguas negras/grises	16,8	12,5
Agua consumos	67,2	65,6
fangos	4,838	4,6
Aceite hidráulico	16,296	16
aceite	36,316	34,17
agua técnica	54	50

Como se puede comprobar, los tanques del compartimentado tienen más capacidad que la necesaria para cumplir los requerimientos.

En este cuaderno se comprueba que aun habiendo reducido la eslora 1m, el buque es capaz de transportar lo requerido en los tanques, además de que la velocidad de servicio así como la capacidad de remolque no se ven afectadas, ya que la capacidad

de los tanques de DO es mayor que la requerida por el motor para la autonomía del buque, posteriormente en el cuaderno 7 también se comprobará que el buque es suficiente en cuanto a la disposición general.

En el anexo II se pueden observar los tanques en el plano por cubiertas.

3 ZONA ESTANCA

En el plano adjunto en el anexo se muestra la zona estanca, que se corresponde con la zona sombreada.

Para realizar los cálculos de KN del buque proyecto se consideraron 2 puntos de inundación progresiva, los más bajos, dado que si el agua entra por estos puntos el buque comienza a inundarse, y los puntos superiores no se tuvieron en cuenta dado que si se llega a estos puntos el agua ya habría empezado a entrar en el buque por los puntos de inundación progresiva más bajos

Los puntos de inundación progresiva esta situados en la parte baja de la cubierta B, a una altura de la línea base de 12.5m, a 45m de la perpendicular de popa y situados a 3 metros a estribor y babor de la línea de crujía.

Los reboses de los tanques estarán siuados a 0.2m sobre la cubierta B es decir a 12.7m de la línea de base.

4 TABLAS Y GRAFICAS DE HIDROSTÁTICAS Y KN

En este apartado se mostraran las tablas y graficas de hidrostáticas y KN obtenidas de MaxSurf a diferentes trimados.

Estos trimados serán:

- 0
- 1.5%Lpp a popa y a proa =1.1625m y -1.1625m respectivamente
- 0.75%Lpp a popa y a proa=0.41625m y -0.41625m respectivamente

4.1 Tablas y graficas de Hidrostáticas y KN a trimado 0

Tabla Hidrostáticas trimado 0								
Displacement t	5096	5722	6362	7014	7678	8353	9032	9716
Heel deg	0	0	0	0	0	0	0	0
Draft at FP m	4,5	4,957	5,414	5,871	6,329	6,786	7,243	7,7
Draft at AP m	4,5	4,957	5,414	5,871	6,329	6,786	7,243	7,7
Draft at LCF m	4,5	4,957	5,414	5,871	6,329	6,786	7,243	7,7
Trim (+ve by stern) m	0	0	0	0	0	0	0	0
WL Length m	82,027	82,196	83,247	84,429	85,491	86,337	82,987	83,141
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,26	20,26	20,264
Wetted Area m^2	1793,342	1890,844	1990,527	2089,466	2189,299	2288,57	2371,069	2452,051
Waterpl. Area m^2	1323,088	1350,998	1378,566	1404,509	1429,283	1449,883	1450,387	1466,112
Prismatic coeff. (Cp)	0,683	0,693	0,695	0,695	0,696	0,699	0,736	0,742
Block coeff. (Cb)	0,665	0,676	0,68	0,681	0,683	0,687	0,724	0,731
Max Sect. area coeff. (Cm)	0,977	0,98	0,981	0,983	0,984	0,985	0,986	0,987
Waterpl. area coeff. (Cwp)	0,796	0,811	0,817	0,821	0,825	0,829	0,863	0,87
LCB from zero pt. (+ve fwd) m	36,14	35,843	35,539	35,232	34,921	34,609	34,318	34,072
LCF from zero pt. (+ve fwd) m	33,725	33,127	32,52	31,936	31,35	30,819	30,667	30,985
KB m	2,459	2,707	2,956	3,206	3,457	3,707	3,956	4,203
KG m	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
BMt m	7,749	7,089	6,545	6,086	5,697	5,354	4,999	4,724
BML m	108,307	101,893	96,604	91,911	87,713	83,362	76,378	72,957
GMt m	2,508	2,097	1,801	1,593	1,454	1,361	1,255	1,227
GML m	103,065	96,9	91,86	87,417	83,469	79,369	72,634	69,461
KMt m	10,208	9,797	9,501	9,293	9,154	9,061	8,955	8,927
KML m	110,765	104,6	99,56	95,117	91,169	87,069	80,334	77,161
Immersion (TPc) tonne/cm	13,562	13,848	14,13	14,396	14,65	14,861	14,866	15,028
MTc tonne.m	67,766	71,547	75,406	79,113	82,69	85,543	84,653	87,077
RM at 1deg = GMt.Disp.sin(1) tonne.m	223,003	209,378	200,015	194,963	194,802	198,39	197,838	208,084
Max deck inclination deg	0	0	0	0	0	0	0	0
Trim angle (+ve by stern) deg	0	0	0	0	0	0	0	0

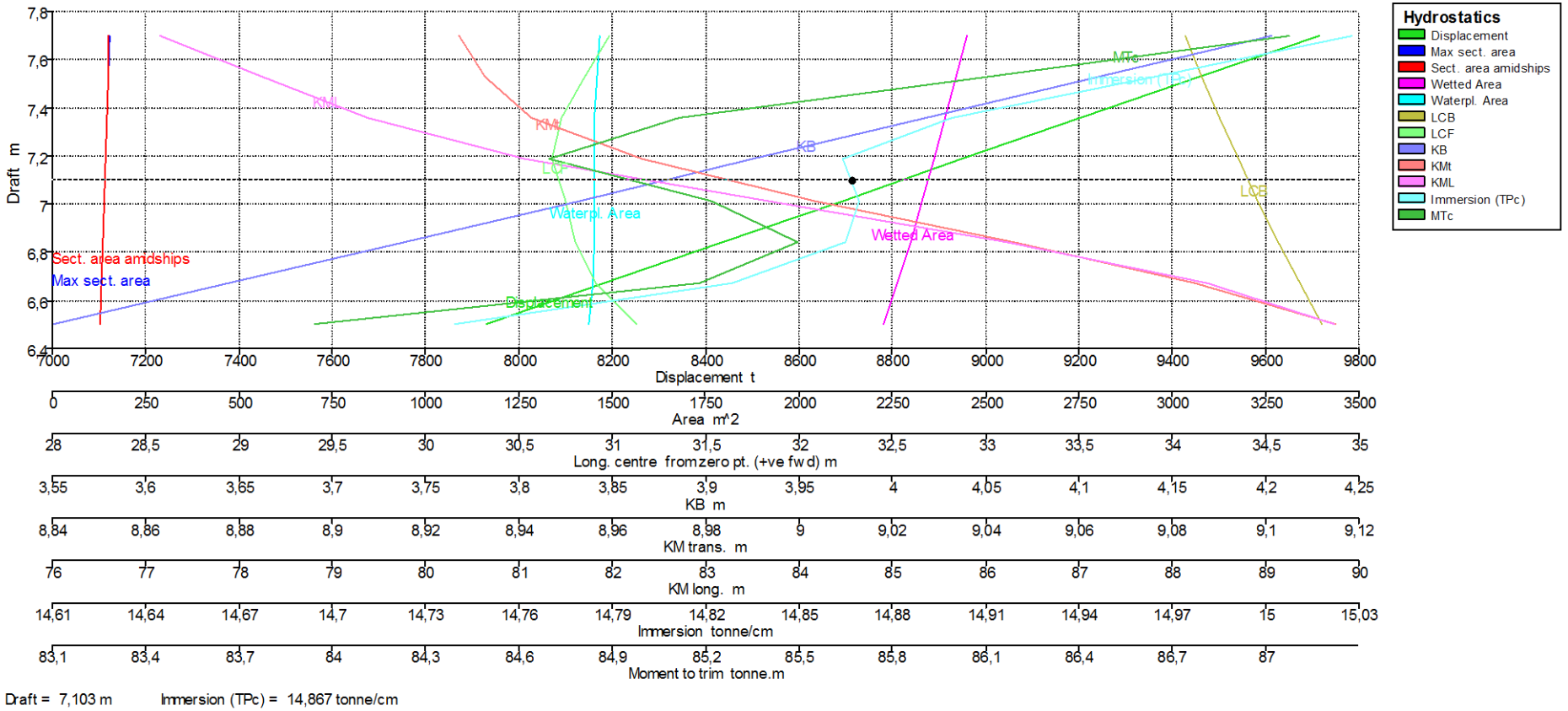
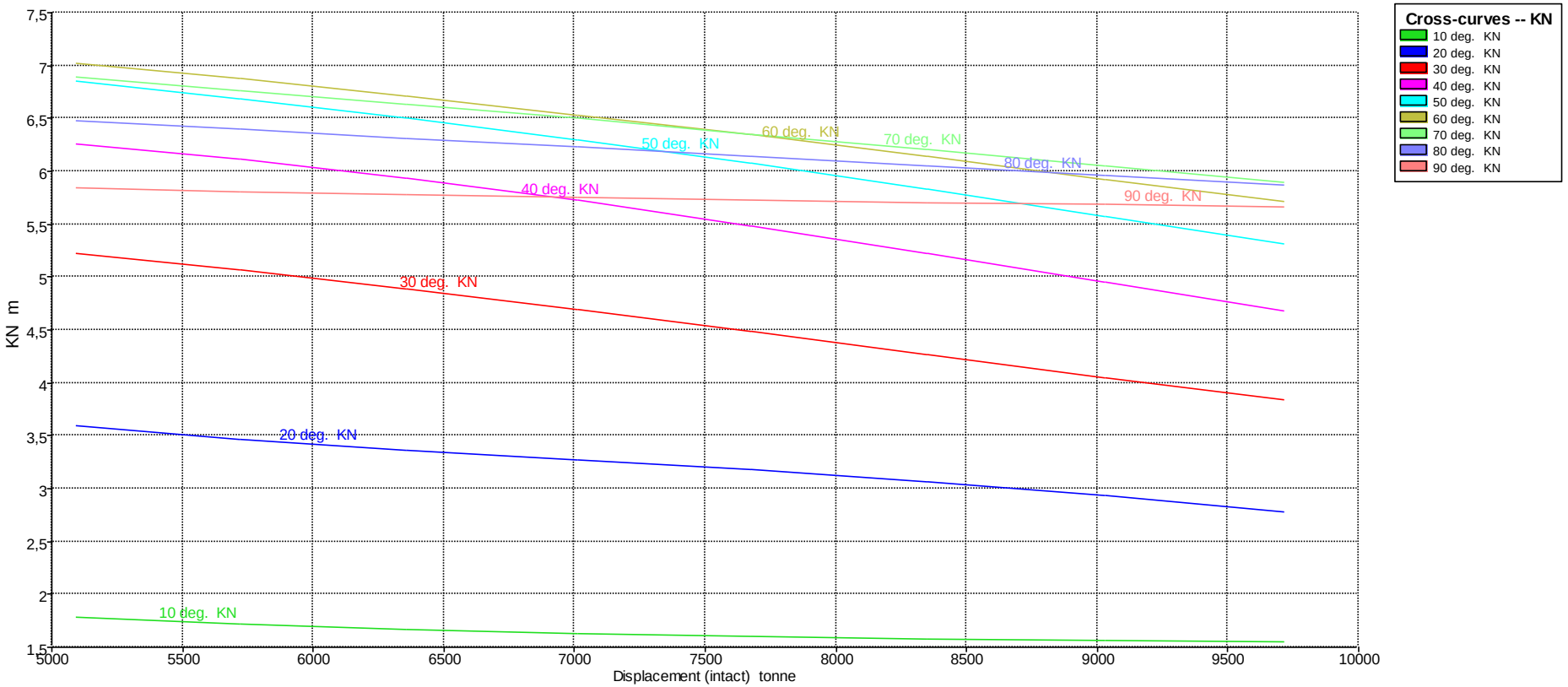

Hydrostatics
Displacement
Max sect. area
Sect. area amidships
Wetted Area
Waterpl. Area
LCB
LCF
KB
KMt
KML
Immersion (TPc)
MTc
Draft m
Displacement t
Area m^2
Long. centre fromzero pt. (+ve fwd) m
KB m
KM trans. m
KM long. m
Immersion tonne/cm
Moment to trim tonne.m
Sect. area amidships
Max sect. area
Waterpl. Area
Wetted Area
Draft = 7,103 m
Immersion (TPc) = 14,867 tonne/cm

Tabla de KN													
Desplazamiento	Calado	Trimado	LCG	TCM	KN 10º	KN 20º	KN 30º	KN 40º	KN 50º	KN 60º	KN 70º	KN 80º	KN 90º
5096	4,5	0	36,14	0	1,787	3,599	5,224	6,258	6,848	7,027	6,886	6,48	5,843
5722	4,957	0	35,843	0	1,715	3,461	5,071	6,113	6,69	6,879	6,765	6,398	5,808
6362	5,414	0	35,539	0	1,663	3,357	4,893	5,934	6,506	6,715	6,636	6,314	5,777
7014	5,871	0	35,232	0	1,626	3,277	4,694	5,724	6,3	6,536	6,499	6,228	5,75
7678	6,329	0	34,921	0	1,599	3,182	4,482	5,487	6,074	6,344	6,354	6,14	5,725
8353	6,786	0	34,609	0	1,581	3,066	4,267	5,227	5,831	6,139	6,203	6,05	5,703
9032	7,243	0	34,318	0	1,569	2,931	4,05	4,955	5,576	5,928	6,048	5,96	5,684
9716	7,7	0	34,072	0	1,552	2,781	3,835	4,685	5,317	5,714	5,892	5,872	5,668


Cross-curves -- KN
10 deg. KN
20 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
80 deg. KN
90 deg. KN
KN m
Displacement (intact) tonne
7,5
7
6,5
6
5,5
5
4,5
4
3,5
3
2,5
2
1,5
5000
5500
6000
6500
7000
7500
8000
8500
9000
9500
10000

4.2 Tablas y graficas de Hidrostáticas y KN a trimado 1.1625

Tabla de hidostaticas trimado 1,1625								
Displacement t	5208	5850	6504	7172	7849	8530	9211	9893
Heel deg	0	0	0	0	0	0	0	0
Draft at FP m	3,919	4,376	4,833	5,29	5,747	6,204	6,662	7,119
Draft at AP m	5,081	5,538	5,996	6,453	6,91	7,367	7,824	8,281
Draft at LCF m	4,588	5,055	5,521	5,986	6,447	6,905	7,362	7,82
Trim (+ve by stern) m	1,163	1,163	1,163	1,163	1,163	1,163	1,163	1,163
WL Length m	82,171	83,512	84,787	85,993	86,511	86,49	86,363	85,908
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,26	20,26	20,266	20,266
Wetted Area m^2	1821,008	1921,051	2021,078	2120,933	2210,944	2291,703	2373,044	2455,434
Waterpl. Area m^2	1353,771	1383,329	1411,503	1437,342	1450,652	1453,843	1455,378	1456,083
Prismatic coeff. (Cp)	0,661	0,665	0,668	0,671	0,678	0,688	0,698	0,71
Block coeff. (Cb)	0,648	0,652	0,657	0,66	0,668	0,679	0,689	0,701
Max Sect. area coeff. (Cm)	0,98	0,981	0,983	0,984	0,985	0,986	0,987	0,988
Waterpl. area coeff. (Cwp)	0,813	0,818	0,822	0,825	0,828	0,83	0,832	0,836
LCB from zero pt. (+ve fwd) m	34,435	34,227	33,998	33,755	33,51	33,297	33,113	32,952
LCF from zero pt. (+ve fwd) m	32,852	32,245	31,652	31,101	30,85	30,827	30,801	30,74
KB m	2,516	2,769	3,023	3,277	3,531	3,782	4,03	4,275
KG m	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
BMt m	7,792	7,123	6,574	6,107	5,67	5,258	4,897	4,599
BML m	112,959	106,582	101,134	96,189	89,825	82,765	76,399	70,407
GMt m	2,544	2,125	1,826	1,61	1,422	1,258	1,143	1,087
GML m	107,711	101,584	96,386	91,691	85,577	78,766	72,644	66,895
KMt m	10,307	9,892	9,596	9,383	9,2	9,039	8,926	8,873
KML m	115,463	109,339	104,145	99,455	93,345	86,538	80,42	74,674
Immersion (TPc) tonne/cm	13,876	14,179	14,468	14,733	14,869	14,902	14,918	14,925
MTc tonne.m	72,386	76,676	80,894	84,848	86,674	86,691	86,342	85,396
RM at 1deg = GMt.Disp.sin(1) tonne.m	231,239	216,964	207,323	201,481	194,816	187,248	183,727	187,748
Max deck inclination deg	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594
Trim angle (+ve by stern) deg	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594

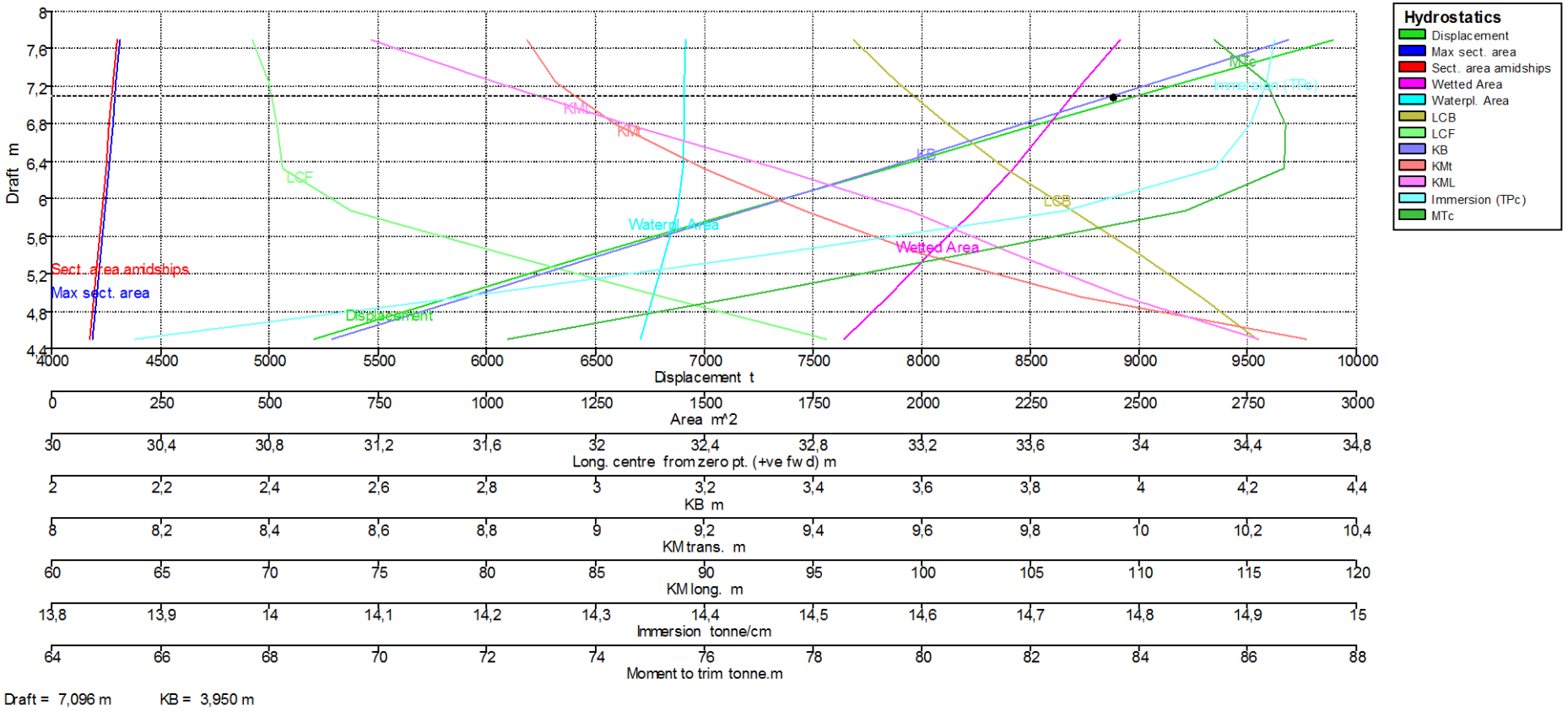
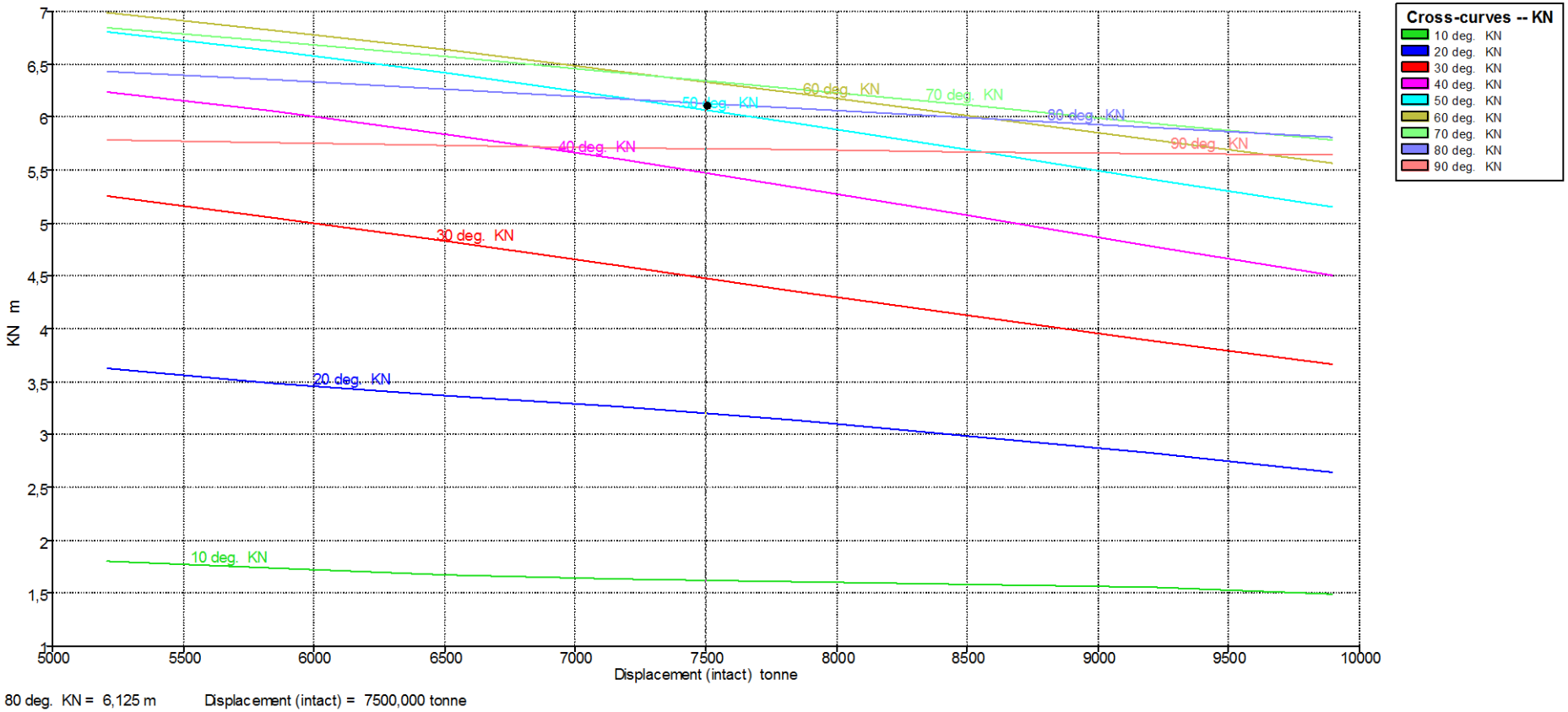

Hydrostatics
Displacement
Max sect. area
Sect. area amidships
Wetted Area
Waterpl. Area
LCB
LCF
KB
KMt
KML
Immersion (TPc)
MTc
Draft m
Displacement t
Area m^2
Long. centre from zero pt. (+ve fwd) m
KB m
KM trans. m
KM long. m
Immersion tonne/cm
Moment to trim tonne.m
Sect. area amidships
Max sect. area
LCF
KML
KMt
KB
Waterpl. Area
Wetted Area
LCB
MTc
Immersion (TPc)
Displacement
Draft = 7,096 m
KB = 3,950 m

Tabla de KN													
Desplazamiento	Calado	Trimado	LCG	TCM	KN 10º	KN 20º	KN 30º	KN 40º	KN 50º	KN 60º	KN 70º	KN 80º	KN 90º
5208	4,5	1,163	34,398	0	1,805	3,631	5,252	6,238	6,811	6,988	6,846	6,433	5,79
5850	4,957	1,163	34,185	0	1,732	3,485	5,053	6,055	6,626	6,82	6,713	6,349	5,762
6504	5,414	1,163	33,953	0	1,677	3,373	4,831	5,841	6,416	6,635	6,571	6,261	5,735
7172	5,871	1,163	33,706	0	1,636	3,261	4,593	5,599	6,184	6,437	6,42	6,17	5,711
7849	6,329	1,163	33,457	0	1,604	3,129	4,348	5,333	5,934	6,226	6,264	6,078	5,69
8530	6,786	1,163	33,24	0	1,581	2,98	4,112	5,055	5,675	6,01	6,105	5,986	5,672
9211	7,243	1,163	33,052	0	1,557	2,818	3,885	4,776	5,41	5,79	5,945	5,895	5,657
9893	7,7	1,163	32,888	0	1,497	2,643	3,663	4,507	5,148	5,571	5,785	5,805	5,644



80 deg. KN = 6,125 m Displacement (intact) = 7500,000 tonne

4.3 Tablas y graficas de Hidrostáticas y KN a trimado -1.1625

Tabla de Hidrostaticas trimado -1.1625								
Displacement t	5003	5615	6240	6877	7525	8184	8856	9544
Heel deg	0	0	0	0	0	0	0	0
Draft at FP m	5,081	5,539	5,996	6,453	6,91	7,367	7,824	8,281
Draft at AP m	3,919	4,376	4,833	5,29	5,747	6,204	6,661	7,119
Draft at LCF m	4,437	4,885	5,333	5,781	6,228	6,676	7,13	7,589
Trim (+ve by stern) m	-1,163	-1,163	-1,163	-1,163	-1,163	-1,163	-1,163	-1,163
WL Length m	82,03	82,167	82,252	82,768	83,626	81,617	82,829	83,356
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,26	20,26	20,259
Wetted Area m^2	1768,192	1865,225	1962,588	2061,458	2160,407	2259,642	2358,615	2447,567
Waterpl. Area m^2	1292,211	1319,772	1346,632	1371,687	1395,114	1417,772	1453,147	1478,198
Prismatic coeff. (Cp)	0,679	0,689	0,699	0,704	0,706	0,733	0,731	0,735
Block coeff. (Cb)	0,606	0,62	0,634	0,643	0,649	0,677	0,678	0,685
Max Sect. area coeff. (Cm)	0,973	0,975	0,977	0,979	0,981	0,982	0,983	0,984
Waterpl. area coeff. (Cwp)	0,778	0,793	0,808	0,818	0,823	0,857	0,866	0,875
LCB from zero pt. (+ve fwd) m	37,778	37,394	37,018	36,647	36,281	35,914	35,565	35,253
LCF from zero pt. (+ve fwd) m	34,569	33,95	33,325	32,711	32,072	31,445	31,214	31,351
KB m	2,433	2,676	2,92	3,164	3,409	3,654	3,901	4,15
KG m	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
BMt m	7,685	7,039	6,506	6,056	5,676	5,347	5,087	4,841
BML m	103,172	97,06	91,92	87,276	82,964	79,159	78,422	76,08
GMt m	2,433	2,036	1,752	1,552	1,422	1,344	1,335	1,344
GML m	97,92	92,057	87,166	82,772	78,71	75,155	74,671	72,582
KMt m	10,117	9,714	9,425	9,22	9,084	9	8,987	8,991
KML m	105,594	99,725	94,829	90,43	86,363	82,804	82,314	80,221
Immersion (TPc) tonne/cm	13,245	13,528	13,803	14,06	14,3	14,532	14,895	15,152
MTc tonne.m	63,215	66,699	70,181	73,444	76,425	79,361	85,327	89,382
RM at 1deg = GMt.Disp.sin(1) tonne.m	212,485	199,508	190,823	186,293	186,739	191,901	206,396	223,851
Max deck inclination deg	0,8597	0,8597	0,8597	0,8597	0,8597	0,8597	0,8597	0,8597
Trim angle (+ve by stern) deg	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597

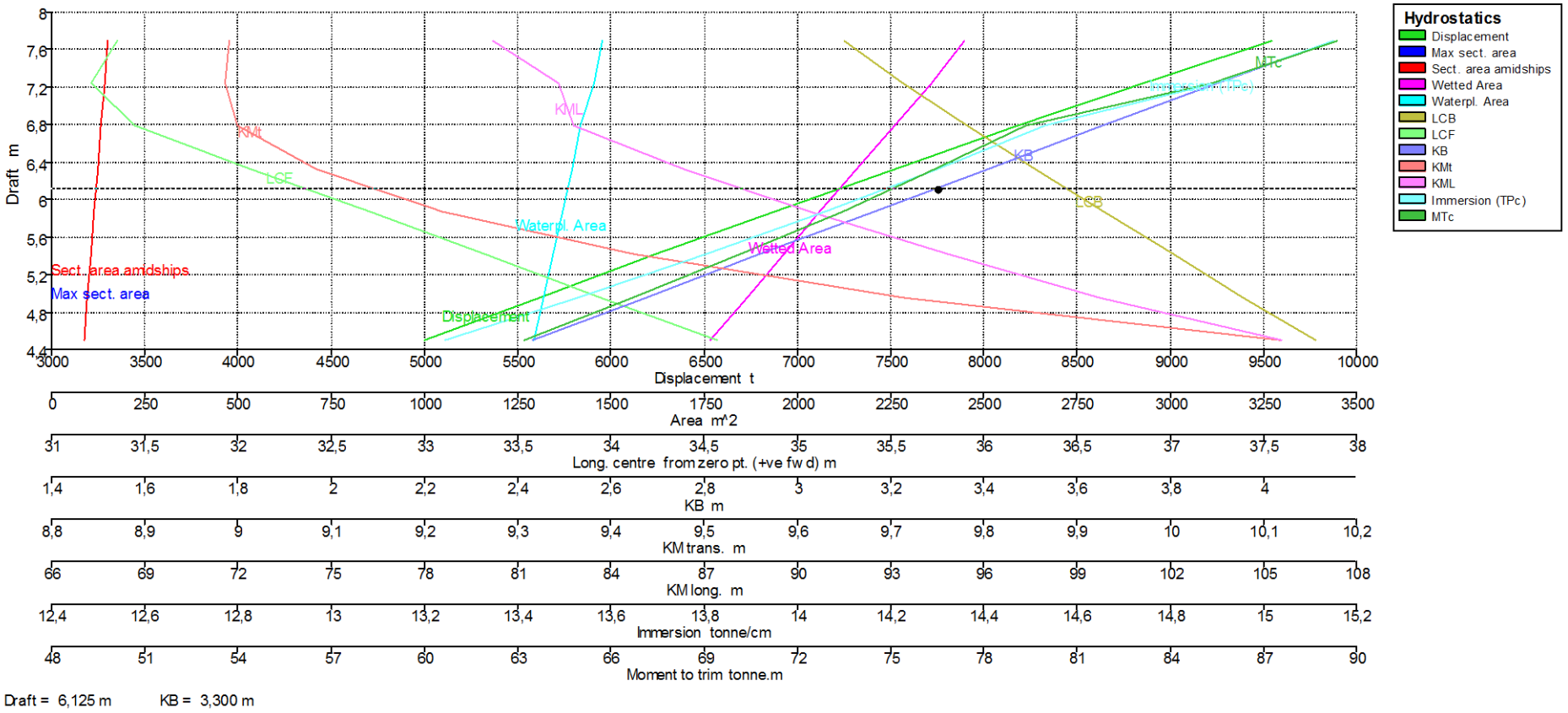
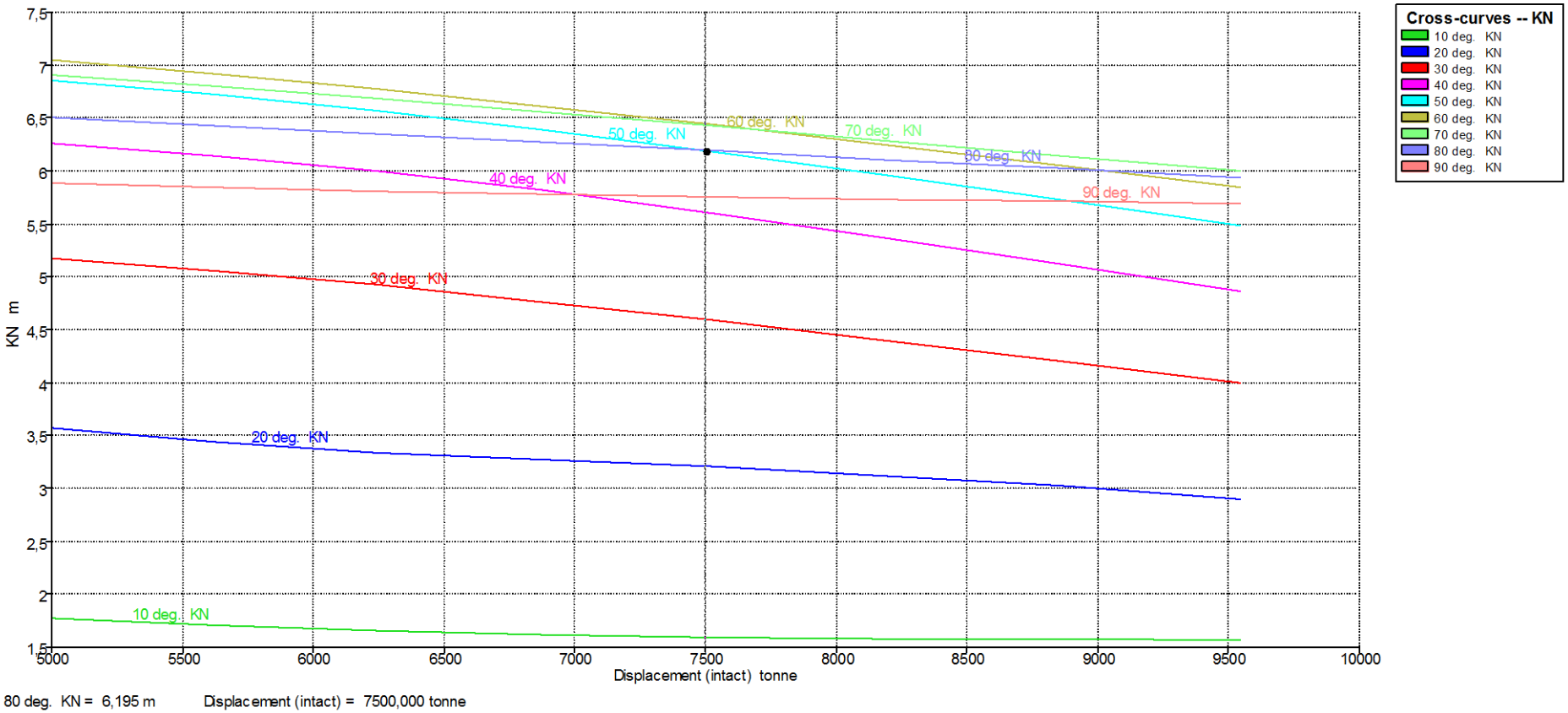
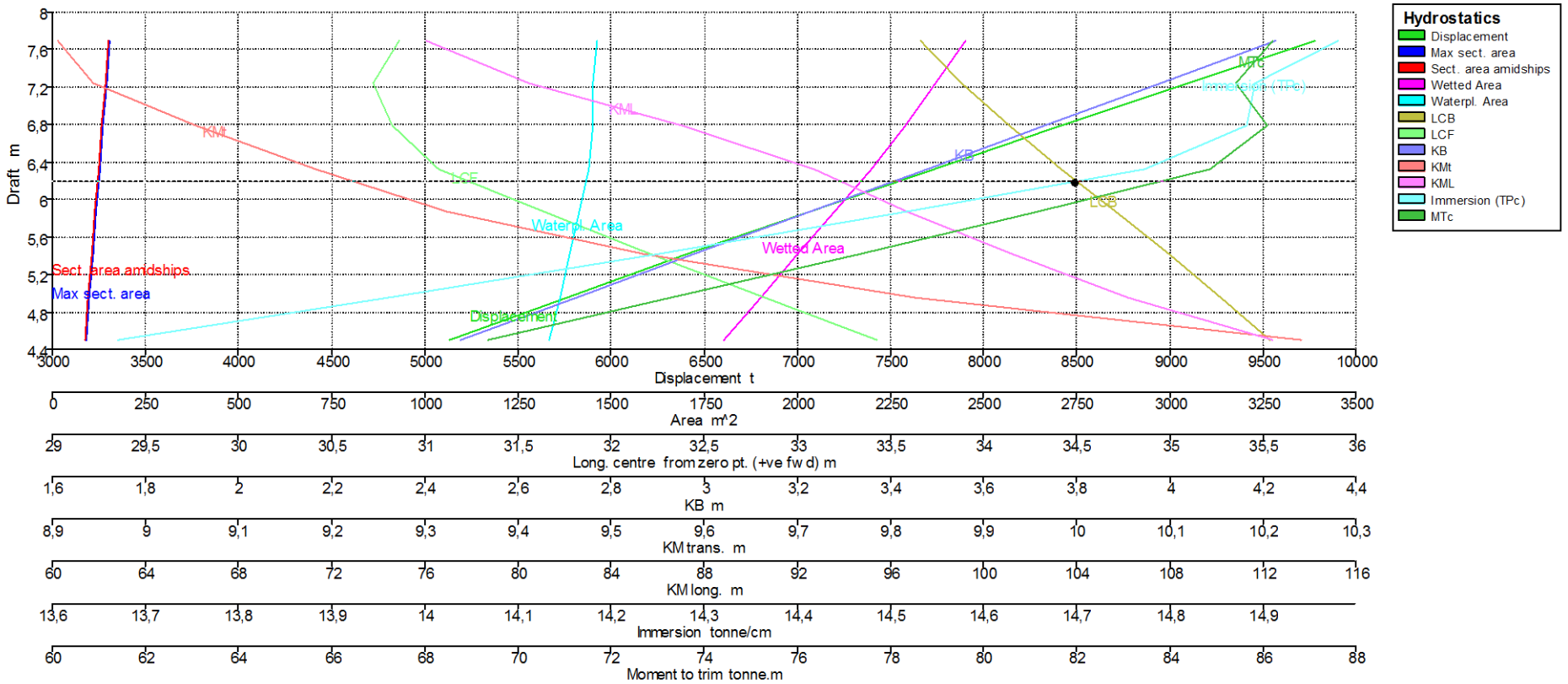

Hydrostatics
Displacement
Max sect. area
Sect. area amidships
Wetted Area
Waterpl. Area
LCB
LCF
KB
KMt
KML
Immersion (TPc)
MTc
Draft m
Displacement t
Area m^2
Long. centre from zero pt. (+ve fwd) m
KB m
KM trans. m
KM long. m
Immersion tonne/cm
Moment to trim tonne.m
Sect. area amidships
Max sect. area
Displacement
Waterpl. Area
Wetted Area
KML
KMt
LCF
KB
LCB
MTc
Draft = 6,125 m
KB = 3,300 m

Tabla de KN													
Desplazamiento	Calado	Trimado	LCG	TCG	KN 10º	KN 20º	KN 30º	KN 40º	KN 50º	KN 60º	KN 70º	KN 80º	KN 90º
5003	4,5	-1,163	37,815	0	1,771	3,564	5,172	6,253	6,86	7,045	6,91	6,511	5,885
5615	4,957	-1,163	37,434	0	1,701	3,436	5,058	6,143	6,728	6,917	6,802	6,433	5,846
6240	5,414	-1,163	37,062	0	1,65	3,34	4,921	5,995	6,569	6,772	6,685	6,354	5,812
6877	5,871	-1,163	36,695	0	1,615	3,269	4,761	5,814	6,386	6,612	6,561	6,274	5,781
7525	6,329	-1,163	36,332	0	1,592	3,203	4,585	5,605	6,184	6,438	6,429	6,192	5,755
8184	6,786	-1,163	35,969	0	1,579	3,122	4,399	5,372	5,964	6,252	6,29	6,108	5,731
8856	7,243	-1,163	35,624	0	1,572	3,02	4,201	5,12	5,727	6,055	6,145	6,023	5,711
9544	7,7	-1,163	35,315	0	1,567	2,897	3,995	4,856	5,477	5,848	5,994	5,936	5,693


Cross-curves -- KN
10 deg. KN
20 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
80 deg. KN
90 deg. KN
KN m
Displacement (intact) tonne
7,5
7
6,5
6
5,5
5
4,5
4
3,5
3
2,5
2
1,5
5000
5500
6000
6500
7000
7500
8000
8500
9000
9500
10000
80 deg. KN = 6,195 m
Displacement (intact) = 7500,000 tonne

