UNIVERSIDADE DA CORUÑA

Escola Politécnica Superior

TRABAJO FIN DE MÁSTER

CURSO 2017/18

PETROLERO DE 300.000 TPM

Máster en Ingeniería Naval y Oceánica

Cuaderno IV

COMPARTIMENTADO Y CÁLCULOS DE ARQUITECTURA NAVAL

Escola Politécnica Superior
UNIVERSIDADE DA CORUÑA

DEPARTAMENTO DE INGENIERÍA NAVAL Y OCEÁNICA

TRABAJO FIN DE MASTER EN INGENIERIA NAVAL Y OCEÁNICA

CURSO 2016-2017

PROYECTO 17-33

TIPO DE BUQUE: Petrolero de crudo de 300.000 TPM.

CLASIFICACIÓN, COTA Y REGLAMENTOS DE APLICACIÓN: DNV, SOLAS, MARPOL.

CARACTERÍSTICAS DE LA CARGA: Crudo y calefacción de tanques.

VELOCIDAD Y AUTONOMÍA: 15 nudos a la velocidad de servicio, 85% MCR y 15% MM.

SISTEMAS Y EQUIPOS DE CARGA / DESCARGA: Bombas en cámara de bombas.

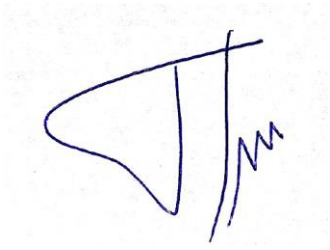
PROPULSIÓN: Motor diésel lento.

TRIPULACIÓN Y PASAJE: 35 tripulantes en camarotes individuales.

OTROS EQUIPOS E INSTALACIONES: las habituales en este tipo de buque.

Ferrol, Febrero de 2017

ALUMNO: D. Pedro Carro Allegue



Fernando Junco Ocampo

CUADERNO IV:

COMPARTIMENTADO Y CÁLCULOS DE ARQUITECTURA NAVAL

ÍNDICE:

ANEXO II: Calibración de tanques.
ANEXO III: Plano de PIP.
ANEXO IV: Curvas hidrostáticas.
ANEXO V: Curvas de KN.

1 INTRODUCCIÓN.

En este cuaderno, se calculará:

- El compartimentado de nuestro buque, disposición y capacidad de los tanques.
- Las curvas hidrostáticas así como los brazos de adrizamiento (KN).
- Así mismo se definirá también la zona estanca de nuestro buque, y el punto de inundación progresiva (PIP).

Al tratarse de un petrolero, la compartimentación del buque viene determinada principalmente por el cumplimiento del MARPOL, en concreto el ANEXO I "Reglas para prevenir la contaminación por hidrocarburos" y el ANEXO II "Reglas para prevenir la contaminación de sustancias nocivas líquidas transportadas a granel".

Para la realización del compartimentado y su posterior estudio, usaremos el programa "MAXURF".

La compartimentación longitudinal del buque se ha realizado teniendo en cuenta la separación entre refuerzos para que los mamparos de separación de espacios coincidan con anillos resistentes del casco.

Verticalmente el compartimentado se limita al doble fondo ya que es un barco de cubierta simple.

Transversalmente el buque cuenta con un doble casco que se utilizará como tanque de lastre.

2 COMPARTIMENTADO LONGITUDINAL.

2.1 Espaciado entre cuadernas.

Según nuestra sociedad de clasificación, el DNV, a pesar de que no nos da un valor concreto para esta separación entre cuadernas, sí nos da unos valores máximos para nuestro buque.

En la siguiente tabla podemos ver estos valores máximos:

ZONA	MÁXIMO ESTIMADO (mm)
Cuerpo Proa	470 + (L/0.6)
Cámara de máquinas	700
Cuerpo central	510 + (L/0.6)
Cuerpo de Popa	470 + (L/0.6)

Con el fin de no sobrepasar estos valores máximos, y basándonos en la experiencia de buques similares, tomaremos los siguientes espaciados:

- Cuerpo de Popa (hasta mamparo de Popa de la cámara de máquinas), 800 mm.

- Cámara de Máquinas (desde el mamparo de Popa hasta el de Proa de la Cámara de máquinas) 700 mm.

- Cuerpo central (desde el mamparo de Proa de la Cámara de máquinas hasta el mamparo de colisión) 1000 mm.

- Cuerpo de Proa (desde el mamparo de colisión hasta proa) 800 mm.

Además el buque posee un reforzado transversal mediante grandes bularcamas que se dispondrán a lo largo de toda la eslora entre perpendiculares del buque. Dichas bularcamas se dispondrán cada 5 cuadernas, es decir, entre bularcama y bularcama habrá 4 cuadernas.

2.2 Pique de Popa.

El DNV no nos determina ninguna limitación para nuestro pique de Popa, por tanto quedará definido en función de la cámara de máquinas y el lastre necesario.

En los apuntes de la asignatura de proyectos, tenemos definido que en buques grandes, la situación longitudinal del Pique de Popa suele ser aproximadamente el 4% de Lpp.

Nosotros nos guiamos por el valor de un buque base y teniendo en cuenta que debe coincidir con una de nuestras secciones transversales, tomará el valor, desde la estampa del buque, de:

Lpipque pp = 18.84 m

Que nos coincide con la cuaderna número 14

2.3 Cámara de Máquinas.

La situaremos justo a continuación del Pique de Popa, y su eslora la podemos definir como:

$$Lcm = 0.28 \cdot Lpp^{0.67} + 0.48 \cdot MCO^{0.35}$$

Como la longitud de esta cámara de máquinas va en función de la potencia del motor, podemos aproximarla a la de nuestro buque base, haciendo que coincida con uno de nuestros refuerzos transversales.

De forma que nuestra eslora de cámara de máquinas será:

Lcámara maq = 31.5 m

Y se situará entre la cuaderna 14 y la cuaderna número 59

Dentro de la cámara de máquinas se situarán tres plataformas (contando la primera plataforma como el propio piso).

La primera se situará a 3.5 metros de la línea base (altura del doble fondo)

La segunda a unos 12.5 metros de la línea base.

La tercera a unos 21.5 metros de la línea base.

Para más detalles de la disposición de la cámara de máquinas se puede consultar el ANEXO I.

2.4 Zona de carga.

En esta zona diferenciaremos distintos compartimentados:

- Cofferdam.
- Tanques de carga.
- Tanques Slops.
- Tanques de lastre.

2.4.1 Cofferdam.

A continuación de la cámara de bombas, se situará un cofferdam que la separe de la zona de carga.

Según nuestra Sociedad de Clasificación, nos obliga a que este cofferdam tenga un espaciado mínimo de 600 mm.

Nosotros tomaremos una separación de 1 metro, de forma que cumpla holgadamente con lo requerido por nuestra Sociedad de Clasificación, y a su vez nos permita un fácil acceso al interior del mismo por si fuese necesario.

Este cofferdam, si fuese necesario, podría utilizarse como tanque de lastre.

Estará entre la cuaderna 59 y la 60.

2.4.2 Tanques de Carga.

A proa de los tanques Slops situaremos nuestros tanques de carga.

Siguiendo las recomendaciones, dispondremos nuestra zona de carga con dos mamparos longitudinales, de manera que los tanques queden agrupados de tres en tres, con la reducción de la influencia de las superficies libres sobre la estabilidad que esto conlleva.

La longitud máxima que podemos dar a nuestros tanques, la delimita el convenio MARPOL, a través de la siguiente tabla:

Table 9.1.4 Permissible length of cargo tanks, see 1.2.20

Number of longitudinal bulkheads inside cargo tanks		One (on centreline)	Two	Three (one on centreline)	Where no longitudinal bulkhead is arranged or where longitudinal bulkheads are perforated across breadth of cargo tanks
Length of wing cargo tank		$\left(0{,}25\frac{b_i}{B}+0{,}15\right)L_L$	$0{,}2L_L$	$0{,}2L_L$	$\left(0{,}5\frac{b_i}{B}+0{,}1\right)L_L$ or $0{,}2L_L$ whichever is the lesser
Length of centre tank	$b_i \geq 0{,}2B$	—	$0{,}2L_L$	$0{,}2L_L$ port and starboard	
	$b_i < 0{,}2B$	—	$\left(0{,}5\frac{b_i}{B}+0{,}1\right)L_L$	$\left(0{,}25\frac{b_i}{B}+0{,}15\right)L_L$ port and starboard	

NOTE
The symbols L_L, B and b_i are defined in 1.5.

Por tanto, como hemos dicho, usaremos dos mamparos longitudinales. Y por tanto, siguiendo el convenio, estableceremos que la longitud de los tanques, tanto laterales como el central será de:

$$L_{tanquescarga} = 0.2 \cdot L_L$$

L_L la podemos definir como 96% de Lfl al 85% D, o bien Lpp al 85%D, la mayor de las dos.

En nuestro caso L_L toma el valor de Lpp al 85%D, es decir 305,5 m. Por tanto, la longitud máxima permitida será de:

$$L_{tanquescarga} = 61.1 \text{ metros}$$

De todas formas, una manera muy común de repartir los tanques de carga en buques similares es en 15 tanques dentro de la zona de carga. Por tanto, nosotros también haremos esa disposición de los tanques, por tanto, la eslora de nuestros tanques será menor que la máxima permitida por el MARPOL.

La longitud de los tanques será la siguiente:

Tanques		Longitud (m)
Tanques 1	Babor	50
	Central	50
	Estribor	50
Tanques 2	Babor	50
	Central	50
	Estribor	50
Tanques 3	Babor	50
	Central	50
	Estribor	50
Tanques 4	Babor	50
	Central	50
	Estribor	50
Tanques 5	Babor	33
	Central	33
	Estribor	33

El comienzo de la zona de estos tanques será en la cuaderna 65, y llegará hasta la cuaderna 298.

2.4.3 Tanques Slops.

Situaremos nuestros tanques Slops a proa del cofferdam y a popa de los tanques de carga.

El MARPOL nos indica que el volumen de estos tanques no puede ser menor al 3% del volumen de carga, con una serie de excepciones en las que permite un 2% y un 1% respectivamente.

Nuestro buque cumple con una de esas excepciones, por lo que debemos tener un volumen mínimo de estos tanques del 2% del volumen de carga.

Además, el convenio establece que los buques con DWT superior a 70000 ton, debe disponer de dos tanques por lo menos.

Nosotros estableceremos dos tanques separados por crujía. Con una eslora de 5 metros cada uno como se disponen en el plano.

Se dispondrán entre la cuaderna 60 y la 65.

Para comprobar que cumple el requisito del 2%, simplemente debemos consultar la tabla de capacidades que nos proporciona el MAXURF.

Más adelante mostraremos una tabla en la que podemos comprobar que cumple con este requisito.

2.4.4 Tanques de lastre.

El MARPOL dispone lo siguiente:

1) Todo buque petrolero de crudo de peso muerto mayor a 20.000 ton irá provisto de tanques de lastre separados.

2) La capacidad de los tanques de lastre será aquella que permita operar al buque con seguridad.

No se transportará nunca agua de lastre en los tanques de carga excepto en los casos:

- Condiciones meteorológicas adversas.
- Particularidades del servicio.

2.5 Pique de Proa.

Las Sociedades de Clasificación requieren que el mamparo del pique de proa se sitúe entre una distancia mínima y otra máxima a la perpendicular de proa.

Siguiendo la siguiente tabla en la que se regula dichas distancias mínima y máxima, podremos obtener nuestras medidas para la colocación del mamparo del pique de proa:

Arrangement	Length L_L, in metres	Distance of collision bulkhead aft of fore end of L_L, in metres	
		Minimum	Maximum
(a)	≤ 200	$0,05L_L$	$0,08L_L$
	> 200	10	$0,08L_L$
(b)	≤ 200	$0,05L_L - f_1$	$0,08L_L - f_1$
	> 200	$10 - f_2$	$0,08L_L - f_2$

Nuestro buque pertenece a los del tipo "a", ya que no tiene ninguna parte de su cuerpo sumergido por fuera de L_L, y como nuestra eslora es mayor de 200 metros deberá estar situado entre una distancia mínima de 10 metros y máxima de 0.08 L_L a popa de la perpendicular de Proa.

L_L la podemos definir como 96% de $L_{fl\ al\ 85\%\ D}$, o bien $L_{pp\ al\ 85\%D}$, la mayor de las dos.

En nuestro caso L_L toma el valor de $L_{pp\ al\ 85\%D}$, es decir 305,5 m.

Por tanto estaremos en un intervalo entre:

$$10\ m < x < 24.4\ m$$

Dentro de este intervalo, tomaremos un valor cercano al valor máximo, pero haciendo que coincida en una de nuestras cuadernas.

Por tanto tomará el valor de 23.8 metros, haciéndolo coincidir con la cuaderna número 298 hasta el extremo de proa.

2.6 Tanques de consumo.

Con esta denominación englobamos a todos los tanques de consumo que tenemos en el buque, entre ellos se encuentran los siguientes:

- Tanques de agua dulce.
- Tanques de Fuel Oil.
- Tanques de Diesel Oil.
- Tanques de lodos.
- Tanques de aguas residuales.
- Tanques de derrames.

2.6.1 Tanques de agua dulce.

Estimamos que cada tripulante consume 150 l/ día, teniendo en cuenta la autonomía y el número de tripulantes obtenemos:

$$Vad = \frac{150\frac{l}{día} \cdot 35\ trip. \cdot 6500\ millas}{1000\ l \cdot 24\ h \cdot 15\ nudos}$$

Vad = 95 m^3

Dispondremos de dos tanques de agua dulcE, según disponemos en el ANEXO I, de forma que cumpla holgadamente con el consumo de agua dulce.

2.6.2 Tanques de agua técnica.

En esta fase del proyecto, podemos basarnos en los tanques de nuestro buque de referencia, que tiene 600 m^3 repartidos en dos tanques simétricos cada uno de 300 m^3.

Vat = 600 m^3

2.6.3 Tanques de Fuel Oil.

El volumen de los tanques de fuel deberá ser suficiente para poder proporcionar al motor principal la autonomía requerida.

El consumo del motor principal (Cep) es de: 125 gr/(BHP hora)

La potencia del motor para la velocidad de servicio (BHPs, calculada en el cuaderno 6) es de 32282,42 HP.

La densidad del combustible la tomaremos como 0.94 ton/m^3

Teniendo en cuenta este consumo, así como la autonomía, velocidad y potencia podemos definir la cantidad de combustible necesario para poder cumplir con la autonomía establecida.

$$Consumo\ [ton] = \frac{Cep \cdot BHPs \cdot Autonomía}{Vs \cdot 10^6}$$

Consumo = 1748.62 ton

Dividiendo este valor por la densidad del combustible, tendremos el valor de los tanques de fuel:

Vol f.o. = 1643.7 m^3

Este volumen irá distribuido en diferentes tanques como son el tanque almacén, tanque de sedimentación y tanque de uso diario.

- Tanque de uso diario:

El tanque tendrá capacidad para alimentar en servicio el motor principal durante 24h.

Por tanto, deberá tener un volumen de:

$$V\ f.o.uso\ diario\ = \frac{(Cep\ \cdot\ BHPs\ \cdot\ 24\ horas)}{10^6 \cdot \rho}$$

Vf.o. uso diario = 103.02 m^3

Dispondremos de dos tanques de uso diario, de la forma en la que se dispone en el ANEXO I.

- Tanque de sedimentación:

Este tanque tiene la misión de separar por sedimentación los elementos más pesados del Fuel Oil, obteniendo así una refinación del Fuel Oil, que seguidamente después de pasar por este proceso se trasiega a los tanques de consumo diario.

Para el cálculo de su volumen, tendremos en cuenta que tenga la capacidad suficiente para cumplir con 36 horas de funcionamiento del motor principal.

$$V\ f.o.sediment. = \frac{(Cep\ \cdot\ BHPs\ \cdot\ 36\ horas)}{10^6 \cdot \rho}$$

Vf.o. sediment. = 154,54 m^3

Dispondremos de dos tanques de sedimentación, de la forma en la que se dispone en el ANEXO I.

- Tanque almacén:

Debe ser capaz de almacenar todo el Fuel Oil que no se encuentra en los dos tanques anteriores, por tanto lo podemos definir como:

Vf.o. almac. = Vf.o. – Vf.o.uso diario – Vf.o.sediment.

Vf.o.almac. = 1386.13 m^3

Dispondremos de dos tanques almacén, uno a cada costado del buque, de la forma en la que se dispone en el ANEXO I.

Mirando la capacidad de los tanques, que expondremos más abajo, podemos comprobar que cumplimos holgadamente con estos volúmenes de tanques.

2.6.4 Tanques de Diesel Oil.

Para la definición de estos tanques, nos basaremos en los datos obtenidos de los planos de un buque base con características similares a nuestro buque.

Por tanto, dispondremos de dos tanques de diésel oil con una capacidad de unos 250 m^3 cada uno.

Las características de dichos tanques las podremos observar en la tabla de capacidades de los tanques, así como en el ANEXO I.

2.6.5 Tanques de aceite.

Para el tanque de servicio se puede estimar de manera muy acertada un peso igual al 4% del peso de combustible de propulsión (Fuel Oil).

Por tanto:

Peso de aceite = 4 % Peso F.O.

Peso de aceite = 72.77 ton

La densidad del aceite que usaremos es de 0.92 ton/m^3. Por tanto el volumen del tanque de aceite será:

Vaceite = Peso de aceite/0.92

Vaceite = 79.1 m^3

Ese es el volumen del aceite que necesitaremos para nuestro motor. Pero colocaremos otro tanque de aceite, de reserva, del mismo tamaño que el anterior.

Por tanto:

V total aceite = 158.2 m^3

Igual que con los tanques anteriores, más adelante veremos una tabla con las capacidades de nuestros tanques y veremos que cumple con este requisito.

2.6.6 Tanque de lodos.

El reglamento MARPOL obliga a los buques mayores de 400 GT a disponer de un tanque de lodos.

El volumen de este tanque lo podemos definir como el 1,5 % del combustible total del buque. Es decir:

$$V_{tanque\ lodos} = 1{,}5\ \% \ (V_{f.o.} + V_{d.o.})$$

$$\underline{\mathbf{V_{tanque\ lodos} \approx 50\ m^3}}$$

Este tanque se situará en el doble fondo de la cámara de máquinas. Supondremos una densidad de lodos de 1,5 ton/m^3.

2.6.7 Tanque de aguas grises y negras.

Para los cálculos de capacidad de aguas negras y grises recurriremos a la norma UNE EN ISO 15749.

Según la "Tabla 2" de la norma:

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.				

Se considera una cantidad mínima de aguas negras y grises es de 180 l. por persona y día. Por tanto, el volumen total de agua de aguas negras es, para nuestros 35 tripulantes:

$$180\ x\ 35 = 6300\ litros = 6{,}3\ m^3\ día$$

Para una autonomía como la de nuestro buque(18.5 días) tenemos entonces que la capacidad de nuestro tanque debe ser de

$$\underline{\mathbf{V_{tanque\ aguas\ residuales} = 113.4\ m^3}}$$

Las aguas tendrán una densidad de 1.5 T / m3, debido a que serán las aguas sucias que se generaren durante la navegación.

2.6.8 Tanque de derrames.

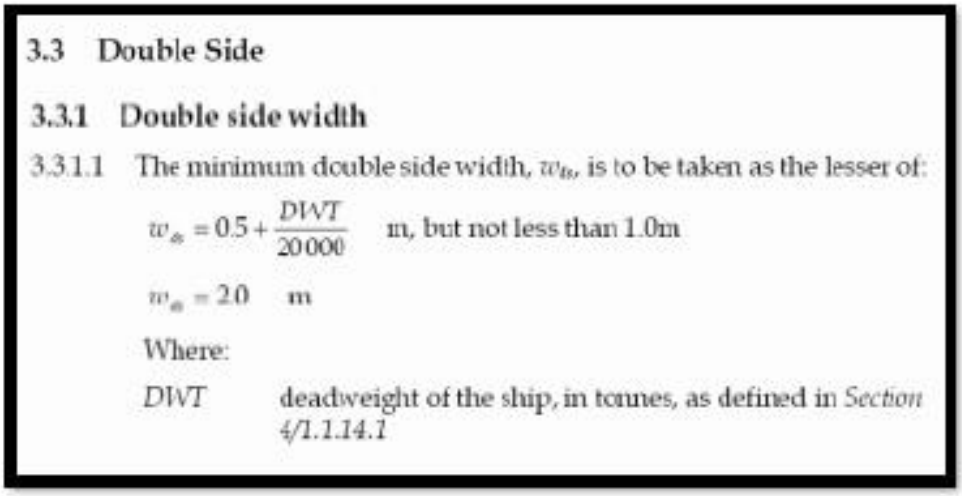
Basándonos en un buque base, tendrá que tener un valor superior a 40 m^3.

La densidad de este tanque será la del petróleo crudo (0.95 T / m3) puesto que el fluido que albergará será el petróleo que vaya rebosando.

3 COMPARTIMENTADO TRANSVERSAL (DOBLE CASCO).

En este apartado, nos centraremos en definir las dimensiones de nuestro doble casco, que es una medida obligatoria por el MARPOL, además de exigida por todas las Sociedades de Clasificación.

El MARPOL nos determina una manga mínima del doble casco en función de nuestro DWT:



3.3 Double Side

3.3.1 Double side width

3.3.1.1 The minimum double side width, w_m, is to be taken as the lesser of:

$w_m = 0.5 + \frac{DWT}{20000}$ m, but not less than 1.0m

$w_m = 2.0$ m

Where:

DWT deadweight of the ship, in tonnes, as defined in *Section 4/1.1.14.1*

Por tanto para nuestro buque, la manga mínima de nuestro doble casco será la menor de las siguientes:

$$m_{\text{mínima}} = 15.5 \text{ metros}$$

$$m_{\text{mínima}} = 2 \text{ metros}$$

A pesar de ser 2 metros el valor mínimo, se suele tomar un valor algo mayor. Por lo que un **doble casco de 3 metros de manga** parece razonable para facilitar el acceso a estos tanques si fuese necesario acceder a ellos.

Este doble casco, lo podremos utilizar a modo de tanques de lastre. Un poco más adelante, veremos la distribución de los tanques de lastre en la zona de carga, que serán en forma de "L" (la forma más comúnmente utilizada), uniendo el doble casco del costado con el doble fondo.

4 COMPARTIMENTADO VERTICAL (DOBLE FONDO).

Según el convenio MARPOL, igual que para el caso del doble casco, es obligatoria la existencia de un doble fondo.

El convenio determina una altura mínima que debe poseer dicho doble fondo en función de la manga de nuestro buque:

3.2 Double Bottom

3.2.1 Double bottom depth

3.2.1.1 The minimum double bottom depth, d_{db}, is to be taken as the lesser of:

$d_{db} = \frac{B}{15}$ m, but not less than 1.0m

$d_{db} = 2.0$ m

Where:

B moulded breadth, in m, as defined in *Section 4/1.1.3.1*

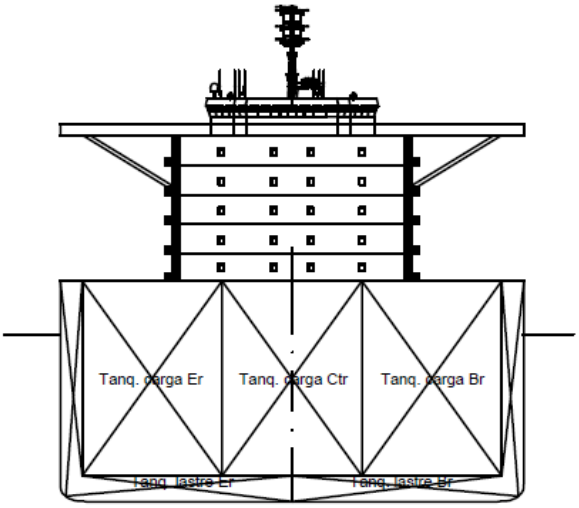
Por tanto para nuestro buque, la altura mínima de nuestro doble fondo será la menor de las siguientes:

h mínima = 4.2 metros

h mínima = 2 metros

A pesar de ser 2 metros el valor mínimo, se suele tomar un valor algo mayor. Por lo que un **doble fondo de 3.5 metros de altura** parece razonable, para facilitar el acceso a estos tanques.

Como hemos dicho anteriormente, estos tanques junto con los del doble casco se utilizarán para lastre. La disposición de los tanques de lastre los podemos ver en la siguiente imagen de una sección transversal, y en el ANEXO I, en donde tenemos nuestros planos de compartimentado.



5 CALIBRADO DE LOS TANQUES.

En este apartado, nos limitaremos a definir el volumen de cada uno de nuestros tanques y a comprobar si cumplen con los volúmenes mínimos anteriormente calculados.

El informe completo de la calibración de los tanques lo podemos observar en el ANEXO II.

	Volumen (m^3)		
	Capacidad real	Capacidad mínima	
Tanques de carga	319580,3	-	
Tanques de lastre	123548,3	-	
Tanques Slop	7255,5	63916,06	CUMPLE
Tanque Agua Dulce	200,0	95	CUMPLE
Tanque almacen F.O.	1640,5	1386,13	CUMPLE
Tanque sedimentación F.O.	222,26	154,54	CUMPLE
Tanque uso diario F.O.	169,2	103,02	CUMPLE
Tanque D.O.	529,2	-	
Tanque aceite	158,8	158,2	CUMPLE
Tanque lodos	75,8	50	CUMPLE
Tanque aguas grises y negras	157	113,4	CUMPLE
Tanque derrames	57,1	-	
Agua técnica	624,75	600	CUMPLE

6 ZONA ESTANCA Y PUNTO DE INUNDACIÓN PROGRESIVA (PIP).

La zona estanca del buque es aquella que no tiene aberturas con el exterior, o que en caso de tenerlas, estén dotadas de cierres estancos que imposibiliten la entrada de agua en dicha zona.

En nuestro buque la zona estanca se extiende desde la línea base hasta las puertas de la cubierta 1ª de habilitación.

En el ANEXO III podemos observar un plano que delimita la zona estanca (zona sombreada), así como los puntos de inundación progresiva.

Las coordenadas de estos puntos de inundación progresiva son:

	Coordenada long. (m)	Coordenada transv. (m)	Coordenada vertical (m)
PIP 1 (Babor)	**38.07**	**15.25**	**30**
PIP 2 (Estribor)	**38.07**	**15.25**	**30**

Estos puntos aquí definidos como PIP 1 y PIP 2, podemos observarlos de forma más sencilla en el cuaderno 7. Y se corresponden a los accesos a la superestructura de popa desde la cubierta principal.

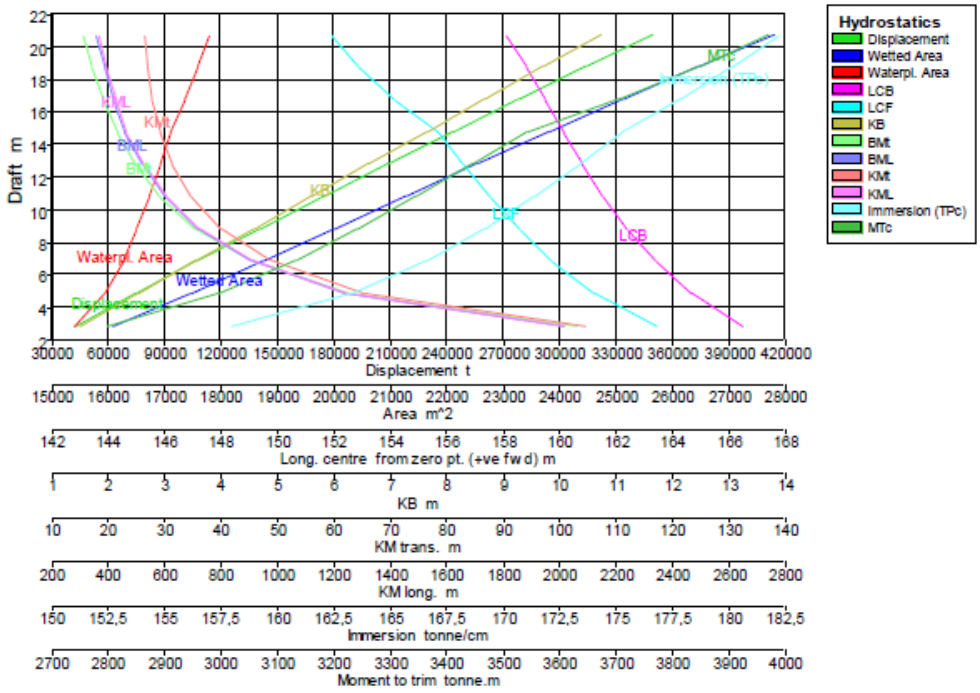
7 CÁLCULO DE HIDROSTÁTICAS.

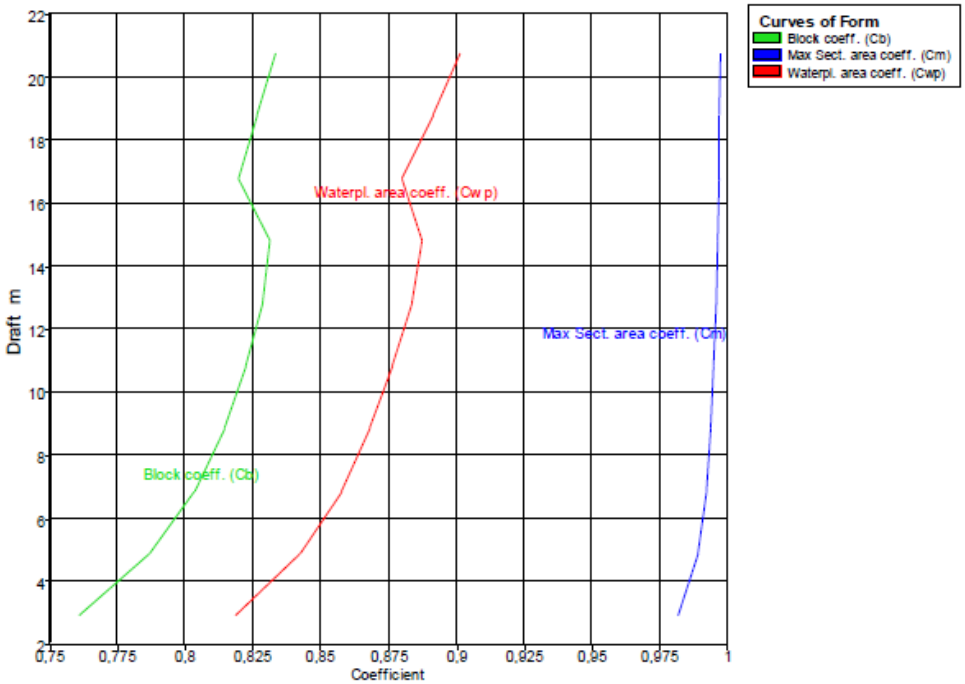
En este apartado procederemos a realizar el cálculo de las curvas hidrostáticas para diferentes calados y diferentes asientos. Estudiaremos los calados que se engloban dentro del intervalo delimitado por nuestro calado en Rosca (2,92 m) y nuestro calado de diseño (20,8 m) en 10 intervalos.

En cuanto a los diferentes trimados, estudiaremos los trimados que se engloben dentro del intervalo de -1.5% Lpp : 1.5 % Lpp. Es decir, se estudiarán los trimados para los siguientes valores:

- t = 0
- t = 0.5 m
- t = 1 m
- t = 1.5 m
- t = 2 m
- t = 2.5 m
- t = 3 m
- t = 3.5 m
- t = 4 m
- t = 4.5 m
- t = - 0.5 m
- t = - 1 m
- t = - 1.5 m
- t = - 2 m
- t = - 2.5 m
- t = - 3 m
- t = - 3.5 m
- t = - 4 m
- t = - 4.5 m

En este apartado, solo reflejaremos las curvas hidrostáticas para los diferentes calados con trimado "t = 0".

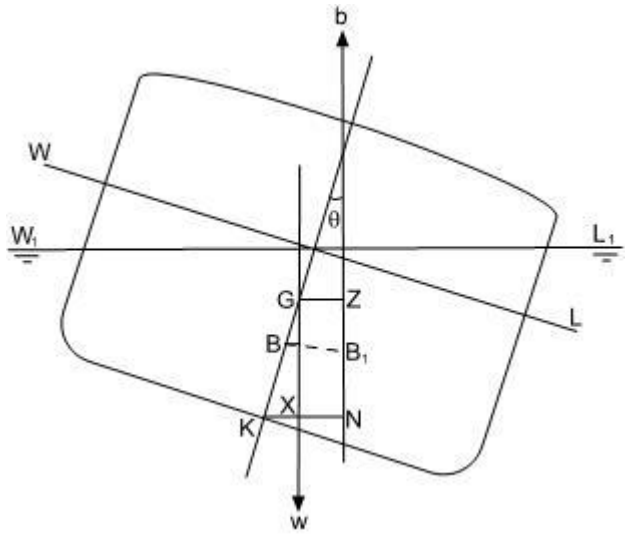




El resto de tablas y curvas hidrostáticas, para los diferentes trimados anteriormente citados, las podremos ver en el ANEXO IV.

8 CURVAS DE KN.

Los valores del brazo del par adrizante se calculan para diversos ángulos de escora, y una serie de desplazamientos que comprenden los desplazamientos más probables del buque, añadiendo cierto margen. El valor de este brazo no depende solo de las formas del buque, sino también del KG del buque.



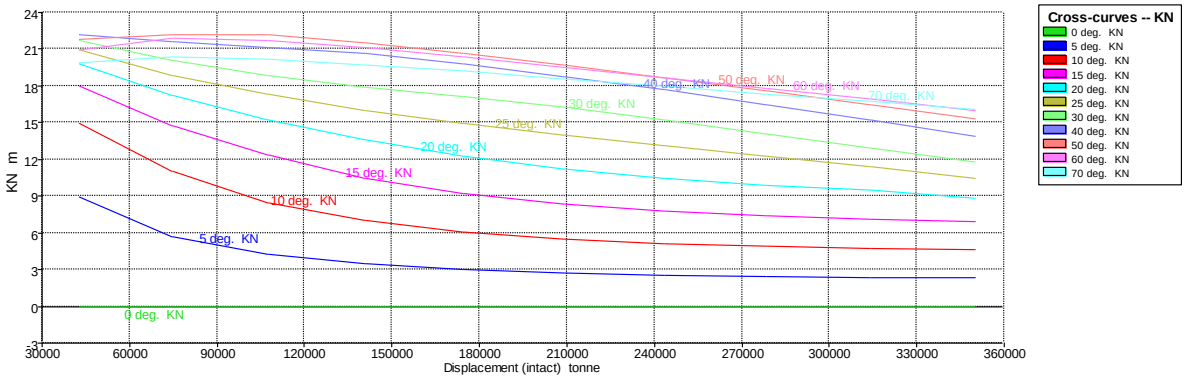
Ahora calcularemos nuestras curvas de KN, en función de diferentes ángulos de escora, y como hemos hecho para las hidrostáticas, diversos calados y trimados.

Los diferentes calados serán, como en el apartado anterior, los calados que se engloban dentro del intervalo delimitado por nuestro calado en Rosca (3.353 m) y nuestro calado de diseño (20,8 m) en 10 intervalos.

Los ángulos de escora, los estudiaremos desde 0 hasta 30º en intervalos de 5º y de 30º hasta 70º en intervalos de 10º.

A su vez, los trimados serán considerados, exactamente igual que en el apartado anterior, es decir los que se engloben dentro del intervalo de - 1.5 % Lpp : 1.5 % Lpp.

En este apartado, solo mostraremos las curvas KN para un trimado de "t = 0". Las curvas de KN para otros trimados las podremos observar en el ANEXO V.



9 BIBLIOGRAFÍA.

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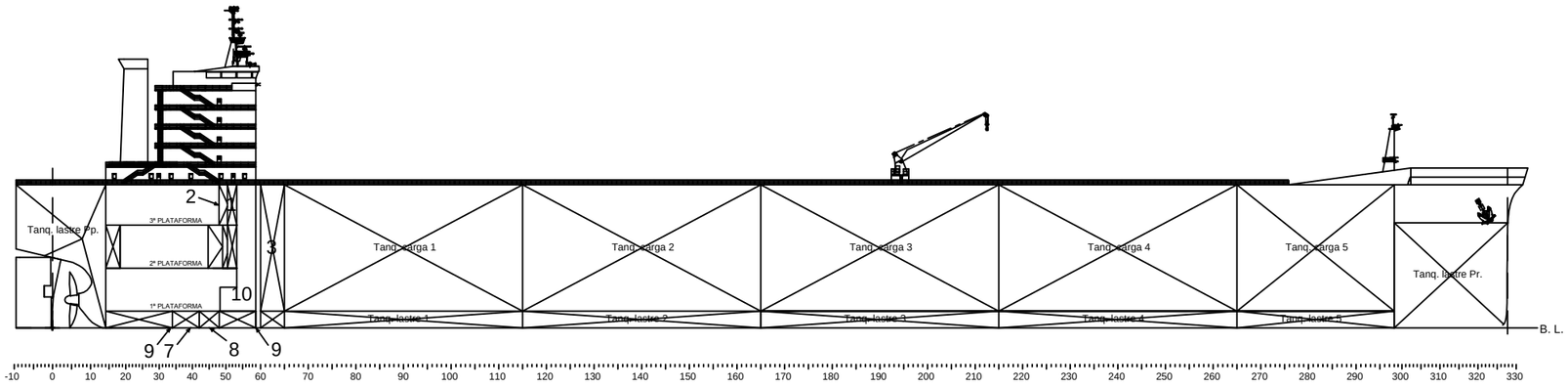
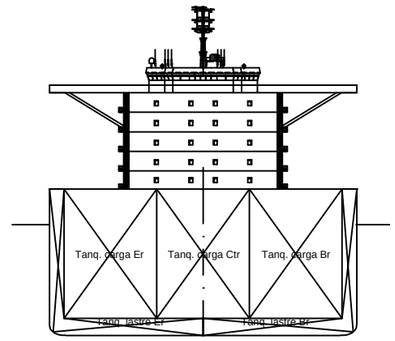
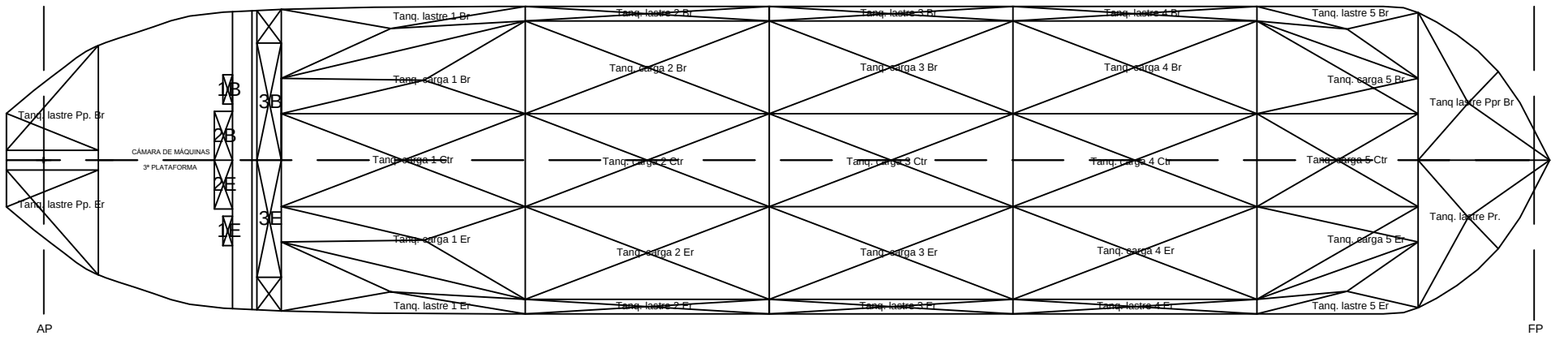
- Proyecto de buques y artefactos - JUNCO OCAMPO, Fernando.
- El proyecto básico del buque mercante - ALBARIÑO, R., AZPIROZ, J.J., MEIZOSO,

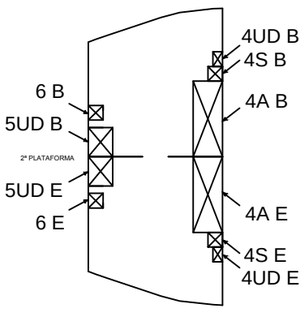
ANEXO I:

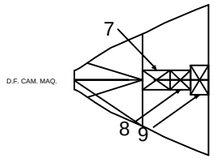
PLANO DE COMPARTIMENTADO











1E- Tanques de agua dulce Er.
1B- Tanque de agua dulce Br.
2E- Tanque de agua técnica Er.
2B- Tanque de agua técnica Br.
3E- Tanque Slop Er.
3B- Tanque Slop Br.
4A E- Tanque almc. FO Er.
4A B- Tanque almc. FO Br.
4S E- Tanque sedim. FO Er.
4S B- Tanque sedim. FO Br.
5UD E- Tanque UD. FO Er.
5UD B- Tanque UD. FO Br.
6 E- Tanque aceite Er.
6 B- Tanque aceite Br.
7 - Tanque lodos.
8 - Tanque derrames.
9 - Tanque aguas grises y negras.
10 - Cámara de bombas

UNIVERSIDADE DA CORUÑA

ESCUELA POLITÉCNICA SUPERIOR
Trabajo Fin de Grado

PROYECTO: 17/33: PETROLERO DE CRUDO DE 300.000 T.P.M.

PLANO: DISPOSICIÓN GENERAL

AUTOR:	FECHA:	ESCALA:	HOJA:
PEDRO CARRO ALLEGUE	FEBRERO 2018	1:1250	1A

ANEXO II:

CALIBRADO DE TANQUES

Tank Calibration

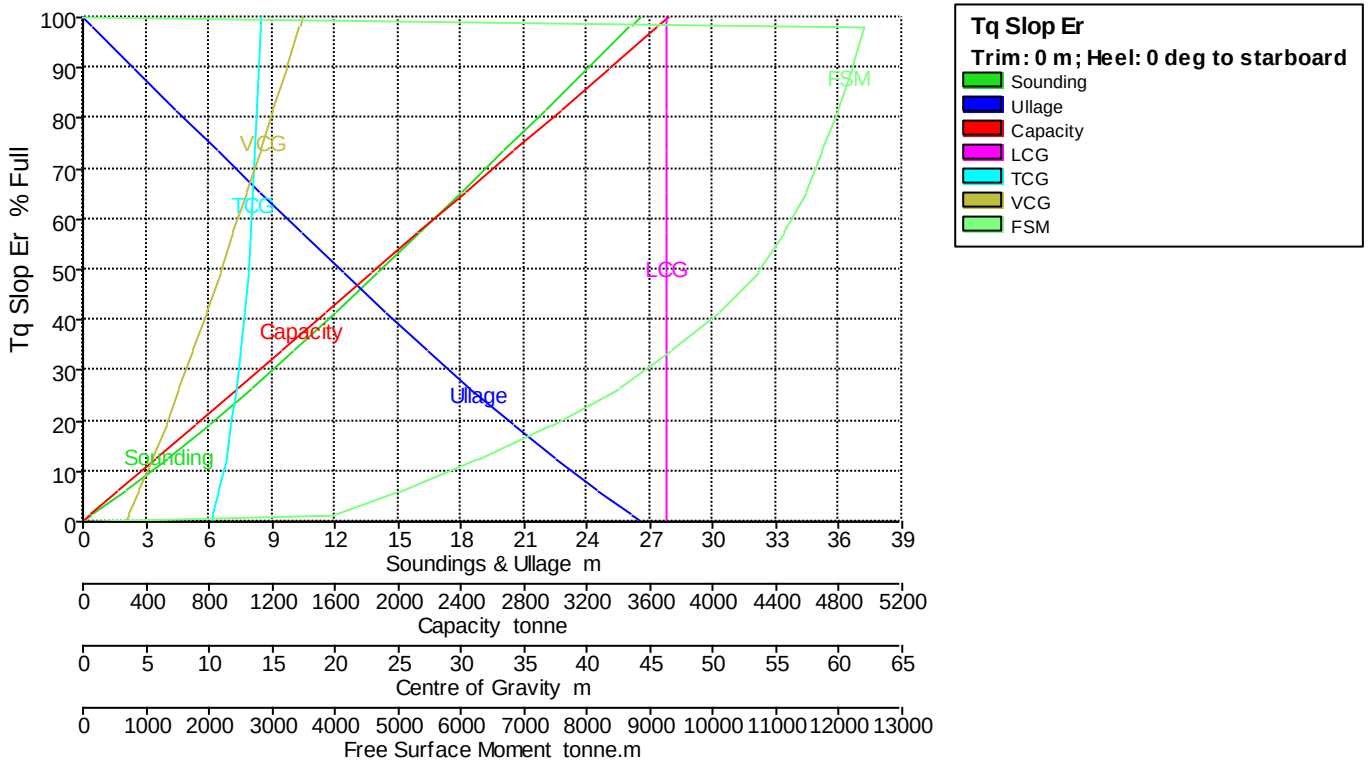
Tank Calibrations - Tq Slop Er

Fluid Type = Sea Water Specific gravity = 1,025

Permeability = 98 %

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
Tq Slop Er	26,500	0,000	100,000	3627,751	3718,444	46,217	14,110	17,457	0,000
	26,019	0,481	98,000	3555,195	3644,075	46,217	14,084	17,206	12411,775
	26,000	0,500	97,922	3552,377	3641,186	46,217	14,083	17,196	12409,798
	25,995	0,505	97,900	3551,568	3640,357	46,217	14,083	17,194	12409,230
	24,000	2,500	89,641	3251,953	3333,251	46,218	13,968	16,152	12199,610
	22,000	4,500	81,407	2953,243	3027,074	46,219	13,839	15,105	11989,541
	20,000	6,500	73,226	2656,447	2722,858	46,221	13,693	14,056	11739,190
	18,000	8,500	65,104	2361,798	2420,843	46,223	13,526	13,002	11468,055
	16,000	10,500	57,053	2069,728	2121,472	46,224	13,332	11,944	11140,296
	14,000	12,500	49,092	1780,949	1825,472	46,226	13,105	10,880	10703,433
	12,000	14,500	41,264	1496,953	1534,377	46,228	12,841	9,813	10068,875
	10,000	16,500	33,616	1219,503	1249,990	46,230	12,542	8,746	9333,229
	8,000	18,500	26,180	949,742	973,486	46,232	12,193	7,678	8484,736
	6,000	20,500	19,020	689,991	707,241	46,234	11,792	6,613	7431,670
	4,000	22,500	12,218	443,228	454,309	46,235	11,342	5,557	6242,419
	2,000	24,500	5,847	212,126	217,429	46,237	10,839	4,517	5006,927
	0,358	26,142	1,000	36,277	37,184	46,239	10,361	3,679	3933,564
	0,000	26,500	0,000	0,000	0,000	46,239	10,243	3,500	0,000


Tq Slop Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq Slop Er % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36 39
Soundings & Ullage m
0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 4400 4800 5200
Capacity tonne
0 5 10 15 20 25 30 35 40 45 50 55 60 65
Centre of Gravity m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000
Free Surface Moment tonne.m

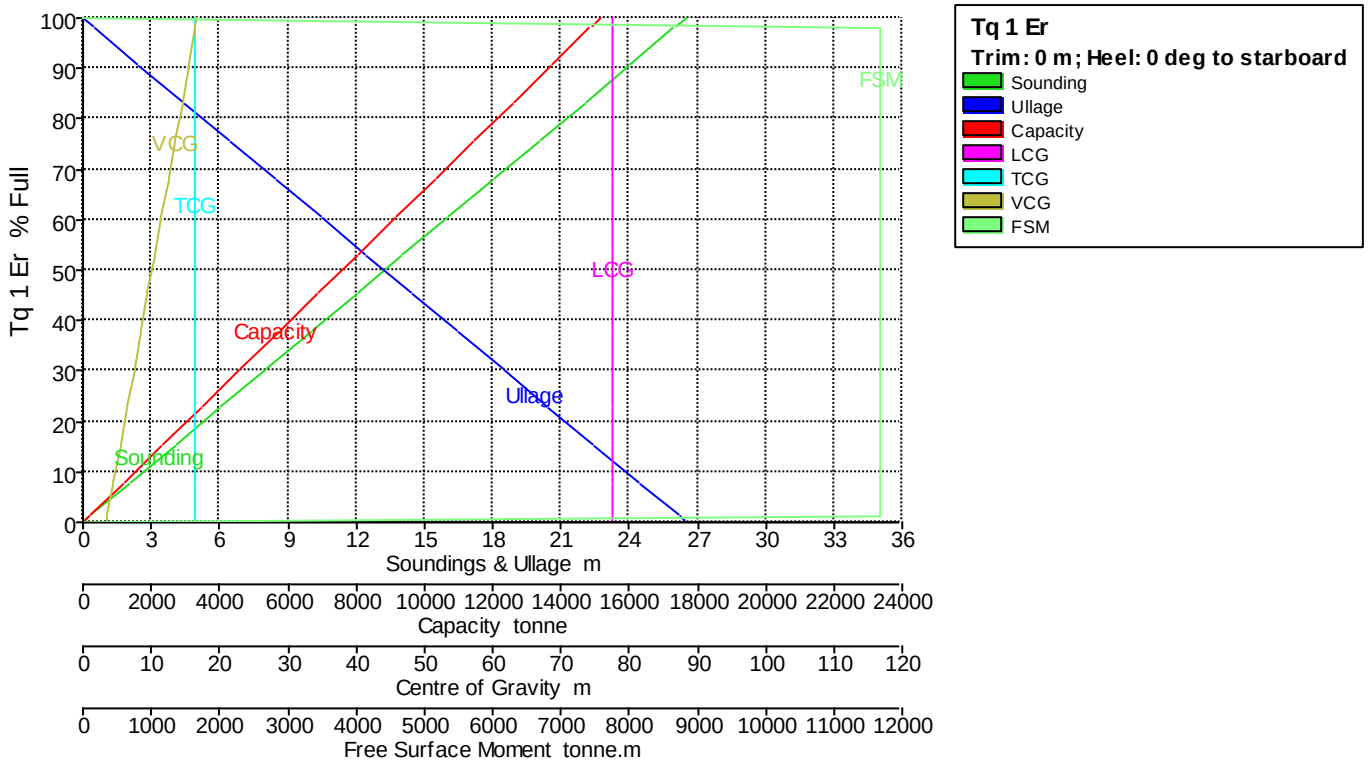
Tank Calibrations - Tq 1 Er

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 1 Er	26,500	0,000	100,000	17042,811	15139,129	77,430	16,511	16,750	0,000
	26,000	0,500	98,113	16721,249	14853,485	77,430	16,511	16,500	11680,778
	25,970	0,530	98,000	16701,955	14836,347	77,430	16,511	16,485	11680,778
	25,944	0,556	97,900	16684,912	14821,207	77,430	16,511	16,472	11680,778
	24,000	2,500	90,566	15434,999	13710,909	77,430	16,511	15,500	11680,778
	22,000	4,500	83,019	14148,749	12568,334	77,430	16,511	14,500	11680,778
	20,000	6,500	75,472	12862,499	11425,758	77,430	16,511	13,500	11680,778
	18,000	8,500	67,925	11576,249	10283,182	77,430	16,511	12,500	11680,778
	16,000	10,500	60,377	10289,999	9140,606	77,430	16,511	11,500	11680,778
	14,000	12,500	52,830	9003,749	7998,030	77,430	16,511	10,500	11680,778
	12,000	14,500	45,283	7717,499	6855,455	77,430	16,511	9,500	11680,778
	10,000	16,500	37,736	6431,250	5712,879	77,430	16,511	8,500	11680,778
	8,000	18,500	30,189	5145,000	4570,303	77,430	16,511	7,500	11680,778
	6,000	20,500	22,642	3858,750	3427,727	77,430	16,511	6,500	11680,778
	4,000	22,500	15,094	2572,500	2285,152	77,430	16,511	5,500	11680,778
	2,000	24,500	7,547	1286,250	1142,576	77,430	16,511	4,500	11680,778
	0,265	26,235	1,000	170,428	151,391	77,430	16,511	3,632	11680,778
	0,000	26,500	0,000	0,000	0,000	77,430	16,511	3,500	0,000


Tq 1 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 1 Er % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
LCG
FSM
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36
Soundings & Ullage m
0 2000 4000 6000 8000 10000 12000 14000 16000 18000 20000 22000 24000
Capacity tonne
0 10 20 30 40 50 60 70 80 90 100 110 120
Centre of Gravity m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000
Free Surface Moment tonne.m

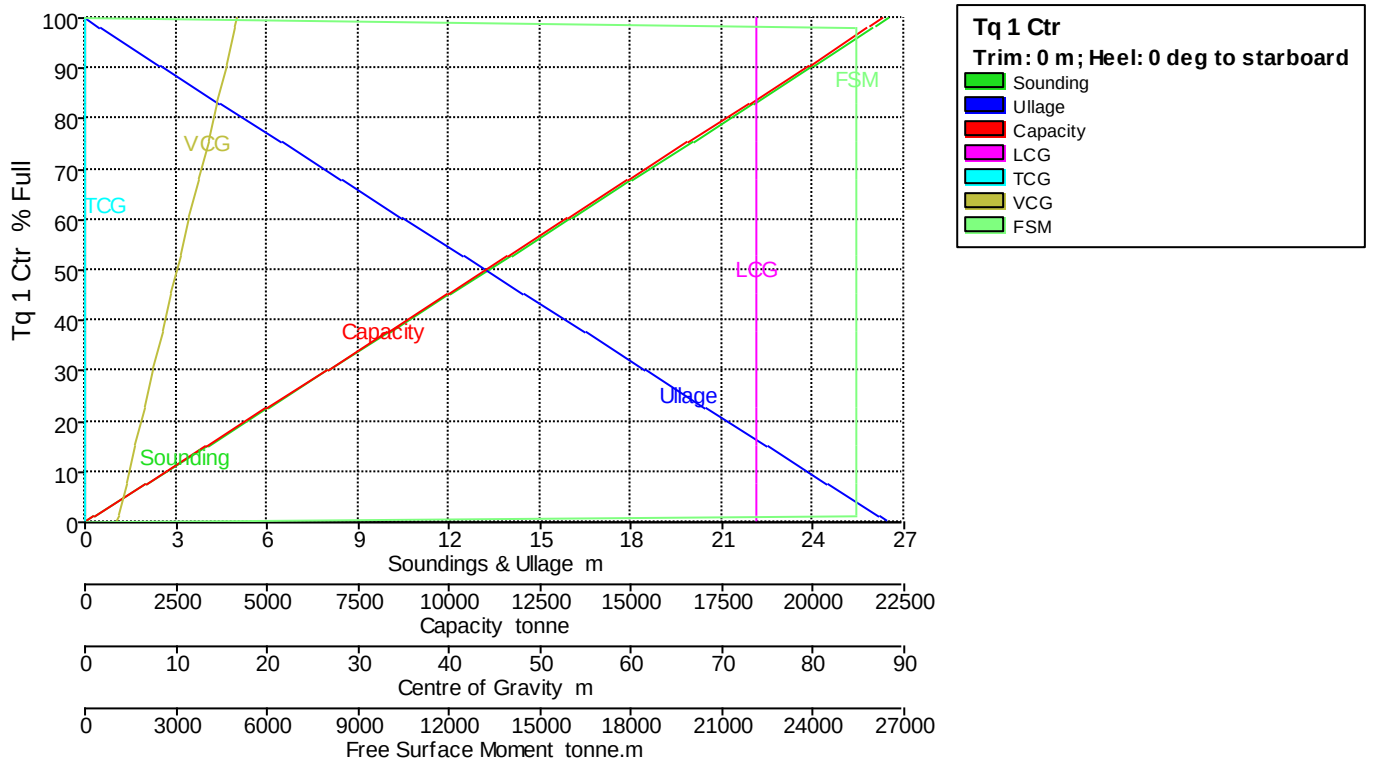
Tank Calibrations - Tq 1 Ctr

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 1 Ctr	26,500	0,000	100,000	24671,499	21915,692	73,700	0,000	16,750	0,000
	26,000	0,500	98,113	24205,999	21502,188	73,700	0,000	16,500	25386,871
	25,970	0,530	98,000	24178,069	21477,378	73,700	0,000	16,485	25386,871
	25,944	0,556	97,900	24153,397	21455,462	73,700	0,000	16,472	25386,871
	24,000	2,500	90,566	22343,999	19848,174	73,700	0,000	15,500	25386,871
	22,000	4,500	83,019	20481,999	18194,159	73,700	0,000	14,500	25386,871
	20,000	6,500	75,472	18619,999	16540,145	73,700	0,000	13,500	25386,871
	18,000	8,500	67,925	16757,999	14886,130	73,700	0,000	12,500	25386,871
	16,000	10,500	60,377	14895,999	13232,116	73,700	0,000	11,500	25386,871
	14,000	12,500	52,830	13033,999	11578,101	73,700	0,000	10,500	25386,871
	12,000	14,500	45,283	11171,999	9924,087	73,700	0,000	9,500	25386,871
	10,000	16,500	37,736	9309,999	8270,072	73,700	0,000	8,500	25386,871
	8,000	18,500	30,189	7448,000	6616,058	73,700	0,000	7,500	25386,871
	6,000	20,500	22,642	5586,000	4962,043	73,700	0,000	6,500	25386,871
	4,000	22,500	15,094	3724,000	3308,029	73,700	0,000	5,500	25386,871
	2,000	24,500	7,547	1862,000	1654,014	73,700	0,000	4,500	25386,871
	0,265	26,235	1,000	246,715	219,157	73,700	0,000	3,633	25386,871
	0,000	26,500	0,000	0,000	0,000	73,700	0,000	3,500	0,000