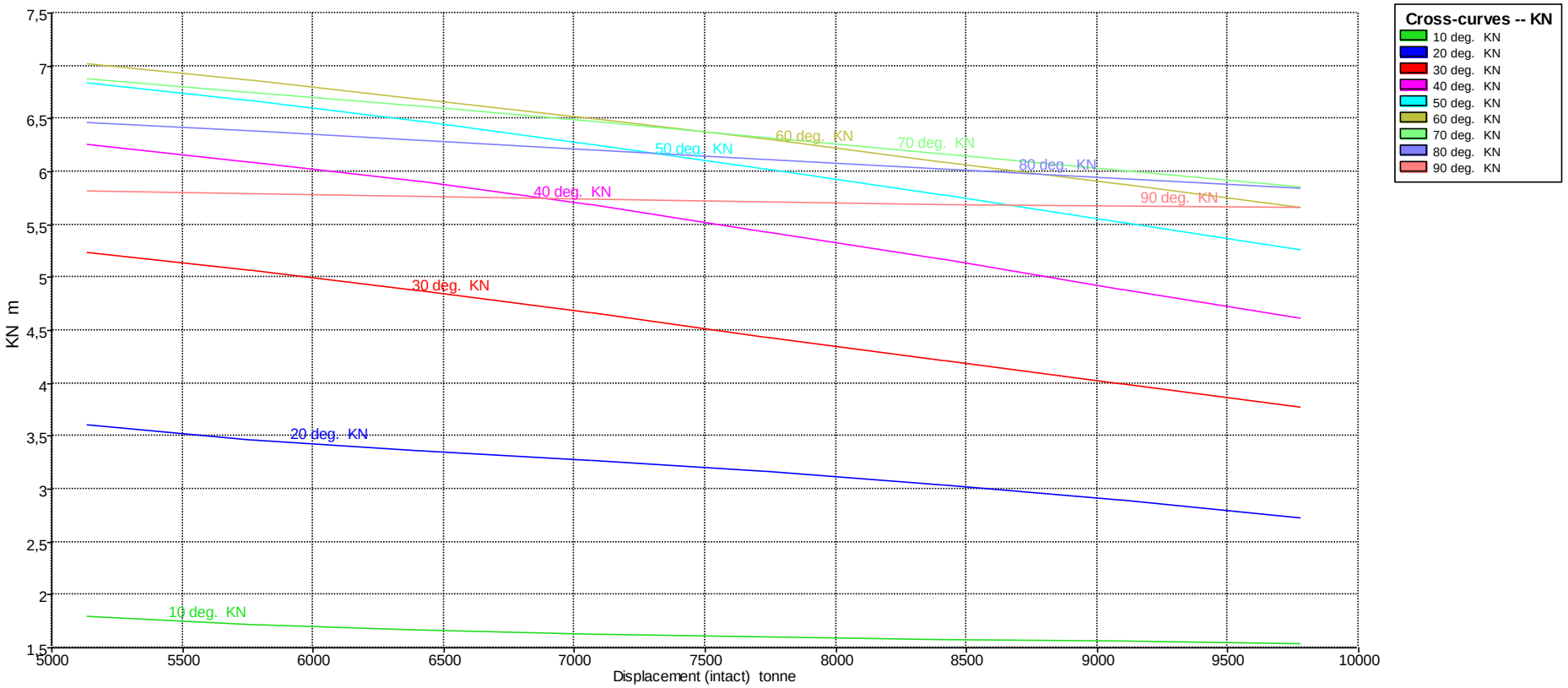
4.4 Tablas y graficas de Hidrostáticas y KN a trimado 0.41625

Tabla de hidrostáticas trimado 0.41625								
Displacement t	5134	5765	6410	7068	7737	8416	9097	9779
Heel deg	0	0	0	0	0	0	0	0
Draft at FP m	4,292	4,749	5,206	5,663	6,12	6,578	7,035	7,492
Draft at AP m	4,708	5,165	5,622	6,08	6,537	6,994	7,451	7,908
Draft at LCF m	4,529	4,989	5,449	5,91	6,37	6,828	7,286	7,742
Trim (+ve by stern) m	0,416	0,416	0,416	0,416	0,416	0,416	0,416	0,416
WL Length m	82,024	82,523	83,798	84,996	86,089	86,378	86,027	83,069
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,26	20,261	20,266
Wetted Area m^2	1802,333	1901,324	2001,156	2100,461	2200,208	2289,785	2371,471	2453,636
Waterpl. Area m^2	1333,646	1362,002	1390,364	1416,349	1441,195	1451,913	1452,766	1461,516
Prismatic coeff. (Cp)	0,678	0,686	0,687	0,689	0,69	0,697	0,708	0,742
Block coeff. (Cb)	0,664	0,673	0,675	0,677	0,679	0,687	0,699	0,732
Max Sect. area coeff. (Cm)	0,979	0,98	0,982	0,983	0,985	0,986	0,987	0,988
Waterpl. area coeff. (Cwp)	0,802	0,815	0,819	0,822	0,826	0,83	0,833	0,868
LCB from zero pt. (+ve fwd) m	35,537	35,271	34,994	34,709	34,42	34,135	33,884	33,664
LCF from zero pt. (+ve fwd) m	33,428	32,829	32,213	31,64	31,072	30,822	30,725	30,863
KB m	2,475	2,726	2,977	3,228	3,48	3,732	3,981	4,227
KG m	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
BMt m	7,767	7,101	6,558	6,096	5,703	5,323	4,964	4,679
BML m	109,93	103,495	98,267	93,497	89,255	83,273	76,512	71,819
GMt m	2,525	2,108	1,814	1,602	1,46	1,33	1,218	1,179
GML m	104,688	98,502	93,523	89,004	85,012	79,28	72,766	68,319
KMt m	10,242	9,827	9,534	9,324	9,183	9,054	8,944	8,906
KML m	112,404	106,219	101,242	96,724	92,734	87,004	80,491	76,045
Immersion (TPc) tonne/cm	13,67	13,961	14,251	14,518	14,772	14,882	14,891	14,981
MTc tonne.m	69,345	73,279	77,357	81,17	84,872	86,094	85,412	86,201
RM at 1deg = GMt.Disp.sin(1) tonne.m	226,205	212,142	202,957	197,658	197,156	195,314	193,397	201,178
Max deck inclination deg	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077
Trim angle (+ve by stern) deg	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077



Draft = 6,193 m Immersion (TPc) = 14,697 tonne/cm

Tabla de KN													
Desplazamiento	Calado	Trimado	LCG	TCM	KN 10º	KN 20º	KN 30º	KN 40º	KN 50º	KN 60º	KN 70º	KN 80º	KN 90º
5134	4,5	0,416	35,524	0	1,793	3,611	5,238	6,254	6,838	7,015	6,874	6,465	5,825
5765	4,957	0,416	35,257	0	1,721	3,47	5,069	6,096	6,671	6,86	6,749	6,382	5,793
6410	5,414	0,416	34,978	0	1,668	3,364	4,875	5,905	6,477	6,689	6,615	6,296	5,763
7068	5,871	0,416	34,692	0	1,63	3,275	4,662	5,683	6,262	6,503	6,473	6,209	5,737
7737	6,329	0,416	34,401	0	1,601	3,167	4,438	5,436	6,028	6,304	6,324	6,119	5,713
8416	6,786	0,416	34,115	0	1,581	3,039	4,213	5,168	5,777	6,094	6,169	6,028	5,692
9097	7,243	0,416	33,862	0	1,568	2,894	3,992	4,892	5,518	5,88	6,012	5,937	5,674
9779	7,7	0,416	33,641	0	1,537	2,734	3,774	4,622	5,257	5,663	5,854	5,848	5,66


Cross-curves -- KN
10 deg. KN
20 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
80 deg. KN
90 deg. KN
KN m
Displacement (intact) tonne
7,5
7
6,5
6
5,5
5
4,5
4
3,5
3
2,5
2
1,5
5000
5500
6000
6500
7000
7500
8000
8500
9000
9500
10000

4.5 Tablas y graficas de Hidrostáticas y KN a trimado -0.41625

Tabla de Hidrostáticas trimado -0.41625								
Displacement t	5060	5682	6316	6962	7621	8290	8968	9653
Heel deg	0	0	0	0	0	0	0	0
Draft at FP m	4,708	5,165	5,622	6,079	6,537	6,994	7,451	7,908
Draft at AP m	4,292	4,749	5,206	5,663	6,121	6,578	7,035	7,492
Draft at LCF m	4,475	4,928	5,382	5,836	6,29	6,744	7,2	7,659
Trim (+ve by stern) m	-0,416	-0,416	-0,416	-0,416	-0,416	-0,416	-0,416	-0,416
WL Length m	82,029	82,19	82,695	83,851	84,866	85,609	83,054	83,216
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,26	20,26	20,262
Wetted Area m^2	1783,76	1881,924	1980,276	2078,379	2178,751	2278,812	2369,181	2450,526
Waterpl. Area m^2	1311,762	1340,315	1366,905	1392,322	1417,282	1439,471	1453,297	1470,646
Prismatic coeff. (Cp)	0,683	0,693	0,699	0,7	0,701	0,704	0,734	0,741
Block coeff. (Cb)	0,645	0,657	0,666	0,669	0,672	0,677	0,708	0,716
Max Sect. area coeff. (Cm)	0,976	0,978	0,98	0,982	0,983	0,984	0,985	0,986
Waterpl. area coeff. (Cwp)	0,789	0,805	0,816	0,82	0,824	0,83	0,864	0,872
LCB from zero pt. (+ve fwd) m	36,734	36,405	36,076	35,745	35,415	35,084	34,758	34,487
LCF from zero pt. (+ve fwd) m	34,038	33,413	32,82	32,233	31,62	30,997	30,78	31,112
KB m	2,446	2,693	2,94	3,188	3,436	3,685	3,934	4,182
KG m	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
BMt m	7,727	7,074	6,531	6,074	5,69	5,357	5,039	4,768
BML m	106,453	100,308	94,924	90,213	86,106	82,013	77,394	74,102
GMt m	2,484	2,079	1,785	1,579	1,445	1,362	1,294	1,272
GML m	101,21	95,314	90,178	85,717	81,86	78,018	73,649	70,606
KMt m	10,173	9,767	9,471	9,262	9,127	9,042	8,972	8,949
KML m	108,897	103	97,862	93,4	89,541	85,697	81,327	78,282
Immersion (TPc) tonne/cm	13,446	13,738	14,011	14,271	14,527	14,755	14,896	15,074
MTc tonne.m	66,086	69,877	73,491	77,007	80,496	83,457	85,226	87,946
RM at 1deg = GMt.Disp.sin(1) tonne.m	219,362	206,183	196,81	191,82	192,147	197,016	202,538	214,362
Max deck inclination deg	0,3075	0,3075	0,3075	0,3075	0,3075	0,3075	0,3075	0,3075
Trim angle (+ve by stern) deg	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075

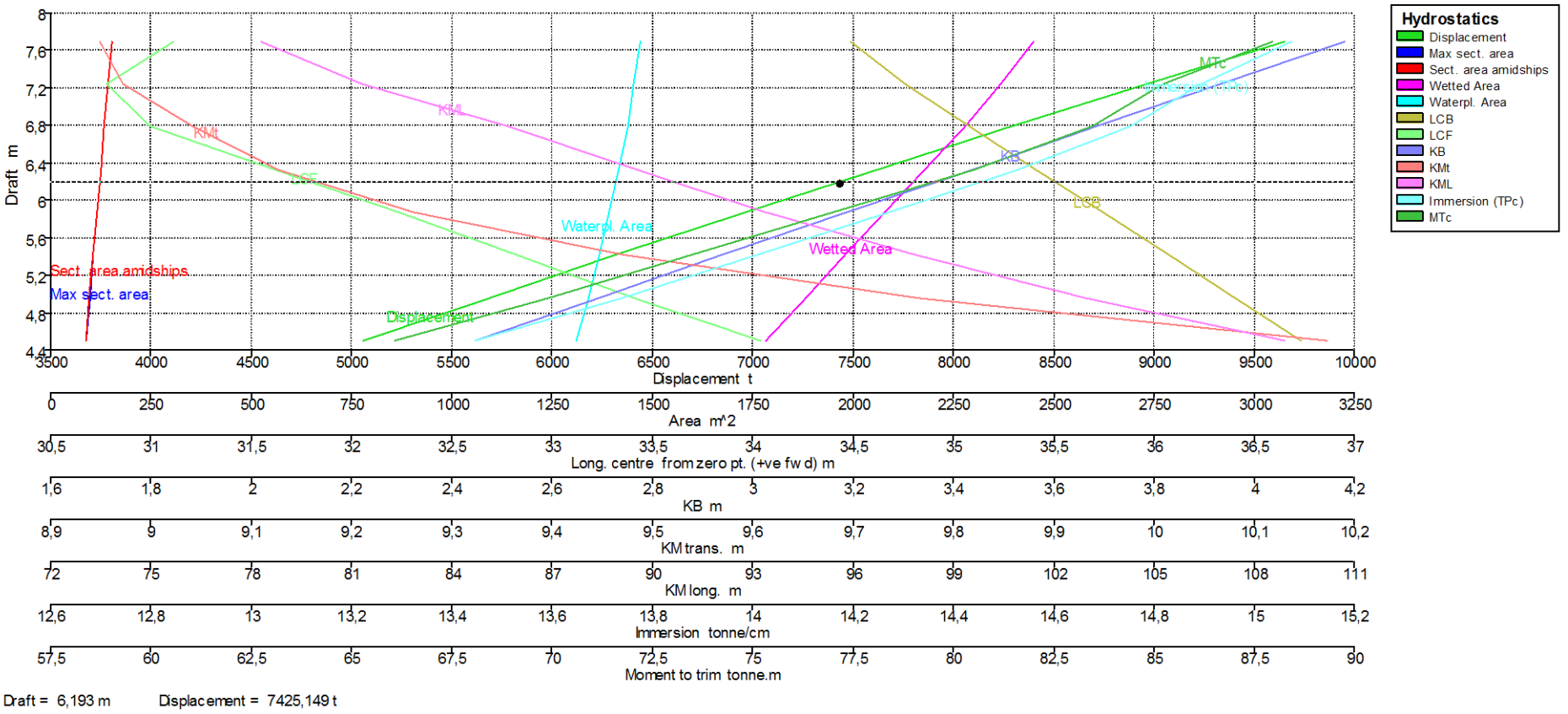
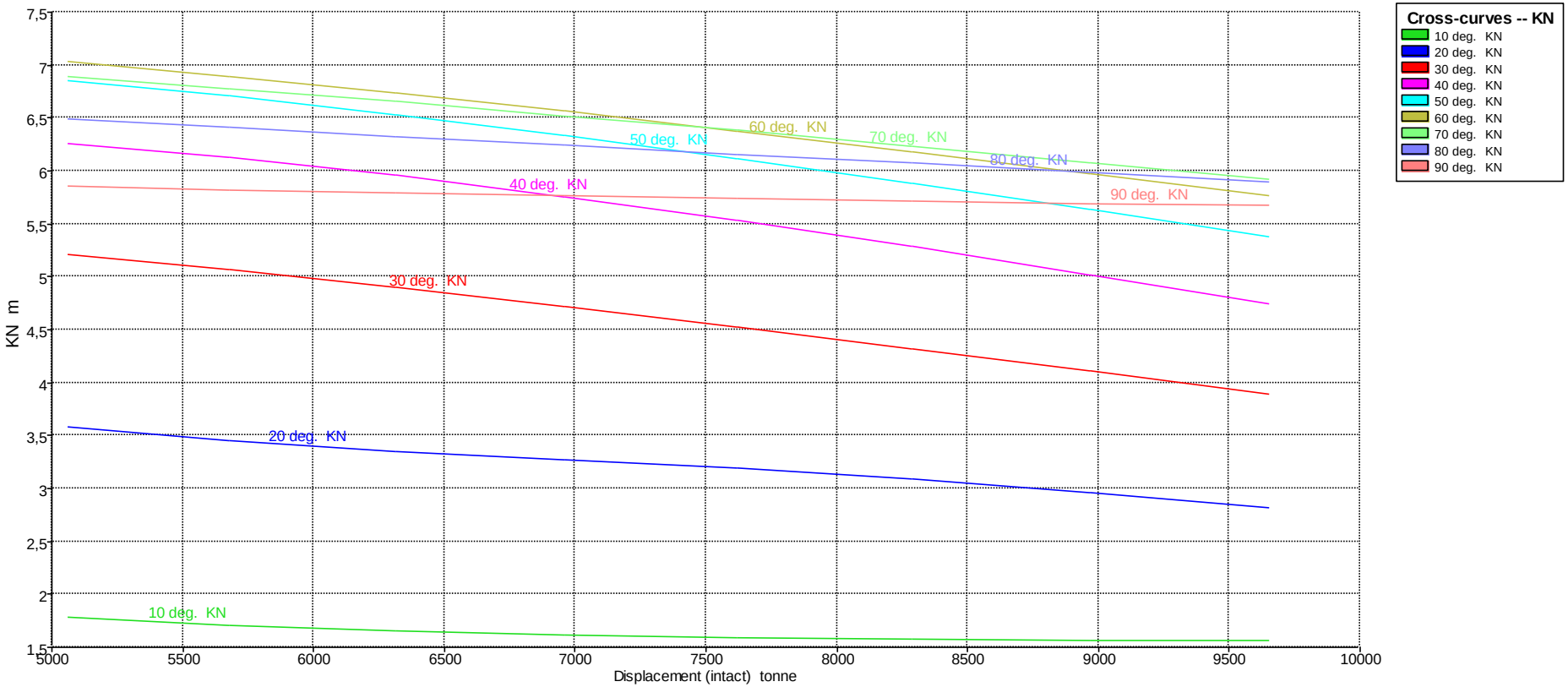

Hydrostatics
Displacement
Max sect. area
Sect. area amidships
Wetted Area
Waterpl. Area
LCB
LCF
KB
KMt
KML
Immersion (TPc)
MTc
Draft m
Displacement t
Area m^2
Long. centre from zero pt. (+ve fwd) m
KB m
KM trans. m
KM long. m
Immersion tonne/cm
Moment to trim tonne.m
Draft = 6,193 m
Displacement = 7425,149 t

Tabla KN													
Desplazamiento	Calado	Trimado	LCG	TCG	KN 10º	KN 20º	KN 30º	KN 40º	KN 50º	KN 60º	KN 70º	KN 80º	KN 90º
5060	4,5	-0,416	36,747	0	1,781	3,586	5,207	6,259	6,855	7,035	6,896	6,492	5,859
5682	4,957	-0,416	36,42	0	1,71	3,452	5,07	6,127	6,706	6,895	6,78	6,411	5,823
6316	5,414	-0,416	36,092	0	1,658	3,351	4,906	5,959	6,532	6,737	6,655	6,329	5,79
6962	5,871	-0,416	35,763	0	1,622	3,275	4,721	5,76	6,334	6,565	6,523	6,245	5,761
7621	6,329	-0,416	35,433	0	1,597	3,193	4,523	5,533	6,117	6,38	6,383	6,159	5,736
8290	6,786	-0,416	35,104	0	1,58	3,09	4,317	5,283	5,882	6,182	6,236	6,072	5,713
8968	7,243	-0,416	34,779	0	1,57	2,966	4,106	5,016	5,632	5,975	6,083	5,983	5,693
9653	7,7	-0,416	34,51	0	1,561	2,825	3,894	4,748	5,376	5,763	5,929	5,895	5,677


Cross-curves -- KN
10 deg. KN
20 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
80 deg. KN
90 deg. KN
KN m
Displacement (intact) tonne
7,5
7
6,5
6
5,5
5
4,5
4
3,5
3
2,5
2
1,5
5000
5500
6000
6500
7000
7500
8000
8500
9000
9500
10000

5 ANEXO I (CALIBRACIÓN DE TANQUES)

:

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - salida puerto 100

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified
pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	2,000	2,000			46,000	0,000	15,000	0,000	User Specified
Total Rosca y pertrechos			4858,750			44,046	0,000	7,039	0,000	

carga en cubierta	0	2000,000	0,000			23,000	0,000	10,200	0,000	User Specified
Agua Suministro1BR	100%	42,000	42,000	42,000	42,000	3,600	-2,500	7,250	0,000	User Specified
Agua Suministro1ER	100%	42,000	42,000	42,000	42,000	3,600	2,500	7,250	0,000	User Specified
Agua Suministro2BR	100%	88,200	88,200	88,200	88,200	13,800	-3,500	7,250	0,000	Maximum
Agua Suministro2ER	100%	88,200	88,200	88,200	88,200	13,800	3,500	7,250	0,000	Maximum
Agua suministro 3 BR	98%	113,400	111,132	113,400	111,132	6,600	-4,500	7,215	0,000	IMO A.749(18)
Agua suministro 3 ER	98%	113,400	111,132	113,400	111,132	6,600	4,500	7,215	0,000	IMO A.749(18)
Agua suministro 4 BR	98%	88,200	86,436	88,200	86,436	10,200	-3,500	7,215	0,000	IMO A.749(18)
Agua suministro 4ER	98%	88,200	86,436	88,200	86,436	10,200	3,500	7,215	0,000	IMO A.749(18)
Brine 1BR	100%	72,480	72,480	48,320	48,320	3,671	-4,461	4,369	0,000	User Specified
BRINE 1ER	100%	72,480	72,480	48,320	48,320	3,671	4,461	4,369	0,000	User Specified
BRINE 2BR	100%	25,200	25,200	16,800	16,800	13,200	-7,500	7,250	0,000	User Specified
BRINE 2ER	100%	25,200	25,200	16,800	16,800	13,200	7,500	7,250	0,000	User Specified
BRINE 3BR	100%	12,600	12,600	8,400	8,400	14,400	-8,500	7,250	0,000	User Specified
BRINE 3ER	100%	12,600	12,600	8,400	8,400	14,400	8,500	7,250	0,000	User Specified
Brine	100%	120,000	120,000	80,000	80,000	21,400	-8,000	3,500	0,000	User Specified
brine	100%	120,000	120,000	80,000	80,000	21,400	8,000	3,500	0,000	User Specified
c1	100%	272,443	272,443	146,475	146,475	18,850	3,000	5,250	0,000	Maximum
c2	100%	272,977	272,977	146,762	146,762	24,349	3,000	5,250	0,000	Maximum

c3	100%	272,443	272,443	146,475	146,475	18,850	-3,000	5,250	0,000	Maximum
c4	100%	272,977	272,977	146,762	146,762	24,349	-3,000	5,250	0,000	Maximum
Lodo1	0%	475,174	0,000	158,391	0,000	11,811	-4,478	1,500	0,000	Maximum
lodo 1	0%	475,174	0,000	158,391	0,000	11,811	4,478	1,500	0,000	Maximum
Agua perforacion	100%	227,633	227,633	222,081	222,081	20,597	-4,755	0,859	0,000	Maximum
agua perforacion	100%	227,633	227,633	222,081	222,081	20,597	4,755	0,859	0,000	Maximum
total carga			2662,201			17,130	0,000	4,838	0,000	
DO 1BR	98%	72,576	71,124	86,400	84,672	30,000	-4,500	3,460	122,472	Maximum
DO 1ER	98%	72,576	71,124	86,400	84,672	30,000	4,500	3,460	122,472	Maximum
DO 2 BR	98%	72,576	71,124	86,400	84,672	32,400	-4,500	3,460	122,472	Maximum
DO 2ER	98%	72,576	71,124	86,400	84,672	32,400	4,500	3,460	122,472	Maximum
DO 3 BR	98%	72,576	71,124	86,400	84,672	34,800	-4,500	3,460	122,472	Maximum
DO 3ER	98%	72,576	71,124	86,400	84,672	34,800	4,500	3,460	122,472	Maximum
DO 4BR	98%	77,616	76,064	92,400	90,552	22,200	-8,000	7,215	0,000	User Specified
DO 4ER	98%	77,616	76,064	92,400	90,552	22,200	8,000	7,215	0,000	User Specified
DO 5 BR	98%	63,504	62,234	75,600	74,088	30,000	-4,500	7,215	122,472	Maximum
DO 5ER	98%	63,504	62,234	75,600	74,088	30,000	4,500	7,215	122,472	Maximum
DO 6BR	98%	42,336	41,489	50,400	49,392	32,400	-3,000	7,215	0,000	User Specified

DO 6ER	98%	42,336	41,489	50,400	49,392	32,400	3,000	7,215	0,000	User Specified
UD BR	97%	42,336	41,066	50,400	48,888	34,800	-3,000	7,198	36,288	User Specified
UD ER	97%	42,336	41,066	50,400	48,888	34,800	3,000	7,198	36,288	User Specified
SED BR	98%	42,336	41,489	50,400	49,392	33,600	-7,500	7,215	0,000	User Specified
SED ER	98%	42,336	41,489	50,400	49,392	33,600	7,500	7,215	0,000	User Specified
total combustible	97,91%	971,712	951,431	1156,800	1132,656	30,767	0,000	5,529	1052,352	
Lastre 1 BR	0%	103,655	0,000	101,127	0,000	35,949	-0,139	0,004	0,000	IMO A.749(18)
Lastre 1 eR	0%	103,655	0,000	101,127	0,000	35,949	0,139	0,004	0,000	IMO A.749(18)
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	IMO A.749(18)
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	IMO A.749(18)
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	IMO A.749(18)
Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	IMO A.749(18)
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	0%	61,148	0,000	59,656	0,000	32,355	-9,523	1,500	0,000	User Specified
Lastre 6 ER	0%	61,148	0,000	59,656	0,000	32,355	9,523	1,500	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified

Lastre 4 ER	0%	70,665	0,000	68,941	0,000	12,411	9,404	1,500	0,000	User Specified
Lastre 7 BR	0%	38,852	0,000	37,905	0,000	4,766	-9,000	3,073	0,000	User Specified
Lastre 7ER	0%	38,852	0,000	37,905	0,000	4,766	9,000	3,073	0,000	User Specified
Agua perforacion	0%	145,258	0,000	145,258	0,000	9,451	-3,646	1,500	0,000	Maximum
agua perforacion	0%	145,258	0,000	145,258	0,000	9,451	3,646	1,500	0,000	Maximum
perforacionE PIQUE PP	0%	127,309	0,000	124,204	0,000	-3,612	0,000	5,834	0,000	IMO A.749(18)
lastre PIQUE PROA	0%	75,694	0,000	75,694	0,000	73,224	0,000	0,317	0,000	IMO A.749(18)
total lsdtre	0%	1765,365	0,000	1731,239	0,000	0,000	0,000	0,000	0,000	
Aguas negras ER	0%	4,200	0,000	4,200	0,000	11,400	-8,500	5,500	0,000	Maximum
Aguas negrasBR	0%	4,200	0,000	4,200	0,000	11,400	8,500	5,500	0,000	User Specified
Aguas GrisesBR	0%	4,200	0,000	4,200	0,000	12,600	-8,500	5,500	0,000	User Specified
Aguas Grises BR	0%	4,200	0,000	4,200	0,000	12,600	8,500	5,500	0,000	User Specified
agua consumos1BR	100%	33,600	33,600	33,600	33,600	3,600	-7,000	7,250	0,000	User Specified
agua consumos1ER	100%	33,600	33,600	33,600	33,600	3,600	7,000	7,250	0,000	User Specified
Fangos1BR	0%	2,419	0,000	2,880	0,000	44,400	-8,400	1,500	0,000	User Specified
Fangos1ER	0%	2,419	0,000	2,880	0,000	44,400	8,400	1,500	0,000	User Specified
LubricanteBR	100%	8,148	8,148	8,400	8,400	9,000	-8,000	7,250	1,552	User Specified
LubricanteER	100%	8,148	8,148	8,400	8,400	9,000	8,000	7,250	1,552	User Specified

Aceite1 BR	100%	18,158	18,158	18,720	18,720	44,400	-3,900	1,750	198,656	User Specified
Aceite1 ER	100%	18,158	18,158	18,720	18,720	44,400	3,900	1,750	198,656	User Specified
AGUA TECNICA BR	100%	53,358	53,358	52,056	52,056	74,908	0,000	7,300	69,522	User Specified
total consumos	88,89%	194,809	173,170	196,056	173,496	34,636	0,000	6,112	469,939	
Total Loadcase			8645,552	5402,152	3299,362	34,108	0,000	6,177	1522,291	
FS correction								0,176		
VCG fluid								6,353		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**
GZ m	-0,985	-0,961	-0,820	-0,473	0,000	0,473	0,820	0,960	0,985	0,815	0,514	0,143	-0,259	-0,6
Area under GZ curve from zero heel m.rad	0,4863	0,3157	0,1576	0,0421	0,0000	0,0421	0,1577	0,3153	0,4871	0,6468	0,7642	0,8222	0,8123	0,73
Displacement t	8646	8646	8646	8646	8646	8646	8646	8646	8646	8645	8646	8646	8646	8645
Draft at FP m	5,923	6,337	6,646	6,750	6,760	6,749	6,645	6,326	5,919	5,480	4,911	3,968	1,438	n/a
Draft at AP m	9,484	8,102	7,308	7,113	7,129	7,113	7,307	8,112	9,488	11,494	14,580	20,336	36,814	n/a
WL Length m	86,608	86,533	86,408	86,415	86,286	86,415	86,408	86,535	86,608	86,619	86,563	86,429	86,182	85,7

Beam max extents on WL m	18,896	21,875	21,004	20,569	20,260	20,569	21,004	21,879	18,897	16,152	14,366	13,271	12,678	12,4
Wetted Area m^2	2635,162	2563,580	2473,551	2311,939	2317,590	2311,933	2473,433	2563,776	2635,202	2665,906	2681,049	2691,083	2699,091	270
Waterpl. Area m^2	1108,223	1216,663	1291,464	1468,523	1452,453	1468,527	1291,521	1216,454	1108,221	987,131	904,452	853,215	824,278	810,
Prismatic coeff. (Cp)	0,706	0,719	0,709	0,702	0,701	0,702	0,709	0,719	0,706	0,699	0,693	0,687	0,683	0,68
Block coeff. (Cb)	0,416	0,406	0,488	0,580	0,691	0,580	0,488	0,406	0,416	0,445	0,472	0,497	0,502	0,48
LCB from zero pt. (+ve fwd) m	34,005	34,060	34,087	34,097	34,096	34,096	34,087	34,044	34,001	33,949	33,902	33,864	33,842	33,8
LCF from zero pt. (+ve fwd) m	39,170	37,659	34,645	31,297	30,792	31,297	34,644	37,663	39,171	40,344	41,305	42,035	42,476	42,4
Max deck inclination deg	40,0422	30,0193	20,0051	10,0035	0,2727	10,0035	20,0051	30,0197	40,0424	50,0597	60,0642	70,0542	80,0316	90,0
Trim angle (+ve by stern) deg	2,6311	1,3050	0,4895	0,2688	0,2727	0,2692	0,4893	1,3200	2,6368	4,4371	7,1116	11,9258	24,5351	90,0

Key point	**Type**	**Immersion angle deg**	**Emergence angle deg**
Margin Line (immersion pos = -5,719 m)		11	n/a
Deck Edge (immersion pos = -5,719 m)		11,3	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	54,2	0

Code	Criteria	Value	Units	Actual	Status	Margin %
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	22,8	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0550	m.rad	0,4399	Pass	+699,90
2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,1718	Pass	+472,62
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	0,994	Pass	+397,00
2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	37,3	Pass	+148,49
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	2,660	Pass	+1673,33
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	0,0	Pass	+100,00
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	0,00	Pass	+100,00
	Area1 / Area2 shall not be less than (>=)	100,00	%	324,95	Pass	+224,95

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - llegada a puerto

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified
pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	0,200	0,200			46,000	0,000	15,000	0,000	User Specified
Total Rosca y pertrechos			4856,950			44,045	0,000	7,036	0,000	
carga cubierta	0	2000,000	0,000			22,500	0,000	10,200	0,000	User Specified
Agua Suministro1BR	0%	42,000	0,000	42,000	0,000	3,600	-2,500	5,500	0,000	User Specified
Agua Suministro1ER	0%	42,000	0,000	42,000	0,000	3,600	2,500	5,500	0,000	User Specified
Agua Suministro2BR	0%	88,200	0,000	88,200	0,000	13,800	-3,500	5,500	0,000	Maximum
Agua Suministro2ER	0%	88,200	0,000	88,200	0,000	13,800	3,500	5,500	0,000	Maximum

Agua suministro 3 BR	0%	113,400	0,000	113,400	0,000	6,600	-4,500	5,500	0,000	IMO A.749(18)
Agua suministro 3 ER	0%	113,400	0,000	113,400	0,000	6,600	4,500	5,500	0,000	IMO A.749(18)
Agua suministro 4 BR	0%	88,200	0,000	88,200	0,000	10,200	-3,500	5,500	0,000	IMO A.749(18)
Agua suministro 4ER	0%	88,200	0,000	88,200	0,000	10,200	3,500	5,500	0,000	IMO A.749(18)
Brine 1BR	0%	72,480	0,000	48,320	0,000	4,766	-0,022	2,841	0,000	User Specified
BRINE 1ER	0%	72,480	0,000	48,320	0,000	4,766	0,022	2,841	0,000	User Specified
BRINE 2BR	0%	25,200	0,000	16,800	0,000	13,200	-7,500	5,500	0,000	User Specified
BRINE 2ER	0%	25,200	0,000	16,800	0,000	13,200	7,500	5,500	0,000	User Specified
BRINE 3BR	0%	12,600	0,000	8,400	0,000	14,400	-8,500	5,500	0,000	User Specified
BRINE 3ER	0%	12,600	0,000	8,400	0,000	14,400	8,500	5,500	0,000	User Specified
Brine	0%	120,000	0,000	80,000	0,000	21,400	-8,000	1,500	0,000	User Specified
brine	0%	120,000	0,000	80,000	0,000	21,400	8,000	1,500	0,000	User Specified
c1	0%	272,443	0,000	146,475	0,000	18,850	3,000	1,500	0,000	Maximum
c2	0%	272,977	0,000	146,762	0,000	24,349	3,000	1,500	0,000	Maximum
c3	0%	272,443	0,000	146,475	0,000	18,850	-3,000	1,500	0,000	Maximum
c4	100%	272,977	272,977	146,762	146,762	24,349	-3,000	5,250	0,000	Maximum
Lodo1	100%	475,174	475,174	158,391	158,391	11,800	-4,500	3,500	0,000	Maximum
lodo 1	100%	475,174	475,174	158,391	158,391	11,800	4,500	3,500	0,000	Maximum
Agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	-0,226	0,017	0,000	Maximum

agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	0,226	0,017	0,000	Maximum
total carga			1223,325			14,600	-0,669	3,891	0,000	
DO 1BR	0%	72,576	0,000	86,400	0,000	30,000	-4,500	1,500	0,000	Maximum
DO 1ER	0%	72,576	0,000	86,400	0,000	30,000	4,500	1,500	0,000	Maximum
DO 2 BR	0%	72,576	0,000	86,400	0,000	32,400	-4,500	1,500	0,000	Maximum
DO 2ER	0%	72,576	0,000	86,400	0,000	32,400	4,500	1,500	0,000	Maximum
DO 3 BR	0%	72,576	0,000	86,400	0,000	34,800	-4,500	1,500	0,000	Maximum
DO 3ER	0%	72,576	0,000	86,400	0,000	34,800	4,500	1,500	0,000	Maximum
DO 4BR	0%	77,616	0,000	92,400	0,000	22,200	-8,000	5,500	0,000	User Specified
DO 4ER	0%	77,616	0,000	92,400	0,000	22,200	8,000	5,500	0,000	User Specified
DO 5 BR	0%	63,504	0,000	75,600	0,000	30,000	-4,500	5,500	0,000	Maximum
DO 5ER	0%	63,504	0,000	75,600	0,000	30,000	4,500	5,500	0,000	Maximum
DO 6BR	0%	42,336	0,000	50,400	0,000	32,400	-3,000	5,500	0,000	User Specified
DO 6ER	0%	42,336	0,000	50,400	0,000	32,400	3,000	5,500	0,000	User Specified
UD BR	98%	42,336	41,489	50,400	49,392	34,800	-3,000	7,215	0,000	User Specified
UD ER	98%	42,336	41,489	50,400	49,392	34,800	3,000	7,215	0,000	User Specified
SED BR	8%	42,336	3,387	50,400	4,032	33,600	-7,500	5,640	0,000	User Specified
SED ER	8%	42,336	3,387	50,400	4,032	33,600	7,500	5,640	0,000	User Specified

total combustible	9,24%	971,712	89,752	1156,800	106,848	34,709	0,000	7,096	0,000	
Lastre 1 BR	100%	103,655	103,655	101,127	101,127	32,398	-4,769	0,789	0,000	IMO A.749(18)
Lastre 1 eR	100%	103,655	103,655	101,127	101,127	32,398	4,769	0,789	0,000	IMO A.749(18)
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	IMO A.749(18)
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	IMO A.749(18)
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	IMO A.749(18)
Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	IMO A.749(18)
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	0%	61,148	0,000	59,656	0,000	32,355	-9,523	1,500	0,000	User Specified
Lastre 6 ER	0%	61,148	0,000	59,656	0,000	32,355	9,523	1,500	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified
Lastre 4 ER	0%	70,665	0,000	68,941	0,000	12,411	9,404	1,500	0,000	User Specified
Lastre 7 BR	100%	38,852	38,852	37,905	37,905	1,084	-9,525	6,884	0,000	User Specified
Lastre 7ER	100%	38,852	38,852	37,905	37,905	1,084	9,525	6,884	0,000	User Specified
Agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	-4,472	3,793	0,000	Maximum
agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	4,472	3,793	0,000	Maximum
perforacionE PIQUE PP	100%	127,309	127,309	124,204	124,204	-4,617	0,000	7,752	0,000	IMO A.749(18)

lastre PIQUE PROA	0%	75,694	0,000	75,694	0,000	73,224	0,000	0,317	0,000	IMO A.749(18)
total lsdtre	39,81%	1765,365	702,839	1731,239	692,782	11,886	0,000	3,966	0,000	
AGUA TECNICA BR	10%	53,358	5,336	52,056	5,206	75,114	0,000	5,657	0,000	User Specified
Aguas negras ER	75%	4,200	3,150	4,200	3,150	11,400	-8,500	6,813	0,100	Maximum
Aguas negrasBR	75%	4,200	3,150	4,200	3,150	11,400	8,500	6,813	0,000	User Specified
Aguas GrisesBR	75%	4,200	3,150	4,200	3,150	12,600	-8,500	6,812	0,000	User Specified
Aguas Grises BR	75%	4,200	3,150	4,200	3,150	12,600	8,500	6,812	0,000	User Specified
agua consumos1BR	10%	33,600	3,360	33,600	3,360	3,600	-7,000	5,675	0,000	User Specified
agua consumos1ER	10%	33,600	3,360	33,600	3,360	3,600	7,000	5,675	0,000	User Specified
Fangos1BR	98%	2,419	2,371	2,880	2,822	44,400	-8,400	1,745	0,000	User Specified
Fangos1ER	98%	2,419	2,371	2,880	2,822	44,400	8,400	1,745	0,000	User Specified
LubricanteBR	10%	8,148	0,815	8,400	0,840	9,000	-8,000	5,675	0,000	User Specified
LubricanteER	10%	8,148	0,815	8,400	0,840	9,000	8,000	5,675	0,000	User Specified
Aceite1 BR	10%	18,158	1,816	18,720	1,872	44,400	-3,900	1,525	0,000	User Specified
Aceite1 ER	10%	18,158	1,816	18,720	1,872	44,400	3,900	1,525	0,000	User Specified
total consumos	17,79%	194,809	34,659	196,056	35,594	27,774	0,000	5,113	0,100	
Total Loadcase			6907,524	5402,152	1298,769	35,356	-0,119	6,158	0,100	
FS correction								0,000		

VCG fluid								6,158		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**
GZ m	-1,713	-1,547	-1,071	-0,444	0,119	0,677	1,294	1,753	1,895	1,695	1,293	0,776	0,199	-0,4
Area under GZ curve from zero heel m.rad	0,6800	0,3924	0,1597	0,0274	0,0038	0,0685	0,2409	0,5105	0,8340	1,1513	1,4142	1,5960	1,6816	1,66
Displacement t	6908	6908	6908	6908	6908	6908	6908	6908	6908	6907	6907	6908	6908	690
Draft at FP m	5,647	5,929	5,944	5,872	5,835	5,873	5,945	5,929	5,646	5,237	4,669	3,683	0,935	n/a
Draft at AP m	5,798	5,520	5,515	5,702	5,771	5,702	5,515	5,521	5,798	6,219	6,857	8,032	11,373	n/a
WL Length m	86,551	86,552	86,627	86,555	84,172	86,555	86,627	86,552	86,551	86,510	86,414	86,251	85,991	85,5
Beam max extents on WL m	19,244	22,004	21,247	20,571	20,261	20,571	21,247	22,003	19,244	16,257	14,412	13,295	12,691	12,5
Wetted Area m^2	2233,333	2194,171	2082,245	2073,380	2073,121	2073,378	2082,249	2194,212	2233,273	2256,239	2270,587	2281,180	2289,803	229
Waterpl. Area m^2	1135,997	1300,204	1446,431	1413,722	1399,021	1413,713	1446,438	1300,199	1135,997	997,932	910,541	857,184	827,538	811,
Prismatic coeff. (Cp)	0,689	0,706	0,689	0,680	0,696	0,680	0,689	0,706	0,689	0,678	0,670	0,663	0,658	0,65
Block coeff. (Cb)	0,396	0,381	0,447	0,542	0,680	0,542	0,447	0,381	0,396	0,440	0,478	0,515	0,550	0,55
LCB from zero pt. (+ve fwd) m	35,351	35,372	35,372	35,361	35,358	35,362	35,373	35,372	35,350	35,322	35,293	35,267	35,246	35,2

LCF from zero pt. (+ve fwd) m	39,075	36,605	33,200	32,249	32,065	32,250	33,200	36,605	39,074	40,377	41,322	41,990	42,364	42,2
Max deck inclination deg	40,0001	30,0010	20,0021	10,0008	0,0472	10,0008	20,0021	30,0010	40,0001	50,0016	60,0033	70,0038	80,0028	90,0
Trim angle (+ve by stern) deg	0,1116	-0,3020	-0,3169	-0,1258	-0,0472	-0,1261	-0,3176	-0,3016	0,1126	0,7258	1,6167	3,2120	7,6708	90,0

Key point	**Type**	**Immersion angle deg**	**Emergence angle deg**
Margin Line (immersion pos = 42,023 m)		18,5	n/a
Deck Edge (immersion pos = 42,023 m)		18,9	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	66,7	0

Code	**Criteria**	**Value**	**Units**	**Actual**	**Status**	**Margin %**
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	21,7	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0550	m.rad	0,8039	Pass	+1361,62
2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,3235	Pass	+978,29
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	1,897	Pass	+848,50

2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	39,1	Pass	+160,61
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	3,158	Pass	+2005,33
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	-2,2	Pass	+113,72
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	-11,62	Pass	+114,53
	Area1 / Area2 shall not be less than (>=)	100,00	%	476,14	Pass	+376,14

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - plena carga cubierta consumo 100%

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified
pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	2,000	2,000			46,000	0,000	15,000	0,000	User Specified
Total			4858,750			44,046	0,000	7,039	0,000	
Carga cubierta	1	2000,000	2000,000			22,500	0,000	10,200	0,000	User Specified
Agua Suministro1BR	100%	42,000	42,000	42,000	42,000	3,600	-2,500	7,250	0,000	User Specified
Agua Suministro1ER	100%	42,000	42,000	42,000	42,000	3,600	2,500	7,250	0,000	User Specified
Agua Suministro2BR	0%	88,200	0,000	88,200	0,000	13,800	-3,500	5,500	0,000	Maximum
Agua Suministro2ER	0%	88,200	0,000	88,200	0,000	13,800	3,500	5,500	0,000	Maximum
Agua suministro 3 BR	0%	113,400	0,000	113,400	0,000	6,600	-4,500	5,500	0,000	IMO A.749(18)
Agua suministro 3 ER	0%	113,400	0,000	113,400	0,000	6,600	4,500	5,500	0,000	IMO A.749(18)
Agua suministro 4 BR	0%	88,200	0,000	88,200	0,000	10,200	-3,500	5,500	0,000	IMO A.749(18)
Agua suministro 4ER	0%	88,200	0,000	88,200	0,000	10,200	3,500	5,500	0,000	IMO A.749(18)
Brine 1BR	0%	72,480	0,000	48,320	0,000	4,766	-0,022	2,841	0,000	User Specified

BRINE 1ER	0%	72,480	0,000	48,320	0,000	4,766	0,022	2,841	0,000	User Specified
BRINE 2BR	0%	25,200	0,000	16,800	0,000	13,200	-7,500	5,500	0,000	User Specified
BRINE 2ER	0%	25,200	0,000	16,800	0,000	13,200	7,500	5,500	0,000	User Specified
BRINE 3BR	0%	12,600	0,000	8,400	0,000	14,400	-8,500	5,500	0,000	User Specified
BRINE 3ER	0%	12,600	0,000	8,400	0,000	14,400	8,500	5,500	0,000	User Specified
Brine	0%	120,000	0,000	80,000	0,000	21,400	-8,000	1,500	0,000	User Specified
brine	0%	120,000	0,000	80,000	0,000	21,400	8,000	1,500	0,000	User Specified
c1	0%	272,443	0,000	146,475	0,000	18,850	3,000	1,500	0,000	Maximum
c2	0%	272,977	0,000	146,762	0,000	24,349	3,000	1,500	0,000	Maximum
c3	0%	272,443	0,000	146,475	0,000	18,850	-3,000	1,500	0,000	Maximum
c4	0%	272,977	0,000	146,762	0,000	24,349	-3,000	1,500	0,000	Maximum
Agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	-0,226	0,017	0,000	Maximum
agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	0,226	0,017	0,000	Maximum
Lodo1	0%	475,174	0,000	158,391	0,000	11,811	-4,478	1,500	0,000	Maximum
lodo 1	0%	475,174	0,000	158,391	0,000	11,811	4,478	1,500	0,000	Maximum
total			2084,000			21,738	0,000	10,081	0,000	
DO 1BR	98%	72,576	71,124	86,400	84,672	30,000	-4,500	3,460	122,472	Maximum
DO 1ER	98%	72,576	71,124	86,400	84,672	30,000	4,500	3,460	122,472	Maximum

DO 2 BR	98%	72,576	71,124	86,400	84,672	32,400	-4,500	3,460	122,472	Maximum
DO 2ER	98%	72,576	71,124	86,400	84,672	32,400	4,500	3,460	122,472	Maximum
DO 3 BR	98%	72,576	71,124	86,400	84,672	34,800	-4,500	3,460	122,472	Maximum
DO 3ER	98%	72,576	71,124	86,400	84,672	34,800	4,500	3,460	122,472	Maximum
DO 4BR	98%	77,616	76,064	92,400	90,552	22,200	-8,000	7,215	0,000	User Specified
DO 4ER	98%	77,616	76,064	92,400	90,552	22,200	8,000	7,215	0,000	User Specified
DO 5 BR	98%	63,504	62,234	75,600	74,088	30,000	-4,500	7,215	122,472	Maximum
DO 5ER	98%	63,504	62,234	75,600	74,088	30,000	4,500	7,215	122,472	Maximum
DO 6BR	98%	42,336	41,489	50,400	49,392	32,400	-3,000	7,215	0,000	User Specified
DO 6ER	98%	42,336	41,489	50,400	49,392	32,400	3,000	7,215	0,000	User Specified
UD BR	97%	42,336	41,066	50,400	48,888	34,800	-3,000	7,198	0,000	User Specified
UD ER	97%	42,336	41,066	50,400	48,888	34,800	3,000	7,198	0,000	User Specified
SED BR	98%	42,336	41,489	50,400	49,392	33,600	-7,500	7,215	0,000	User Specified
SED ER	98%	42,336	41,489	50,400	49,392	33,600	7,500	7,215	0,000	User Specified
Total	97,91%	971,712	951,431	1156,800	1132,656	30,767	0,000	5,529	979,776	
Agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	-4,472	3,793	0,000	Maximum
agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	4,472	3,793	0,000	Maximum
Lastre 1 BR	0%	103,655	0,000	101,127	0,000	35,949	-0,139	0,004	0,000	Maximum

Lastre 1 eR	0%	103,655	0,000	101,127	0,000	35,949	0,139	0,004	0,000	Maximum
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	Maximum
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	Maximum
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	Maximum
Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	Maximum
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	0%	61,148	0,000	59,656	0,000	32,355	-9,523	1,500	0,000	User Specified
Lastre 6 ER	0%	61,148	0,000	59,656	0,000	32,355	9,523	1,500	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified
Lastre 4 ER	0%	70,665	0,000	68,941	0,000	12,411	9,404	1,500	0,000	User Specified
Lastre 7 BR	100%	38,852	38,852	37,905	37,905	1,084	-9,525	6,884	0,000	User Specified
Lastre 7ER	100%	38,852	38,852	37,905	37,905	1,084	9,525	6,884	0,000	User Specified
lastre PIQUE PROA	0%	75,694	0,000	75,694	0,000	73,224	0,000	0,317	0,000	Maximum
perforacionE PIQUE PP	100%	127,309	127,309	124,204	124,204	-4,617	0,000	7,752	0,000	Maximum
Total	28,07%	1765,365	495,529	1731,239	490,529	3,304	0,000	5,295	0,000	
Fangos1BR	0%	2,419	0,000	2,880	0,000	44,400	-8,400	1,500	0,000	User Specified
Fangos1ER	0%	2,419	0,000	2,880	0,000	44,400	8,400	1,500	0,000	User Specified

Aguas negras ER	0%	4,200	0,000	4,200	0,000	11,400	-8,500	5,500	0,000	Maximum
Aguas negrasBR	0%	4,200	0,000	4,200	0,000	11,400	8,500	5,500	0,000	User Specified
Aguas GrisesBR	0%	4,200	0,000	4,200	0,000	12,600	-8,500	5,500	0,000	User Specified
Aguas Grises BR	0%	4,200	0,000	4,200	0,000	12,600	8,500	5,500	0,000	User Specified
agua consumos1BR	100%	33,600	33,600	33,600	33,600	3,600	-7,000	7,250	0,000	User Specified
agua consumos1ER	100%	33,600	33,600	33,600	33,600	3,600	7,000	7,250	0,000	User Specified
LubricanteBR	100%	8,148	8,148	8,400	8,400	9,000	-8,000	7,250	0,000	User Specified
LubricanteER	100%	8,148	8,148	8,400	8,400	9,000	8,000	7,250	0,000	User Specified
Aceite1 BR	100%	18,158	18,158	18,720	18,720	44,400	-3,900	1,750	0,000	User Specified
Aceite1 ER	100%	18,158	18,158	18,720	18,720	44,400	3,900	1,750	0,000	User Specified
AGUA TECNICA BR	100%	53,358	53,358	52,056	52,056	74,908	0,000	7,300	0,000	User Specified
Total	88,89%	194,809	173,170	196,056	173,496	34,636	0,000	6,112	0,000	
Total Loadcase			8562,881	5402,152	1880,681	34,593	0,000	7,492	979,776	
FS correction								0,114		
VCG fluid								7,607		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**
GZ m	-0,249	-0,397	-0,427	-0,255	0,000	0,255	0,427	0,397	0,248	-0,082	-0,520	-0,996	-1,469	-1,9
Area under GZ curve from zero heel m.rad	0,2163	0,1592	0,0846	0,0227	0,0000	0,0227	0,0847	0,1589	0,2173	0,2342	0,1826	0,0505	-0,1650	-0,4
Displacement t	8563	8563	8564	8563	8563	8563	8563	8563	8563	8562	8563	8563	8563	8562
Draft at FP m	6,256	6,616	6,903	6,968	6,974	6,968	6,898	6,617	6,251	5,899	5,472	4,818	3,173	n/a
Draft at AP m	8,951	7,692	6,982	6,871	6,896	6,871	6,985	7,691	8,957	10,775	13,559	18,728	33,473	n/a
WL Length m	86,565	86,434	86,231	86,152	86,093	86,152	86,234	86,433	86,566	86,623	86,616	86,531	86,380	86,1
Beam max extents on WL m	18,906	21,891	21,005	20,569	20,260	20,569	21,005	21,891	18,906	16,156	14,368	13,272	12,679	12,4
Wetted Area m^2	2614,138	2541,415	2447,517	2306,606	2315,063	2306,601	2447,403	2541,319	2614,243	2644,136	2659,021	2668,480	2675,956	2679
Waterpl. Area m^2	1110,541	1229,536	1309,977	1462,759	1450,076	1462,763	1309,931	1229,564	1110,547	986,734	904,286	854,435	827,682	816,
Prismatic coeff. (Cp)	0,702	0,713	0,714	0,705	0,704	0,705	0,714	0,713	0,702	0,695	0,689	0,684	0,679	0,67
Block coeff. (Cb)	0,421	0,410	0,491	0,581	0,690	0,581	0,491	0,410	0,421	0,451	0,479	0,505	0,517	0,50
LCB from zero pt. (+ve fwd) m	34,488	34,546	34,595	34,599	34,597	34,598	34,590	34,547	34,482	34,429	34,384	34,355	34,344	34,3
LCF from zero pt. (+ve fwd) m	39,070	37,486	34,395	31,417	30,768	31,417	34,396	37,485	39,071	40,293	41,282	42,062	42,581	42,6
Max deck inclination deg	40,0242	30,0072	20,0001	10,0003	0,0575	10,0002	20,0001	30,0071	40,0244	50,0393	60,0449	70,0392	80,0232	90,0
Trim angle (+ve by stern) deg	1,9920	0,7952	0,0588	-0,0723	-0,0575	-0,0720	0,0637	0,7937	2,0001	3,6000	5,9572	10,1756	21,3538	90,0

Key point	Type	Immersion angle deg	Emergence angle deg
Margin Line (immersion pos = 35,079 m)		12,3	n/a
Deck Edge (immersion pos = 34,211 m)		12,7	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	54,5	0

Code	Criteria	Value	Units	Actual	Status	Margin %
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	20,4	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0623	m.rad	0,1053	Pass	+69,12
2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,0583	Pass	+94,49
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	0,397	Pass	+98,50
2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	22,7	Pass	+51,51
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	1,417	Pass	+844,67
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	0,0	Pass	+100,00
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	0,00	Pass	+100,00

	Area1 / Area2 shall not be less than (>=)	100,00	%	268,90	Pass	+168,90

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - Loadcase 4

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified

pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	0,200	0,200			46,000	0,000	15,000	0,000	User Specified
Total Rosca y pertrechos			4856,950			44,045	0,000	7,036	0,000	
Carga en cubierta	0	2000,000	0,000			22,500	0,000	10,200	0,000	User Specified
Agua Suministro1BR	100%	42,000	42,000	42,000	42,000	3,600	-2,500	7,250	0,000	User Specified
Agua Suministro1ER	100%	42,000	42,000	42,000	42,000	3,600	2,500	7,250	0,000	User Specified
Agua Suministro2BR	100%	88,200	88,200	88,200	88,200	13,800	-3,500	7,250	0,000	Maximum
Agua Suministro2ER	100%	88,200	88,200	88,200	88,200	13,800	3,500	7,250	0,000	Maximum
Agua suministro 3 BR	100%	113,400	113,400	113,400	113,400	6,600	-4,500	7,250	0,000	IMO A.749(18)
Agua suministro 3 ER	100%	113,400	113,400	113,400	113,400	6,600	4,500	7,250	0,000	IMO A.749(18)
Agua suministro 4 BR	100%	88,200	88,200	88,200	88,200	10,200	-3,500	7,250	0,000	IMO A.749(18)
Agua suministro 4ER	100%	88,200	88,200	88,200	88,200	10,200	3,500	7,250	0,000	IMO A.749(18)
Brine 1BR	100%	72,480	72,480	48,320	48,320	3,671	-4,461	4,369	0,000	User Specified
BRINE 1ER	100%	72,480	72,480	48,320	48,320	3,671	4,461	4,369	0,000	User Specified
BRINE 2BR	100%	25,200	25,200	16,800	16,800	13,200	-7,500	7,250	0,000	User Specified
BRINE 2ER	100%	25,200	25,200	16,800	16,800	13,200	7,500	7,250	0,000	User Specified
BRINE 3BR	100%	12,600	12,600	8,400	8,400	14,400	-8,500	7,250	0,000	User Specified

BRINE 3ER	100%	12,600	12,600	8,400	8,400	14,400	8,500	7,250	0,000	User Specified
Brine	100%	120,000	120,000	80,000	80,000	21,400	-8,000	3,500	0,000	User Specified
brine	100%	120,000	120,000	80,000	80,000	21,400	8,000	3,500	0,000	User Specified
c1	98%	272,443	266,994	146,475	143,545	18,850	3,000	5,175	57,049	Maximum
c2	98%	272,977	267,518	146,762	143,827	24,349	3,000	5,175	57,042	Maximum
c3	98%	272,443	266,994	146,475	143,545	18,850	-3,000	5,175	57,049	Maximum
c4	98%	272,977	267,518	146,762	143,827	24,349	-3,000	5,175	57,042	Maximum
Agua perforacion	98%	227,633	223,080	222,081	217,639	20,626	-4,751	0,847	1635,787	Maximum
agua perforacion	98%	227,633	223,080	222,081	217,639	20,626	4,751	0,847	1635,787	Maximum
Lodo1	0%	475,174	0,000	158,391	0,000	11,811	-4,478	1,500	0,000	Maximum
lodo 1	0%	475,174	0,000	158,391	0,000	11,811	4,478	1,500	0,000	Maximum
total			2639,343			17,059	0,000	4,828	3499,757	
DO 1BR	0%	72,576	0,000	86,400	0,000	30,000	-4,500	1,500	0,000	IMO A.749(18)
DO 1ER	0%	72,576	0,000	86,400	0,000	30,000	4,500	1,500	0,000	IMO A.749(18)
DO 2 BR	0%	72,576	0,000	86,400	0,000	32,400	-4,500	1,500	0,000	Maximum
DO 2ER	0%	72,576	0,000	86,400	0,000	32,400	4,500	1,500	0,000	Maximum
DO 3 BR	0%	72,576	0,000	86,400	0,000	34,800	-4,500	1,500	0,000	Maximum
DO 3ER	0%	72,576	0,000	86,400	0,000	34,800	4,500	1,500	0,000	Maximum

DO 4BR	0%	77,616	0,000	92,400	0,000	22,200	-8,000	5,500	0,000	User Specified
DO 4ER	0%	77,616	0,000	92,400	0,000	22,200	8,000	5,500	0,000	User Specified
DO 5 BR	0%	63,504	0,000	75,600	0,000	30,000	-4,500	5,500	0,000	Maximum
DO 5ER	0%	63,504	0,000	75,600	0,000	30,000	4,500	5,500	0,000	Maximum
DO 6BR	0%	42,336	0,000	50,400	0,000	32,400	-3,000	5,500	0,000	User Specified
DO 6ER	0%	42,336	0,000	50,400	0,000	32,400	3,000	5,500	0,000	User Specified
UD BR	98%	42,336	41,489	50,400	49,392	34,800	-3,000	7,215	0,000	User Specified
UD ER	98%	42,336	41,489	50,400	49,392	34,800	3,000	7,215	0,000	User Specified
SED BR	8%	42,336	3,387	50,400	4,032	33,600	-7,500	5,640	0,000	User Specified
SED ER	8%	42,336	3,387	50,400	4,032	33,600	7,500	5,640	0,000	User Specified
total	9,24%	971,712	89,752	1156,800	106,848	34,709	0,000	7,096	0,000	
Agua perforacion	0%	145,258	0,000	145,258	0,000	9,451	-3,646	1,500	0,000	Maximum
agua perforacion	0%	145,258	0,000	145,258	0,000	9,451	3,646	1,500	0,000	Maximum
Lastre 1 BR	0%	103,655	0,000	101,127	0,000	35,949	-0,139	0,004	0,000	IMO A.749(18)
Lastre 1 eR	0%	103,655	0,000	101,127	0,000	35,949	0,139	0,004	0,000	IMO A.749(18)
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	IMO A.749(18)
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	IMO A.749(18)
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	IMO A.749(18)

Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	IMO A.749(18)
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	0%	61,148	0,000	59,656	0,000	32,355	-9,523	1,500	0,000	User Specified
Lastre 6 ER	0%	61,148	0,000	59,656	0,000	32,355	9,523	1,500	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified
Lastre 4 ER	0%	70,665	0,000	68,941	0,000	12,411	9,404	1,500	0,000	User Specified
Lastre 7 BR	0%	38,852	0,000	37,905	0,000	4,766	-9,000	3,073	0,000	User Specified
Lastre 7ER	0%	38,852	0,000	37,905	0,000	4,766	9,000	3,073	0,000	User Specified
lastre PIQUE PROA	100%	75,694	75,694	75,694	75,694	75,117	0,000	3,269	0,000	IMO A.749(18)
perforacionE PIQUE PP	0%	127,309	0,000	124,204	0,000	-3,612	0,000	5,834	0,000	IMO A.749(18)
total	4,29%	1765,365	75,694	1731,239	75,694	75,117	0,000	3,269	0,000	
Fangos1BR	98%	2,419	2,371	2,880	2,822	44,400	-8,400	1,745	0,000	User Specified
Fangos1ER	98%	2,419	2,371	2,880	2,822	44,400	8,400	1,745	0,000	User Specified
LubricanteBR	10%	8,148	0,815	8,400	0,840	9,000	-8,000	5,675	0,000	User Specified
LubricanteER	10%	8,148	0,815	8,400	0,840	9,000	8,000	5,675	0,000	User Specified
Aceite1 BR	10%	18,158	1,816	18,720	1,872	44,400	-3,900	1,525	0,000	User Specified
Aceite1 ER	10%	18,158	1,816	18,720	1,872	44,400	3,900	1,525	0,000	User Specified

Aguas negras ER	75%	4,200	3,150	4,200	3,150	11,400	-8,500	6,813	0,100	Maximum
Aguas negrasBR	75%	4,200	3,150	4,200	3,150	11,400	8,500	6,813	0,000	User Specified
Aguas GrisesBR	75%	4,200	3,150	4,200	3,150	12,600	-8,500	6,812	0,000	User Specified
Aguas Grises BR	75%	4,200	3,150	4,200	3,150	12,600	8,500	6,812	0,000	User Specified
agua consumos1BR	10%	33,600	3,360	33,600	3,360	3,600	-7,000	5,675	0,000	User Specified
agua consumos1ER	10%	33,600	3,360	33,600	3,360	3,600	7,000	5,675	0,000	User Specified
AGUA TECNICA BR	10%	53,358	5,336	52,056	5,206	75,114	0,000	5,657	0,000	User Specified
total	17,79%	194,809	34,659	196,056	35,594	27,774	0,000	5,113	0,100	
Total Loadcase			7696,397	5402,152	2198,798	34,914	0,000	6,234	3499,857	
FS correction								0,455		
VCG fluid								6,689		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**

GZ m	-1,176	-1,131	-0,892	-0,437	0,000	0,437	0,892	1,131	1,176	0,939	0,541	0,062	-0,451	-0,9
Area under GZ curve from zero heel m.rad	0,5380	0,3350	0,1548	0,0374	0,0000	0,0374	0,1549	0,3346	0,5394	0,7276	0,8582	0,9116	0,8777	0,75
Displacement t	7697	7697	7697	7696	7696	7696	7696	7696	7696	7696	7696	7696	7696	7696
Draft at FP m	5,912	6,244	6,383	6,367	6,342	6,367	6,383	6,242	5,911	5,523	5,011	4,160	1,862	n/a
Draft at AP m	7,318	6,544	6,199	6,287	6,341	6,287	6,199	6,545	7,318	8,416	10,090	13,200	22,071	n/a
WL Length m	86,563	86,522	86,487	86,491	85,516	86,491	86,487	86,523	86,563	86,557	86,491	86,358	86,144	85,8
Beam max extents on WL m	19,128	22,451	20,966	20,570	20,261	20,570	20,966	22,451	19,128	16,220	14,396	13,287	12,687	12,4
Wetted Area m^2	2416,548	2358,292	2252,825	2186,552	2192,103	2186,552	2252,771	2358,299	2416,452	2441,451	2455,767	2465,990	2474,236	247
Waterpl. Area m^2	1128,709	1281,831	1386,328	1440,743	1429,924	1440,743	1386,340	1281,797	1128,714	994,245	908,514	856,519	828,100	814,
Prismatic coeff. (Cp)	0,696	0,711	0,701	0,691	0,696	0,691	0,701	0,711	0,696	0,687	0,680	0,674	0,669	0,66
Block coeff. (Cb)	0,408	0,388	0,474	0,561	0,683	0,561	0,474	0,388	0,408	0,445	0,479	0,510	0,538	0,52
LCB from zero pt. (+ve fwd) m	34,863	34,907	34,923	34,918	34,914	34,918	34,922	34,903	34,862	34,819	34,779	34,748	34,728	34,7
LCF from zero pt. (+ve fwd) m	39,067	36,943	33,689	31,764	31,335	31,764	33,689	36,943	39,067	40,346	41,308	42,022	42,457	42,4
Max deck inclination deg	40,0066	30,0006	20,0004	10,0002	0,0012	10,0002	20,0004	30,0006	40,0066	50,0138	60,0177	70,0166	80,0103	90,0
Trim angle (+ve by stern) deg	1,0392	0,2214	-0,1359	-0,0589	-0,0012	-0,0589	-0,1355	0,2242	1,0400	2,1379	3,7498	6,6532	14,6150	90,0

Key point	**Type**	**Immersion angle deg**	**Emergence angle deg**
Margin Line (immersion pos = 39,072 m)		15,6	n/a

Deck Edge (immersion pos = 39,245 m)		16	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	60,6	0

Code	Criteria	Value	Units	Actual	Status	Margin %
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	22,2	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0550	m.rad	0,4830	Pass	+778,25
2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,2048	Pass	+582,81
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	1,190	Pass	+495,00
2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	37,3	Pass	+148,49
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	2,462	Pass	+1541,33
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	0,0	Pass	+100,00
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	0,00	Pass	+100,00
	Area1 / Area2 shall not be less than (>=)	100,00	%	381,70	Pass	+281,70

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - plena carga en cubierta 10 consumos

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified
pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	0,200	0,200			46,000	0,000	15,000	0,000	User Specified
total			4856,950			44,045	0,000	7,036	0,000	

Carga cubierta	1	2000,000	2000,000			22,500	0,000	10,200	0,000	User Specified
Agua Suministro1BR	100%	42,000	42,000	42,000	42,000	3,600	-2,500	7,250	0,000	User Specified
Agua Suministro1ER	100%	42,000	42,000	42,000	42,000	3,600	2,500	7,250	0,000	User Specified
Agua Suministro2BR	0%	88,200	0,000	88,200	0,000	13,800	-3,500	5,500	0,000	IMO A.749(18)
Agua Suministro2ER	0%	88,200	0,000	88,200	0,000	13,800	3,500	5,500	0,000	IMO A.749(18)
Agua suministro 3 BR	0%	113,400	0,000	113,400	0,000	6,600	-4,500	5,500	0,000	Maximum
Agua suministro 3 ER	0%	113,400	0,000	113,400	0,000	6,600	4,500	5,500	0,000	Maximum
Agua suministro 4 BR	0%	88,200	0,000	88,200	0,000	10,200	-3,500	5,500	0,000	Maximum
Agua suministro 4ER	0%	88,200	0,000	88,200	0,000	10,200	3,500	5,500	0,000	Maximum
Brine 1BR	100%	72,480	72,480	48,320	48,320	3,671	-4,461	4,369	0,000	User Specified
BRINE 1ER	100%	72,480	72,480	48,320	48,320	3,671	4,461	4,369	0,000	User Specified
BRINE 2BR	0%	25,200	0,000	16,800	0,000	13,200	-7,500	5,500	0,600	User Specified
BRINE 2ER	0%	25,200	0,000	16,800	0,000	13,200	7,500	5,500	0,600	User Specified
BRINE 3BR	0%	12,600	0,000	8,400	0,000	14,400	-8,500	5,500	0,000	User Specified
BRINE 3ER	0%	12,600	0,000	8,400	0,000	14,400	8,500	5,500	0,000	User Specified
Brine	0%	120,000	0,000	80,000	0,000	21,400	-8,000	1,500	0,000	User Specified
brine	0%	120,000	0,000	80,000	0,000	21,400	8,000	1,500	0,000	User Specified
c1	0%	272,443	0,000	146,475	0,000	18,850	3,000	1,500	0,000	Maximum
c2	0%	272,977	0,000	146,762	0,000	24,349	3,000	1,500	0,000	Maximum

c3	0%	272,443	0,000	146,475	0,000	18,850	-3,000	1,500	0,000	Maximum
c4	0%	272,977	0,000	146,762	0,000	24,349	-3,000	1,500	0,000	Maximum
Agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	-0,226	0,017	0,000	Maximum
agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	0,226	0,017	0,000	Maximum
Lodo1	0%	475,174	0,000	158,391	0,000	11,811	-4,478	1,500	0,000	Maximum
lodo 1	0%	475,174	0,000	158,391	0,000	11,811	4,478	1,500	0,000	Maximum
total			2228,960			20,563	0,000	9,710	1,200	
DO 1BR	0%	72,576	0,000	86,400	0,000	30,000	-4,500	1,500	0,000	Maximum
DO 1ER	0%	72,576	0,000	86,400	0,000	30,000	4,500	1,500	0,000	IMO A.749(18)
DO 2 BR	0%	72,576	0,000	86,400	0,000	32,400	-4,500	1,500	0,000	Maximum
DO 2ER	0%	72,576	0,000	86,400	0,000	32,400	4,500	1,500	0,000	Maximum
DO 3 BR	0%	72,576	0,000	86,400	0,000	34,800	-4,500	1,500	0,000	Maximum
DO 3ER	0%	72,576	0,000	86,400	0,000	34,800	4,500	1,500	0,000	Maximum
DO 4BR	0%	77,616	0,000	92,400	0,000	22,200	-8,000	5,500	0,000	User Specified
DO 4ER	0%	77,616	0,000	92,400	0,000	22,200	8,000	5,500	0,000	User Specified
DO 5 BR	0%	63,504	0,000	75,600	0,000	30,000	-4,500	5,500	0,000	IMO A.749(18)
DO 5ER	0%	63,504	0,000	75,600	0,000	30,000	4,500	5,500	0,000	IMO A.749(18)
DO 6BR	0%	42,336	0,000	50,400	0,000	32,400	-3,000	5,500	0,000	User Specified

DO 6ER	0%	42,336	0,000	50,400	0,000	32,400	3,000	5,500	0,000	User Specified
UD BR	98%	42,336	41,489	50,400	49,392	34,800	-3,000	7,215	0,000	User Specified
UD ER	98%	42,336	41,489	50,400	49,392	34,800	3,000	7,215	0,000	User Specified
SED BR	8%	42,336	3,387	50,400	4,032	33,600	-7,500	5,640	0,000	User Specified
SED ER	8%	42,336	3,387	50,400	4,032	33,600	7,500	5,640	0,000	User Specified
total	9,24%	971,712	89,752	1156,800	106,848	34,709	0,000	7,096	0,000	
Lastre 1 BR	0%	103,655	0,000	101,127	0,000	35,949	-0,139	0,004	0,000	Maximum
Lastre 1 eR	0%	103,655	0,000	101,127	0,000	35,949	0,139	0,004	0,000	Maximum
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	Maximum
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	Maximum
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	Maximum
Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	Maximum
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	0%	61,148	0,000	59,656	0,000	32,355	-9,523	1,500	0,000	User Specified
Lastre 6 ER	0%	61,148	0,000	59,656	0,000	32,355	9,523	1,500	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified
Lastre 4 ER	0%	70,665	0,000	68,941	0,000	12,411	9,404	1,500	0,000	User Specified

Lastre 7 BR	0%	38,852	0,000	37,905	0,000	4,766	-9,000	3,073	0,000	User Specified
Lastre 7ER	0%	38,852	0,000	37,905	0,000	4,766	9,000	3,073	0,000	User Specified
lastre PIQUE PROA	0%	75,694	0,000	75,694	0,000	73,224	0,000	0,317	0,000	Maximum
perforacionE PIQUE PP	100%	127,309	127,309	124,204	124,204	-4,617	0,000	7,752	0,000	Maximum
Agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	-4,472	3,793	0,000	IMO A.749(18)
agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	4,472	3,793	0,000	IMO A.749(18)
total	23,67%	1765,365	417,825	1731,239	414,720	3,717	0,000	4,999	0,000	
Fangos1BR	98%	2,419	2,371	2,880	2,822	44,400	-8,400	1,745	0,000	User Specified
Fangos1ER	98%	2,419	2,371	2,880	2,822	44,400	8,400	1,745	0,000	User Specified
agua consumos1BR	10%	33,600	3,360	33,600	3,360	3,600	-7,000	5,675	0,000	User Specified
agua consumos1ER	10%	33,600	3,360	33,600	3,360	3,600	7,000	5,675	0,000	User Specified
LubricanteBR	10%	8,148	0,815	8,400	0,840	9,000	-8,000	5,675	0,000	User Specified
LubricanteER	10%	8,148	0,815	8,400	0,840	9,000	8,000	5,675	0,000	User Specified
Aguas negras ER	75%	4,200	3,150	4,200	3,150	11,400	-8,500	6,813	0,100	Maximum
Aguas negrasBR	75%	4,200	3,150	4,200	3,150	11,400	8,500	6,813	0,000	User Specified
Aguas GrisesBR	75%	4,200	3,150	4,200	3,150	12,600	-8,500	6,813	0,000	User Specified
Aguas Grises BR	75%	4,200	3,150	4,200	3,150	12,600	8,500	6,813	0,000	User Specified
Aceite1 BR	10%	18,158	1,816	18,720	1,872	44,400	-3,900	1,525	0,000	User Specified

Aceite1 ER	10%	18,158	1,816	18,720	1,872	44,400	3,900	1,525	0,000	User Specified
AGUA TECNICA BR	10%	53,358	5,336	52,056	5,206	75,114	0,000	5,657	0,000	User Specified
Total	17,79%	194,809	34,659	196,056	35,594	27,774	0,000	5,113	0,100	
Total Loadcase			7628,145	5402,152	737,802	34,791	0,000	7,698	1,300	
FS correction								0,000		
VCG fluid								7,698		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**
GZ m	-0,543	-0,641	-0,556	-0,265	0,000	0,265	0,556	0,640	0,544	0,181	-0,321	-0,878	-1,440	-1,9
Area under GZ curve from zero heel m.rad	0,3081	0,2033	0,0954	0,0224	0,0000	0,0223	0,0955	0,2029	0,3095	0,3760	0,3649	0,2608	0,0583	-0,2
Displacement t	7629	7628	7628	7628	7628	7628	7628	7628	7628	7628	7628	7628	7628	7628
Draft at FP m	5,762	6,115	6,255	6,236	6,211	6,236	6,254	6,113	5,761	5,333	4,760	3,793	1,155	n/a
Draft at AP m	7,315	6,547	6,207	6,298	6,352	6,298	6,208	6,549	7,315	8,406	10,066	13,139	21,901	n/a

WL Length m	86,563	86,541	86,517	86,520	85,592	86,520	86,517	86,541	86,563	86,536	86,450	86,294	86,039	85,6
Beam max extents on WL m	19,144	22,414	20,961	20,570	20,261	20,570	20,961	22,414	19,144	16,224	14,398	13,288	12,688	12,4
Wetted Area m^2	2402,002	2345,772	2239,568	2176,363	2182,493	2176,364	2239,516	2345,787	2401,872	2426,446	2440,938	2451,094	2459,446	246
Waterpl. Area m^2	1129,724	1282,471	1389,402	1440,549	1430,740	1440,548	1389,413	1282,433	1129,731	994,863	908,688	855,974	826,664	811,
Prismatic coeff. (Cp)	0,697	0,713	0,699	0,690	0,694	0,690	0,699	0,713	0,697	0,688	0,681	0,675	0,670	0,66
Block coeff. (Cb)	0,405	0,387	0,472	0,559	0,683	0,559	0,472	0,387	0,405	0,442	0,476	0,507	0,536	0,51
LCB from zero pt. (+ve fwd) m	34,723	34,774	34,794	34,788	34,783	34,788	34,794	34,770	34,721	34,673	34,632	34,604	34,590	34,5
LCF from zero pt. (+ve fwd) m	39,072	36,907	33,666	31,747	31,319	31,747	33,666	36,907	39,072	40,352	41,303	41,991	42,389	42,3
Max deck inclination deg	40,0080	30,0012	20,0000	10,0001	0,1045	10,0001	20,0000	30,0012	40,0081	50,0156	60,0194	70,0177	80,0109	90,0
Trim angle (+ve by stern) deg	1,1473	0,3194	-0,0350	0,0459	0,1045	0,0458	-0,0346	0,3225	1,1490	2,2711	3,9165	6,8767	14,9861	90,0

Key point	**Type**	**Immersion angle deg**	**Emergence angle deg**
Margin Line (immersion pos = -5,198 m)		15,9	n/a
Deck Edge (immersion pos = 13,899 m)		16,3	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	61,2	0

Code	Criteria	Value	Units	Actual	Status	Margin %
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	20,1	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0550	m.rad	0,2029	Pass	+268,96
2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,1066	Pass	+255,26
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	0,640	Pass	+220,00
2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	30,0	Pass	+100,00
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	1,476	Pass	+884,00
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	0,0	Pass	+100,00
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	0,00	Pass	+100,00
	Area1 / Area2 shall not be less than (>=)	100,00	%	390,65	Pass	+290,65

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - 100 consumos sin carga

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified
pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	2,000	2,000			46,000	0,000	15,000	0,000	User Specified
TOTAL			4858,750			44,046	0,000	7,039	0,000	
carga en cubiert	0	2000,000	0,000			0,000	0,000	0,000	0,000	User Specified
Agua Suministro1BR	0%	42,000	0,000	42,000	0,000	3,600	-2,500	5,500	0,000	User Specified
Agua Suministro1ER	0%	42,000	0,000	42,000	0,000	3,600	2,500	5,500	0,000	User Specified

Agua Suministro2BR	0%	88,200	0,000	88,200	0,000	13,800	-3,500	5,500	0,000	IMO A.749(18)
Agua Suministro2ER	0%	88,200	0,000	88,200	0,000	13,800	3,500	5,500	0,000	IMO A.749(18)
Agua suministro 3 BR	0%	113,400	0,000	113,400	0,000	6,600	-4,500	5,500	0,000	IMO A.749(18)
Agua suministro 3 ER	0%	113,400	0,000	113,400	0,000	6,600	4,500	5,500	0,000	IMO A.749(18)
Agua suministro 4 BR	0%	88,200	0,000	88,200	0,000	10,200	-3,500	5,500	0,000	IMO A.749(18)
Agua suministro 4ER	0%	88,200	0,000	88,200	0,000	10,200	3,500	5,500	0,000	IMO A.749(18)
Brine 1BR	0%	72,480	0,000	48,320	0,000	4,766	-0,022	2,841	0,000	User Specified
BRINE 1ER	0%	72,480	0,000	48,320	0,000	4,766	0,022	2,841	0,000	User Specified
BRINE 2BR	0%	25,200	0,000	16,800	0,000	13,200	-7,500	5,500	0,000	User Specified
BRINE 2ER	0%	25,200	0,000	16,800	0,000	13,200	7,500	5,500	0,000	User Specified
BRINE 3BR	0%	12,600	0,000	8,400	0,000	14,400	-8,500	5,500	0,000	User Specified
BRINE 3ER	0%	12,600	0,000	8,400	0,000	14,400	8,500	5,500	0,000	User Specified
Brine	0%	120,000	0,000	80,000	0,000	21,400	-8,000	1,500	0,000	User Specified
brine	0%	120,000	0,000	80,000	0,000	21,400	8,000	1,500	0,000	User Specified
c1	0%	272,443	0,000	146,475	0,000	18,850	3,000	1,500	0,000	Maximum
c2	0%	272,977	0,000	146,762	0,000	24,349	3,000	1,500	0,000	Maximum
c3	0%	272,443	0,000	146,475	0,000	18,850	-3,000	1,500	0,000	Maximum
c4	0%	272,977	0,000	146,762	0,000	24,349	-3,000	1,500	0,000	Maximum
Agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	-0,226	0,017	0,000	Maximum

agua perforacion	0%	227,633	0,000	222,081	0,000	28,752	0,226	0,017	0,000	Maximum
Lodo1	100%	475,174	475,174	158,391	158,391	11,800	-4,500	3,500	0,000	Maximum
lodo 1	100%	475,174	475,174	158,391	158,391	11,800	4,500	3,500	0,000	Maximum
total			950,347			11,800	0,000	3,500	0,000	
DO 1BR	98%	72,576	71,124	86,400	84,672	30,000	-4,500	3,460	122,472	Maximum
DO 1ER	98%	72,576	71,124	86,400	84,672	30,000	4,500	3,460	122,472	Maximum
DO 2 BR	98%	72,576	71,124	86,400	84,672	32,400	-4,500	3,460	122,472	Maximum
DO 2ER	98%	72,576	71,124	86,400	84,672	32,400	4,500	3,460	122,472	Maximum
DO 3 BR	98%	72,576	71,124	86,400	84,672	34,800	-4,500	3,460	122,472	Maximum
DO 3ER	98%	72,576	71,124	86,400	84,672	34,800	4,500	3,460	122,472	Maximum
DO 4BR	98%	77,616	76,064	92,400	90,552	22,200	-8,000	7,215	0,000	User Specified
DO 4ER	98%	77,616	76,064	92,400	90,552	22,200	8,000	7,215	0,000	User Specified
DO 5 BR	98%	63,504	62,234	75,600	74,088	30,000	-4,500	7,215	0,000	IMO A.749(18)
DO 5ER	98%	63,504	62,234	75,600	74,088	30,000	4,500	7,215	0,000	IMO A.749(18)
DO 6BR	98%	42,336	41,489	50,400	49,392	32,400	-3,000	7,215	0,000	User Specified
DO 6ER	98%	42,336	41,489	50,400	49,392	32,400	3,000	7,215	0,000	User Specified
UD BR	97%	42,336	41,066	50,400	48,888	34,800	-3,000	7,198	0,000	User Specified
UD ER	97%	42,336	41,066	50,400	48,888	34,800	3,000	7,198	0,000	User Specified