Tq 1 Ctr

Trim: 0 m; Heel: 0 deg to starboard

- Sounding
- Ullage
- Capacity
- LCG
- TCG
- VCG
- FSM

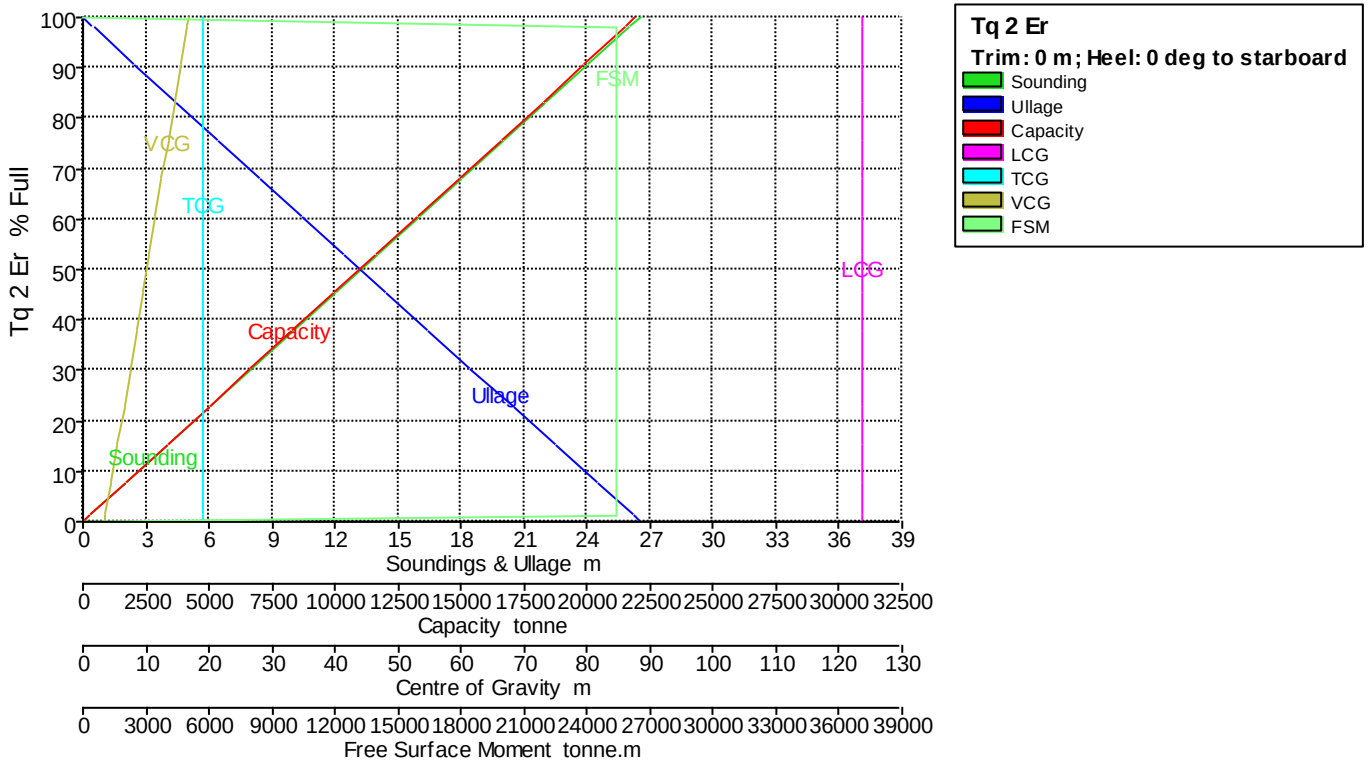
Tank Calibrations - Tq 2 Er

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 2 Er	26,500	0,000	100,000	24671,500	21915,694	123,700	19,000	16,750	0,000
	26,000	0,500	98,113	24206,000	21502,190	123,700	19,000	16,500	25386,873
	25,970	0,530	98,000	24178,070	21477,380	123,700	19,000	16,485	25386,873
	25,944	0,556	97,900	24153,399	21455,464	123,700	19,000	16,472	25386,873
	24,000	2,500	90,566	22344,000	19848,175	123,700	19,000	15,500	25386,873
	22,000	4,500	83,019	20482,000	18194,161	123,700	19,000	14,500	25386,873
	20,000	6,500	75,472	18620,000	16540,146	123,700	19,000	13,500	25386,873
	18,000	8,500	67,925	16758,000	14886,131	123,700	19,000	12,500	25386,873
	16,000	10,500	60,377	14896,000	13232,117	123,700	19,000	11,500	25386,873
	14,000	12,500	52,830	13034,000	11578,102	123,700	19,000	10,500	25386,873
	12,000	14,500	45,283	11172,000	9924,088	123,700	19,000	9,500	25386,873
	10,000	16,500	37,736	9310,000	8270,073	123,700	19,000	8,500	25386,873
	8,000	18,500	30,189	7448,000	6616,058	123,700	19,000	7,500	25386,873
	6,000	20,500	22,642	5586,000	4962,044	123,700	19,000	6,500	25386,873
	4,000	22,500	15,094	3724,000	3308,029	123,700	19,000	5,500	25386,873
	2,000	24,500	7,547	1862,000	1654,015	123,700	19,000	4,500	25386,873
	0,265	26,235	1,000	246,715	219,157	123,700	19,000	3,632	25386,873
	0,000	26,500	0,000	0,000	0,000	123,700	19,000	3,500	0,000


Tq 2 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 2 Er % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36 39
Soundings & Ullage m
0 2500 5000 7500 10000 12500 15000 17500 20000 22500 25000 27500 30000 32500
Capacity tonne
0 10 20 30 40 50 60 70 80 90 100 110 120 130
Centre of Gravity m
0 3000 6000 9000 12000 15000 18000 21000 24000 27000 30000 33000 36000 39000
Free Surface Moment tonne.m

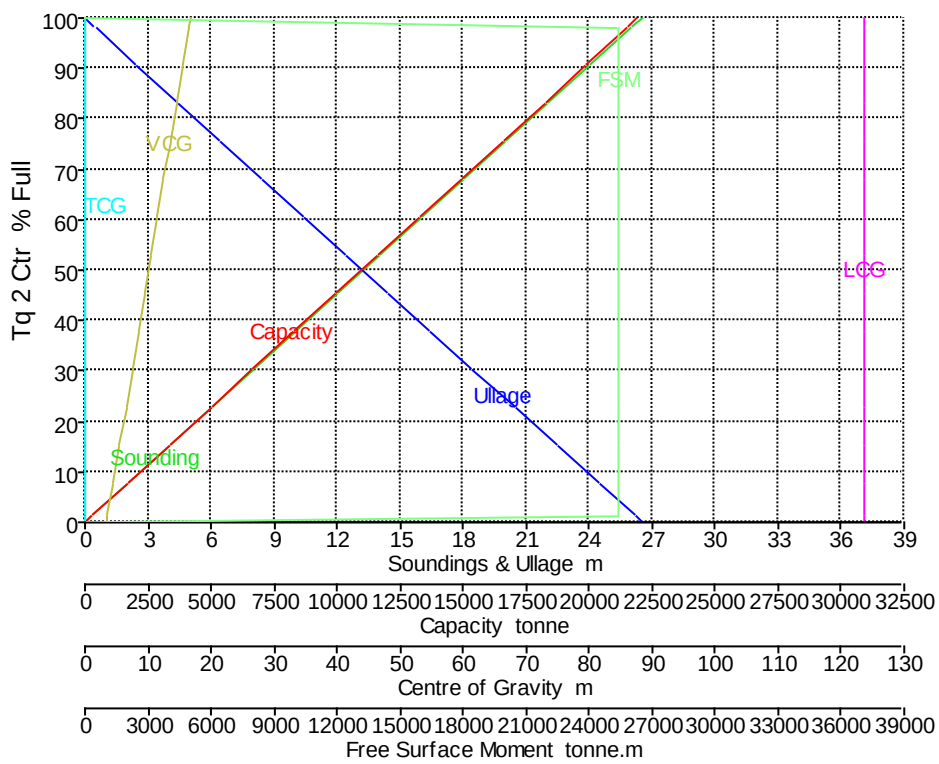
Tank Calibrations - Tq 2 Ctr

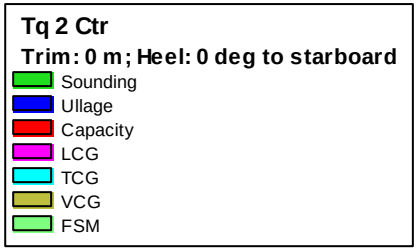
Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 2 Ctr	26,500	0,000	100,000	24671,500	21915,694	123,700	0,000	16,750	0,000
	26,000	0,500	98,113	24206,000	21502,190	123,700	0,000	16,500	25386,873
	25,970	0,530	98,000	24178,070	21477,380	123,700	0,000	16,485	25386,873
	25,944	0,556	97,900	24153,399	21455,464	123,700	0,000	16,472	25386,873
	24,000	2,500	90,566	22344,000	19848,175	123,700	0,000	15,500	25386,873
	22,000	4,500	83,019	20482,000	18194,161	123,700	0,000	14,500	25386,873
	20,000	6,500	75,472	18620,000	16540,146	123,700	0,000	13,500	25386,873
	18,000	8,500	67,925	16758,000	14886,131	123,700	0,000	12,500	25386,873
	16,000	10,500	60,377	14896,000	13232,117	123,700	0,000	11,500	25386,873
	14,000	12,500	52,830	13034,000	11578,102	123,700	0,000	10,500	25386,873
	12,000	14,500	45,283	11172,000	9924,088	123,700	0,000	9,500	25386,873
	10,000	16,500	37,736	9310,000	8270,073	123,700	0,000	8,500	25386,873
	8,000	18,500	30,189	7448,000	6616,058	123,700	0,000	7,500	25386,873
	6,000	20,500	22,642	5586,000	4962,044	123,700	0,000	6,500	25386,873
	4,000	22,500	15,094	3724,000	3308,029	123,700	0,000	5,500	25386,873
	2,000	24,500	7,547	1862,000	1654,015	123,700	0,000	4,500	25386,873
	0,265	26,235	1,000	246,715	219,157	123,700	0,000	3,633	25386,873
	0,000	26,500	0,000	0,000	0,000	123,700	0,000	3,500	0,000


Tq 2 Ctr % Full
100
90
80
70
60
50
40
30
20
10
0
FSM
VCG
TCG
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36 39
Soundings & Ullage m
0 2500 5000 7500 10000 12500 15000 17500 20000 22500 25000 27500 30000 32500
Capacity tonne
0 10 20 30 40 50 60 70 80 90 100 110 120 130
Centre of Gravity m
0 3000 6000 9000 12000 15000 18000 21000 24000 27000 30000 33000 36000 39000
Free Surface Moment tonne.m


Tq 2 Ctr
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM

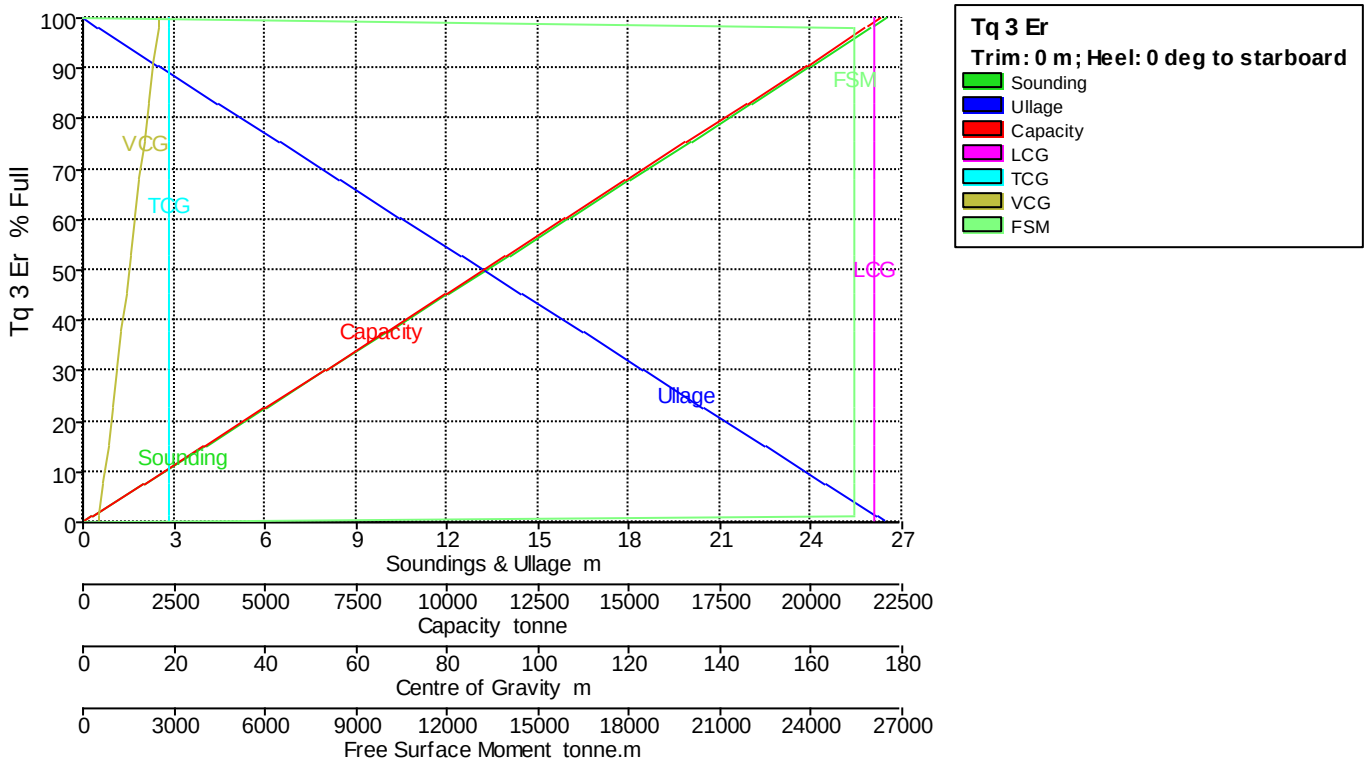
Tank Calibrations - Tq 3 Er

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 3 Er	26,500	0,000	100,000	24671,500	21915,694	173,700	19,000	16,750	0,000
	26,000	0,500	98,113	24206,000	21502,190	173,700	19,000	16,500	25386,873
	25,970	0,530	98,000	24178,070	21477,380	173,700	19,000	16,485	25386,873
	25,944	0,556	97,900	24153,399	21455,464	173,700	19,000	16,472	25386,873
	24,000	2,500	90,566	22344,000	19848,175	173,700	19,000	15,500	25386,873
	22,000	4,500	83,019	20482,000	18194,161	173,700	19,000	14,500	25386,873
	20,000	6,500	75,472	18620,000	16540,146	173,700	19,000	13,500	25386,873
	18,000	8,500	67,925	16758,000	14886,131	173,700	19,000	12,500	25386,873
	16,000	10,500	60,377	14896,000	13232,117	173,700	19,000	11,500	25386,873
	14,000	12,500	52,830	13034,000	11578,102	173,700	19,000	10,500	25386,873
	12,000	14,500	45,283	11172,000	9924,088	173,700	19,000	9,500	25386,873
	10,000	16,500	37,736	9310,000	8270,073	173,700	19,000	8,500	25386,873
	8,000	18,500	30,189	7448,000	6616,058	173,700	19,000	7,500	25386,873
	6,000	20,500	22,642	5586,000	4962,044	173,700	19,000	6,500	25386,873
	4,000	22,500	15,094	3724,000	3308,029	173,700	19,000	5,500	25386,873
	2,000	24,500	7,547	1862,000	1654,015	173,700	19,000	4,500	25386,873
	0,265	26,235	1,000	246,715	219,157	173,700	19,000	3,632	25386,873
	0,000	26,500	0,000	0,000	0,000	173,700	19,000	3,500	0,000


Tq 3 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 3 Er % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27
Soundings & Ullage m
0 2500 5000 7500 10000 12500 15000 17500 20000 22500
Capacity tonne
0 20 40 60 80 100 120 140 160 180
Centre of Gravity m
0 3000 6000 9000 12000 15000 18000 21000 24000 27000
Free Surface Moment tonne.m

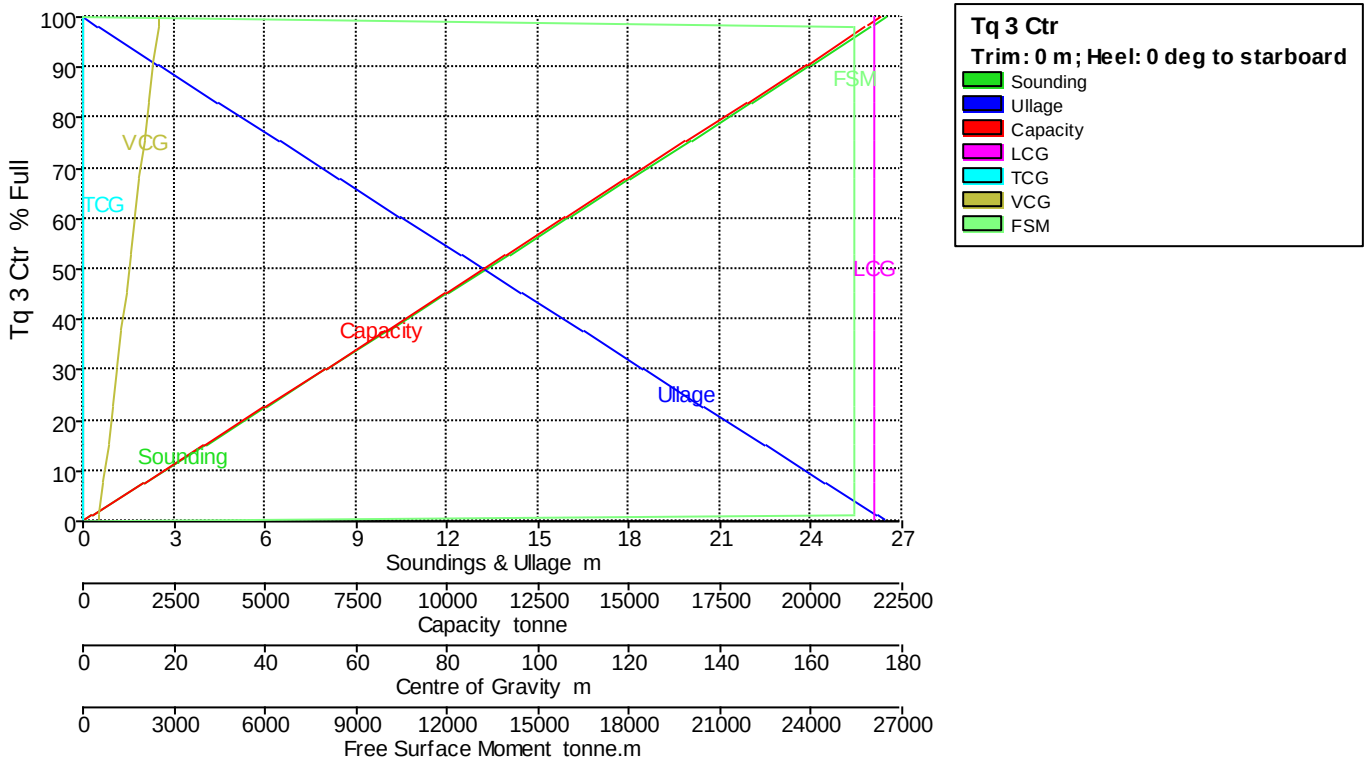
Tank Calibrations - Tq 3 Ctr

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 3 Ctr	26,500	0,000	100,000	24671,500	21915,694	173,700	0,000	16,750	0,000
	26,000	0,500	98,113	24206,000	21502,190	173,700	0,000	16,500	25386,873
	25,970	0,530	98,000	24178,070	21477,380	173,700	0,000	16,485	25386,873
	25,944	0,556	97,900	24153,399	21455,464	173,700	0,000	16,472	25386,873
	24,000	2,500	90,566	22344,000	19848,175	173,700	0,000	15,500	25386,873
	22,000	4,500	83,019	20482,000	18194,161	173,700	0,000	14,500	25386,873
	20,000	6,500	75,472	18620,000	16540,146	173,700	0,000	13,500	25386,873
	18,000	8,500	67,925	16758,000	14886,131	173,700	0,000	12,500	25386,873
	16,000	10,500	60,377	14896,000	13232,117	173,700	0,000	11,500	25386,873
	14,000	12,500	52,830	13034,000	11578,102	173,700	0,000	10,500	25386,873
	12,000	14,500	45,283	11172,000	9924,088	173,700	0,000	9,500	25386,873
	10,000	16,500	37,736	9310,000	8270,073	173,700	0,000	8,500	25386,873
	8,000	18,500	30,189	7448,000	6616,058	173,700	0,000	7,500	25386,873
	6,000	20,500	22,642	5586,000	4962,044	173,700	0,000	6,500	25386,873
	4,000	22,500	15,094	3724,000	3308,029	173,700	0,000	5,500	25386,873
	2,000	24,500	7,547	1862,000	1654,015	173,700	0,000	4,500	25386,873
	0,265	26,235	1,000	246,715	219,157	173,700	0,000	3,633	25386,873
	0,000	26,500	0,000	0,000	0,000	173,700	0,000	3,500	0,000


Tq 3 Ctr
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 3 Ctr % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27
Soundings & Ullage m
0 2500 5000 7500 10000 12500 15000 17500 20000 22500
Capacity tonne
0 20 40 60 80 100 120 140 160 180
Centre of Gravity m
0 3000 6000 9000 12000 15000 18000 21000 24000 27000
Free Surface Moment tonne.m

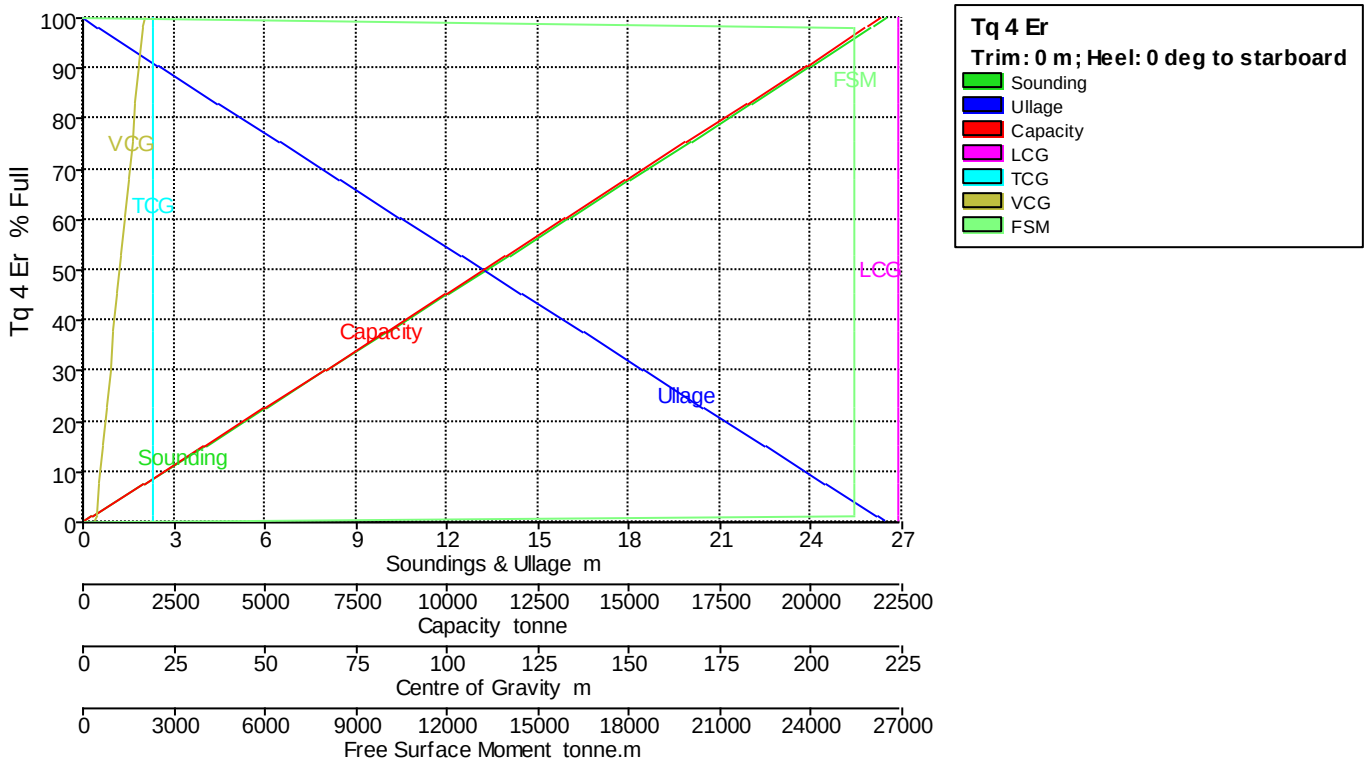
Tank Calibrations - Tq 4 Er

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 4 Er	26,500	0,000	100,000	24671,500	21915,694	223,700	19,000	16,750	0,000
	26,000	0,500	98,113	24206,000	21502,190	223,700	19,000	16,500	25386,873
	25,970	0,530	98,000	24178,070	21477,380	223,700	19,000	16,485	25386,873
	25,944	0,556	97,900	24153,399	21455,464	223,700	19,000	16,472	25386,873
	24,000	2,500	90,566	22344,000	19848,175	223,700	19,000	15,500	25386,873
	22,000	4,500	83,019	20482,000	18194,161	223,700	19,000	14,500	25386,873
	20,000	6,500	75,472	18620,000	16540,146	223,700	19,000	13,500	25386,873
	18,000	8,500	67,925	16758,000	14886,131	223,700	19,000	12,500	25386,873
	16,000	10,500	60,377	14896,000	13232,117	223,700	19,000	11,500	25386,873
	14,000	12,500	52,830	13034,000	11578,102	223,700	19,000	10,500	25386,873
	12,000	14,500	45,283	11172,000	9924,088	223,700	19,000	9,500	25386,873
	10,000	16,500	37,736	9310,000	8270,073	223,700	19,000	8,500	25386,873
	8,000	18,500	30,189	7448,000	6616,058	223,700	19,000	7,500	25386,873
	6,000	20,500	22,642	5586,000	4962,044	223,700	19,000	6,500	25386,873
	4,000	22,500	15,094	3724,000	3308,029	223,700	19,000	5,500	25386,873
	2,000	24,500	7,547	1862,000	1654,015	223,700	19,000	4,500	25386,873
	0,265	26,235	1,000	246,715	219,157	223,700	19,000	3,632	25386,873
	0,000	26,500	0,000	0,000	0,000	223,700	19,000	3,500	0,000


Tq 4 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 4 Er % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27
Soundings & Ullage m
0 2500 5000 7500 10000 12500 15000 17500 20000 22500
Capacity tonne
0 25 50 75 100 125 150 175 200 225
Centre of Gravity m
0 3000 6000 9000 12000 15000 18000 21000 24000 27000
Free Surface Moment tonne.m

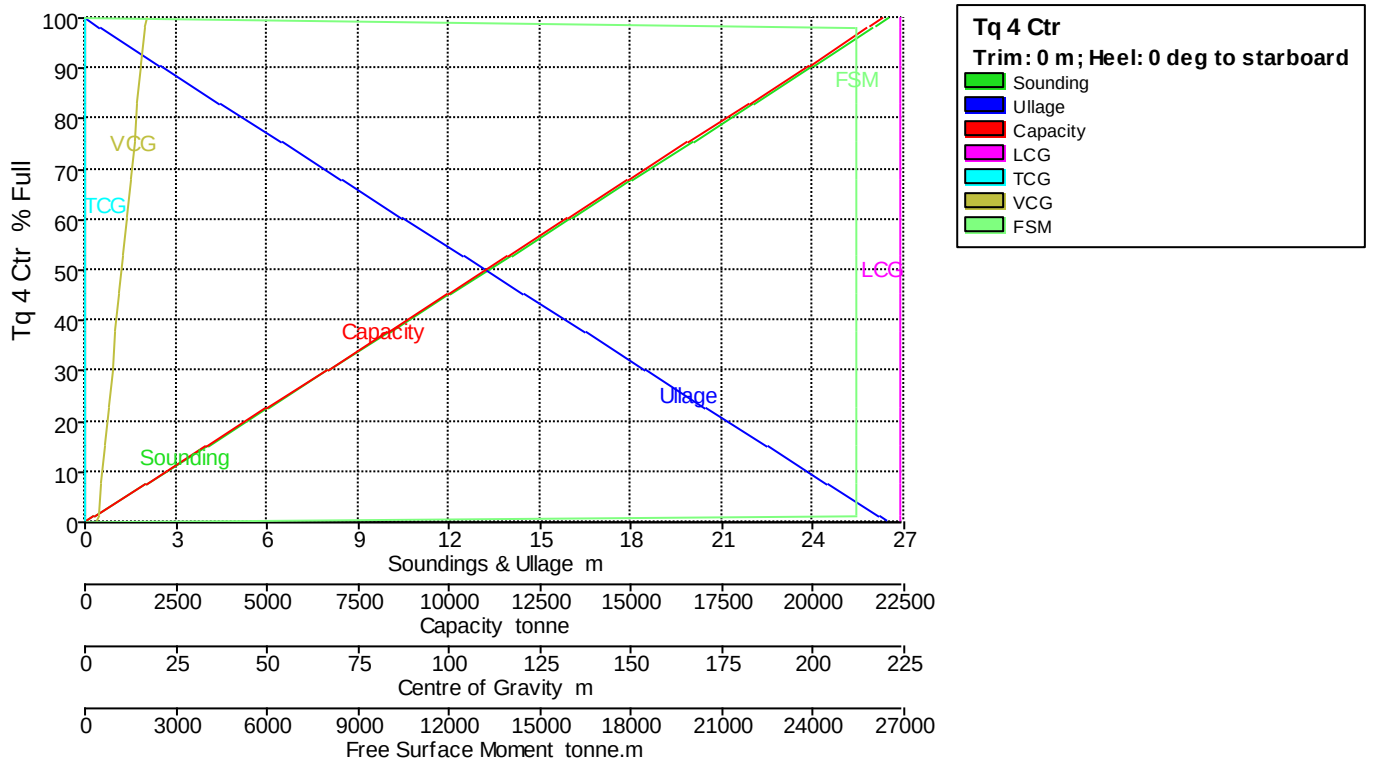
Tank Calibrations - Tq 4 Ctr

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 4 Ctr	26,500	0,000	100,000	24671,500	21915,694	223,700	0,000	16,750	0,000
	26,000	0,500	98,113	24206,000	21502,190	223,700	0,000	16,500	25386,873
	25,970	0,530	98,000	24178,070	21477,380	223,700	0,000	16,485	25386,873
	25,944	0,556	97,900	24153,399	21455,464	223,700	0,000	16,472	25386,873
	24,000	2,500	90,566	22344,000	19848,175	223,700	0,000	15,500	25386,873
	22,000	4,500	83,019	20482,000	18194,161	223,700	0,000	14,500	25386,873
	20,000	6,500	75,472	18620,000	16540,146	223,700	0,000	13,500	25386,873
	18,000	8,500	67,925	16758,000	14886,131	223,700	0,000	12,500	25386,873
	16,000	10,500	60,377	14896,000	13232,117	223,700	0,000	11,500	25386,873
	14,000	12,500	52,830	13034,000	11578,102	223,700	0,000	10,500	25386,873
	12,000	14,500	45,283	11172,000	9924,088	223,700	0,000	9,500	25386,873
	10,000	16,500	37,736	9310,000	8270,073	223,700	0,000	8,500	25386,873
	8,000	18,500	30,189	7448,000	6616,058	223,700	0,000	7,500	25386,873
	6,000	20,500	22,642	5586,000	4962,044	223,700	0,000	6,500	25386,873
	4,000	22,500	15,094	3724,000	3308,029	223,700	0,000	5,500	25386,873
	2,000	24,500	7,547	1862,000	1654,015	223,700	0,000	4,500	25386,873
	0,265	26,235	1,000	246,715	219,157	223,700	0,000	3,633	25386,873
	0,000	26,500	0,000	0,000	0,000	223,700	0,000	3,500	0,000


Tq 4 Ctr
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 4 Ctr % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27
Soundings & Ullage m
0 2500 5000 7500 10000 12500 15000 17500 20000 22500
Capacity tonne
0 25 50 75 100 125 150 175 200 225
Centre of Gravity m
0 3000 6000 9000 12000 15000 18000 21000 24000 27000
Free Surface Moment tonne.m

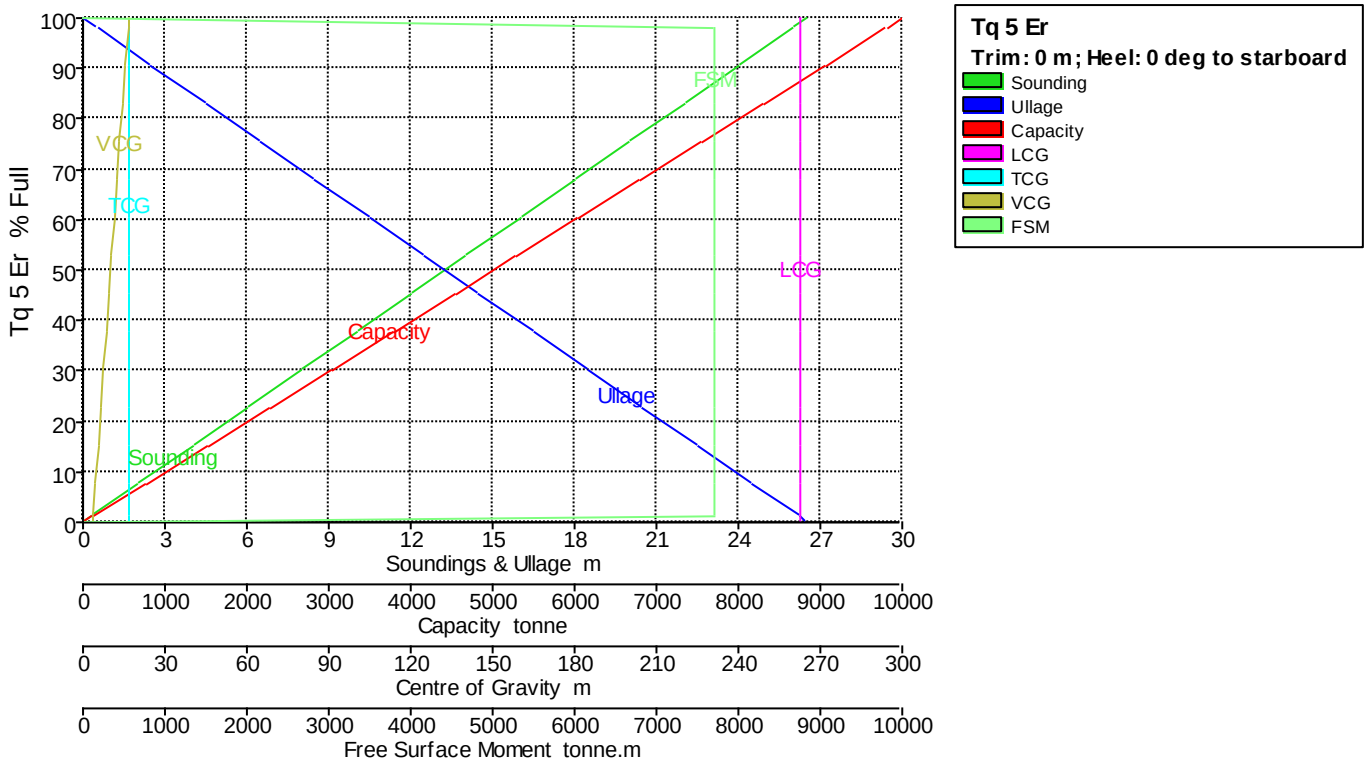
Tank Calibrations - Tq 5 Er

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 5 Er	26,500	0,000	100,000	11248,261	9991,830	262,738	16,511	16,750	0,000
	26,000	0,500	98,113	11036,030	9803,305	262,738	16,511	16,500	7709,320
	25,970	0,530	98,000	11023,296	9791,994	262,738	16,511	16,485	7709,320
	25,944	0,556	97,900	11012,048	9782,002	262,738	16,511	16,472	7709,320
	24,000	2,500	90,566	10187,104	9049,205	262,738	16,511	15,500	7709,320
	22,000	4,500	83,019	9338,179	8295,104	262,738	16,511	14,500	7709,320
	20,000	6,500	75,472	8489,254	7541,004	262,738	16,511	13,500	7709,320
	18,000	8,500	67,925	7640,328	6786,904	262,738	16,511	12,500	7709,320
	16,000	10,500	60,377	6791,403	6032,803	262,738	16,511	11,500	7709,320
	14,000	12,500	52,830	5942,478	5278,703	262,738	16,511	10,500	7709,320
	12,000	14,500	45,283	5093,552	4524,602	262,738	16,511	9,500	7709,320
	10,000	16,500	37,736	4244,627	3770,502	262,738	16,511	8,500	7709,320
	8,000	18,500	30,189	3395,701	3016,402	262,738	16,511	7,500	7709,320
	6,000	20,500	22,642	2546,776	2262,301	262,738	16,511	6,500	7709,320
	4,000	22,500	15,094	1697,851	1508,201	262,738	16,511	5,500	7709,320
	2,000	24,500	7,547	848,925	754,100	262,738	16,511	4,500	7709,320
	0,265	26,235	1,000	112,483	99,918	262,738	16,511	3,632	7709,320
	0,000	26,500	0,000	0,000	0,000	262,738	16,511	3,500	0,000


Tq 5 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 5 Er % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30
Soundings & Ullage m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
Capacity tonne
0 30 60 90 120 150 180 210 240 270 300
Centre of Gravity m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
Free Surface Moment tonne.m

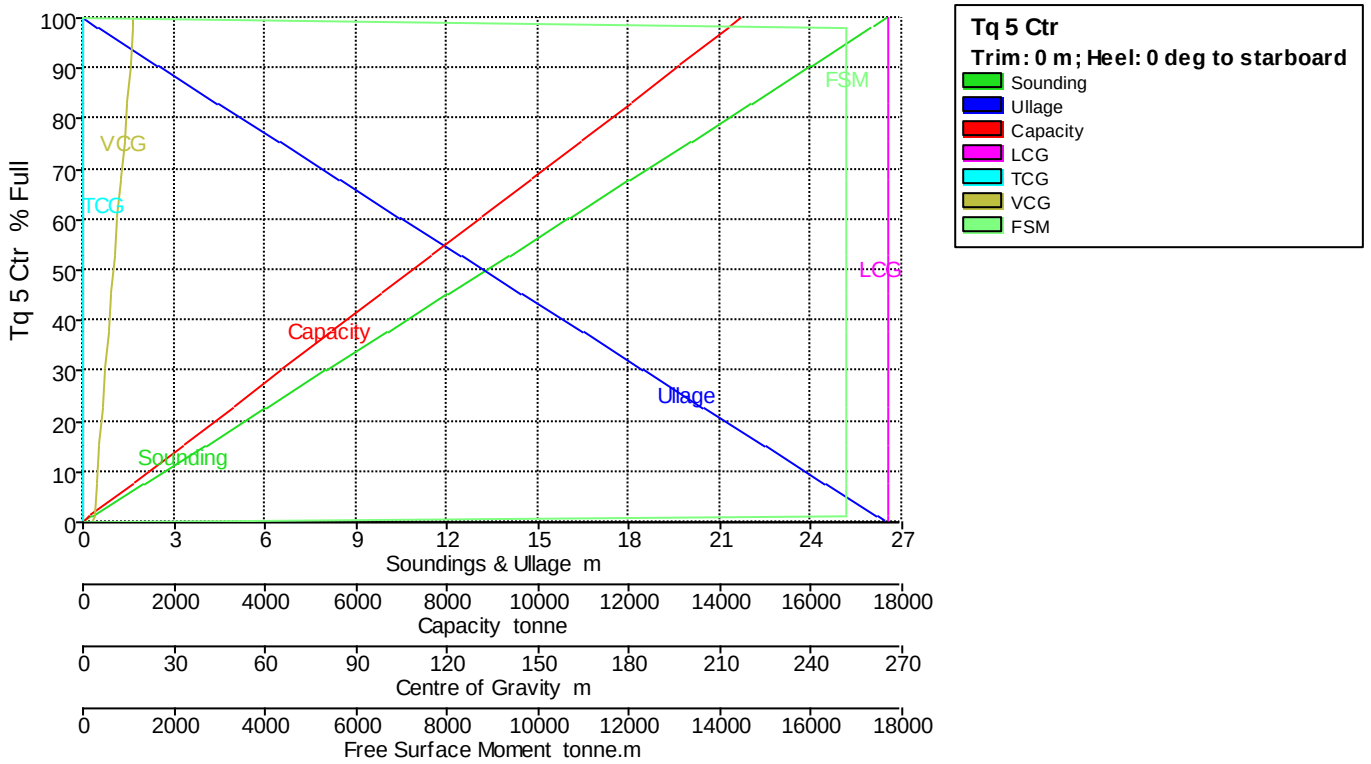
Tank Calibrations - Tq 5 Ctr

Fluid Type = ANS Crude Specific gravity = 0,8883

Permeability = 98 %

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
Tq 5 Ctr	26,500	0,000	100,000	16283,198	14464,364	265,200	0,000	16,750	0,000
	26,000	0,500	98,113	15975,968	14191,452	265,200	0,000	16,500	16755,344
	25,970	0,530	98,000	15957,534	14175,077	265,200	0,000	16,485	16755,344
	25,944	0,556	97,900	15941,251	14160,613	265,200	0,000	16,472	16755,344
	24,000	2,500	90,566	14747,047	13099,802	265,200	0,000	15,500	16755,344
	22,000	4,500	83,019	13518,127	12008,152	265,200	0,000	14,500	16755,344
	20,000	6,500	75,472	12289,206	10916,501	265,200	0,000	13,500	16755,344
	18,000	8,500	67,925	11060,285	9824,851	265,200	0,000	12,500	16755,344
	16,000	10,500	60,377	9831,365	8733,201	265,200	0,000	11,500	16755,344
	14,000	12,500	52,830	8602,444	7641,551	265,200	0,000	10,500	16755,344
	12,000	14,500	45,283	7373,524	6549,901	265,200	0,000	9,500	16755,344
	10,000	16,500	37,736	6144,603	5458,251	265,200	0,000	8,500	16755,344
	8,000	18,500	30,189	4915,682	4366,601	265,200	0,000	7,500	16755,344
	6,000	20,500	22,642	3686,762	3274,950	265,200	0,000	6,500	16755,344
	4,000	22,500	15,094	2457,841	2183,300	265,200	0,000	5,500	16755,344
	2,000	24,500	7,547	1228,921	1091,650	265,200	0,000	4,500	16755,344
	0,265	26,235	1,000	162,832	144,644	265,200	0,000	3,633	16755,344
	0,000	26,500	0,000	0,000	0,000	265,200	0,000	3,500	0,000


Tq 5 Ctr
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq 5 Ctr % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0
3
6
9
12
15
18
21
24
27
Soundings & Ullage m
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Capacity tonne
0
30
60
90
120
150
180
210
240
270
Centre of Gravity m
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Free Surface Moment tonne.m

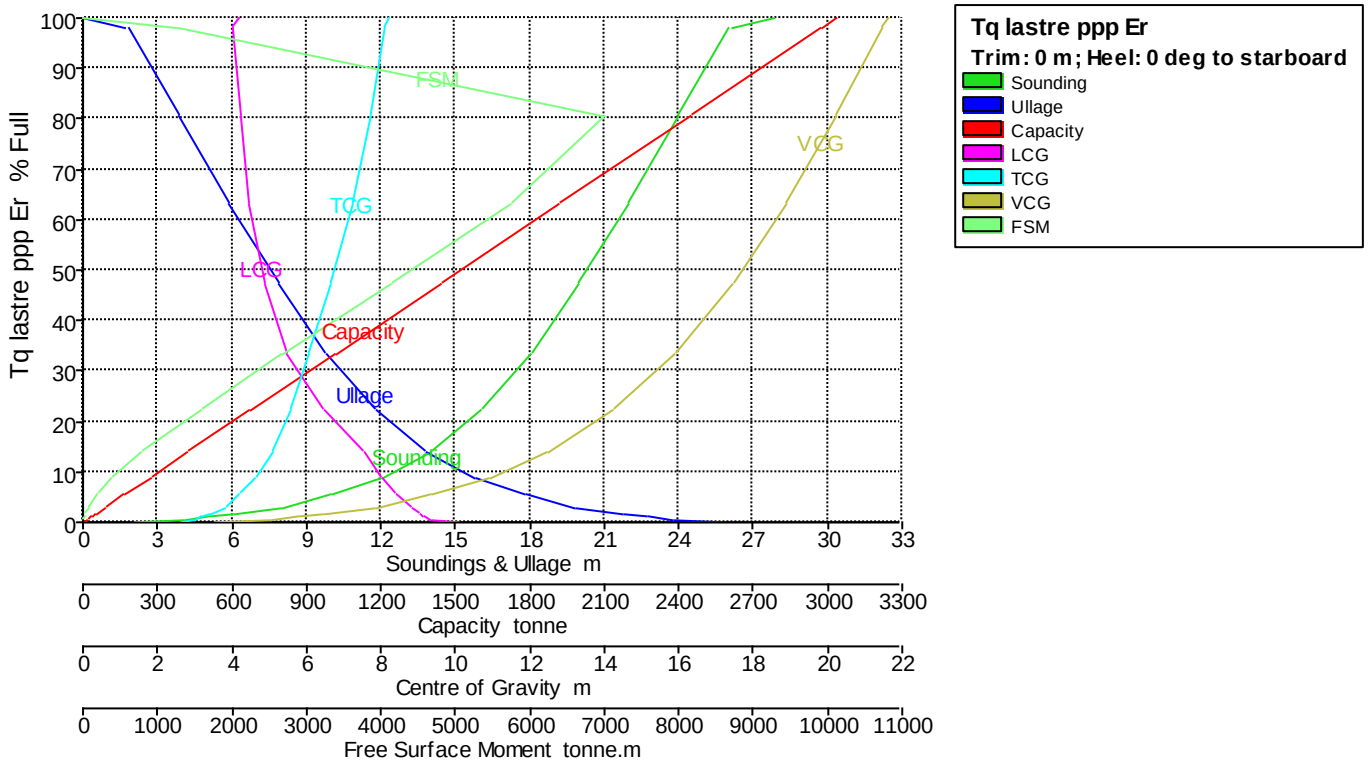
Tank Calibrations - Tq lastre ppp Er

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre ppp Er	27,849	0,000	100,000	2958,850	3032,821	4,164	8,206	21,607	0,000
	26,066	1,783	98,000	2899,673	2972,165	4,042	8,115	21,454	1287,739
	26,000	1,849	97,926	2897,495	2969,932	4,038	8,111	21,449	1284,629
	25,976	1,873	97,900	2896,714	2969,132	4,036	8,110	21,447	1283,516
	24,000	3,849	80,680	2387,213	2446,893	4,214	7,726	20,241	7011,942
	22,000	5,849	63,284	1872,469	1919,280	4,466	7,227	18,888	5747,393
	20,000	7,849	47,374	1401,719	1436,762	4,857	6,663	17,450	4141,538
	18,000	9,849	33,517	991,714	1016,506	5,482	6,089	15,909	2652,770
	16,000	11,849	22,118	654,447	670,808	6,479	5,568	14,219	1579,990
	14,000	13,849	13,904	411,406	421,691	7,585	5,124	12,437	775,437
	12,000	15,849	8,908	263,574	270,163	8,037	4,641	10,873	372,475
	10,000	17,849	5,382	159,242	163,223	8,436	4,190	9,347	194,113
	8,000	19,849	2,966	87,770	89,964	8,876	3,802	7,815	85,408
	6,000	21,849	1,490	44,096	45,198	9,058	3,357	6,424	30,998
	5,094	22,755	1,000	29,588	30,328	9,167	3,162	5,791	19,198
	4,000	23,849	0,545	16,138	16,542	9,369	2,942	5,011	9,572
	2,000	25,849	0,095	2,801	2,871	10,126	2,592	3,488	0,972
	0,000	27,849	0,000	0,000	0,000	10,142	2,000	2,151	0,000


Tq lastre ppp Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq lastre ppp Er % Full
100
90
80
70
60
50
40
30
20
10
0
FSM
TCG
LCG
Capacity
Ullage
Sounding
VCG
0 3 6 9 12 15 18 21 24 27 30 33
Soundings & Ullage m
0 300 600 900 1200 1500 1800 2100 2400 2700 3000 3300
Capacity tonne
0 2 4 6 8 10 12 14 16 18 20 22
Centre of Gravity m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000
Free Surface Moment tonne.m

Tank Calibrations - Tq lastre CM. Er

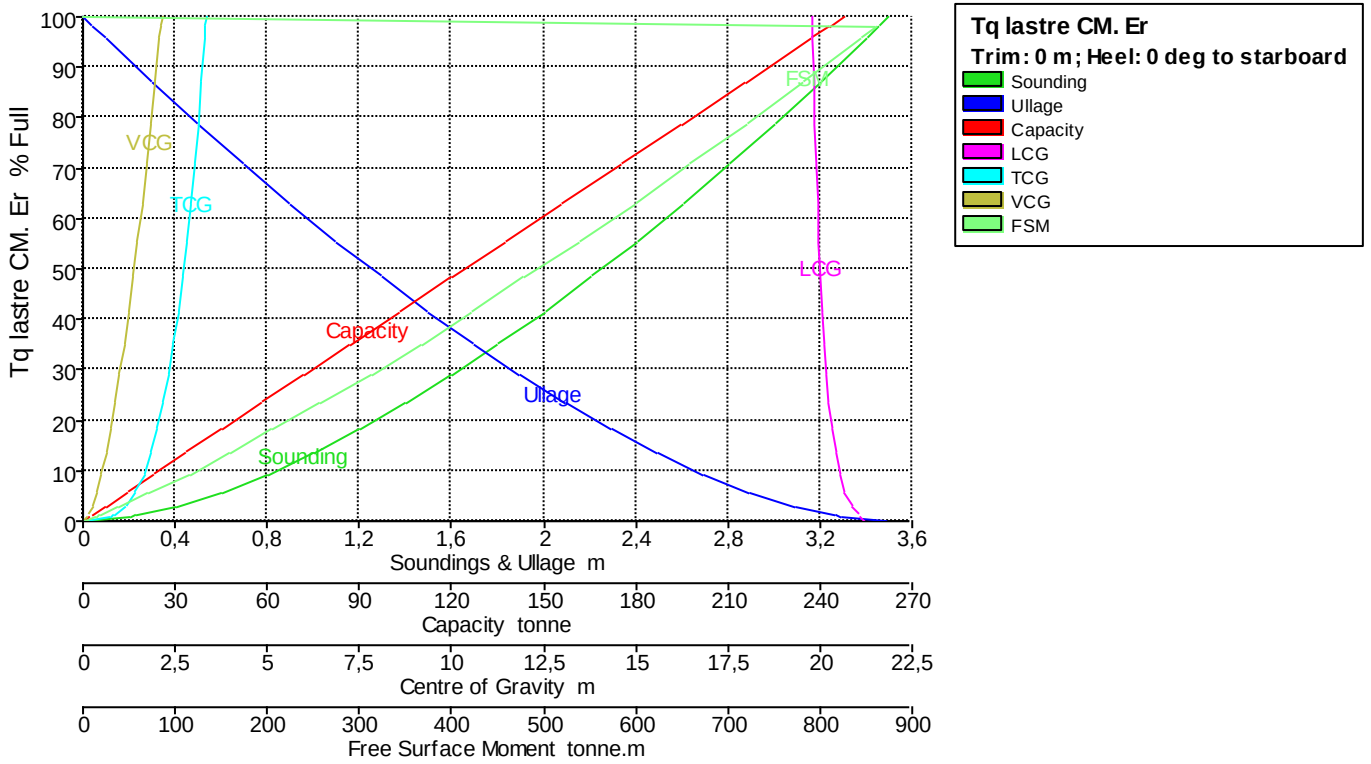
Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre CM. Er	3,500	0,000	100,000	241,763	247,807	19,776	3,341	2,145	0,000
	3,455	0,045	98,000	236,927	242,851	19,782	3,322	2,118	861,302
	3,453	0,047	97,900	236,686	242,603	19,783	3,321	2,116	860,566
	3,400	0,100	95,592	231,105	236,882	19,790	3,298	2,085	843,636
	3,200	0,300	86,974	210,271	215,528	19,821	3,210	1,964	780,506
	3,000	0,500	78,629	190,096	194,848	19,855	3,118	1,844	718,972
	2,800	0,700	70,570	170,612	174,877	19,890	3,022	1,723	657,983
	2,600	0,900	62,809	151,849	155,645	19,928	2,922	1,602	598,089
	2,400	1,100	55,356	133,830	137,176	19,968	2,816	1,481	537,278
	2,200	1,300	48,231	116,604	119,520	20,013	2,706	1,360	476,868
	2,000	1,500	41,449	100,208	102,713	20,062	2,589	1,239	419,982
	1,800	1,700	35,023	84,673	86,790	20,116	2,464	1,118	365,534
	1,600	1,900	28,980	70,063	71,814	20,176	2,329	0,996	311,379
	1,400	2,100	23,352	56,455	57,867	20,244	2,185	0,874	255,685
	1,200	2,300	18,169	43,926	45,024	20,324	2,028	0,752	203,850
	1,000	2,500	13,460	32,541	33,354	20,419	1,855	0,630	157,922
	0,800	2,700	9,272	22,417	22,977	20,529	1,654	0,507	115,331
	0,600	2,900	5,693	13,763	14,108	20,669	1,422	0,384	70,291