SED BR	98%	42,336	41,489	50,400	49,392	33,600	-7,500	7,215	0,000	User Specified
SED ER	98%	42,336	41,489	50,400	49,392	33,600	7,500	7,215	0,000	User Specified
total	97,91%	971,712	951,431	1156,800	1132,656	30,767	0,000	5,529	734,832	
Agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	-4,472	3,793	0,000	IMO A.749(18)
agua perforacion	100%	145,258	145,258	145,258	145,258	7,370	4,472	3,793	0,000	IMO A.749(18)
Lastre 1 BR	0%	103,655	0,000	101,127	0,000	35,949	-0,139	0,004	0,000	IMO A.749(18)
Lastre 1 eR	0%	103,655	0,000	101,127	0,000	35,949	0,139	0,004	0,000	IMO A.749(18)
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	IMO A.749(18)
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	IMO A.749(18)
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	IMO A.749(18)
Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	IMO A.749(18)
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	0%	61,148	0,000	59,656	0,000	32,355	-9,523	1,500	0,000	User Specified
Lastre 6 ER	0%	61,148	0,000	59,656	0,000	32,355	9,523	1,500	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified
Lastre 4 ER	100%	70,665	70,665	68,941	68,941	9,651	9,541	5,617	0,000	User Specified
Lastre 7 BR	100%	38,852	38,852	37,905	37,905	1,084	-9,525	6,884	0,000	User Specified

Lastre 7ER	100%	38,852	38,852	37,905	37,905	1,084	9,525	6,884	0,000	User Specified
lastre PIQUE PROA	0%	75,694	0,000	75,694	0,000	73,224	0,000	0,317	0,000	IMO A.749(18)
perforacionE PIQUE PP	100%	127,309	127,309	124,204	124,204	-4,617	0,000	7,752	0,000	IMO A.749(18)
total	32,07%	1765,365	566,194	1731,239	559,470	4,096	1,191	5,335	0,000	
Fangos1BR	0%	2,419	0,000	2,880	0,000	44,400	-8,400	1,500	0,000	User Specified
Fangos1ER	0%	2,419	0,000	2,880	0,000	44,400	8,400	1,500	0,000	User Specified
LubricanteBR	100%	8,148	8,148	8,400	8,400	9,000	-8,000	7,250	0,000	User Specified
LubricanteER	100%	8,148	8,148	8,400	8,400	9,000	8,000	7,250	0,000	User Specified
agua consumos1BR	100%	33,600	33,600	33,600	33,600	3,600	-7,000	7,250	0,000	User Specified
agua consumos1ER	100%	33,600	33,600	33,600	33,600	3,600	7,000	7,250	0,000	User Specified
Aguas negras ER	0%	4,200	0,000	4,200	0,000	11,400	-8,500	5,500	0,000	Maximum
Aguas negrasBR	0%	4,200	0,000	4,200	0,000	11,400	8,500	5,500	0,000	User Specified
Aguas GrisesBR	0%	4,200	0,000	4,200	0,000	12,600	-8,500	5,500	0,000	User Specified
Aguas Grises BR	0%	4,200	0,000	4,200	0,000	12,600	8,500	5,500	0,000	User Specified
Aceite1 BR	100%	18,158	18,158	18,720	18,720	44,400	-3,900	1,750	0,000	User Specified
Aceite1 ER	100%	18,158	18,158	18,720	18,720	44,400	3,900	1,750	0,000	User Specified
AGUA TECNICA BR	100%	53,358	53,358	52,056	52,056	74,908	0,000	7,300	0,000	User Specified
total	88,89%	194,809	173,170	196,056	173,496	34,636	0,000	6,112	0,000	

Total Loadcase			7499,893	5402,152	2182,405	35,042	0,090	6,249	734,832	
FS correction								0,098		
VCG fluid								6,347		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**
GZ m	-1,540	-1,445	-1,123	-0,591	-0,090	0,414	0,955	1,289	1,403	1,214	0,852	0,397	-0,103	-0,6
Area under GZ curve from zero heel m.rad	0,7000	0,4375	0,2094	0,0586	-0,0029	0,0274	0,1480	0,3472	0,5860	0,8181	1,0002	1,1102	1,1362	1,07
Displacement t	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7499	7500	7500	749
Draft at FP m	5,866	6,183	6,289	6,256	6,227	6,256	6,289	6,182	5,867	5,481	4,966	4,102	1,749	n/a
Draft at AP m	6,917	6,270	6,013	6,134	6,193	6,134	6,013	6,271	6,916	7,837	9,238	11,841	19,263	n/a
WL Length m	86,560	86,530	86,508	86,515	85,180	86,515	86,508	86,530	86,560	86,547	86,476	86,338	86,119	85,7
Beam max extents on WL m	19,162	22,372	20,956	20,570	20,261	20,570	20,956	22,371	19,162	16,230	14,400	13,289	12,688	12,4
Wetted Area m^2	2370,888	2317,638	2209,377	2158,815	2162,463	2158,815	2209,341	2317,624	2370,838	2395,155	2409,463	2419,729	2428,113	243
Waterpl. Area m^2	1131,059	1289,032	1402,611	1434,269	1422,065	1434,266	1402,621	1289,009	1131,061	995,317	909,145	856,896	828,316	813,
Prismatic coeff. (Cp)	0,694	0,710	0,698	0,688	0,696	0,688	0,698	0,710	0,694	0,685	0,678	0,672	0,666	0,66

Block coeff. (Cb)	0,406	0,386	0,469	0,556	0,682	0,556	0,469	0,386	0,406	0,444	0,479	0,511	0,542	0,52
LCB from zero pt. (+ve fwd) m	35,005	35,042	35,053	35,047	35,043	35,047	35,053	35,040	35,006	34,968	34,932	34,903	34,881	34,8
LCF from zero pt. (+ve fwd) m	39,070	36,844	33,549	31,877	31,524	31,877	33,549	36,844	39,070	40,355	41,313	42,019	42,443	42,3
Max deck inclination deg	40,0037	30,0000	20,0009	10,0004	0,0255	10,0004	20,0009	30,0000	40,0037	50,0092	60,0126	70,0122	80,0078	90,0
Trim angle (+ve by stern) deg	0,7769	0,0640	-0,2043	-0,0901	-0,0255	-0,0903	-0,2041	0,0660	0,7759	1,7408	3,1550	5,7022	12,7339	90,0

Key point	**Type**	**Immersion angle deg**	**Emergence angle deg**
Margin Line (immersion pos = 41,155 m)		16,3	n/a
Deck Edge (immersion pos = 42,023 m)		16,7	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	62,1	0

Code	**Criteria**	**Value**	**Units**	**Actual**	**Status**	**Margin %**
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	22,2	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0550	m.rad	0,5637	Pass	+924,94

2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,2388	Pass	+696,05
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	1,405	Pass	+602,50
2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	39,1	Pass	+160,61
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	2,835	Pass	+1790,00
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	1,9	Pass	+88,37
	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	11,13	Pass	+86,09
	Area1 / Area2 shall not be less than (>=)	100,00	%	375,45	Pass	+275,45

Stability Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Loadcase - CONDICION INTERMADIA

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Free to Trim

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Fluid analysis method: Use corrected VCG

Item Name	Quantity	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	4793,000	4793,000			44,000	0,000	7,000	0,000	User Specified
tripulacion	30	0,125	3,750			50,000	0,000	17,500	0,000	User Specified
pertrechos	1	60,000	60,000			47,300	0,000	9,270	0,000	User Specified
VIVERES	1	1,000	1,000			46,000	0,000	15,000	0,000	User Specified
TOTAL			4857,750			44,046	0,000	7,038	0,000	
Carga en cubierta	1	1000,000	1000,000			22,500	0,000	10,200	0,000	User Specified
total			1000,000			22,500	0,000	10,200	0,000	
Agua Suministro1BR	0%	42,000	0,000	42,000	0,000	3,600	-2,500	5,500	0,000	User Specified
Agua Suministro1ER	0%	42,000	0,000	42,000	0,000	3,600	2,500	5,500	0,000	User Specified
Agua Suministro2BR	50%	88,200	44,100	88,200	44,100	13,800	-3,500	6,375	102,900	Maximum
Agua Suministro2ER	50%	88,200	44,100	88,200	44,100	13,800	3,500	6,375	102,900	Maximum
Agua suministro 3 BR	100%	113,400	113,400	113,400	113,400	6,600	-4,500	7,250	0,000	Maximum
Agua suministro 3 ER	100%	113,400	113,400	113,400	113,400	6,600	4,500	7,250	0,000	Maximum
Agua suministro 4 BR	0%	88,200	0,000	88,200	0,000	10,200	-3,500	5,500	0,000	Maximum

Agua suministro 4ER	0%	88,200	0,000	88,200	0,000	10,200	3,500	5,500	0,000	Maximum
Brine 1BR	0%	72,480	0,000	48,320	0,000	4,766	-0,022	2,841	0,000	User Specified
BRINE 1ER	0%	72,480	0,000	48,320	0,000	4,766	0,022	2,841	0,000	User Specified
BRINE 2BR	0%	25,200	0,000	16,800	0,000	13,200	-7,500	5,500	0,000	User Specified
BRINE 2ER	0%	25,200	0,000	16,800	0,000	13,200	7,500	5,500	0,000	User Specified
BRINE 3BR	0%	12,600	0,000	8,400	0,000	14,400	-8,500	5,500	0,000	User Specified
BRINE 3ER	0%	12,600	0,000	8,400	0,000	14,400	8,500	5,500	0,000	User Specified
Brine	100%	120,000	120,000	80,000	80,000	21,400	-8,000	3,500	0,000	User Specified
brine	100%	120,000	120,000	80,000	80,000	21,400	8,000	3,500	0,000	User Specified
c1	0%	272,443	0,000	146,475	0,000	18,850	3,000	1,500	0,000	Maximum
c2	100%	272,977	272,977	146,762	146,762	24,349	3,000	5,250	0,000	Maximum
c3	0%	272,443	0,000	146,475	0,000	18,850	-3,000	1,500	0,000	Maximum
c4	100%	272,977	272,977	146,762	146,762	24,349	-3,000	5,250	0,000	Maximum
Agua perforacion	50%	227,633	113,816	222,081	111,040	21,458	-4,575	0,518	1635,787	Maximum
agua perforacion	50%	227,633	113,816	222,081	111,040	21,458	4,575	0,518	1635,787	Maximum
Lodo1	50%	475,174	237,587	158,391	79,196	11,800	-4,500	2,500	801,900	Maximum
lodo 1	50%	475,174	237,587	158,391	79,196	11,800	4,500	2,500	801,900	Maximum
TOTAL	49,82%	3620,612	1803,761	2318,056	1148,996	17,539	0,000	4,002	5081,173	

DO 1BR	0%	72,576	0,000	86,400	0,000	30,000	-4,500	1,500	0,000	Maximum
DO 1ER	0%	72,576	0,000	86,400	0,000	30,000	4,500	1,500	0,000	Maximum
DO 2 BR	0%	72,576	0,000	86,400	0,000	32,400	-4,500	1,500	0,000	Maximum
DO 2ER	0%	72,576	0,000	86,400	0,000	32,400	4,500	1,500	0,000	Maximum
DO 3 BR	0%	72,576	0,000	86,400	0,000	34,800	-4,500	1,500	0,000	Maximum
DO 3ER	0%	72,576	0,000	86,400	0,000	34,800	4,500	1,500	0,000	Maximum
DO 4BR	98%	77,616	76,064	92,400	90,552	22,200	-8,000	7,215	0,000	User Specified
DO 4ER	98%	77,616	76,064	92,400	90,552	22,200	8,000	7,215	0,000	User Specified
DO 5 BR	50%	63,504	31,752	75,600	37,800	30,000	-4,500	6,375	122,472	Maximum
DO 5ER	50%	63,504	31,752	75,600	37,800	30,000	4,500	6,375	122,472	Maximum
DO 6BR	98%	42,336	41,489	50,400	49,392	32,400	-3,000	7,215	0,000	User Specified
DO 6ER	98%	42,336	41,489	50,400	49,392	32,400	3,000	7,215	0,000	User Specified
UD BR	98%	42,336	41,489	50,400	49,392	34,800	-3,000	7,215	0,000	User Specified
UD ER	98%	42,336	41,489	50,400	49,392	34,800	3,000	7,215	0,000	User Specified
SED BR	98%	42,336	41,489	50,400	49,392	33,600	-7,500	7,215	0,000	User Specified
SED ER	98%	42,336	41,489	50,400	49,392	33,600	7,500	7,215	0,000	User Specified
TOTAL	47,81%	971,712	464,567	1156,800	553,056	29,375	0,000	7,100	244,944	
Agua perforacion	0%	145,258	0,000	145,258	0,000	9,451	-3,646	1,500	0,000	User Specified

agua perforacion	0%	145,258	0,000	145,258	0,000	9,451	3,646	1,500	0,000	User Specified
Lastre 1 BR	0%	103,655	0,000	101,127	0,000	35,949	-0,139	0,004	0,000	Maximum
Lastre 1 eR	0%	103,655	0,000	101,127	0,000	35,949	0,139	0,004	0,000	Maximum
Lastre 2 BR	0%	117,488	0,000	114,622	0,000	43,575	-0,032	0,000	0,000	Maximum
Lastre 2 ER	0%	117,488	0,000	114,622	0,000	43,575	0,032	0,000	0,000	Maximum
Lastre 3 BR	0%	116,379	0,000	113,541	0,000	44,645	-0,021	0,000	0,000	Maximum
Lastre 3 ER	0%	116,379	0,000	113,541	0,000	44,645	0,021	0,000	0,000	Maximum
Lastre 5 BR	0%	127,737	0,000	124,622	0,000	21,467	-9,533	1,500	0,000	User Specified
Lastre 5 ER	0%	127,737	0,000	124,622	0,000	21,467	9,533	1,500	0,000	User Specified
Lastre 6 BR	100%	61,148	61,148	59,656	59,656	32,373	-9,553	5,270	0,000	User Specified
Lastre 6 ER	100%	61,148	61,148	59,656	59,656	32,373	9,553	5,270	0,000	User Specified
Lastre 4 BR	0%	70,665	0,000	68,941	0,000	12,411	-9,404	1,500	0,000	User Specified
Lastre 4 ER	0%	70,665	0,000	68,941	0,000	12,411	9,404	1,500	0,000	User Specified
Lastre 7 BR	0%	38,852	0,000	37,905	0,000	4,766	-9,000	3,073	0,000	User Specified
Lastre 7ER	0%	38,852	0,000	37,905	0,000	4,766	9,000	3,073	0,000	User Specified
lastre PIQUE PROA	100%	75,694	75,694	75,694	75,694	75,117	0,000	3,269	0,000	Maximum
perforacionE PIQUE PP	100%	127,309	127,309	124,204	124,204	-4,617	0,000	7,752	0,000	Maximum
TOTAL	18,43%	1765,365	325,298	1731,239	319,210	27,843	0,000	5,776	0,000	

Fangos1BR	50%	2,419	1,210	2,880	1,440	44,400	-8,400	1,625	0,000	User Specified
Fangos1ER	50%	2,419	1,210	2,880	1,440	44,400	8,400	1,625	0,000	User Specified
agua consumos1BR	50%	33,600	16,800	33,600	16,800	3,600	-7,000	6,375	0,000	User Specified
agua consumos1ER	50%	33,600	16,800	33,600	16,800	3,600	7,000	6,375	0,000	User Specified
LubricanteBR	50%	8,148	4,074	8,400	4,200	9,000	-8,000	6,375	0,000	User Specified
LubricanteER	50%	8,148	4,074	8,400	4,200	9,000	8,000	6,375	0,000	User Specified
Aguas negras ER	50%	4,200	2,100	4,200	2,100	11,400	-8,500	6,375	0,100	Maximum
Aguas negrasBR	50%	4,200	2,100	4,200	2,100	11,400	8,500	6,375	0,000	User Specified
Aguas GrisesBR	50%	4,200	2,100	4,200	2,100	12,600	-8,500	6,375	0,000	User Specified
Aguas Grises BR	50%	4,200	2,100	4,200	2,100	12,600	8,500	6,375	0,000	User Specified
Aceite1 BR	50%	18,158	9,079	18,720	9,360	44,400	-3,900	1,625	0,000	User Specified
Aceite1 ER	50%	18,158	9,079	18,720	9,360	44,400	3,900	1,625	0,000	User Specified
AGUA TECNICA BR	50%	53,358	26,679	52,056	26,028	75,003	0,000	6,341	0,000	User Specified
Total Loadcase			8548,780	5402,152	2119,290	34,392	0,000	6,703	5326,217	
FS correction								0,623		
VCG fluid								7,326		

Heel to Starboard deg	**-40,0**	**-30,0**	**-20,0**	**-10,0**	**0,0**	**10,0**	**20,0**	**30,0**	**40,0**	**50,0**	**60,0**	**70,0**	**80,0**	**90,0**
GZ m	-0,418	-0,525	-0,518	-0,305	0,000	0,305	0,518	0,524	0,417	0,123	-0,285	-0,739	-1,198	-1,6
Area under GZ curve from zero heel m.rad	0,2779	0,1950	0,1013	0,0271	0,0000	0,0271	0,1014	0,1946	0,2788	0,3285	0,3154	0,2264	0,0571	-0,1
Displacement t	8549	8549	8549	8549	8549	8549	8549	8549	8549	8548	8549	8549	8549	8548
Draft at FP m	6,078	6,464	6,758	6,834	6,840	6,833	6,754	6,459	6,075	5,679	5,180	4,383	2,305	n/a
Draft at AP m	9,101	7,810	7,076	6,946	6,969	6,947	7,080	7,814	9,104	10,969	13,827	19,141	34,314	n/a
WL Length m	86,589	86,493	86,339	86,351	86,228	86,351	86,341	86,494	86,590	86,620	86,583	86,472	86,281	85,9
Beam max extents on WL m	18,920	21,963	21,002	20,569	20,260	20,569	21,002	21,965	18,920	16,159	14,369	13,273	12,679	12,4
Wetted Area m^2	2612,164	2539,956	2446,769	2301,670	2309,749	2301,665	2446,867	2540,065	2612,198	2642,021	2656,940	2666,671	2674,564	2678
Waterpl. Area m^2	1111,425	1228,288	1306,963	1464,454	1451,219	1464,458	1306,820	1228,199	1111,427	987,666	904,805	854,185	826,452	813,
Prismatic coeff. (Cp)	0,704	0,716	0,712	0,703	0,702	0,703	0,712	0,716	0,704	0,696	0,690	0,685	0,681	0,67
Block coeff. (Cb)	0,418	0,406	0,489	0,579	0,691	0,579	0,489	0,406	0,418	0,448	0,476	0,502	0,511	0,49
LCB from zero pt. (+ve fwd) m	34,279	34,336	34,385	34,388	34,386	34,387	34,378	34,329	34,275	34,222	34,176	34,145	34,133	34,1
LCF from zero pt. (+ve fwd) m	39,110	37,527	34,452	31,377	30,790	31,377	34,454	37,528	39,110	40,321	41,297	42,051	42,535	42,5
Max deck inclination deg	40,0305	30,0112	20,0012	10,0003	0,0955	10,0003	20,0012	30,0114	40,0306	50,0462	60,0513	70,0441	80,0259	90,0
Trim angle (+ve by stern) deg	2,2342	0,9950	0,2350	0,0834	0,0955	0,0837	0,2405	1,0016	2,2381	3,9050	6,3666	10,7813	22,4421	90,0

Key point	Type	Immersion angle deg	Emergence angle deg
Margin Line (immersion pos = -5,719 m)		11,9	n/a
Deck Edge (immersion pos = -5,719 m)		12,3	n/a
DF point	Downflooding point	Not immersed in positive range	0
DF point	Downflooding point	54,7	0

Code	Criteria	Value	Units	Actual	Status	Margin %
267(85) Ch2 - General Criteria	2.3: IMO roll back angle	21,4	deg			
2.4 Offshore supply vessels	2.4.5.2.1: GZ area between 0 and angle of maximum GZ	0,0605	m.rad	0,1437	Pass	+137,64
2.4 Offshore supply vessels	2.4.5.2.2: Area 30 to 40	0,0300	m.rad	0,0842	Pass	+180,69
2.4 Offshore supply vessels	2.4.5.2.3: Maximum GZ at 30 or greater	0,200	m	0,524	Pass	+162,00
2.4 Offshore supply vessels	2.4.5.2.4: Angle of maximum GZ	15,0	deg	24,5	Pass	+63,63
2.4 Offshore supply vessels	2.4.5.2.5: Initial GMt	0,150	m	1,701	Pass	+1034,00
267(85) Ch2 - General Criteria	2.3: Severe wind and rolling				Pass	
	Angle of steady heel shall not be greater than (<=)	16,0	deg	0,0	Pass	+100,00

	Angle of steady heel / Deck edge immersion angle shall not be greater than (<=)	80,00	%	0,00	Pass	+100,00
	Area1 / Area2 shall not be less than (>=)	100,00	%	287,94	Pass	+187,94

Hydrostatics - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Fixed Trim = 0 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Draft Amidships m	**6,500**	**6,671**	**6,843**	**7,014**	**7,186**	**7,357**	**7,529**	**7,700**
Displacement t	7930	8183	8438	8693	8947	9202	9458	9716
Heel deg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Draft at FP m	6,500	6,671	6,843	7,014	7,186	7,357	7,529	7,700
Draft at AP m	6,500	6,671	6,843	7,014	7,186	7,357	7,529	7,700

Draft at LCF m	6,500	6,671	6,843	7,014	7,186	7,357	7,529	7,700
Trim (+ve by stern) m	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
WL Length m	85,847	86,175	86,222	86,036	85,335	83,020	83,081	83,141
Beam max extents on WL m	20,261	20,260	20,260	20,260	20,260	20,260	20,262	20,264
Wetted Area m^2	2226,843	2264,149	2298,763	2329,509	2361,071	2391,257	2421,674	2452,051
Waterpl. Area m^2	1438,016	1446,681	1450,231	1450,665	1450,163	1453,598	1459,931	1466,112
Prismatic coeff. (Cp)	0,697	0,698	0,701	0,706	0,714	0,737	0,740	0,742
Block coeff. (Cb)	0,684	0,685	0,689	0,694	0,703	0,726	0,728	0,731
Max Sect. area coeff. (Cm)	0,984	0,985	0,985	0,986	0,986	0,986	0,987	0,987
Waterpl. area coeff. (Cwp)	0,827	0,829	0,830	0,832	0,839	0,864	0,867	0,870
LCB from zero pt. (+ve fwd) m	34,804	34,688	34,571	34,460	34,353	34,251	34,158	34,072
LCF from zero pt. (+ve fwd) m	31,134	30,911	30,802	30,747	30,676	30,725	30,854	30,985
KB m	3,550	3,645	3,738	3,832	3,925	4,018	4,111	4,203
KG m	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700
BMt m	5,565	5,440	5,308	5,172	5,041	4,925	4,822	4,724
BML m	86,192	84,729	82,490	79,845	77,138	75,362	74,144	72,957
GMt m	1,415	1,385	1,346	1,304	1,266	1,243	1,233	1,227
GML m	82,043	80,673	78,529	75,977	73,363	71,680	70,554	69,461
KMt m	9,115	9,085	9,046	9,004	8,966	8,943	8,933	8,927

KML m	89,743	88,373	86,229	83,677	81,063	79,380	78,254	77,161
Immersion (TPc) tonne/cm	14,740	14,828	14,865	14,869	14,864	14,899	14,964	15,028
MTc tonne.m	83,944	85,181	85,497	85,218	84,699	85,114	86,108	87,077
RM at 1deg = GMt.Disp.sin(1) tonne.m	195,832	197,771	198,206	197,771	197,739	199,569	203,508	208,084
Max deck inclination deg	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Trim angle (+ve by stern) deg	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

KN Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Initial Trim = 0 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

VCG = 0 m; TCG = 0 m

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 10,0 deg. Starb.	KN 20,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 de Starb.
5096	4,500	0,000	36,140	0,000	0,000	1,787	3,599	5,224	6,258	6,848	7,027
5722	4,957	0,000	35,843	0,000	0,000	1,715	3,461	5,071	6,113	6,690	6,879
6362	5,414	0,000	35,539	0,000	0,000	1,663	3,357	4,893	5,934	6,506	6,715
7014	5,871	0,000	35,232	0,000	0,000	1,626	3,277	4,694	5,724	6,300	6,536
7678	6,329	0,000	34,921	0,000	0,000	1,599	3,182	4,482	5,487	6,074	6,344
8353	6,786	0,000	34,609	0,000	0,000	1,581	3,066	4,267	5,227	5,831	6,139
9032	7,243	0,000	34,318	0,000	0,000	1,569	2,931	4,050	4,955	5,576	5,928
9716	7,700	0,000	34,072	0,000	0,000	1,552	2,781	3,835	4,685	5,317	5,714

Hydrostatics - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Fixed Trim = 0 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Draft Amidships m	**4,500**	**4,957**	**5,414**	**5,871**	**6,329**	**6,786**	**7,243**	**7,700**
Displacement t	5096	5722	6362	7014	7678	8353	9032	9716
Heel deg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Draft at FP m	4,500	4,957	5,414	5,871	6,329	6,786	7,243	7,700
Draft at AP m	4,500	4,957	5,414	5,871	6,329	6,786	7,243	7,700
Draft at LCF m	4,500	4,957	5,414	5,871	6,329	6,786	7,243	7,700
Trim (+ve by stern) m	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
WL Length m	82,027	82,196	83,247	84,429	85,491	86,337	82,987	83,141
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,260	20,260	20,264
Wetted Area m^2	1793,342	1890,844	1990,527	2089,466	2189,299	2288,570	2371,069	2452,051
Waterpl. Area m^2	1323,088	1350,998	1378,566	1404,509	1429,283	1449,883	1450,387	1466,112
Prismatic coeff. (Cp)	0,683	0,693	0,695	0,695	0,696	0,699	0,736	0,742
Block coeff. (Cb)	0,665	0,676	0,680	0,681	0,683	0,687	0,724	0,731
Max Sect. area coeff. (Cm)	0,977	0,980	0,981	0,983	0,984	0,985	0,986	0,987

Waterpl. area coeff. (Cwp)	0,796	0,811	0,817	0,821	0,825	0,829	0,863	0,870
LCB from zero pt. (+ve fwd) m	36,140	35,843	35,539	35,232	34,921	34,609	34,318	34,072
LCF from zero pt. (+ve fwd) m	33,725	33,127	32,520	31,936	31,350	30,819	30,667	30,985
KB m	2,459	2,707	2,956	3,206	3,457	3,707	3,956	4,203
KG m	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700
BMt m	7,749	7,089	6,545	6,086	5,697	5,354	4,999	4,724
BML m	108,307	101,893	96,604	91,911	87,713	83,362	76,378	72,957
GMt m	2,508	2,097	1,801	1,593	1,454	1,361	1,255	1,227
GML m	103,065	96,900	91,860	87,417	83,469	79,369	72,634	69,461
KMt m	10,208	9,797	9,501	9,293	9,154	9,061	8,955	8,927
KML m	110,765	104,600	99,560	95,117	91,169	87,069	80,334	77,161
Immersion (TPc) tonne/cm	13,562	13,848	14,130	14,396	14,650	14,861	14,866	15,028
MTc tonne.m	67,766	71,547	75,406	79,113	82,690	85,543	84,653	87,077
RM at 1deg = GMt.Disp.sin(1) tonne.m	223,003	209,378	200,015	194,963	194,802	198,390	197,838	208,084
Max deck inclination deg	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Trim angle (+ve by stern) deg	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

Hydrostatics - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Fixed Trim = 1,163 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Draft Amidships m	**4,500**	**4,957**	**5,414**	**5,871**	**6,329**	**6,786**	**7,243**	**7,700**
Displacement t	5208	5850	6504	7172	7849	8530	9211	9893
Heel deg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Draft at FP m	3,919	4,376	4,833	5,290	5,747	6,204	6,662	7,119
Draft at AP m	5,081	5,538	5,996	6,453	6,910	7,367	7,824	8,281
Draft at LCF m	4,588	5,055	5,521	5,986	6,447	6,905	7,362	7,820
Trim (+ve by stern) m	1,163	1,163	1,163	1,163	1,163	1,163	1,163	1,163
WL Length m	82,171	83,512	84,787	85,993	86,511	86,490	86,363	85,908

Beam max extents on WL m	20,261	20,261	20,261	20,261	20,260	20,260	20,266	20,266
Wetted Area m^2	1821,008	1921,051	2021,078	2120,933	2210,944	2291,703	2373,044	2455,434
Waterpl. Area m^2	1353,771	1383,329	1411,503	1437,342	1450,652	1453,843	1455,378	1456,083
Prismatic coeff. (Cp)	0,661	0,665	0,668	0,671	0,678	0,688	0,698	0,710
Block coeff. (Cb)	0,648	0,652	0,657	0,660	0,668	0,679	0,689	0,701
Max Sect. area coeff. (Cm)	0,980	0,981	0,983	0,984	0,985	0,986	0,987	0,988
Waterpl. area coeff. (Cwp)	0,813	0,818	0,822	0,825	0,828	0,830	0,832	0,836
LCB from zero pt. (+ve fwd) m	34,435	34,227	33,998	33,755	33,510	33,297	33,113	32,952
LCF from zero pt. (+ve fwd) m	32,852	32,245	31,652	31,101	30,850	30,827	30,801	30,740
KB m	2,516	2,769	3,023	3,277	3,531	3,782	4,030	4,275
KG m	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700
BMt m	7,792	7,123	6,574	6,107	5,670	5,258	4,897	4,599
BML m	112,959	106,582	101,134	96,189	89,825	82,765	76,399	70,407
GMt m	2,544	2,125	1,826	1,610	1,422	1,258	1,143	1,087
GML m	107,711	101,584	96,386	91,691	85,577	78,766	72,644	66,895
KMt m	10,307	9,892	9,596	9,383	9,200	9,039	8,926	8,873
KML m	115,463	109,339	104,145	99,455	93,345	86,538	80,420	74,674
Immersion (TPc) tonne/cm	13,876	14,179	14,468	14,733	14,869	14,902	14,918	14,925
MTc tonne.m	72,386	76,676	80,894	84,848	86,674	86,691	86,342	85,396

RM at 1deg = GMt.Disp.sin(1) tonne.m	231,239	216,964	207,323	201,481	194,816	187,248	183,727	187,748
Max deck inclination deg	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594
Trim angle (+ve by stern) deg	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594	0,8594

KN Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Initial Trim = 1,163 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

VCG = 0 m; TCG = 0 m

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 10,0 deg. Starb.	KN 20,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 de
5208	4,500	1,163	34,398	0,000	0,000	1,805	3,631	5,252	6,238	6,811	6,988
5850	4,957	1,163	34,185	0,000	0,000	1,732	3,485	5,053	6,055	6,626	6,820
6504	5,414	1,163	33,953	0,000	0,000	1,677	3,373	4,831	5,841	6,416	6,635
7172	5,871	1,163	33,706	0,000	0,000	1,636	3,261	4,593	5,599	6,184	6,437
7849	6,329	1,163	33,457	0,000	0,000	1,604	3,129	4,348	5,333	5,934	6,226
8530	6,786	1,163	33,240	0,000	0,000	1,581	2,980	4,112	5,055	5,675	6,010
9211	7,243	1,163	33,052	0,000	0,000	1,557	2,818	3,885	4,776	5,410	5,790
9893	7,700	1,163	32,888	0,000	0,000	1,497	2,643	3,663	4,507	5,148	5,571

Hydrostatics - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Fixed Trim = -1,163 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Draft Amidships m	**4,500**	**4,957**	**5,414**	**5,871**	**6,329**	**6,786**	**7,243**	**7,700**
Displacement t	5003	5615	6240	6877	7525	8184	8856	9544
Heel deg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Draft at FP m	5,081	5,539	5,996	6,453	6,910	7,367	7,824	8,281
Draft at AP m	3,919	4,376	4,833	5,290	5,747	6,204	6,661	7,119
Draft at LCF m	4,437	4,885	5,333	5,781	6,228	6,676	7,130	7,589
Trim (+ve by stern) m	-1,163	-1,163	-1,163	-1,163	-1,163	-1,163	-1,163	-1,163
WL Length m	82,030	82,167	82,252	82,768	83,626	81,617	82,829	83,356
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,260	20,260	20,259
Wetted Area m^2	1768,192	1865,225	1962,588	2061,458	2160,407	2259,642	2358,615	2447,567
Waterpl. Area m^2	1292,211	1319,772	1346,632	1371,687	1395,114	1417,772	1453,147	1478,198
Prismatic coeff. (Cp)	0,679	0,689	0,699	0,704	0,706	0,733	0,731	0,735
Block coeff. (Cb)	0,606	0,620	0,634	0,643	0,649	0,677	0,678	0,685
Max Sect. area coeff. (Cm)	0,973	0,975	0,977	0,979	0,981	0,982	0,983	0,984
Waterpl. area coeff. (Cwp)	0,778	0,793	0,808	0,818	0,823	0,857	0,866	0,875
LCB from zero pt. (+ve fwd) m	37,778	37,394	37,018	36,647	36,281	35,914	35,565	35,253
LCF from zero pt. (+ve fwd) m	34,569	33,950	33,325	32,711	32,072	31,445	31,214	31,351
KB m	2,433	2,676	2,920	3,164	3,409	3,654	3,901	4,150

KG m	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700
BMt m	7,685	7,039	6,506	6,056	5,676	5,347	5,087	4,841
BML m	103,172	97,060	91,920	87,276	82,964	79,159	78,422	76,080
GMt m	2,433	2,036	1,752	1,552	1,422	1,344	1,335	1,344
GML m	97,920	92,057	87,166	82,772	78,710	75,155	74,671	72,582
KMt m	10,117	9,714	9,425	9,220	9,084	9,000	8,987	8,991
KML m	105,594	99,725	94,829	90,430	86,363	82,804	82,314	80,221
Immersion (TPc) tonne/cm	13,245	13,528	13,803	14,060	14,300	14,532	14,895	15,152
MTc tonne.m	63,215	66,699	70,181	73,444	76,425	79,361	85,327	89,382
RM at 1deg = GMt.Disp.sin(1) tonne.m	212,485	199,508	190,823	186,293	186,739	191,901	206,396	223,851
Max deck inclination deg	0,8597	0,8597	0,8597	0,8597	0,8597	0,8597	0,8597	0,8597
Trim angle (+ve by stern) deg	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597	-0,8597

KN Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Initial Trim = -1,163 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

VCG = 0 m; TCG = 0 m

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 10,0 deg. Starb.	KN 20,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 de Starb.
5003	4,500	-1,163	37,815	0,000	0,000	1,771	3,564	5,172	6,253	6,860	7,045
5615	4,957	-1,163	37,434	0,000	0,000	1,701	3,436	5,058	6,143	6,728	6,917
6240	5,414	-1,163	37,062	0,000	0,000	1,650	3,340	4,921	5,995	6,569	6,772
6877	5,871	-1,163	36,695	0,000	0,000	1,615	3,269	4,761	5,814	6,386	6,612
7525	6,329	-1,163	36,332	0,000	0,000	1,592	3,203	4,585	5,605	6,184	6,438
8184	6,786	-1,163	35,969	0,000	0,000	1,579	3,122	4,399	5,372	5,964	6,252
8856	7,243	-1,163	35,624	0,000	0,000	1,572	3,020	4,201	5,120	5,727	6,055

9544	7,700	-1,163	35,315	0,000	0,000	1,567	2,897	3,995	4,856	5,477	5,848

Hydrostatics - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Fixed Trim = 0,416 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Draft Amidships m	**4,500**	**4,957**	**5,414**	**5,871**	**6,329**	**6,786**	**7,243**	**7,700**
Displacement t	5134	5765	6410	7068	7737	8416	9097	9779
Heel deg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Draft at FP m	4,292	4,749	5,206	5,663	6,120	6,578	7,035	7,492
Draft at AP m	4,708	5,165	5,622	6,080	6,537	6,994	7,451	7,908
Draft at LCF m	4,529	4,989	5,449	5,910	6,370	6,828	7,286	7,742
Trim (+ve by stern) m	0,416	0,416	0,416	0,416	0,416	0,416	0,416	0,416
WL Length m	82,024	82,523	83,798	84,996	86,089	86,378	86,027	83,069

Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,260	20,261	20,266
Wetted Area m^2	1802,333	1901,324	2001,156	2100,461	2200,208	2289,785	2371,471	2453,636
Waterpl. Area m^2	1333,646	1362,002	1390,364	1416,349	1441,195	1451,913	1452,766	1461,516
Prismatic coeff. (Cp)	0,678	0,686	0,687	0,689	0,690	0,697	0,708	0,742
Block coeff. (Cb)	0,664	0,673	0,675	0,677	0,679	0,687	0,699	0,732
Max Sect. area coeff. (Cm)	0,979	0,980	0,982	0,983	0,985	0,986	0,987	0,988
Waterpl. area coeff. (Cwp)	0,802	0,815	0,819	0,822	0,826	0,830	0,833	0,868
LCB from zero pt. (+ve fwd) m	35,537	35,271	34,994	34,709	34,420	34,135	33,884	33,664
LCF from zero pt. (+ve fwd) m	33,428	32,829	32,213	31,640	31,072	30,822	30,725	30,863
KB m	2,475	2,726	2,977	3,228	3,480	3,732	3,981	4,227
KG m	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700
BMt m	7,767	7,101	6,558	6,096	5,703	5,323	4,964	4,679
BML m	109,930	103,495	98,267	93,497	89,255	83,273	76,512	71,819
GMt m	2,525	2,108	1,814	1,602	1,460	1,330	1,218	1,179
GML m	104,688	98,502	93,523	89,004	85,012	79,280	72,766	68,319
KMt m	10,242	9,827	9,534	9,324	9,183	9,054	8,944	8,906
KML m	112,404	106,219	101,242	96,724	92,734	87,004	80,491	76,045
Immersion (TPc) tonne/cm	13,670	13,961	14,251	14,518	14,772	14,882	14,891	14,981
MTc tonne.m	69,345	73,279	77,357	81,170	84,872	86,094	85,412	86,201

RM at 1deg = GMt.Disp.sin(1) tonne.m	226,205	212,142	202,957	197,658	197,156	195,314	193,397	201,178
Max deck inclination deg	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077
Trim angle (+ve by stern) deg	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077	0,3077

KN Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Initial Trim = -1,163 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

VCG = 0 m; TCG = 0 m

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 10,0 deg. Starb.	KN 20,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 de
5003	4,500	-1,163	37,815	0,000	0,000	1,771	3,564	5,172	6,253	6,860	7,045
5615	4,957	-1,163	37,434	0,000	0,000	1,701	3,436	5,058	6,143	6,728	6,917
6240	5,414	-1,163	37,062	0,000	0,000	1,650	3,340	4,921	5,995	6,569	6,772
6877	5,871	-1,163	36,695	0,000	0,000	1,615	3,269	4,761	5,814	6,386	6,612
7525	6,329	-1,163	36,332	0,000	0,000	1,592	3,203	4,585	5,605	6,184	6,438
8184	6,786	-1,163	35,969	0,000	0,000	1,579	3,122	4,399	5,372	5,964	6,252
8856	7,243	-1,163	35,624	0,000	0,000	1,572	3,020	4,201	5,120	5,727	6,055
9544	7,700	-1,163	35,315	0,000	0,000	1,567	2,897	3,995	4,856	5,477	5,848

KN Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Initial Trim = 0,416 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

VCG = 0 m; TCG = 0 m

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 10,0 deg. Starb.	KN 20,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 de Starb.
5134	4,500	0,416	35,524	0,000	0,000	1,793	3,611	5,238	6,254	6,838	7,015
5765	4,957	0,416	35,257	0,000	0,000	1,721	3,470	5,069	6,096	6,671	6,860
6410	5,414	0,416	34,978	0,000	0,000	1,668	3,364	4,875	5,905	6,477	6,689
7068	5,871	0,416	34,692	0,000	0,000	1,630	3,275	4,662	5,683	6,262	6,503
7737	6,329	0,416	34,401	0,000	0,000	1,601	3,167	4,438	5,436	6,028	6,304
8416	6,786	0,416	34,115	0,000	0,000	1,581	3,039	4,213	5,168	5,777	6,094
9097	7,243	0,416	33,862	0,000	0,000	1,568	2,894	3,992	4,892	5,518	5,880
9779	7,700	0,416	33,641	0,000	0,000	1,537	2,734	3,774	4,622	5,257	5,663

KN Calculation - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Initial Trim = -0,416 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

VCG = 0 m; TCG = 0 m

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 10,0 deg. Starb.	KN 20,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 de Starb.
5060	4,500	-0,416	36,747	0,000	0,000	1,781	3,586	5,207	6,259	6,855	7,035
5682	4,957	-0,416	36,420	0,000	0,000	1,710	3,452	5,070	6,127	6,706	6,895
6316	5,414	-0,416	36,092	0,000	0,000	1,658	3,351	4,906	5,959	6,532	6,737
6962	5,871	-0,416	35,763	0,000	0,000	1,622	3,275	4,721	5,760	6,334	6,565
7621	6,329	-0,416	35,433	0,000	0,000	1,597	3,193	4,523	5,533	6,117	6,380
8290	6,786	-0,416	35,104	0,000	0,000	1,580	3,090	4,317	5,283	5,882	6,182
8968	7,243	-0,416	34,779	0,000	0,000	1,570	2,966	4,106	5,016	5,632	5,975
9653	7,700	-0,416	34,510	0,000	0,000	1,561	2,825	3,894	4,748	5,376	5,763