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,400	3,100	2,814	6,803	6,973	20,878	1,150	0,261	36,897
	0,230	3,270	1,000	2,418	2,478	21,072	0,788	0,153	16,455
	0,200	3,300	0,759	1,834	1,880	21,080	0,690	0,133	12,213
	0,000	3,500	0,000	0,000	0,000	21,234	0,000	0,000	0,000



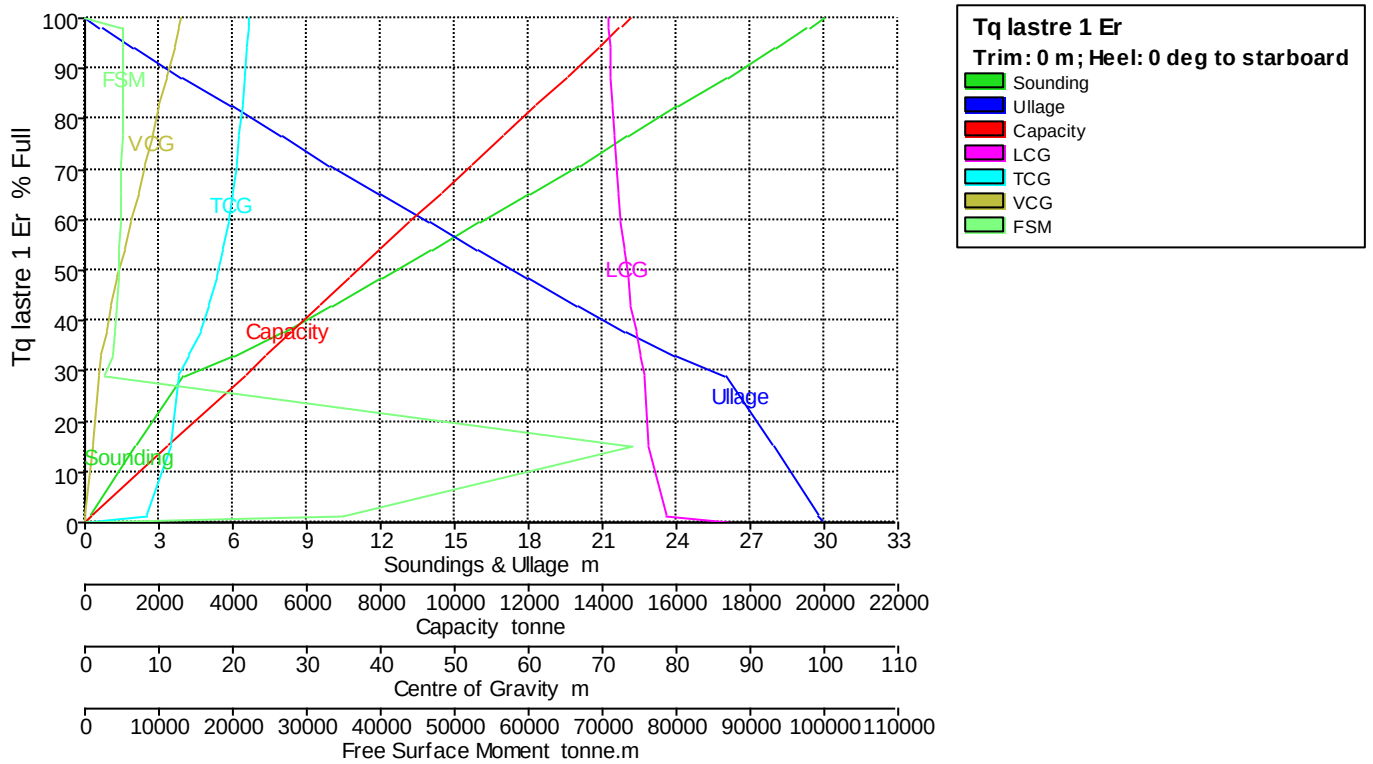
Tank Calibrations - Tq lastre 1 Er

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre 1 Er	30,000	0,000	100,000	14398,591	14758,555	70,878	22,133	13,055	0,000
	29,322	0,678	98,000	14110,620	14463,385	70,930	22,049	12,716	5192,446
	29,288	0,712	97,900	14096,221	14448,627	70,933	22,044	12,699	5191,625
	28,000	2,000	94,108	13550,215	13888,970	71,037	21,874	12,057	5160,645
	26,000	4,000	88,243	12705,794	13023,439	71,215	21,583	11,063	5113,424
	24,000	6,000	82,406	11865,369	12162,003	71,414	21,254	10,076	5065,315
	22,000	8,000	76,601	11029,432	11305,168	71,639	20,878	9,097	5011,199
	20,000	10,000	70,830	10198,511	10453,474	71,895	20,447	8,127	4953,109
	18,000	12,000	65,099	9373,342	9607,675	72,190	19,945	7,170	4888,255
	16,000	14,000	59,417	8555,230	8769,110	72,530	19,355	6,229	4809,631
	14,000	16,000	53,803	7746,902	7940,574	72,925	18,656	5,314	4707,478
	12,000	18,000	48,290	6953,083	7126,911	73,380	17,818	4,436	4575,725
	10,000	20,000	42,924	6180,410	6334,920	73,900	16,809	3,615	4402,770
	8,000	22,000	37,796	5442,132	5578,186	74,473	15,595	2,883	4149,468
	6,000	24,000	33,091	4764,706	4883,824	75,054	14,186	2,295	3687,383
	4,000	26,000	29,146	4196,542	4301,455	75,581	12,714	1,923	2729,899
	2,000	28,000	14,953	2153,033	2206,859	76,104	11,572	1,075	73962,364
	0,208	29,792	1,000	143,986	147,586	78,690	8,414	0,118	34717,806
	0,000	30,000	0,000	0,000	0,000	87,179	0,076	0,000	0,000


Tq lastre 1 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
Tq lastre 1 Er % Full
100
90
80
70
60
50
40
30
20
10
0
FSM
VCG
TCG
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33
Soundings & Ullage m
0 2000 4000 6000 8000 10000 12000 14000 16000 18000 20000 22000
Capacity tonne
0 10 20 30 40 50 60 70 80 90 100 110
Centre of Gravity m
0 10000 20000 30000 40000 50000 60000 70000 80000 90000 100000 110000
Free Surface Moment tonne.m

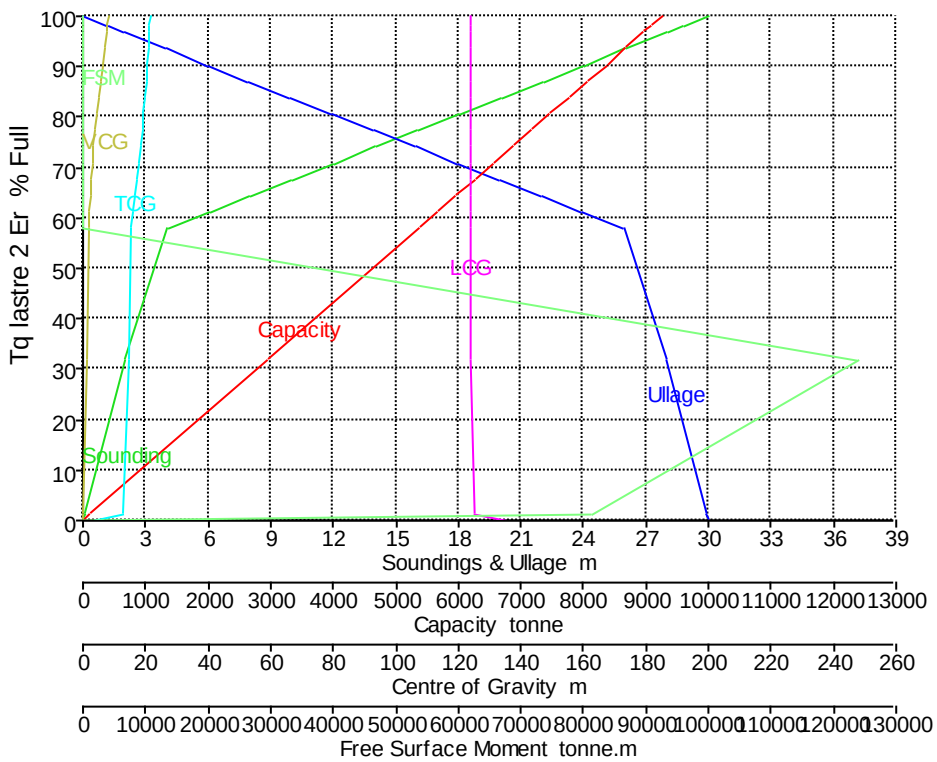
Tank Calibrations - Tq lastre 2 Er

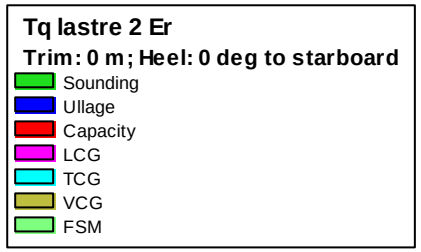
Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre 2 Er	30,000	0,000	100,000	9030,911	9256,684	123,917	21,479	8,227	0,000
	28,769	1,231	98,000	8850,293	9071,550	123,921	21,305	7,795	114,784
	28,708	1,292	97,900	8841,262	9062,294	123,921	21,296	7,773	114,782
	28,000	2,000	96,749	8737,357	8955,791	123,923	21,193	7,529	114,757
	26,000	4,000	93,500	8443,863	8654,960	123,930	20,887	6,852	114,686
	24,000	6,000	90,250	8150,432	8354,192	123,937	20,559	6,198	114,615
	22,000	8,000	87,002	7857,061	8053,488	123,945	20,206	5,571	114,544
	20,000	10,000	83,754	7563,758	7752,852	123,953	19,827	4,973	114,459
	18,000	12,000	80,507	7270,532	7452,295	123,961	19,417	4,407	114,369
	16,000	14,000	77,261	6977,384	7151,819	123,970	18,972	3,878	114,279
	14,000	16,000	74,016	6684,322	6851,430	123,979	18,489	3,390	114,169
	12,000	18,000	70,772	6391,364	6551,148	123,989	17,961	2,950	114,048
	10,000	20,000	67,529	6098,520	6250,983	124,000	17,384	2,563	113,898
	8,000	22,000	64,288	5805,830	5950,976	124,011	16,748	2,239	113,700
	6,000	24,000	61,050	5513,378	5651,212	124,022	16,045	1,986	113,332
	4,000	26,000	57,827	5222,272	5352,829	124,030	15,268	1,818	108,821
	2,000	28,000	31,713	2863,957	2935,556	124,146	14,668	1,024	124008,428
	0,076	29,924	1,000	90,309	92,566	125,226	12,493	0,040	81085,864
	0,000	30,000	0,000	0,000	0,000	135,696	3,380	0,000	0,000


Tq lastre 2 Er % Full
100
90
80
70
60
50
40
30
20
10
0
FSM
VCG
TCG
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36 39
Soundings & Ullage m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000
Capacity tonne
0 20 40 60 80 100 120 140 160 180 200 220 240 260
Centre of Gravity m
0 10000 20000 30000 40000 50000 60000 70000 80000 90000 100000 110000 120000 130000
Free Surface Moment tonne.m


Tq lastre 2 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM

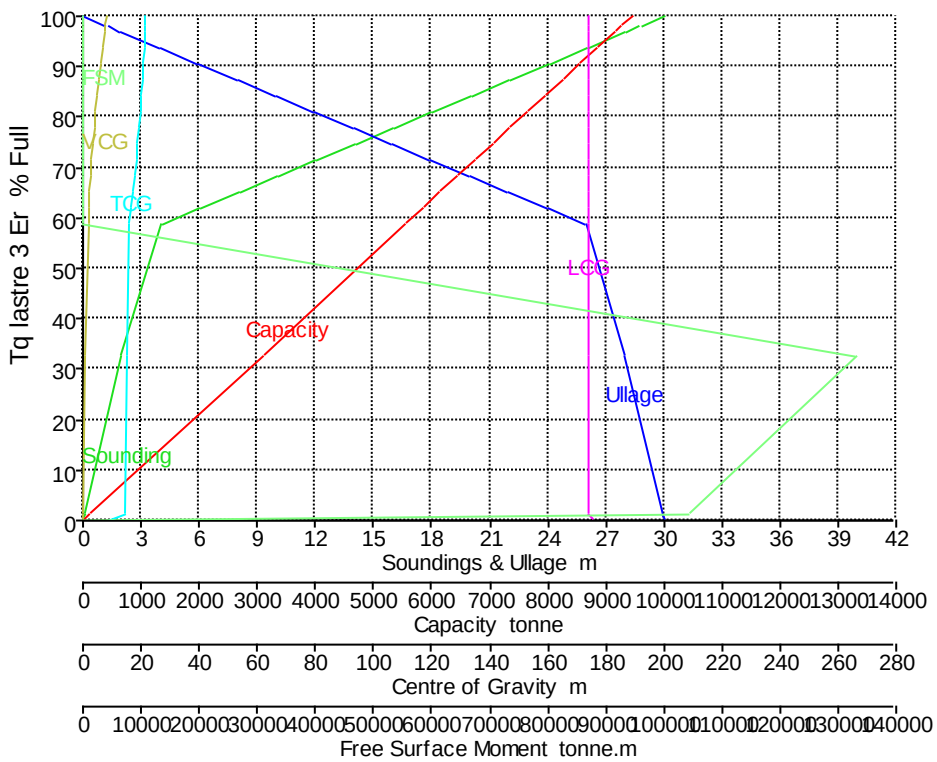
Tank Calibrations - Tq lastre 3 Er

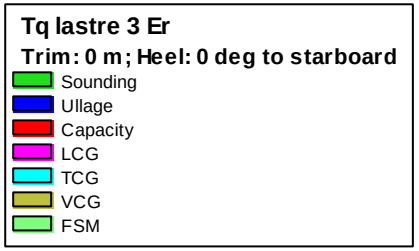
Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre 3 Er	30,000	0,000	100,000	9219,088	9449,566	173,721	21,643	8,098	0,000
	28,746	1,254	98,000	9034,707	9260,574	173,721	21,473	7,664	115,309
	28,683	1,317	97,900	9025,487	9251,124	173,721	21,464	7,642	115,309
	28,000	2,000	96,811	8925,091	9148,218	173,721	21,368	7,410	115,307
	26,000	4,000	93,622	8631,098	8846,876	173,722	21,074	6,742	115,301
	24,000	6,000	90,433	8337,111	8545,539	173,723	20,759	6,098	115,295
	22,000	8,000	87,244	8043,128	8244,207	173,724	20,422	5,481	115,289
	20,000	10,000	84,056	7749,151	7942,880	173,725	20,058	4,892	115,282
	18,000	12,000	80,867	7455,180	7641,560	173,726	19,666	4,336	115,274
	16,000	14,000	77,678	7161,217	7340,247	173,727	19,242	3,816	115,265
	14,000	16,000	74,490	6867,261	7038,942	173,728	18,782	3,337	115,257
	12,000	18,000	71,301	6573,313	6737,646	173,729	18,280	2,905	115,245
	10,000	20,000	68,113	6279,376	6436,361	173,731	17,731	2,526	115,232
	8,000	22,000	64,925	5985,451	6135,087	173,733	17,129	2,208	115,215
	6,000	24,000	61,737	5691,543	5833,832	173,735	16,464	1,961	115,193
	4,000	26,000	58,549	5397,660	5532,601	173,737	15,727	1,795	115,152
	2,000	28,000	32,646	3009,663	3084,905	173,766	15,365	1,013	132955,663
	0,066	29,934	1,000	92,192	94,497	173,870	14,263	0,033	104366,901
	0,000	30,000	0,000	0,000	0,000	175,547	7,985	0,000	0,000


Tq lastre 3 Er % Full
100
90
80
70
60
50
40
30
20
10
0
FSM
VCG
TCG
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42
Soundings & Ullage m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000
Capacity tonne
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280
Centre of Gravity m
0 10000 20000 30000 40000 50000 60000 70000 80000 90000 100000 110000 120000 130000 140000
Free Surface Moment tonne.m


Tq lastre 3 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM

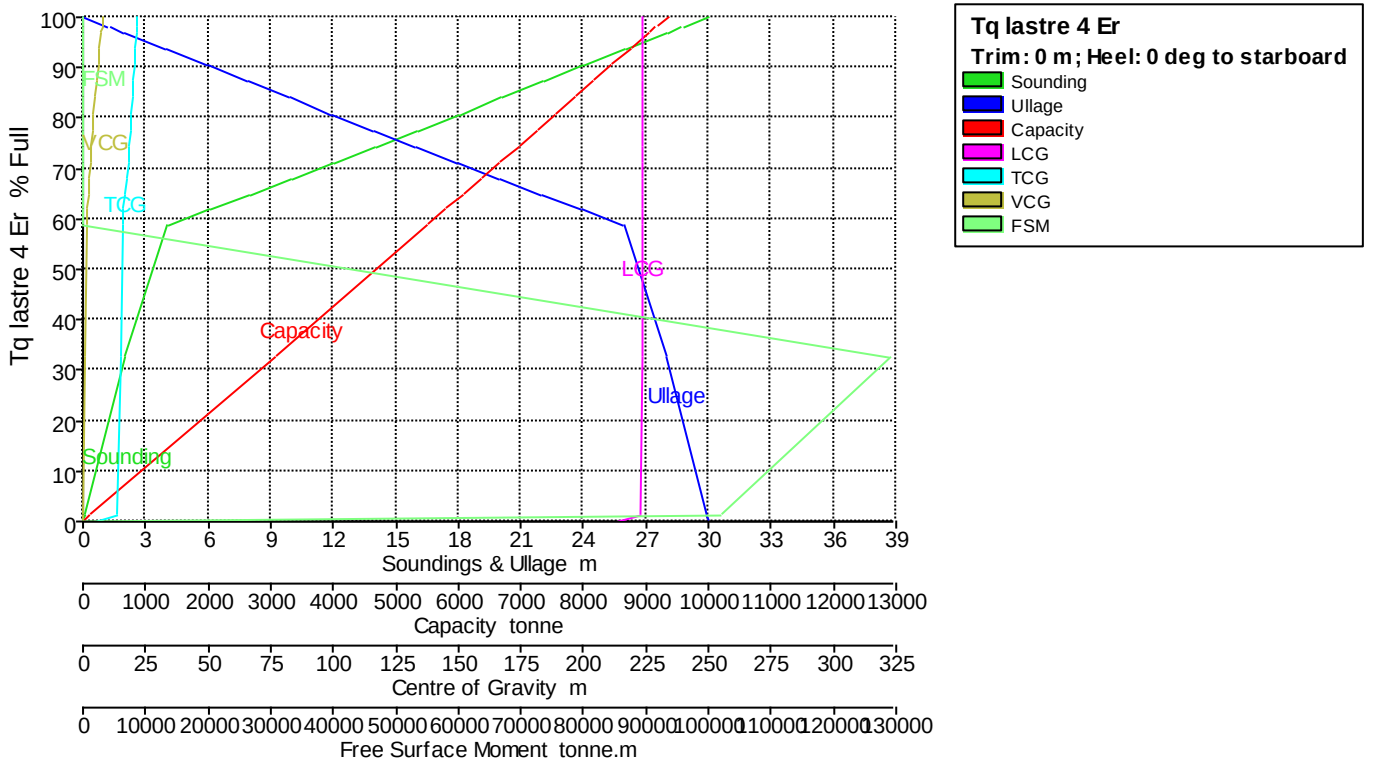
Tank Calibrations - Tq lastre 4 Er

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre 4 Er	30,000	0,000	100,000	9119,125	9347,103	223,505	21,543	8,115	0,000
	28,759	1,241	98,000	8936,742	9160,160	223,501	21,371	7,681	115,022
	28,697	1,303	97,900	8927,622	9150,813	223,501	21,362	7,659	115,007
	28,000	2,000	96,778	8825,324	9045,957	223,499	21,262	7,419	114,845
	26,000	4,000	93,561	8531,923	8745,221	223,493	20,961	6,746	114,381
	24,000	6,000	90,348	8238,920	8444,893	223,487	20,640	6,097	113,921
	22,000	8,000	87,139	7946,317	8144,975	223,481	20,296	5,475	113,454
	20,000	10,000	83,935	7654,178	7845,532	223,476	19,926	4,882	112,854
	18,000	12,000	80,738	7362,597	7546,662	223,471	19,527	4,323	112,218
	16,000	14,000	77,547	7071,589	7248,378	223,467	19,097	3,801	111,560
	14,000	16,000	74,363	6781,250	6950,781	223,465	18,631	3,322	110,748
	12,000	18,000	71,188	6491,722	6654,016	223,463	18,125	2,890	109,805
	10,000	20,000	68,024	6203,185	6358,264	223,464	17,573	2,513	108,658
	8,000	22,000	64,874	5915,984	6063,884	223,468	16,972	2,198	107,043
	6,000	24,000	61,748	5630,909	5771,682	223,478	16,314	1,954	104,494
	4,000	26,000	58,666	5349,798	5483,543	223,502	15,599	1,794	100,073
	2,000	28,000	32,724	2984,105	3058,707	223,460	15,247	1,013	129198,509
	0,069	29,931	1,000	91,191	93,471	222,856	13,725	0,036	101820,971
	0,000	30,000	0,000	0,000	0,000	212,931	4,634	0,000	0,000



Tq lastre 4 Er

Trim: 0 m; Heel: 0 deg to starboard

- Sounding
- Ullage
- Capacity
- LCG
- TCG
- VCG
- FSM

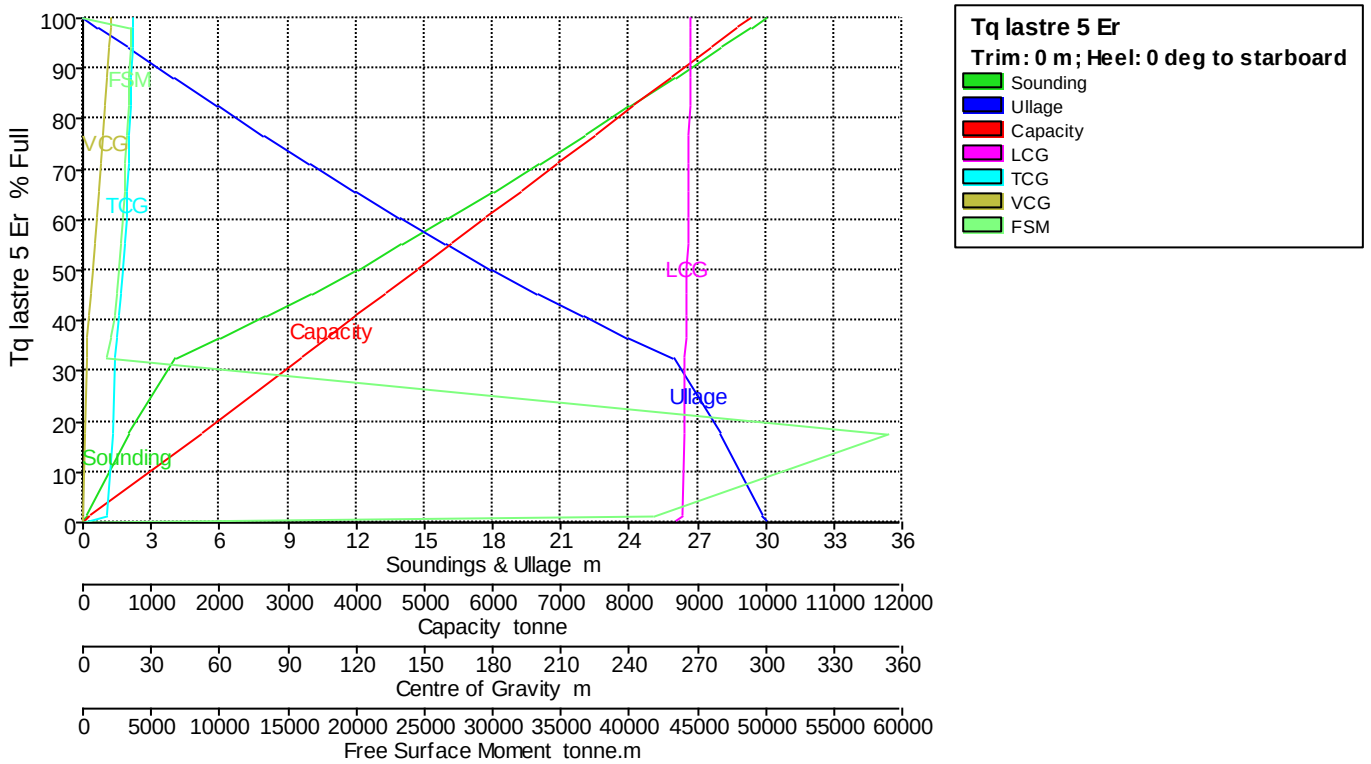
Tank Calibrations - Tq lastre 5 Er

Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre 5 Er	30,000	0,000	100,000	9526,045	9764,196	266,953	21,917	12,647	0,000
	29,328	0,672	98,000	9335,525	9568,913	266,917	21,827	12,300	3505,661
	29,294	0,706	97,900	9325,998	9559,148	266,915	21,823	12,282	3504,483
	28,000	2,000	94,072	8961,348	9185,382	266,843	21,640	11,617	3460,190
	26,000	4,000	88,210	8402,891	8612,963	266,724	21,332	10,594	3390,123
	24,000	6,000	82,421	7851,474	8047,761	266,596	20,989	9,582	3314,254
	22,000	8,000	76,719	7308,313	7491,021	266,457	20,605	8,585	3229,445
	20,000	10,000	71,121	6775,016	6944,392	266,307	20,174	7,607	3135,237
	18,000	12,000	65,646	6253,481	6409,818	266,146	19,689	6,657	3030,821
	16,000	14,000	60,316	5745,704	5889,346	265,973	19,141	5,742	2916,157
	14,000	16,000	55,149	5253,517	5384,855	265,788	18,518	4,874	2791,517
	12,000	18,000	50,164	4778,604	4898,069	265,587	17,808	4,066	2654,207
	10,000	20,000	45,378	4322,713	4430,780	265,365	16,994	3,334	2500,737
	8,000	22,000	40,817	3888,258	3985,464	265,114	16,059	2,700	2322,085
	6,000	24,000	36,523	3479,179	3566,159	264,827	14,989	2,193	2105,654
	4,000	26,000	32,568	3102,470	3180,032	264,495	13,787	1,850	1821,216
	2,000	28,000	17,583	1674,999	1716,874	264,342	13,132	1,028	59019,566
	0,142	29,858	1,000	95,261	97,643	263,644	10,945	0,077	41731,841
	0,000	30,000	0,000	0,000	0,000	259,579	0,304	0,000	0,000


Tq lastre 5 Er % Full
100
90
80
70
60
50
40
30
20
10
0
FSM
VCG
TCG
LCG
Capacity
Ullage
Sounding
0 3 6 9 12 15 18 21 24 27 30 33 36
Soundings & Ullage m
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000
Capacity tonne
0 30 60 90 120 150 180 210 240 270 300 330 360
Centre of Gravity m
0 5000 10000 15000 20000 25000 30000 35000 40000 45000 50000 55000 60000
Free Surface Moment tonne.m
Tq lastre 5 Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM

Tank Calibrations - Tq lastre ppr Er

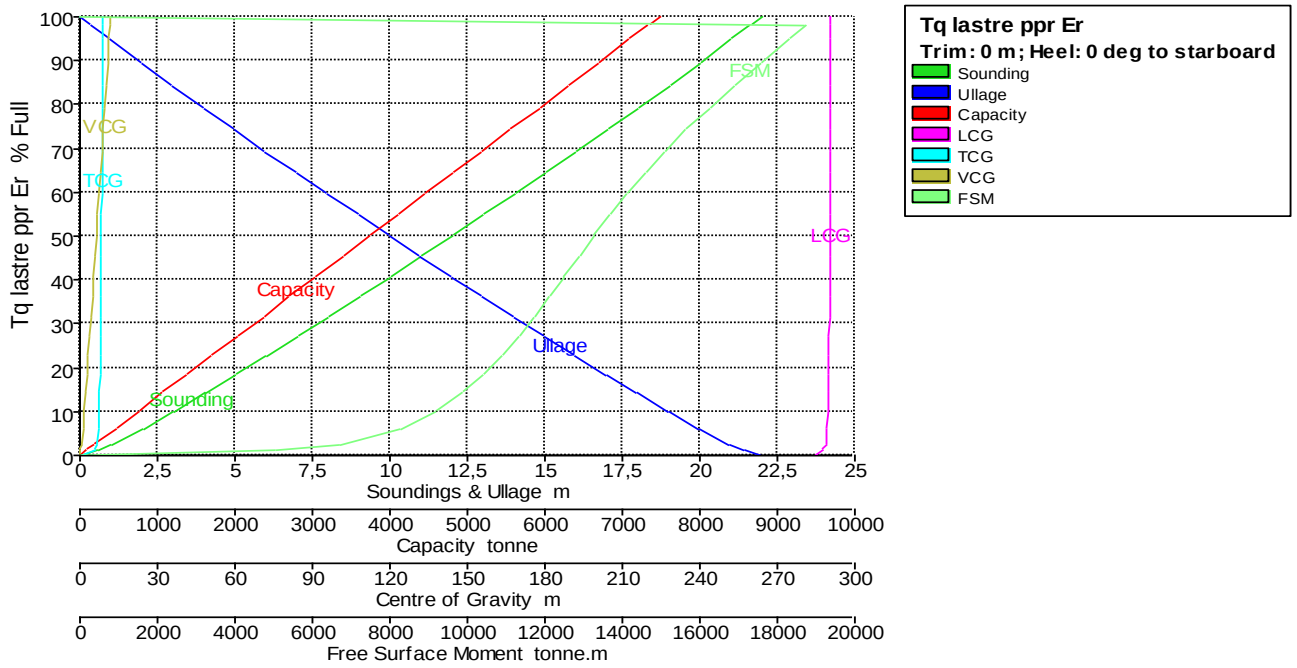
Fluid Type = Water Ballast Specific gravity = 1,025

Permeability = 98 %

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
Tq lastre ppr Er	22,000	0,000	100,000	7299,056	7481,533	290,368	8,958	11,777	0,000
	21,627	0,373	98,000	7153,075	7331,902	290,364	8,933	11,572	18750,418
	21,609	0,391	97,900	7145,776	7324,420	290,364	8,932	11,562	18735,854
	21,000	1,000	94,663	6909,470	7082,206	290,357	8,893	11,229	18271,780
	20,000	2,000	89,411	6526,153	6689,307	290,347	8,829	10,684	17543,468
	19,000	3,000	84,239	6148,647	6302,363	290,336	8,767	10,143	16859,702
	18,000	4,000	79,141	5776,563	5920,977	290,325	8,705	9,604	16219,865
	17,000	5,000	74,113	5409,560	5544,799	290,313	8,645	9,068	15623,923
	16,000	6,000	69,150	5047,329	5173,513	290,301	8,585	8,535	15071,931
	15,000	7,000	64,249	4689,594	4806,834	290,287	8,525	8,004	14562,373
	14,000	8,000	59,407	4336,118	4444,521	290,272	8,464	7,474	14092,539
	13,000	9,000	54,620	3986,711	4086,378	290,255	8,402	6,946	13659,851
	12,000	10,000	49,886	3641,234	3732,264	290,235	8,339	6,419	13252,105
	11,000	11,000	45,206	3299,609	3382,099	290,214	8,272	5,893	12861,179
	10,000	12,000	40,578	2961,836	3035,882	290,188	8,202	5,367	12479,908
	9,000	13,000	36,004	2627,988	2693,688	290,158	8,126	4,842	12100,549
	8,000	14,000	31,487	2298,230	2355,685	290,122	8,043	4,317	11714,972
	7,000	15,000	27,029	1972,842	2022,163	290,078	7,951	3,792	11311,746
	6,000	16,000	22,637	1652,263	1693,570	290,020	7,845	3,266	10878,122
	5,000	17,000	18,319	1337,135	1370,564	289,943	7,721	2,739	10396,320

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	4,000	18,000	14,091	1028,502	1054,214	289,831	7,569	2,210	9840,484
	3,000	19,000	9,978	728,317	746,525	289,654	7,368	1,677	9162,359
	2,000	20,000	6,041	440,900	451,923	289,341	7,068	1,138	8238,844
	1,000	21,000	2,439	178,036	182,487	288,660	6,484	0,586	6661,880
	0,529	21,471	1,000	72,991	74,815	287,925	5,850	0,318	5027,321
	0,000	22,000	0,000	0,000	0,000	284,175	0,009	0,000	0,000



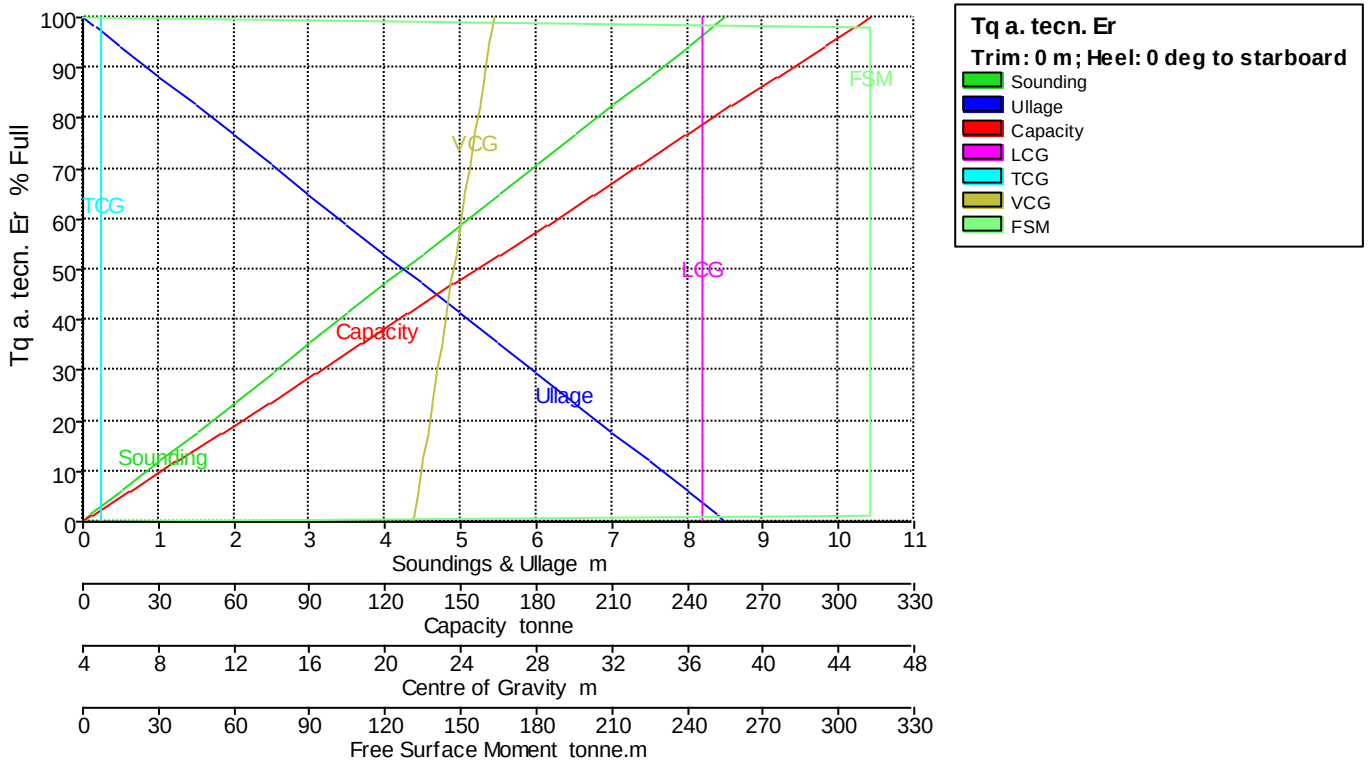
Tank Calibrations - Tq a. tecn. Er

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 98 %

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
Tq a. tecn. Er	8,500	0,000	100,000	312,375	312,375	36,825	5,000	25,750	0,000
	8,330	0,170	98,000	306,128	306,128	36,825	5,000	25,665	312,500
	8,322	0,178	97,900	305,815	305,815	36,825	5,000	25,661	312,500
	8,000	0,500	94,118	294,000	294,000	36,825	5,000	25,500	312,500
	7,500	1,000	88,235	275,625	275,625	36,825	5,000	25,250	312,500
	7,000	1,500	82,353	257,250	257,250	36,825	5,000	25,000	312,500
	6,500	2,000	76,471	238,875	238,875	36,825	5,000	24,750	312,500
	6,000	2,500	70,588	220,500	220,500	36,825	5,000	24,500	312,500
	5,500	3,000	64,706	202,125	202,125	36,825	5,000	24,250	312,500
	5,000	3,500	58,824	183,750	183,750	36,825	5,000	24,000	312,500
	4,500	4,000	52,941	165,375	165,375	36,825	5,000	23,750	312,500
	4,000	4,500	47,059	147,000	147,000	36,825	5,000	23,500	312,500
	3,500	5,000	41,176	128,625	128,625	36,825	5,000	23,250	312,500
	3,000	5,500	35,294	110,250	110,250	36,825	5,000	23,000	312,500
	2,500	6,000	29,412	91,875	91,875	36,825	5,000	22,750	312,500
	2,000	6,500	23,529	73,500	73,500	36,825	5,000	22,500	312,500
	1,500	7,000	17,647	55,125	55,125	36,825	5,000	22,250	312,500
	1,000	7,500	11,765	36,750	36,750	36,825	5,000	22,000	312,500
	0,500	8,000	5,882	18,375	18,375	36,825	5,000	21,750	312,500
	0,085	8,415	1,000	3,124	3,124	36,825	5,000	21,542	312,500
	0,000	8,500	0,000	0,000	0,000	36,825	5,000	21,500	0,000


Tq a. tecn. Er % Full
100
90
80
70
60
50
40
30
20
10
0
TCG
VCG
FSM
LCG
Capacity
Ullage
Sounding
0 1 2 3 4 5 6 7 8 9 10 11
Soundings & Ullage m
0 30 60 90 120 150 180 210 240 270 300 330
Capacity tonne
4 8 12 16 20 24 28 32 36 40 44 48
Centre of Gravity m
0 30 60 90 120 150 180 210 240 270 300 330
Free Surface Moment tonne.m
Tq a. tecn. Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM

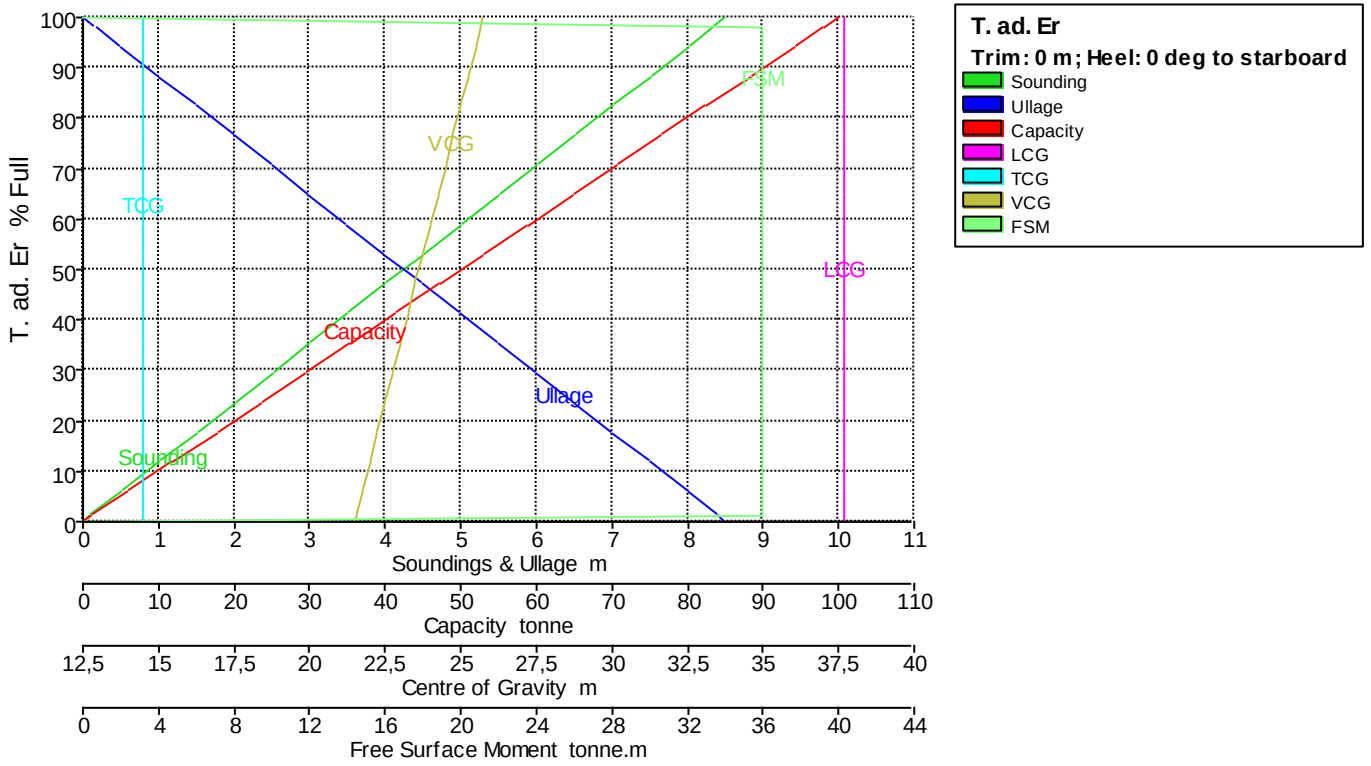
Tank Calibrations - T. ad. Er

Fluid Type = Fresh Water Specific gravity = 1

Permeability = 98 %

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
T. ad. Er	8,500	0,000	100,000	99,960	99,960	37,700	14,500	25,750	0,000
	8,330	0,170	98,000	97,961	97,961	37,700	14,500	25,665	36,000
	8,322	0,178	97,900	97,861	97,861	37,700	14,500	25,661	36,000
	8,000	0,500	94,118	94,080	94,080	37,700	14,500	25,500	36,000
	7,500	1,000	88,235	88,200	88,200	37,700	14,500	25,250	36,000
	7,000	1,500	82,353	82,320	82,320	37,700	14,500	25,000	36,000
	6,500	2,000	76,471	76,440	76,440	37,700	14,500	24,750	36,000
	6,000	2,500	70,588	70,560	70,560	37,700	14,500	24,500	36,000
	5,500	3,000	64,706	64,680	64,680	37,700	14,500	24,250	36,000
	5,000	3,500	58,824	58,800	58,800	37,700	14,500	24,000	36,000
	4,500	4,000	52,941	52,920	52,920	37,700	14,500	23,750	36,000
	4,000	4,500	47,059	47,040	47,040	37,700	14,500	23,500	36,000
	3,500	5,000	41,176	41,160	41,160	37,700	14,500	23,250	36,000
	3,000	5,500	35,294	35,280	35,280	37,700	14,500	23,000	36,000
	2,500	6,000	29,412	29,400	29,400	37,700	14,500	22,750	36,000
	2,000	6,500	23,529	23,520	23,520	37,700	14,500	22,500	36,000
	1,500	7,000	17,647	17,640	17,640	37,700	14,500	22,250	36,000
	1,000	7,500	11,765	11,760	11,760	37,700	14,500	22,000	36,000
	0,500	8,000	5,882	5,880	5,880	37,700	14,500	21,750	36,000
	0,085	8,415	1,000	1,000	1,000	37,700	14,500	21,543	36,000
	0,000	8,500	0,000	0,000	0,000	37,700	14,500	21,500	0,000


T. ad. Er
Trim: 0 m; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM
T. ad. Er % Full
100
90
80
70
60
50
40
30
20
10
0
TCG
VCG
FSM
LCG
Capacity
Ullage
Sounding
0 1 2 3 4 5 6 7 8 9 10 11
Soundings & Ullage m
0 10 20 30 40 50 60 70 80 90 100 110
Capacity tonne
12,5 15 17,5 20 22,5 25 27,5 30 32,5 35 37,5 40
Centre of Gravity m
0 4 8 12 16 20 24 28 32 36 40 44
Free Surface Moment tonne.m

Tank Calibrations - FO almc Er

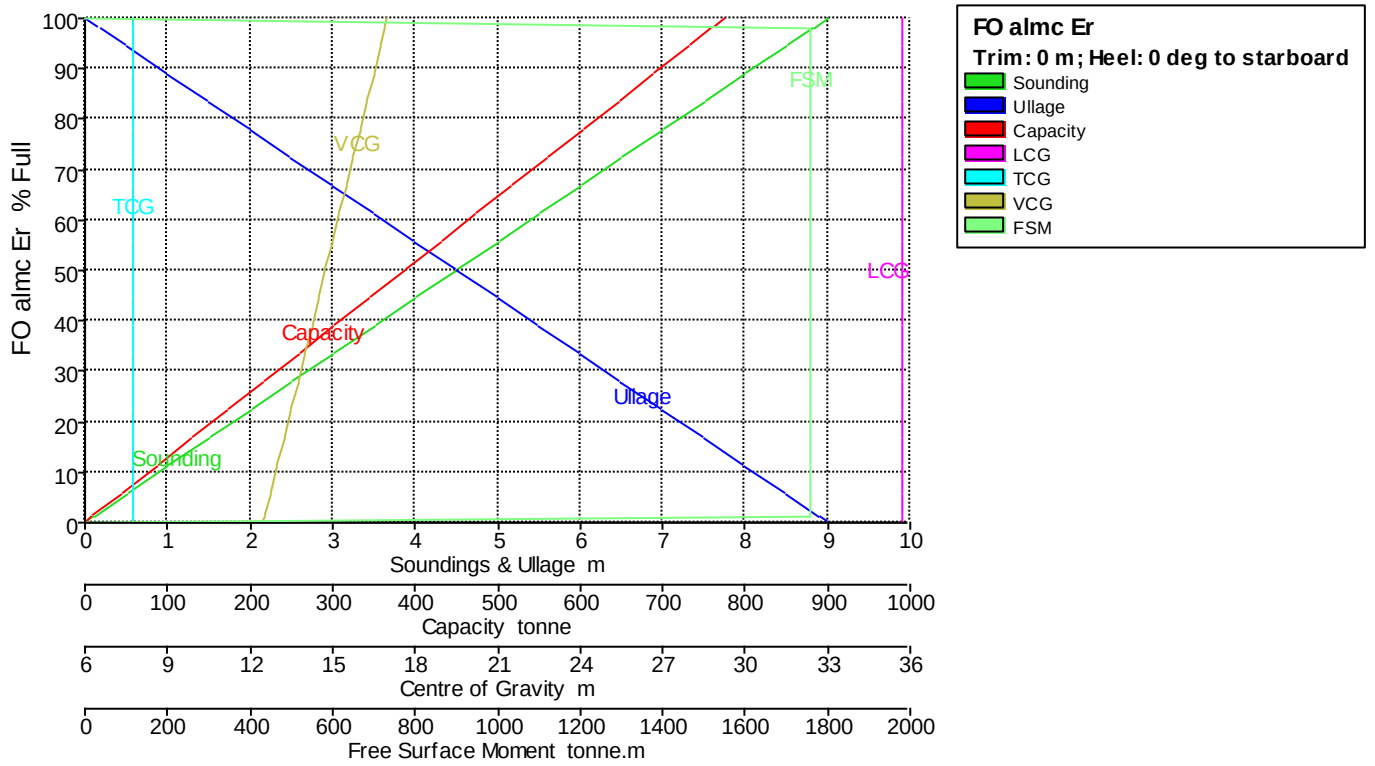
Fluid Type = Fuel Oil Specific gravity = 0,9443

Permeability = 98 %

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
FO almc Er	9,000	0,000	100,000	820,260	774,572	35,700	7,750	17,000	0,000
	8,820	0,180	98,000	803,855	759,080	35,700	7,750	16,910	1758,228
	8,811	0,189	97,900	803,035	758,306	35,700	7,750	16,906	1758,228
	8,500	0,500	94,444	774,690	731,540	35,700	7,750	16,750	1758,228
	8,000	1,000	88,889	729,120	688,508	35,700	7,750	16,500	1758,228
	7,500	1,500	83,333	683,550	645,476	35,700	7,750	16,250	1758,228
	7,000	2,000	77,778	637,980	602,445	35,700	7,750	16,000	1758,228
	6,500	2,500	72,222	592,410	559,413	35,700	7,750	15,750	1758,228
	6,000	3,000	66,667	546,840	516,381	35,700	7,750	15,500	1758,228
	5,500	3,500	61,111	501,270	473,349	35,700	7,750	15,250	1758,228
	5,000	4,000	55,556	455,700	430,318	35,700	7,750	15,000	1758,228
	4,500	4,500	50,000	410,130	387,286	35,700	7,750	14,750	1758,228
	4,000	5,000	44,444	364,560	344,254	35,700	7,750	14,500	1758,228
	3,500	5,500	38,889	318,990	301,222	35,700	7,750	14,250	1758,228
	3,000	6,000	33,333	273,420	258,191	35,700	7,750	14,000	1758,228
	2,500	6,500	27,778	227,850	215,159	35,700	7,750	13,750	1758,228
	2,000	7,000	22,222	182,280	172,127	35,700	7,750	13,500	1758,228
	1,500	7,500	16,667	136,710	129,095	35,700	7,750	13,250	1758,228
	1,000	8,000	11,111	91,140	86,064	35,700	7,750	13,000	1758,228
	0,500	8,500	5,556	45,570	43,032	35,700	7,750	12,750	1758,228

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,090	8,910	1,000	8,203	7,746	35,700	7,750	12,545	1758,228
	0,000	9,000	0,000	0,000	0,000	35,700	7,750	12,500	0,000



Tank Calibrations - FO sed. Er

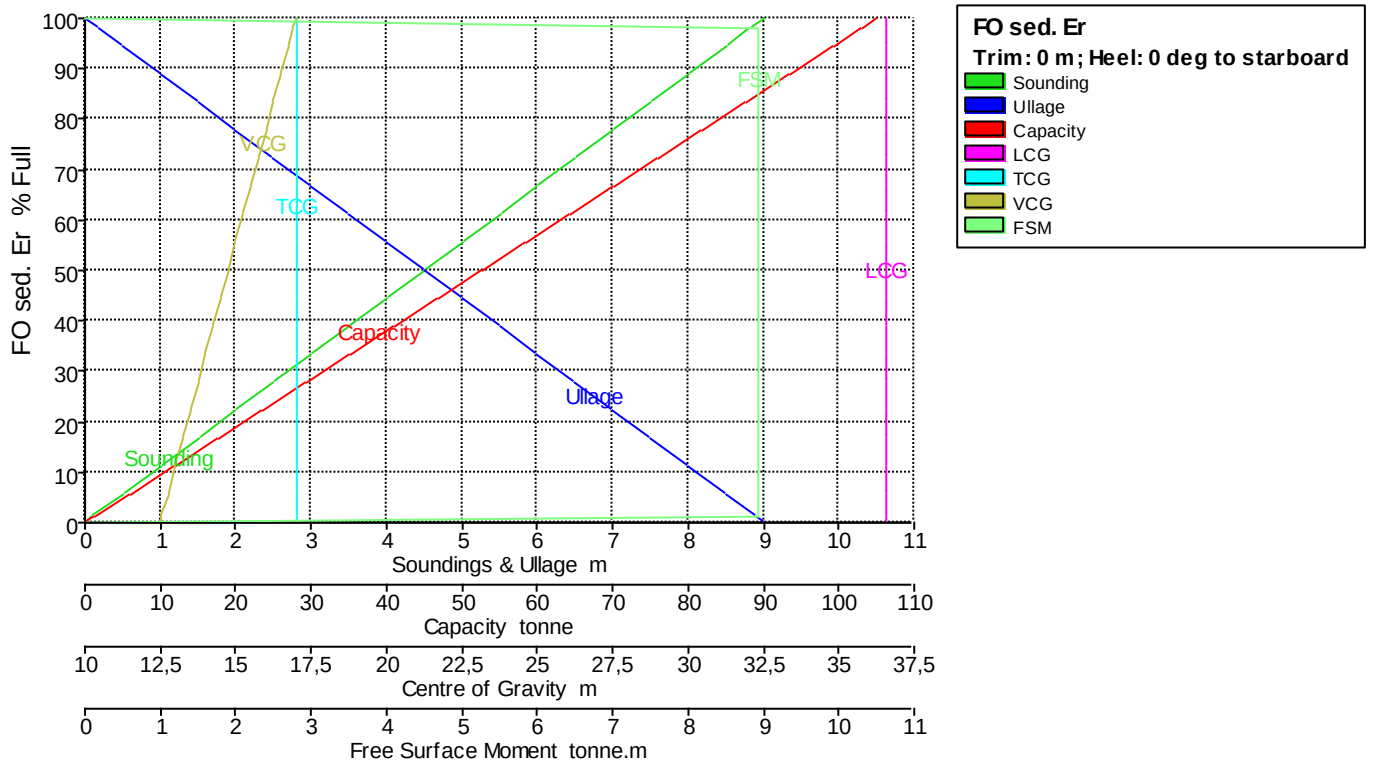
Fluid Type = Fuel Oil Specific gravity = 0,9443

Permeability = 98 %

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
FO sed. Er	9,000	0,000	100,000	111,132	104,942	36,600	17,000	17,000	0,000
	8,820	0,180	98,000	108,909	102,843	36,600	17,000	16,910	8,924
	8,811	0,189	97,900	108,798	102,738	36,600	17,000	16,906	8,924
	8,500	0,500	94,444	104,958	99,112	36,600	17,000	16,750	8,924
	8,000	1,000	88,889	98,784	93,282	36,600	17,000	16,500	8,924
	7,500	1,500	83,333	92,610	87,452	36,600	17,000	16,250	8,924
	7,000	2,000	77,778	86,436	81,622	36,600	17,000	16,000	8,924
	6,500	2,500	72,222	80,262	75,791	36,600	17,000	15,750	8,924
	6,000	3,000	66,667	74,088	69,961	36,600	17,000	15,500	8,924
	5,500	3,500	61,111	67,914	64,131	36,600	17,000	15,250	8,924
	5,000	4,000	55,556	61,740	58,301	36,600	17,000	15,000	8,924
	4,500	4,500	50,000	55,566	52,471	36,600	17,000	14,750	8,924
	4,000	5,000	44,444	49,392	46,641	36,600	17,000	14,500	8,924
	3,500	5,500	38,889	43,218	40,811	36,600	17,000	14,250	8,924
	3,000	6,000	33,333	37,044	34,981	36,600	17,000	14,000	8,924
	2,500	6,500	27,778	30,870	29,151	36,600	17,000	13,750	8,924
	2,000	7,000	22,222	24,696	23,320	36,600	17,000	13,500	8,924
	1,500	7,500	16,667	18,522	17,490	36,600	17,000	13,250	8,924
	1,000	8,000	11,111	12,348	11,660	36,600	17,000	13,000	8,924
	0,500	8,500	5,556	6,174	5,830	36,600	17,000	12,750	8,924

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,090	8,910	1,000	1,111	1,049	36,600	17,000	12,545	8,924
	0,000	9,000	0,000	0,000	0,000	36,600	17,000	12,500	0,000



Tank Calibrations - FO ud Er

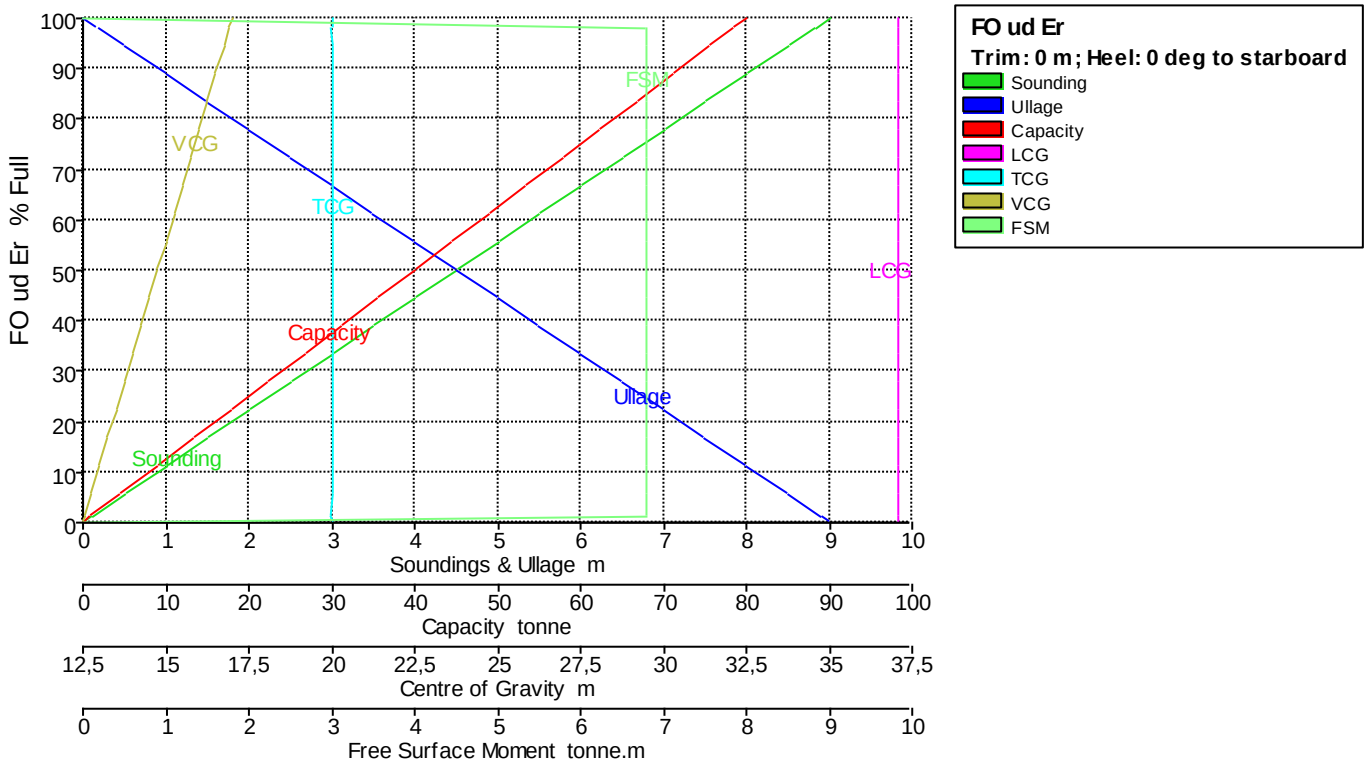
Fluid Type = Fuel Oil Specific gravity = 0,9443

Permeability = 98 %

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
FO ud Er	9,000	0,000	100,000	84,672	79,956	37,100	20,000	17,000	0,000
	8,820	0,180	98,000	82,979	78,357	37,100	20,000	16,910	6,799
	8,811	0,189	97,900	82,894	78,277	37,100	20,000	16,905	6,799
	8,500	0,500	94,444	79,968	75,514	37,100	20,000	16,750	6,799
	8,000	1,000	88,889	75,264	71,072	37,100	20,000	16,500	6,799
	7,500	1,500	83,333	70,560	66,630	37,100	20,000	16,250	6,799
	7,000	2,000	77,778	65,856	62,188	37,100	20,000	16,000	6,799
	6,500	2,500	72,222	61,152	57,746	37,100	20,000	15,750	6,799
	6,000	3,000	66,667	56,448	53,304	37,100	20,000	15,500	6,799
	5,500	3,500	61,111	51,744	48,862	37,100	20,000	15,250	6,799
	5,000	4,000	55,556	47,040	44,420	37,100	20,000	15,000	6,799
	4,500	4,500	50,000	42,336	39,978	37,100	20,000	14,750	6,799
	4,000	5,000	44,444	37,632	35,536	37,100	20,000	14,500	6,799
	3,500	5,500	38,889	32,928	31,094	37,100	20,000	14,250	6,799
	3,000	6,000	33,333	28,224	26,652	37,100	20,000	14,000	6,799
	2,500	6,500	27,778	23,520	22,210	37,100	20,000	13,750	6,799
	2,000	7,000	22,222	18,816	17,768	37,100	20,000	13,500	6,799
	1,500	7,500	16,667	14,112	13,326	37,100	20,000	13,250	6,799
	1,000	8,000	11,111	9,408	8,884	37,100	20,000	13,000	6,799
	0,500	8,500	5,556	4,704	4,442	37,100	20,000	12,750	6,799

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,090	8,910	1,000	0,847	0,800	37,100	20,000	12,545	6,799
	0,000	9,000	0,000	0,000	0,000	37,100	20,000	12,500	0,000



Tank Calibrations - DO Er

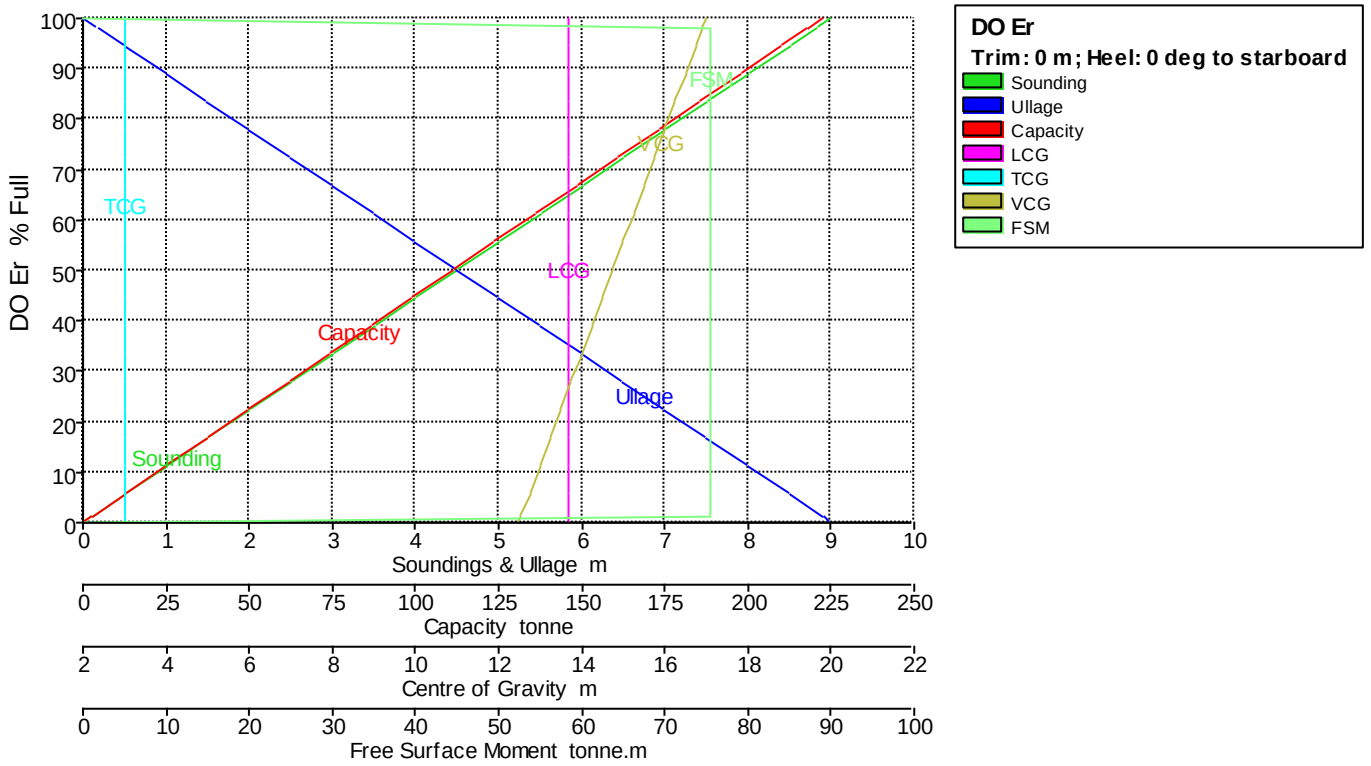
Fluid Type = Diesel Specific gravity = 0,84

Permeability = 98 %

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 Er	9,000	0,000	100,000	264,600	222,264	13,700	3,000	17,000	0,000
	8,820	0,180	98,000	259,308	217,819	13,700	3,000	16,910	75,600
	8,811	0,189	97,900	259,043	217,597	13,700	3,000	16,905	75,600
	8,500	0,500	94,444	249,900	209,916	13,700	3,000	16,750	75,600
	8,000	1,000	88,889	235,200	197,568	13,700	3,000	16,500	75,600
	7,500	1,500	83,333	220,500	185,220	13,700	3,000	16,250	75,600
	7,000	2,000	77,778	205,800	172,872	13,700	3,000	16,000	75,600
	6,500	2,500	72,222	191,100	160,524	13,700	3,000	15,750	75,600
	6,000	3,000	66,667	176,400	148,176	13,700	3,000	15,500	75,600
	5,500	3,500	61,111	161,700	135,828	13,700	3,000	15,250	75,600
	5,000	4,000	55,556	147,000	123,480	13,700	3,000	15,000	75,600
	4,500	4,500	50,000	132,300	111,132	13,700	3,000	14,750	75,600
	4,000	5,000	44,444	117,600	98,784	13,700	3,000	14,500	75,600
	3,500	5,500	38,889	102,900	86,436	13,700	3,000	14,250	75,600
	3,000	6,000	33,333	88,200	74,088	13,700	3,000	14,000	75,600
	2,500	6,500	27,778	73,500	61,740	13,700	3,000	13,750	75,600
	2,000	7,000	22,222	58,800	49,392	13,700	3,000	13,500	75,600
	1,500	7,500	16,667	44,100	37,044	13,700	3,000	13,250	75,600
	1,000	8,000	11,111	29,400	24,696	13,700	3,000	13,000	75,600
	0,500	8,500	5,556	14,700	12,348	13,700	3,000	12,750	75,600

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,090	8,910	1,000	2,646	2,223	13,700	3,000	12,545	75,600
	0,000	9,000	0,000	0,000	0,000	13,700	3,000	12,500	0,000



Tank Calibrations - Aceite Er

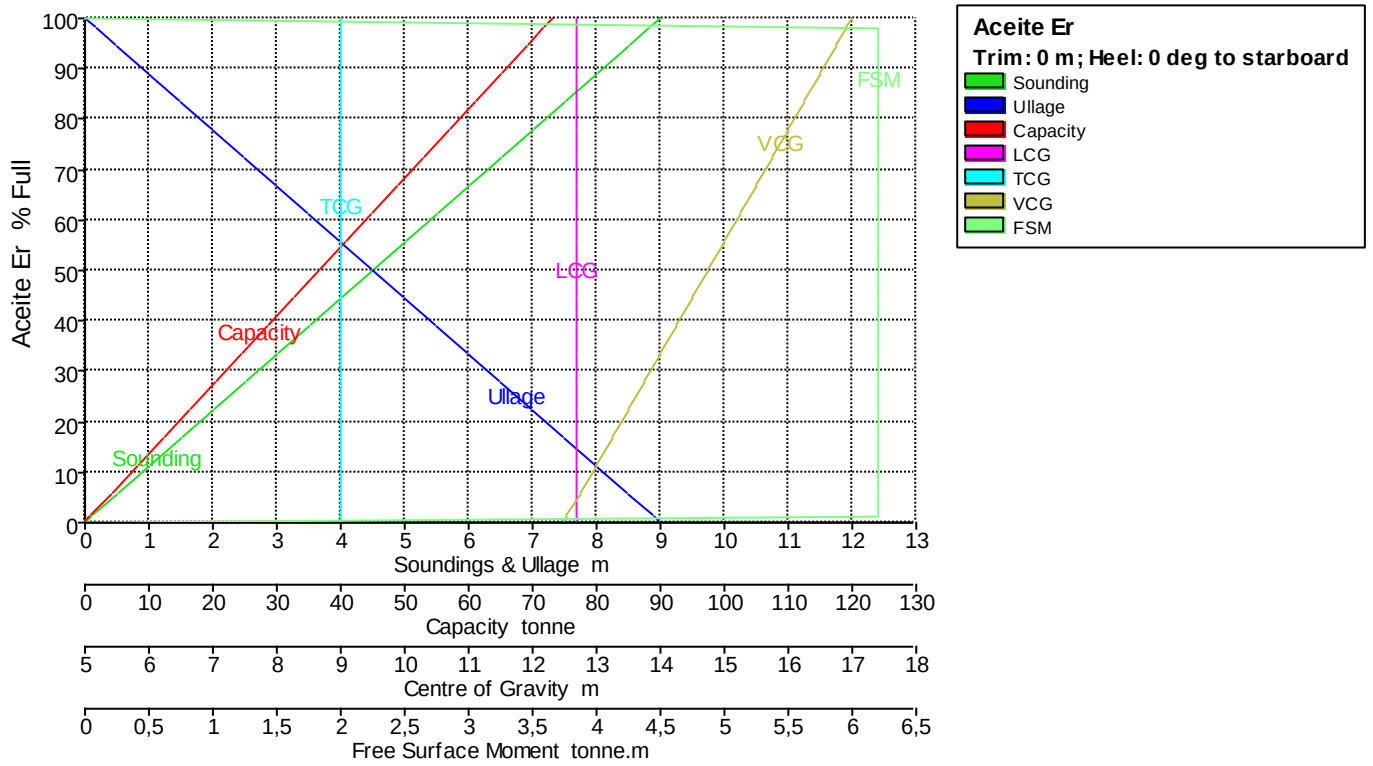
Fluid Type = Lube Oil Specific gravity = 0,92

Permeability = 98 %

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
Aceite Er	9,000	0,000	100,000	79,380	73,030	12,700	9,000	17,000	0,000
	8,820	0,180	98,000	77,792	71,569	12,700	9,000	16,910	6,210
	8,811	0,189	97,900	77,713	71,496	12,700	9,000	16,906	6,210
	8,500	0,500	94,444	74,970	68,972	12,700	9,000	16,750	6,210
	8,000	1,000	88,889	70,560	64,915	12,700	9,000	16,500	6,210
	7,500	1,500	83,333	66,150	60,858	12,700	9,000	16,250	6,210
	7,000	2,000	77,778	61,740	56,801	12,700	9,000	16,000	6,210
	6,500	2,500	72,222	57,330	52,744	12,700	9,000	15,750	6,210
	6,000	3,000	66,667	52,920	48,686	12,700	9,000	15,500	6,210
	5,500	3,500	61,111	48,510	44,629	12,700	9,000	15,250	6,210
	5,000	4,000	55,556	44,100	40,572	12,700	9,000	15,000	6,210
	4,500	4,500	50,000	39,690	36,515	12,700	9,000	14,750	6,210
	4,000	5,000	44,444	35,280	32,458	12,700	9,000	14,500	6,210
	3,500	5,500	38,889	30,870	28,400	12,700	9,000	14,250	6,210
	3,000	6,000	33,333	26,460	24,343	12,700	9,000	14,000	6,210
	2,500	6,500	27,778	22,050	20,286	12,700	9,000	13,750	6,210
	2,000	7,000	22,222	17,640	16,229	12,700	9,000	13,500	6,210
	1,500	7,500	16,667	13,230	12,172	12,700	9,000	13,250	6,210
	1,000	8,000	11,111	8,820	8,114	12,700	9,000	13,000	6,210
	0,500	8,500	5,556	4,410	4,057	12,700	9,000	12,750	6,210

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,090	8,910	1,000	0,794	0,730	12,700	9,000	12,545	6,210
	0,000	9,000	0,000	0,000	0,000	12,700	9,000	12,500	0,000



Tank Calibrations - Tq lodos

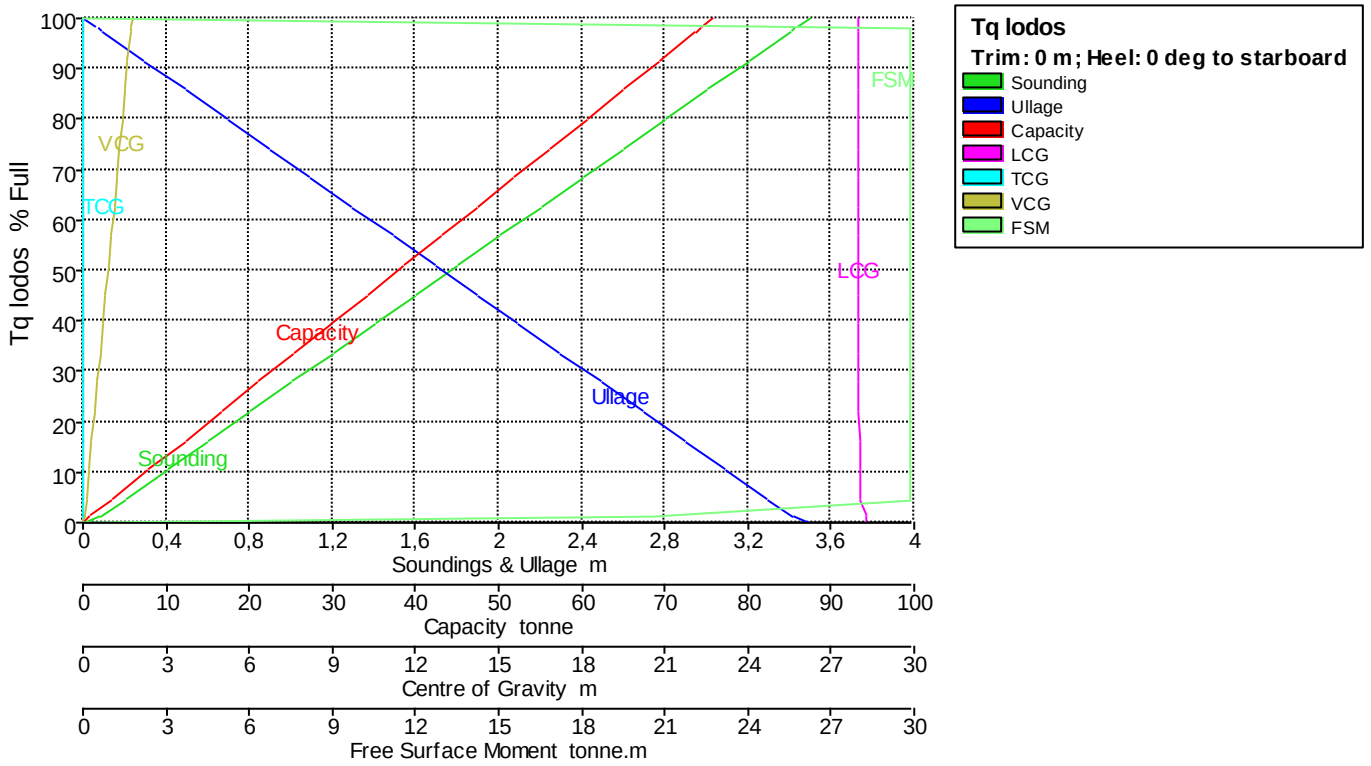
Fluid Type = Specific gravity = 1

Permeability = 98 %

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
Tq lodos	3,500	0,000	100,000	75,838	75,838	28,003	0,000	1,773	0,000
	3,431	0,069	98,000	74,321	74,321	28,003	0,000	1,738	29,867
	3,427	0,073	97,900	74,245	74,245	28,003	0,000	1,736	29,867
	3,400	0,100	97,105	73,643	73,643	28,003	0,000	1,723	29,867
	3,200	0,300	91,316	69,252	69,252	28,004	0,000	1,623	29,867
	3,000	0,500	85,527	64,862	64,862	28,004	0,000	1,523	29,867
	2,800	0,700	79,738	60,471	60,471	28,004	0,000	1,423	29,867
	2,600	0,900	73,949	56,081	56,081	28,005	0,000	1,322	29,867
	2,400	1,100	68,159	51,691	51,691	28,005	0,000	1,222	29,867
	2,200	1,300	62,370	47,300	47,300	28,005	0,000	1,122	29,867
	2,000	1,500	56,581	42,910	42,910	28,006	0,000	1,022	29,867
	1,800	1,700	50,792	38,519	38,519	28,007	0,000	0,922	29,867
	1,600	1,900	45,003	34,129	34,129	28,008	0,000	0,822	29,867
	1,400	2,100	39,213	29,739	29,739	28,009	0,000	0,722	29,867
	1,200	2,300	33,424	25,348	25,348	28,010	0,000	0,622	29,867
	1,000	2,500	27,635	20,958	20,958	28,012	0,000	0,522	29,867
	0,800	2,700	21,846	16,567	16,567	28,016	0,000	0,422	29,867
	0,600	2,900	16,057	12,177	12,177	28,021	0,000	0,322	29,867
	0,400	3,100	10,267	7,787	7,787	28,033	0,000	0,222	29,867
	0,200	3,300	4,478	3,396	3,396	28,076	0,000	0,120	29,867

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,078	3,422	1,000	0,758	0,758	28,254	0,000	0,052	20,452
	0,000	3,500	0,000	0,000	0,000	28,257	0,000	0,000	0,000



Tank Calibrations - Tq aguas grises/negras

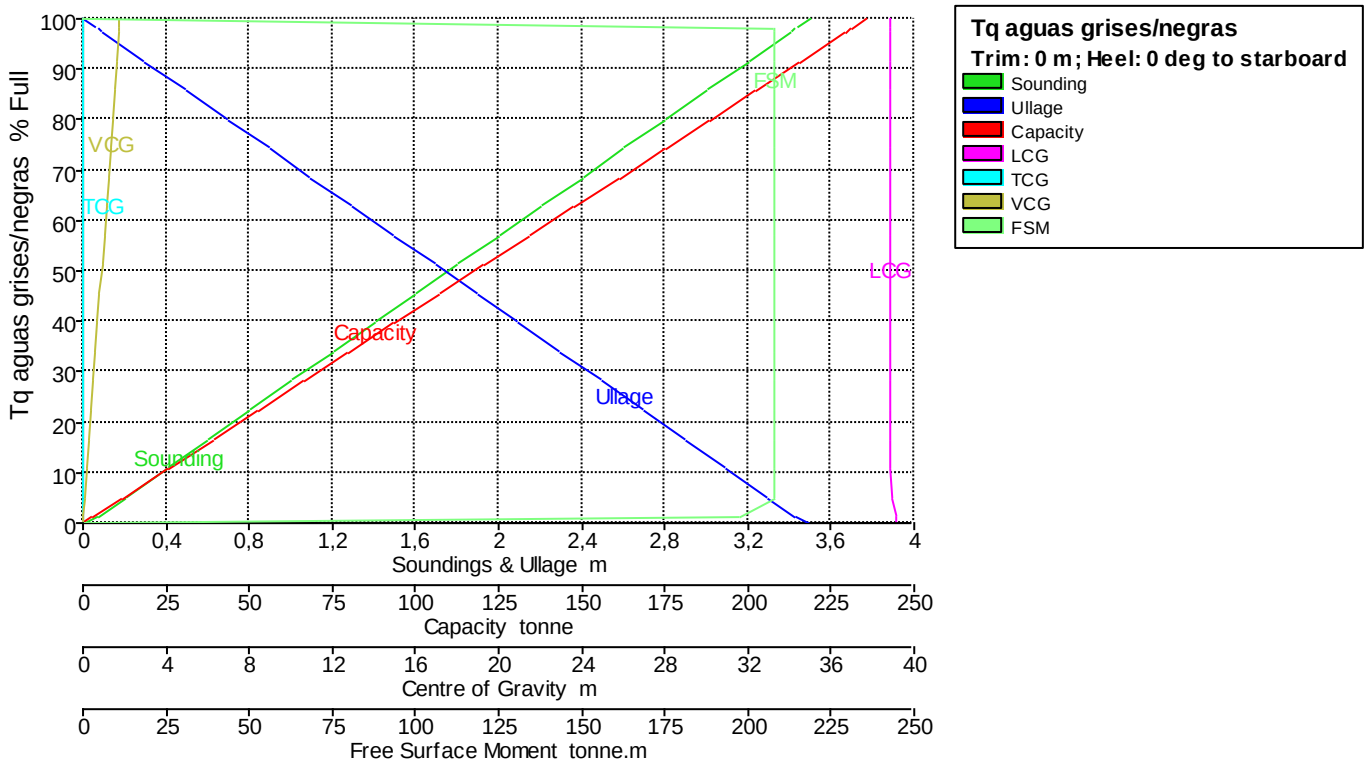
Fluid Type = Specific gravity = 1,5

Permeability = 98 %

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
Tq aguas grises/negras	3,500	0,000	100,000	157,160	235,740	38,853	0,000	1,764	0,000
	3,431	0,069	98,000	154,017	231,026	38,853	0,000	1,730	207,900
	3,427	0,073	97,900	153,860	230,790	38,853	0,000	1,728	207,900
	3,400	0,100	97,119	152,633	228,949	38,853	0,000	1,714	207,900
	3,200	0,300	91,357	143,578	215,366	38,853	0,000	1,614	207,900
	3,000	0,500	85,596	134,522	201,783	38,853	0,000	1,514	207,900
	2,800	0,700	79,834	125,467	188,201	38,853	0,000	1,414	207,900
	2,600	0,900	74,072	116,412	174,618	38,854	0,000	1,314	207,900
	2,400	1,100	68,310	107,357	161,035	38,854	0,000	1,214	207,900
	2,200	1,300	62,549	98,302	147,452	38,854	0,000	1,114	207,900
	2,000	1,500	56,787	89,246	133,869	38,855	0,000	1,014	207,900
	1,800	1,700	51,025	80,191	120,287	38,855	0,000	0,914	207,900
	1,600	1,900	45,263	71,136	106,704	38,856	0,000	0,814	207,900
	1,400	2,100	39,502	62,081	93,121	38,857	0,000	0,714	207,900
	1,200	2,300	33,740	53,026	79,538	38,858	0,000	0,614	207,900
	1,000	2,500	27,978	43,970	65,955	38,859	0,000	0,514	207,900
	0,800	2,700	22,216	34,915	52,373	38,862	0,000	0,414	207,900
	0,600	2,900	16,454	25,860	38,790	38,866	0,000	0,314	207,900

Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,400	3,100	10,693	16,805	25,207	38,874	0,000	0,214	207,900
	0,200	3,300	4,931	7,750	11,624	38,903	0,000	0,114	207,900
	0,063	3,437	1,000	1,572	2,357	39,105	0,000	0,042	196,955
	0,000	3,500	0,000	0,000	0,000	39,163	0,000	0,000	0,000


Tq aguas grises/negras % Full
100
90
80
70
60
50
40
30
20
10
0
VCG
TCG
FSM
LCG
Capacity
Ullage
Sounding
0
0,4
0,8
1,2
1,6
2
2,4
2,8
3,2
3,6
4
Soundings & Ullage m
0
25
50
75
100
125
150
175
200
225
250
Capacity tonne
0
4
8
12
16
20
24
28
32
36
40
Centre of Gravity m
0
25
50
75
100
125
150
175
200
225
250
Free Surface Moment tonne.m
Tq aguas grises/negras
Trim: 0 m ; Heel: 0 deg to starboard
Sounding
Ullage
Capacity
LCG
TCG
VCG
FSM

Tank Calibrations - Tq derrames

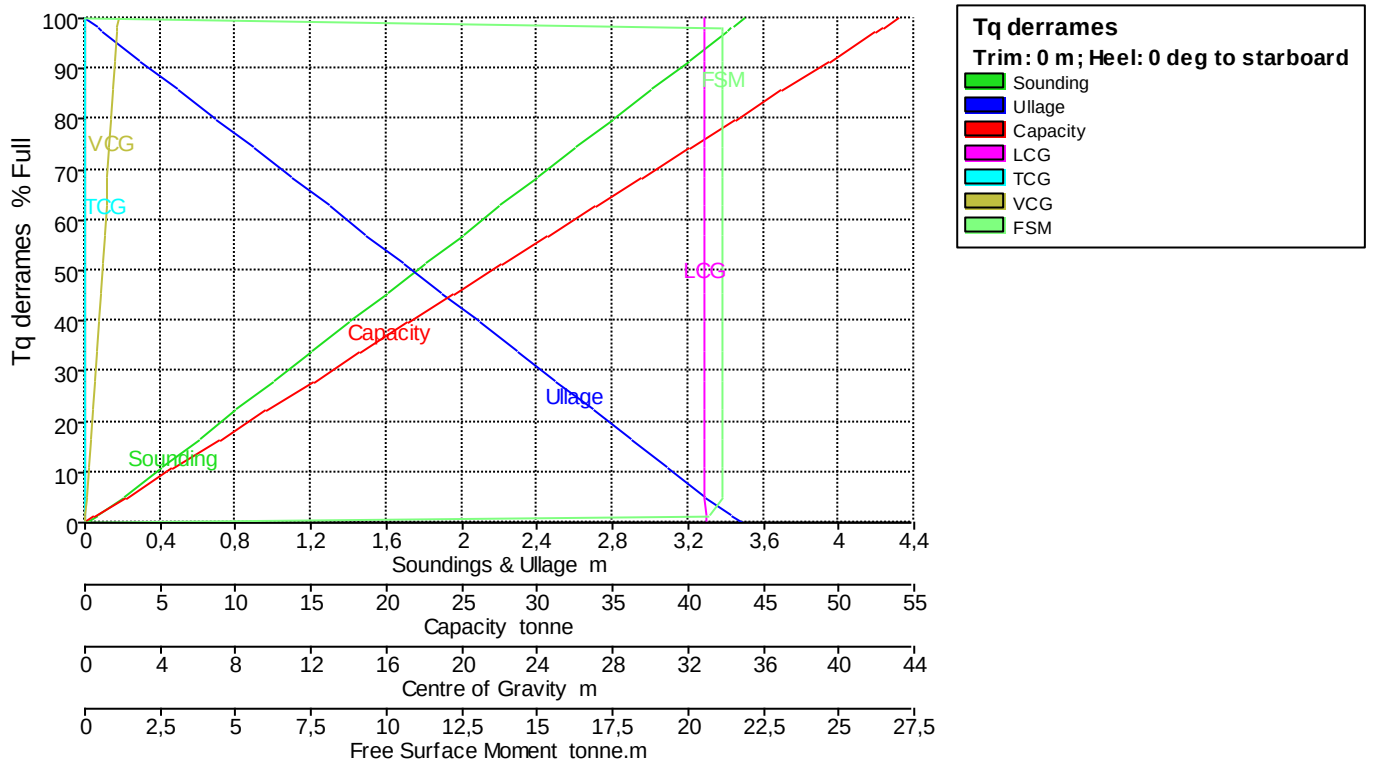
Fluid Type = Fuel Oil Specific gravity = 0,9443

Permeability = 98 %

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

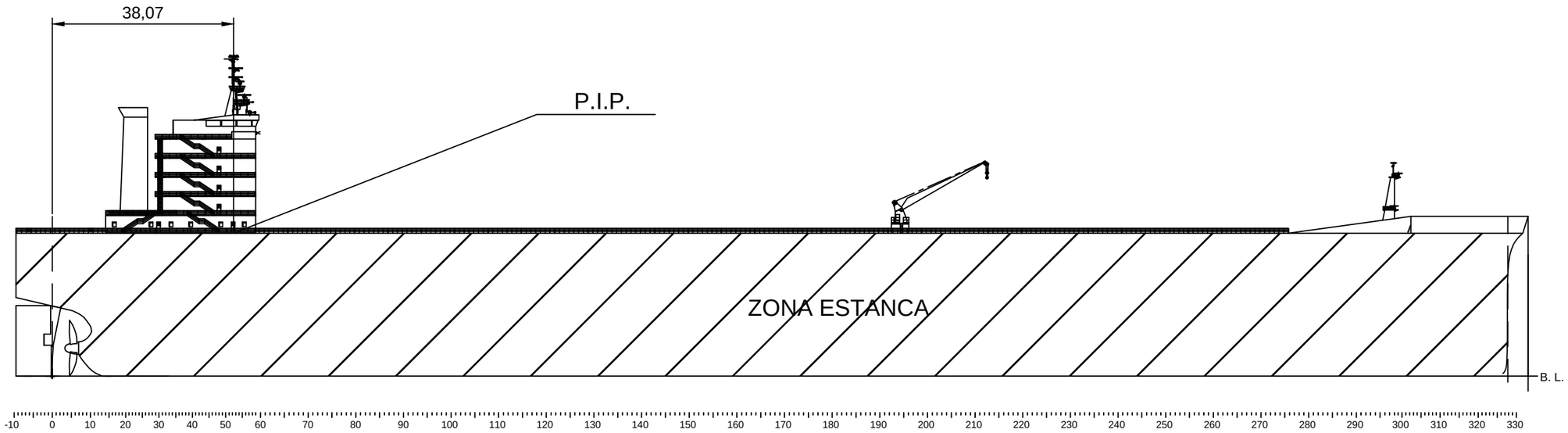
Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
Tq derrames	3,500	0,000	100,000	57,138	53,956	32,901	0,000	1,765	0,000
	3,431	0,069	98,000	55,995	52,876	32,901	0,000	1,730	21,152
	3,427	0,073	97,900	55,938	52,822	32,901	0,000	1,728	21,152
	3,400	0,100	97,119	55,492	52,401	32,901	0,000	1,715	21,152
	3,200	0,300	91,356	52,199	49,291	32,901	0,000	1,615	21,152
	3,000	0,500	85,593	48,906	46,182	32,901	0,000	1,515	21,152
	2,800	0,700	79,830	45,613	43,073	32,901	0,000	1,415	21,152
	2,600	0,900	74,067	42,321	39,963	32,901	0,000	1,315	21,152
	2,400	1,100	68,304	39,028	36,854	32,901	0,000	1,215	21,152
	2,200	1,300	62,541	35,735	33,744	32,902	0,000	1,115	21,152
	2,000	1,500	56,778	32,442	30,635	32,902	0,000	1,015	21,152
	1,800	1,700	51,016	29,149	27,526	32,902	0,000	0,915	21,152
	1,600	1,900	45,253	25,857	24,416	32,902	0,000	0,815	21,152
	1,400	2,100	39,490	22,564	21,307	32,902	0,000	0,715	21,152
	1,200	2,300	33,727	19,271	18,198	32,903	0,000	0,615	21,152
	1,000	2,500	27,964	15,978	15,088	32,903	0,000	0,515	21,152
	0,800	2,700	22,201	12,685	11,979	32,904	0,000	0,415	21,152
	0,600	2,900	16,438	9,393	8,869	32,906	0,000	0,314	21,152
	0,400	3,100	10,675	6,100	5,760	32,909	0,000	0,214	21,152
	0,200	3,300	4,913	2,807	2,651	32,920	0,000	0,114	21,152

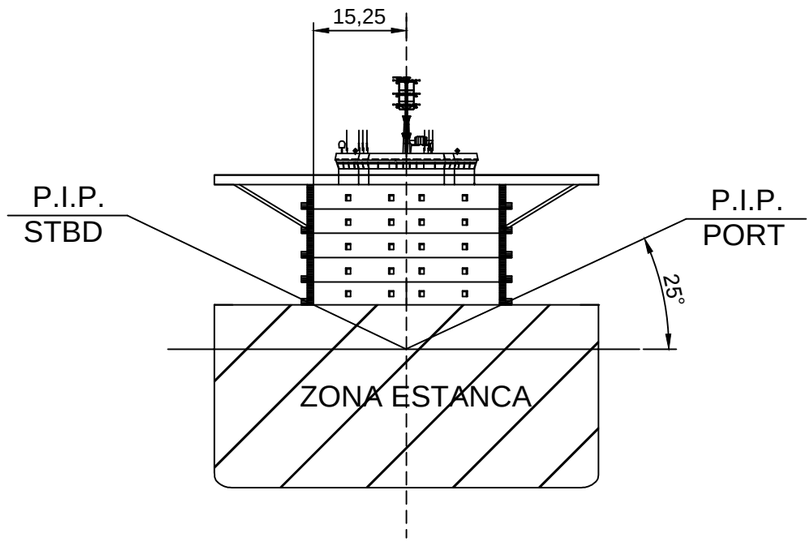
Tank Name	Sounding m	Ullage m	% Full	Capacity m^3	Capacity tonne	LCG m	TCG m	VCG m	FSM tonne.m
	0,064	3,436	1,000	0,571	0,540	32,996	0,000	0,043	20,654
	0,000	3,500	0,000	0,000	0,000	33,014	0,000	0,000	0,000



ANEXO III:

PLANO DE P.I.P





UNIVERSIDADE DA CORUÑA

ESCUELA POLITÉCNICA SUPERIOR
Trabajo Fin de Grado

PROYECTO: 17/33: PETROLERO DE CRUDO DE 300.000 T.P.M.			
PLANO: PUNTO DE INUNDACIÓN PROGRESIVA			
AUTOR: PEDRO CARRO ALLEGUE	FECHA: FEBRERO 2018	ESCALA: 1:1000	HOJA: 1A

ANEXO IV:

CURVAS HIDROSTÁTICAS

Hydrostatics

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

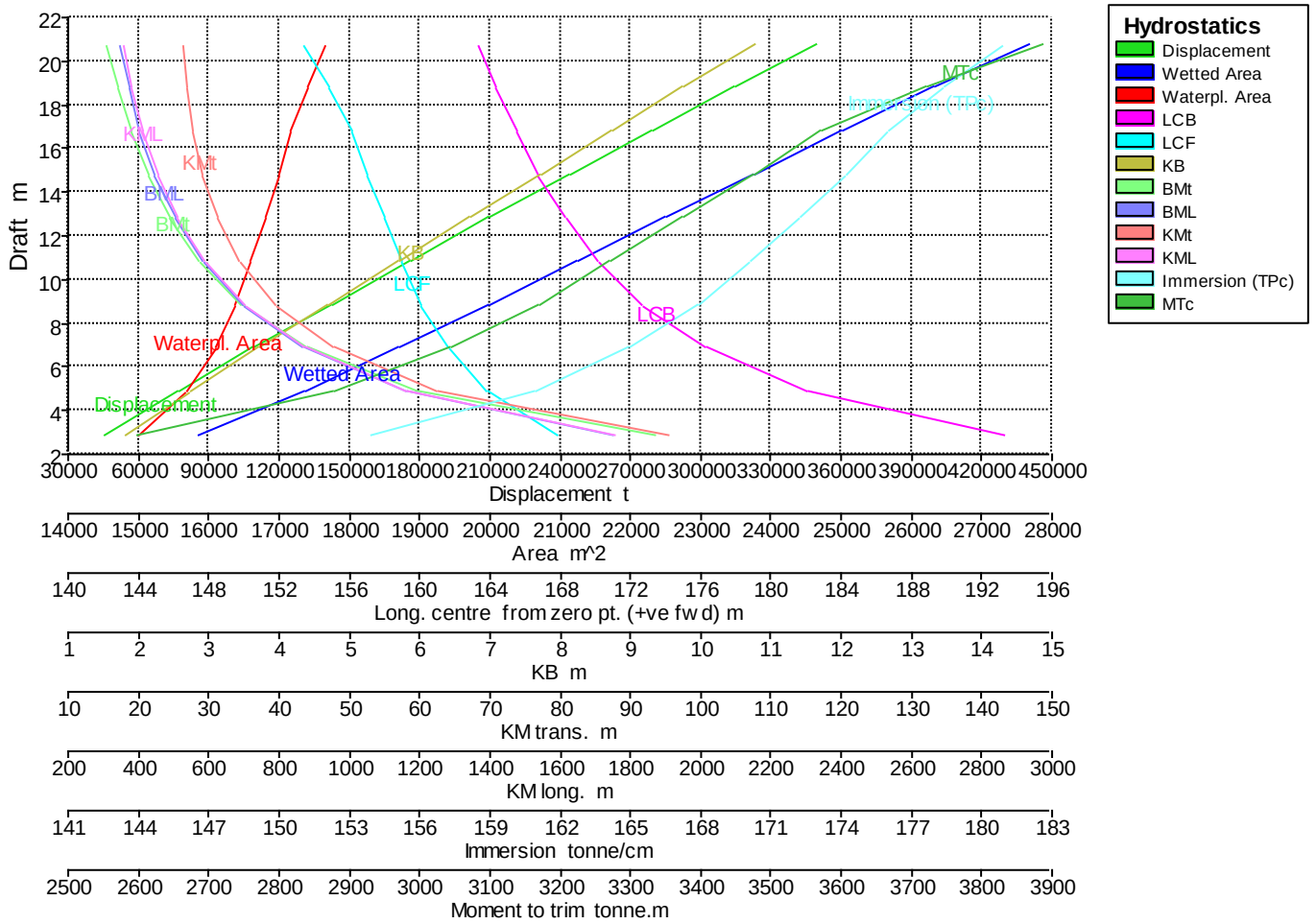
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

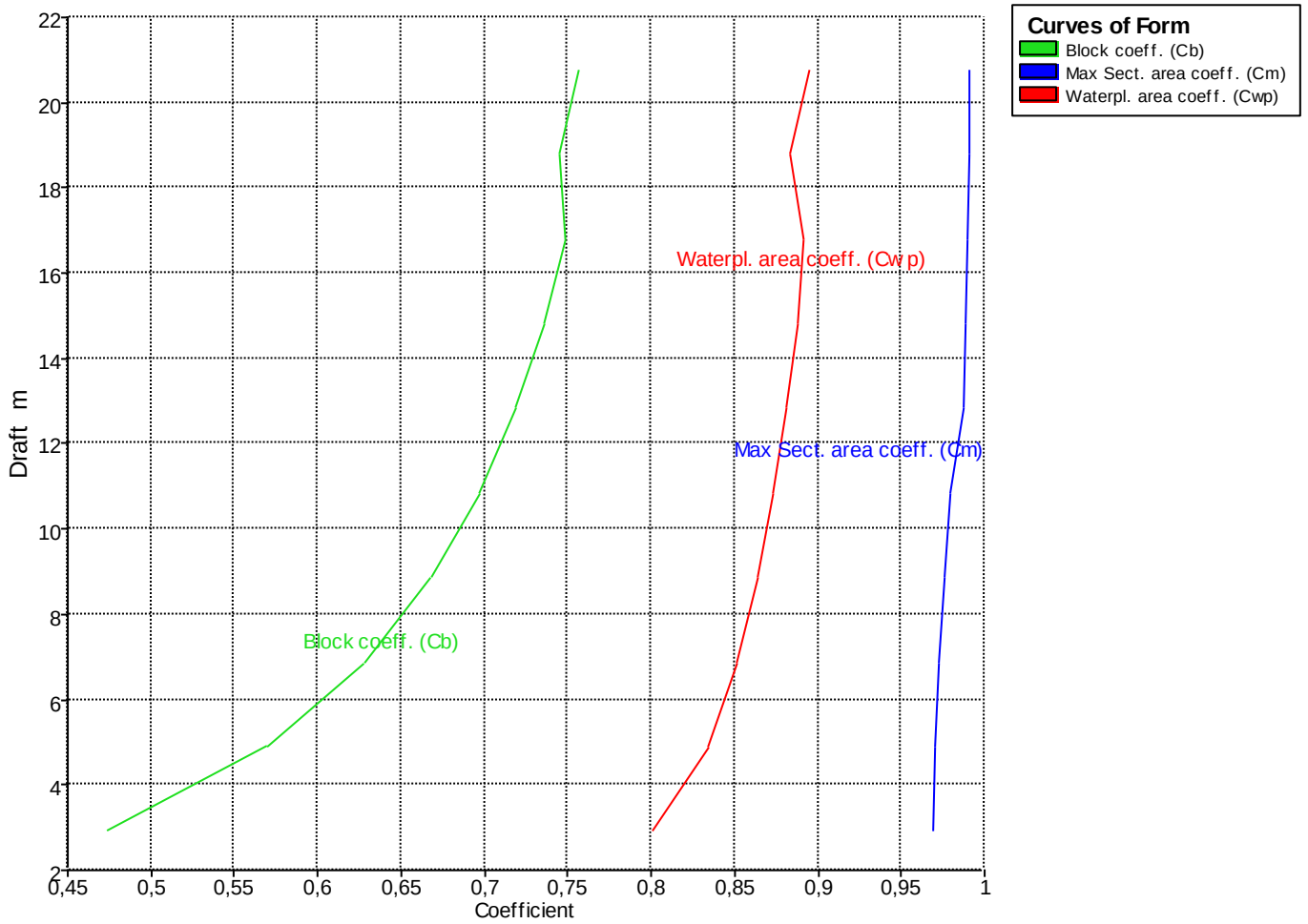
Damage Case - Intact

Fixed Trim = -4,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	45806	15849,107	15016,720	0,474	0,969	0,801	193,317	167,803	1,807	93,583	1752,223	95,380	1753,839	153,921	2597,891
4,907	77168	17377,506	15703,653	0,570	0,970	0,834	182,008	163,773	2,742	59,740	1158,163	62,476	1160,780	160,962	2878,766
6,893	109574	18721,182	16097,775	0,628	0,973	0,851	176,266	161,608	3,720	43,854	866,284	47,570	869,910	165,002	3044,603
8,880	142656	20012,265	16380,862	0,668	0,976	0,864	172,679	160,109	4,715	34,654	695,252	39,365	699,892	167,904	3170,076
10,867	176238	21250,832	16602,297	0,697	0,979	0,873	170,176	158,991	5,717	28,656	582,596	34,370	588,250	170,174	3272,426
12,853	210252	22506,486	16805,134	0,719	0,988	0,881	168,282	157,963	6,725	24,450	504,647	31,172	511,317	172,253	3374,670
14,840	244665	23762,336	16996,043	0,736	0,989	0,888	166,763	157,009	7,737	21,343	447,422	29,077	455,110	174,209	3476,988
16,827	279453	25025,770	17171,731	0,748	0,990	0,892	165,495	156,188	8,752	18,963	402,918	27,712	411,626	176,010	3573,739
18,813	314637	26337,768	17403,585	0,745	0,991	0,884	164,389	154,874	9,771	17,087	372,554	26,856	382,284	178,387	3721,615
20,800	350348	27697,644	17652,760	0,756	0,991	0,894	163,336	153,456	10,796	15,575	349,207	26,369	359,965	180,941	3888,212


Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc
Draft m
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
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


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cw p)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,45
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

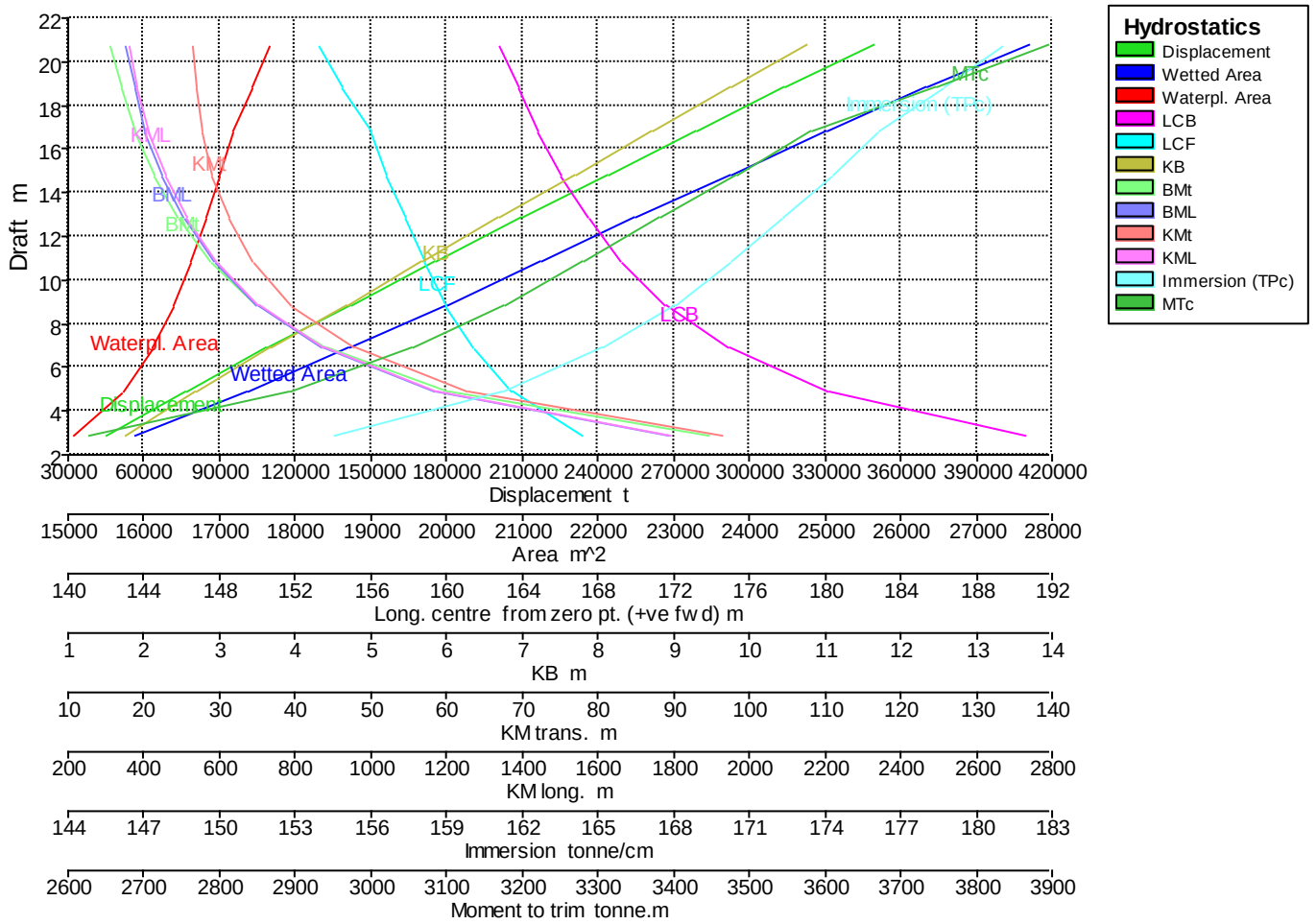
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact

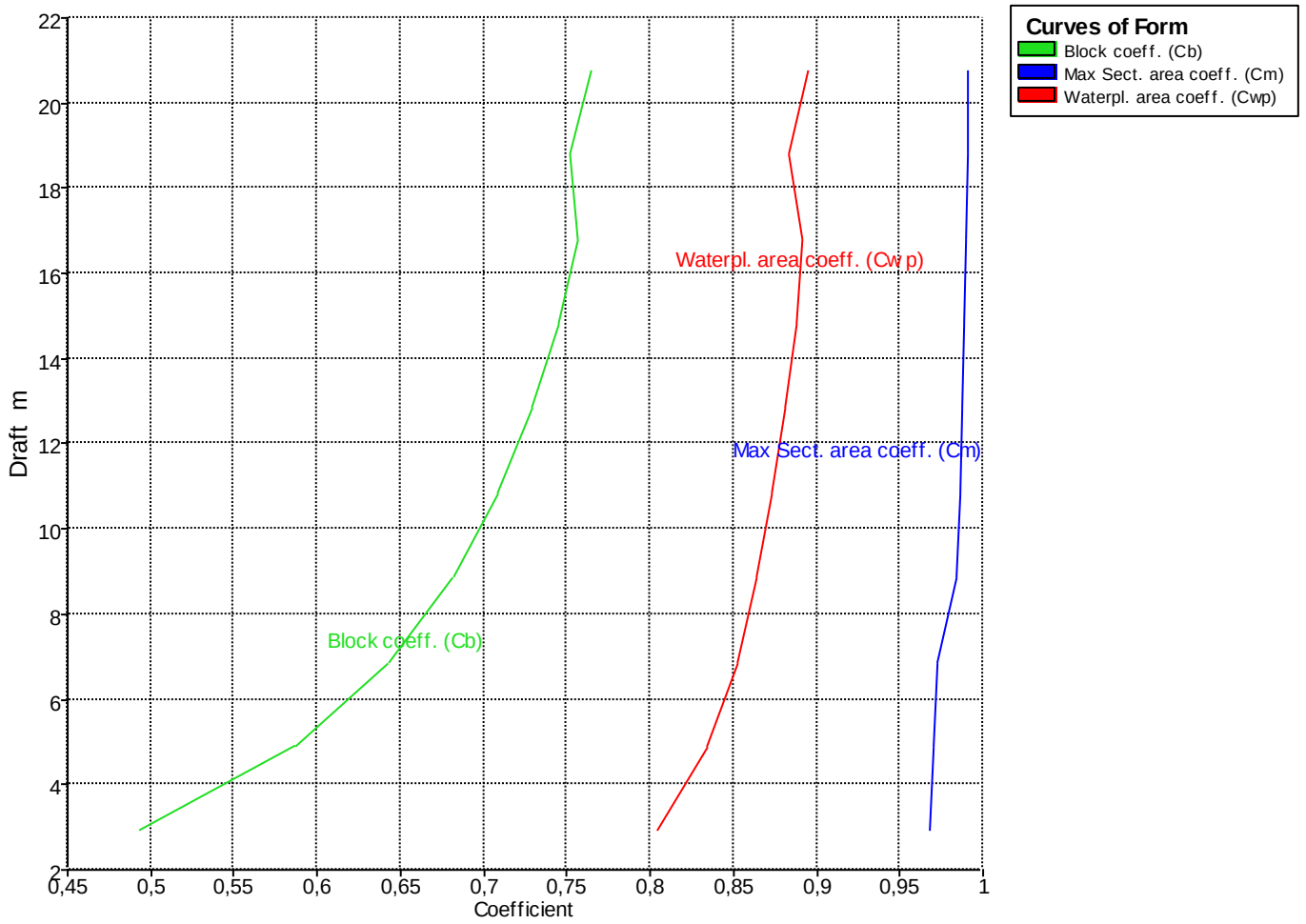
Fixed Trim = -4 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	45433	15887,738	15076,736	0,494	0,968	0,804	190,624	167,207	1,756	94,729	1787,379	96,477	1788,982	154,537	2629,104
4,907	76881	17390,648	15733,312	0,587	0,970	0,835	180,171	163,465	2,707	60,103	1168,435	62,805	1171,042	161,266	2894,007
6,893	109337	18728,698	16118,168	0,644	0,973	0,852	174,875	161,384	3,693	44,016	871,187	47,705	874,806	165,211	3055,695
8,880	142457	20017,579	16396,323	0,682	0,984	0,864	171,556	159,928	4,693	34,740	698,087	39,429	702,720	168,062	3178,978
10,867	176066	21254,463	16615,700	0,709	0,986	0,873	169,232	158,827	5,699	28,707	584,549	34,404	590,197	170,311	3280,615
12,853	210107	22509,903	16817,551	0,729	0,988	0,881	167,462	157,806	6,709	24,483	506,124	31,189	512,790	172,380	3382,636
14,840	244545	23766,014	17008,080	0,745	0,989	0,888	166,035	156,853	7,723	21,366	448,614	29,087	456,298	174,333	3484,978
16,827	279357	25033,260	17186,078	0,756	0,990	0,891	164,839	156,008	8,740	18,980	404,131	27,718	412,836	176,157	3583,753
18,813	314580	26365,359	17436,469	0,752	0,990	0,884	163,779	154,524	9,760	17,102	375,107	26,861	384,836	178,724	3747,412
20,800	350330	27711,164	17667,409	0,764	0,991	0,895	162,765	153,268	10,787	15,587	350,094	26,373	360,851	181,091	3898,364