Hydrostatics - hats parametrizado

Stability 20.00.06.0, build: 0

Model file: G:\TFG\cuaderno 4\hats parametrizado (Highest precision, 506 sections, Trimming on, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact|GUID|f30841fc-df8a-4697-a1de-2258cd56f7d8

Fixed Trim = -0,416 m (+ve by stern)

Specific gravity = 1,025; (Density = 1,025 tonne/m^3)

Draft Amidships m	**4,500**	**4,957**	**5,414**	**5,871**	**6,329**	**6,786**	**7,243**	**7,700**
Displacement t	5060	5682	6316	6962	7621	8290	8968	9653
Heel deg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Draft at FP m	4,708	5,165	5,622	6,079	6,537	6,994	7,451	7,908
Draft at AP m	4,292	4,749	5,206	5,663	6,121	6,578	7,035	7,492
Draft at LCF m	4,475	4,928	5,382	5,836	6,290	6,744	7,200	7,659
Trim (+ve by stern) m	-0,416	-0,416	-0,416	-0,416	-0,416	-0,416	-0,416	-0,416
WL Length m	82,029	82,190	82,695	83,851	84,866	85,609	83,054	83,216
Beam max extents on WL m	20,261	20,261	20,261	20,261	20,261	20,260	20,260	20,262
Wetted Area m^2	1783,760	1881,924	1980,276	2078,379	2178,751	2278,812	2369,181	2450,526
Waterpl. Area m^2	1311,762	1340,315	1366,905	1392,322	1417,282	1439,471	1453,297	1470,646

Prismatic coeff. (Cp)	0,683	0,693	0,699	0,700	0,701	0,704	0,734	0,741
Block coeff. (Cb)	0,645	0,657	0,666	0,669	0,672	0,677	0,708	0,716
Max Sect. area coeff. (Cm)	0,976	0,978	0,980	0,982	0,983	0,984	0,985	0,986
Waterpl. area coeff. (Cwp)	0,789	0,805	0,816	0,820	0,824	0,830	0,864	0,872
LCB from zero pt. (+ve fwd) m	36,734	36,405	36,076	35,745	35,415	35,084	34,758	34,487
LCF from zero pt. (+ve fwd) m	34,038	33,413	32,820	32,233	31,620	30,997	30,780	31,112
KB m	2,446	2,693	2,940	3,188	3,436	3,685	3,934	4,182
KG m	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700
BMt m	7,727	7,074	6,531	6,074	5,690	5,357	5,039	4,768
BML m	106,453	100,308	94,924	90,213	86,106	82,013	77,394	74,102
GMt m	2,484	2,079	1,785	1,579	1,445	1,362	1,294	1,272
GML m	101,210	95,314	90,178	85,717	81,860	78,018	73,649	70,606
KMt m	10,173	9,767	9,471	9,262	9,127	9,042	8,972	8,949
KML m	108,897	103,000	97,862	93,400	89,541	85,697	81,327	78,282
Immersion (TPc) tonne/cm	13,446	13,738	14,011	14,271	14,527	14,755	14,896	15,074
MTc tonne.m	66,086	69,877	73,491	77,007	80,496	83,457	85,226	87,946
RM at 1deg = GMt.Disp.sin(1) tonne.m	219,362	206,183	196,810	191,820	192,147	197,016	202,538	214,362
Max deck inclination deg	0,3075	0,3075	0,3075	0,3075	0,3075	0,3075	0,3075	0,3075
Trim angle (+ve by stern) deg	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075	-0,3075

Tank Calibrations - hats parametrizado

Stability 20.00.06.0, build: 0

Tank Calibrations - Agua Suministro1BR

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Agua Suministro1BR	3,500	0,000	100,000	42,000	42,000	3,600	-2,500	7,250	0,000

	3,430	0,070	98,000	41,160	41,160	3,600	-2,500	7,215	25,000
	3,426	0,074	97,900	41,118	41,118	3,600	-2,500	7,213	25,000
	3,400	0,100	97,143	40,800	40,800	3,600	-2,500	7,200	25,000
	3,200	0,300	91,429	38,400	38,400	3,600	-2,500	7,100	25,000
	3,000	0,500	85,714	36,000	36,000	3,600	-2,500	7,000	25,000
	2,800	0,700	80,000	33,600	33,600	3,600	-2,500	6,900	25,000
	2,600	0,900	74,286	31,200	31,200	3,600	-2,500	6,800	25,000
	2,400	1,100	68,571	28,800	28,800	3,600	-2,500	6,700	25,000
	2,200	1,300	62,857	26,400	26,400	3,600	-2,500	6,600	25,000
	2,000	1,500	57,143	24,000	24,000	3,600	-2,500	6,500	25,000
	1,800	1,700	51,429	21,600	21,600	3,600	-2,500	6,400	25,000
	1,600	1,900	45,714	19,200	19,200	3,600	-2,500	6,300	25,000
	1,400	2,100	40,000	16,800	16,800	3,600	-2,500	6,200	25,000
	1,200	2,300	34,286	14,400	14,400	3,600	-2,500	6,100	25,000
	1,000	2,500	28,571	12,000	12,000	3,600	-2,500	6,000	25,000
	0,800	2,700	22,857	9,600	9,600	3,600	-2,500	5,900	25,000
	0,600	2,900	17,143	7,200	7,200	3,600	-2,500	5,800	25,000

	0,400	3,100	11,429	4,800	4,800	3,600	-2,500	5,700	25,000
	0,200	3,300	5,714	2,400	2,400	3,600	-2,500	5,600	25,000
	0,035	3,465	1,000	0,420	0,420	3,600	-2,500	5,518	25,000
	0,000	3,500	0,000	0,000	0,000	3,600	-2,500	5,500	0,000

Tank Calibrations - Agua Suministro1ER

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
Agua Suministro1ER	3,500	0,000	100,000	42,000	42,000	3,600	2,500	7,250	0,000
	3,430	0,070	98,000	41,160	41,160	3,600	2,500	7,215	25,000

	3,426	0,074	97,900	41,118	41,118	3,600	2,500	7,213	25,000
	3,400	0,100	97,143	40,800	40,800	3,600	2,500	7,200	25,000
	3,200	0,300	91,429	38,400	38,400	3,600	2,500	7,100	25,000
	3,000	0,500	85,714	36,000	36,000	3,600	2,500	7,000	25,000
	2,800	0,700	80,000	33,600	33,600	3,600	2,500	6,900	25,000
	2,600	0,900	74,286	31,200	31,200	3,600	2,500	6,800	25,000
	2,400	1,100	68,571	28,800	28,800	3,600	2,500	6,700	25,000
	2,200	1,300	62,857	26,400	26,400	3,600	2,500	6,600	25,000
	2,000	1,500	57,143	24,000	24,000	3,600	2,500	6,500	25,000
	1,800	1,700	51,429	21,600	21,600	3,600	2,500	6,400	25,000
	1,600	1,900	45,714	19,200	19,200	3,600	2,500	6,300	25,000
	1,400	2,100	40,000	16,800	16,800	3,600	2,500	6,200	25,000
	1,200	2,300	34,286	14,400	14,400	3,600	2,500	6,100	25,000
	1,000	2,500	28,571	12,000	12,000	3,600	2,500	6,000	25,000
	0,800	2,700	22,857	9,600	9,600	3,600	2,500	5,900	25,000
	0,600	2,900	17,143	7,200	7,200	3,600	2,500	5,800	25,000
	0,400	3,100	11,429	4,800	4,800	3,600	2,500	5,700	25,000

	0,200	3,300	5,714	2,400	2,400	3,600	2,500	5,600	25,000
	0,035	3,465	1,000	0,420	0,420	3,600	2,500	5,518	25,000
	0,000	3,500	0,000	0,000	0,000	3,600	2,500	5,500	0,000

Tank Calibrations - Agua Suministro2BR

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
Agua Suministro2BR	3,500	0,000	100,000	88,200	88,200	13,800	-3,500	7,250	0,000
	3,430	0,070	98,000	86,436	86,436	13,800	-3,500	7,215	102,900
	3,426	0,074	97,900	86,348	86,348	13,800	-3,500	7,213	102,900

	3,400	0,100	97,143	85,680	85,680	13,800	-3,500	7,200	102,900
	3,200	0,300	91,429	80,640	80,640	13,800	-3,500	7,100	102,900
	3,000	0,500	85,714	75,600	75,600	13,800	-3,500	7,000	102,900
	2,800	0,700	80,000	70,560	70,560	13,800	-3,500	6,900	102,900
	2,600	0,900	74,286	65,520	65,520	13,800	-3,500	6,800	102,900
	2,400	1,100	68,571	60,480	60,480	13,800	-3,500	6,700	102,900
	2,200	1,300	62,857	55,440	55,440	13,800	-3,500	6,600	102,900
	2,000	1,500	57,143	50,400	50,400	13,800	-3,500	6,500	102,900
	1,800	1,700	51,429	45,360	45,360	13,800	-3,500	6,400	102,900
	1,600	1,900	45,714	40,320	40,320	13,800	-3,500	6,300	102,900
	1,400	2,100	40,000	35,280	35,280	13,800	-3,500	6,200	102,900
	1,200	2,300	34,286	30,240	30,240	13,800	-3,500	6,100	102,900
	1,000	2,500	28,571	25,200	25,200	13,800	-3,500	6,000	102,900
	0,800	2,700	22,857	20,160	20,160	13,800	-3,500	5,900	102,900
	0,600	2,900	17,143	15,120	15,120	13,800	-3,500	5,800	102,900
	0,400	3,100	11,429	10,080	10,080	13,800	-3,500	5,700	102,900
	0,200	3,300	5,714	5,040	5,040	13,800	-3,500	5,600	102,900

	0,035	3,465	1,000	0,882	0,882	13,800	-3,500	5,518	102,900
	0,000	3,500	0,000	0,000	0,000	13,800	-3,500	5,500	0,000

Tank Calibrations - Agua Suministro2ER

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
Agua Suministro2ER	3,500	0,000	100,000	88,200	88,200	13,800	3,500	7,250	0,000
	3,430	0,070	98,000	86,436	86,436	13,800	3,500	7,215	102,900
	3,426	0,074	97,900	86,348	86,348	13,800	3,500	7,213	102,900
	3,400	0,100	97,143	85,680	85,680	13,800	3,500	7,200	102,900

	3,200	0,300	91,429	80,640	80,640	13,800	3,500	7,100	102,900
	3,000	0,500	85,714	75,600	75,600	13,800	3,500	7,000	102,900
	2,800	0,700	80,000	70,560	70,560	13,800	3,500	6,900	102,900
	2,600	0,900	74,286	65,520	65,520	13,800	3,500	6,800	102,900
	2,400	1,100	68,571	60,480	60,480	13,800	3,500	6,700	102,900
	2,200	1,300	62,857	55,440	55,440	13,800	3,500	6,600	102,900
	2,000	1,500	57,143	50,400	50,400	13,800	3,500	6,500	102,900
	1,800	1,700	51,429	45,360	45,360	13,800	3,500	6,400	102,900
	1,600	1,900	45,714	40,320	40,320	13,800	3,500	6,300	102,900
	1,400	2,100	40,000	35,280	35,280	13,800	3,500	6,200	102,900
	1,200	2,300	34,286	30,240	30,240	13,800	3,500	6,100	102,900
	1,000	2,500	28,571	25,200	25,200	13,800	3,500	6,000	102,900
	0,800	2,700	22,857	20,160	20,160	13,800	3,500	5,900	102,900
	0,600	2,900	17,143	15,120	15,120	13,800	3,500	5,800	102,900
	0,400	3,100	11,429	10,080	10,080	13,800	3,500	5,700	102,900
	0,200	3,300	5,714	5,040	5,040	13,800	3,500	5,600	102,900
	0,035	3,465	1,000	0,882	0,882	13,800	3,500	5,518	102,900

	0,000	3,500	0,000	0,000	0,000	13,800	3,500	5,500	0,000

Tank Calibrations - Agua suministro 3 BR

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
Agua suministro 3 BR	3,500	0,000	100,000	113,400	113,400	6,600	-4,500	7,250	0,000
	3,430	0,070	98,000	111,132	111,132	6,600	-4,500	7,215	218,700
	3,426	0,074	97,900	111,019	111,019	6,600	-4,500	7,213	218,700
	3,400	0,100	97,143	110,160	110,160	6,600	-4,500	7,200	218,700
	3,200	0,300	91,429	103,680	103,680	6,600	-4,500	7,100	218,700

	3,000	0,500	85,714	97,200	97,200	6,600	-4,500	7,000	218,700
	2,800	0,700	80,000	90,720	90,720	6,600	-4,500	6,900	218,700
	2,600	0,900	74,286	84,240	84,240	6,600	-4,500	6,800	218,700
	2,400	1,100	68,571	77,760	77,760	6,600	-4,500	6,700	218,700
	2,200	1,300	62,857	71,280	71,280	6,600	-4,500	6,600	218,700
	2,000	1,500	57,143	64,800	64,800	6,600	-4,500	6,500	218,700
	1,800	1,700	51,429	58,320	58,320	6,600	-4,500	6,400	218,700
	1,600	1,900	45,714	51,840	51,840	6,600	-4,500	6,300	218,700
	1,400	2,100	40,000	45,360	45,360	6,600	-4,500	6,200	218,700
	1,200	2,300	34,286	38,880	38,880	6,600	-4,500	6,100	218,700
	1,000	2,500	28,571	32,400	32,400	6,600	-4,500	6,000	218,700
	0,800	2,700	22,857	25,920	25,920	6,600	-4,500	5,900	218,700
	0,600	2,900	17,143	19,440	19,440	6,600	-4,500	5,800	218,700
	0,400	3,100	11,429	12,960	12,960	6,600	-4,500	5,700	218,700
	0,200	3,300	5,714	6,480	6,480	6,600	-4,500	5,600	218,700
	0,035	3,465	1,000	1,134	1,134	6,600	-4,500	5,518	218,700
	0,000	3,500	0,000	0,000	0,000	6,600	-4,500	5,500	0,000

Tank Calibrations - Agua suministro 3 ER

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Agua suministro 3 ER	3,500	0,000	100,000	113,400	113,400	6,600	4,500	7,250	0,000
	3,430	0,070	98,000	111,132	111,132	6,600	4,500	7,215	218,700
	3,426	0,074	97,900	111,019	111,019	6,600	4,500	7,213	218,700
	3,400	0,100	97,143	110,160	110,160	6,600	4,500	7,200	218,700
	3,200	0,300	91,429	103,680	103,680	6,600	4,500	7,100	218,700
	3,000	0,500	85,714	97,200	97,200	6,600	4,500	7,000	218,700
	2,800	0,700	80,000	90,720	90,720	6,600	4,500	6,900	218,700

	2,600	0,900	74,286	84,240	84,240	6,600	4,500	6,800	218,700
	2,400	1,100	68,571	77,760	77,760	6,600	4,500	6,700	218,700
	2,200	1,300	62,857	71,280	71,280	6,600	4,500	6,600	218,700
	2,000	1,500	57,143	64,800	64,800	6,600	4,500	6,500	218,700
	1,800	1,700	51,429	58,320	58,320	6,600	4,500	6,400	218,700
	1,600	1,900	45,714	51,840	51,840	6,600	4,500	6,300	218,700
	1,400	2,100	40,000	45,360	45,360	6,600	4,500	6,200	218,700
	1,200	2,300	34,286	38,880	38,880	6,600	4,500	6,100	218,700
	1,000	2,500	28,571	32,400	32,400	6,600	4,500	6,000	218,700
	0,800	2,700	22,857	25,920	25,920	6,600	4,500	5,900	218,700
	0,600	2,900	17,143	19,440	19,440	6,600	4,500	5,800	218,700
	0,400	3,100	11,429	12,960	12,960	6,600	4,500	5,700	218,700
	0,200	3,300	5,714	6,480	6,480	6,600	4,500	5,600	218,700
	0,035	3,465	1,000	1,134	1,134	6,600	4,500	5,518	218,700
	0,000	3,500	0,000	0,000	0,000	6,600	4,500	5,500	0,000

Tank Calibrations - Agua suministro 4 BR

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Agua suministro 4 BR	3,500	0,000	100,000	88,200	88,200	10,200	-3,500	7,250	0,000
	3,430	0,070	98,000	86,436	86,436	10,200	-3,500	7,215	102,900
	3,426	0,074	97,900	86,348	86,348	10,200	-3,500	7,213	102,900
	3,400	0,100	97,143	85,680	85,680	10,200	-3,500	7,200	102,900
	3,200	0,300	91,429	80,640	80,640	10,200	-3,500	7,100	102,900
	3,000	0,500	85,714	75,600	75,600	10,200	-3,500	7,000	102,900
	2,800	0,700	80,000	70,560	70,560	10,200	-3,500	6,900	102,900
	2,600	0,900	74,286	65,520	65,520	10,200	-3,500	6,800	102,900

	2,400	1,100	68,571	60,480	60,480	10,200	-3,500	6,700	102,900
	2,200	1,300	62,857	55,440	55,440	10,200	-3,500	6,600	102,900
	2,000	1,500	57,143	50,400	50,400	10,200	-3,500	6,500	102,900
	1,800	1,700	51,429	45,360	45,360	10,200	-3,500	6,400	102,900
	1,600	1,900	45,714	40,320	40,320	10,200	-3,500	6,300	102,900
	1,400	2,100	40,000	35,280	35,280	10,200	-3,500	6,200	102,900
	1,200	2,300	34,286	30,240	30,240	10,200	-3,500	6,100	102,900
	1,000	2,500	28,571	25,200	25,200	10,200	-3,500	6,000	102,900
	0,800	2,700	22,857	20,160	20,160	10,200	-3,500	5,900	102,900
	0,600	2,900	17,143	15,120	15,120	10,200	-3,500	5,800	102,900
	0,400	3,100	11,429	10,080	10,080	10,200	-3,500	5,700	102,900
	0,200	3,300	5,714	5,040	5,040	10,200	-3,500	5,600	102,900
	0,035	3,465	1,000	0,882	0,882	10,200	-3,500	5,518	102,900
	0,000	3,500	0,000	0,000	0,000	10,200	-3,500	5,500	0,000

Tank Calibrations - Agua suministro 4ER

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Agua suministro 4ER	3,500	0,000	100,000	88,200	88,200	10,200	3,500	7,250	0,000
	3,430	0,070	98,000	86,436	86,436	10,200	3,500	7,215	102,900
	3,426	0,074	97,900	86,348	86,348	10,200	3,500	7,213	102,900
	3,400	0,100	97,143	85,680	85,680	10,200	3,500	7,200	102,900
	3,200	0,300	91,429	80,640	80,640	10,200	3,500	7,100	102,900
	3,000	0,500	85,714	75,600	75,600	10,200	3,500	7,000	102,900
	2,800	0,700	80,000	70,560	70,560	10,200	3,500	6,900	102,900
	2,600	0,900	74,286	65,520	65,520	10,200	3,500	6,800	102,900
	2,400	1,100	68,571	60,480	60,480	10,200	3,500	6,700	102,900

	2,200	1,300	62,857	55,440	55,440	10,200	3,500	6,600	102,900
	2,000	1,500	57,143	50,400	50,400	10,200	3,500	6,500	102,900
	1,800	1,700	51,429	45,360	45,360	10,200	3,500	6,400	102,900
	1,600	1,900	45,714	40,320	40,320	10,200	3,500	6,300	102,900
	1,400	2,100	40,000	35,280	35,280	10,200	3,500	6,200	102,900
	1,200	2,300	34,286	30,240	30,240	10,200	3,500	6,100	102,900
	1,000	2,500	28,571	25,200	25,200	10,200	3,500	6,000	102,900
	0,800	2,700	22,857	20,160	20,160	10,200	3,500	5,900	102,900
	0,600	2,900	17,143	15,120	15,120	10,200	3,500	5,800	102,900
	0,400	3,100	11,429	10,080	10,080	10,200	3,500	5,700	102,900
	0,200	3,300	5,714	5,040	5,040	10,200	3,500	5,600	102,900
	0,035	3,465	1,000	0,882	0,882	10,200	3,500	5,518	102,900
	0,000	3,500	0,000	0,000	0,000	10,200	3,500	5,500	0,000

Tank Calibrations - Brine 1BR

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Brine 1BR	2,659	0,000	100,000	48,320	72,480	3,671	-4,461	4,369	0,000
	2,614	0,045	98,000	47,353	71,030	3,672	-4,460	4,347	218,700
	2,612	0,047	97,900	47,305	70,958	3,672	-4,460	4,346	218,700
	2,600	0,059	97,361	47,045	70,567	3,672	-4,460	4,339	218,700
	2,400	0,259	88,421	42,725	64,087	3,680	-4,456	4,238	218,700
	2,200	0,459	79,480	38,405	57,607	3,689	-4,451	4,137	218,700
	2,000	0,659	70,540	34,085	51,127	3,700	-4,444	4,035	218,700
	1,800	0,859	61,600	29,765	44,647	3,715	-4,436	3,932	218,700
	1,600	1,059	52,659	25,445	38,167	3,734	-4,425	3,829	218,700
	1,400	1,259	43,719	21,125	31,687	3,761	-4,410	3,724	218,700

	1,200	1,459	34,778	16,805	25,207	3,803	-4,387	3,617	218,700
	1,000	1,659	25,838	12,485	18,727	3,873	-4,348	3,505	218,667
	0,800	1,859	16,964	8,197	12,295	4,012	-4,284	3,381	206,153
	0,600	2,059	9,369	4,527	6,790	4,209	-4,209	3,248	149,732
	0,400	2,259	4,006	1,936	2,903	4,407	-4,062	3,114	97,149
	0,210	2,449	1,000	0,483	0,725	4,595	-3,738	2,984	44,678
	0,200	2,459	0,901	0,435	0,653	4,604	-3,716	2,977	37,647
	0,000	2,659	0,000	0,000	0,000	4,766	-0,022	2,841	0,000

Tank Calibrations - BRINE 1ER

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
BRINE 1ER	2,659	0,000	100,000	48,320	72,480	3,671	4,461	4,369	0,000
	2,614	0,045	98,000	47,353	71,030	3,672	4,460	4,347	218,700
	2,612	0,047	97,900	47,305	70,958	3,672	4,460	4,346	218,700
	2,600	0,059	97,361	47,045	70,567	3,672	4,460	4,339	218,700
	2,400	0,259	88,421	42,725	64,087	3,680	4,456	4,238	218,700
	2,200	0,459	79,480	38,405	57,607	3,689	4,451	4,137	218,700
	2,000	0,659	70,540	34,085	51,127	3,700	4,444	4,035	218,700
	1,800	0,859	61,600	29,765	44,647	3,715	4,436	3,932	218,700
	1,600	1,059	52,659	25,445	38,167	3,734	4,425	3,829	218,700
	1,400	1,259	43,719	21,125	31,687	3,761	4,410	3,724	218,700
	1,200	1,459	34,778	16,805	25,207	3,803	4,387	3,617	218,700
	1,000	1,659	25,838	12,485	18,727	3,873	4,348	3,505	218,667
	0,800	1,859	16,964	8,197	12,295	4,012	4,284	3,381	206,153
	0,600	2,059	9,369	4,527	6,790	4,209	4,209	3,248	149,732
	0,400	2,259	4,006	1,936	2,903	4,407	4,062	3,114	97,149

	0,210	2,449	1,000	0,483	0,725	4,595	3,738	2,984	44,678
	0,200	2,459	0,901	0,435	0,653	4,604	3,716	2,977	37,647
	0,000	2,659	0,000	0,000	0,000	4,766	0,022	2,841	0,000

Tank Calibrations - BRINE 2BR

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
BRINE 2BR	3,500	0,000	100,000	16,800	25,200	13,200	-7,500	7,250	0,000
	3,430	0,070	98,000	16,464	24,696	13,200	-7,500	7,215	0,600
	3,426	0,074	97,900	16,447	24,671	13,200	-7,500	7,213	0,600
	3,400	0,100	97,143	16,320	24,480	13,200	-7,500	7,200	0,600

	3,200	0,300	91,429	15,360	23,040	13,200	-7,500	7,100	0,600
	3,000	0,500	85,714	14,400	21,600	13,200	-7,500	7,000	0,600
	2,800	0,700	80,000	13,440	20,160	13,200	-7,500	6,900	0,600
	2,600	0,900	74,286	12,480	18,720	13,200	-7,500	6,800	0,600
	2,400	1,100	68,571	11,520	17,280	13,200	-7,500	6,700	0,600
	2,200	1,300	62,857	10,560	15,840	13,200	-7,500	6,600	0,600
	2,000	1,500	57,143	9,600	14,400	13,200	-7,500	6,500	0,600
	1,800	1,700	51,429	8,640	12,960	13,200	-7,500	6,400	0,600
	1,600	1,900	45,714	7,680	11,520	13,200	-7,500	6,300	0,600
	1,400	2,100	40,000	6,720	10,080	13,200	-7,500	6,200	0,600
	1,200	2,300	34,286	5,760	8,640	13,200	-7,500	6,100	0,600
	1,000	2,500	28,571	4,800	7,200	13,200	-7,500	6,000	0,600
	0,800	2,700	22,857	3,840	5,760	13,200	-7,500	5,900	0,600
	0,600	2,900	17,143	2,880	4,320	13,200	-7,500	5,800	0,600
	0,400	3,100	11,429	1,920	2,880	13,200	-7,500	5,700	0,600
	0,200	3,300	5,714	0,960	1,440	13,200	-7,500	5,600	0,600

	0,035	3,465	1,000	0,168	0,252	13,200	-7,500	5,518	0,600
	0,000	3,500	0,000	0,000	0,000	13,200	-7,500	5,500	0,000

Tank Calibrations - BRINE 2ER

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
BRINE 2ER	3,500	0,000	100,000	16,800	25,200	13,200	7,500	7,250	0,000
	3,430	0,070	98,000	16,464	24,696	13,200	7,500	7,215	0,600
	3,426	0,074	97,900	16,447	24,671	13,200	7,500	7,213	0,600
	3,400	0,100	97,143	16,320	24,480	13,200	7,500	7,200	0,600
	3,200	0,300	91,429	15,360	23,040	13,200	7,500	7,100	0,600

	3,000	0,500	85,714	14,400	21,600	13,200	7,500	7,000	0,600
	2,800	0,700	80,000	13,440	20,160	13,200	7,500	6,900	0,600
	2,600	0,900	74,286	12,480	18,720	13,200	7,500	6,800	0,600
	2,400	1,100	68,571	11,520	17,280	13,200	7,500	6,700	0,600
	2,200	1,300	62,857	10,560	15,840	13,200	7,500	6,600	0,600
	2,000	1,500	57,143	9,600	14,400	13,200	7,500	6,500	0,600
	1,800	1,700	51,429	8,640	12,960	13,200	7,500	6,400	0,600
	1,600	1,900	45,714	7,680	11,520	13,200	7,500	6,300	0,600
	1,400	2,100	40,000	6,720	10,080	13,200	7,500	6,200	0,600
	1,200	2,300	34,286	5,760	8,640	13,200	7,500	6,100	0,600
	1,000	2,500	28,571	4,800	7,200	13,200	7,500	6,000	0,600
	0,800	2,700	22,857	3,840	5,760	13,200	7,500	5,900	0,600
	0,600	2,900	17,143	2,880	4,320	13,200	7,500	5,800	0,600
	0,400	3,100	11,429	1,920	2,880	13,200	7,500	5,700	0,600
	0,200	3,300	5,714	0,960	1,440	13,200	7,500	5,600	0,600
	0,035	3,465	1,000	0,168	0,252	13,200	7,500	5,518	0,600

	0,000	3,500	0,000	0,000	0,000	13,200	7,500	5,500	0,000

Tank Calibrations - BRINE 3BR

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
BRINE 3BR	3,500	0,000	100,000	8,400	12,600	14,400	-8,500	7,250	0,000
	3,430	0,070	98,000	8,232	12,348	14,400	-8,500	7,215	0,300
	3,426	0,074	97,900	8,224	12,335	14,400	-8,500	7,213	0,300
	3,400	0,100	97,143	8,160	12,240	14,400	-8,500	7,200	0,300
	3,200	0,300	91,429	7,680	11,520	14,400	-8,500	7,100	0,300
	3,000	0,500	85,714	7,200	10,800	14,400	-8,500	7,000	0,300

	2,800	0,700	80,000	6,720	10,080	14,400	-8,500	6,900	0,300
	2,600	0,900	74,286	6,240	9,360	14,400	-8,500	6,800	0,300
	2,400	1,100	68,571	5,760	8,640	14,400	-8,500	6,700	0,300
	2,200	1,300	62,857	5,280	7,920	14,400	-8,500	6,600	0,300
	2,000	1,500	57,143	4,800	7,200	14,400	-8,500	6,500	0,300
	1,800	1,700	51,429	4,320	6,480	14,400	-8,500	6,400	0,300
	1,600	1,900	45,714	3,840	5,760	14,400	-8,500	6,300	0,300
	1,400	2,100	40,000	3,360	5,040	14,400	-8,500	6,200	0,300
	1,200	2,300	34,286	2,880	4,320	14,400	-8,500	6,100	0,300
	1,000	2,500	28,571	2,400	3,600	14,400	-8,500	6,000	0,300
	0,800	2,700	22,857	1,920	2,880	14,400	-8,500	5,900	0,300
	0,600	2,900	17,143	1,440	2,160	14,400	-8,500	5,800	0,300
	0,400	3,100	11,429	0,960	1,440	14,400	-8,500	5,700	0,300
	0,200	3,300	5,714	0,480	0,720	14,400	-8,500	5,600	0,300
	0,035	3,465	1,000	0,084	0,126	14,400	-8,500	5,518	0,300
	0,000	3,500	0,000	0,000	0,000	14,400	-8,500	5,500	0,000

Tank Calibrations - BRINE 3ER

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
BRINE 3ER	3,500	0,000	100,000	8,400	12,600	14,400	8,500	7,250	0,000
	3,430	0,070	98,000	8,232	12,348	14,400	8,500	7,215	0,300
	3,426	0,074	97,900	8,224	12,335	14,400	8,500	7,213	0,300
	3,400	0,100	97,143	8,160	12,240	14,400	8,500	7,200	0,300
	3,200	0,300	91,429	7,680	11,520	14,400	8,500	7,100	0,300
	3,000	0,500	85,714	7,200	10,800	14,400	8,500	7,000	0,300
	2,800	0,700	80,000	6,720	10,080	14,400	8,500	6,900	0,300

	2,600	0,900	74,286	6,240	9,360	14,400	8,500	6,800	0,300
	2,400	1,100	68,571	5,760	8,640	14,400	8,500	6,700	0,300
	2,200	1,300	62,857	5,280	7,920	14,400	8,500	6,600	0,300
	2,000	1,500	57,143	4,800	7,200	14,400	8,500	6,500	0,300
	1,800	1,700	51,429	4,320	6,480	14,400	8,500	6,400	0,300
	1,600	1,900	45,714	3,840	5,760	14,400	8,500	6,300	0,300
	1,400	2,100	40,000	3,360	5,040	14,400	8,500	6,200	0,300
	1,200	2,300	34,286	2,880	4,320	14,400	8,500	6,100	0,300
	1,000	2,500	28,571	2,400	3,600	14,400	8,500	6,000	0,300
	0,800	2,700	22,857	1,920	2,880	14,400	8,500	5,900	0,300
	0,600	2,900	17,143	1,440	2,160	14,400	8,500	5,800	0,300
	0,400	3,100	11,429	0,960	1,440	14,400	8,500	5,700	0,300
	0,200	3,300	5,714	0,480	0,720	14,400	8,500	5,600	0,300
	0,035	3,465	1,000	0,084	0,126	14,400	8,500	5,518	0,300
	0,000	3,500	0,000	0,000	0,000	14,400	8,500	5,500	0,000

Tank Calibrations - Brine

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Brine	4,000	0,000	100,000	80,000	120,000	21,400	-8,000	3,500	0,000
	3,920	0,080	98,000	78,400	117,600	21,400	-8,000	3,460	10,000
	3,916	0,084	97,900	78,320	117,480	21,400	-8,000	3,458	10,000
	3,800	0,200	95,000	76,000	114,000	21,400	-8,000	3,400	10,000
	3,600	0,400	90,000	72,000	108,000	21,400	-8,000	3,300	10,000
	3,400	0,600	85,000	68,000	102,000	21,400	-8,000	3,200	10,000
	3,200	0,800	80,000	64,000	96,000	21,400	-8,000	3,100	10,000
	3,000	1,000	75,000	60,000	90,000	21,400	-8,000	3,000	10,000

	2,800	1,200	70,000	56,000	84,000	21,400	-8,000	2,900	10,000
	2,600	1,400	65,000	52,000	78,000	21,400	-8,000	2,800	10,000
	2,400	1,600	60,000	48,000	72,000	21,400	-8,000	2,700	10,000
	2,200	1,800	55,000	44,000	66,000	21,400	-8,000	2,600	10,000
	2,000	2,000	50,000	40,000	60,000	21,400	-8,000	2,500	10,000
	1,800	2,200	45,000	36,000	54,000	21,400	-8,000	2,400	10,000
	1,600	2,400	40,000	32,000	48,000	21,400	-8,000	2,300	10,000
	1,400	2,600	35,000	28,000	42,000	21,400	-8,000	2,200	10,000
	1,200	2,800	30,000	24,000	36,000	21,400	-8,000	2,100	10,000
	1,000	3,000	25,000	20,000	30,000	21,400	-8,000	2,000	10,000
	0,800	3,200	20,000	16,000	24,000	21,400	-8,000	1,900	10,000
	0,600	3,400	15,000	12,000	18,000	21,400	-8,000	1,800	10,000
	0,400	3,600	10,000	8,000	12,000	21,400	-8,000	1,700	10,000
	0,200	3,800	5,000	4,000	6,000	21,400	-8,000	1,600	10,000
	0,040	3,960	1,000	0,800	1,200	21,400	-8,000	1,520	10,000
	0,000	4,000	0,000	0,000	0,000	21,400	-8,000	1,500	0,000

Tank Calibrations - brine

Fluid Type = Specific gravity = 1,5

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
brine	4,000	0,000	100,000	80,000	120,000	21,400	8,000	3,500	0,000
	3,920	0,080	98,000	78,400	117,600	21,400	8,000	3,460	10,000
	3,916	0,084	97,900	78,320	117,480	21,400	8,000	3,458	10,000
	3,800	0,200	95,000	76,000	114,000	21,400	8,000	3,400	10,000
	3,600	0,400	90,000	72,000	108,000	21,400	8,000	3,300	10,000
	3,400	0,600	85,000	68,000	102,000	21,400	8,000	3,200	10,000
	3,200	0,800	80,000	64,000	96,000	21,400	8,000	3,100	10,000

	3,000	1,000	75,000	60,000	90,000	21,400	8,000	3,000	10,000
	2,800	1,200	70,000	56,000	84,000	21,400	8,000	2,900	10,000
	2,600	1,400	65,000	52,000	78,000	21,400	8,000	2,800	10,000
	2,400	1,600	60,000	48,000	72,000	21,400	8,000	2,700	10,000
	2,200	1,800	55,000	44,000	66,000	21,400	8,000	2,600	10,000
	2,000	2,000	50,000	40,000	60,000	21,400	8,000	2,500	10,000
	1,800	2,200	45,000	36,000	54,000	21,400	8,000	2,400	10,000
	1,600	2,400	40,000	32,000	48,000	21,400	8,000	2,300	10,000
	1,400	2,600	35,000	28,000	42,000	21,400	8,000	2,200	10,000
	1,200	2,800	30,000	24,000	36,000	21,400	8,000	2,100	10,000
	1,000	3,000	25,000	20,000	30,000	21,400	8,000	2,000	10,000
	0,800	3,200	20,000	16,000	24,000	21,400	8,000	1,900	10,000
	0,600	3,400	15,000	12,000	18,000	21,400	8,000	1,800	10,000
	0,400	3,600	10,000	8,000	12,000	21,400	8,000	1,700	10,000
	0,200	3,800	5,000	4,000	6,000	21,400	8,000	1,600	10,000
	0,040	3,960	1,000	0,800	1,200	21,400	8,000	1,520	10,000
	0,000	4,000	0,000	0,000	0,000	21,400	8,000	1,500	0,000

Tank Calibrations - Lodo1

Fluid Type = Specific gravity = 3

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lodo1	4,000	0,000	100,000	158,391	475,174	11,800	-4,500	3,500	0,000
	3,920	0,080	98,000	155,223	465,670	11,800	-4,500	3,460	801,900
	3,916	0,084	97,900	155,065	465,195	11,800	-4,500	3,458	801,900
	3,800	0,200	95,000	150,471	451,414	11,800	-4,500	3,400	801,900
	3,600	0,400	89,999	142,551	427,654	11,800	-4,500	3,300	801,900
	3,400	0,600	84,999	134,631	403,894	11,800	-4,500	3,200	801,900
	3,200	0,800	79,999	126,711	380,134	11,800	-4,500	3,100	801,900

	3,000	1,000	74,999	118,791	356,374	11,800	-4,500	3,000	801,900
	2,800	1,200	69,998	110,871	332,614	11,800	-4,500	2,900	801,900
	2,600	1,400	64,998	102,951	308,854	11,800	-4,500	2,800	801,900
	2,400	1,600	59,998	95,031	285,094	11,800	-4,500	2,700	801,900
	2,200	1,800	54,998	87,111	261,334	11,800	-4,500	2,600	801,900
	2,000	2,000	49,997	79,191	237,574	11,800	-4,500	2,500	801,900
	1,800	2,200	44,997	71,271	213,814	11,800	-4,499	2,400	801,900
	1,600	2,400	39,997	63,351	190,054	11,800	-4,499	2,300	801,900
	1,400	2,600	34,996	55,431	166,294	11,800	-4,499	2,200	801,900
	1,200	2,800	29,996	47,511	142,534	11,800	-4,499	2,100	801,900
	1,000	3,000	24,996	39,591	118,774	11,800	-4,499	2,000	801,900
	0,800	3,200	19,996	31,671	95,014	11,801	-4,499	1,900	801,900
	0,600	3,400	14,995	23,751	71,254	11,801	-4,498	1,800	801,900
	0,400	3,600	9,995	15,831	47,494	11,801	-4,498	1,700	801,900
	0,200	3,800	4,995	7,911	23,734	11,802	-4,495	1,600	801,900
	0,040	3,960	1,000	1,584	4,752	11,808	-4,484	1,520	796,677
	0,000	4,000	0,000	0,000	0,000	11,811	-4,478	1,500	0,000

Tank Calibrations - lodo 1

Fluid Type = Specific gravity = 3

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
lodo 1	4,000	0,000	100,000	158,391	475,174	11,800	4,500	3,500	0,000
	3,920	0,080	98,000	155,223	465,670	11,800	4,500	3,460	801,900
	3,916	0,084	97,900	155,065	465,195	11,800	4,500	3,458	801,900
	3,800	0,200	95,000	150,471	451,414	11,800	4,500	3,400	801,900
	3,600	0,400	89,999	142,551	427,654	11,800	4,500	3,300	801,900
	3,400	0,600	84,999	134,631	403,894	11,800	4,500	3,200	801,900
	3,200	0,800	79,999	126,711	380,134	11,800	4,500	3,100	801,900

	3,000	1,000	74,999	118,791	356,374	11,800	4,500	3,000	801,900
	2,800	1,200	69,998	110,871	332,614	11,800	4,500	2,900	801,900
	2,600	1,400	64,998	102,951	308,854	11,800	4,500	2,800	801,900
	2,400	1,600	59,998	95,031	285,094	11,800	4,500	2,700	801,900
	2,200	1,800	54,998	87,111	261,334	11,800	4,500	2,600	801,900
	2,000	2,000	49,997	79,191	237,574	11,800	4,500	2,500	801,900
	1,800	2,200	44,997	71,271	213,814	11,800	4,499	2,400	801,900
	1,600	2,400	39,997	63,351	190,054	11,800	4,499	2,300	801,900
	1,400	2,600	34,996	55,431	166,294	11,800	4,499	2,200	801,900
	1,200	2,800	29,996	47,511	142,534	11,800	4,499	2,100	801,900
	1,000	3,000	24,996	39,591	118,774	11,800	4,499	2,000	801,900
	0,800	3,200	19,996	31,671	95,014	11,801	4,499	1,900	801,900
	0,600	3,400	14,995	23,751	71,254	11,801	4,498	1,800	801,900
	0,400	3,600	9,995	15,831	47,494	11,801	4,498	1,700	801,900
	0,200	3,800	4,995	7,911	23,734	11,802	4,495	1,600	801,900
	0,040	3,960	1,000	1,584	4,752	11,808	4,484	1,520	796,677
	0,000	4,000	0,000	0,000	0,000	11,811	4,478	1,500	0,000