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KML
BML
BML
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
140 144 148 152 156 160 164 168 172 176 180 184 188 192
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
144 147 150 153 156 159 162 165 168 171 174 177 180 183
Immersion tonne/cm
2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900
Moment to trim tonne.m

Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,45
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

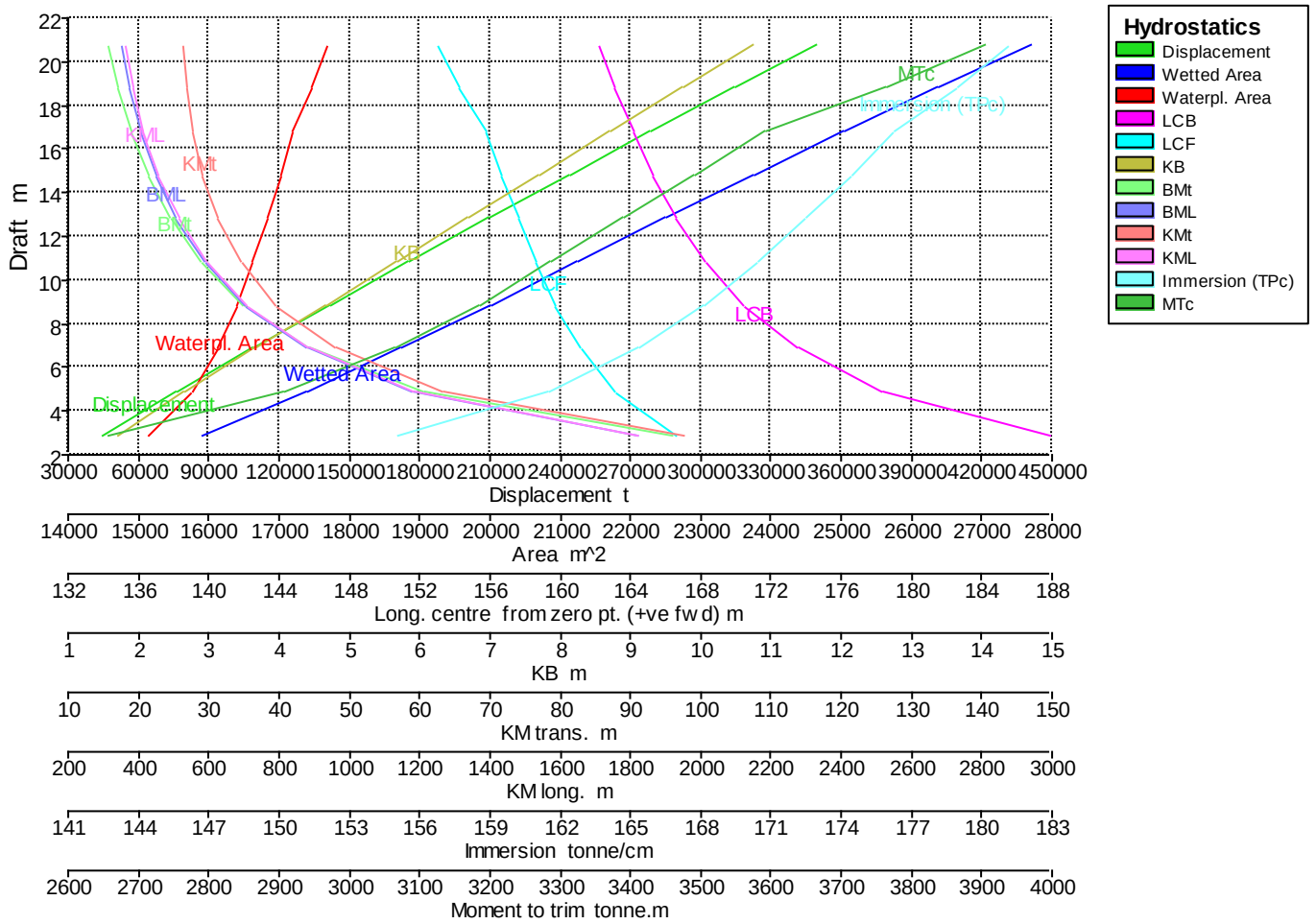
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

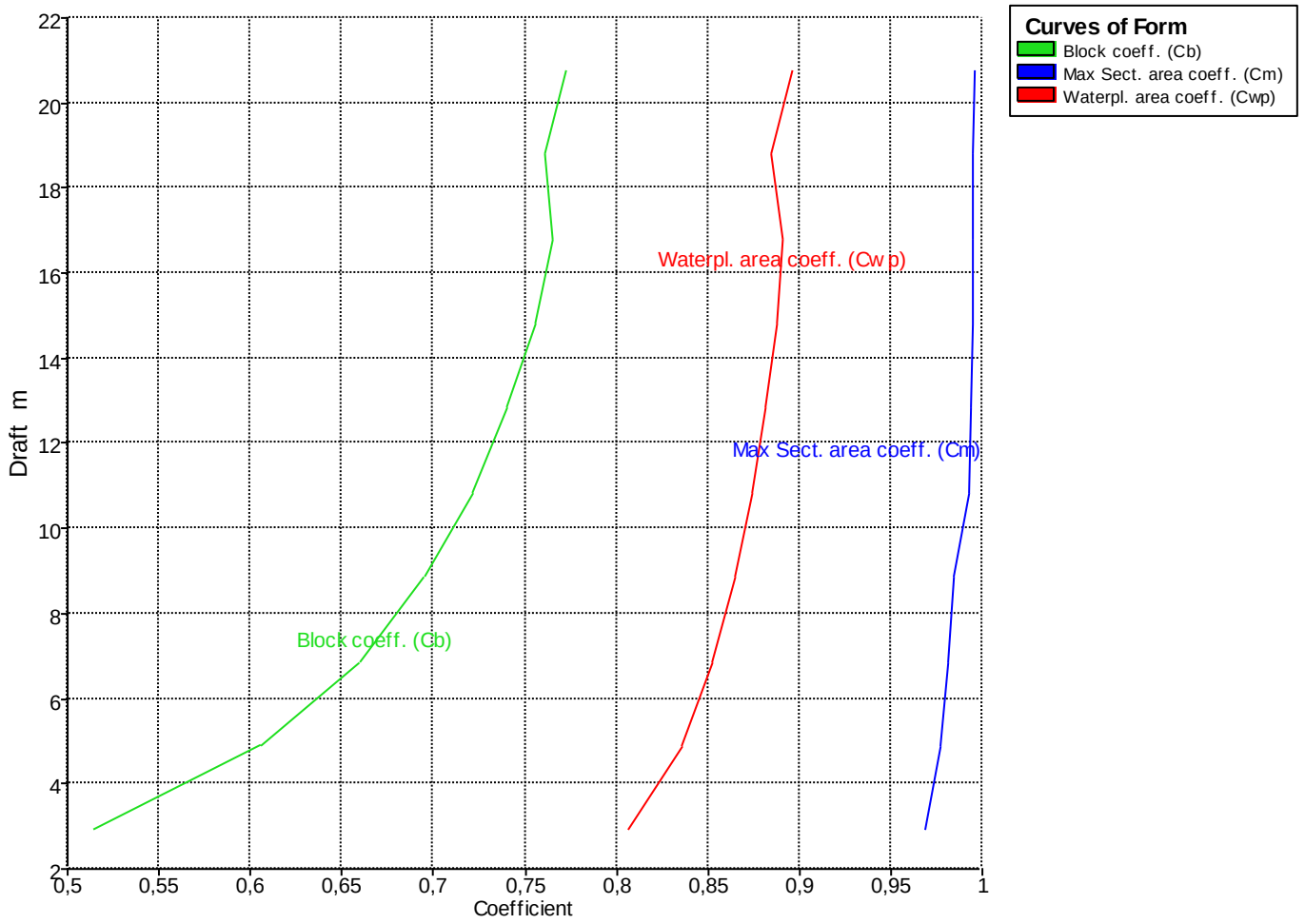
Damage Case - Intact

Fixed Trim = -3,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	45074	15923,527	15133,262	0,515	0,968	0,807	187,852	166,636	1,708	95,853	1821,312	97,555	1822,901	155,116	2658,427
4,907	76602	17403,496	15762,229	0,606	0,977	0,836	178,310	163,160	2,675	60,458	1178,542	63,129	1181,140	161,563	2908,923
6,893	109107	18735,954	16138,042	0,660	0,981	0,853	173,473	161,165	3,669	44,176	875,975	47,842	879,586	165,415	3066,453
8,880	142262	20022,866	16411,470	0,696	0,984	0,865	170,426	159,749	4,673	34,823	700,882	39,493	705,509	168,218	3187,760
10,867	175899	21258,104	16629,106	0,721	0,993	0,874	168,284	158,663	5,682	28,758	586,496	34,438	592,140	170,448	3288,827
12,853	209967	22513,361	16829,987	0,740	0,994	0,881	166,640	157,649	6,695	24,515	507,599	31,208	514,260	172,507	3390,634
14,840	244430	23769,740	17020,139	0,755	0,994	0,888	165,305	156,696	7,710	21,388	449,803	29,097	457,484	174,456	3492,989
16,827	279265	25041,605	17201,299	0,765	0,995	0,891	164,180	155,822	8,729	18,997	405,413	27,725	414,115	176,313	3594,445
18,813	314532	26389,645	17459,592	0,761	0,995	0,885	163,166	154,264	9,752	17,116	376,839	26,866	386,565	178,961	3764,826
20,800	350317	27724,607	17681,758	0,772	0,996	0,896	162,192	153,083	10,780	15,600	350,951	26,378	361,708	181,238	3908,228


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
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cw p)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

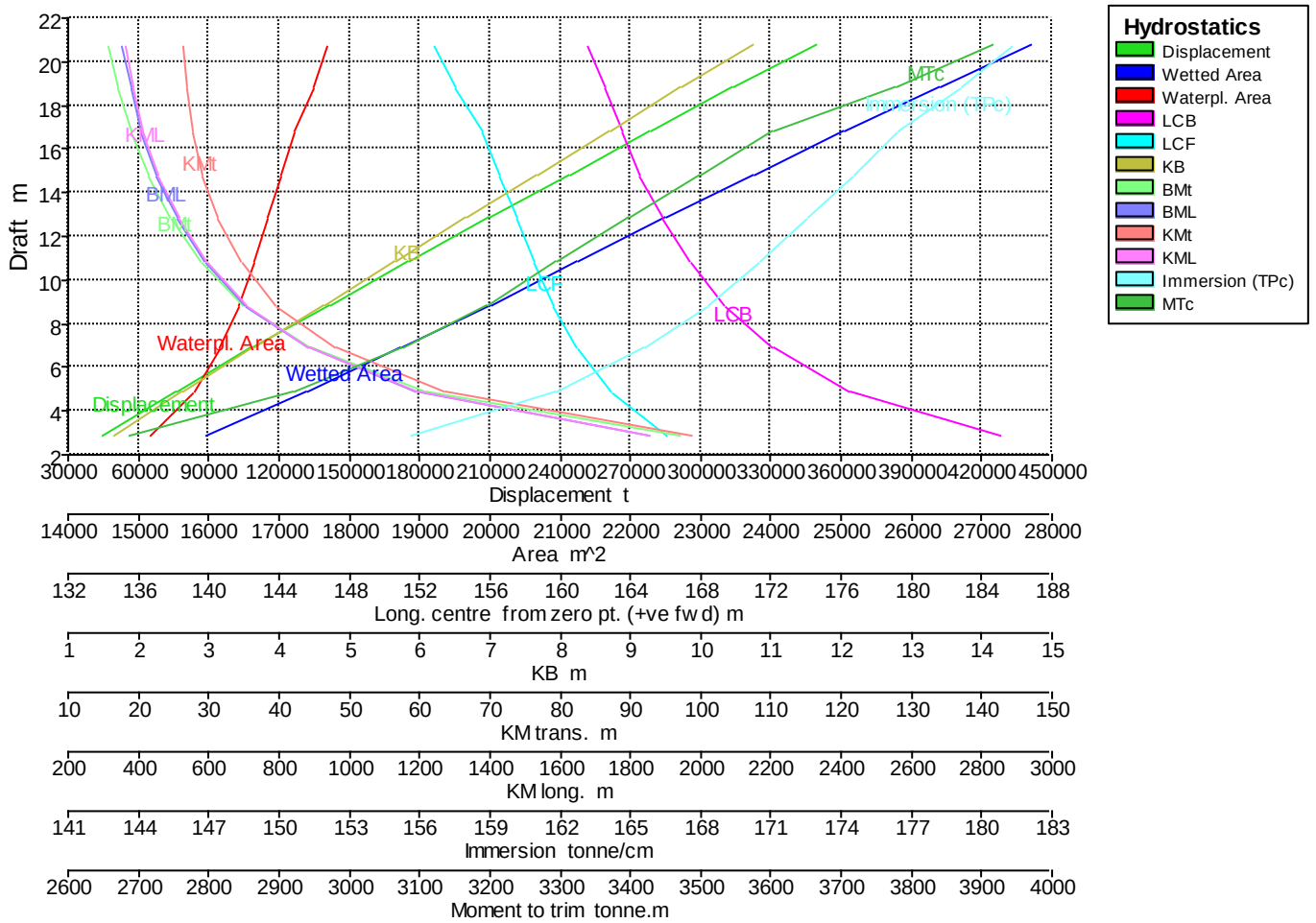
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

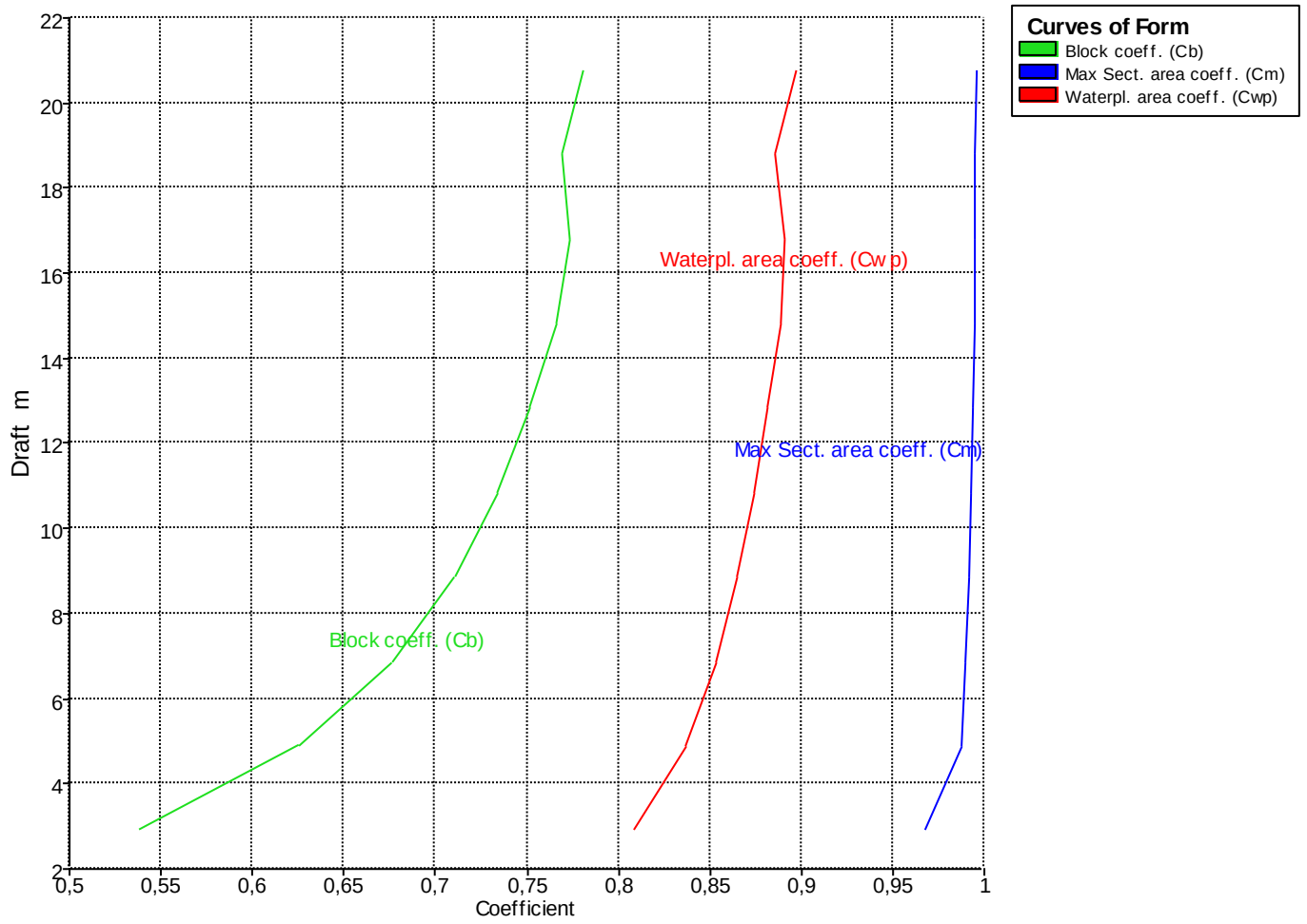
Damage Case - Intact

Fixed Trim = -3 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	44727	15957,067	15186,782	0,539	0,968	0,809	185,003	166,086	1,666	96,954	1854,115	98,615	1855,691	155,665	2686,074
4,907	76330	17415,195	15789,456	0,626	0,987	0,837	176,426	162,866	2,646	60,802	1188,278	63,445	1190,866	161,842	2923,006
6,893	108882	18742,796	16157,129	0,677	0,990	0,854	172,061	160,950	3,647	44,332	880,618	47,976	884,222	165,611	3076,772
8,880	142072	20028,249	16426,669	0,711	0,992	0,865	169,291	159,569	4,655	34,905	703,664	39,558	708,284	168,373	3196,543
10,867	175736	21261,743	16642,456	0,734	0,993	0,874	167,332	158,500	5,667	28,807	588,434	34,472	594,072	170,585	3297,038
12,853	209830	22516,918	16842,533	0,752	0,994	0,882	165,814	157,491	6,682	24,547	509,079	31,227	515,736	172,636	3398,717
14,840	244319	23773,578	17032,387	0,766	0,994	0,888	164,572	156,538	7,699	21,411	451,001	29,109	458,679	174,582	3501,113
16,827	279179	25050,644	17217,082	0,774	0,995	0,891	163,518	155,631	8,719	19,015	406,733	27,733	415,433	176,475	3605,543
18,813	314491	26406,061	17479,762	0,770	0,995	0,886	162,549	154,033	9,744	17,130	378,310	26,873	388,036	179,168	3779,638
20,800	350310	27738,049	17695,976	0,780	0,996	0,897	161,617	152,902	10,774	15,612	351,789	26,385	362,546	181,384	3917,923


Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc
Draft m
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
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


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cw p)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

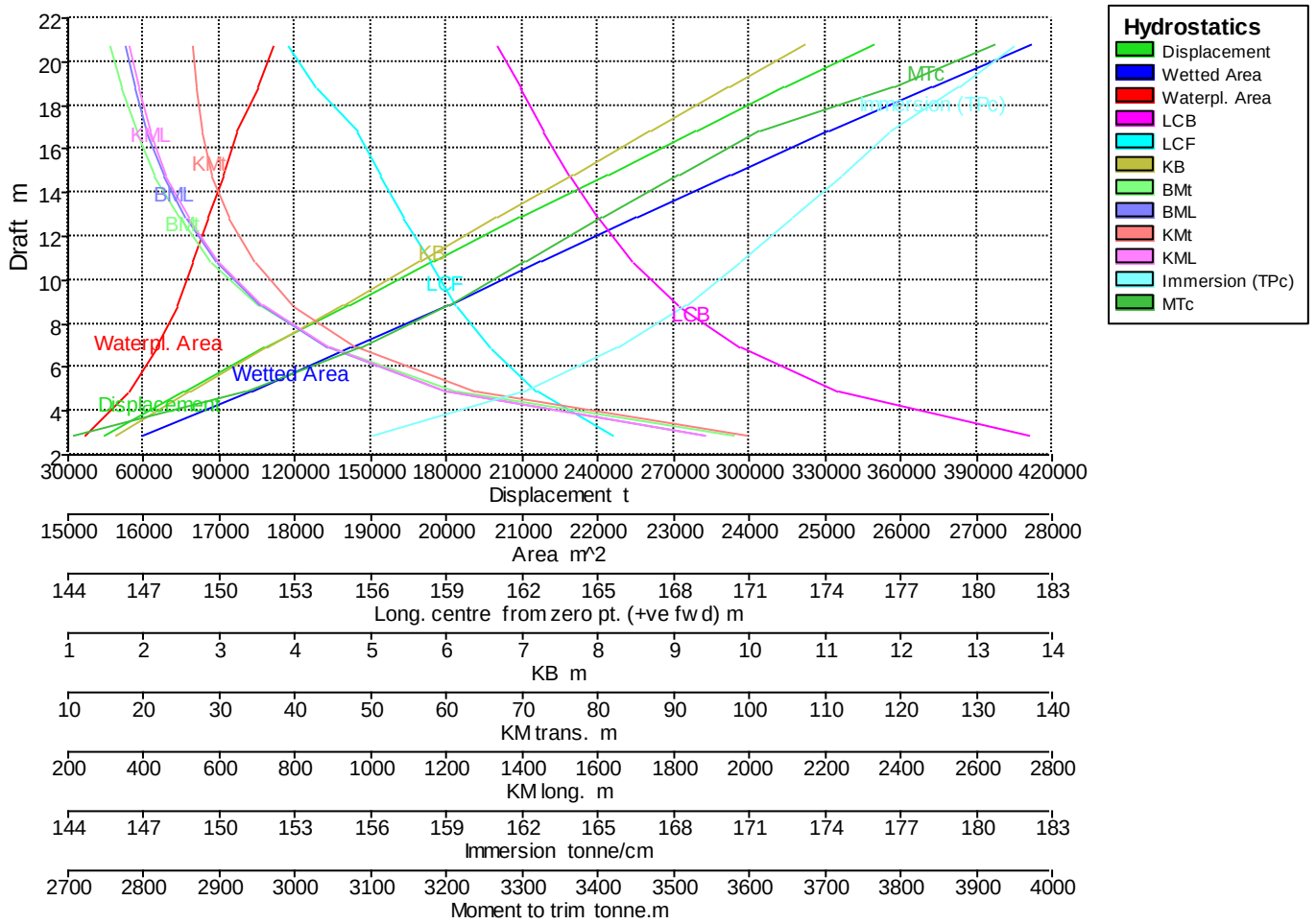
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

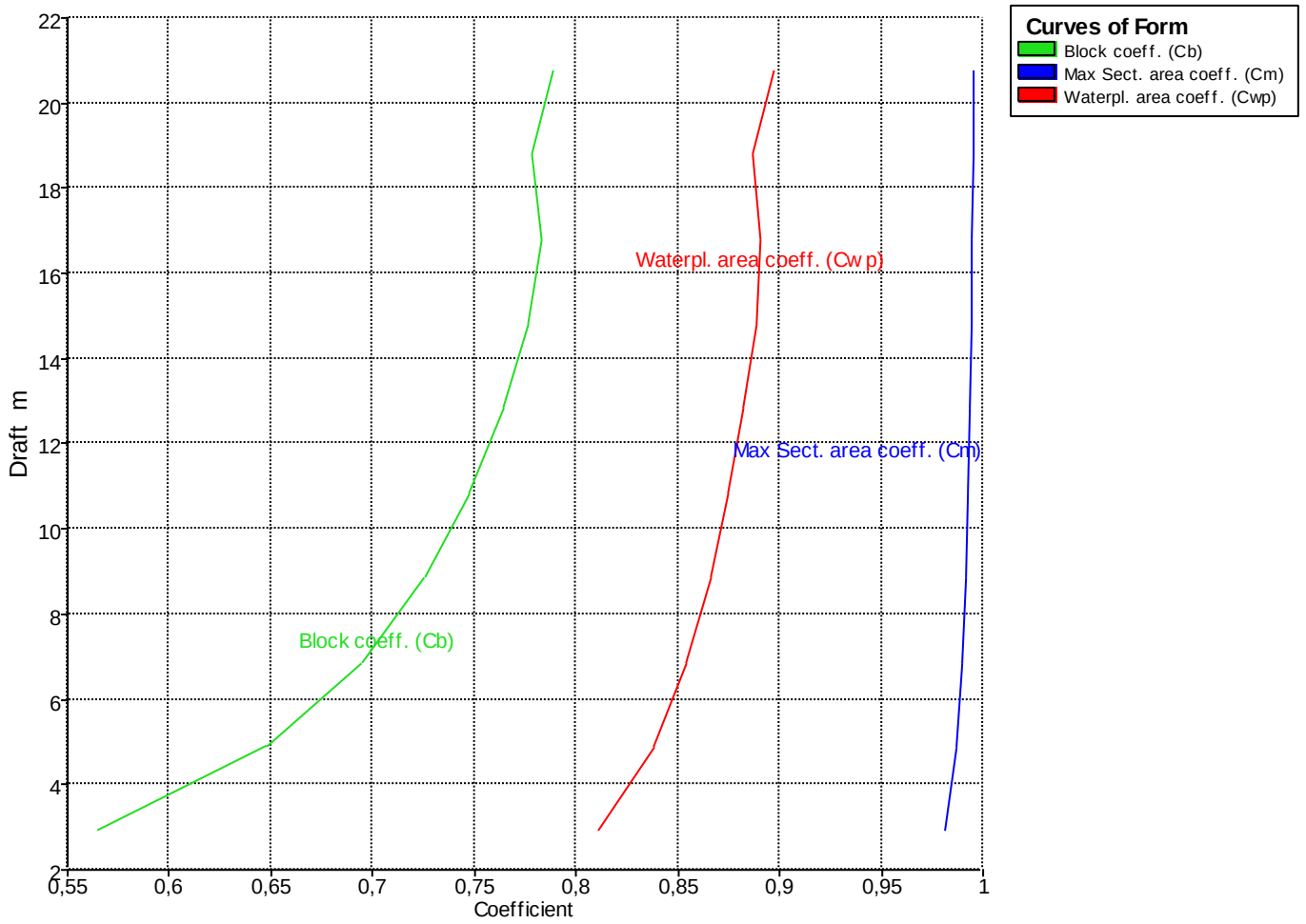
Damage Case - Intact

Fixed Trim = -2,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	44393	15982,928	15231,515	0,565	0,982	0,811	182,081	165,610	1,628	98,014	1883,300	99,638	1884,865	156,123	2708,450
4,907	76065	17426,258	15815,672	0,648	0,987	0,838	174,519	162,580	2,620	61,138	1197,765	63,756	1200,345	162,111	2936,569
6,893	108663	18749,299	16175,490	0,695	0,990	0,854	170,637	160,740	3,627	44,482	885,158	48,107	888,755	165,799	3086,805
8,880	141887	20033,669	16441,728	0,726	0,992	0,866	168,149	159,391	4,639	34,986	706,421	39,624	711,036	168,528	3205,279
10,867	175577	21265,311	16655,564	0,748	0,993	0,874	166,376	158,338	5,653	28,855	590,345	34,507	595,979	170,720	3305,150
12,853	209698	22520,693	16855,223	0,764	0,994	0,882	164,985	157,333	6,670	24,578	510,564	31,248	517,217	172,766	3406,883
14,840	244212	23777,481	17044,773	0,776	0,994	0,889	163,837	156,381	7,689	21,433	452,204	29,122	459,878	174,709	3509,324
16,827	279099	25058,616	17232,083	0,783	0,995	0,891	162,854	155,450	8,711	19,032	407,971	27,742	416,668	176,629	3615,948
18,813	314456	26421,385	17498,443	0,779	0,995	0,887	161,930	153,816	9,737	17,145	379,645	26,881	389,369	179,359	3793,109
20,800	350308	27751,458	17709,975	0,789	0,995	0,898	161,041	152,723	10,768	15,625	352,605	26,392	363,362	181,527	3927,416


Draft m
22
20
18
16
14
12
10
8
6
4
2
MTc
Immersion (TPc)
KML
KMt
BML
BMt
KB
LCF
LCB
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
144 147 150 153 156 159 162 165 168 171 174 177 180 183
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
144 147 150 153 156 159 162 165 168 171 174 177 180 183
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cw p)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

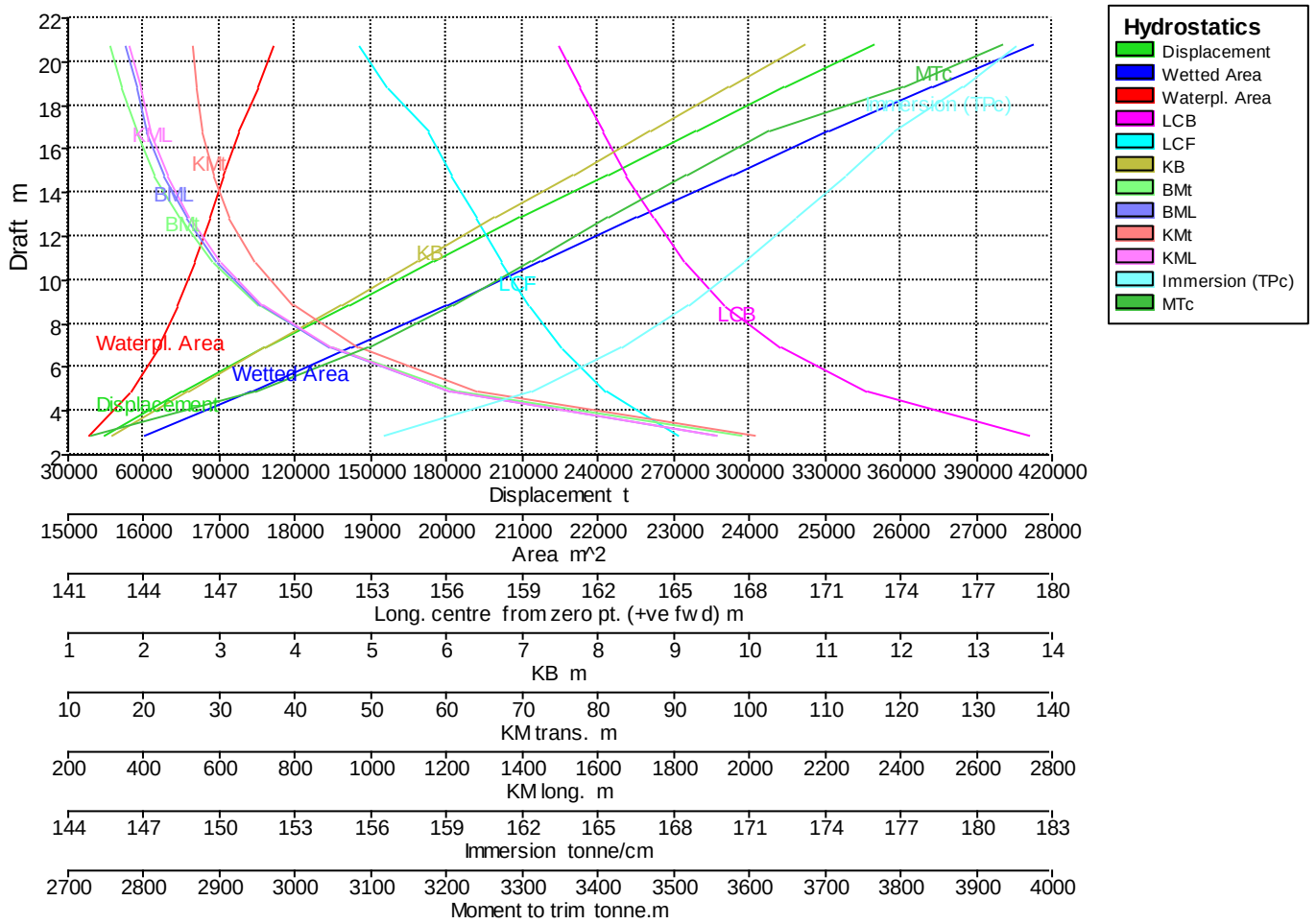
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact

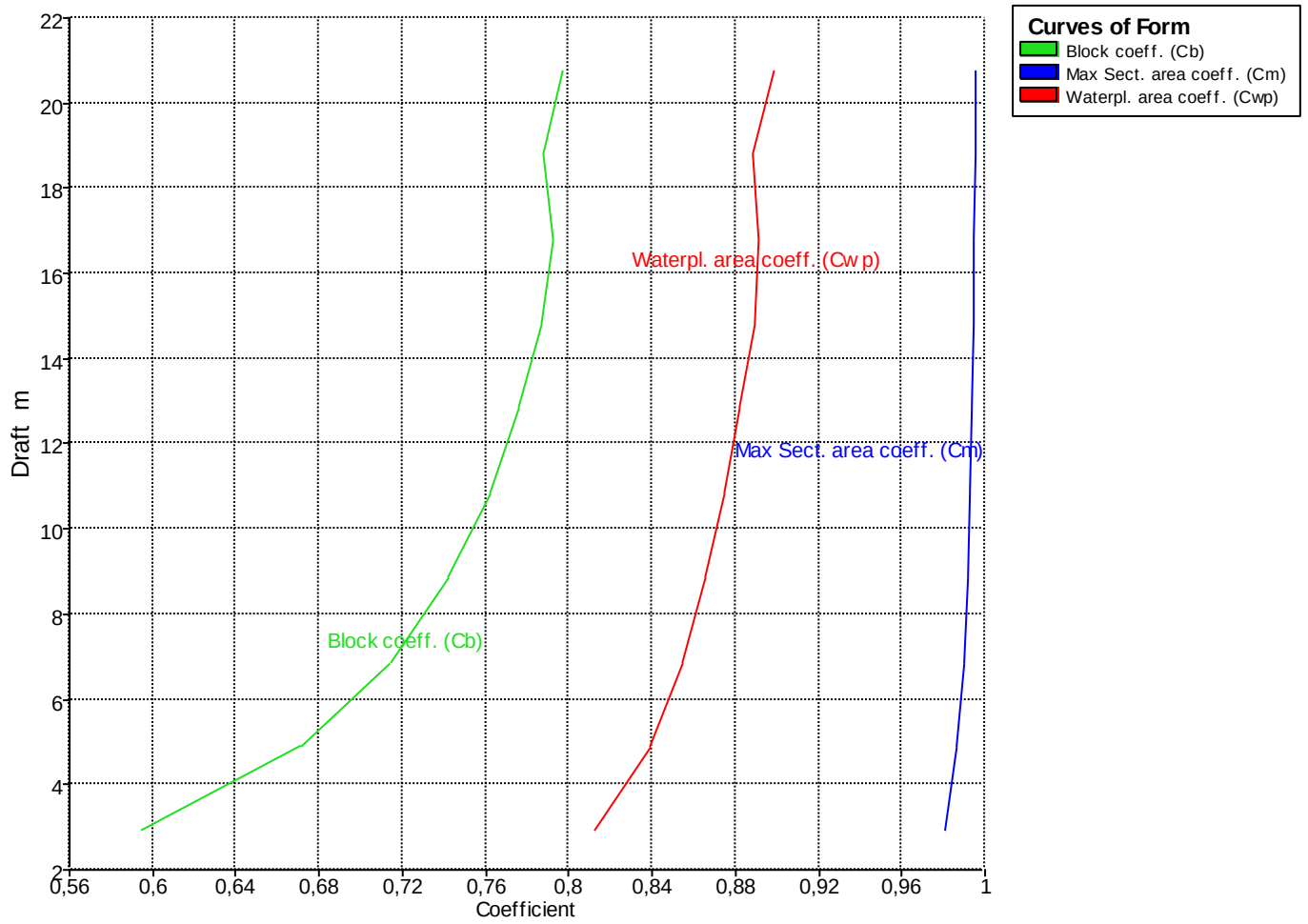
Fixed Trim = -2 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	44069	16006,515	15273,312	0,595	0,981	0,813	179,090	165,153	1,595	99,053	1911,323	100,646	1912,876	156,551	2729,176
4,907	75808	17436,619	15840,738	0,672	0,987	0,839	172,590	162,300	2,598	61,469	1206,919	64,066	1209,491	162,368	2949,414
6,893	108449	18755,778	16193,532	0,715	0,990	0,855	169,204	160,530	3,610	44,629	889,635	48,238	893,225	165,984	3096,701
8,880	141699	20009,317	16449,477	0,742	0,992	0,866	167,011	159,279	4,625	35,066	707,995	39,690	712,604	168,607	3208,407
10,867	175423	21268,965	16668,818	0,762	0,993	0,875	165,416	158,175	5,642	28,902	592,261	34,543	597,890	170,855	3313,346
12,853	209570	22524,515	16867,999	0,776	0,994	0,882	164,154	157,175	6,660	24,610	512,052	31,270	518,701	172,897	3415,123
14,840	244110	23781,471	17057,304	0,787	0,994	0,889	163,100	156,223	7,681	21,455	453,412	29,135	461,083	174,837	3517,617
16,827	279024	25067,482	17247,891	0,792	0,995	0,891	162,187	155,261	8,704	19,049	409,269	27,753	417,964	176,791	3626,960
18,813	314428	26436,015	17515,992	0,788	0,995	0,888	161,309	153,611	9,732	17,159	380,880	26,890	390,603	179,539	3805,613
20,800	350311	27764,885	17723,858	0,797	0,995	0,898	160,464	152,548	10,764	15,637	353,406	26,401	364,163	181,670	3936,790


Draft m
22
20
18
16
14
12
10
8
6
4
2
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
141 144 147 150 153 156 159 162 165 168 171 174 177 180
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
144 147 150 153 156 159 162 165 168 171 174 177 180 183
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement

Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,56
0,6
0,64
0,68
0,72
0,76
0,8
0,84
0,88
0,92
0,96
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

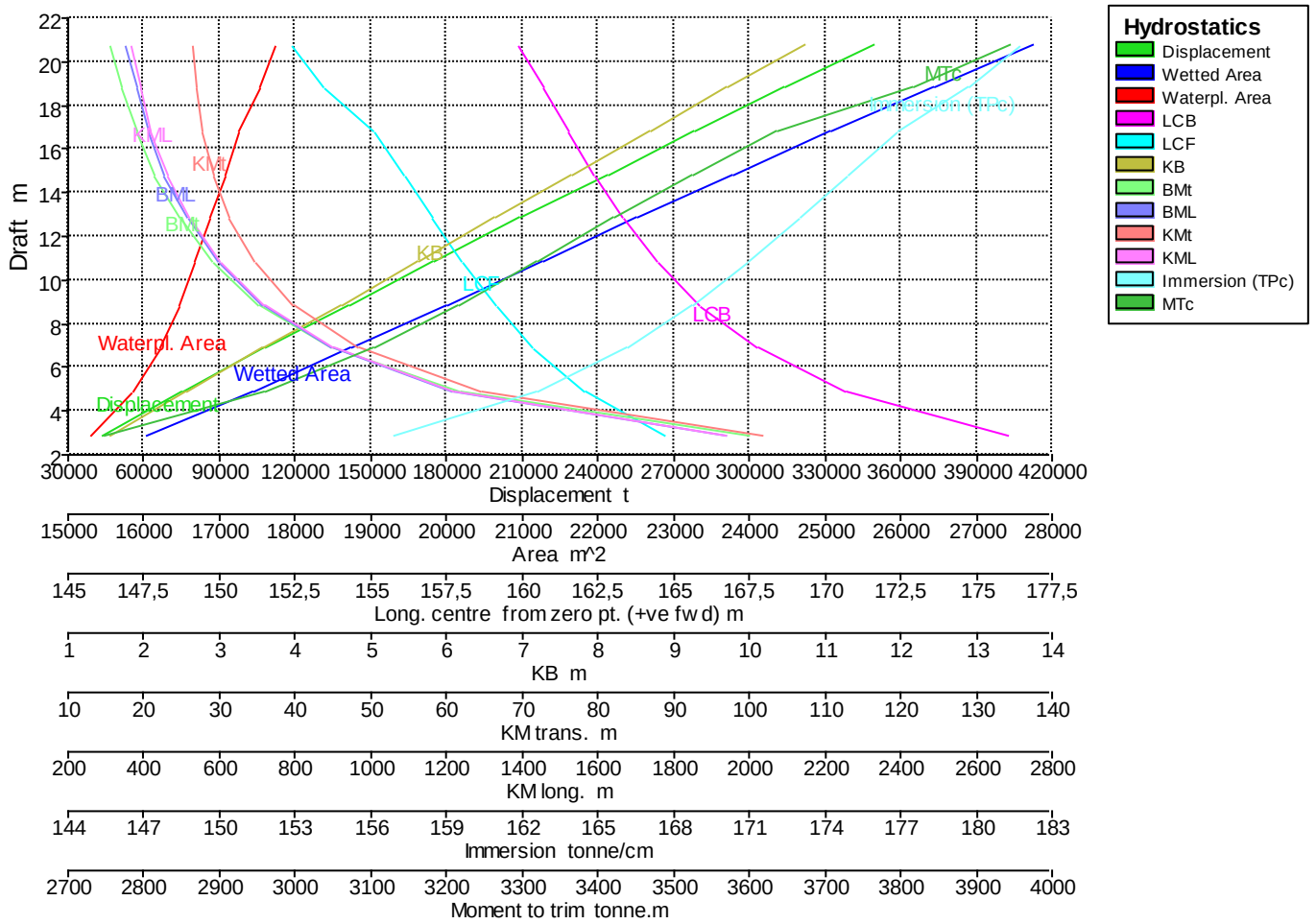
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

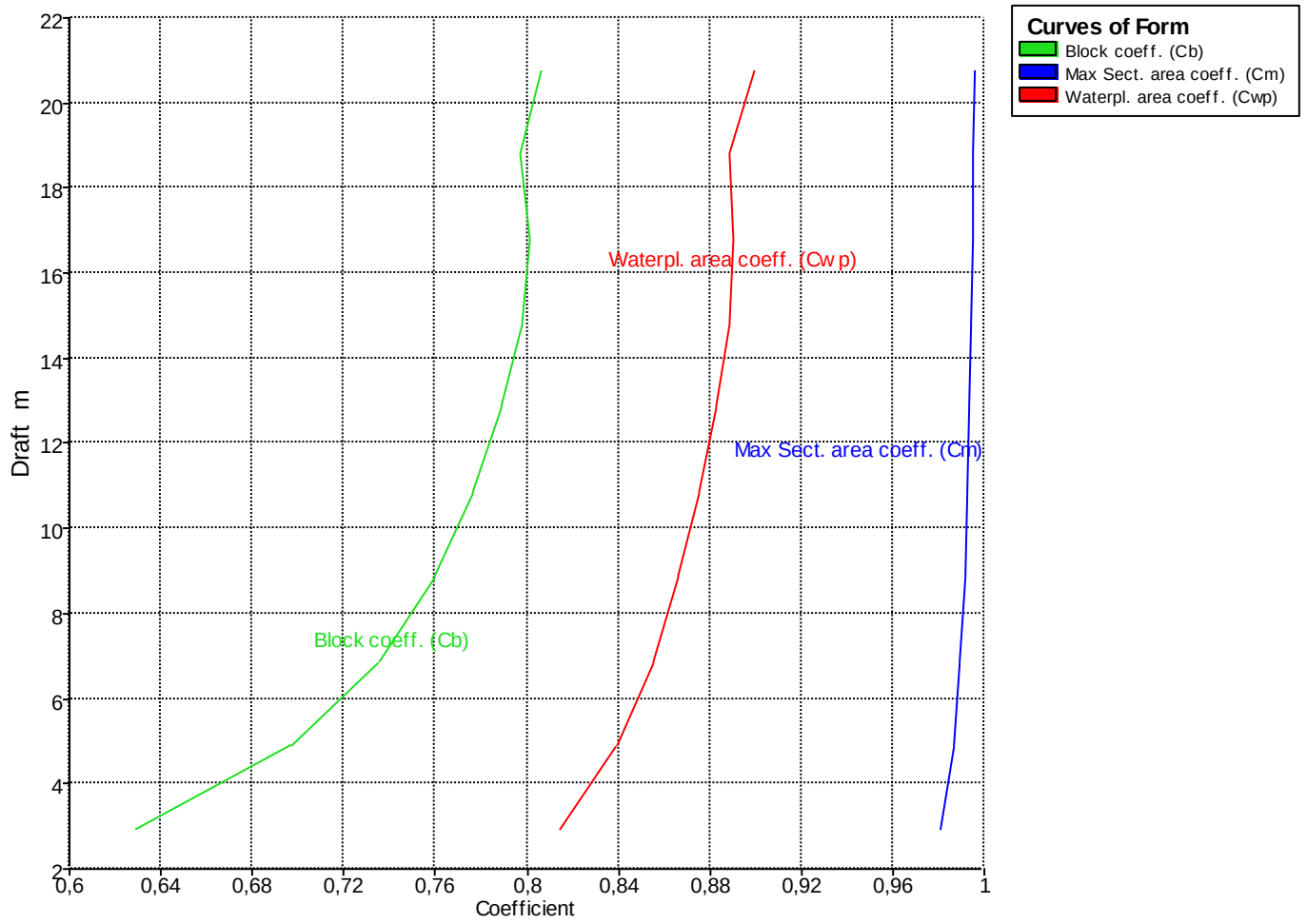
Damage Case - Intact

Fixed Trim = -1,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	43756	16028,656	15312,674	0,629	0,981	0,815	176,033	164,702	1,567	100,065	1938,490	101,630	1940,033	156,955	2748,758
4,907	75558	17446,485	15864,657	0,697	0,986	0,840	170,640	162,025	2,578	61,792	1215,789	64,370	1218,352	162,613	2961,666
6,893	108241	18762,158	16211,226	0,735	0,990	0,856	167,760	160,322	3,595	44,774	894,031	48,368	897,615	166,165	3106,395
8,880	141521	20013,131	16463,746	0,759	0,991	0,866	165,860	159,104	4,613	35,143	710,665	39,755	715,269	168,753	3216,820
10,867	175273	21272,654	16682,044	0,776	0,993	0,875	164,451	158,012	5,632	28,949	594,174	34,580	599,798	170,991	3321,576
12,853	209447	22528,319	16880,635	0,789	0,994	0,882	163,319	157,016	6,652	24,640	513,526	31,291	520,172	173,027	3423,318
14,840	244012	23785,567	17069,997	0,798	0,994	0,889	162,360	156,065	7,674	21,477	454,626	29,150	462,294	174,967	3526,009
16,827	278955	25076,385	17263,706	0,802	0,995	0,891	161,517	155,074	8,698	19,067	410,558	27,765	419,251	176,953	3637,952
18,813	314405	26450,243	17532,858	0,797	0,995	0,889	160,685	153,413	9,728	17,172	382,047	26,900	391,770	179,712	3817,483
20,800	350320	27778,327	17737,645	0,806	0,995	0,899	159,885	152,375	10,761	15,649	354,193	26,410	364,950	181,811	3946,049


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
145 147,5 150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
144 147 150 153 156 159 162 165 168 171 174 177 180 183
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cw p)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,6
0,64
0,68
0,72
0,76
0,8
0,84
0,88
0,92
0,96
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

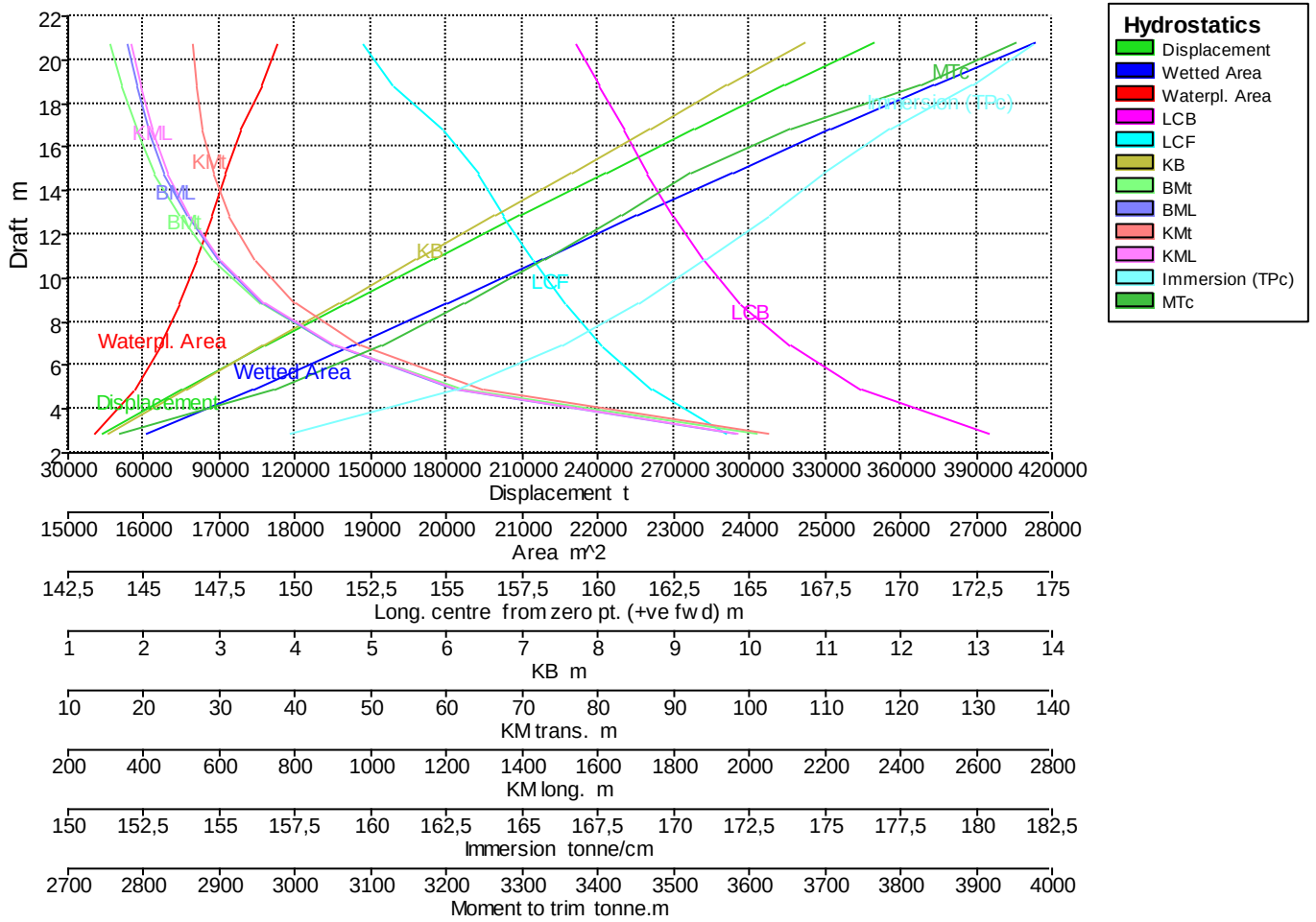
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

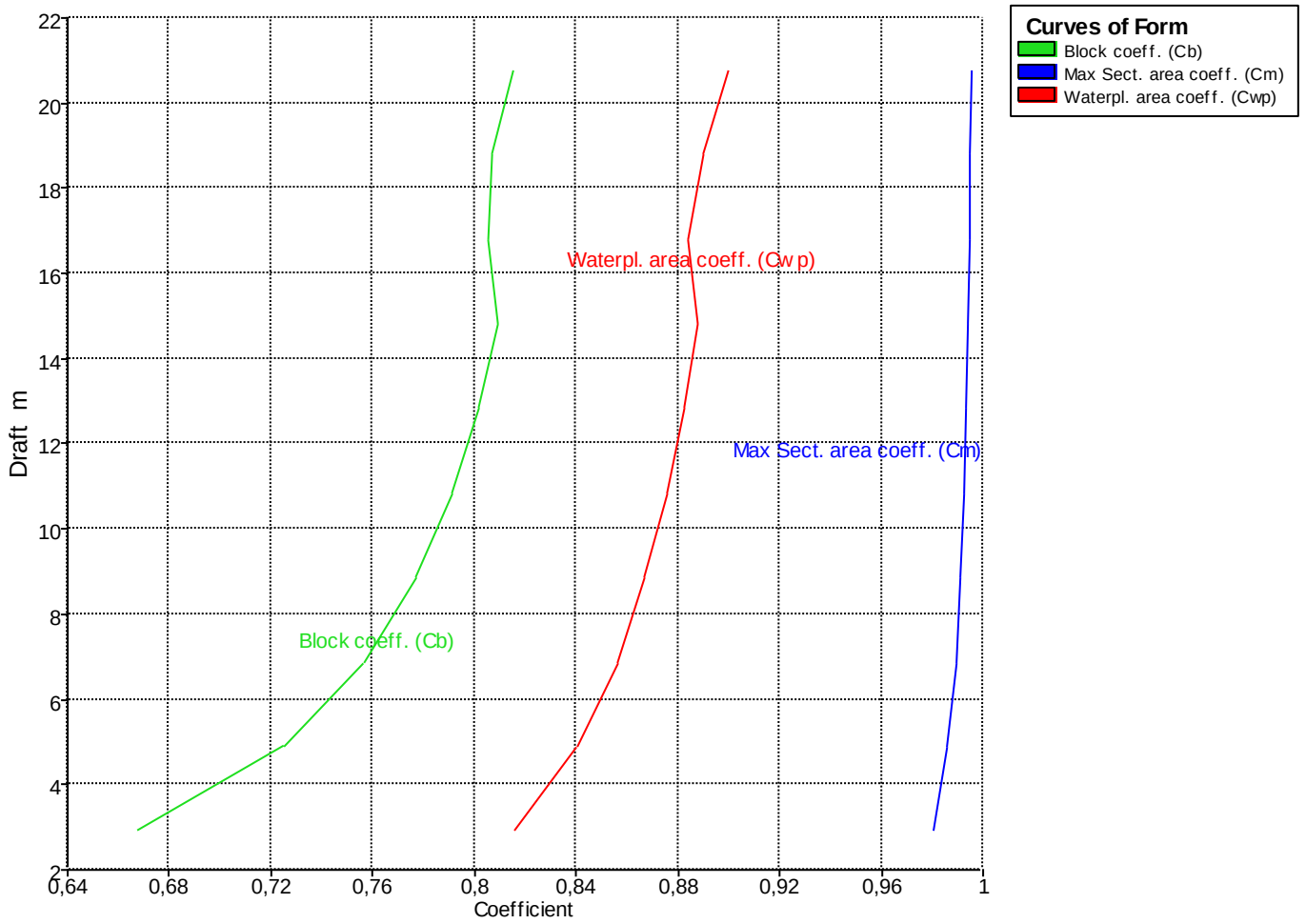
Damage Case - Intact

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

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	43454	16049,375	15349,769	0,668	0,980	0,816	172,911	164,258	1,544	101,050	1964,791	102,593	1966,324	157,335	2767,230
4,907	75314	17455,626	15887,290	0,725	0,986	0,841	168,669	161,757	2,563	62,103	1224,377	64,665	1226,933	162,845	2973,346
6,893	108038	18768,471	16228,714	0,757	0,989	0,856	166,306	160,115	3,582	44,917	898,373	48,499	901,950	166,344	3115,986
8,880	141347	20017,089	16478,205	0,777	0,991	0,867	164,703	158,928	4,603	35,218	713,346	39,821	717,945	168,902	3225,353
10,867	175128	21276,372	16695,323	0,791	0,993	0,875	163,483	157,850	5,623	28,994	596,084	34,617	601,704	171,127	3329,851
12,853	209328	22532,215	16893,369	0,802	0,993	0,883	162,481	156,858	6,645	24,669	515,005	31,314	521,647	173,157	3431,589
14,840	243916	23791,644	17069,443	0,809	0,994	0,888	161,620	156,026	7,668	21,499	454,513	29,166	462,179	174,962	3523,824
16,827	278891	25091,519	17285,651	0,805	0,995	0,884	160,845	154,830	8,693	19,083	412,408	27,777	421,100	177,178	3654,118
18,813	314389	26464,217	17549,242	0,807	0,995	0,890	160,060	153,221	9,724	17,186	383,161	26,911	392,884	179,880	3828,873
20,800	350333	27791,795	17751,341	0,815	0,995	0,900	159,304	152,204	10,759	15,662	354,966	26,421	365,724	181,951	3955,200


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
142,5 145 147,5 150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,64
0,68
0,72
0,76
0,8
0,84
0,88
0,92
0,96
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

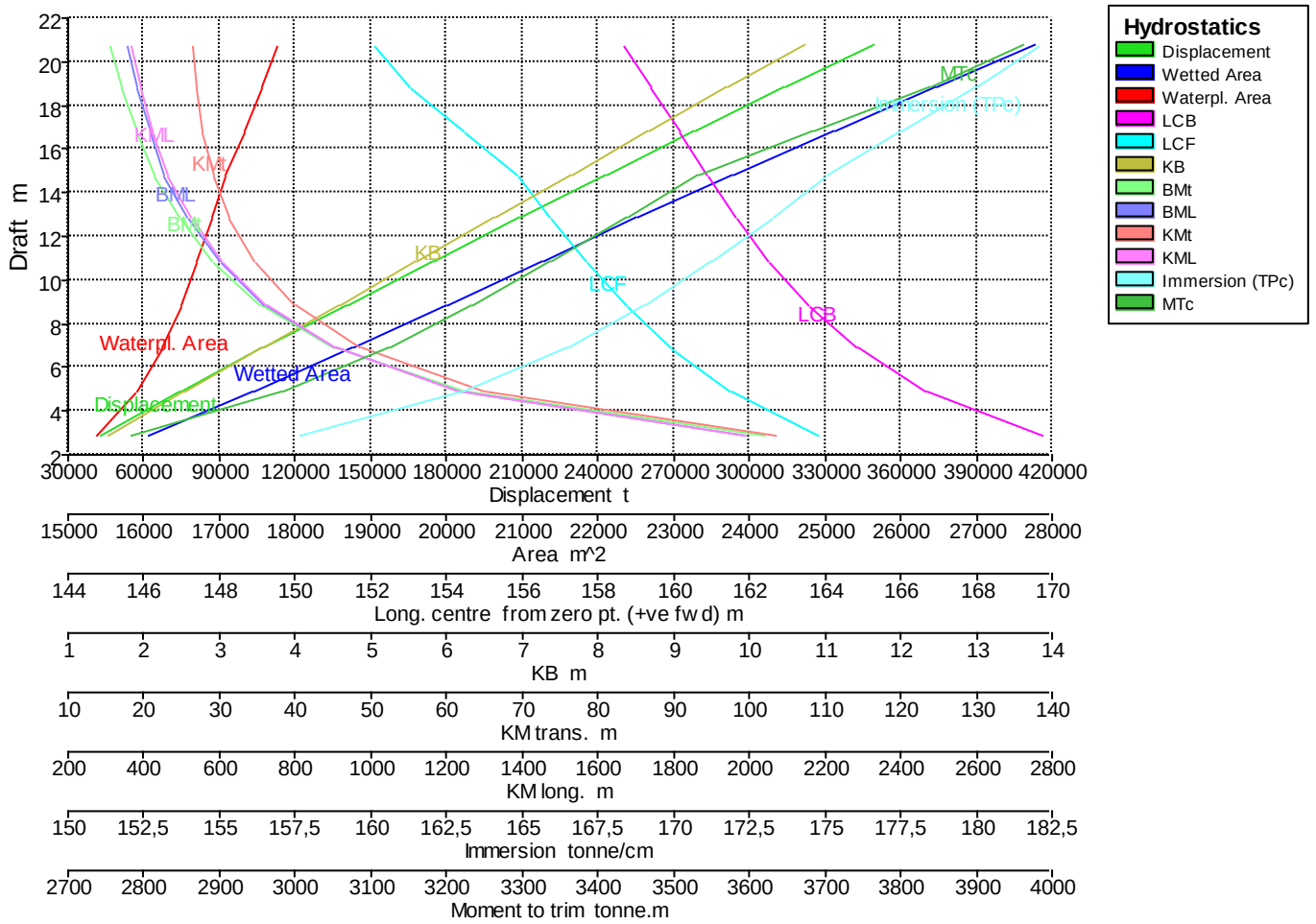
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact

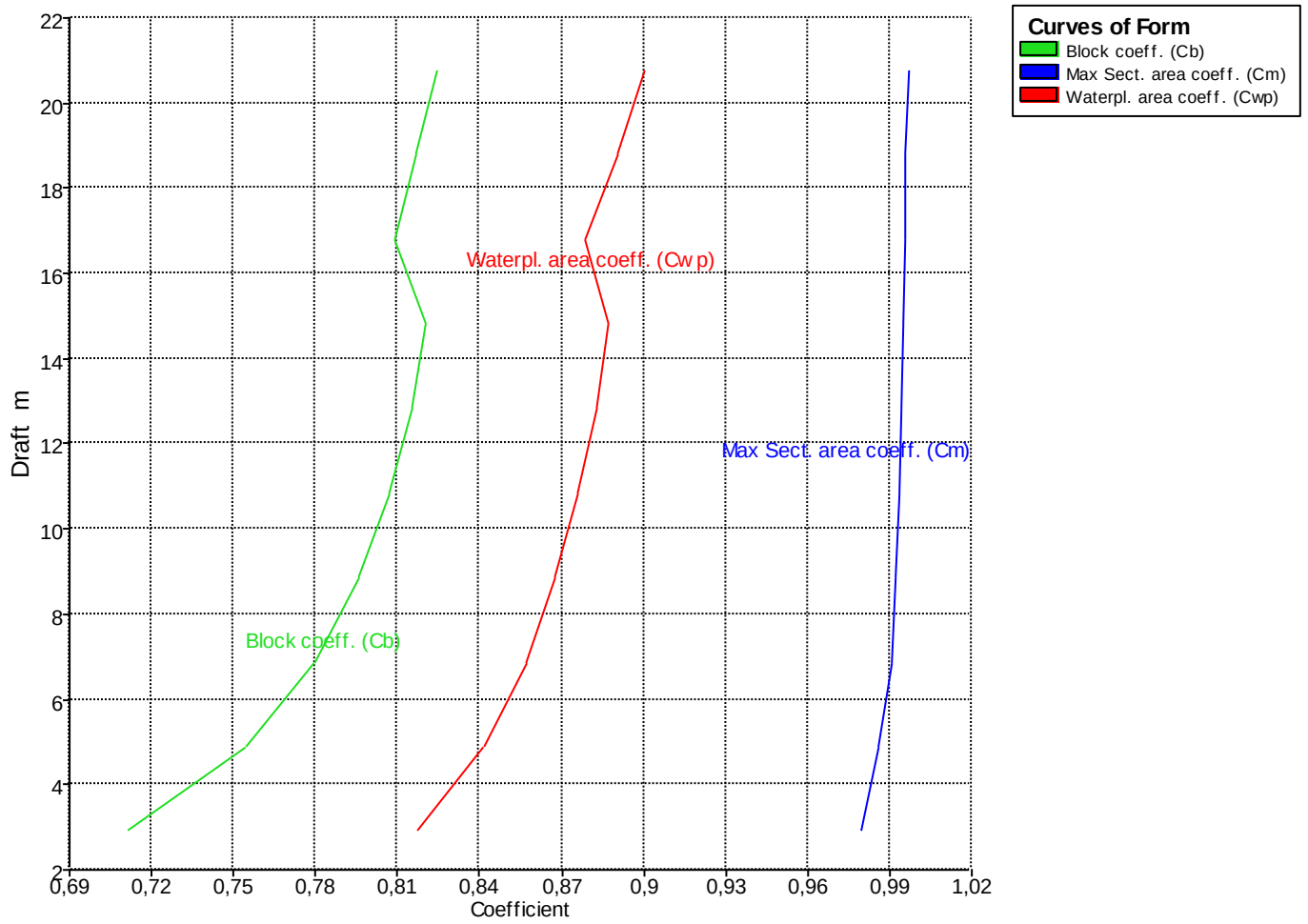
Fixed Trim = -0,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	43163	16067,373	15383,212	0,711	0,980	0,817	169,727	163,837	1,526	102,005	1989,535	103,531	1991,059	157,678	2783,657
4,907	75078	17464,456	15909,276	0,755	0,986	0,842	166,678	161,493	2,550	62,407	1232,796	64,957	1235,344	163,070	2984,735
6,893	107840	18774,451	16245,382	0,779	0,991	0,857	164,843	159,913	3,573	45,053	902,597	48,625	906,168	166,515	3125,253
8,880	141178	20021,097	16492,695	0,796	0,992	0,867	163,541	158,752	4,595	35,293	716,015	39,888	720,608	169,050	3233,896
10,867	174987	21280,051	16708,397	0,807	0,994	0,876	162,511	157,687	5,617	29,038	597,974	34,655	603,589	171,261	3338,069
12,853	209213	22536,180	16906,165	0,815	0,994	0,883	161,641	156,698	6,639	24,698	516,483	31,338	523,122	173,288	3439,915
14,840	243824	23798,949	17084,254	0,820	0,995	0,887	160,877	155,850	7,663	21,520	455,937	29,183	463,599	175,114	3533,951
16,827	278836	25123,911	17324,593	0,809	0,996	0,878	160,169	154,432	8,690	19,100	415,835	27,790	424,525	177,577	3684,776
18,813	314377	26477,953	17565,073	0,817	0,996	0,890	159,432	153,035	9,723	17,200	384,226	26,923	393,948	180,042	3839,803
20,800	350352	27805,255	17764,914	0,824	0,997	0,900	158,723	152,036	10,758	15,674	355,724	26,432	366,482	182,090	3964,222


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
144 146 148 150 152 154 156 158 160 162 164 166 168 170
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m

Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Draft m
22
20
18
16
14
12
10
8
6
4
2
0,69
0,72
0,75
0,78
0,81
0,84
0,87
0,9
0,93
0,96
0,99
1,02
Coefficient
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

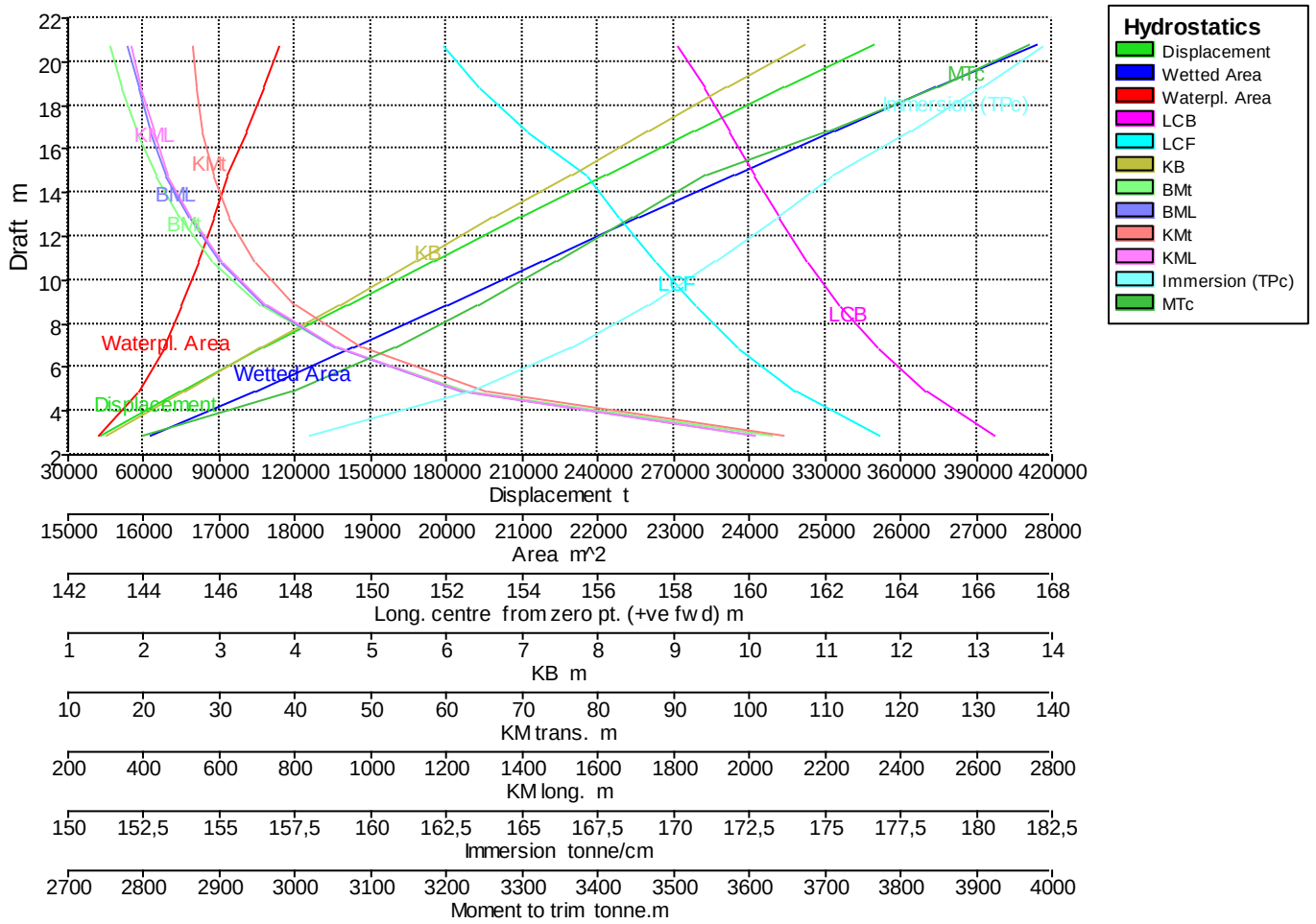
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

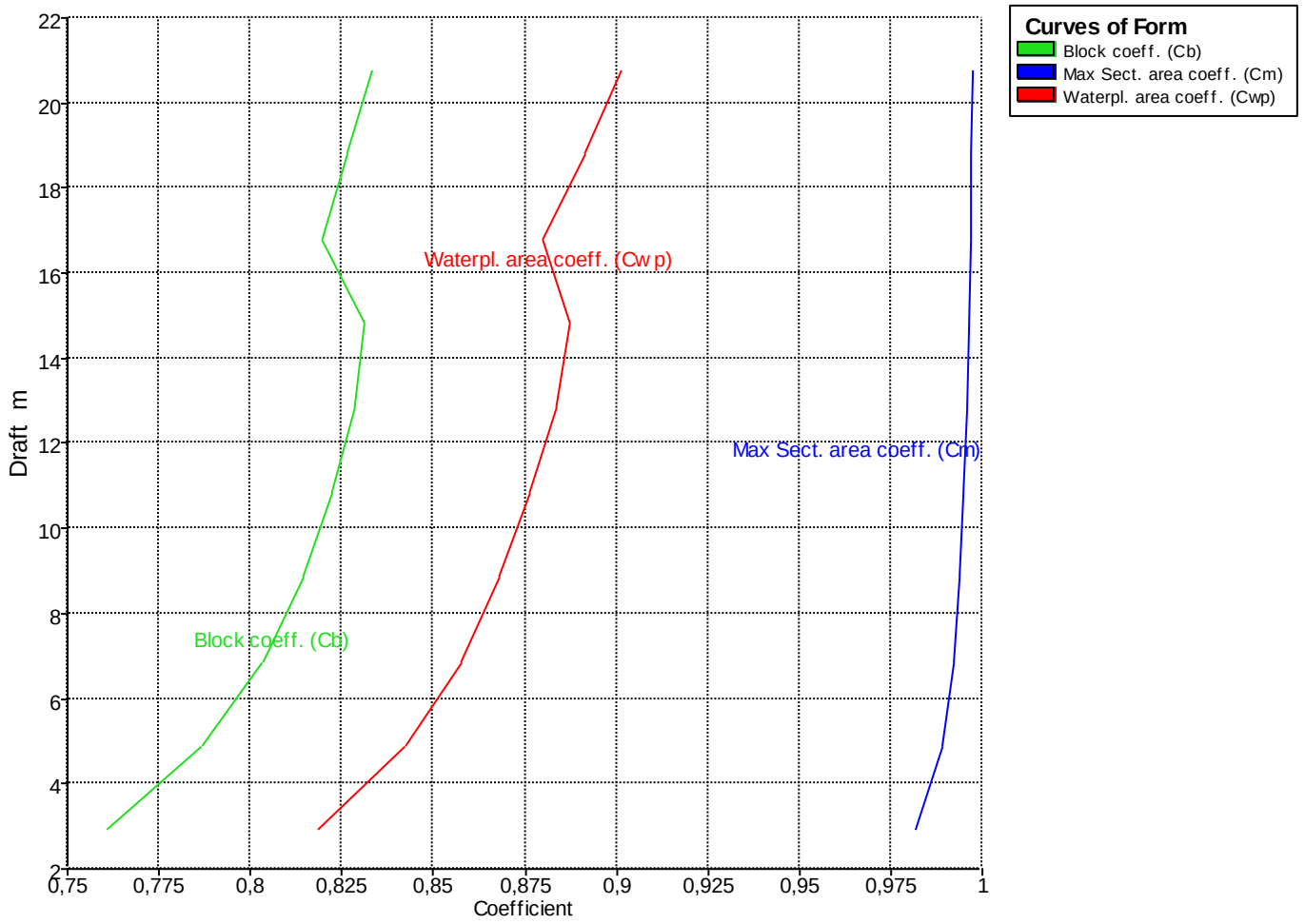
Damage Case - Intact

Fixed Trim = 0 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	42881	16082,884	15413,150	0,761	0,982	0,819	166,484	163,437	1,514	102,932	2012,691	104,446	2014,205	157,985	2798,025
4,907	74848	17472,951	15930,575	0,787	0,989	0,842	164,668	161,231	2,541	62,704	1241,010	65,245	1243,551	163,288	2995,753
6,893	107648	18780,347	16261,625	0,803	0,992	0,857	163,370	159,710	3,566	45,185	906,740	48,751	910,306	166,682	3134,328
8,880	141014	20024,933	16506,732	0,814	0,994	0,868	162,373	158,577	4,589	35,365	718,634	39,953	723,222	169,194	3242,282
10,867	174851	21283,777	16721,560	0,822	0,995	0,876	161,535	157,525	5,612	29,082	599,861	34,693	605,473	171,396	3346,330
12,853	209103	22540,190	16918,995	0,829	0,996	0,883	160,798	156,539	6,635	24,727	517,959	31,363	524,594	173,420	3448,270
14,840	243738	23806,673	17099,494	0,831	0,996	0,887	160,132	155,670	7,660	21,541	457,393	29,201	465,053	175,270	3544,395
16,827	278792	25147,686	17353,794	0,820	0,997	0,880	159,488	154,124	8,688	19,116	418,334	27,805	427,022	177,876	3707,090
18,813	314372	26491,614	17580,645	0,826	0,997	0,891	158,803	152,852	9,722	17,214	385,258	26,936	394,980	180,202	3850,460
20,800	350376	27818,695	17778,341	0,833	0,997	0,901	158,140	151,870	10,758	15,686	356,465	26,445	367,224	182,228	3973,107


Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc
Draft m
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
22
20
18
16
14
12
10
8
6
4
2
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
142 144 146 148 150 152 154 156 158 160 162 164 166 168
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,75
0,775
0,8
0,825
0,85
0,875
0,9
0,925
0,95
0,975
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

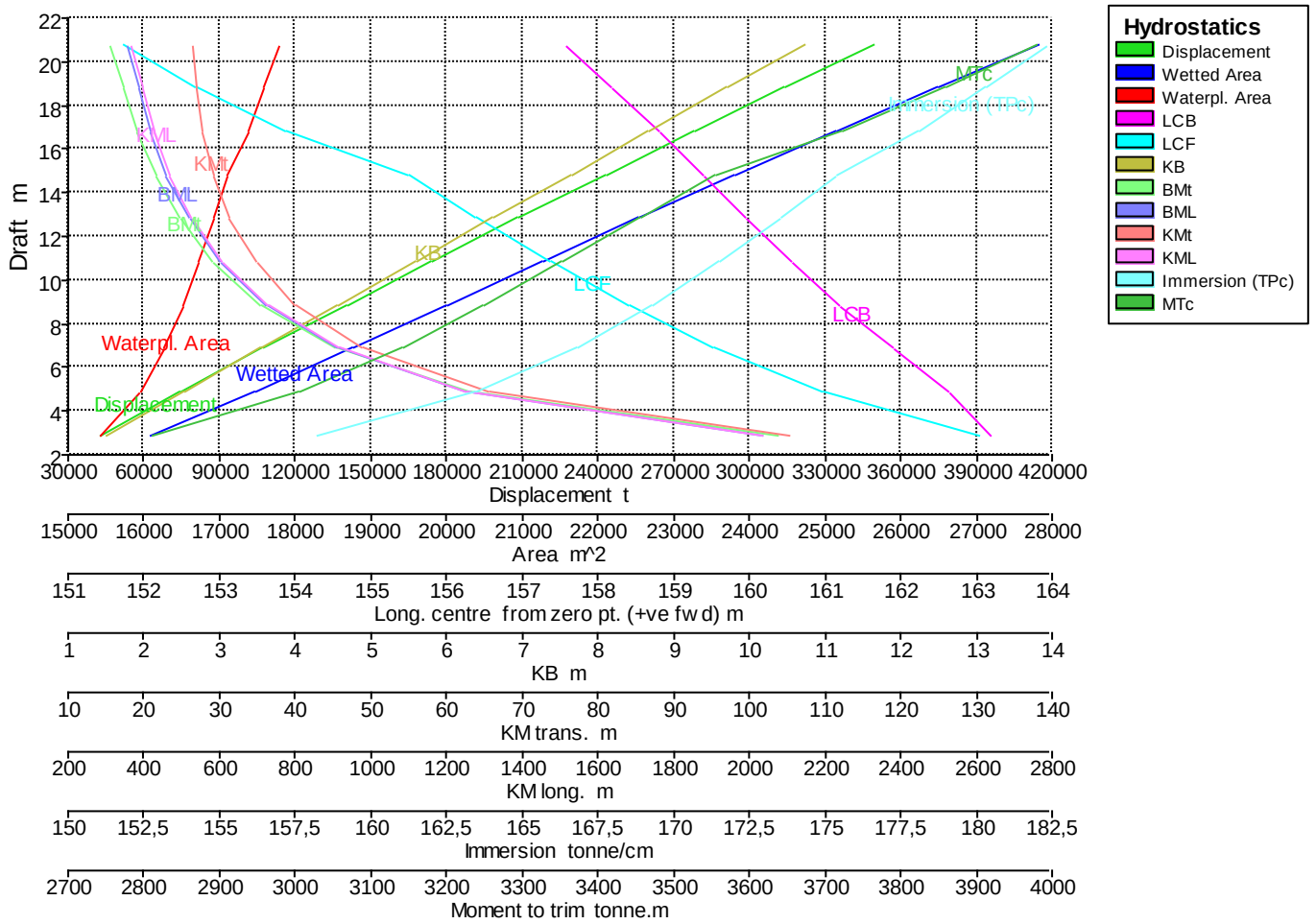
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

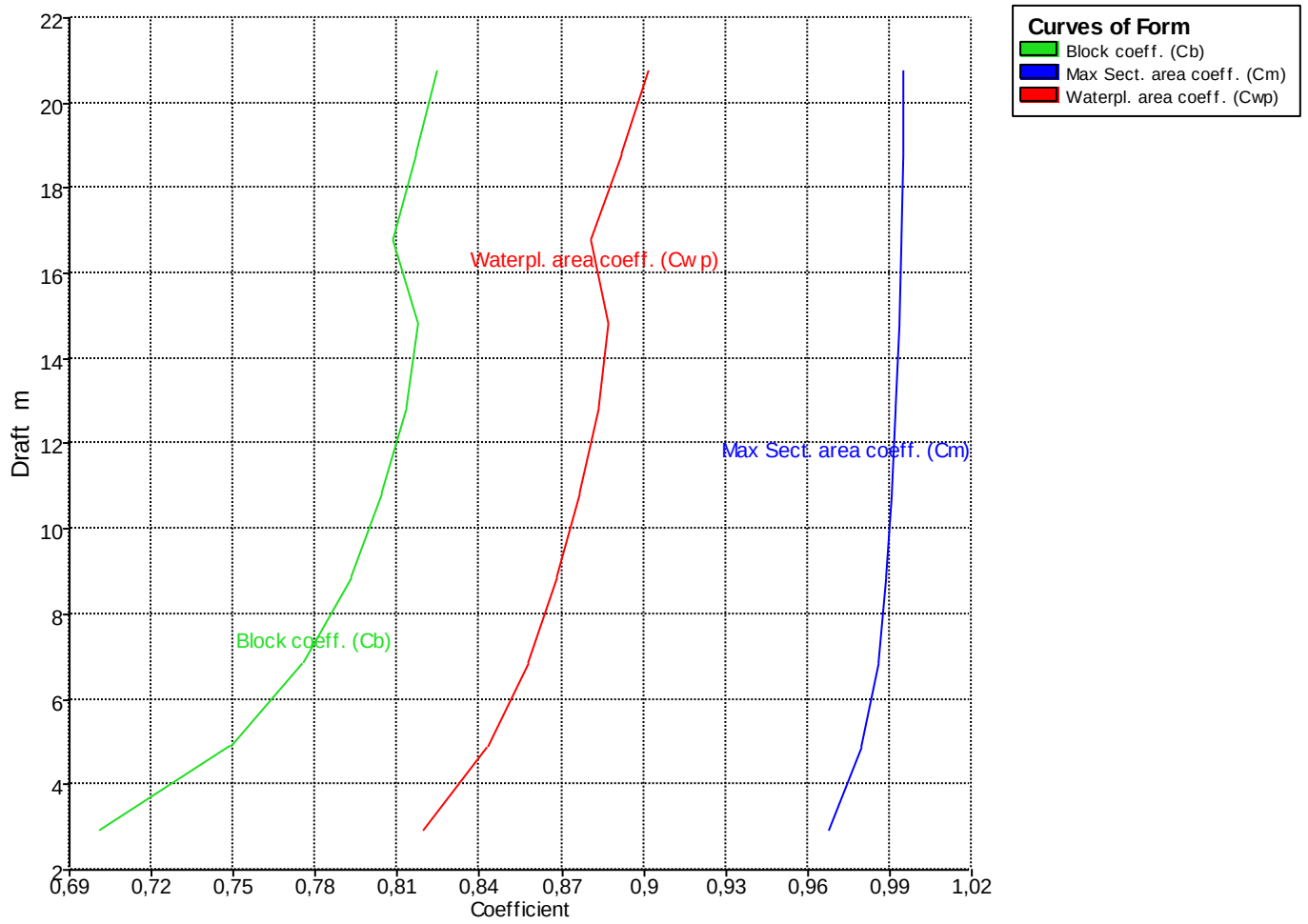
Damage Case - Intact

Fixed Trim = 0,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	42610	16096,483	15439,573	0,701	0,968	0,820	163,184	163,030	1,508	103,814	2034,547	105,322	2036,053	158,256	2810,807
4,907	74625	17481,077	15950,912	0,749	0,980	0,843	162,639	160,970	2,536	62,994	1248,953	65,530	1251,487	163,497	3006,248
6,893	107461	18786,228	16277,601	0,776	0,986	0,858	161,888	159,509	3,561	45,315	910,816	48,876	914,376	166,845	3143,260
8,880	140855	20028,642	16520,415	0,793	0,989	0,868	161,199	158,405	4,585	35,434	721,206	40,018	725,790	169,334	3250,524
10,867	174719	21287,526	16734,733	0,805	0,991	0,876	160,555	157,362	5,608	29,124	601,741	34,733	607,348	171,531	3354,608
12,853	208997	22544,233	16931,881	0,813	0,992	0,884	159,952	156,381	6,633	24,755	519,431	31,388	526,063	173,552	3456,660
14,840	243657	23815,283	17115,567	0,817	0,993	0,887	159,384	155,483	7,658	21,562	458,925	29,220	466,583	175,435	3555,509
16,827	278756	25165,840	17376,617	0,808	0,994	0,881	158,802	153,875	8,688	19,133	420,222	27,820	428,909	178,110	3723,916
18,813	314371	26505,205	17595,969	0,817	0,995	0,892	158,172	152,673	9,722	17,228	386,261	26,950	395,983	180,359	3860,868
20,800	350404	27837,379	17791,583	0,824	0,995	0,902	157,556	151,707	10,760	15,698	357,189	26,458	367,948	182,364	3981,836


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
151 152 153 154 155 156 157 158 159 160 161 162 163 164
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
22
20
18
16
14
12
10
8
6
4
2
0,69
0,72
0,75
0,78
0,81
0,84
0,87
0,9
0,93
0,96
0,99
1,02
Coefficient

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

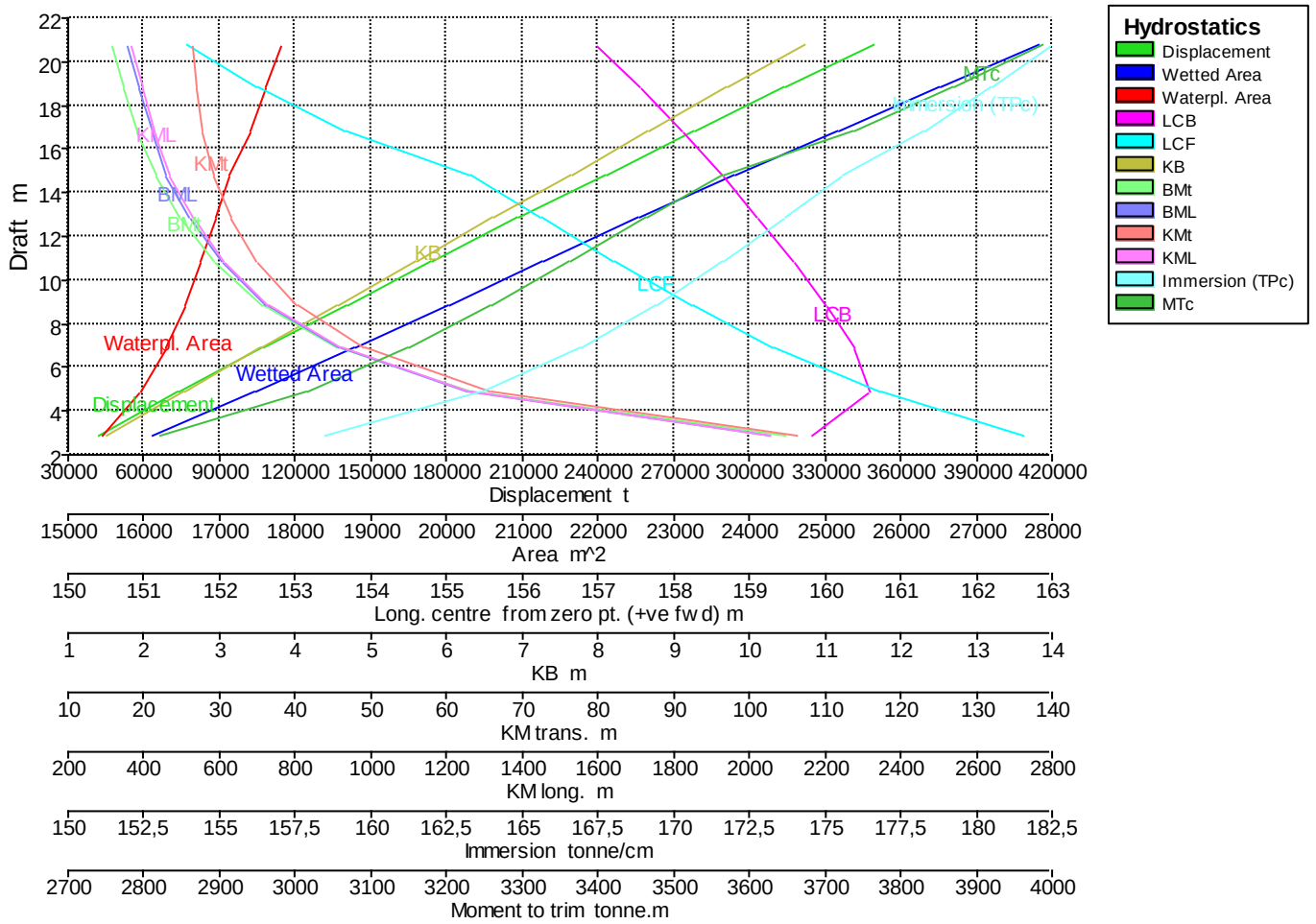
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact

Fixed Trim = 1 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	42348	16108,947	15464,029	0,649	0,956	0,821	159,832	162,623	1,508	104,672	2055,433	106,180	2056,930	158,506	2822,524
4,907	74408	17488,745	15970,170	0,715	0,972	0,844	160,591	160,712	2,534	63,274	1256,619	65,807	1259,146	163,694	3016,218
6,893	107280	18791,974	16293,231	0,750	0,980	0,858	160,398	159,309	3,559	45,442	914,796	49,001	918,350	167,006	3151,955
8,880	140700	20032,438	16534,196	0,772	0,984	0,869	160,020	158,231	4,583	35,502	723,773	40,085	728,352	169,476	3258,815
10,867	174591	21291,390	16748,079	0,787	0,987	0,877	159,572	157,199	5,607	29,167	603,631	34,774	609,235	171,668	3363,009
12,853	208895	22548,341	16944,830	0,799	0,989	0,884	159,103	156,221	6,632	24,783	520,903	31,415	527,532	173,685	3465,102
14,840	243581	23824,302	17131,838	0,804	0,990	0,887	158,633	155,295	7,658	21,582	460,464	29,240	468,120	175,601	3566,734
16,827	278726	25182,078	17396,987	0,798	0,992	0,882	158,114	153,649	8,689	19,149	421,868	27,837	430,554	178,319	3738,615
18,813	314376	26518,751	17610,997	0,807	0,992	0,893	157,539	152,496	9,724	17,241	387,233	26,965	396,955	180,513	3871,023
20,800	350438	27850,526	17804,627	0,815	0,993	0,903	156,970	151,547	10,762	15,710	357,892	26,472	368,652	182,497	3990,381


Draft m
22
20
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16
14
12
10
8
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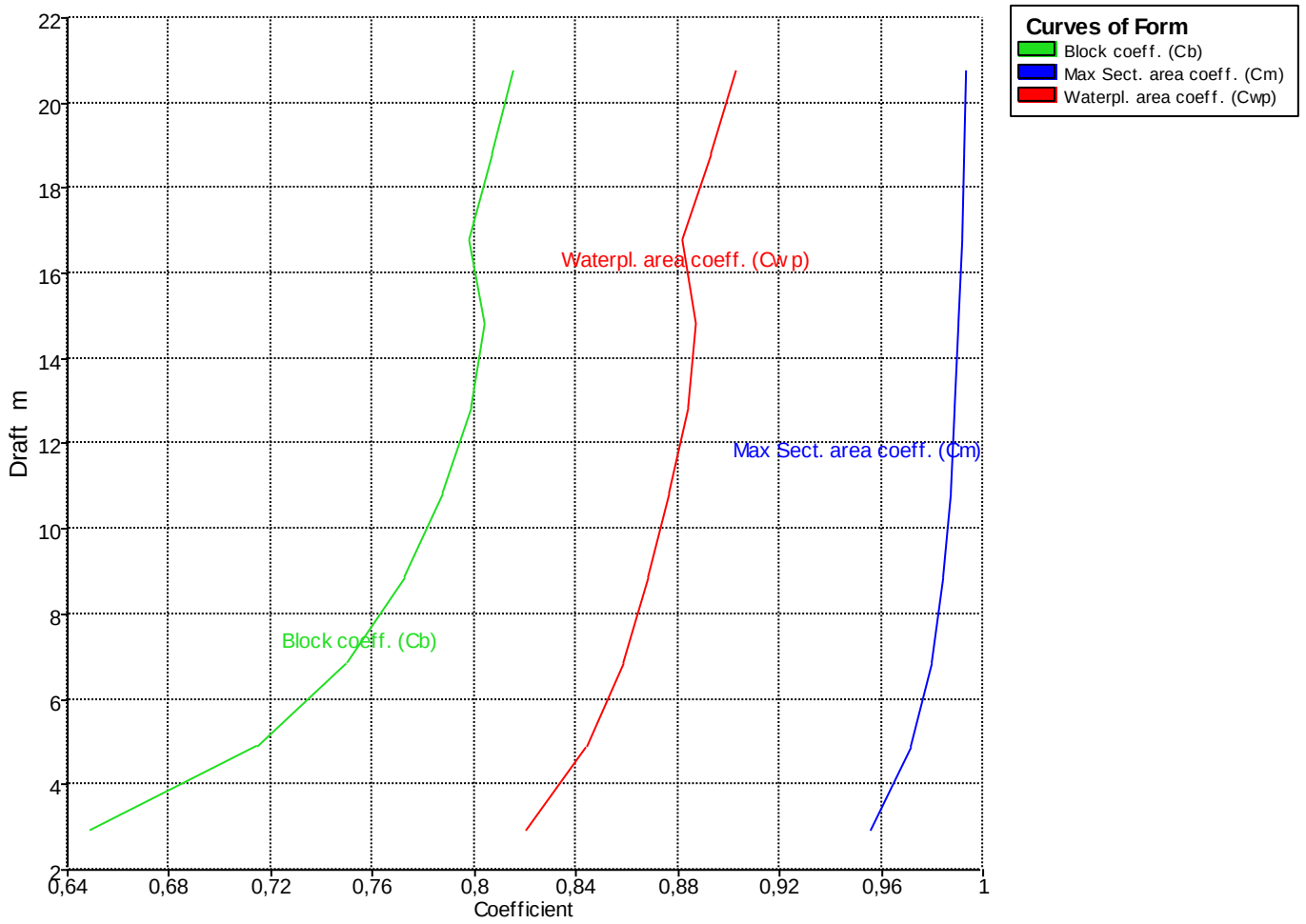
4
2
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
150 151 152 153 154 155 156 157 158 159 160 161 162 163
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
150 152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m

Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,64
0,68
0,72
0,76
0,8
0,84
0,88
0,92
0,96
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

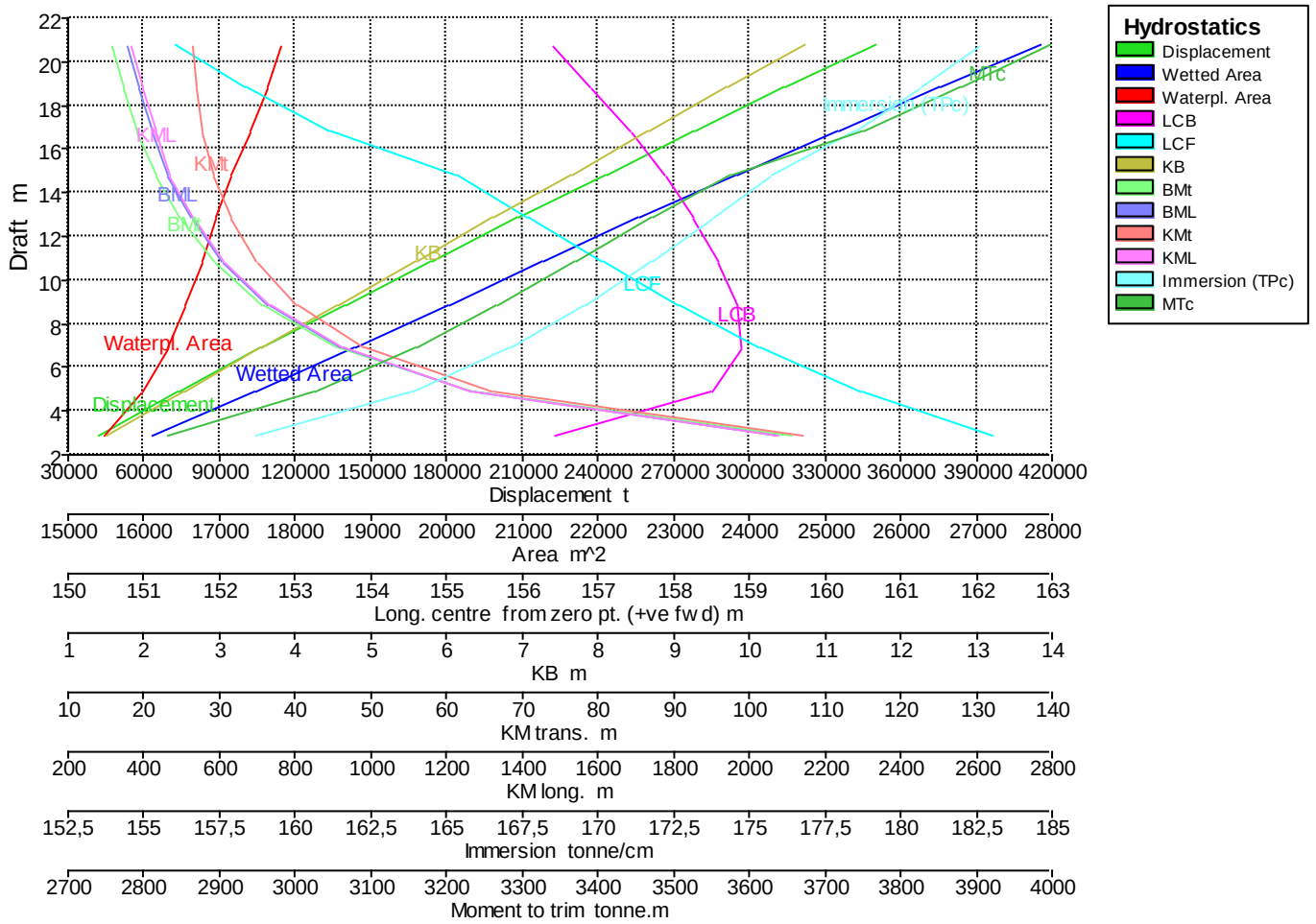
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

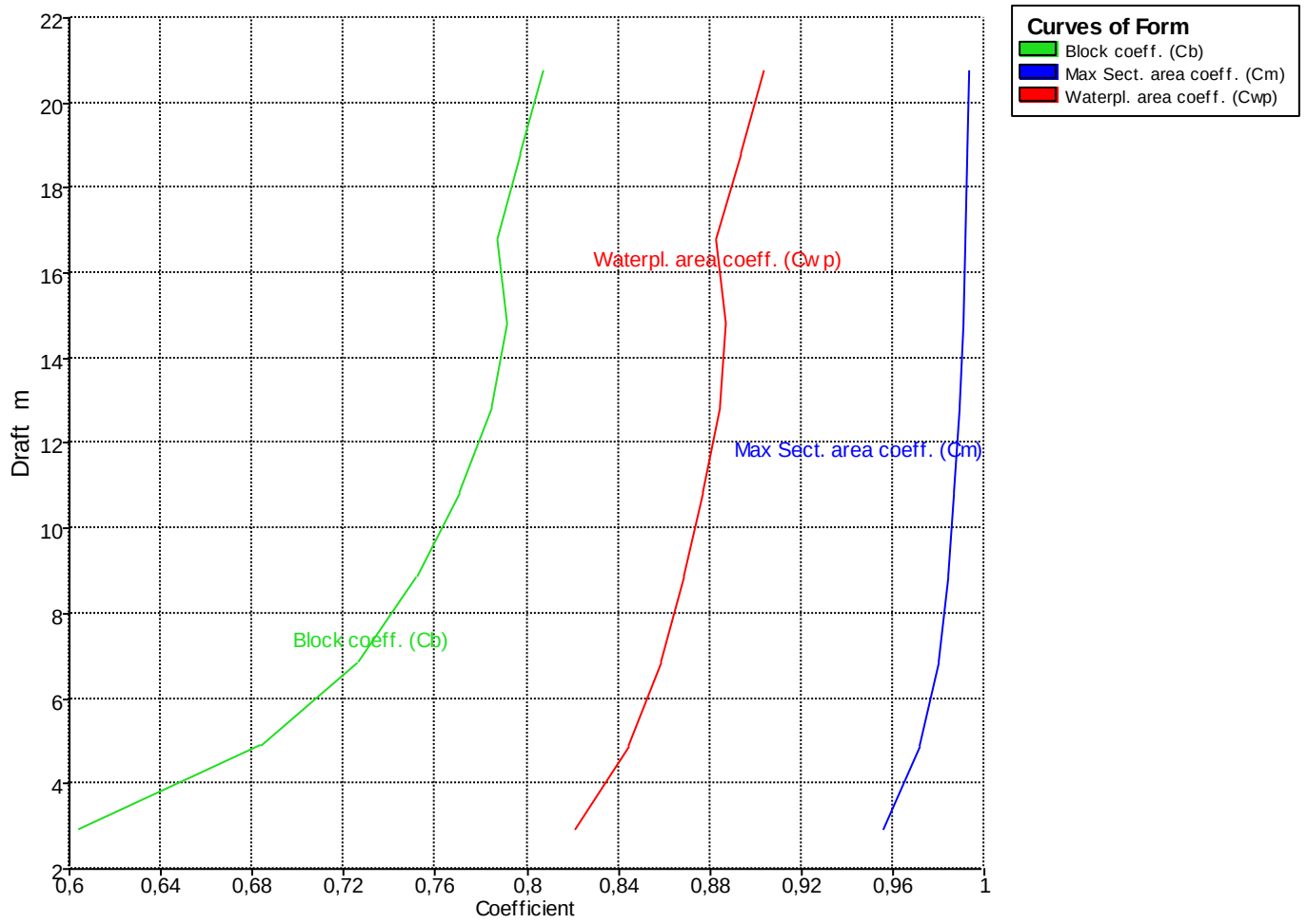
Damage Case - Intact

Fixed Trim = 1,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	42097	16119,859	15485,761	0,604	0,956	0,822	156,429	162,215	1,514	105,488	2075,143	107,001	2076,632	158,729	2832,946
4,907	74198	17495,846	15988,264	0,684	0,972	0,845	158,527	160,459	2,536	63,542	1263,998	66,077	1266,518	163,880	3025,645
6,893	107104	18797,520	16308,243	0,726	0,980	0,859	158,898	159,113	3,560	45,564	918,685	49,123	922,233	167,159	3160,431
8,880	140551	20036,283	16548,038	0,753	0,984	0,869	158,836	158,056	4,583	35,570	726,325	40,153	730,900	169,617	3267,115
10,867	174468	21295,209	16761,298	0,771	0,987	0,877	158,584	157,036	5,607	29,207	605,505	34,815	611,105	171,803	3371,377
12,853	208798	22552,536	16957,918	0,784	0,989	0,884	158,251	156,061	6,633	24,811	522,380	31,443	529,006	173,819	3473,630
14,840	243511	23832,913	17147,902	0,791	0,991	0,887	157,879	155,109	7,659	21,602	461,976	29,261	469,630	175,766	3577,818
16,827	278703	25197,411	17416,097	0,787	0,992	0,883	157,423	153,437	8,691	19,165	423,381	27,855	432,066	178,515	3752,172
18,813	314386	26532,315	17625,956	0,797	0,993	0,894	156,905	152,321	9,727	17,255	388,188	26,982	397,911	180,666	3881,055
20,800	350476	27863,588	17817,457	0,807	0,993	0,903	156,383	151,389	10,766	15,722	358,575	26,488	369,336	182,629	3998,735


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KML
BML
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
150 151 152 153 154 155 156 157 158 159 160 161 162 163
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5 185
Immersion tonne/cm
2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000
Moment to trim tonne.m
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,6
0,64
0,68
0,72
0,76
0,8
0,84
0,88
0,92
0,96
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

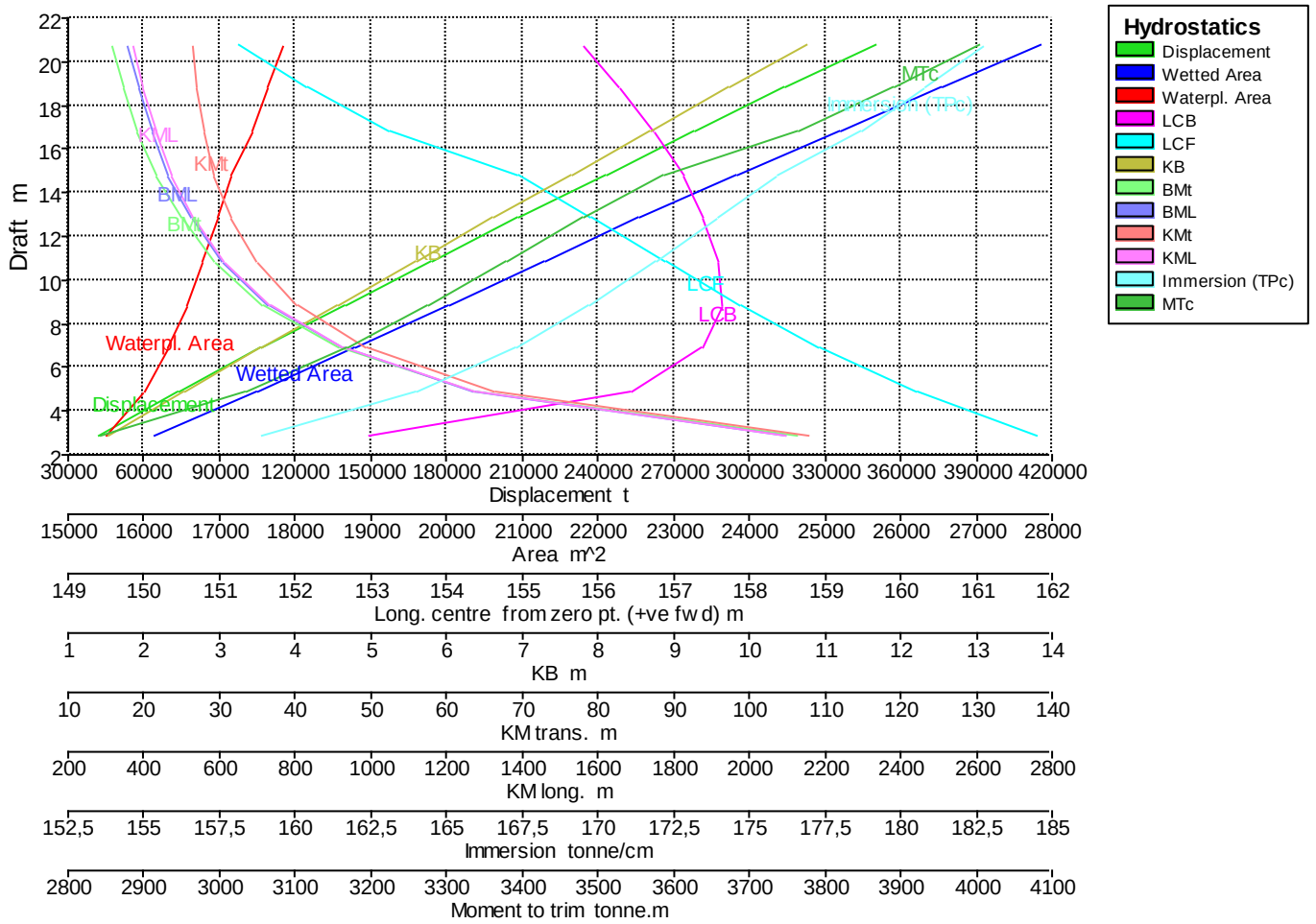
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

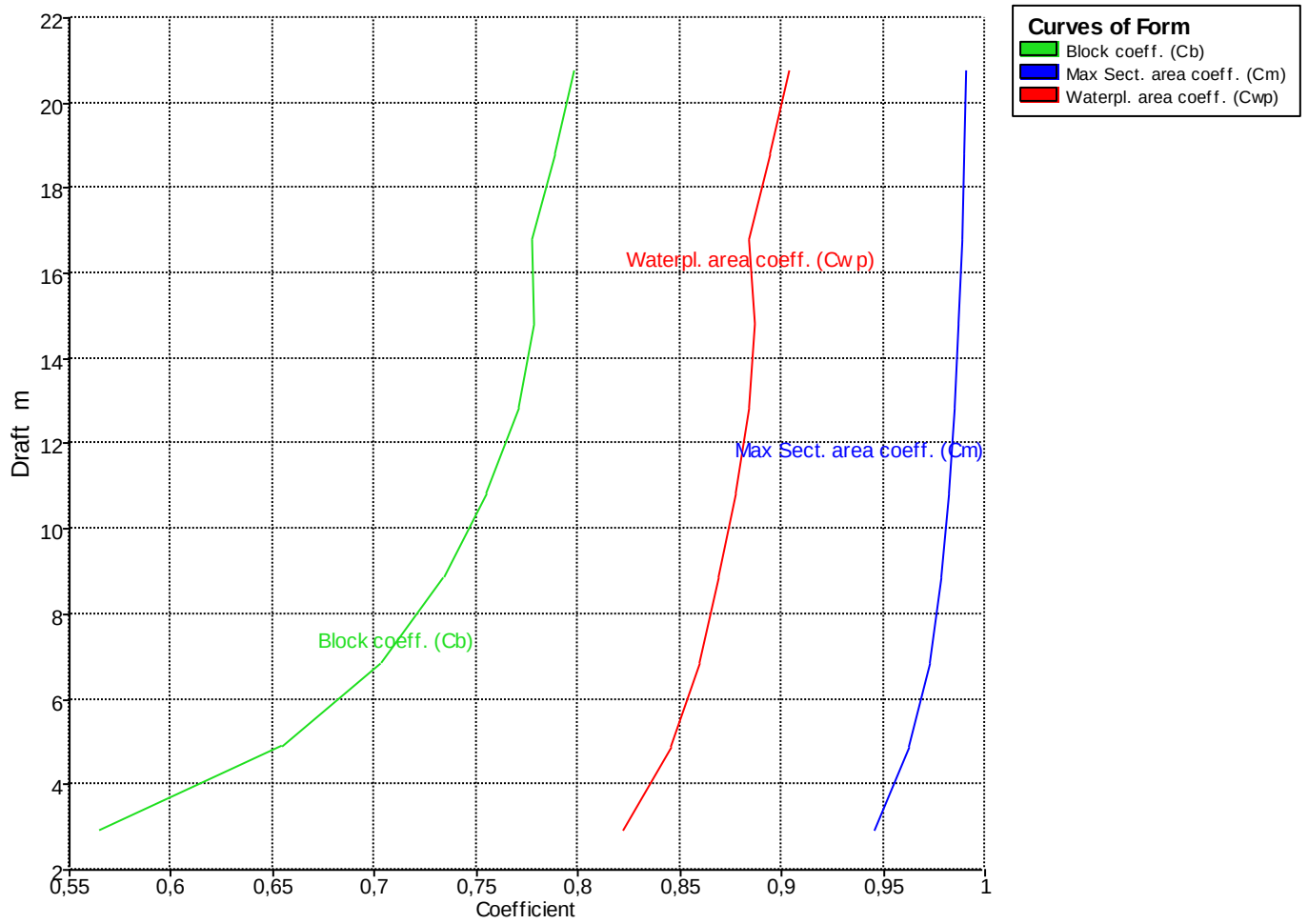
Damage Case - Intact

Fixed Trim = 2 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	41856	16130,463	15504,786	0,565	0,946	0,823	152,977	161,801	1,525	106,267	2093,597	107,790	2095,078	158,924	2842,008
4,907	73995	17502,666	16005,779	0,655	0,962	0,845	156,445	160,209	2,541	63,805	1271,179	66,344	1273,693	164,059	3034,752
6,893	106933	18802,965	16322,821	0,703	0,973	0,859	157,390	158,916	3,563	45,682	922,490	49,244	926,034	167,309	3168,717
8,880	140405	20040,095	16561,680	0,734	0,979	0,869	157,646	157,882	4,586	35,635	728,852	40,220	733,422	169,757	3275,374
10,867	174349	21299,071	16774,495	0,755	0,982	0,877	157,593	156,872	5,610	29,247	607,370	34,856	612,967	171,939	3379,760
12,853	208705	22556,777	16970,986	0,771	0,985	0,884	157,397	155,901	6,635	24,837	523,852	31,471	530,476	173,953	3482,181
14,840	243446	23842,089	17164,287	0,778	0,987	0,886	157,123	154,920	7,662	21,622	463,510	29,283	471,162	175,934	3589,143
16,827	278685	25212,116	17434,180	0,777	0,989	0,884	156,730	153,235	8,694	19,180	424,790	27,874	433,475	178,700	3764,857
18,813	314401	26545,897	17640,825	0,788	0,990	0,894	156,269	152,148	9,731	17,269	389,126	26,999	398,848	180,818	3890,957
20,800	350519	27876,631	17830,192	0,798	0,991	0,904	155,796	151,233	10,770	15,734	359,244	26,504	370,006	182,759	4006,979