Tank Calibrations - DO 1BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 1BR	4,000	0,000	100,000	86,400	72,576	30,000	-4,500	3,500	0,000
	3,920	0,080	98,000	84,672	71,124	30,000	-4,500	3,460	122,472
	3,916	0,084	97,900	84,586	71,052	30,000	-4,500	3,458	122,472
	3,800	0,200	95,000	82,080	68,947	30,000	-4,500	3,400	122,472
	3,600	0,400	90,000	77,760	65,318	30,000	-4,500	3,300	122,472
	3,400	0,600	85,000	73,440	61,690	30,000	-4,500	3,200	122,472
	3,200	0,800	80,000	69,120	58,061	30,000	-4,500	3,100	122,472

	3,000	1,000	75,000	64,800	54,432	30,000	-4,500	3,000	122,472
	2,800	1,200	70,000	60,480	50,803	30,000	-4,500	2,900	122,472
	2,600	1,400	65,000	56,160	47,174	30,000	-4,500	2,800	122,472
	2,400	1,600	60,000	51,840	43,546	30,000	-4,500	2,700	122,472
	2,200	1,800	55,000	47,520	39,917	30,000	-4,500	2,600	122,472
	2,000	2,000	50,000	43,200	36,288	30,000	-4,500	2,500	122,472
	1,800	2,200	45,000	38,880	32,659	30,000	-4,500	2,400	122,472
	1,600	2,400	40,000	34,560	29,030	30,000	-4,500	2,300	122,472
	1,400	2,600	35,000	30,240	25,402	30,000	-4,500	2,200	122,472
	1,200	2,800	30,000	25,920	21,773	30,000	-4,500	2,100	122,472
	1,000	3,000	25,000	21,600	18,144	30,000	-4,500	2,000	122,472
	0,800	3,200	20,000	17,280	14,515	30,000	-4,500	1,900	122,472
	0,600	3,400	15,000	12,960	10,886	30,000	-4,500	1,800	122,472
	0,400	3,600	10,000	8,640	7,258	30,000	-4,500	1,700	122,472
	0,200	3,800	5,000	4,320	3,629	30,000	-4,500	1,600	122,472
	0,040	3,960	1,000	0,864	0,726	30,000	-4,500	1,520	122,472
	0,000	4,000	0,000	0,000	0,000	30,000	-4,500	1,500	0,000

Tank Calibrations - DO 1ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 1ER	4,000	0,000	100,000	86,400	72,576	30,000	4,500	3,500	0,000
	3,920	0,080	98,000	84,672	71,124	30,000	4,500	3,460	122,472
	3,916	0,084	97,900	84,586	71,052	30,000	4,500	3,458	122,472
	3,800	0,200	95,000	82,080	68,947	30,000	4,500	3,400	122,472
	3,600	0,400	90,000	77,760	65,318	30,000	4,500	3,300	122,472
	3,400	0,600	85,000	73,440	61,690	30,000	4,500	3,200	122,472
	3,200	0,800	80,000	69,120	58,061	30,000	4,500	3,100	122,472

	3,000	1,000	75,000	64,800	54,432	30,000	4,500	3,000	122,472
	2,800	1,200	70,000	60,480	50,803	30,000	4,500	2,900	122,472
	2,600	1,400	65,000	56,160	47,174	30,000	4,500	2,800	122,472
	2,400	1,600	60,000	51,840	43,546	30,000	4,500	2,700	122,472
	2,200	1,800	55,000	47,520	39,917	30,000	4,500	2,600	122,472
	2,000	2,000	50,000	43,200	36,288	30,000	4,500	2,500	122,472
	1,800	2,200	45,000	38,880	32,659	30,000	4,500	2,400	122,472
	1,600	2,400	40,000	34,560	29,030	30,000	4,500	2,300	122,472
	1,400	2,600	35,000	30,240	25,402	30,000	4,500	2,200	122,472
	1,200	2,800	30,000	25,920	21,773	30,000	4,500	2,100	122,472
	1,000	3,000	25,000	21,600	18,144	30,000	4,500	2,000	122,472
	0,800	3,200	20,000	17,280	14,515	30,000	4,500	1,900	122,472
	0,600	3,400	15,000	12,960	10,886	30,000	4,500	1,800	122,472
	0,400	3,600	10,000	8,640	7,258	30,000	4,500	1,700	122,472
	0,200	3,800	5,000	4,320	3,629	30,000	4,500	1,600	122,472
	0,040	3,960	1,000	0,864	0,726	30,000	4,500	1,520	122,472

	0,000	4,000	0,000	0,000	0,000	30,000	4,500	1,500	0,000

Tank Calibrations - DO 2 BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 2 BR	4,000	0,000	100,000	86,400	72,576	32,400	-4,500	3,500	0,000
	3,920	0,080	98,000	84,672	71,124	32,400	-4,500	3,460	122,472
	3,916	0,084	97,900	84,586	71,052	32,400	-4,500	3,458	122,472
	3,800	0,200	95,000	82,080	68,947	32,400	-4,500	3,400	122,472
	3,600	0,400	90,000	77,760	65,318	32,400	-4,500	3,300	122,472
	3,400	0,600	85,000	73,440	61,690	32,400	-4,500	3,200	122,472

	3,200	0,800	80,000	69,120	58,061	32,400	-4,500	3,100	122,472
	3,000	1,000	75,000	64,800	54,432	32,400	-4,500	3,000	122,472
	2,800	1,200	70,000	60,480	50,803	32,400	-4,500	2,900	122,472
	2,600	1,400	65,000	56,160	47,174	32,400	-4,500	2,800	122,472
	2,400	1,600	60,000	51,840	43,546	32,400	-4,500	2,700	122,472
	2,200	1,800	55,000	47,520	39,917	32,400	-4,500	2,600	122,472
	2,000	2,000	50,000	43,200	36,288	32,400	-4,500	2,500	122,472
	1,800	2,200	45,000	38,880	32,659	32,400	-4,500	2,400	122,472
	1,600	2,400	40,000	34,560	29,030	32,400	-4,500	2,300	122,472
	1,400	2,600	35,000	30,240	25,402	32,400	-4,500	2,200	122,472
	1,200	2,800	30,000	25,920	21,773	32,400	-4,500	2,100	122,472
	1,000	3,000	25,000	21,600	18,144	32,400	-4,500	2,000	122,472
	0,800	3,200	20,000	17,280	14,515	32,400	-4,500	1,900	122,472
	0,600	3,400	15,000	12,960	10,886	32,400	-4,500	1,800	122,472
	0,400	3,600	10,000	8,640	7,258	32,400	-4,500	1,700	122,472
	0,200	3,800	5,000	4,320	3,629	32,400	-4,500	1,600	122,472

	0,040	3,960	1,000	0,864	0,726	32,400	-4,500	1,520	122,472
	0,000	4,000	0,000	0,000	0,000	32,400	-4,500	1,500	0,000

Tank Calibrations - DO 2ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 2ER	4,000	0,000	100,000	86,400	72,576	32,400	4,500	3,500	0,000
	3,920	0,080	98,000	84,672	71,124	32,400	4,500	3,460	122,472
	3,916	0,084	97,900	84,586	71,052	32,400	4,500	3,458	122,472
	3,800	0,200	95,000	82,080	68,947	32,400	4,500	3,400	122,472
	3,600	0,400	90,000	77,760	65,318	32,400	4,500	3,300	122,472

	3,400	0,600	85,000	73,440	61,690	32,400	4,500	3,200	122,472
	3,200	0,800	80,000	69,120	58,061	32,400	4,500	3,100	122,472
	3,000	1,000	75,000	64,800	54,432	32,400	4,500	3,000	122,472
	2,800	1,200	70,000	60,480	50,803	32,400	4,500	2,900	122,472
	2,600	1,400	65,000	56,160	47,174	32,400	4,500	2,800	122,472
	2,400	1,600	60,000	51,840	43,546	32,400	4,500	2,700	122,472
	2,200	1,800	55,000	47,520	39,917	32,400	4,500	2,600	122,472
	2,000	2,000	50,000	43,200	36,288	32,400	4,500	2,500	122,472
	1,800	2,200	45,000	38,880	32,659	32,400	4,500	2,400	122,472
	1,600	2,400	40,000	34,560	29,030	32,400	4,500	2,300	122,472
	1,400	2,600	35,000	30,240	25,402	32,400	4,500	2,200	122,472
	1,200	2,800	30,000	25,920	21,773	32,400	4,500	2,100	122,472
	1,000	3,000	25,000	21,600	18,144	32,400	4,500	2,000	122,472
	0,800	3,200	20,000	17,280	14,515	32,400	4,500	1,900	122,472
	0,600	3,400	15,000	12,960	10,886	32,400	4,500	1,800	122,472
	0,400	3,600	10,000	8,640	7,258	32,400	4,500	1,700	122,472

	0,200	3,800	5,000	4,320	3,629	32,400	4,500	1,600	122,472
	0,040	3,960	1,000	0,864	0,726	32,400	4,500	1,520	122,472
	0,000	4,000	0,000	0,000	0,000	32,400	4,500	1,500	0,000

Tank Calibrations - DO 3 BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 3 BR	4,000	0,000	100,000	86,400	72,576	34,800	-4,500	3,500	0,000
	3,920	0,080	98,000	84,672	71,124	34,800	-4,500	3,460	122,472
	3,916	0,084	97,900	84,586	71,052	34,800	-4,500	3,458	122,472
	3,800	0,200	95,000	82,080	68,947	34,800	-4,500	3,400	122,472

	3,600	0,400	90,000	77,760	65,318	34,800	-4,500	3,300	122,472
	3,400	0,600	85,000	73,440	61,690	34,800	-4,500	3,200	122,472
	3,200	0,800	80,000	69,120	58,061	34,800	-4,500	3,100	122,472
	3,000	1,000	75,000	64,800	54,432	34,800	-4,500	3,000	122,472
	2,800	1,200	70,000	60,480	50,803	34,800	-4,500	2,900	122,472
	2,600	1,400	65,000	56,160	47,174	34,800	-4,500	2,800	122,472
	2,400	1,600	60,000	51,840	43,546	34,800	-4,500	2,700	122,472
	2,200	1,800	55,000	47,520	39,917	34,800	-4,500	2,600	122,472
	2,000	2,000	50,000	43,200	36,288	34,800	-4,500	2,500	122,472
	1,800	2,200	45,000	38,880	32,659	34,800	-4,500	2,400	122,472
	1,600	2,400	40,000	34,560	29,030	34,800	-4,500	2,300	122,472
	1,400	2,600	35,000	30,240	25,402	34,800	-4,500	2,200	122,472
	1,200	2,800	30,000	25,920	21,773	34,800	-4,500	2,100	122,472
	1,000	3,000	25,000	21,600	18,144	34,800	-4,500	2,000	122,472
	0,800	3,200	20,000	17,280	14,515	34,800	-4,500	1,900	122,472
	0,600	3,400	15,000	12,960	10,886	34,800	-4,500	1,800	122,472

	0,400	3,600	10,000	8,640	7,258	34,800	-4,500	1,700	122,472
	0,200	3,800	5,000	4,320	3,629	34,800	-4,500	1,600	122,472
	0,040	3,960	1,000	0,864	0,726	34,800	-4,500	1,520	122,472
	0,000	4,000	0,000	0,000	0,000	34,800	-4,500	1,500	0,000

Tank Calibrations - DO 3ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 3ER	4,000	0,000	100,000	86,400	72,576	34,800	4,500	3,500	0,000
	3,920	0,080	98,000	84,672	71,124	34,800	4,500	3,460	122,472
	3,916	0,084	97,900	84,586	71,052	34,800	4,500	3,458	122,472

	3,800	0,200	95,000	82,080	68,947	34,800	4,500	3,400	122,472
	3,600	0,400	90,000	77,760	65,318	34,800	4,500	3,300	122,472
	3,400	0,600	85,000	73,440	61,690	34,800	4,500	3,200	122,472
	3,200	0,800	80,000	69,120	58,061	34,800	4,500	3,100	122,472
	3,000	1,000	75,000	64,800	54,432	34,800	4,500	3,000	122,472
	2,800	1,200	70,000	60,480	50,803	34,800	4,500	2,900	122,472
	2,600	1,400	65,000	56,160	47,174	34,800	4,500	2,800	122,472
	2,400	1,600	60,000	51,840	43,546	34,800	4,500	2,700	122,472
	2,200	1,800	55,000	47,520	39,917	34,800	4,500	2,600	122,472
	2,000	2,000	50,000	43,200	36,288	34,800	4,500	2,500	122,472
	1,800	2,200	45,000	38,880	32,659	34,800	4,500	2,400	122,472
	1,600	2,400	40,000	34,560	29,030	34,800	4,500	2,300	122,472
	1,400	2,600	35,000	30,240	25,402	34,800	4,500	2,200	122,472
	1,200	2,800	30,000	25,920	21,773	34,800	4,500	2,100	122,472
	1,000	3,000	25,000	21,600	18,144	34,800	4,500	2,000	122,472
	0,800	3,200	20,000	17,280	14,515	34,800	4,500	1,900	122,472

	0,600	3,400	15,000	12,960	10,886	34,800	4,500	1,800	122,472
	0,400	3,600	10,000	8,640	7,258	34,800	4,500	1,700	122,472
	0,200	3,800	5,000	4,320	3,629	34,800	4,500	1,600	122,472
	0,040	3,960	1,000	0,864	0,726	34,800	4,500	1,520	122,472
	0,000	4,000	0,000	0,000	0,000	34,800	4,500	1,500	0,000

Tank Calibrations - DO 4BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 4BR	3,500	0,000	100,000	92,400	77,616	22,200	-8,000	7,250	0,000
	3,430	0,070	98,000	90,552	76,064	22,200	-8,000	7,215	7,392

	3,426	0,074	97,900	90,460	75,986	22,200	-8,000	7,213	7,392
	3,400	0,100	97,143	89,760	75,398	22,200	-8,000	7,200	7,392
	3,200	0,300	91,429	84,480	70,963	22,200	-8,000	7,100	7,392
	3,000	0,500	85,714	79,200	66,528	22,200	-8,000	7,000	7,392
	2,800	0,700	80,000	73,920	62,093	22,200	-8,000	6,900	7,392
	2,600	0,900	74,286	68,640	57,658	22,200	-8,000	6,800	7,392
	2,400	1,100	68,571	63,360	53,222	22,200	-8,000	6,700	7,392
	2,200	1,300	62,857	58,080	48,787	22,200	-8,000	6,600	7,392
	2,000	1,500	57,143	52,800	44,352	22,200	-8,000	6,500	7,392
	1,800	1,700	51,429	47,520	39,917	22,200	-8,000	6,400	7,392
	1,600	1,900	45,714	42,240	35,482	22,200	-8,000	6,300	7,392
	1,400	2,100	40,000	36,960	31,046	22,200	-8,000	6,200	7,392
	1,200	2,300	34,286	31,680	26,611	22,200	-8,000	6,100	7,392
	1,000	2,500	28,571	26,400	22,176	22,200	-8,000	6,000	7,392
	0,800	2,700	22,857	21,120	17,741	22,200	-8,000	5,900	7,392
	0,600	2,900	17,143	15,840	13,306	22,200	-8,000	5,800	7,392

	0,400	3,100	11,429	10,560	8,870	22,200	-8,000	5,700	7,392
	0,200	3,300	5,714	5,280	4,435	22,200	-8,000	5,600	7,392
	0,035	3,465	1,000	0,924	0,776	22,200	-8,000	5,518	7,392
	0,000	3,500	0,000	0,000	0,000	22,200	-8,000	5,500	0,000

Tank Calibrations - DO 4ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 4ER	3,500	0,000	100,000	92,400	77,616	22,200	8,000	7,250	0,000
	3,430	0,070	98,000	90,552	76,064	22,200	8,000	7,215	7,392
	3,426	0,074	97,900	90,460	75,986	22,200	8,000	7,213	7,392

	3,400	0,100	97,143	89,760	75,398	22,200	8,000	7,200	7,392
	3,200	0,300	91,429	84,480	70,963	22,200	8,000	7,100	7,392
	3,000	0,500	85,714	79,200	66,528	22,200	8,000	7,000	7,392
	2,800	0,700	80,000	73,920	62,093	22,200	8,000	6,900	7,392
	2,600	0,900	74,286	68,640	57,658	22,200	8,000	6,800	7,392
	2,400	1,100	68,571	63,360	53,222	22,200	8,000	6,700	7,392
	2,200	1,300	62,857	58,080	48,787	22,200	8,000	6,600	7,392
	2,000	1,500	57,143	52,800	44,352	22,200	8,000	6,500	7,392
	1,800	1,700	51,429	47,520	39,917	22,200	8,000	6,400	7,392
	1,600	1,900	45,714	42,240	35,482	22,200	8,000	6,300	7,392
	1,400	2,100	40,000	36,960	31,046	22,200	8,000	6,200	7,392
	1,200	2,300	34,286	31,680	26,611	22,200	8,000	6,100	7,392
	1,000	2,500	28,571	26,400	22,176	22,200	8,000	6,000	7,392
	0,800	2,700	22,857	21,120	17,741	22,200	8,000	5,900	7,392
	0,600	2,900	17,143	15,840	13,306	22,200	8,000	5,800	7,392
	0,400	3,100	11,429	10,560	8,870	22,200	8,000	5,700	7,392

	0,200	3,300	5,714	5,280	4,435	22,200	8,000	5,600	7,392
	0,035	3,465	1,000	0,924	0,776	22,200	8,000	5,518	7,392
	0,000	3,500	0,000	0,000	0,000	22,200	8,000	5,500	0,000

Tank Calibrations - DO 5 BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
DO 5 BR	3,500	0,000	100,000	75,600	63,504	30,000	-4,500	7,250	0,000
	3,430	0,070	98,000	74,088	62,234	30,000	-4,500	7,215	122,472
	3,426	0,074	97,900	74,012	62,170	30,000	-4,500	7,213	122,472
	3,400	0,100	97,143	73,440	61,690	30,000	-4,500	7,200	122,472

	3,200	0,300	91,429	69,120	58,061	30,000	-4,500	7,100	122,472
	3,000	0,500	85,714	64,800	54,432	30,000	-4,500	7,000	122,472
	2,800	0,700	80,000	60,480	50,803	30,000	-4,500	6,900	122,472
	2,600	0,900	74,286	56,160	47,174	30,000	-4,500	6,800	122,472
	2,400	1,100	68,571	51,840	43,546	30,000	-4,500	6,700	122,472
	2,200	1,300	62,857	47,520	39,917	30,000	-4,500	6,600	122,472
	2,000	1,500	57,143	43,200	36,288	30,000	-4,500	6,500	122,472
	1,800	1,700	51,429	38,880	32,659	30,000	-4,500	6,400	122,472
	1,600	1,900	45,714	34,560	29,030	30,000	-4,500	6,300	122,472
	1,400	2,100	40,000	30,240	25,402	30,000	-4,500	6,200	122,472
	1,200	2,300	34,286	25,920	21,773	30,000	-4,500	6,100	122,472
	1,000	2,500	28,571	21,600	18,144	30,000	-4,500	6,000	122,472
	0,800	2,700	22,857	17,280	14,515	30,000	-4,500	5,900	122,472
	0,600	2,900	17,143	12,960	10,886	30,000	-4,500	5,800	122,472
	0,400	3,100	11,429	8,640	7,258	30,000	-4,500	5,700	122,472
	0,200	3,300	5,714	4,320	3,629	30,000	-4,500	5,600	122,472

	0,035	3,465	1,000	0,756	0,635	30,000	-4,500	5,518	122,472
	0,000	3,500	0,000	0,000	0,000	30,000	-4,500	5,500	0,000

Tank Calibrations - DO 5ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 5ER	3,500	0,000	100,000	75,600	63,504	30,000	4,500	7,250	0,000
	3,430	0,070	98,000	74,088	62,234	30,000	4,500	7,215	122,472
	3,426	0,074	97,900	74,012	62,170	30,000	4,500	7,213	122,472
	3,400	0,100	97,143	73,440	61,690	30,000	4,500	7,200	122,472
	3,200	0,300	91,429	69,120	58,061	30,000	4,500	7,100	122,472

	3,000	0,500	85,714	64,800	54,432	30,000	4,500	7,000	122,472
	2,800	0,700	80,000	60,480	50,803	30,000	4,500	6,900	122,472
	2,600	0,900	74,286	56,160	47,174	30,000	4,500	6,800	122,472
	2,400	1,100	68,571	51,840	43,546	30,000	4,500	6,700	122,472
	2,200	1,300	62,857	47,520	39,917	30,000	4,500	6,600	122,472
	2,000	1,500	57,143	43,200	36,288	30,000	4,500	6,500	122,472
	1,800	1,700	51,429	38,880	32,659	30,000	4,500	6,400	122,472
	1,600	1,900	45,714	34,560	29,030	30,000	4,500	6,300	122,472
	1,400	2,100	40,000	30,240	25,402	30,000	4,500	6,200	122,472
	1,200	2,300	34,286	25,920	21,773	30,000	4,500	6,100	122,472
	1,000	2,500	28,571	21,600	18,144	30,000	4,500	6,000	122,472
	0,800	2,700	22,857	17,280	14,515	30,000	4,500	5,900	122,472
	0,600	2,900	17,143	12,960	10,886	30,000	4,500	5,800	122,472
	0,400	3,100	11,429	8,640	7,258	30,000	4,500	5,700	122,472
	0,200	3,300	5,714	4,320	3,629	30,000	4,500	5,600	122,472
	0,035	3,465	1,000	0,756	0,635	30,000	4,500	5,518	122,472

	0,000	3,500	0,000	0,000	0,000	30,000	4,500	5,500	0,000

Tank Calibrations - DO 6BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 6BR	3,500	0,000	100,000	50,400	42,336	32,400	-3,000	7,250	0,000
	3,430	0,070	98,000	49,392	41,489	32,400	-3,000	7,215	36,288
	3,426	0,074	97,900	49,342	41,447	32,400	-3,000	7,213	36,288
	3,400	0,100	97,143	48,960	41,126	32,400	-3,000	7,200	36,288
	3,200	0,300	91,429	46,080	38,707	32,400	-3,000	7,100	36,288
	3,000	0,500	85,714	43,200	36,288	32,400	-3,000	7,000	36,288

	2,800	0,700	80,000	40,320	33,869	32,400	-3,000	6,900	36,288
	2,600	0,900	74,286	37,440	31,450	32,400	-3,000	6,800	36,288
	2,400	1,100	68,571	34,560	29,030	32,400	-3,000	6,700	36,288
	2,200	1,300	62,857	31,680	26,611	32,400	-3,000	6,600	36,288
	2,000	1,500	57,143	28,800	24,192	32,400	-3,000	6,500	36,288
	1,800	1,700	51,429	25,920	21,773	32,400	-3,000	6,400	36,288
	1,600	1,900	45,714	23,040	19,354	32,400	-3,000	6,300	36,288
	1,400	2,100	40,000	20,160	16,934	32,400	-3,000	6,200	36,288
	1,200	2,300	34,286	17,280	14,515	32,400	-3,000	6,100	36,288
	1,000	2,500	28,571	14,400	12,096	32,400	-3,000	6,000	36,288
	0,800	2,700	22,857	11,520	9,677	32,400	-3,000	5,900	36,288
	0,600	2,900	17,143	8,640	7,258	32,400	-3,000	5,800	36,288
	0,400	3,100	11,429	5,760	4,838	32,400	-3,000	5,700	36,288
	0,200	3,300	5,714	2,880	2,419	32,400	-3,000	5,600	36,288
	0,035	3,465	1,000	0,504	0,423	32,400	-3,000	5,518	36,288
	0,000	3,500	0,000	0,000	0,000	32,400	-3,000	5,500	0,000

Tank Calibrations - DO 6ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
DO 6ER	3,500	0,000	100,000	50,400	42,336	32,400	3,000	7,250	0,000
	3,430	0,070	98,000	49,392	41,489	32,400	3,000	7,215	36,288
	3,426	0,074	97,900	49,342	41,447	32,400	3,000	7,213	36,288
	3,400	0,100	97,143	48,960	41,126	32,400	3,000	7,200	36,288
	3,200	0,300	91,429	46,080	38,707	32,400	3,000	7,100	36,288
	3,000	0,500	85,714	43,200	36,288	32,400	3,000	7,000	36,288
	2,800	0,700	80,000	40,320	33,869	32,400	3,000	6,900	36,288

	2,600	0,900	74,286	37,440	31,450	32,400	3,000	6,800	36,288
	2,400	1,100	68,571	34,560	29,030	32,400	3,000	6,700	36,288
	2,200	1,300	62,857	31,680	26,611	32,400	3,000	6,600	36,288
	2,000	1,500	57,143	28,800	24,192	32,400	3,000	6,500	36,288
	1,800	1,700	51,429	25,920	21,773	32,400	3,000	6,400	36,288
	1,600	1,900	45,714	23,040	19,354	32,400	3,000	6,300	36,288
	1,400	2,100	40,000	20,160	16,934	32,400	3,000	6,200	36,288
	1,200	2,300	34,286	17,280	14,515	32,400	3,000	6,100	36,288
	1,000	2,500	28,571	14,400	12,096	32,400	3,000	6,000	36,288
	0,800	2,700	22,857	11,520	9,677	32,400	3,000	5,900	36,288
	0,600	2,900	17,143	8,640	7,258	32,400	3,000	5,800	36,288
	0,400	3,100	11,429	5,760	4,838	32,400	3,000	5,700	36,288
	0,200	3,300	5,714	2,880	2,419	32,400	3,000	5,600	36,288
	0,035	3,465	1,000	0,504	0,423	32,400	3,000	5,518	36,288
	0,000	3,500	0,000	0,000	0,000	32,400	3,000	5,500	0,000

Tank Calibrations - UD BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
UD BR	3,500	0,000	100,000	50,400	42,336	34,800	-3,000	7,250	0,000
	3,430	0,070	98,000	49,392	41,489	34,800	-3,000	7,215	36,288
	3,426	0,074	97,900	49,342	41,447	34,800	-3,000	7,213	36,288
	3,400	0,100	97,143	48,960	41,126	34,800	-3,000	7,200	36,288
	3,200	0,300	91,429	46,080	38,707	34,800	-3,000	7,100	36,288
	3,000	0,500	85,714	43,200	36,288	34,800	-3,000	7,000	36,288
	2,800	0,700	80,000	40,320	33,869	34,800	-3,000	6,900	36,288
	2,600	0,900	74,286	37,440	31,450	34,800	-3,000	6,800	36,288

	2,400	1,100	68,571	34,560	29,030	34,800	-3,000	6,700	36,288
	2,200	1,300	62,857	31,680	26,611	34,800	-3,000	6,600	36,288
	2,000	1,500	57,143	28,800	24,192	34,800	-3,000	6,500	36,288
	1,800	1,700	51,429	25,920	21,773	34,800	-3,000	6,400	36,288
	1,600	1,900	45,714	23,040	19,354	34,800	-3,000	6,300	36,288
	1,400	2,100	40,000	20,160	16,934	34,800	-3,000	6,200	36,288
	1,200	2,300	34,286	17,280	14,515	34,800	-3,000	6,100	36,288
	1,000	2,500	28,571	14,400	12,096	34,800	-3,000	6,000	36,288
	0,800	2,700	22,857	11,520	9,677	34,800	-3,000	5,900	36,288
	0,600	2,900	17,143	8,640	7,258	34,800	-3,000	5,800	36,288
	0,400	3,100	11,429	5,760	4,838	34,800	-3,000	5,700	36,288
	0,200	3,300	5,714	2,880	2,419	34,800	-3,000	5,600	36,288
	0,035	3,465	1,000	0,504	0,423	34,800	-3,000	5,518	36,288
	0,000	3,500	0,000	0,000	0,000	34,800	-3,000	5,500	0,000

Tank Calibrations - UD ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
UD ER	3,500	0,000	100,000	50,400	42,336	34,800	3,000	7,250	0,000
	3,430	0,070	98,000	49,392	41,489	34,800	3,000	7,215	36,288
	3,426	0,074	97,900	49,342	41,447	34,800	3,000	7,213	36,288
	3,400	0,100	97,143	48,960	41,126	34,800	3,000	7,200	36,288
	3,200	0,300	91,429	46,080	38,707	34,800	3,000	7,100	36,288
	3,000	0,500	85,714	43,200	36,288	34,800	3,000	7,000	36,288
	2,800	0,700	80,000	40,320	33,869	34,800	3,000	6,900	36,288
	2,600	0,900	74,286	37,440	31,450	34,800	3,000	6,800	36,288
	2,400	1,100	68,571	34,560	29,030	34,800	3,000	6,700	36,288

	2,200	1,300	62,857	31,680	26,611	34,800	3,000	6,600	36,288
	2,000	1,500	57,143	28,800	24,192	34,800	3,000	6,500	36,288
	1,800	1,700	51,429	25,920	21,773	34,800	3,000	6,400	36,288
	1,600	1,900	45,714	23,040	19,354	34,800	3,000	6,300	36,288
	1,400	2,100	40,000	20,160	16,934	34,800	3,000	6,200	36,288
	1,200	2,300	34,286	17,280	14,515	34,800	3,000	6,100	36,288
	1,000	2,500	28,571	14,400	12,096	34,800	3,000	6,000	36,288
	0,800	2,700	22,857	11,520	9,677	34,800	3,000	5,900	36,288
	0,600	2,900	17,143	8,640	7,258	34,800	3,000	5,800	36,288
	0,400	3,100	11,429	5,760	4,838	34,800	3,000	5,700	36,288
	0,200	3,300	5,714	2,880	2,419	34,800	3,000	5,600	36,288
	0,035	3,465	1,000	0,504	0,423	34,800	3,000	5,518	36,288
	0,000	3,500	0,000	0,000	0,000	34,800	3,000	5,500	0,000

Tank Calibrations - SED BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
SED BR	3,500	0,000	100,000	50,400	42,336	33,600	-7,500	7,250	0,000
	3,430	0,070	98,000	49,392	41,489	33,600	-7,500	7,215	9,072
	3,426	0,074	97,900	49,342	41,447	33,600	-7,500	7,213	9,072
	3,400	0,100	97,143	48,960	41,126	33,600	-7,500	7,200	9,072
	3,200	0,300	91,429	46,080	38,707	33,600	-7,500	7,100	9,072
	3,000	0,500	85,714	43,200	36,288	33,600	-7,500	7,000	9,072
	2,800	0,700	80,000	40,320	33,869	33,600	-7,500	6,900	9,072
	2,600	0,900	74,286	37,440	31,450	33,600	-7,500	6,800	9,072
	2,400	1,100	68,571	34,560	29,030	33,600	-7,500	6,700	9,072
	2,200	1,300	62,857	31,680	26,611	33,600	-7,500	6,600	9,072

	2,000	1,500	57,143	28,800	24,192	33,600	-7,500	6,500	9,072
	1,800	1,700	51,429	25,920	21,773	33,600	-7,500	6,400	9,072
	1,600	1,900	45,714	23,040	19,354	33,600	-7,500	6,300	9,072
	1,400	2,100	40,000	20,160	16,934	33,600	-7,500	6,200	9,072
	1,200	2,300	34,286	17,280	14,515	33,600	-7,500	6,100	9,072
	1,000	2,500	28,571	14,400	12,096	33,600	-7,500	6,000	9,072
	0,800	2,700	22,857	11,520	9,677	33,600	-7,500	5,900	9,072
	0,600	2,900	17,143	8,640	7,258	33,600	-7,500	5,800	9,072
	0,400	3,100	11,429	5,760	4,838	33,600	-7,500	5,700	9,072
	0,200	3,300	5,714	2,880	2,419	33,600	-7,500	5,600	9,072
	0,035	3,465	1,000	0,504	0,423	33,600	-7,500	5,518	9,072
	0,000	3,500	0,000	0,000	0,000	33,600	-7,500	5,500	0,000

Tank Calibrations - SED ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
SED ER	3,500	0,000	100,000	50,400	42,336	33,600	7,500	7,250	0,000
	3,430	0,070	98,000	49,392	41,489	33,600	7,500	7,215	9,072
	3,426	0,074	97,900	49,342	41,447	33,600	7,500	7,213	9,072
	3,400	0,100	97,143	48,960	41,126	33,600	7,500	7,200	9,072
	3,200	0,300	91,429	46,080	38,707	33,600	7,500	7,100	9,072
	3,000	0,500	85,714	43,200	36,288	33,600	7,500	7,000	9,072
	2,800	0,700	80,000	40,320	33,869	33,600	7,500	6,900	9,072
	2,600	0,900	74,286	37,440	31,450	33,600	7,500	6,800	9,072
	2,400	1,100	68,571	34,560	29,030	33,600	7,500	6,700	9,072
	2,200	1,300	62,857	31,680	26,611	33,600	7,500	6,600	9,072
	2,000	1,500	57,143	28,800	24,192	33,600	7,500	6,500	9,072
	1,800	1,700	51,429	25,920	21,773	33,600	7,500	6,400	9,072

	1,600	1,900	45,714	23,040	19,354	33,600	7,500	6,300	9,072
	1,400	2,100	40,000	20,160	16,934	33,600	7,500	6,200	9,072
	1,200	2,300	34,286	17,280	14,515	33,600	7,500	6,100	9,072
	1,000	2,500	28,571	14,400	12,096	33,600	7,500	6,000	9,072
	0,800	2,700	22,857	11,520	9,677	33,600	7,500	5,900	9,072
	0,600	2,900	17,143	8,640	7,258	33,600	7,500	5,800	9,072
	0,400	3,100	11,429	5,760	4,838	33,600	7,500	5,700	9,072
	0,200	3,300	5,714	2,880	2,419	33,600	7,500	5,600	9,072
	0,035	3,465	1,000	0,504	0,423	33,600	7,500	5,518	9,072
	0,000	3,500	0,000	0,000	0,000	33,600	7,500	5,500	0,000

Tank Calibrations - c1

Fluid Type = Specific gravity = 1,86

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
c1	7,500	0,000	100,000	146,475	272,443	18,850	3,000	5,250	0,000
	7,350	0,150	98,000	143,545	266,994	18,850	3,000	5,175	57,049
	7,343	0,157	97,900	143,399	266,721	18,850	3,000	5,171	57,049
	7,000	0,500	93,333	136,710	254,280	18,850	3,000	5,000	57,049
	6,500	1,000	86,667	126,945	236,117	18,850	3,000	4,750	57,049
	6,000	1,500	80,000	117,180	217,954	18,850	3,000	4,500	57,049
	5,500	2,000	73,333	107,415	199,791	18,850	3,000	4,250	57,049
	5,000	2,500	66,667	97,650	181,628	18,850	3,000	4,000	57,049
	4,500	3,000	60,000	87,885	163,466	18,850	3,000	3,750	57,049
	4,000	3,500	53,333	78,120	145,303	18,850	3,000	3,500	57,049
	3,500	4,000	46,667	68,355	127,140	18,850	3,000	3,250	57,049
	3,000	4,500	40,000	58,590	108,977	18,850	3,000	3,000	57,049
	2,500	5,000	33,333	48,825	90,814	18,850	3,000	2,750	57,049
	2,000	5,500	26,667	39,060	72,651	18,850	3,000	2,500	57,049

	1,500	6,000	20,000	29,295	54,489	18,850	3,000	2,250	57,049
	1,000	6,500	13,333	19,530	36,326	18,850	3,000	2,000	57,049
	0,500	7,000	6,667	9,765	18,163	18,850	3,000	1,750	57,049
	0,075	7,425	1,000	1,465	2,724	18,850	3,000	1,538	57,049
	0,000	7,500	0,000	0,000	0,000	18,850	3,000	1,500	0,000

Tank Calibrations - c2

Fluid Type = Specific gravity = 1,86

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
c2	7,500	0,000	100,000	146,762	272,977	24,349	3,000	5,250	0,000
	7,350	0,150	98,000	143,827	267,518	24,349	3,000	5,175	57,042

	7,343	0,157	97,900	143,680	267,245	24,349	3,000	5,171	57,042
	7,000	0,500	93,333	136,978	254,779	24,349	3,000	5,000	57,042
	6,500	1,000	86,667	127,194	236,580	24,349	3,000	4,750	57,042
	6,000	1,500	80,000	117,410	218,382	24,349	3,000	4,500	57,042
	5,500	2,000	73,333	107,625	200,183	24,349	3,000	4,250	57,042
	5,000	2,500	66,667	97,841	181,985	24,349	3,000	4,000	57,042
	4,500	3,000	60,000	88,057	163,786	24,349	3,000	3,750	57,042
	4,000	3,500	53,333	78,273	145,588	24,349	3,000	3,500	57,042
	3,500	4,000	46,667	68,489	127,389	24,349	3,000	3,250	57,042
	3,000	4,500	40,000	58,705	109,191	24,349	3,000	3,000	57,042
	2,500	5,000	33,333	48,921	90,992	24,349	3,000	2,750	57,042
	2,000	5,500	26,667	39,137	72,794	24,349	3,000	2,500	57,042
	1,500	6,000	20,000	29,352	54,595	24,349	3,000	2,250	57,042
	1,000	6,500	13,333	19,568	36,397	24,349	3,000	2,000	57,042
	0,500	7,000	6,667	9,784	18,198	24,349	3,000	1,750	57,042
	0,075	7,425	1,000	1,468	2,730	24,349	3,000	1,537	57,042

	0,000	7,500	0,000	0,000	0,000	24,349	3,000	1,500	0,000

Tank Calibrations - c3

Fluid Type = Specific gravity = 1,86

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
c3	7,500	0,000	100,000	146,475	272,443	18,850	-3,000	5,250	0,000
	7,350	0,150	98,000	143,545	266,994	18,850	-3,000	5,175	57,049
	7,343	0,157	97,900	143,399	266,721	18,850	-3,000	5,171	57,049
	7,000	0,500	93,333	136,710	254,280	18,850	-3,000	5,000	57,049
	6,500	1,000	86,667	126,945	236,117	18,850	-3,000	4,750	57,049
	6,000	1,500	80,000	117,180	217,954	18,850	-3,000	4,500	57,049

	5,500	2,000	73,333	107,415	199,791	18,850	-3,000	4,250	57,049
	5,000	2,500	66,667	97,650	181,628	18,850	-3,000	4,000	57,049
	4,500	3,000	60,000	87,885	163,466	18,850	-3,000	3,750	57,049
	4,000	3,500	53,333	78,120	145,303	18,850	-3,000	3,500	57,049
	3,500	4,000	46,667	68,355	127,140	18,850	-3,000	3,250	57,049
	3,000	4,500	40,000	58,590	108,977	18,850	-3,000	3,000	57,049
	2,500	5,000	33,333	48,825	90,814	18,850	-3,000	2,750	57,049
	2,000	5,500	26,667	39,060	72,651	18,850	-3,000	2,500	57,049
	1,500	6,000	20,000	29,295	54,489	18,850	-3,000	2,250	57,049
	1,000	6,500	13,333	19,530	36,326	18,850	-3,000	2,000	57,049
	0,500	7,000	6,667	9,765	18,163	18,850	-3,000	1,750	57,049
	0,075	7,425	1,000	1,465	2,724	18,850	-3,000	1,538	57,049
	0,000	7,500	0,000	0,000	0,000	18,850	-3,000	1,500	0,000

Tank Calibrations - c4

Fluid Type = Specific gravity = 1,86

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
c4	7,500	0,000	100,000	146,762	272,977	24,349	-3,000	5,250	0,000
	7,350	0,150	98,000	143,827	267,518	24,349	-3,000	5,175	57,042
	7,343	0,157	97,900	143,680	267,245	24,349	-3,000	5,171	57,042
	7,000	0,500	93,333	136,978	254,779	24,349	-3,000	5,000	57,042
	6,500	1,000	86,667	127,194	236,580	24,349	-3,000	4,750	57,042
	6,000	1,500	80,000	117,410	218,382	24,349	-3,000	4,500	57,042
	5,500	2,000	73,333	107,625	200,183	24,349	-3,000	4,250	57,042
	5,000	2,500	66,667	97,841	181,985	24,349	-3,000	4,000	57,042
	4,500	3,000	60,000	88,057	163,786	24,349	-3,000	3,750	57,042
	4,000	3,500	53,333	78,273	145,588	24,349	-3,000	3,500	57,042

	3,500	4,000	46,667	68,489	127,389	24,349	-3,000	3,250	57,042
	3,000	4,500	40,000	58,705	109,191	24,349	-3,000	3,000	57,042
	2,500	5,000	33,333	48,921	90,992	24,349	-3,000	2,750	57,042
	2,000	5,500	26,667	39,137	72,794	24,349	-3,000	2,500	57,042
	1,500	6,000	20,000	29,352	54,595	24,349	-3,000	2,250	57,042
	1,000	6,500	13,333	19,568	36,397	24,349	-3,000	2,000	57,042
	0,500	7,000	6,667	9,784	18,198	24,349	-3,000	1,750	57,042
	0,075	7,425	1,000	1,468	2,730	24,349	-3,000	1,538	57,042
	0,000	7,500	0,000	0,000	0,000	24,349	-3,000	1,500	0,000

Tank Calibrations - Agua perforacion

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Agua perforacion	4,000	0,000	100,000	145,258	145,258	7,370	-4,472	3,793	0,000
	3,933	0,067	98,000	142,353	142,353	7,373	-4,472	3,759	291,600
	3,929	0,071	97,900	142,207	142,207	7,373	-4,472	3,757	291,600
	3,800	0,200	94,052	136,618	136,618	7,380	-4,470	3,692	291,600
	3,600	0,400	88,104	127,978	127,978	7,393	-4,468	3,590	291,600
	3,400	0,600	82,156	119,338	119,338	7,406	-4,466	3,488	291,600
	3,200	0,800	76,208	110,698	110,698	7,423	-4,463	3,385	291,600
	3,000	1,000	70,260	102,058	102,058	7,441	-4,460	3,282	291,600
	2,800	1,200	64,312	93,418	93,418	7,464	-4,457	3,179	291,600
	2,600	1,400	58,364	84,778	84,778	7,491	-4,452	3,075	291,600
	2,400	1,600	52,416	76,138	76,138	7,524	-4,447	2,970	291,600
	2,200	1,800	46,468	67,498	67,498	7,565	-4,440	2,864	291,600
	2,000	2,000	40,520	58,858	58,858	7,619	-4,431	2,756	291,600
	1,800	2,200	34,572	50,218	50,218	7,691	-4,419	2,645	291,600
	1,600	2,400	28,623	41,578	41,578	7,793	-4,403	2,529	291,600

	1,400	2,600	22,686	32,953	32,953	7,947	-4,379	2,406	286,597
	1,200	2,800	17,041	24,754	24,754	8,155	-4,358	2,275	252,670
	1,000	3,000	12,156	17,658	17,658	8,370	-4,332	2,143	216,912
	0,800	3,200	8,072	11,726	11,726	8,586	-4,295	2,012	175,981
	0,600	3,400	4,797	6,969	6,969	8,805	-4,238	1,880	134,640
	0,400	3,600	2,348	3,411	3,411	9,024	-4,141	1,749	92,758
	0,240	3,760	1,000	1,453	1,453	9,197	-3,994	1,645	59,641
	0,200	3,800	0,744	1,080	1,080	9,241	-3,942	1,619	50,131
	0,000	4,000	0,000	0,000	0,000	9,451	-3,646	1,500	0,000

Tank Calibrations - agua perforacion

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
agua perforacion	4,000	0,000	100,000	145,258	145,258	7,370	4,472	3,793	0,000
	3,933	0,067	98,000	142,353	142,353	7,373	4,472	3,759	291,600
	3,929	0,071	97,900	142,207	142,207	7,373	4,472	3,757	291,600
	3,800	0,200	94,052	136,618	136,618	7,380	4,470	3,692	291,600
	3,600	0,400	88,104	127,978	127,978	7,393	4,468	3,590	291,600
	3,400	0,600	82,156	119,338	119,338	7,406	4,466	3,488	291,600
	3,200	0,800	76,208	110,698	110,698	7,423	4,463	3,385	291,600
	3,000	1,000	70,260	102,058	102,058	7,441	4,460	3,282	291,600
	2,800	1,200	64,312	93,418	93,418	7,464	4,457	3,179	291,600
	2,600	1,400	58,364	84,778	84,778	7,491	4,452	3,075	291,600
	2,400	1,600	52,416	76,138	76,138	7,524	4,447	2,970	291,600
	2,200	1,800	46,468	67,498	67,498	7,565	4,440	2,864	291,600
	2,000	2,000	40,520	58,858	58,858	7,619	4,431	2,756	291,600
	1,800	2,200	34,572	50,218	50,218	7,691	4,419	2,645	291,600

	1,600	2,400	28,623	41,578	41,578	7,793	4,403	2,529	291,600
	1,400	2,600	22,686	32,953	32,953	7,947	4,379	2,406	286,597
	1,200	2,800	17,041	24,754	24,754	8,155	4,358	2,275	252,670
	1,000	3,000	12,156	17,658	17,658	8,370	4,332	2,143	216,912
	0,800	3,200	8,072	11,726	11,726	8,586	4,295	2,012	175,981
	0,600	3,400	4,797	6,969	6,969	8,805	4,238	1,880	134,640
	0,400	3,600	2,348	3,411	3,411	9,024	4,141	1,749	92,758
	0,240	3,760	1,000	1,453	1,453	9,197	3,994	1,645	59,641
	0,200	3,800	0,744	1,080	1,080	9,241	3,942	1,619	50,131
	0,000	4,000	0,000	0,000	0,000	9,451	3,646	1,500	0,000

Tank Calibrations - Agua perforacion

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Agua perforacion	1,483	0,000	100,000	222,081	227,633	20,597	-4,755	0,859	0,000
	1,460	0,023	98,000	217,639	223,080	20,626	-4,751	0,847	1635,787
	1,458	0,024	97,900	217,417	222,852	20,627	-4,750	0,846	1635,551
	1,400	0,083	92,862	206,229	211,385	20,701	-4,739	0,813	1615,533
	1,300	0,183	84,379	187,388	192,073	20,830	-4,717	0,758	1573,867
	1,200	0,283	76,076	168,950	173,174	20,964	-4,692	0,702	1532,397
	1,100	0,383	67,960	150,926	154,699	21,104	-4,663	0,646	1491,098
	1,000	0,483	60,039	133,335	136,668	21,251	-4,629	0,591	1447,234
	0,900	0,583	52,323	116,199	119,104	21,408	-4,589	0,535	1397,035
	0,800	0,683	44,828	99,554	102,043	21,576	-4,540	0,480	1340,579
	0,700	0,783	37,569	83,434	85,520	21,762	-4,479	0,424	1274,677
	0,600	0,883	30,576	67,903	69,601	21,969	-4,404	0,368	1205,878
	0,500	0,983	23,884	53,042	54,368	22,208	-4,306	0,312	1117,039
	0,400	1,083	17,550	38,976	39,950	22,499	-4,176	0,256	1003,468

	0,300	1,183	11,662	25,899	26,547	22,878	-3,991	0,199	861,729
	0,200	1,283	6,379	14,167	14,521	23,443	-3,703	0,142	665,363
	0,100	1,383	2,056	4,566	4,680	24,568	-3,160	0,082	372,615
	0,067	1,415	1,000	2,221	2,276	25,311	-2,842	0,062	241,029
	0,000	1,483	0,000	0,000	0,000	28,752	-0,226	0,017	0,000

Tank Calibrations - agua perforacion

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
agua perforacion	1,483	0,000	100,000	222,081	227,633	20,597	4,755	0,859	0,000
	1,460	0,023	98,000	217,639	223,080	20,626	4,751	0,847	1635,787

	1,458	0,024	97,900	217,417	222,852	20,627	4,750	0,846	1635,551
	1,400	0,083	92,862	206,229	211,385	20,701	4,739	0,813	1615,533
	1,300	0,183	84,379	187,388	192,073	20,830	4,717	0,758	1573,867
	1,200	0,283	76,076	168,950	173,174	20,964	4,692	0,702	1532,397
	1,100	0,383	67,960	150,926	154,699	21,104	4,663	0,646	1491,098
	1,000	0,483	60,039	133,335	136,668	21,251	4,629	0,591	1447,234
	0,900	0,583	52,323	116,199	119,104	21,408	4,589	0,535	1397,035
	0,800	0,683	44,828	99,554	102,043	21,576	4,540	0,480	1340,579
	0,700	0,783	37,569	83,434	85,520	21,762	4,479	0,424	1274,677
	0,600	0,883	30,576	67,903	69,601	21,969	4,404	0,368	1205,878
	0,500	0,983	23,884	53,042	54,368	22,208	4,306	0,312	1117,039
	0,400	1,083	17,550	38,976	39,950	22,499	4,176	0,256	1003,468
	0,300	1,183	11,662	25,899	26,547	22,878	3,991	0,199	861,729
	0,200	1,283	6,379	14,167	14,521	23,443	3,703	0,142	665,363
	0,100	1,383	2,056	4,566	4,680	24,568	3,160	0,082	372,615
	0,067	1,415	1,000	2,221	2,276	25,311	2,842	0,062	241,029

	0,000	1,483	0,000	0,000	0,000	28,752	0,226	0,017	0,000

Tank Calibrations - Lastre 1 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 1 BR	1,496	0,000	100,000	101,127	103,655	32,398	-4,769	0,789	0,000
	1,468	0,028	98,000	99,104	101,582	32,398	-4,764	0,774	622,934
	1,467	0,029	97,900	99,003	101,478	32,398	-4,764	0,774	622,904
	1,400	0,096	93,115	94,164	96,518	32,398	-4,751	0,739	621,394
	1,300	0,196	85,975	86,944	89,118	32,398	-4,729	0,688	618,678
	1,200	0,296	78,848	79,736	81,730	32,399	-4,704	0,637	615,304

	1,100	0,396	71,735	72,543	74,356	32,399	-4,675	0,586	611,175
	1,000	0,496	64,639	65,367	67,002	32,399	-4,641	0,535	606,096
	0,900	0,596	57,566	58,215	59,670	32,400	-4,601	0,483	599,658
	0,800	0,696	50,522	51,091	52,368	32,401	-4,553	0,432	591,227
	0,700	0,796	43,516	44,007	45,107	32,402	-4,494	0,380	579,950
	0,600	0,896	36,564	36,976	37,900	32,403	-4,420	0,328	564,549
	0,500	0,996	29,686	30,021	30,771	32,405	-4,325	0,276	543,073
	0,400	1,096	22,917	23,175	23,755	32,408	-4,198	0,223	512,375
	0,300	1,196	16,312	16,495	16,908	32,414	-4,020	0,170	466,980
	0,200	1,296	9,973	10,085	10,337	32,427	-3,744	0,116	396,123
	0,100	1,396	4,128	4,175	4,279	32,475	-3,227	0,062	273,905
	0,037	1,460	1,000	1,011	1,037	32,691	-2,420	0,027	126,634
	0,000	1,496	0,000	0,000	0,000	35,949	-0,139	0,004	0,000

Tank Calibrations - Lastre 1 eR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 1 eR	1,496	0,000	100,000	101,127	103,655	32,398	4,769	0,789	0,000
	1,468	0,028	98,000	99,104	101,582	32,398	4,764	0,774	622,934
	1,467	0,029	97,900	99,003	101,478	32,398	4,764	0,774	622,904
	1,400	0,096	93,115	94,164	96,518	32,398	4,751	0,739	621,394
	1,300	0,196	85,975	86,944	89,118	32,398	4,729	0,688	618,678
	1,200	0,296	78,848	79,736	81,730	32,399	4,704	0,637	615,304
	1,100	0,396	71,735	72,543	74,356	32,399	4,675	0,586	611,175
	1,000	0,496	64,639	65,367	67,002	32,399	4,641	0,535	606,096
	0,900	0,596	57,566	58,215	59,670	32,400	4,601	0,483	599,658
	0,800	0,696	50,522	51,091	52,368	32,401	4,553	0,432	591,227

	0,700	0,796	43,516	44,007	45,107	32,402	4,494	0,380	579,950
	0,600	0,896	36,564	36,976	37,900	32,403	4,420	0,328	564,549
	0,500	0,996	29,686	30,021	30,771	32,405	4,325	0,276	543,073
	0,400	1,096	22,917	23,175	23,755	32,408	4,198	0,223	512,375
	0,300	1,196	16,312	16,495	16,908	32,414	4,020	0,170	466,980
	0,200	1,296	9,973	10,085	10,337	32,427	3,744	0,116	396,123
	0,100	1,396	4,128	4,175	4,279	32,475	3,227	0,062	273,905
	0,037	1,460	1,000	1,011	1,037	32,691	2,420	0,027	126,634
	0,000	1,496	0,000	0,000	0,000	35,949	0,139	0,004	0,000

Tank Calibrations - Lastre 2 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 2 BR	1,500	0,000	100,000	114,622	117,488	40,156	-4,632	0,792	0,000
	1,472	0,028	98,000	112,330	115,138	40,156	-4,627	0,778	682,876
	1,471	0,029	97,900	112,215	115,020	40,156	-4,626	0,777	682,833
	1,400	0,100	92,796	106,365	109,024	40,155	-4,610	0,741	680,493
	1,300	0,200	85,604	98,121	100,574	40,153	-4,585	0,689	676,693
	1,200	0,300	78,427	89,895	92,142	40,152	-4,557	0,638	672,199
	1,100	0,400	71,268	81,689	83,731	40,150	-4,524	0,587	666,793
	1,000	0,500	64,130	73,507	75,345	40,147	-4,485	0,535	660,107
	0,900	0,600	57,020	65,357	66,991	40,145	-4,439	0,483	651,606
	0,800	0,700	49,945	57,248	58,679	40,141	-4,384	0,431	640,565
	0,700	0,800	42,917	49,192	50,422	40,137	-4,317	0,379	625,929
	0,600	0,900	35,953	41,210	42,240	40,132	-4,233	0,327	606,125
	0,500	1,000	29,079	33,330	34,164	40,126	-4,124	0,274	578,719
	0,400	1,100	22,334	25,600	26,240	40,117	-3,980	0,221	539,776
	0,300	1,200	15,788	18,097	18,549	40,104	-3,777	0,167	482,583

	0,200	1,300	9,564	10,963	11,237	40,085	-3,468	0,113	395,254
	0,100	1,400	3,929	4,503	4,616	40,055	-2,908	0,058	254,125
	0,037	1,463	1,000	1,146	1,175	40,038	-2,110	0,022	107,834
	0,000	1,500	0,000	0,000	0,000	43,575	-0,032	0,000	0,000

Tank Calibrations - Lastre 2 ER

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 2 ER	1,500	0,000	100,000	114,622	117,488	40,156	4,632	0,792	0,000
	1,472	0,028	98,000	112,330	115,138	40,156	4,627	0,778	682,876

	1,471	0,029	97,900	112,215	115,020	40,156	4,626	0,777	682,833
	1,400	0,100	92,796	106,365	109,024	40,155	4,610	0,741	680,493
	1,300	0,200	85,604	98,121	100,574	40,153	4,585	0,689	676,693
	1,200	0,300	78,427	89,895	92,142	40,152	4,557	0,638	672,199
	1,100	0,400	71,268	81,689	83,731	40,150	4,524	0,587	666,793
	1,000	0,500	64,130	73,507	75,345	40,147	4,485	0,535	660,107
	0,900	0,600	57,020	65,357	66,991	40,145	4,439	0,483	651,606
	0,800	0,700	49,945	57,248	58,679	40,141	4,384	0,431	640,565
	0,700	0,800	42,917	49,192	50,422	40,137	4,317	0,379	625,929
	0,600	0,900	35,953	41,210	42,240	40,132	4,233	0,327	606,125
	0,500	1,000	29,079	33,330	34,164	40,126	4,124	0,274	578,719
	0,400	1,100	22,334	25,600	26,240	40,117	3,980	0,221	539,776
	0,300	1,200	15,788	18,097	18,549	40,104	3,777	0,167	482,583
	0,200	1,300	9,564	10,963	11,237	40,085	3,468	0,113	395,254
	0,100	1,400	3,929	4,503	4,616	40,055	2,908	0,058	254,125
	0,037	1,463	1,000	1,146	1,175	40,038	2,110	0,022	107,834
	0,000	1,500	0,000	0,000	0,000	43,575	0,032	0,000	0,000

Tank Calibrations - Lastre 3 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 3 BR	1,500	0,000	100,000	113,541	116,379	48,999	-4,116	0,818	0,000
	1,474	0,026	98,000	111,270	114,052	48,997	-4,108	0,805	606,854
	1,472	0,028	97,900	111,156	113,935	48,997	-4,107	0,804	606,787
	1,400	0,100	92,390	104,900	107,522	48,992	-4,083	0,766	602,853
	1,300	0,200	84,803	96,286	98,693	48,985	-4,046	0,714	596,573
	1,200	0,300	77,248	87,707	89,900	48,977	-4,004	0,662	589,014
	1,100	0,400	69,730	79,172	81,151	48,967	-3,956	0,609	579,747

	1,000	0,500	62,260	70,691	72,458	48,956	-3,899	0,556	568,215
	0,900	0,600	54,851	62,278	63,835	48,943	-3,832	0,503	553,671
	0,800	0,700	47,521	53,956	55,304	48,928	-3,752	0,449	535,105
	0,700	0,800	40,295	45,751	46,894	48,910	-3,655	0,395	511,164
	0,600	0,900	33,207	37,704	38,646	48,888	-3,537	0,341	480,035
	0,500	1,000	26,310	29,872	30,619	48,861	-3,389	0,286	439,364
	0,400	1,100	19,676	22,340	22,899	48,828	-3,198	0,230	386,225
	0,300	1,200	13,415	15,232	15,612	48,784	-2,944	0,174	317,197
	0,200	1,300	7,704	8,747	8,965	48,720	-2,584	0,118	228,569
	0,100	1,400	2,875	3,264	3,345	48,600	-2,001	0,060	116,180
	0,049	1,451	1,000	1,135	1,164	48,448	-1,486	0,030	51,160
	0,000	1,500	0,000	0,000	0,000	44,645	-0,021	0,000	0,000

Tank Calibrations - Lastre 3 ER

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 3 ER	1,500	0,000	100,000	113,541	116,379	48,999	4,116	0,818	0,000
	1,474	0,026	98,000	111,270	114,052	48,997	4,108	0,805	606,854
	1,472	0,028	97,900	111,156	113,935	48,997	4,107	0,804	606,787
	1,400	0,100	92,390	104,900	107,522	48,992	4,083	0,766	602,853
	1,300	0,200	84,803	96,286	98,693	48,985	4,046	0,714	596,573
	1,200	0,300	77,248	87,707	89,900	48,977	4,004	0,662	589,014
	1,100	0,400	69,730	79,172	81,151	48,967	3,956	0,609	579,747
	1,000	0,500	62,260	70,691	72,458	48,956	3,899	0,556	568,215
	0,900	0,600	54,851	62,278	63,835	48,943	3,832	0,503	553,671
	0,800	0,700	47,521	53,956	55,304	48,928	3,752	0,449	535,105
	0,700	0,800	40,295	45,751	46,894	48,910	3,655	0,395	511,164
	0,600	0,900	33,207	37,704	38,646	48,888	3,537	0,341	480,035

	0,500	1,000	26,310	29,872	30,619	48,861	3,389	0,286	439,364
	0,400	1,100	19,676	22,340	22,899	48,828	3,198	0,230	386,225
	0,300	1,200	13,415	15,232	15,612	48,784	2,944	0,174	317,197
	0,200	1,300	7,704	8,747	8,965	48,720	2,584	0,118	228,569
	0,100	1,400	2,875	3,264	3,345	48,600	2,001	0,060	116,180
	0,049	1,451	1,000	1,135	1,164	48,448	1,486	0,030	51,160
	0,000	1,500	0,000	0,000	0,000	44,645	0,021	0,000	0,000

Tank Calibrations - Lastre 5 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 5 BR	7,500	0,000	100,000	124,622	127,737	21,410	-9,561	5,266	0,000
	7,351	0,149	98,000	122,129	125,183	21,410	-9,561	5,191	1,811
	7,343	0,157	97,900	122,005	125,055	21,411	-9,561	5,187	1,811
	7,000	0,500	93,306	116,279	119,186	21,411	-9,561	5,016	1,813
	6,500	1,000	86,608	107,932	110,631	21,413	-9,561	4,765	1,815
	6,000	1,500	79,907	99,582	102,071	21,414	-9,561	4,515	1,818
	5,500	2,000	73,203	91,227	93,508	21,415	-9,560	4,265	1,819
	5,000	2,500	66,499	82,873	84,944	21,417	-9,560	4,014	1,819
	4,500	3,000	59,795	74,518	76,381	21,418	-9,560	3,763	1,819
	4,000	3,500	53,092	66,164	67,819	21,420	-9,559	3,513	1,818
	3,500	4,000	46,390	57,813	59,258	21,422	-9,558	3,262	1,816
	3,000	4,500	39,692	49,465	50,701	21,424	-9,557	3,010	1,813
	2,500	5,000	32,999	41,124	42,152	21,427	-9,556	2,759	1,807
	2,000	5,500	26,316	32,796	33,616	21,431	-9,554	2,507	1,796
	1,500	6,000	19,651	24,490	25,102	21,435	-9,552	2,256	1,778

	1,000	6,500	13,017	16,222	16,628	21,441	-9,548	2,003	1,745
	0,500	7,000	6,443	8,030	8,230	21,450	-9,543	1,751	1,680
	0,079	7,421	1,000	1,246	1,277	21,463	-9,535	1,539	1,566
	0,000	7,500	0,000	0,000	0,000	21,467	-9,533	1,500	0,000

Tank Calibrations - Lastre 5 ER

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 5 ER	7,500	0,000	100,000	124,622	127,737	21,410	9,561	5,266	0,000
	7,351	0,149	98,000	122,129	125,183	21,410	9,561	5,191	1,811
	7,343	0,157	97,900	122,005	125,055	21,411	9,561	5,187	1,811

	7,000	0,500	93,306	116,279	119,186	21,411	9,561	5,016	1,813
	6,500	1,000	86,608	107,932	110,631	21,413	9,561	4,765	1,815
	6,000	1,500	79,907	99,582	102,071	21,414	9,561	4,515	1,818
	5,500	2,000	73,203	91,227	93,508	21,415	9,560	4,265	1,819
	5,000	2,500	66,499	82,873	84,944	21,417	9,560	4,014	1,819
	4,500	3,000	59,795	74,518	76,381	21,418	9,560	3,763	1,819
	4,000	3,500	53,092	66,164	67,819	21,420	9,559	3,513	1,818
	3,500	4,000	46,390	57,813	59,258	21,422	9,558	3,262	1,816
	3,000	4,500	39,692	49,465	50,701	21,424	9,557	3,010	1,813
	2,500	5,000	32,999	41,124	42,152	21,427	9,556	2,759	1,807
	2,000	5,500	26,316	32,796	33,616	21,431	9,554	2,507	1,796
	1,500	6,000	19,651	24,490	25,102	21,435	9,552	2,256	1,778
	1,000	6,500	13,017	16,222	16,628	21,441	9,548	2,003	1,745
	0,500	7,000	6,443	8,030	8,230	21,450	9,543	1,751	1,680
	0,079	7,421	1,000	1,246	1,277	21,463	9,535	1,539	1,566
	0,000	7,500	0,000	0,000	0,000	21,467	9,533	1,500	0,000

Tank Calibrations - Lastre 6 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 6 BR	7,500	0,000	100,000	59,656	61,148	32,373	-9,553	5,270	0,000
	7,351	0,149	98,000	58,463	59,925	32,373	-9,552	5,195	0,854
	7,344	0,156	97,900	58,403	59,863	32,373	-9,552	5,191	0,854
	7,000	0,500	93,269	55,641	57,032	32,372	-9,552	5,019	0,852
	6,500	1,000	86,546	51,630	52,921	32,371	-9,552	4,768	0,849
	6,000	1,500	79,830	47,624	48,814	32,370	-9,551	4,517	0,847
	5,500	2,000	73,122	43,622	44,712	32,369	-9,551	4,266	0,845

	5,000	2,500	66,417	39,622	40,612	32,369	-9,551	4,015	0,844
	4,500	3,000	59,715	35,623	36,514	32,368	-9,550	3,764	0,843
	4,000	3,500	53,015	31,627	32,417	32,368	-9,549	3,513	0,842
	3,500	4,000	46,318	27,632	28,322	32,367	-9,549	3,262	0,841
	3,000	4,500	39,626	23,639	24,230	32,366	-9,547	3,011	0,839
	2,500	5,000	32,941	19,651	20,143	32,365	-9,546	2,759	0,836
	2,000	5,500	26,267	15,670	16,061	32,364	-9,544	2,508	0,830
	1,500	6,000	19,611	11,699	11,992	32,363	-9,542	2,256	0,821
	1,000	6,500	12,988	7,748	7,942	32,361	-9,538	2,003	0,806
	0,500	7,000	6,427	3,834	3,930	32,359	-9,533	1,751	0,775
	0,079	7,421	1,000	0,597	0,611	32,356	-9,525	1,540	0,721
	0,000	7,500	0,000	0,000	0,000	32,355	-9,523	1,500	0,000

Tank Calibrations - Lastre 6 ER

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 6 ER	7,500	0,000	100,000	59,656	61,148	32,373	9,553	5,270	0,000
	7,351	0,149	98,000	58,463	59,925	32,373	9,552	5,195	0,854
	7,344	0,156	97,900	58,403	59,863	32,373	9,552	5,191	0,854
	7,000	0,500	93,269	55,641	57,032	32,372	9,552	5,019	0,852
	6,500	1,000	86,546	51,630	52,921	32,371	9,552	4,768	0,849
	6,000	1,500	79,830	47,624	48,814	32,370	9,551	4,517	0,847
	5,500	2,000	73,122	43,622	44,712	32,369	9,551	4,266	0,845
	5,000	2,500	66,417	39,622	40,612	32,369	9,551	4,015	0,844
	4,500	3,000	59,715	35,623	36,514	32,368	9,550	3,764	0,843
	4,000	3,500	53,015	31,627	32,417	32,368	9,549	3,513	0,842
	3,500	4,000	46,318	27,632	28,322	32,367	9,549	3,262	0,841
	3,000	4,500	39,626	23,639	24,230	32,366	9,547	3,011	0,839

	2,500	5,000	32,941	19,651	20,143	32,365	9,546	2,759	0,836
	2,000	5,500	26,267	15,670	16,061	32,364	9,544	2,508	0,830
	1,500	6,000	19,611	11,699	11,992	32,363	9,542	2,256	0,821
	1,000	6,500	12,988	7,748	7,942	32,361	9,538	2,003	0,806
	0,500	7,000	6,427	3,834	3,930	32,359	9,533	1,751	0,775
	0,079	7,421	1,000	0,597	0,611	32,356	9,525	1,540	0,721
	0,000	7,500	0,000	0,000	0,000	32,355	9,523	1,500	0,000

Tank Calibrations - Lastre 4 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 4 BR	7,500	0,000	100,000	68,941	70,665	9,651	-9,541	5,617	0,000
	7,368	0,132	98,000	67,562	69,251	9,656	-9,541	5,549	1,137
	7,361	0,139	97,900	67,493	69,181	9,656	-9,541	5,546	1,137
	7,000	0,500	92,452	63,737	65,331	9,671	-9,539	5,361	1,138
	6,500	1,000	84,903	58,533	59,996	9,696	-9,537	5,104	1,137
	6,000	1,500	77,360	53,333	54,666	9,724	-9,534	4,846	1,133
	5,500	2,000	69,828	48,140	49,343	9,760	-9,531	4,587	1,128
	5,000	2,500	62,308	42,956	44,030	9,803	-9,527	4,326	1,121
	4,500	3,000	54,811	37,788	38,732	9,857	-9,522	4,062	1,108
	4,000	3,500	47,351	32,645	33,461	9,926	-9,516	3,797	1,088
	3,500	4,000	39,948	27,541	28,229	10,018	-9,509	3,527	1,059
	3,000	4,500	32,630	22,496	23,058	10,145	-9,500	3,253	1,017
	2,500	5,000	25,448	17,544	17,983	10,329	-9,489	2,971	0,956
	2,000	5,500	18,501	12,755	13,074	10,612	-9,476	2,678	0,866
	1,500	6,000	12,079	8,327	8,535	11,039	-9,464	2,371	0,738

	1,000	6,500	6,764	4,663	4,780	11,509	-9,451	2,065	0,558
	0,500	7,000	2,721	1,876	1,923	11,972	-9,432	1,771	0,373
	0,214	7,286	1,000	0,689	0,707	12,228	-9,417	1,612	0,266
	0,000	7,500	0,000	0,000	0,000	12,411	-9,404	1,500	0,000

Tank Calibrations - Lastre 4 ER

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 4 ER	7,500	0,000	100,000	68,941	70,665	9,651	9,541	5,617	0,000
	7,368	0,132	98,000	67,562	69,251	9,656	9,541	5,549	1,137
	7,361	0,139	97,900	67,493	69,181	9,656	9,541	5,546	1,137

	7,000	0,500	92,452	63,737	65,331	9,671	9,539	5,361	1,138
	6,500	1,000	84,903	58,533	59,996	9,696	9,537	5,104	1,137
	6,000	1,500	77,360	53,333	54,666	9,724	9,534	4,846	1,133
	5,500	2,000	69,828	48,140	49,343	9,760	9,531	4,587	1,128
	5,000	2,500	62,308	42,956	44,030	9,803	9,527	4,326	1,121
	4,500	3,000	54,811	37,788	38,732	9,857	9,522	4,062	1,108
	4,000	3,500	47,351	32,645	33,461	9,926	9,516	3,797	1,088
	3,500	4,000	39,948	27,541	28,229	10,018	9,509	3,527	1,059
	3,000	4,500	32,630	22,496	23,058	10,145	9,500	3,253	1,017
	2,500	5,000	25,448	17,544	17,983	10,329	9,489	2,971	0,956
	2,000	5,500	18,501	12,755	13,074	10,612	9,476	2,678	0,866
	1,500	6,000	12,079	8,327	8,535	11,039	9,464	2,371	0,738
	1,000	6,500	6,764	4,663	4,780	11,509	9,451	2,065	0,558
	0,500	7,000	2,721	1,876	1,923	11,972	9,432	1,771	0,373
	0,214	7,286	1,000	0,689	0,707	12,228	9,417	1,612	0,266
	0,000	7,500	0,000	0,000	0,000	12,411	9,404	1,500	0,000

Tank Calibrations - Lastre 7 BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Lastre 7 BR	5,927	0,000	100,000	37,905	38,852	1,084	-9,525	6,884	0,000
	5,847	0,080	98,000	37,146	38,075	1,094	-9,524	6,841	1,042
	5,843	0,084	97,900	37,109	38,036	1,094	-9,524	6,839	1,042
	5,750	0,177	95,557	36,220	37,126	1,106	-9,523	6,790	1,042
	5,500	0,427	89,282	33,842	34,688	1,142	-9,520	6,655	1,043
	5,250	0,677	83,006	31,463	32,250	1,183	-9,516	6,520	1,043
	5,000	0,927	76,731	29,085	29,812	1,231	-9,512	6,383	1,042

	4,750	1,177	70,458	26,707	27,374	1,287	-9,507	6,243	1,041
	4,500	1,427	64,193	24,332	24,940	1,354	-9,502	6,101	1,032
	4,250	1,677	57,955	21,968	22,517	1,434	-9,495	5,956	1,014
	4,000	1,927	51,771	19,623	20,114	1,530	-9,488	5,808	0,983
	3,750	2,177	45,670	17,311	17,744	1,646	-9,479	5,656	0,940
	3,500	2,427	39,695	15,046	15,422	1,787	-9,470	5,499	0,886
	3,250	2,677	33,904	12,851	13,172	1,959	-9,460	5,336	0,822
	3,000	2,927	28,387	10,760	11,029	2,163	-9,450	5,169	0,754
	2,750	3,177	23,301	8,832	9,053	2,384	-9,441	4,998	0,665
	2,500	3,427	18,740	7,103	7,281	2,607	-9,430	4,827	0,574
	2,250	3,677	14,701	5,572	5,712	2,829	-9,418	4,656	0,485
	2,000	3,927	11,180	4,238	4,344	3,052	-9,404	4,484	0,401
	1,750	4,177	8,169	3,097	3,174	3,275	-9,388	4,312	0,321
	1,500	4,427	5,662	2,146	2,200	3,497	-9,369	4,139	0,245
	1,250	4,677	3,646	1,382	1,416	3,720	-9,346	3,965	0,176
	1,000	4,927	2,106	0,798	0,818	3,941	-9,316	3,790	0,113
	0,750	5,177	1,023	0,388	0,397	4,160	-9,278	3,614	0,062

	0,743	5,184	1,000	0,379	0,389	4,166	-9,276	3,609	0,061
	0,500	5,427	0,360	0,136	0,140	4,377	-9,225	3,436	0,024
	0,250	5,677	0,057	0,022	0,022	4,589	-9,148	3,256	0,004
	0,000	5,927	0,000	0,000	0,000	4,766	-9,000	3,073	0,000

Tank Calibrations - Lastre 7ER

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
Lastre 7ER	5,927	0,000	100,000	37,905	38,852	1,084	9,525	6,884	0,000
	5,847	0,080	98,000	37,146	38,075	1,094	9,524	6,841	1,042

	5,843	0,084	97,900	37,109	38,036	1,094	9,524	6,839	1,042
	5,750	0,177	95,557	36,220	37,126	1,106	9,523	6,790	1,042
	5,500	0,427	89,282	33,842	34,688	1,142	9,520	6,655	1,043
	5,250	0,677	83,006	31,463	32,250	1,183	9,516	6,520	1,043
	5,000	0,927	76,731	29,085	29,812	1,231	9,512	6,383	1,042
	4,750	1,177	70,458	26,707	27,374	1,287	9,507	6,243	1,041
	4,500	1,427	64,193	24,332	24,940	1,354	9,502	6,101	1,032
	4,250	1,677	57,955	21,968	22,517	1,434	9,495	5,956	1,014
	4,000	1,927	51,771	19,623	20,114	1,530	9,488	5,808	0,983
	3,750	2,177	45,670	17,311	17,744	1,646	9,479	5,656	0,940
	3,500	2,427	39,695	15,046	15,422	1,787	9,470	5,499	0,886
	3,250	2,677	33,904	12,851	13,172	1,959	9,460	5,336	0,822
	3,000	2,927	28,387	10,760	11,029	2,163	9,450	5,169	0,754
	2,750	3,177	23,301	8,832	9,053	2,384	9,441	4,998	0,665
	2,500	3,427	18,740	7,103	7,281	2,607	9,430	4,827	0,574
	2,250	3,677	14,701	5,572	5,712	2,829	9,418	4,656	0,485
	2,000	3,927	11,180	4,238	4,344	3,052	9,404	4,484	0,401

	1,750	4,177	8,169	3,097	3,174	3,275	9,388	4,312	0,321
	1,500	4,427	5,662	2,146	2,200	3,497	9,369	4,139	0,245
	1,250	4,677	3,646	1,382	1,416	3,720	9,346	3,965	0,176
	1,000	4,927	2,106	0,798	0,818	3,941	9,316	3,790	0,113
	0,750	5,177	1,023	0,388	0,397	4,160	9,278	3,614	0,062
	0,743	5,184	1,000	0,379	0,389	4,166	9,276	3,609	0,061
	0,500	5,427	0,360	0,136	0,140	4,377	9,225	3,436	0,024
	0,250	5,677	0,057	0,022	0,022	4,589	9,148	3,256	0,004
	0,000	5,927	0,000	0,000	0,000	4,766	9,000	3,073	0,000

Tank Calibrations - Fangos1BR

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Fangos1BR	0,500	0,000	100,000	2,880	2,419	44,400	-8,400	1,750	0,000
	0,490	0,010	98,000	2,822	2,371	44,400	-8,400	1,745	0,581
	0,490	0,010	97,900	2,820	2,368	44,400	-8,400	1,745	0,581
	0,480	0,020	96,000	2,765	2,322	44,400	-8,400	1,740	0,581
	0,460	0,040	92,000	2,650	2,226	44,400	-8,400	1,730	0,581
	0,440	0,060	88,000	2,534	2,129	44,400	-8,400	1,720	0,581
	0,420	0,080	84,000	2,419	2,032	44,400	-8,400	1,710	0,581
	0,400	0,100	80,000	2,304	1,935	44,400	-8,400	1,700	0,581
	0,380	0,120	76,000	2,189	1,839	44,400	-8,400	1,690	0,581
	0,360	0,140	72,000	2,074	1,742	44,400	-8,400	1,680	0,581
	0,340	0,160	68,000	1,958	1,645	44,400	-8,400	1,670	0,581
	0,320	0,180	64,000	1,843	1,548	44,400	-8,400	1,660	0,581
	0,300	0,200	60,000	1,728	1,452	44,400	-8,400	1,650	0,581
	0,280	0,220	56,000	1,613	1,355	44,400	-8,400	1,640	0,581
	0,260	0,240	52,000	1,498	1,258	44,400	-8,400	1,630	0,581

	0,240	0,260	48,000	1,382	1,161	44,400	-8,400	1,620	0,581
	0,220	0,280	44,000	1,267	1,064	44,400	-8,400	1,610	0,581
	0,200	0,300	40,000	1,152	0,968	44,400	-8,400	1,600	0,581
	0,180	0,320	36,000	1,037	0,871	44,400	-8,400	1,590	0,581
	0,160	0,340	32,000	0,922	0,774	44,400	-8,400	1,580	0,581
	0,140	0,360	28,000	0,806	0,677	44,400	-8,400	1,570	0,581
	0,120	0,380	24,000	0,691	0,581	44,400	-8,400	1,560	0,581
	0,100	0,400	20,000	0,576	0,484	44,400	-8,400	1,550	0,581
	0,080	0,420	16,000	0,461	0,387	44,400	-8,400	1,540	0,581
	0,060	0,440	12,000	0,346	0,290	44,400	-8,400	1,530	0,581
	0,040	0,460	8,000	0,230	0,194	44,400	-8,400	1,520	0,581
	0,020	0,480	4,000	0,115	0,097	44,400	-8,400	1,510	0,581
	0,005	0,495	1,000	0,029	0,024	44,400	-8,400	1,503	0,581
	0,000	0,500	0,000	0,000	0,000	44,400	-8,400	1,500	0,000

Tank Calibrations - Fangos1ER

Fluid Type = Diesel Specific gravity = 0,84

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Fangos1ER	0,500	0,000	100,000	2,880	2,419	44,400	8,400	1,750	0,000
	0,490	0,010	98,000	2,822	2,371	44,400	8,400	1,745	0,581
	0,490	0,010	97,900	2,820	2,368	44,400	8,400	1,745	0,581
	0,480	0,020	96,000	2,765	2,322	44,400	8,400	1,740	0,581
	0,460	0,040	92,000	2,650	2,226	44,400	8,400	1,730	0,581
	0,440	0,060	88,000	2,534	2,129	44,400	8,400	1,720	0,581
	0,420	0,080	84,000	2,419	2,032	44,400	8,400	1,710	0,581
	0,400	0,100	80,000	2,304	1,935	44,400	8,400	1,700	0,581
	0,380	0,120	76,000	2,189	1,839	44,400	8,400	1,690	0,581

	0,360	0,140	72,000	2,074	1,742	44,400	8,400	1,680	0,581
	0,340	0,160	68,000	1,958	1,645	44,400	8,400	1,670	0,581
	0,320	0,180	64,000	1,843	1,548	44,400	8,400	1,660	0,581
	0,300	0,200	60,000	1,728	1,452	44,400	8,400	1,650	0,581
	0,280	0,220	56,000	1,613	1,355	44,400	8,400	1,640	0,581
	0,260	0,240	52,000	1,498	1,258	44,400	8,400	1,630	0,581
	0,240	0,260	48,000	1,382	1,161	44,400	8,400	1,620	0,581
	0,220	0,280	44,000	1,267	1,064	44,400	8,400	1,610	0,581
	0,200	0,300	40,000	1,152	0,968	44,400	8,400	1,600	0,581
	0,180	0,320	36,000	1,037	0,871	44,400	8,400	1,590	0,581
	0,160	0,340	32,000	0,922	0,774	44,400	8,400	1,580	0,581
	0,140	0,360	28,000	0,806	0,677	44,400	8,400	1,570	0,581
	0,120	0,380	24,000	0,691	0,581	44,400	8,400	1,560	0,581
	0,100	0,400	20,000	0,576	0,484	44,400	8,400	1,550	0,581
	0,080	0,420	16,000	0,461	0,387	44,400	8,400	1,540	0,581
	0,060	0,440	12,000	0,346	0,290	44,400	8,400	1,530	0,581
	0,040	0,460	8,000	0,230	0,194	44,400	8,400	1,520	0,581

	0,020	0,480	4,000	0,115	0,097	44,400	8,400	1,510	0,581
	0,005	0,495	1,000	0,029	0,024	44,400	8,400	1,503	0,581
	0,000	0,500	0,000	0,000	0,000	44,400	8,400	1,500	0,000

Tank Calibrations - agua consumos1BR

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
agua consumos1BR	3,500	0,000	100,000	33,600	33,600	3,600	-7,000	7,250	0,000
	3,430	0,070	98,000	32,928	32,928	3,600	-7,000	7,215	12,800
	3,426	0,074	97,900	32,894	32,894	3,600	-7,000	7,213	12,800

	3,400	0,100	97,143	32,640	32,640	3,600	-7,000	7,200	12,800
	3,200	0,300	91,429	30,720	30,720	3,600	-7,000	7,100	12,800
	3,000	0,500	85,714	28,800	28,800	3,600	-7,000	7,000	12,800
	2,800	0,700	80,000	26,880	26,880	3,600	-7,000	6,900	12,800
	2,600	0,900	74,286	24,960	24,960	3,600	-7,000	6,800	12,800
	2,400	1,100	68,571	23,040	23,040	3,600	-7,000	6,700	12,800
	2,200	1,300	62,857	21,120	21,120	3,600	-7,000	6,600	12,800
	2,000	1,500	57,143	19,200	19,200	3,600	-7,000	6,500	12,800
	1,800	1,700	51,429	17,280	17,280	3,600	-7,000	6,400	12,800
	1,600	1,900	45,714	15,360	15,360	3,600	-7,000	6,300	12,800
	1,400	2,100	40,000	13,440	13,440	3,600	-7,000	6,200	12,800
	1,200	2,300	34,286	11,520	11,520	3,600	-7,000	6,100	12,800
	1,000	2,500	28,571	9,600	9,600	3,600	-7,000	6,000	12,800
	0,800	2,700	22,857	7,680	7,680	3,600	-7,000	5,900	12,800
	0,600	2,900	17,143	5,760	5,760	3,600	-7,000	5,800	12,800
	0,400	3,100	11,429	3,840	3,840	3,600	-7,000	5,700	12,800
	0,200	3,300	5,714	1,920	1,920	3,600	-7,000	5,600	12,800

	0,035	3,465	1,000	0,336	0,336	3,600	-7,000	5,518	12,800
	0,000	3,500	0,000	0,000	0,000	3,600	-7,000	5,500	0,000

Tank Calibrations - agua consumos1ER

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
agua consumos1ER	3,500	0,000	100,000	33,600	33,600	3,600	7,000	7,250	0,000
	3,430	0,070	98,000	32,928	32,928	3,600	7,000	7,215	12,800
	3,426	0,074	97,900	32,894	32,894	3,600	7,000	7,213	12,800
	3,400	0,100	97,143	32,640	32,640	3,600	7,000	7,200	12,800

	3,200	0,300	91,429	30,720	30,720	3,600	7,000	7,100	12,800
	3,000	0,500	85,714	28,800	28,800	3,600	7,000	7,000	12,800
	2,800	0,700	80,000	26,880	26,880	3,600	7,000	6,900	12,800
	2,600	0,900	74,286	24,960	24,960	3,600	7,000	6,800	12,800
	2,400	1,100	68,571	23,040	23,040	3,600	7,000	6,700	12,800
	2,200	1,300	62,857	21,120	21,120	3,600	7,000	6,600	12,800
	2,000	1,500	57,143	19,200	19,200	3,600	7,000	6,500	12,800
	1,800	1,700	51,429	17,280	17,280	3,600	7,000	6,400	12,800
	1,600	1,900	45,714	15,360	15,360	3,600	7,000	6,300	12,800
	1,400	2,100	40,000	13,440	13,440	3,600	7,000	6,200	12,800
	1,200	2,300	34,286	11,520	11,520	3,600	7,000	6,100	12,800
	1,000	2,500	28,571	9,600	9,600	3,600	7,000	6,000	12,800
	0,800	2,700	22,857	7,680	7,680	3,600	7,000	5,900	12,800
	0,600	2,900	17,143	5,760	5,760	3,600	7,000	5,800	12,800
	0,400	3,100	11,429	3,840	3,840	3,600	7,000	5,700	12,800
	0,200	3,300	5,714	1,920	1,920	3,600	7,000	5,600	12,800
	0,035	3,465	1,000	0,336	0,336	3,600	7,000	5,518	12,800

	0,000	3,500	0,000	0,000	0,000	3,600	7,000	5,500	0,000

Tank Calibrations - LubricanteBR

Fluid Type = Specific gravity = 0,97

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
LubricanteBR	3,500	0,000	100,000	8,400	8,148	9,000	-8,000	7,250	0,000
	3,430	0,070	98,000	8,232	7,985	9,000	-8,000	7,215	0,776
	3,426	0,074	97,900	8,224	7,977	9,000	-8,000	7,213	0,776
	3,400	0,100	97,143	8,160	7,915	9,000	-8,000	7,200	0,776
	3,200	0,300	91,429	7,680	7,450	9,000	-8,000	7,100	0,776

	3,000	0,500	85,714	7,200	6,984	9,000	-8,000	7,000	0,776
	2,800	0,700	80,000	6,720	6,518	9,000	-8,000	6,900	0,776
	2,600	0,900	74,286	6,240	6,053	9,000	-8,000	6,800	0,776
	2,400	1,100	68,571	5,760	5,587	9,000	-8,000	6,700	0,776
	2,200	1,300	62,857	5,280	5,122	9,000	-8,000	6,600	0,776
	2,000	1,500	57,143	4,800	4,656	9,000	-8,000	6,500	0,776
	1,800	1,700	51,429	4,320	4,190	9,000	-8,000	6,400	0,776
	1,600	1,900	45,714	3,840	3,725	9,000	-8,000	6,300	0,776
	1,400	2,100	40,000	3,360	3,259	9,000	-8,000	6,200	0,776
	1,200	2,300	34,286	2,880	2,794	9,000	-8,000	6,100	0,776
	1,000	2,500	28,571	2,400	2,328	9,000	-8,000	6,000	0,776
	0,800	2,700	22,857	1,920	1,862	9,000	-8,000	5,900	0,776
	0,600	2,900	17,143	1,440	1,397	9,000	-8,000	5,800	0,776
	0,400	3,100	11,429	0,960	0,931	9,000	-8,000	5,700	0,776
	0,200	3,300	5,714	0,480	0,466	9,000	-8,000	5,600	0,776
	0,035	3,465	1,000	0,084	0,081	9,000	-8,000	5,518	0,776
	0,000	3,500	0,000	0,000	0,000	9,000	-8,000	5,500	0,000

Tank Calibrations - LubricanteER

Fluid Type = Specific gravity = 0,97

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
LubricanteER	3,500	0,000	100,000	8,400	8,148	9,000	8,000	7,250	0,000
	3,430	0,070	98,000	8,232	7,985	9,000	8,000	7,215	0,776
	3,426	0,074	97,900	8,224	7,977	9,000	8,000	7,213	0,776
	3,400	0,100	97,143	8,160	7,915	9,000	8,000	7,200	0,776
	3,200	0,300	91,429	7,680	7,450	9,000	8,000	7,100	0,776
	3,000	0,500	85,714	7,200	6,984	9,000	8,000	7,000	0,776
	2,800	0,700	80,000	6,720	6,518	9,000	8,000	6,900	0,776

	2,600	0,900	74,286	6,240	6,053	9,000	8,000	6,800	0,776
	2,400	1,100	68,571	5,760	5,587	9,000	8,000	6,700	0,776
	2,200	1,300	62,857	5,280	5,122	9,000	8,000	6,600	0,776
	2,000	1,500	57,143	4,800	4,656	9,000	8,000	6,500	0,776
	1,800	1,700	51,429	4,320	4,190	9,000	8,000	6,400	0,776
	1,600	1,900	45,714	3,840	3,725	9,000	8,000	6,300	0,776
	1,400	2,100	40,000	3,360	3,259	9,000	8,000	6,200	0,776
	1,200	2,300	34,286	2,880	2,794	9,000	8,000	6,100	0,776
	1,000	2,500	28,571	2,400	2,328	9,000	8,000	6,000	0,776
	0,800	2,700	22,857	1,920	1,862	9,000	8,000	5,900	0,776
	0,600	2,900	17,143	1,440	1,397	9,000	8,000	5,800	0,776
	0,400	3,100	11,429	0,960	0,931	9,000	8,000	5,700	0,776
	0,200	3,300	5,714	0,480	0,466	9,000	8,000	5,600	0,776
	0,035	3,465	1,000	0,084	0,081	9,000	8,000	5,518	0,776
	0,000	3,500	0,000	0,000	0,000	9,000	8,000	5,500	0,000

Tank Calibrations - Aguas negras ER

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Aguas negras ER	3,500	0,000	100,000	4,200	4,200	11,400	-8,500	7,250	0,000
	3,430	0,070	98,000	4,116	4,116	11,400	-8,500	7,215	0,100
	3,426	0,074	97,900	4,112	4,112	11,400	-8,500	7,213	0,100
	3,400	0,100	97,143	4,080	4,080	11,400	-8,500	7,200	0,100
	3,200	0,300	91,429	3,840	3,840	11,400	-8,500	7,100	0,100
	3,000	0,500	85,714	3,600	3,600	11,400	-8,500	7,000	0,100
	2,800	0,700	80,000	3,360	3,360	11,400	-8,500	6,900	0,100
	2,600	0,900	74,286	3,120	3,120	11,400	-8,500	6,800	0,100

	2,400	1,100	68,571	2,880	2,880	11,400	-8,500	6,700	0,100
	2,200	1,300	62,857	2,640	2,640	11,400	-8,500	6,600	0,100
	2,000	1,500	57,143	2,400	2,400	11,400	-8,500	6,500	0,100
	1,800	1,700	51,429	2,160	2,160	11,400	-8,500	6,400	0,100
	1,600	1,900	45,714	1,920	1,920	11,400	-8,500	6,300	0,100
	1,400	2,100	40,000	1,680	1,680	11,400	-8,500	6,200	0,100
	1,200	2,300	34,286	1,440	1,440	11,400	-8,500	6,100	0,100
	1,000	2,500	28,571	1,200	1,200	11,400	-8,500	6,000	0,100
	0,800	2,700	22,857	0,960	0,960	11,400	-8,500	5,900	0,100
	0,600	2,900	17,143	0,720	0,720	11,400	-8,500	5,800	0,100
	0,400	3,100	11,429	0,480	0,480	11,400	-8,500	5,700	0,100
	0,200	3,300	5,714	0,240	0,240	11,400	-8,500	5,600	0,100
	0,035	3,465	1,000	0,042	0,042	11,400	-8,500	5,518	0,100
	0,000	3,500	0,000	0,000	0,000	11,400	-8,500	5,500	0,000

Tank Calibrations - Aguas negrasBR

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Aguas negrasBR	3,500	0,000	100,000	4,200	4,200	11,400	8,500	7,250	0,000
	3,430	0,070	98,000	4,116	4,116	11,400	8,500	7,215	0,100
	3,426	0,074	97,900	4,112	4,112	11,400	8,500	7,213	0,100
	3,400	0,100	97,143	4,080	4,080	11,400	8,500	7,200	0,100
	3,200	0,300	91,429	3,840	3,840	11,400	8,500	7,100	0,100
	3,000	0,500	85,714	3,600	3,600	11,400	8,500	7,000	0,100
	2,800	0,700	80,000	3,360	3,360	11,400	8,500	6,900	0,100
	2,600	0,900	74,286	3,120	3,120	11,400	8,500	6,800	0,100
	2,400	1,100	68,571	2,880	2,880	11,400	8,500	6,700	0,100

	2,200	1,300	62,857	2,640	2,640	11,400	8,500	6,600	0,100
	2,000	1,500	57,143	2,400	2,400	11,400	8,500	6,500	0,100
	1,800	1,700	51,429	2,160	2,160	11,400	8,500	6,400	0,100
	1,600	1,900	45,714	1,920	1,920	11,400	8,500	6,300	0,100
	1,400	2,100	40,000	1,680	1,680	11,400	8,500	6,200	0,100
	1,200	2,300	34,286	1,440	1,440	11,400	8,500	6,100	0,100
	1,000	2,500	28,571	1,200	1,200	11,400	8,500	6,000	0,100
	0,800	2,700	22,857	0,960	0,960	11,400	8,500	5,900	0,100
	0,600	2,900	17,143	0,720	0,720	11,400	8,500	5,800	0,100
	0,400	3,100	11,429	0,480	0,480	11,400	8,500	5,700	0,100
	0,200	3,300	5,714	0,240	0,240	11,400	8,500	5,600	0,100
	0,035	3,465	1,000	0,042	0,042	11,400	8,500	5,518	0,100
	0,000	3,500	0,000	0,000	0,000	11,400	8,500	5,500	0,000

Tank Calibrations - Aguas GrisesBR

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Aguas GrisesBR	3,500	0,000	100,000	4,200	4,200	12,600	-8,500	7,250	0,000
	3,430	0,070	98,000	4,116	4,116	12,600	-8,500	7,215	0,100
	3,426	0,074	97,900	4,112	4,112	12,600	-8,500	7,213	0,100
	3,400	0,100	97,143	4,080	4,080	12,600	-8,500	7,200	0,100
	3,200	0,300	91,429	3,840	3,840	12,600	-8,500	7,100	0,100
	3,000	0,500	85,714	3,600	3,600	12,600	-8,500	7,000	0,100
	2,800	0,700	80,000	3,360	3,360	12,600	-8,500	6,900	0,100
	2,600	0,900	74,286	3,120	3,120	12,600	-8,500	6,800	0,100
	2,400	1,100	68,571	2,880	2,880	12,600	-8,500	6,700	0,100
	2,200	1,300	62,857	2,640	2,640	12,600	-8,500	6,600	0,100

	2,000	1,500	57,143	2,400	2,400	12,600	-8,500	6,500	0,100
	1,800	1,700	51,429	2,160	2,160	12,600	-8,500	6,400	0,100
	1,600	1,900	45,714	1,920	1,920	12,600	-8,500	6,300	0,100
	1,400	2,100	40,000	1,680	1,680	12,600	-8,500	6,200	0,100
	1,200	2,300	34,286	1,440	1,440	12,600	-8,500	6,100	0,100
	1,000	2,500	28,571	1,200	1,200	12,600	-8,500	6,000	0,100
	0,800	2,700	22,857	0,960	0,960	12,600	-8,500	5,900	0,100
	0,600	2,900	17,143	0,720	0,720	12,600	-8,500	5,800	0,100
	0,400	3,100	11,429	0,480	0,480	12,600	-8,500	5,700	0,100
	0,200	3,300	5,714	0,240	0,240	12,600	-8,500	5,600	0,100
	0,035	3,465	1,000	0,042	0,042	12,600	-8,500	5,518	0,100
	0,000	3,500	0,000	0,000	0,000	12,600	-8,500	5,500	0,000

Tank Calibrations - Aguas Grises BR

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Aguas Grises BR	3,500	0,000	100,000	4,200	4,200	12,600	8,500	7,250	0,000
	3,430	0,070	98,000	4,116	4,116	12,600	8,500	7,215	0,100
	3,426	0,074	97,900	4,112	4,112	12,600	8,500	7,213	0,100
	3,400	0,100	97,143	4,080	4,080	12,600	8,500	7,200	0,100
	3,200	0,300	91,429	3,840	3,840	12,600	8,500	7,100	0,100
	3,000	0,500	85,714	3,600	3,600	12,600	8,500	7,000	0,100
	2,800	0,700	80,000	3,360	3,360	12,600	8,500	6,900	0,100
	2,600	0,900	74,286	3,120	3,120	12,600	8,500	6,800	0,100
	2,400	1,100	68,571	2,880	2,880	12,600	8,500	6,700	0,100
	2,200	1,300	62,857	2,640	2,640	12,600	8,500	6,600	0,100
	2,000	1,500	57,143	2,400	2,400	12,600	8,500	6,500	0,100
	1,800	1,700	51,429	2,160	2,160	12,600	8,500	6,400	0,100

	1,600	1,900	45,714	1,920	1,920	12,600	8,500	6,300	0,100
	1,400	2,100	40,000	1,680	1,680	12,600	8,500	6,200	0,100
	1,200	2,300	34,286	1,440	1,440	12,600	8,500	6,100	0,100
	1,000	2,500	28,571	1,200	1,200	12,600	8,500	6,000	0,100
	0,800	2,700	22,857	0,960	0,960	12,600	8,500	5,900	0,100
	0,600	2,900	17,143	0,720	0,720	12,600	8,500	5,800	0,100
	0,400	3,100	11,429	0,480	0,480	12,600	8,500	5,700	0,100
	0,200	3,300	5,714	0,240	0,240	12,600	8,500	5,600	0,100
	0,035	3,465	1,000	0,042	0,042	12,600	8,500	5,518	0,100
	0,000	3,500	0,000	0,000	0,000	12,600	8,500	5,500	0,000

Tank Calibrations - Aceite1 BR

Fluid Type = Specific gravity = 0,97

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Aceite1 BR	0,500	0,000	100,000	18,720	18,158	44,400	-3,900	1,750	0,000
	0,490	0,010	98,000	18,346	17,795	44,400	-3,900	1,745	184,126
	0,490	0,010	97,900	18,327	17,777	44,400	-3,900	1,745	184,126
	0,480	0,020	96,000	17,971	17,432	44,400	-3,900	1,740	184,126
	0,460	0,040	92,000	17,222	16,706	44,400	-3,900	1,730	184,126
	0,440	0,060	88,000	16,474	15,979	44,400	-3,900	1,720	184,126
	0,420	0,080	84,000	15,725	15,253	44,400	-3,900	1,710	184,126
	0,400	0,100	80,000	14,976	14,527	44,400	-3,900	1,700	184,126
	0,380	0,120	76,000	14,227	13,800	44,400	-3,900	1,690	184,126
	0,360	0,140	72,000	13,478	13,074	44,400	-3,900	1,680	184,126
	0,340	0,160	68,000	12,730	12,348	44,400	-3,900	1,670	184,126
	0,320	0,180	64,000	11,981	11,621	44,400	-3,900	1,660	184,126
	0,300	0,200	60,000	11,232	10,895	44,400	-3,900	1,650	184,126
	0,280	0,220	56,000	10,483	10,169	44,400	-3,900	1,640	184,126

	0,260	0,240	52,000	9,734	9,442	44,400	-3,900	1,630	184,126
	0,240	0,260	48,000	8,986	8,716	44,400	-3,900	1,620	184,126
	0,220	0,280	44,000	8,237	7,990	44,400	-3,900	1,610	184,126
	0,200	0,300	40,000	7,488	7,263	44,400	-3,900	1,600	184,126
	0,180	0,320	36,000	6,739	6,537	44,400	-3,900	1,590	184,126
	0,160	0,340	32,000	5,990	5,811	44,400	-3,900	1,580	184,126
	0,140	0,360	28,000	5,242	5,084	44,400	-3,900	1,570	184,126
	0,120	0,380	24,000	4,493	4,358	44,400	-3,900	1,560	184,126
	0,100	0,400	20,000	3,744	3,632	44,400	-3,900	1,550	184,126
	0,080	0,420	16,000	2,995	2,905	44,400	-3,900	1,540	184,126
	0,060	0,440	12,000	2,246	2,179	44,400	-3,900	1,530	184,126
	0,040	0,460	8,000	1,498	1,453	44,400	-3,900	1,520	184,126
	0,020	0,480	4,000	0,749	0,726	44,400	-3,900	1,510	184,126
	0,005	0,495	1,000	0,187	0,182	44,400	-3,900	1,503	184,126
	0,000	0,500	0,000	0,000	0,000	44,400	-3,900	1,500	0,000

Tank Calibrations - Aceite1 ER

Fluid Type = Specific gravity = 0,97

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Aceite1 ER	0,500	0,000	100,000	18,720	18,158	44,400	3,900	1,750	0,000
	0,490	0,010	98,000	18,346	17,795	44,400	3,900	1,745	184,126
	0,490	0,010	97,900	18,327	17,777	44,400	3,900	1,745	184,126
	0,480	0,020	96,000	17,971	17,432	44,400	3,900	1,740	184,126
	0,460	0,040	92,000	17,222	16,706	44,400	3,900	1,730	184,126
	0,440	0,060	88,000	16,474	15,979	44,400	3,900	1,720	184,126
	0,420	0,080	84,000	15,725	15,253	44,400	3,900	1,710	184,126
	0,400	0,100	80,000	14,976	14,527	44,400	3,900	1,700	184,126

	0,380	0,120	76,000	14,227	13,800	44,400	3,900	1,690	184,126
	0,360	0,140	72,000	13,478	13,074	44,400	3,900	1,680	184,126
	0,340	0,160	68,000	12,730	12,348	44,400	3,900	1,670	184,126
	0,320	0,180	64,000	11,981	11,621	44,400	3,900	1,660	184,126
	0,300	0,200	60,000	11,232	10,895	44,400	3,900	1,650	184,126
	0,280	0,220	56,000	10,483	10,169	44,400	3,900	1,640	184,126
	0,260	0,240	52,000	9,734	9,442	44,400	3,900	1,630	184,126
	0,240	0,260	48,000	8,986	8,716	44,400	3,900	1,620	184,126
	0,220	0,280	44,000	8,237	7,990	44,400	3,900	1,610	184,126
	0,200	0,300	40,000	7,488	7,263	44,400	3,900	1,600	184,126
	0,180	0,320	36,000	6,739	6,537	44,400	3,900	1,590	184,126
	0,160	0,340	32,000	5,990	5,811	44,400	3,900	1,580	184,126
	0,140	0,360	28,000	5,242	5,084	44,400	3,900	1,570	184,126
	0,120	0,380	24,000	4,493	4,358	44,400	3,900	1,560	184,126
	0,100	0,400	20,000	3,744	3,632	44,400	3,900	1,550	184,126
	0,080	0,420	16,000	2,995	2,905	44,400	3,900	1,540	184,126
	0,060	0,440	12,000	2,246	2,179	44,400	3,900	1,530	184,126

	0,040	0,460	8,000	1,498	1,453	44,400	3,900	1,520	184,126
	0,020	0,480	4,000	0,749	0,726	44,400	3,900	1,510	184,126
	0,005	0,495	1,000	0,187	0,182	44,400	3,900	1,503	184,126
	0,000	0,500	0,000	0,000	0,000	44,400	3,900	1,500	0,000

Tank Calibrations - AGUA TECNICA BR

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
AGUA TECNICA BR	3,500	0,000	100,000	52,056	53,358	74,908	0,000	7,300	0,000
	3,450	0,050	98,000	51,015	52,290	74,907	0,000	7,266	54,072
	3,447	0,053	97,900	50,963	52,237	74,907	0,000	7,265	53,964

	3,400	0,100	96,030	49,990	51,239	74,907	0,000	7,232	51,955
	3,200	0,300	88,464	46,051	47,203	74,906	0,000	7,098	44,062
	3,000	0,500	81,400	42,374	43,433	74,907	0,000	6,968	37,041
	2,800	0,700	74,835	38,956	39,930	74,911	0,000	6,842	30,843
	2,600	0,900	68,772	35,800	36,695	74,919	0,000	6,722	25,415
	2,400	1,100	63,213	32,906	33,729	74,932	0,000	6,609	20,702
	2,200	1,300	58,165	30,279	31,036	74,951	0,000	6,506	16,649
	2,000	1,500	53,603	27,904	28,601	74,976	0,000	6,413	13,201
	1,800	1,700	49,522	25,779	26,424	75,007	0,000	6,331	10,300
	1,600	1,900	45,484	23,677	24,269	75,039	0,000	6,254	11,361
	1,400	2,100	40,850	21,265	21,797	75,062	0,000	6,170	13,172
	1,200	2,300	35,765	18,618	19,084	75,077	0,000	6,081	15,022
	1,000	2,500	30,347	15,798	16,193	75,089	0,000	5,988	16,827
	0,800	2,700	24,660	12,837	13,158	75,098	0,000	5,893	18,547
	0,600	2,900	18,749	9,760	10,004	75,106	0,000	5,796	20,156
	0,400	3,100	12,650	6,585	6,750	75,112	0,000	5,699	21,635

	0,200	3,300	6,392	3,327	3,411	75,117	0,000	5,600	22,971
	0,031	3,469	1,000	0,521	0,534	75,120	0,000	5,516	23,981
	0,000	3,500	0,000	0,000	0,000	75,121	0,000	5,500	0,000

Tank Calibrations - lastre PIQUE PROA

Fluid Type = Specific gravity = 1

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	**Sounding m**	**Ullage m**	**% Full**	**Capacity m^3**	**Capacity tonne**	**LCG m**	**TCG m**	**VCG m**	**FSM tonne.m**
lastre PIQUE PROA	5,183	0,000	100,000	75,694	75,694	75,117	0,000	3,269	0,000
	5,093	0,090	98,000	74,180	74,180	75,117	0,000	3,225	24,034
	5,088	0,094	97,900	74,104	74,104	75,117	0,000	3,223	24,056
	5,000	0,183	95,920	72,606	72,606	75,116	0,000	3,178	24,483

	4,800	0,383	91,389	69,176	69,176	75,116	0,000	3,077	25,334
	4,600	0,583	86,806	65,707	65,707	75,115	0,000	2,975	26,019
	4,400	0,783	82,184	62,208	62,208	75,113	0,000	2,871	26,536
	4,200	0,983	77,533	58,688	58,688	75,112	0,000	2,767	26,882
	4,000	1,183	72,864	55,154	55,154	75,110	0,000	2,661	27,058
	3,800	1,383	68,189	51,615	51,615	75,107	0,000	2,554	27,060
	3,600	1,583	63,517	48,079	48,079	75,105	0,000	2,447	26,888
	3,400	1,783	58,860	44,553	44,553	75,101	0,000	2,338	26,540
	3,200	1,983	54,228	41,047	41,047	75,098	0,000	2,229	26,016
	3,000	2,183	49,633	37,569	37,569	75,093	0,000	2,119	25,313
	2,800	2,383	45,087	34,128	34,128	75,088	0,000	2,008	24,431
	2,600	2,583	40,602	30,733	30,733	75,082	0,000	1,896	23,370
	2,400	2,783	36,192	27,395	27,395	75,074	0,000	1,784	22,131
	2,200	2,983	31,873	24,126	24,126	75,066	0,000	1,671	20,715
	2,000	3,183	27,661	20,937	20,937	75,055	0,000	1,557	19,124
	1,800	3,383	23,575	17,845	17,845	75,042	0,000	1,443	17,364

	1,600	3,583	19,638	14,864	14,864	75,026	0,000	1,327	15,440
	1,400	3,783	15,876	12,017	12,017	75,004	0,000	1,211	13,352
	1,200	3,983	12,325	9,329	9,329	74,975	0,000	1,094	11,109
	1,000	4,183	9,027	6,833	6,833	74,933	0,000	0,975	8,735
	0,800	4,383	6,044	4,575	4,575	74,866	0,000	0,854	6,286
	0,600	4,583	3,464	2,622	2,622	74,744	0,000	0,731	3,870
	0,400	4,783	1,440	1,090	1,090	74,477	0,000	0,601	1,715
	0,342	4,840	1,000	0,757	0,757	74,356	0,000	0,562	1,203
	0,200	4,983	0,261	0,198	0,198	73,966	0,000	0,463	0,301
	0,000	5,183	0,000	0,000	0,000	73,224	0,000	0,317	0,000

Tank Calibrations - perforacionE PIQUE PP

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 100 %

Trim = 0 m (+ve by stern); Heel = 0 deg to starboard

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
perforacionE PIQUE PP	3,366	0,000	100,000	124,204	127,309	-4,617	0,000	7,752	0,000
	3,308	0,057	98,000	121,720	124,763	-4,616	0,000	7,723	1522,910
	3,305	0,060	97,900	121,596	124,636	-4,616	0,000	7,721	1522,910
	3,200	0,166	94,213	117,017	119,942	-4,614	0,000	7,668	1522,910
	3,000	0,366	87,223	108,335	111,043	-4,609	0,000	7,566	1522,909
	2,800	0,566	80,233	99,653	102,144	-4,604	0,000	7,464	1522,910
	2,600	0,766	73,243	90,971	93,245	-4,598	0,000	7,362	1522,911
	2,400	0,966	66,253	82,289	84,346	-4,590	0,000	7,260	1522,908
	2,200	1,166	59,263	73,607	75,447	-4,580	0,000	7,156	1522,901
	2,000	1,366	52,275	64,927	66,551	-4,568	0,000	7,052	1518,818
	1,800	1,566	45,300	56,264	57,671	-4,552	0,000	6,947	1505,550
	1,600	1,766	38,353	47,637	48,827	-4,531	0,000	6,841	1481,981
	1,400	1,966	31,453	39,066	40,043	-4,502	0,000	6,733	1446,236
	1,200	2,166	24,622	30,581	31,346	-4,457	0,000	6,621	1395,115

	1,000	2,366	17,892	22,223	22,779	-4,380	0,000	6,504	1321,081
	0,800	2,566	11,443	14,212	14,568	-4,238	0,000	6,372	1086,919
	0,600	2,766	6,346	7,882	8,079	-4,082	0,000	6,238	817,538
	0,400	2,966	2,761	3,430	3,515	-3,926	0,000	6,104	505,517
	0,245	3,121	1,000	1,242	1,273	-3,802	0,000	5,999	291,444
	0,200	3,166	0,664	0,825	0,846	-3,769	0,000	5,969	216,575
	0,000	3,366	0,000	0,000	0,000	-3,612	0,000	5,834	0,000

UNIVERSIDADE DA CORUÑA

Escola Politécnica Superior

TRABAJO FIN DE GRADO

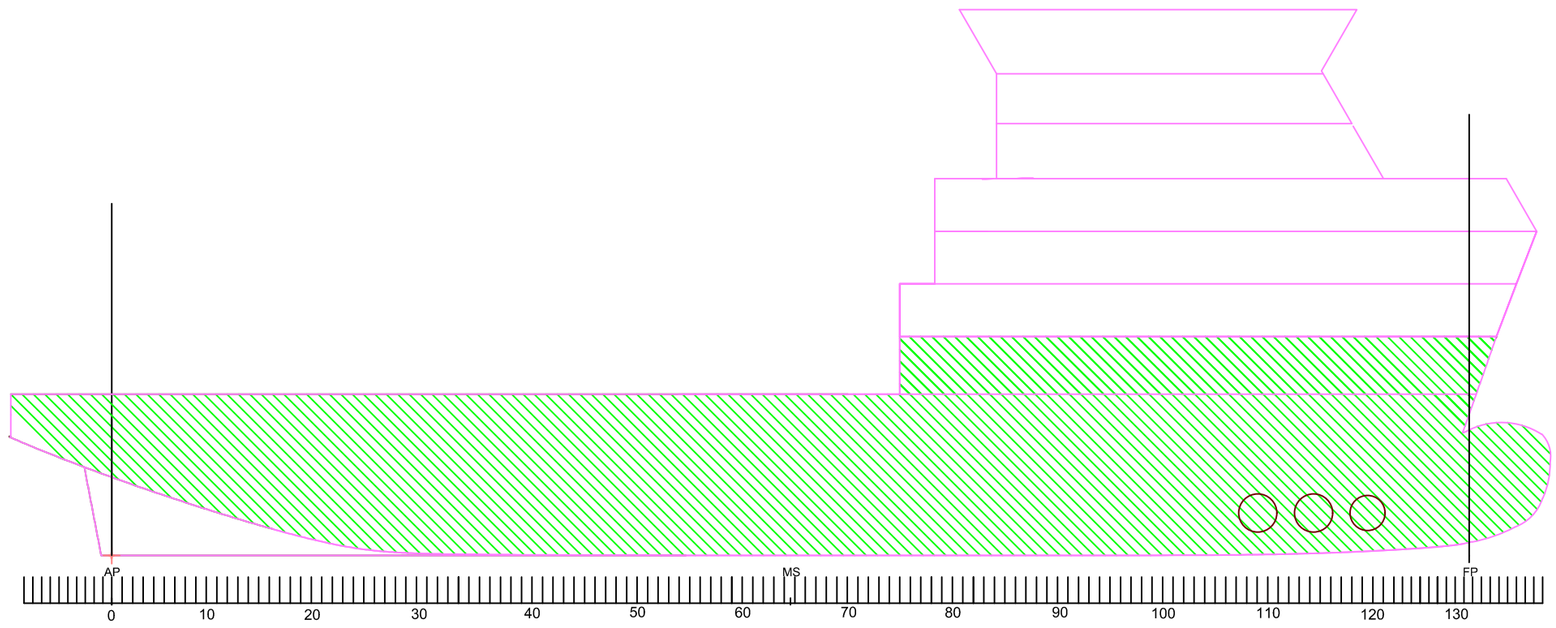
CURSO 2016/17

BUQUE SUPPLY AHTS 250 TPF

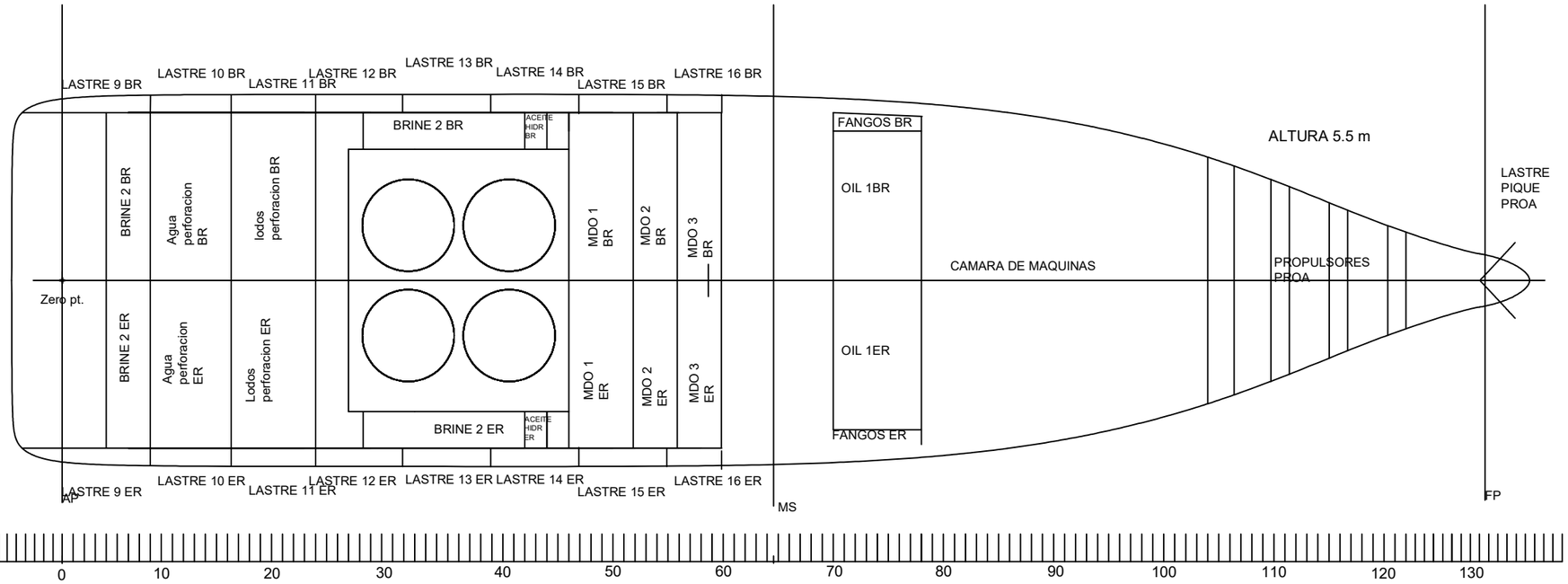
CUADERNO 4: CÁLCULOS DE ARQUITECTURA NAVAL

Grado en Ingeniería Naval y Oceánica

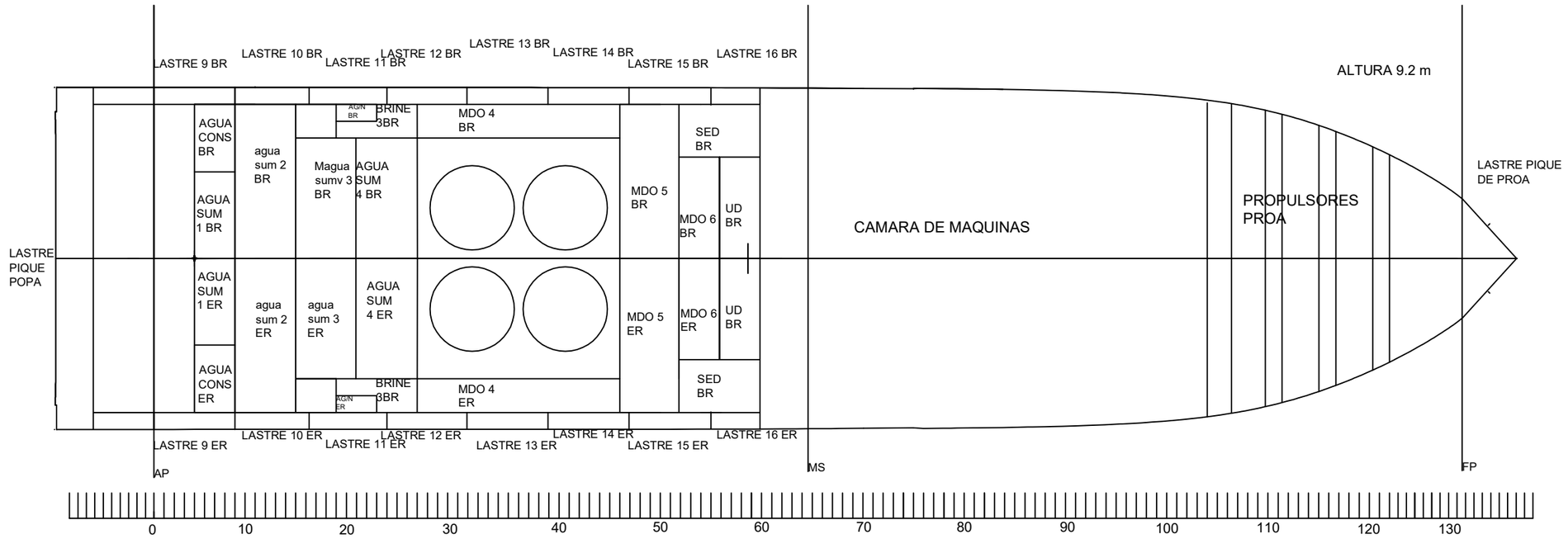
PLANOS DE TANQUES Y ZONA ESTANCA



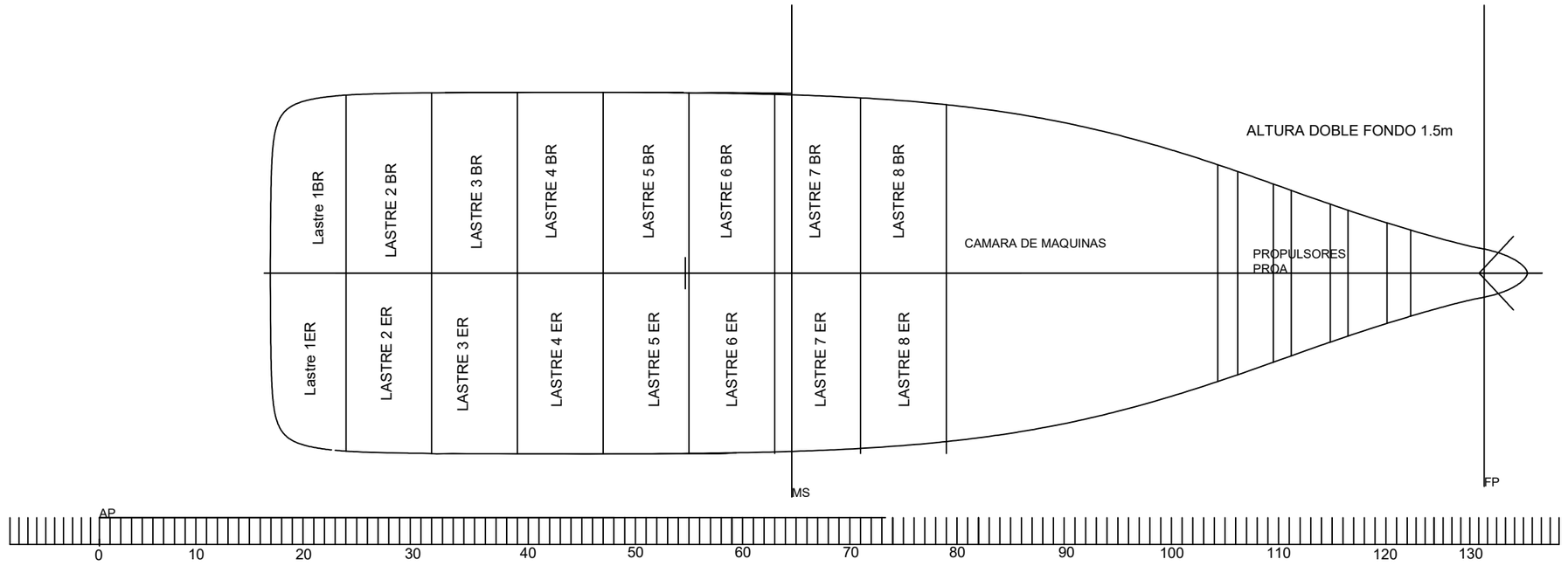
ESCOLA POLITECNICA SUPERIOR DE FERROL			
ALUMNO	NOELIA PAREDES PORTAS	FIRMA	REF. PIEZA ABD83562458 489−7
TRABAJO	PERFIL ZONA ESTANCA	NUMERO 2/2	ESCALA 1/350 FECHA 16/05/2017



ESCOLA POLITECNICA SUPERIOR DE FERROL			
ALUMNO	NOELIA PAREDES PORTAS	FIRMA	ABD83562458 489-7
TRABAJO	TANQUES HASTA CUBIERTA INTERMEDIA	NUMERO: 2/3	ESCALA: 1/300
			FECHA: 16/05/2017



ESCOLA POLITECNICA SUPERIOR DE FERROL			
ALUMNO	NOELIA PAREDES PORTAS	FIRMA	ABD83562458 489-7
TRABAJO	TANQUES HASTA CUBIERTA PRINCIPAL	NUMERO	ESCALA
		3/3	1/300
			FECHA
			16/05/2017



ESCOLA POLITECNICA SUPERIOR DE FERROL			
ALUMNO	NOELIA PAREDES PORTAS	FIRMA	ABD83562458 489−7
TRABAJO	TANQUES DOBLE FONDO	NUMERO: 1/3	ESCALA: 1/300
			FECHA: 16/05/2017