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
149 150 151 152 153 154 155 156 157 158 159 160 161 162
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5 185
Immersion tonne/cm
2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100
Moment to trim tonne.m
Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

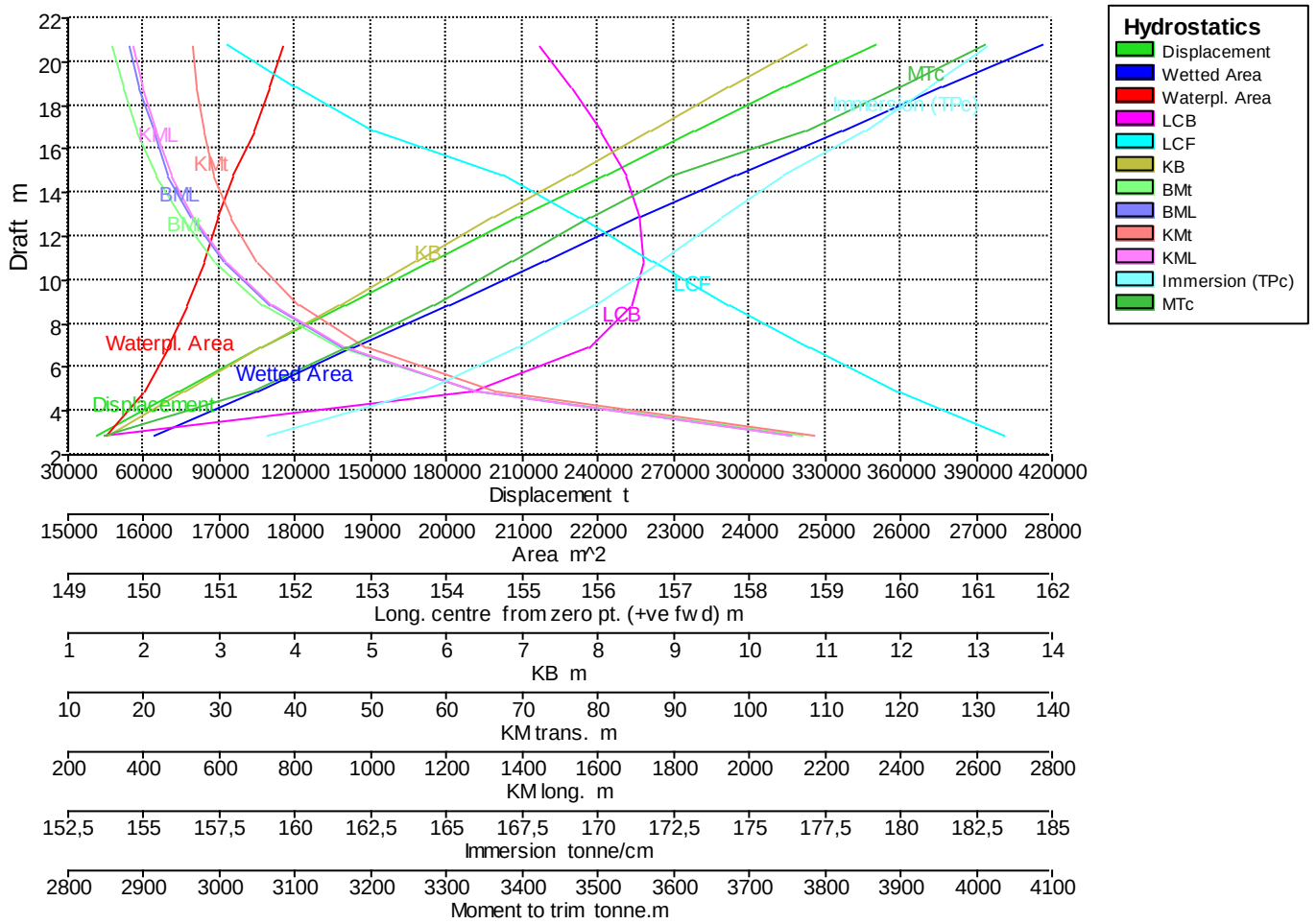
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact

Fixed Trim = 2,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	41626	16135,662	15517,904	0,530	0,946	0,823	149,482	161,369	1,543	106,994	2109,330	108,534	2110,803	159,059	2847,796
4,907	73798	17509,192	16022,272	0,628	0,963	0,846	154,347	159,956	2,551	64,057	1278,076	66,605	1280,584	164,228	3043,340
6,893	106755	18777,081	16329,909	0,682	0,973	0,859	155,891	158,787	3,569	45,802	924,677	49,369	928,214	167,382	3171,105
8,880	140265	20043,753	16574,903	0,716	0,979	0,870	156,451	157,709	4,590	35,697	731,329	40,286	735,895	169,893	3283,483
10,867	174235	21302,964	16787,605	0,740	0,983	0,878	156,599	156,708	5,613	29,286	609,223	34,898	614,816	172,073	3388,133
12,853	208617	22561,094	16984,151	0,757	0,985	0,884	156,540	155,741	6,638	24,863	525,325	31,501	531,946	174,088	3490,796
14,840	243387	23851,309	17180,779	0,766	0,987	0,886	156,363	154,732	7,665	21,642	465,039	29,307	472,688	176,103	3600,492
16,827	278674	25226,413	17451,557	0,767	0,989	0,885	156,034	153,040	8,699	19,196	426,121	27,894	434,806	178,878	3776,898
18,813	314421	26559,480	17655,580	0,779	0,990	0,895	155,631	151,978	9,736	17,282	390,045	27,018	399,769	180,970	3900,735
20,800	350567	27889,493	17842,618	0,790	0,991	0,905	155,207	151,081	10,776	15,746	359,887	26,521	370,651	182,887	4014,968


Draft m
22
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10
8
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4
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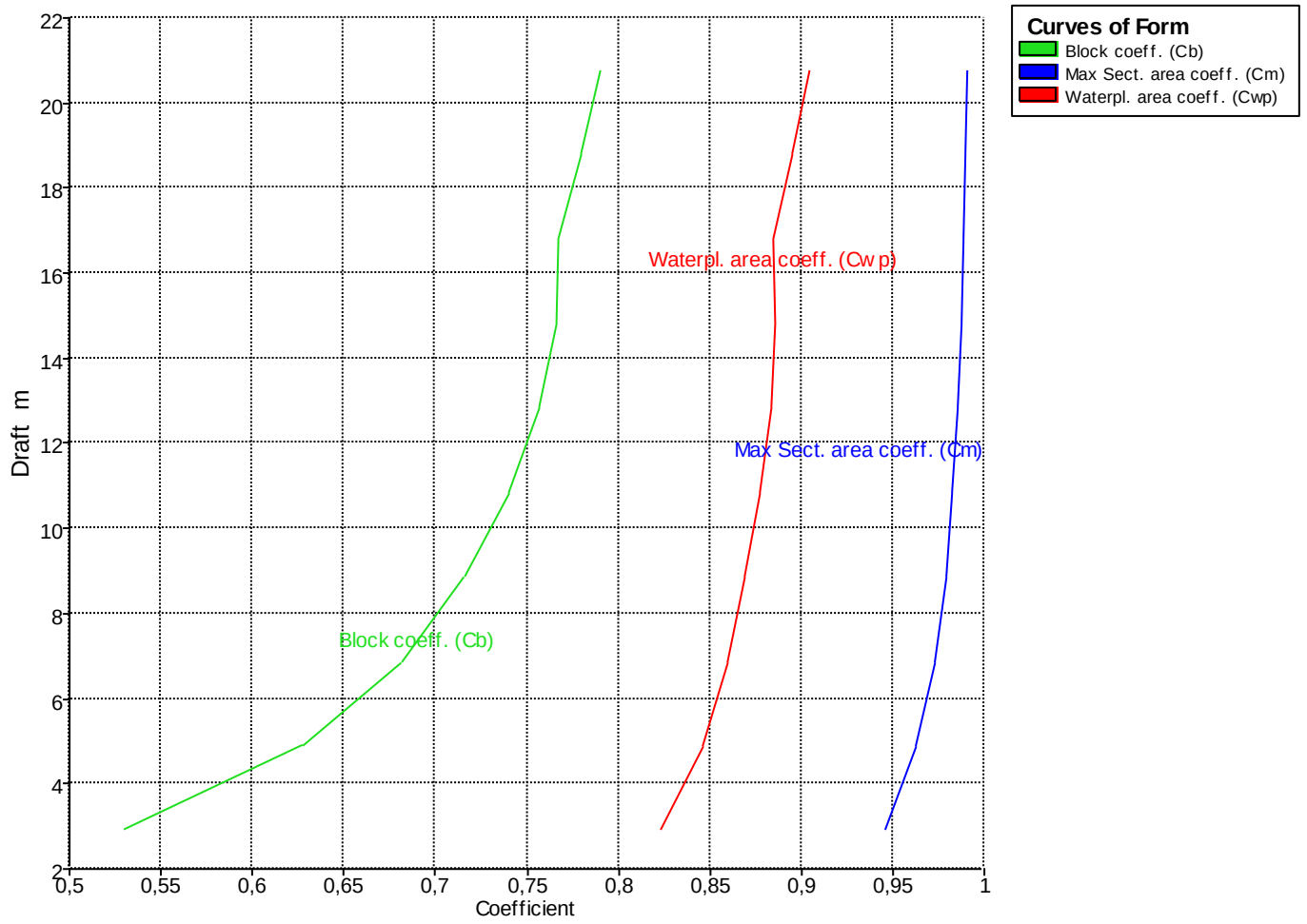
KML
KMt
BML
BMt
KB
LCF
LCB
MTc
Immersion (TPc)
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
149 150 151 152 153 154 155 156 157 158 159 160 161 162
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5 185
Immersion tonne/cm
2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100
Moment to trim tonne.m

Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

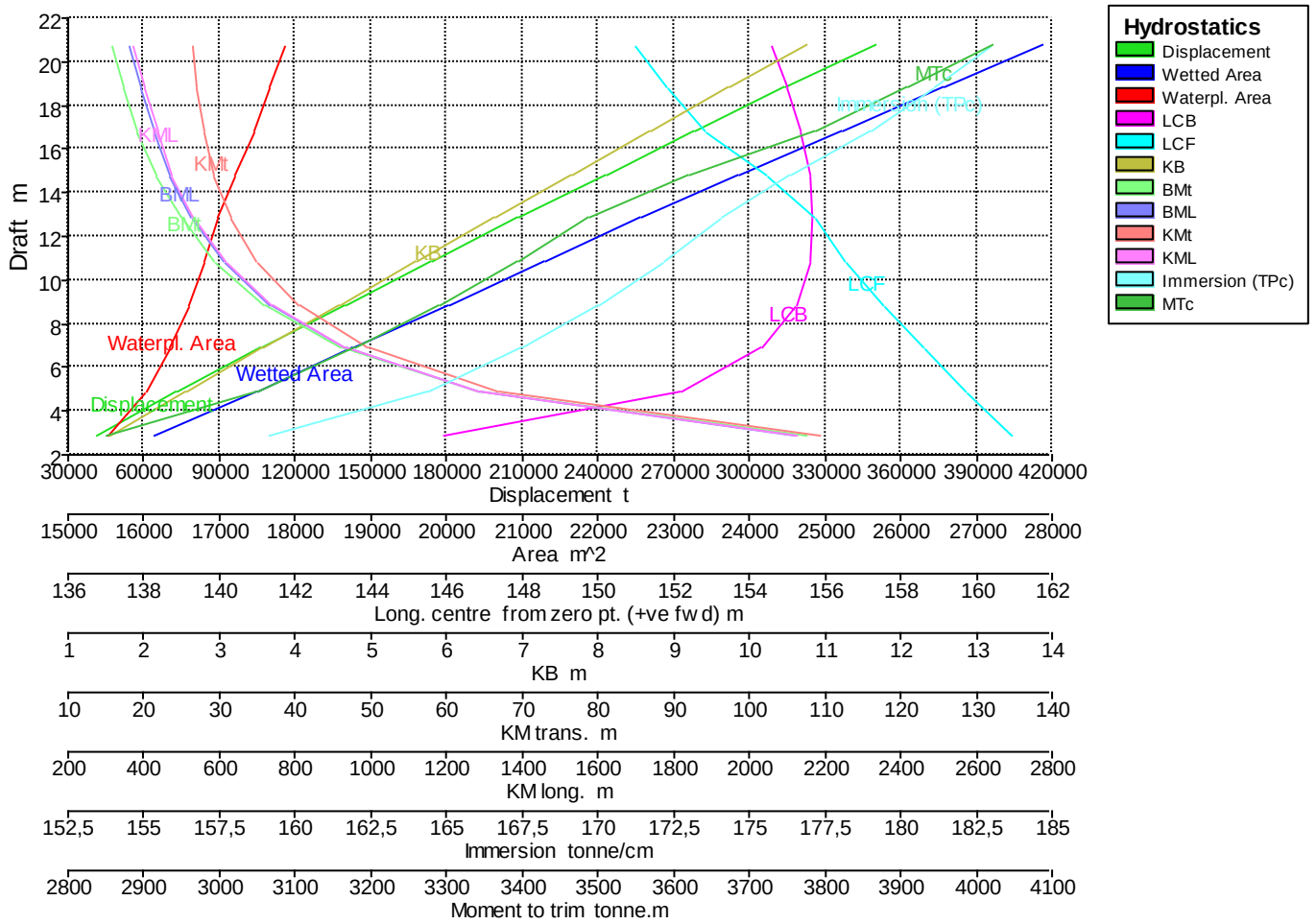
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

Damage Case - Intact

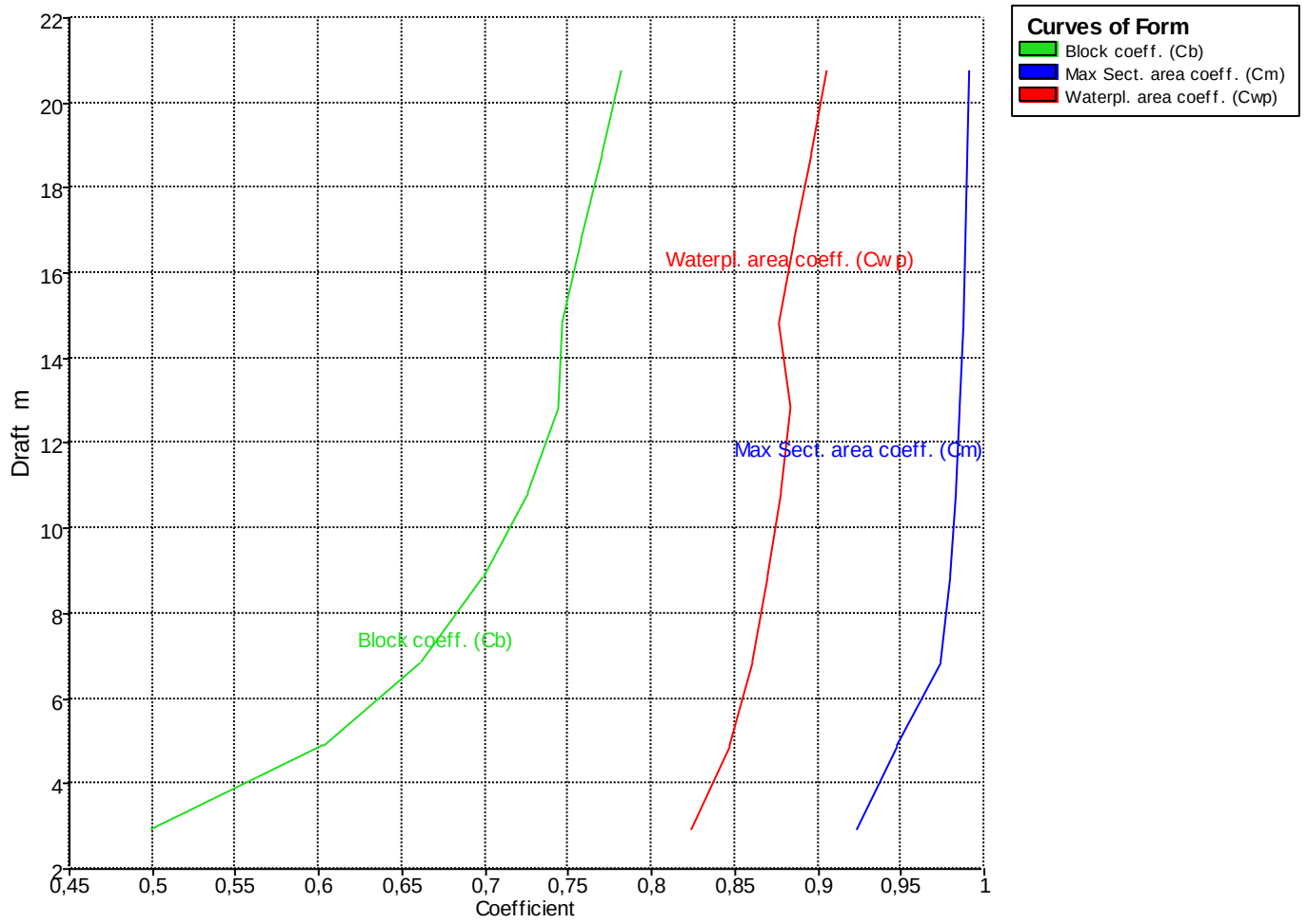
Fixed Trim = 3 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	41407	16138,262	15526,301	0,499	0,923	0,823	145,949	160,922	1,568	107,652	2122,995	109,215	2124,461	159,145	2851,332
4,907	73608	17515,269	16037,496	0,603	0,948	0,846	152,234	159,697	2,564	64,299	1284,627	66,859	1287,128	164,384	3051,277
6,893	106592	18781,116	16344,128	0,662	0,973	0,860	154,370	158,589	3,577	45,916	928,388	49,491	931,921	167,527	3179,207
8,880	140129	20047,489	16588,237	0,699	0,979	0,870	155,252	157,536	4,597	35,759	733,803	40,354	738,364	170,029	3291,653
10,867	174125	21306,948	16800,827	0,725	0,983	0,878	155,601	156,542	5,619	29,324	611,077	34,941	616,666	172,208	3396,578
12,853	208530	22567,469	16983,454	0,743	0,985	0,883	155,682	155,707	6,644	24,890	525,175	31,532	531,793	174,080	3488,347
14,840	243334	23872,200	17208,701	0,746	0,987	0,877	155,601	154,441	7,671	21,662	467,752	29,332	475,401	176,389	3621,348
16,827	278668	25240,493	17468,489	0,757	0,989	0,886	155,336	152,850	8,705	19,211	427,397	27,916	436,081	179,052	3788,500
18,813	314447	26573,065	17670,212	0,770	0,990	0,896	154,992	151,809	9,743	17,296	390,947	27,038	400,671	181,120	3910,381
20,800	350619	27902,244	17854,782	0,782	0,991	0,905	154,617	150,931	10,783	15,758	360,508	26,540	371,273	183,012	4022,751


Draft m
22
20
18
16
14
12
10
8
6
4
2
KML
KMt
BML
BMt
KB
MTc
Immersion (TPc)
LCF
LCB
Waterpl. Area
Wetted Area
Displacement
30000 60000 90000 120000 150000 180000 210000 240000 270000 300000 330000 360000 390000 420000
Displacement t
15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000
Area m^2
136 138 140 142 144 146 148 150 152 154 156 158 160 162
Long. centre from zero pt. (+ve fwd) m
1 2 3 4 5 6 7 8 9 10 11 12 13 14
KB m
10 20 30 40 50 60 70 80 90 100 110 120 130 140
KM trans. m
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
KM long. m
152,5 155 157,5 160 162,5 165 167,5 170 172,5 175 177,5 180 182,5 185
Immersion tonne/cm
2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100
Moment to trim tonne.m

Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,45
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

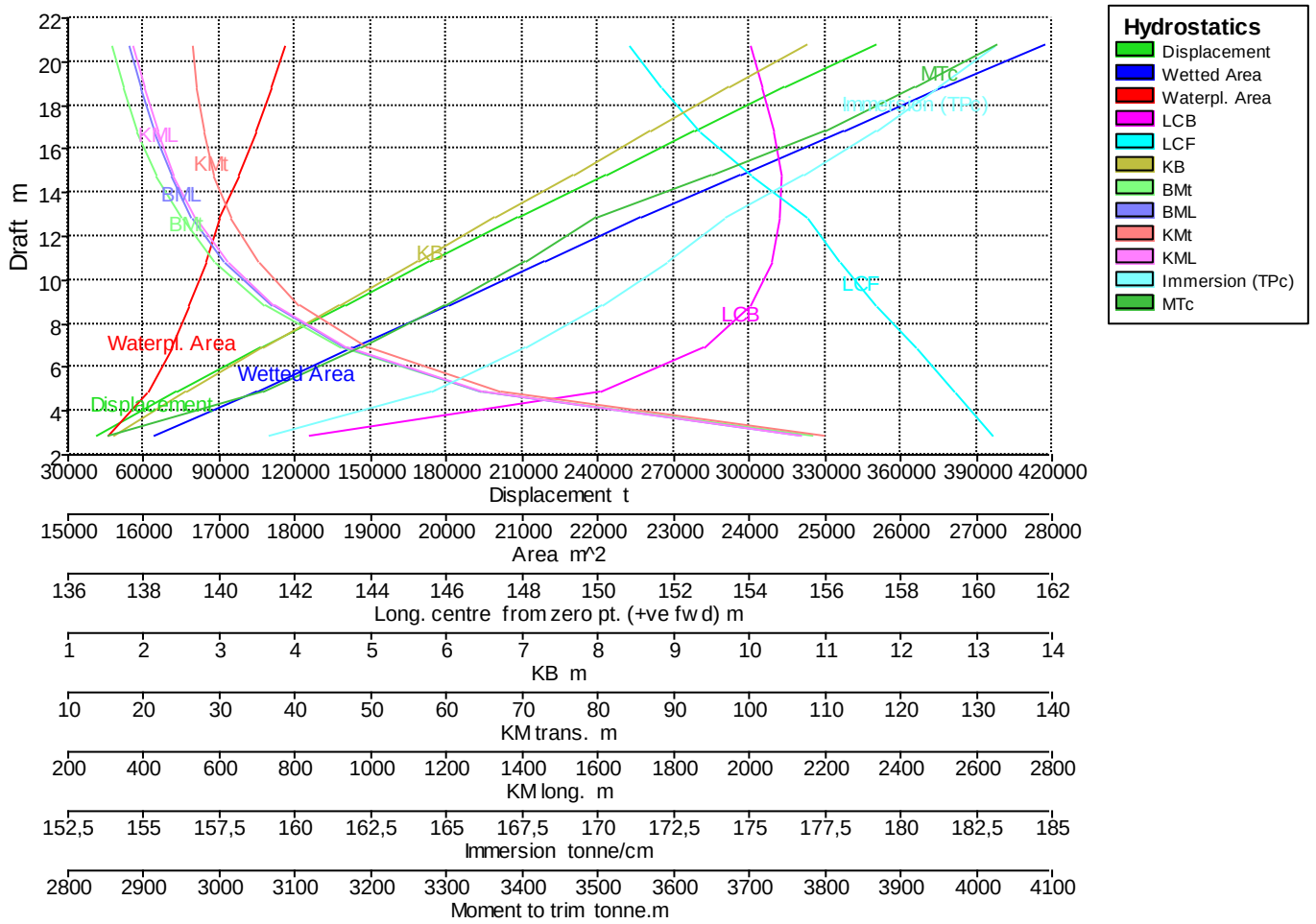
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

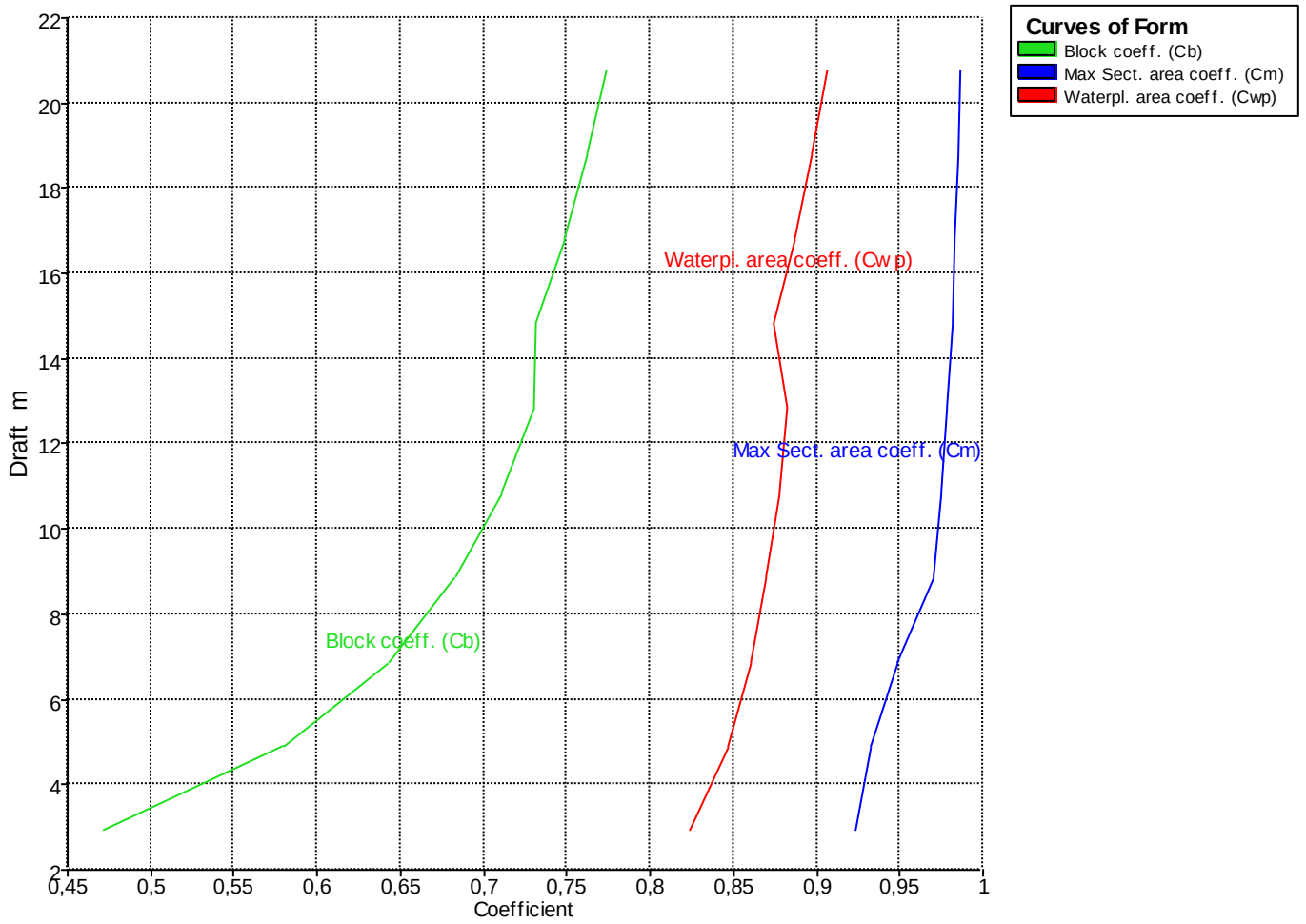
Damage Case - Intact

Fixed Trim = 3,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	41200	16136,825	15529,775	0,471	0,923	0,824	142,384	160,444	1,599	108,264	2134,091	109,856	2135,549	159,180	2852,015
4,907	73425	17521,000	16051,850	0,580	0,933	0,847	150,106	159,440	2,580	64,529	1290,945	67,105	1293,441	164,531	3058,850
6,893	106434	18785,029	16357,810	0,643	0,949	0,860	152,842	158,391	3,589	46,024	932,021	49,610	935,549	167,668	3187,149
8,880	139998	20051,307	16601,676	0,683	0,970	0,870	154,047	157,360	4,606	35,819	736,270	40,423	740,828	170,167	3299,879
10,867	174020	21310,915	16813,960	0,711	0,975	0,878	154,600	156,378	5,627	29,361	612,915	34,985	618,501	172,343	3405,002
12,853	208448	22575,033	16998,857	0,731	0,979	0,883	154,822	155,527	6,650	24,916	526,892	31,564	533,508	174,238	3498,708
14,840	243291	23905,335	17248,455	0,732	0,981	0,874	154,832	154,040	7,678	21,682	471,718	29,358	479,365	176,797	3652,318
16,827	278668	25254,398	17485,012	0,748	0,983	0,886	154,636	152,665	8,713	19,227	428,623	27,938	437,307	179,221	3799,711
18,813	314477	26586,629	17684,685	0,762	0,985	0,897	154,352	151,643	9,751	17,310	391,830	27,059	401,555	181,268	3919,887
20,800	350675	27914,832	17866,586	0,774	0,986	0,906	154,026	150,786	10,791	15,769	361,101	26,558	371,868	183,133	4030,265


Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc
Draft m
KML
KMt
BML
BMt
KB
MTc
Immersion (TPc)
LCF
LCB
Waterpl. Area
Wetted Area
Displacement
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


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,45
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

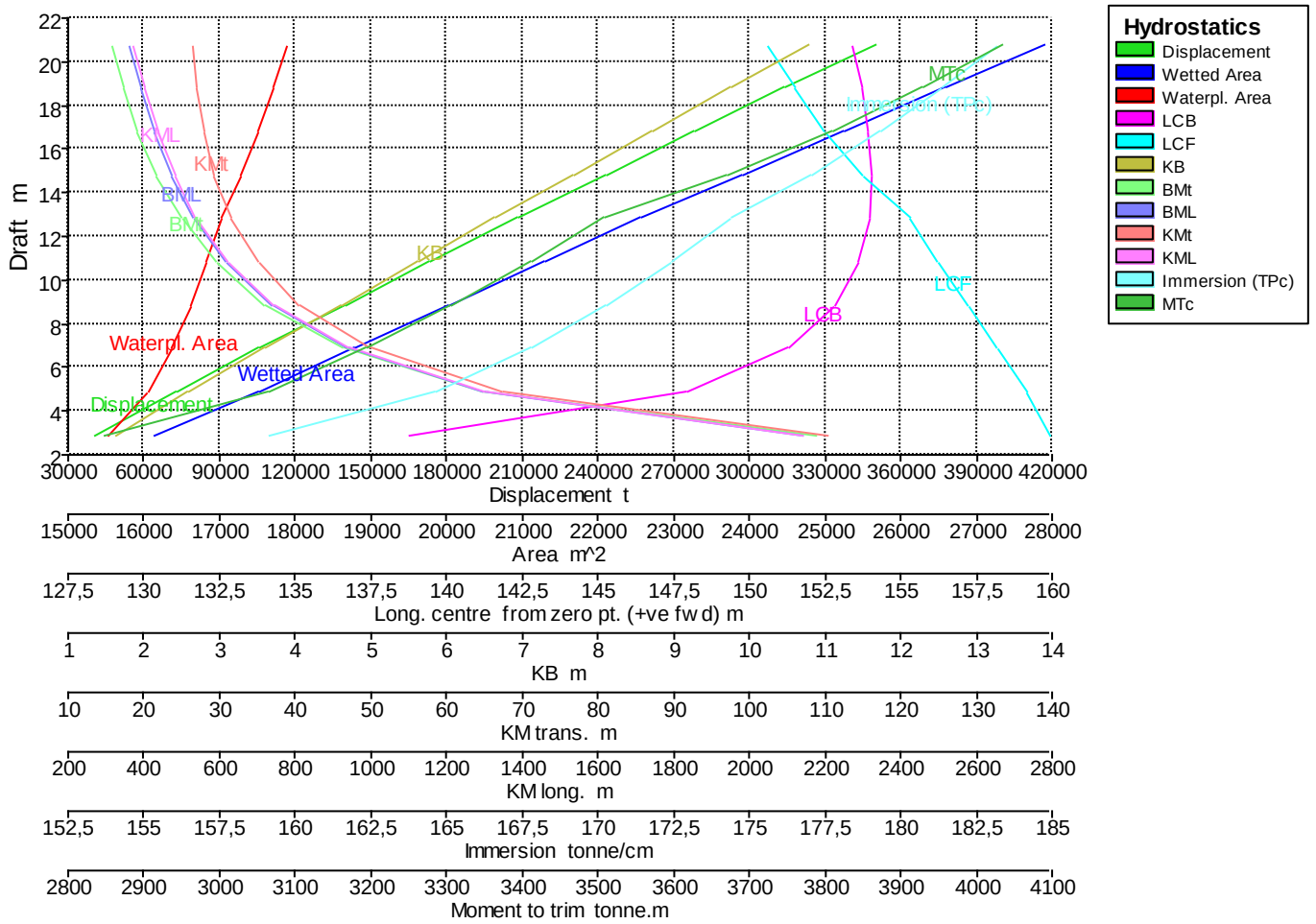
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

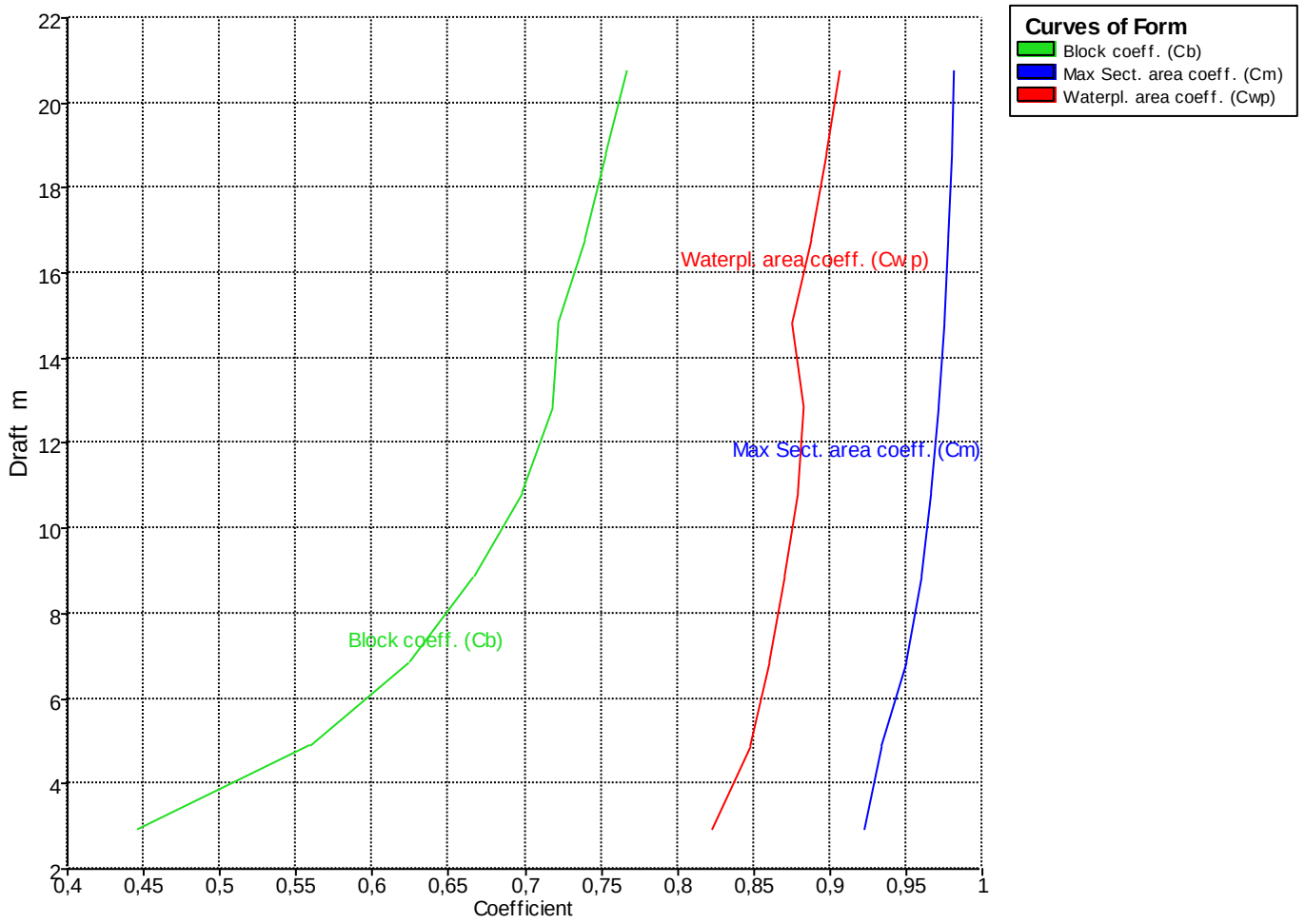
Damage Case - Intact

Fixed Trim = 4 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	41006	16129,649	15525,875	0,446	0,923	0,823	138,795	159,917	1,636	108,800	2141,610	110,426	2143,062	159,140	2848,661
4,907	73249	17526,439	16065,433	0,559	0,933	0,847	147,964	159,184	2,601	64,751	1297,012	67,346	1299,502	164,671	3066,019
6,893	106282	18788,814	16371,122	0,625	0,950	0,861	151,306	158,193	3,603	46,127	935,576	49,726	939,099	167,804	3194,934
8,880	139871	20055,135	16615,009	0,667	0,960	0,870	152,838	157,184	4,617	35,878	738,714	40,492	743,267	170,304	3308,078
10,867	173919	21314,934	16827,141	0,698	0,966	0,879	153,595	156,213	5,636	29,397	614,746	35,030	620,329	172,478	3413,450
12,853	208372	22583,015	17014,665	0,718	0,971	0,883	153,958	155,344	6,659	24,941	528,644	31,598	535,258	174,400	3509,374
14,840	243258	23927,121	17275,680	0,722	0,975	0,876	154,059	153,755	7,686	21,701	474,329	29,386	481,975	177,076	3672,626
16,827	278673	25268,184	17501,163	0,739	0,977	0,887	153,934	152,484	8,721	19,242	429,806	27,962	438,491	179,387	3810,602
18,813	314512	26600,158	17698,968	0,753	0,980	0,897	153,710	151,479	9,759	17,323	392,692	27,081	402,418	181,414	3929,236
20,800	350736	27927,311	17878,099	0,766	0,981	0,906	153,435	150,643	10,800	15,780	361,673	26,578	372,442	183,251	4037,573


Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc
Draft m
KML
KMt
BML
BMt
KB
MTc
Immersion (TPc)
LCF
LCB
Waterpl. Area
Wetted Area
Displacement
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


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
2
0,4
0,45
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)

Hydrostatics - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

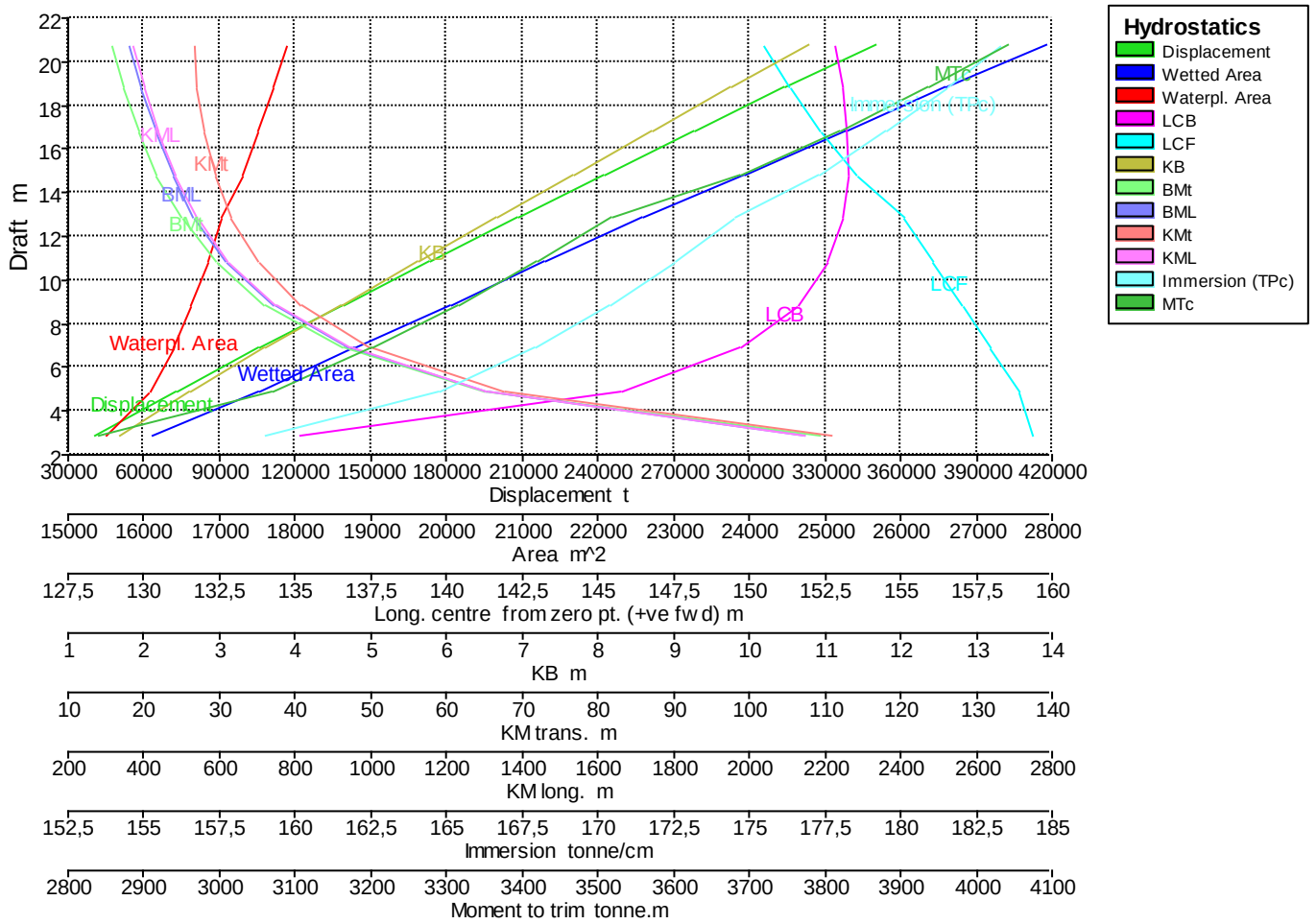
Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, Skin thickness not applied). Long. datum: AP; Vert. datum: Baseline. Analysis tolerance - ideal(worst case): Disp.%: 0,01000(0,100); Trim%(LCG-TCG): 0,01000(0,100); Heel%(LCG-TCG): 0,01000(0,100)

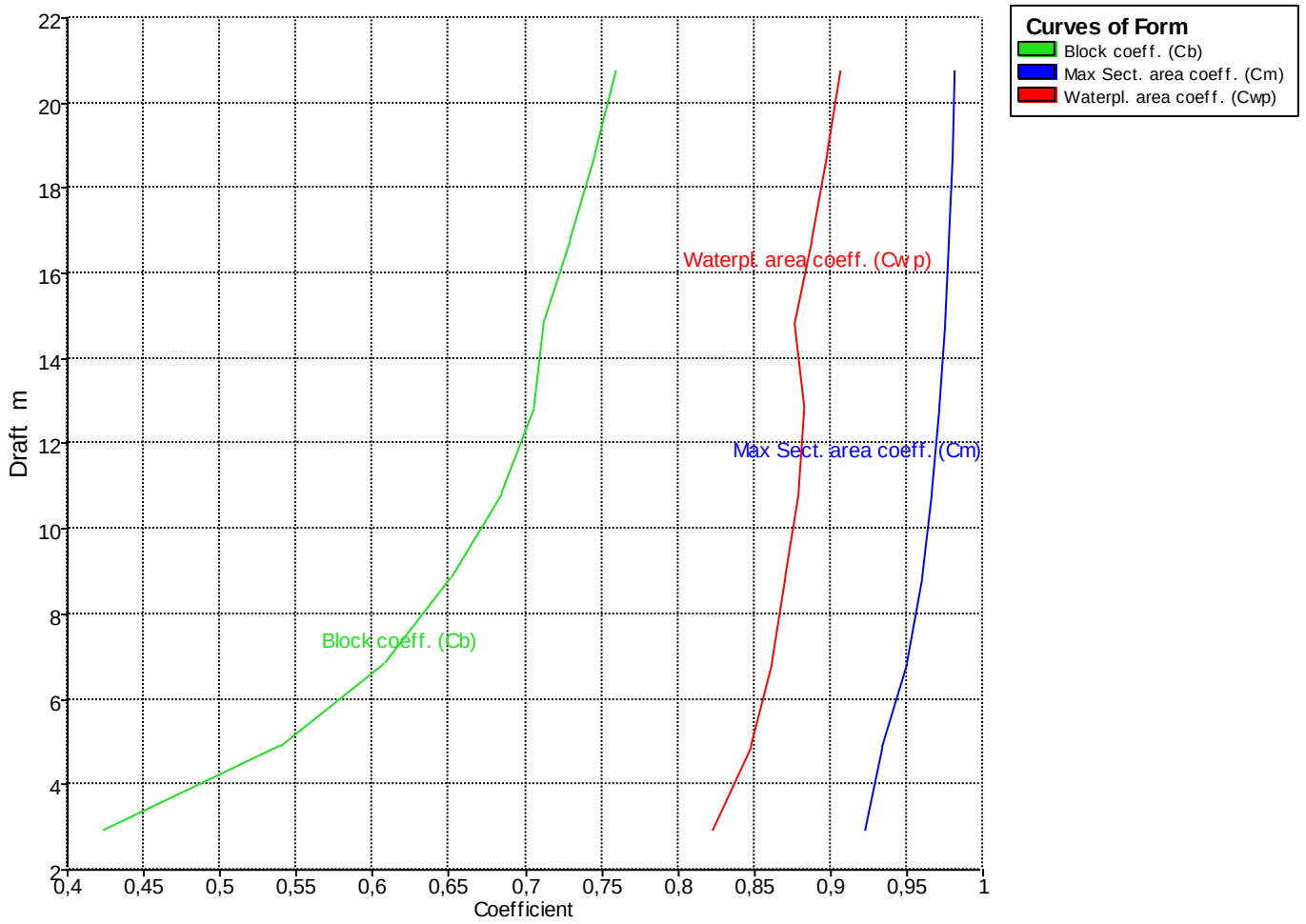
Damage Case - Intact

Fixed Trim = 4,5 m (+ve by stern)

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

Draft Amidships m	Displacement t	Wetted Area m^2	Waterpl. Area m^2	Block coeff. (Cb)	Max Sect. area coeff. (Cm)	Waterpl. area coeff. (Cwp)	LCB from zero pt. (+ve fwd) m	LCF from zero pt. (+ve fwd) m	KB m	BMt m	BML m	KMt m	KML m	Immersion (TPc) tonne/cm	MTc tonne.m
2,920	40827	16116,113	15514,393	0,424	0,923	0,823	135,189	159,338	1,680	109,260	2145,212	110,928	2146,659	159,023	2840,986
4,907	73079	17531,171	16077,351	0,539	0,934	0,848	145,810	158,919	2,625	64,960	1302,610	67,578	1305,094	164,793	3072,278
6,893	106135	18792,544	16384,187	0,608	0,950	0,861	149,764	157,994	3,620	46,228	939,065	49,842	942,583	167,938	3202,606
8,880	139750	20058,792	16627,870	0,653	0,960	0,871	151,624	157,009	4,630	35,934	741,095	40,560	745,644	170,436	3316,076
10,867	173823	21318,992	16840,254	0,685	0,967	0,879	152,588	156,047	5,647	29,432	616,563	35,076	622,143	172,613	3421,888
12,853	208300	22591,900	17031,335	0,706	0,971	0,882	153,092	155,152	6,669	24,966	530,488	31,632	537,099	174,571	3520,736
14,840	243232	23944,758	17298,133	0,712	0,975	0,877	153,281	153,514	7,696	21,720	476,413	29,414	484,057	177,306	3688,833
16,827	278683	25281,965	17517,200	0,730	0,978	0,888	153,230	152,306	8,731	19,258	430,964	27,987	439,648	179,551	3821,321
18,813	314552	26613,645	17713,088	0,745	0,980	0,898	153,067	151,317	9,770	17,336	393,533	27,104	403,260	181,559	3938,420
20,800	350802	27939,641	17889,360	0,759	0,981	0,907	152,842	150,505	10,810	15,790	362,223	26,599	372,993	183,366	4044,667


Hydrostatics
Displacement
Wetted Area
Waterpl. Area
LCB
LCF
KB
BMt
BML
KMt
KML
Immersion (TPc)
MTc
Draft m
KML
KMt
BML
BMt
KB
MTc
Immersion (TPc)
LCF
LCB
Waterpl. Area
Wetted Area
Displacement
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


Curves of Form
Block coeff. (Cb)
Max Sect. area coeff. (Cm)
Waterpl. area coeff. (Cwp)
Waterpl. area coeff. (Cwp)
Max Sect. area coeff. (Cm)
Block coeff. (Cb)
Draft m
Coefficient
22
20
18
16
14
12
10
8
6
4
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0,4
0,45
0,5
0,55
0,6
0,65
0,7
0,75
0,8
0,85
0,9
0,95
1

ANEXO V:

CURVAS DE KN

KN Values

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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

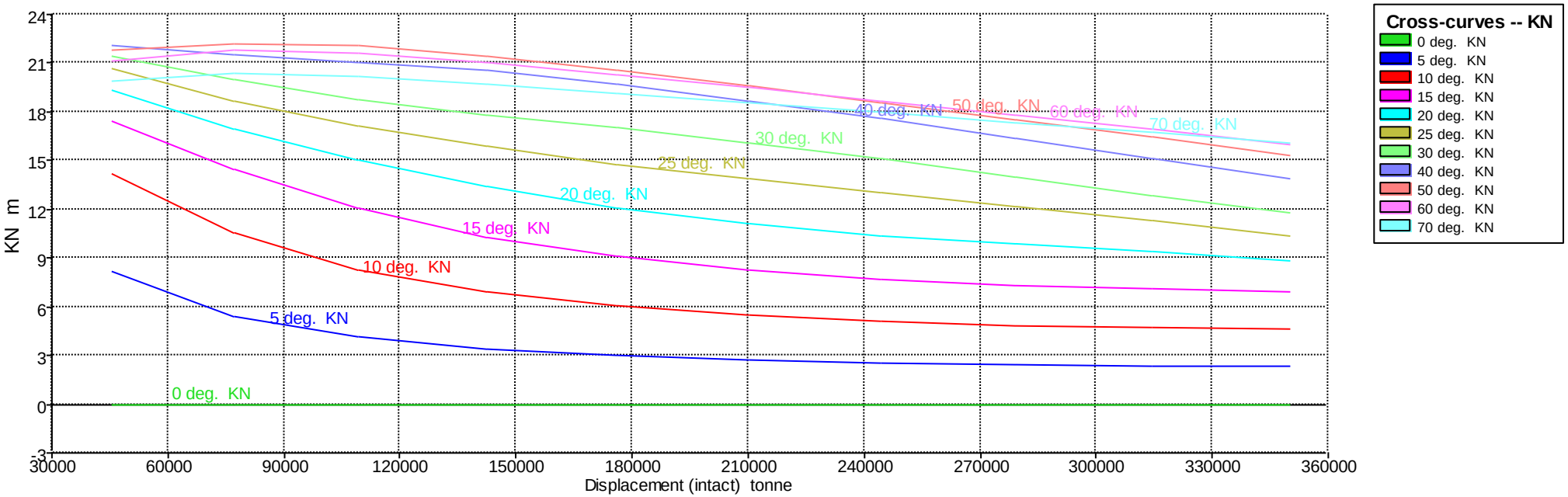
Fixed Trim = -4,5 m (+ve by stern)

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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
45806	2,920	-4,500 (fixed)	193,343	0,000	0,000	0,000	8,123	14,147	17,408	19,372	20,633	21,430	22,058	21,823	21,118	19,923
77168	4,907	-4,500 (fixed)	182,048	0,000	0,000	0,000	5,427	10,574	14,417	16,934	18,695	19,964	21,520	22,188	21,841	20,359
109574	6,893	-4,500 (fixed)	176,321	0,000	0,000	0,000	4,149	8,257	12,087	15,008	17,152	18,791	21,076	22,066	21,629	20,137
142656	8,880	-4,500 (fixed)	172,748	0,000	0,000	0,000	3,437	6,882	10,295	13,414	15,873	17,819	20,526	21,448	21,055	19,694
176238	10,867	-4,500 (fixed)	170,260	0,000	0,000	0,000	3,003	6,025	9,073	12,087	14,783	16,988	19,699	20,597	20,319	19,150
210252	12,855	-4,500 (fixed)	168,380	0,000	0,000	0,000	2,724	5,469	8,253	11,077	13,844	16,121	18,698	19,630	19,504	18,561
244665	14,841	-4,500 (fixed)	166,876	0,000	0,000	0,000	2,541	5,102	7,704	10,364	12,991	15,110	17,588	18,605	18,659	17,954
279453	16,828	-4,500 (fixed)	165,624	0,000	0,000	0,000	2,421	4,861	7,339	9,861	12,147	13,994	16,406	17,540	17,795	17,341
314637	18,815	-4,500 (fixed)	164,532	0,000	0,000	0,000	2,346	4,709	7,105	9,383	11,284	12,860	15,168	16,437	16,908	16,718

Displacement (intact) tonne	Draft Amidships m	Trim (+ve by stern) m	LCG m	TCG m	Assumed VCG m	KN 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
350348	20,801	-4,500 (fixed)	163,494	0,000	0,000	0,000	2,303	4,621	6,889	8,806	10,393	11,745	13,890	15,294	15,994	16,081



KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

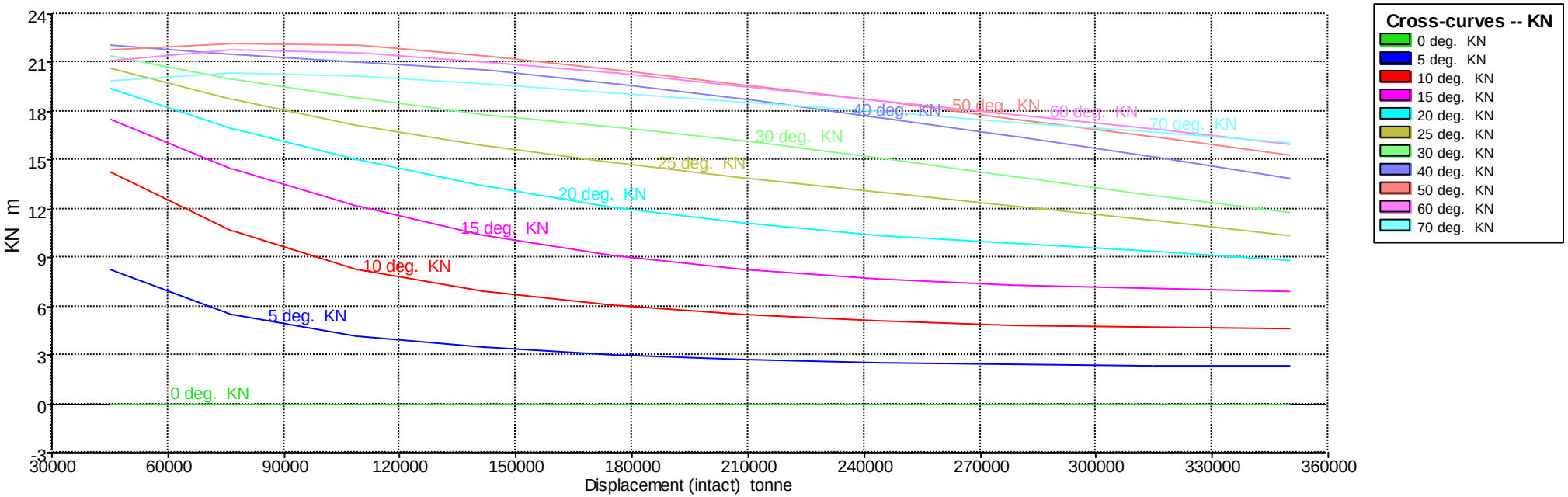
Damage Case - Intact

Fixed Trim = -4 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
45433	2,920	-4,000 (fixed)	190,647	0,000	0,000	0,000	8,222	14,271	17,498	19,440	20,686	21,468	22,073	21,818	21,096	19,918
76881	4,907	-4,000 (fixed)	180,207	0,000	0,000	0,000	5,456	10,633	14,471	16,975	18,725	19,988	21,532	22,191	21,851	20,366
109337	6,893	-4,000 (fixed)	174,924	0,000	0,000	0,000	4,161	8,283	12,123	15,037	17,174	18,807	21,085	22,081	21,641	20,146
142457	8,880	-4,000 (fixed)	171,617	0,000	0,000	0,000	3,443	6,895	10,315	13,437	15,891	17,832	20,542	21,461	21,066	19,702
176066	10,867	-4,000 (fixed)	169,307	0,000	0,000	0,000	3,006	6,031	9,084	12,103	14,799	17,002	19,715	20,609	20,328	19,157
210107	12,853	-4,000 (fixed)	167,550	0,000	0,000	0,000	2,725	5,472	8,259	11,087	13,857	16,141	18,713	19,641	19,511	18,566
244545	14,840	-4,000 (fixed)	166,136	0,000	0,000	0,000	2,542	5,104	7,707	10,370	13,008	15,129	17,601	18,615	18,666	17,957
279357	16,827	-4,000 (fixed)	164,953	0,000	0,000	0,000	2,422	4,862	7,341	9,869	12,163	14,011	16,419	17,549	17,800	17,344
314580	18,813	-4,000 (fixed)	163,907	0,000	0,000	0,000	2,347	4,710	7,107	9,395	11,296	12,872	15,179	16,444	16,913	16,721
350330	20,800	-4,000 (fixed)	162,906	0,000	0,000	0,000	2,304	4,622	6,898	8,815	10,401	11,753	13,896	15,299	15,998	16,084


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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-3
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60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

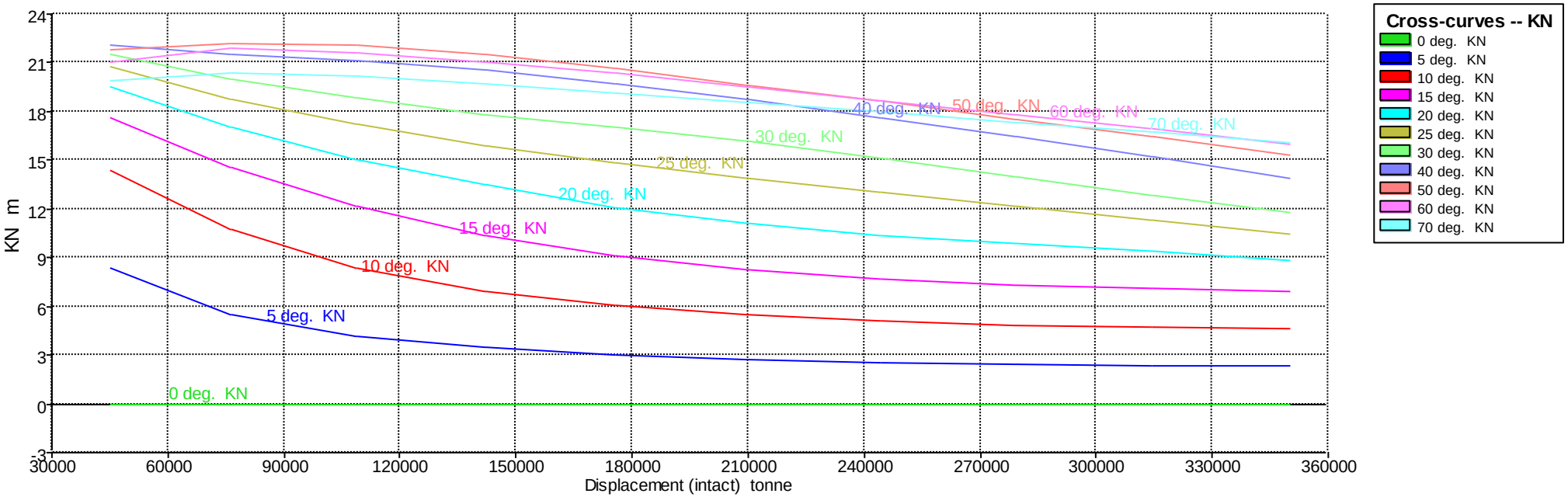
Damage Case - Intact

Fixed Trim = -3,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
45074	2,920	-3,500 (fixed)	187,872	0,000	0,000	0,000	8,318	14,387	17,582	19,505	20,735	21,504	22,087	21,814	21,075	19,912
76602	4,907	-3,500 (fixed)	178,341	0,000	0,000	0,000	5,485	10,691	14,523	17,012	18,754	20,011	21,542	22,193	21,859	20,373
109107	6,893	-3,500 (fixed)	173,516	0,000	0,000	0,000	4,173	8,308	12,158	15,065	17,194	18,821	21,092	22,094	21,652	20,154
142262	8,880	-3,500 (fixed)	170,480	0,000	0,000	0,000	3,449	6,907	10,335	13,460	15,908	17,843	20,556	21,474	21,076	19,709
175899	10,867	-3,500 (fixed)	168,349	0,000	0,000	0,000	3,009	6,038	9,096	12,119	14,814	17,015	19,730	20,620	20,337	19,163
209967	12,853	-3,500 (fixed)	166,716	0,000	0,000	0,000	2,727	5,476	8,266	11,098	13,870	16,159	18,727	19,651	19,518	18,571
244430	14,840	-3,500 (fixed)	165,393	0,000	0,000	0,000	2,543	5,106	7,711	10,376	13,025	15,147	17,614	18,624	18,672	17,961
279265	16,827	-3,500 (fixed)	164,280	0,000	0,000	0,000	2,423	4,864	7,344	9,876	12,178	14,027	16,431	17,557	17,806	17,347
314532	18,813	-3,500 (fixed)	163,277	0,000	0,000	0,000	2,347	4,711	7,109	9,405	11,307	12,883	15,188	16,450	16,917	16,724
350317	20,800	-3,500 (fixed)	162,315	0,000	0,000	0,000	2,304	4,623	6,906	8,824	10,409	11,760	13,903	15,304	16,001	16,086


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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-3
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90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

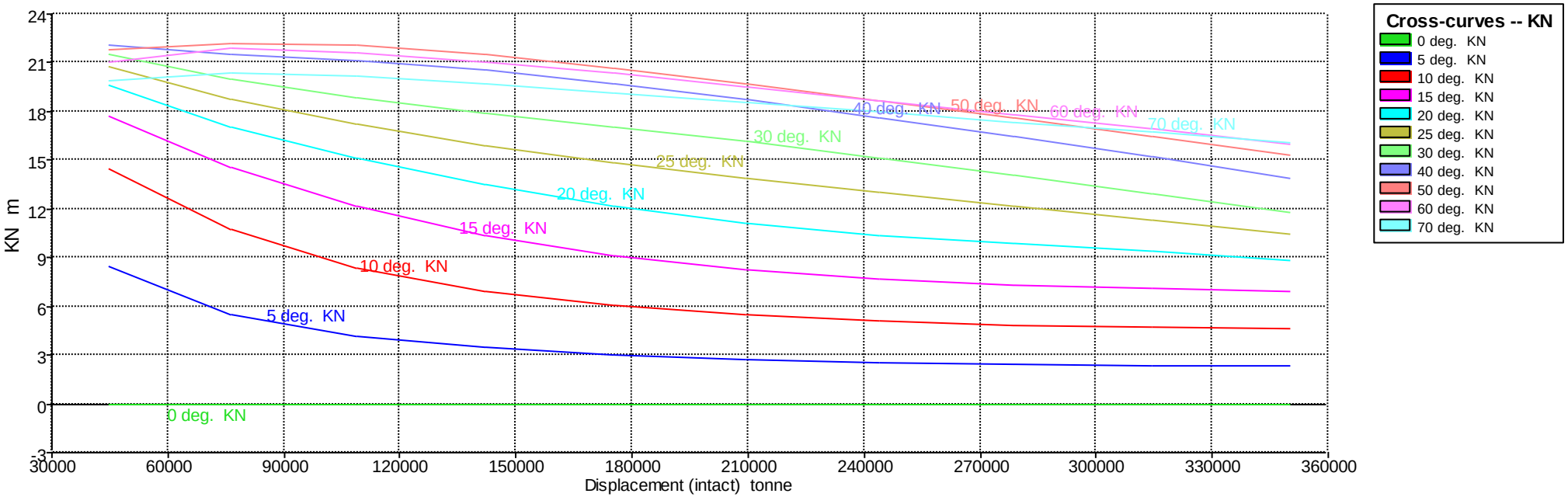
Damage Case - Intact

Fixed Trim = -3 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
44727	2,920	-3,000 (fixed)	185,019	0,000	0,000	0,000	8,410	14,494	17,658	19,564	20,781	21,537	22,101	21,811	21,053	19,906
76330	4,907	-3,000 (fixed)	176,452	0,000	0,000	0,000	5,513	10,747	14,570	17,047	18,780	20,031	21,552	22,194	21,867	20,379
108882	6,893	-3,000 (fixed)	172,097	0,000	0,000	0,000	4,185	8,333	12,192	15,091	17,213	18,834	21,099	22,107	21,662	20,161
142072	8,880	-3,000 (fixed)	169,337	0,000	0,000	0,000	3,455	6,920	10,355	13,481	15,924	17,855	20,569	21,487	21,086	19,715
175736	10,867	-3,000 (fixed)	167,388	0,000	0,000	0,000	3,012	6,044	9,107	12,135	14,828	17,027	19,743	20,630	20,345	19,168
209830	12,853	-3,000 (fixed)	165,880	0,000	0,000	0,000	2,729	5,480	8,273	11,108	13,883	16,177	18,739	19,660	19,525	18,575
244319	14,840	-3,000 (fixed)	164,648	0,000	0,000	0,000	2,544	5,108	7,715	10,383	13,041	15,165	17,626	18,632	18,678	17,964
279179	16,827	-3,000 (fixed)	163,604	0,000	0,000	0,000	2,423	4,865	7,346	9,884	12,192	14,042	16,441	17,564	17,811	17,350
314491	18,813	-3,000 (fixed)	162,645	0,000	0,000	0,000	2,348	4,712	7,111	9,415	11,318	12,894	15,196	16,456	16,920	16,726
350310	20,802	-3,000 (fixed)	161,722	0,000	0,000	0,000	2,305	4,624	6,914	8,832	10,415	11,766	13,909	15,308	16,004	16,088


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
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15
12
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3
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-3
30000
60000
90000
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150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

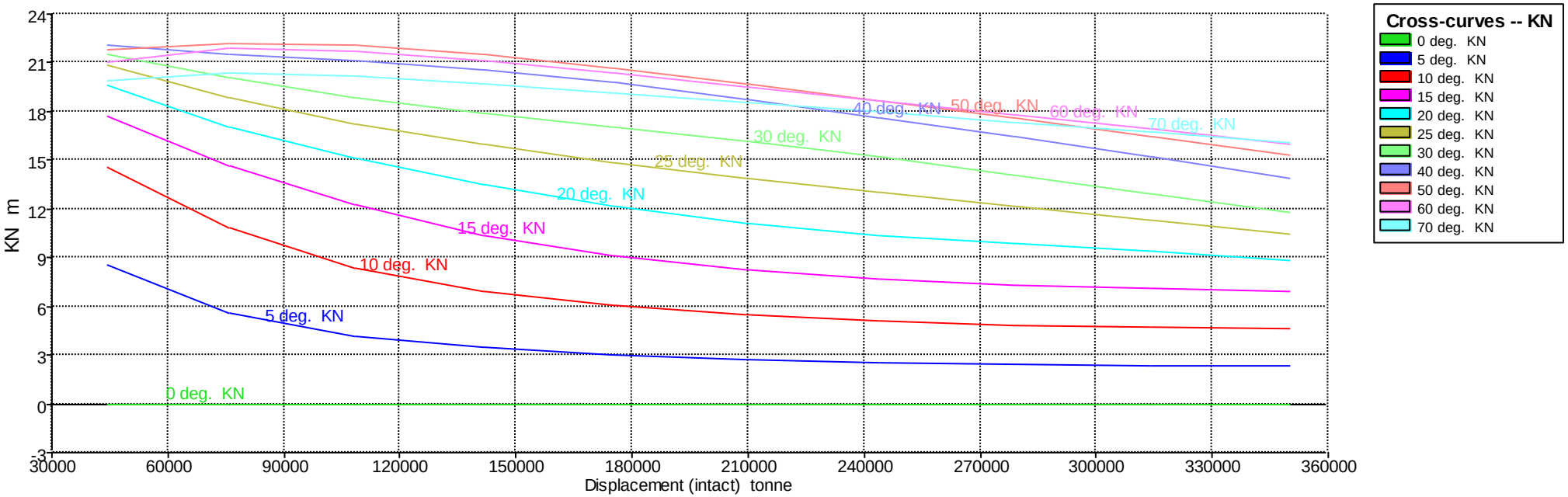
Damage Case - Intact

Fixed Trim = -2,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
44393	2,920	-2,500 (fixed)	182,094	0,000	0,000	0,000	8,499	14,591	17,726	19,618	20,822	21,567	22,113	21,808	21,034	19,901
76065	4,907	-2,500 (fixed)	174,541	0,000	0,000	0,000	5,541	10,801	14,614	17,078	18,803	20,049	21,560	22,194	21,874	20,385
108663	6,893	-2,500 (fixed)	170,667	0,000	0,000	0,000	4,196	8,357	12,224	15,115	17,230	18,847	21,105	22,118	21,672	20,168
141887	8,880	-2,500 (fixed)	168,187	0,000	0,000	0,000	3,460	6,932	10,374	13,501	15,939	17,865	20,581	21,498	21,095	19,721
175577	10,867	-2,500 (fixed)	166,422	0,000	0,000	0,000	3,015	6,051	9,119	12,151	14,842	17,038	19,755	20,640	20,352	19,173
209698	12,853	-2,500 (fixed)	165,040	0,000	0,000	0,000	2,731	5,484	8,279	11,119	13,896	16,193	18,751	19,668	19,531	18,579
244212	14,840	-2,500 (fixed)	163,900	0,000	0,000	0,000	2,545	5,111	7,719	10,391	13,057	15,181	17,637	18,640	18,683	17,968
279099	16,827	-2,500 (fixed)	162,925	0,000	0,000	0,000	2,424	4,867	7,350	9,891	12,205	14,056	16,451	17,572	17,815	17,353
314456	18,813	-2,500 (fixed)	162,010	0,000	0,000	0,000	2,348	4,713	7,114	9,424	11,327	12,904	15,204	16,460	16,923	16,728
350308	20,802	-2,500 (fixed)	161,129	0,000	0,000	0,000	2,305	4,625	6,921	8,839	10,421	11,771	13,914	15,312	16,006	16,090


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
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-3
30000
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120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

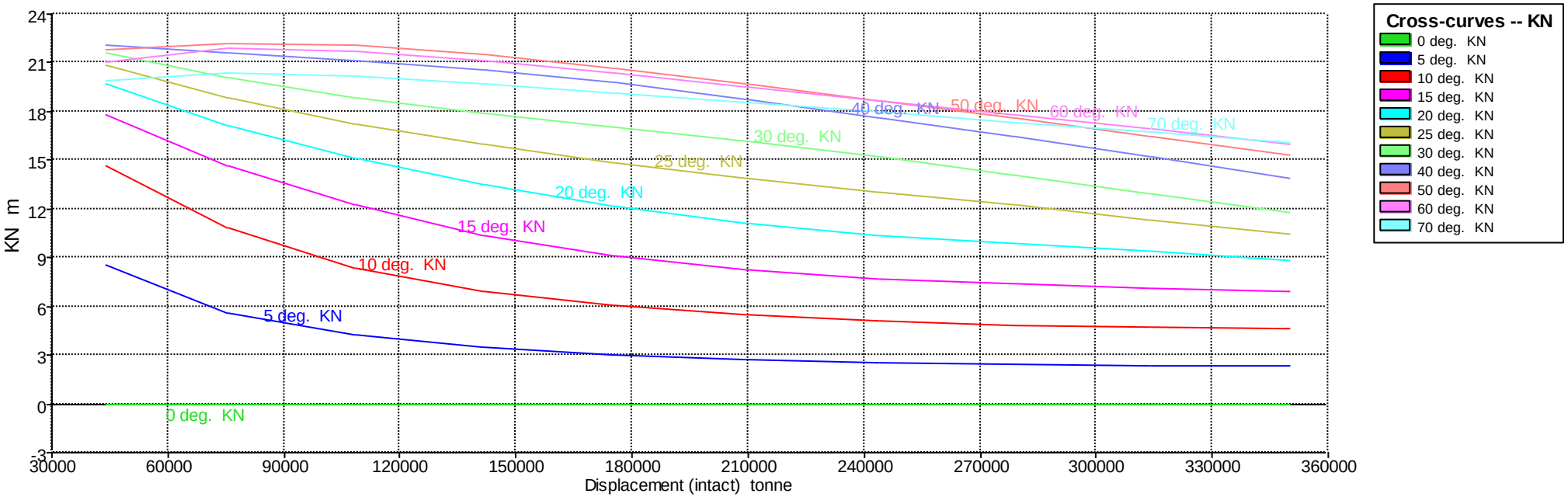
Damage Case - Intact

Fixed Trim = -2 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
44069	2,920	-2,000 (fixed)	179,101	0,000	0,000	0,000	8,585	14,678	17,788	19,667	20,860	21,594	22,124	21,805	21,015	19,895
75808	4,907	-2,000 (fixed)	172,607	0,000	0,000	0,000	5,568	10,852	14,654	17,107	18,825	20,065	21,568	22,193	21,880	20,391
108449	6,893	-2,000 (fixed)	169,227	0,000	0,000	0,000	4,208	8,381	12,255	15,138	17,246	18,858	21,110	22,127	21,681	20,174
141699	8,880	-2,000 (fixed)	167,041	0,000	0,000	0,000	3,466	6,945	10,394	13,521	15,953	17,875	20,591	21,509	21,103	19,726
175423	10,867	-2,000 (fixed)	165,453	0,000	0,000	0,000	3,018	6,058	9,131	12,167	14,855	17,048	19,766	20,648	20,358	19,177
209570	12,853	-2,000 (fixed)	164,197	0,000	0,000	0,000	2,733	5,488	8,287	11,130	13,909	16,208	18,762	19,676	19,536	18,583
244110	14,840	-2,000 (fixed)	163,150	0,000	0,000	0,000	2,546	5,113	7,724	10,398	13,072	15,196	17,647	18,647	18,687	17,970
279024	16,827	-2,000 (fixed)	162,244	0,000	0,000	0,000	2,425	4,869	7,353	9,898	12,218	14,069	16,460	17,577	17,819	17,355
314428	18,813	-2,000 (fixed)	161,373	0,000	0,000	0,000	2,349	4,715	7,117	9,432	11,335	12,912	15,211	16,465	16,926	16,730
350311	20,802	-2,000 (fixed)	160,533	0,000	0,000	0,000	2,306	4,627	6,928	8,844	10,426	11,776	13,918	15,314	16,008	16,091


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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-3
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150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

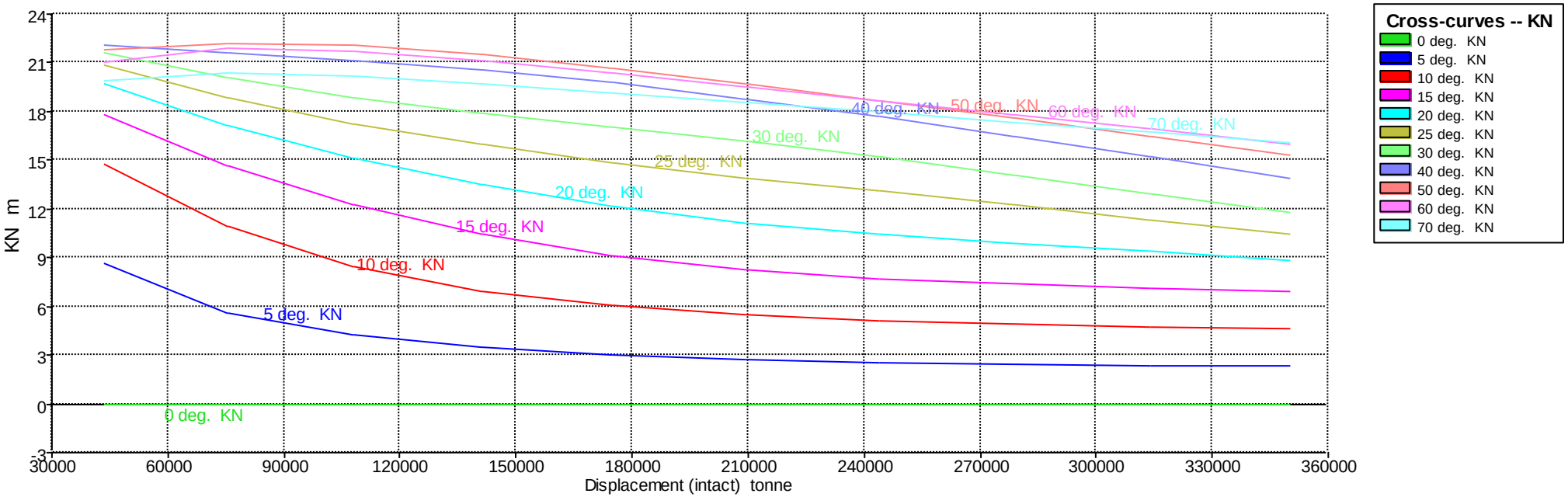
Damage Case - Intact

Fixed Trim = -1,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
43756	2,920	-1,500 (fixed)	176,041	0,000	0,000	0,000	8,667	14,754	17,841	19,710	20,894	21,619	22,134	21,802	20,999	19,890
75558	4,907	-1,500 (fixed)	170,653	0,000	0,000	0,000	5,595	10,901	14,690	17,132	18,843	20,079	21,574	22,192	21,885	20,396
108241	6,893	-1,500 (fixed)	167,778	0,000	0,000	0,000	4,220	8,405	12,283	15,158	17,260	18,868	21,115	22,135	21,689	20,179
141521	8,880	-1,500 (fixed)	165,883	0,000	0,000	0,000	3,472	6,957	10,414	13,539	15,966	17,884	20,601	21,518	21,110	19,731
175273	10,867	-1,500 (fixed)	164,479	0,000	0,000	0,000	3,022	6,065	9,142	12,183	14,868	17,058	19,776	20,655	20,364	19,181
209447	12,853	-1,500 (fixed)	163,352	0,000	0,000	0,000	2,735	5,492	8,294	11,142	13,922	16,222	18,771	19,683	19,541	18,586
244012	14,840	-1,500 (fixed)	162,398	0,000	0,000	0,000	2,547	5,116	7,729	10,406	13,087	15,210	17,656	18,654	18,692	17,973
278955	16,827	-1,500 (fixed)	161,560	0,000	0,000	0,000	2,426	4,871	7,357	9,905	12,230	14,081	16,468	17,582	17,822	17,357
314405	18,813	-1,500 (fixed)	160,733	0,000	0,000	0,000	2,350	4,717	7,120	9,439	11,343	12,920	15,217	16,468	16,928	16,731
350320	20,802	-1,500 (fixed)	159,937	0,000	0,000	0,000	2,307	4,628	6,933	8,849	10,430	11,780	13,922	15,317	16,010	16,092


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
18
15
12
9
6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

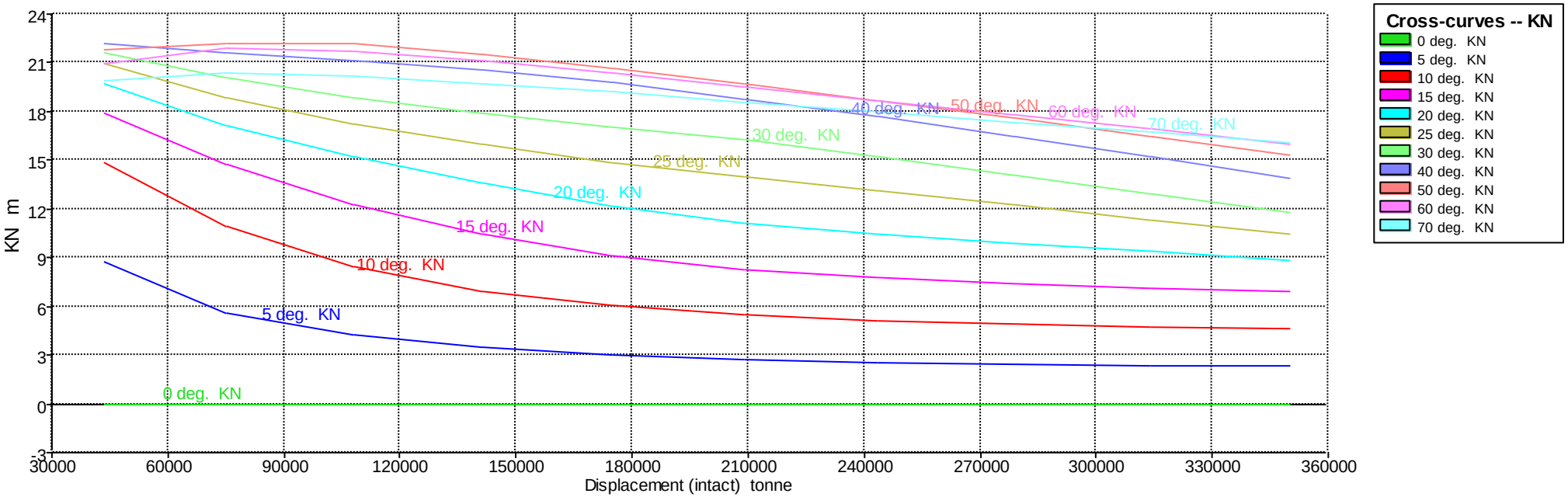
Damage Case - Intact

Fixed Trim = -1 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
43454	2,920	-1,000 (fixed)	172,916	0,000	0,000	0,000	8,746	14,821	17,887	19,747	20,923	21,641	22,143	21,800	20,983	19,885
75314	4,907	-1,000 (fixed)	168,678	0,000	0,000	0,000	5,621	10,947	14,721	17,154	18,859	20,092	21,580	22,191	21,888	20,400
108038	6,893	-1,000 (fixed)	166,318	0,000	0,000	0,000	4,231	8,428	12,310	15,176	17,273	18,876	21,119	22,142	21,696	20,184
141347	8,880	-1,000 (fixed)	164,718	0,000	0,000	0,000	3,478	6,970	10,433	13,557	15,978	17,892	20,608	21,526	21,116	19,735
175128	10,867	-1,000 (fixed)	163,502	0,000	0,000	0,000	3,025	6,072	9,154	12,199	14,881	17,067	19,784	20,661	20,369	19,185
209328	12,853	-1,000 (fixed)	162,503	0,000	0,000	0,000	2,737	5,497	8,301	11,153	13,935	16,234	18,780	19,689	19,545	18,589
243916	14,840	-1,000 (fixed)	161,645	0,000	0,000	0,000	2,549	5,119	7,734	10,415	13,100	15,222	17,664	18,659	18,696	17,975
278891	16,827	-1,000 (fixed)	160,874	0,000	0,000	0,000	2,427	4,874	7,361	9,913	12,241	14,093	16,475	17,587	17,824	17,359
314389	18,813	-1,000 (fixed)	160,092	0,000	0,000	0,000	2,351	4,719	7,123	9,446	11,349	12,927	15,222	16,471	16,930	16,732
350333	20,802	-1,000 (fixed)	159,339	0,000	0,000	0,000	2,308	4,630	6,937	8,852	10,433	11,783	13,925	15,319	16,011	16,093


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
18
15
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6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

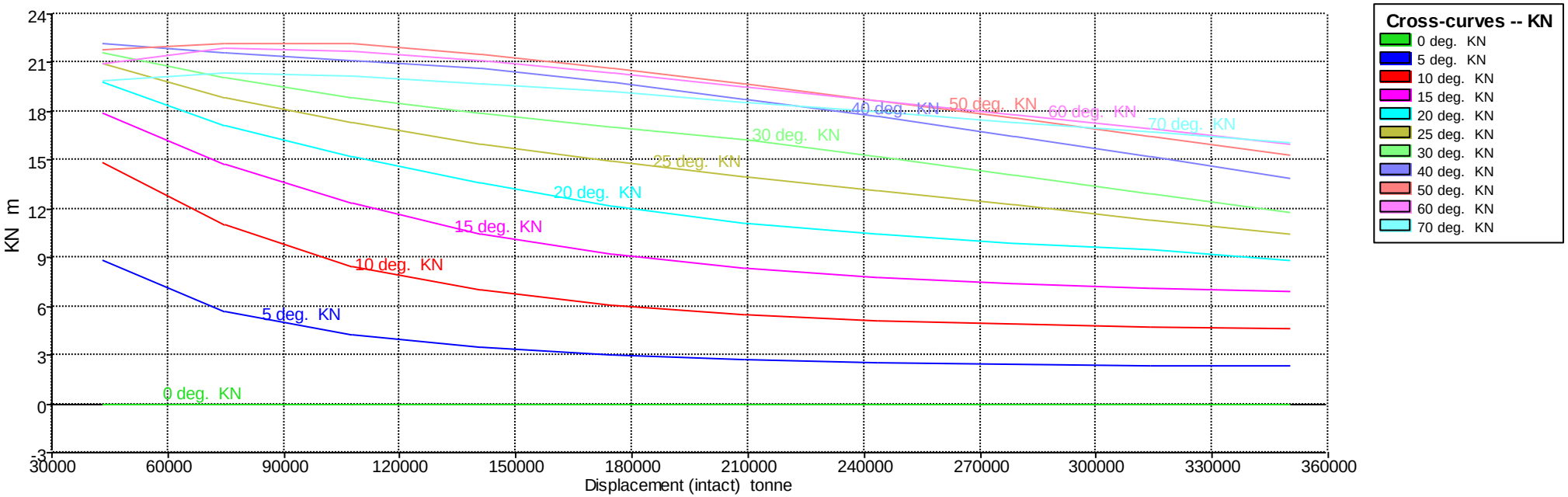
Damage Case - Intact

Fixed Trim = -0,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
43163	2,920	-0,500 (fixed)	169,729	0,000	0,000	0,000	8,822	14,876	17,925	19,778	20,948	21,659	22,151	21,798	20,970	19,881
75078	4,907	-0,500 (fixed)	166,683	0,000	0,000	0,000	5,646	10,990	14,749	17,173	18,873	20,102	21,584	22,190	21,891	20,404
107840	6,893	-0,500 (fixed)	164,849	0,000	0,000	0,000	4,242	8,452	12,335	15,193	17,284	18,884	21,123	22,148	21,701	20,189
141178	8,880	-0,500 (fixed)	163,548	0,000	0,000	0,000	3,484	6,982	10,452	13,573	15,989	17,900	20,614	21,533	21,122	19,739
174987	10,867	-0,500 (fixed)	162,520	0,000	0,000	0,000	3,028	6,080	9,167	12,215	14,892	17,075	19,792	20,667	20,374	19,189
209213	12,853	-0,500 (fixed)	161,652	0,000	0,000	0,000	2,739	5,501	8,309	11,165	13,948	16,246	18,787	19,694	19,549	18,592
243824	14,840	-0,500 (fixed)	160,890	0,000	0,000	0,000	2,550	5,122	7,740	10,423	13,113	15,234	17,672	18,664	18,699	17,977
278836	16,827	-0,500 (fixed)	160,183	0,000	0,000	0,000	2,428	4,876	7,365	9,920	12,251	14,103	16,481	17,590	17,827	17,360
314377	18,813	-0,500 (fixed)	159,448	0,000	0,000	0,000	2,352	4,721	7,127	9,451	11,355	12,933	15,226	16,473	16,931	16,733
350352	20,802	-0,500 (fixed)	158,740	0,000	0,000	0,000	2,309	4,632	6,941	8,855	10,435	11,785	13,927	15,320	16,012	16,094


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
18
15
12
9
6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

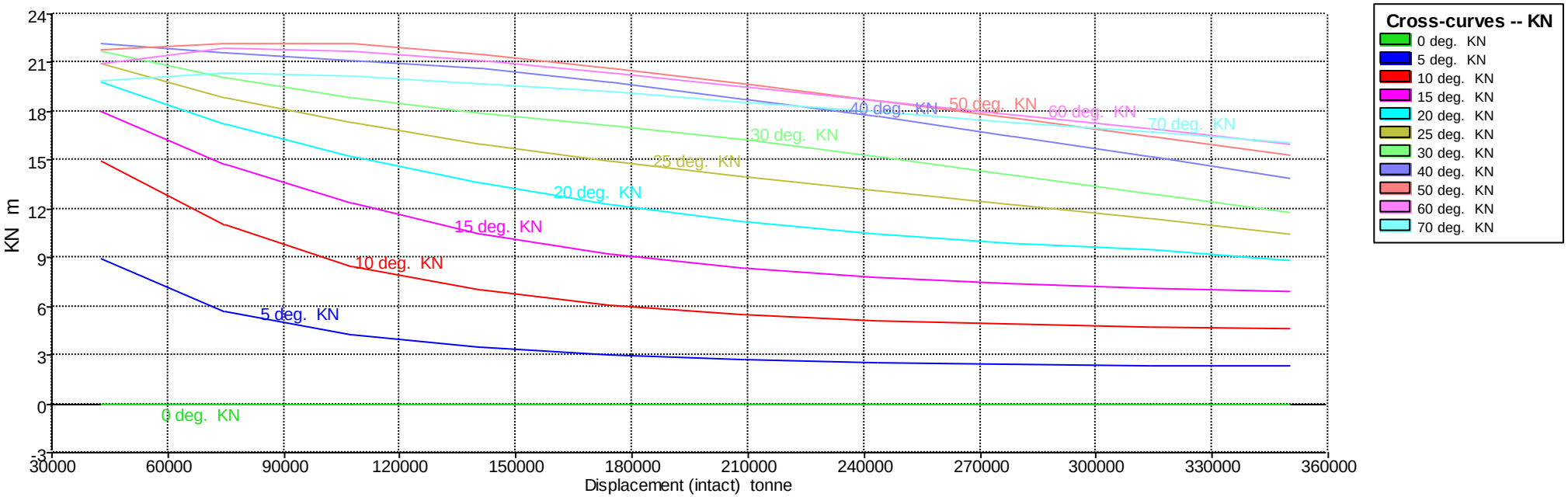
Damage Case - Intact

Fixed 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
42881	2,920	0,000 (fixed)	166,484	0,000	0,000	0,000	8,894	14,920	17,956	19,803	20,969	21,675	22,158	21,795	20,959	19,877
74848	4,907	0,000 (fixed)	164,668	0,000	0,000	0,000	5,672	11,030	14,772	17,188	18,884	20,111	21,588	22,190	21,892	20,409
107648	6,893	0,000 (fixed)	163,370	0,000	0,000	0,000	4,254	8,474	12,358	15,207	17,293	18,890	21,126	22,152	21,706	20,194
141014	8,880	0,000 (fixed)	162,373	0,000	0,000	0,000	3,490	6,995	10,471	13,588	15,999	17,907	20,619	21,538	21,126	19,742
174851	10,867	0,000 (fixed)	161,535	0,000	0,000	0,000	3,032	6,087	9,179	12,230	14,904	17,084	19,799	20,671	20,377	19,192
209103	12,853	0,000 (fixed)	160,798	0,000	0,000	0,000	2,741	5,506	8,317	11,177	13,960	16,255	18,793	19,698	19,552	18,594
243738	14,840	0,000 (fixed)	160,132	0,000	0,000	0,000	2,552	5,126	7,745	10,432	13,126	15,244	17,678	18,669	18,702	17,979
278792	16,827	0,000 (fixed)	159,488	0,000	0,000	0,000	2,430	4,879	7,370	9,927	12,259	14,111	16,487	17,593	17,829	17,361
314372	18,813	0,000 (fixed)	158,803	0,000	0,000	0,000	2,353	4,724	7,131	9,456	11,359	12,938	15,230	16,475	16,932	16,734
350376	20,802	0,000 (fixed)	158,139	0,000	0,000	0,000	2,310	4,634	6,943	8,857	10,437	11,786	13,929	15,321	16,012	16,094


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
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18
15
12
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6
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0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

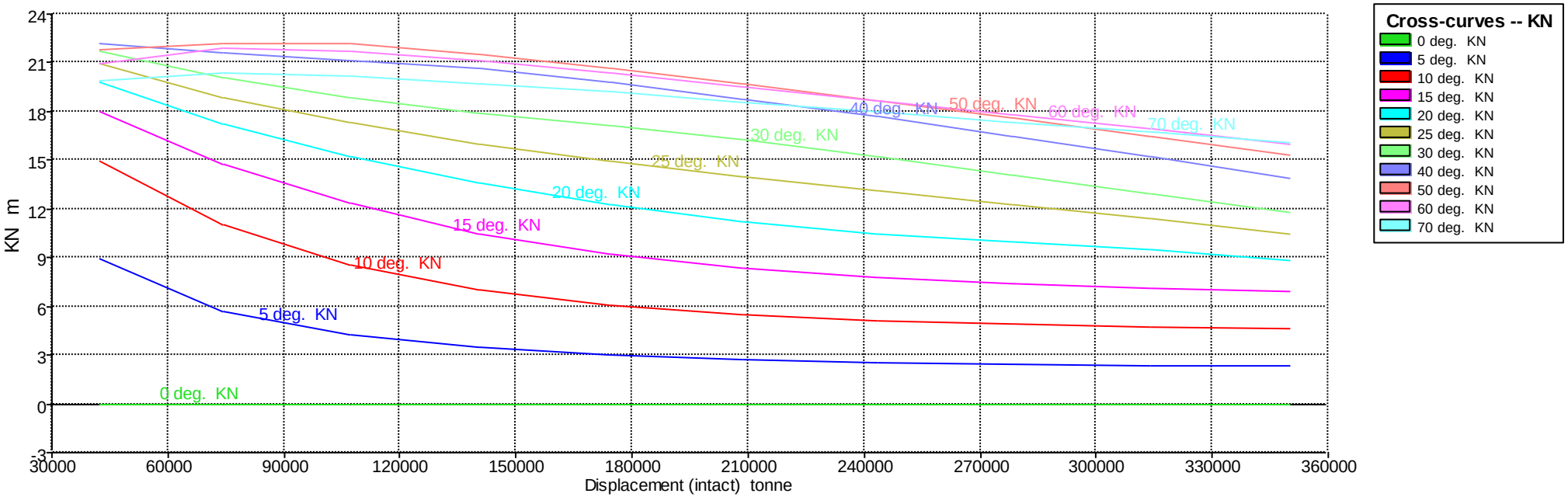
Damage Case - Intact

Fixed Trim = 0,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
42610	2,920	0,500 (fixed)	163,182	0,000	0,000	0,000	8,962	14,952	17,978	19,821	20,985	21,688	22,164	21,793	20,950	19,872
74625	4,907	0,500 (fixed)	162,635	0,000	0,000	0,000	5,696	11,065	14,792	17,200	18,893	20,117	21,590	22,190	21,892	20,413
107461	6,893	0,500 (fixed)	161,883	0,000	0,000	0,000	4,265	8,497	12,379	15,220	17,301	18,895	21,128	22,155	21,710	20,198
140855	8,880	0,500 (fixed)	161,192	0,000	0,000	0,000	3,496	7,008	10,490	13,602	16,009	17,913	20,623	21,541	21,130	19,746
174719	10,867	0,500 (fixed)	160,546	0,000	0,000	0,000	3,035	6,094	9,191	12,245	14,914	17,092	19,804	20,675	20,380	19,195
208997	12,853	0,500 (fixed)	159,941	0,000	0,000	0,000	2,743	5,511	8,325	11,189	13,973	16,264	18,798	19,702	19,554	18,596
243657	14,840	0,500 (fixed)	159,371	0,000	0,000	0,000	2,554	5,130	7,751	10,442	13,137	15,253	17,683	18,672	18,705	17,980
278756	16,827	0,500 (fixed)	158,788	0,000	0,000	0,000	2,431	4,882	7,375	9,934	12,267	14,119	16,491	17,596	17,830	17,362
314371	18,813	0,500 (fixed)	158,156	0,000	0,000	0,000	2,355	4,726	7,135	9,459	11,363	12,942	15,232	16,476	16,932	16,734
350404	20,802	0,500 (fixed)	157,537	0,000	0,000	0,000	2,311	4,637	6,944	8,857	10,437	11,787	13,930	15,321	16,013	16,094


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

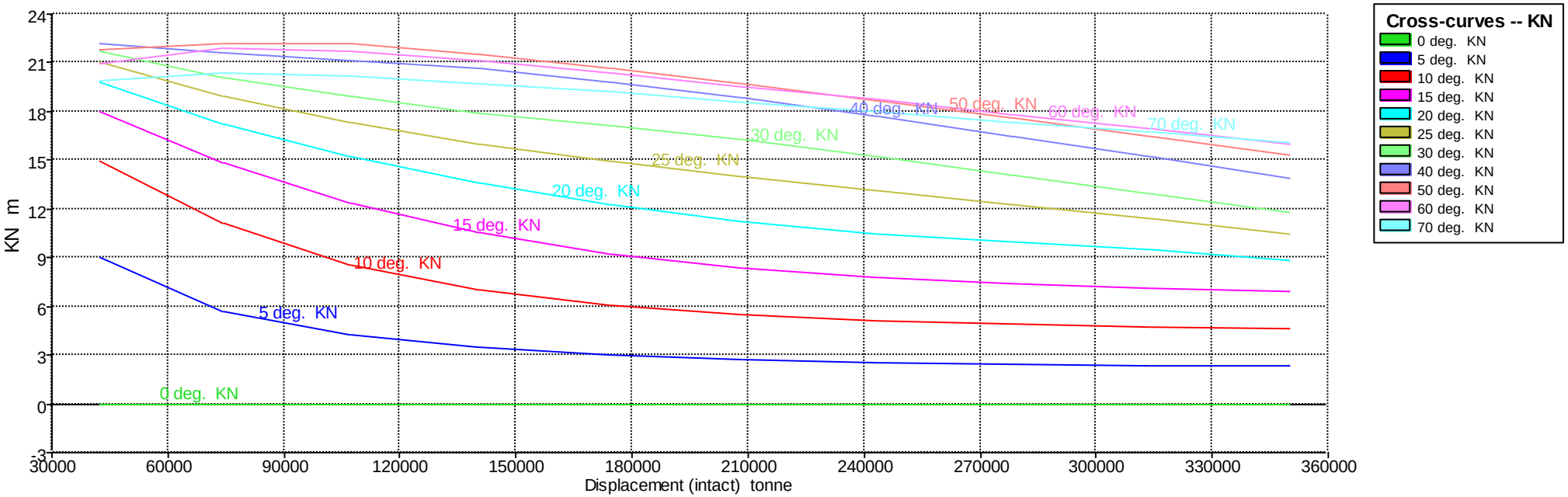
Damage Case - Intact

Fixed Trim = 1 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
42348	2,920	1,000 (fixed)	159,827	0,000	0,000	0,000	9,026	14,973	17,992	19,833	20,997	21,699	22,169	21,791	20,942	19,865
74408	4,907	1,000 (fixed)	160,583	0,000	0,000	0,000	5,720	11,097	14,806	17,210	18,899	20,121	21,593	22,189	21,893	20,417
107280	6,893	1,000 (fixed)	160,386	0,000	0,000	0,000	4,276	8,519	12,397	15,230	17,308	18,899	21,129	22,156	21,713	20,202
140700	8,880	1,000 (fixed)	160,005	0,000	0,000	0,000	3,502	7,020	10,508	13,615	16,017	17,919	20,625	21,544	21,133	19,748
174591	10,867	1,000 (fixed)	159,553	0,000	0,000	0,000	3,039	6,102	9,204	12,260	14,925	17,099	19,808	20,677	20,381	19,197
208895	12,853	1,000 (fixed)	159,081	0,000	0,000	0,000	2,746	5,516	8,334	11,202	13,985	16,271	18,803	19,705	19,557	18,597
243581	14,840	1,000 (fixed)	158,608	0,000	0,000	0,000	2,555	5,133	7,758	10,452	13,148	15,261	17,688	18,675	18,707	17,981
278726	16,827	1,000 (fixed)	158,086	0,000	0,000	0,000	2,433	4,885	7,380	9,941	12,274	14,125	16,493	17,597	17,831	17,362
314376	18,813	1,000 (fixed)	157,507	0,000	0,000	0,000	2,356	4,729	7,139	9,462	11,365	12,945	15,234	16,476	16,932	16,734
350438	20,802	1,000 (fixed)	156,934	0,000	0,000	0,000	2,312	4,639	6,945	8,857	10,437	11,787	13,931	15,321	16,012	16,094


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
18
15
12
9
6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

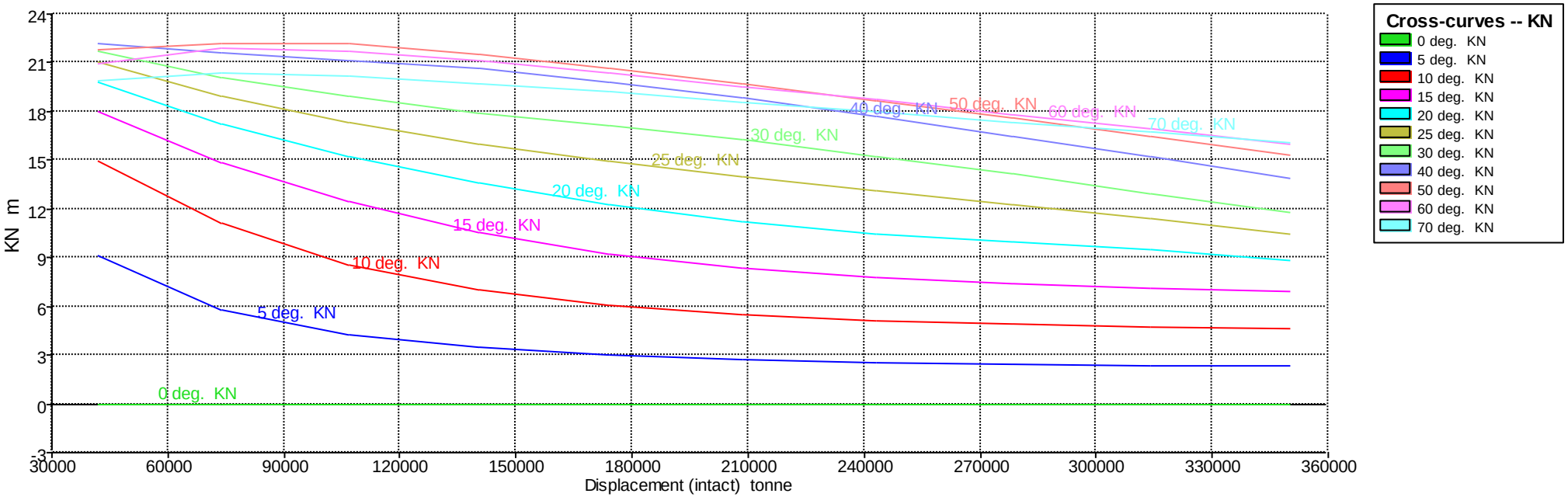
Damage Case - Intact

Fixed Trim = 1,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
42097	2,920	1,500 (fixed)	156,421	0,000	0,000	0,000	9,082	14,983	17,998	19,839	21,004	21,706	22,173	21,790	20,936	19,858
74198	4,907	1,500 (fixed)	158,514	0,000	0,000	0,000	5,744	11,123	14,817	17,215	18,903	20,124	21,594	22,189	21,893	20,420
107104	6,893	1,500 (fixed)	158,881	0,000	0,000	0,000	4,287	8,540	12,414	15,239	17,313	18,902	21,130	22,157	21,715	20,205
140551	8,880	1,500 (fixed)	158,813	0,000	0,000	0,000	3,508	7,033	10,527	13,627	16,024	17,924	20,626	21,545	21,135	19,751
174468	10,867	1,500 (fixed)	158,557	0,000	0,000	0,000	3,042	6,110	9,216	12,275	14,934	17,106	19,811	20,679	20,382	19,199
208798	12,853	1,500 (fixed)	158,219	0,000	0,000	0,000	2,748	5,521	8,342	11,215	13,997	16,277	18,806	19,707	19,559	18,598
243511	14,840	1,500 (fixed)	157,842	0,000	0,000	0,000	2,557	5,137	7,764	10,462	13,158	15,268	17,691	18,677	18,708	17,982
278703	16,827	1,500 (fixed)	157,380	0,000	0,000	0,000	2,434	4,888	7,385	9,948	12,280	14,131	16,495	17,598	17,831	17,362
314386	18,813	1,500 (fixed)	156,857	0,000	0,000	0,000	2,357	4,732	7,144	9,463	11,367	12,948	15,235	16,476	16,932	16,734
350476	20,802	1,500 (fixed)	156,330	0,000	0,000	0,000	2,314	4,642	6,944	8,855	10,435	11,786	13,930	15,320	16,012	16,094


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

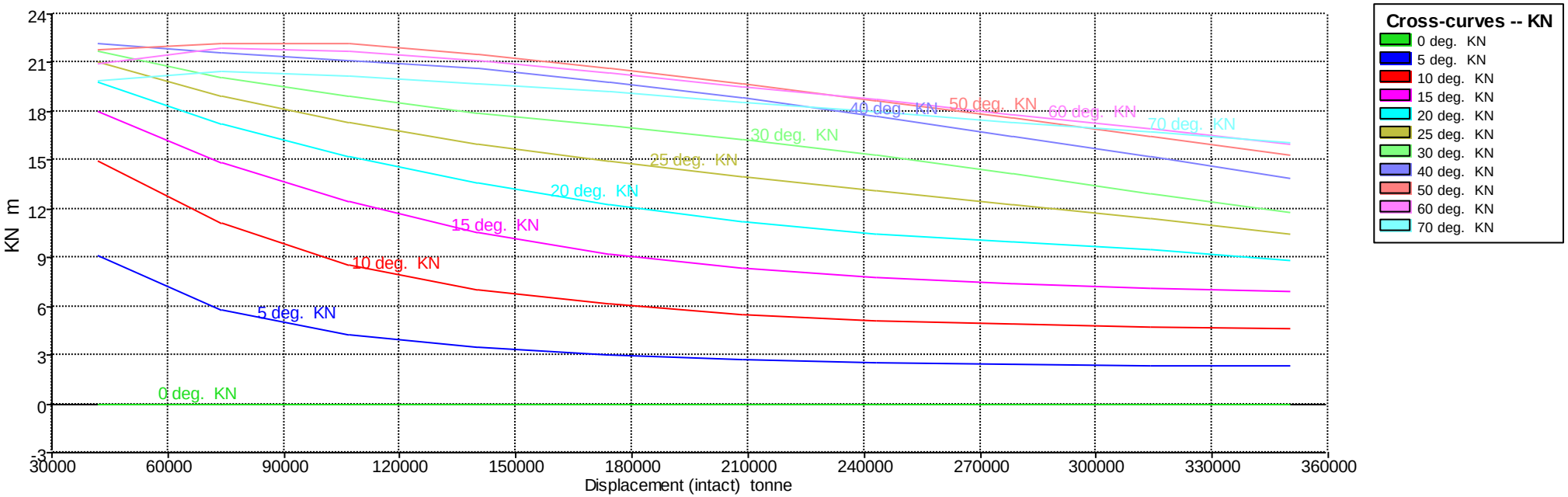
Damage Case - Intact

Fixed Trim = 2 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
41856	2,920	2,000 (fixed)	152,967	0,000	0,000	0,000	9,127	14,981	17,996	19,838	21,007	21,711	22,175	21,788	20,931	19,851
73995	4,907	2,000 (fixed)	156,428	0,000	0,000	0,000	5,767	11,146	14,823	17,218	18,904	20,124	21,594	22,189	21,892	20,423
106933	6,893	2,000 (fixed)	157,367	0,000	0,000	0,000	4,297	8,562	12,428	15,245	17,316	18,904	21,130	22,156	21,716	20,208
140405	8,880	2,000 (fixed)	157,616	0,000	0,000	0,000	3,514	7,045	10,544	13,638	16,030	17,928	20,625	21,546	21,136	19,753
174349	10,867	2,000 (fixed)	157,557	0,000	0,000	0,000	3,046	6,117	9,229	12,289	14,943	17,113	19,812	20,681	20,383	19,201
208705	12,853	2,000 (fixed)	157,354	0,000	0,000	0,000	2,751	5,526	8,351	11,228	14,009	16,282	18,808	19,709	19,560	18,599
243446	14,840	2,000 (fixed)	157,072	0,000	0,000	0,000	2,559	5,141	7,771	10,473	13,167	15,273	17,693	18,679	18,709	17,982
278685	16,827	2,000 (fixed)	156,673	0,000	0,000	0,000	2,436	4,892	7,391	9,954	12,284	14,135	16,496	17,598	17,831	17,362
314401	18,813	2,000 (fixed)	156,205	0,000	0,000	0,000	2,359	4,735	7,149	9,464	11,368	12,949	15,235	16,475	16,931	16,734
350519	20,802	2,000 (fixed)	155,725	0,000	0,000	0,000	2,315	4,645	6,942	8,853	10,433	11,784	13,930	15,319	16,011	16,094


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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21
18
15
12
9
6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

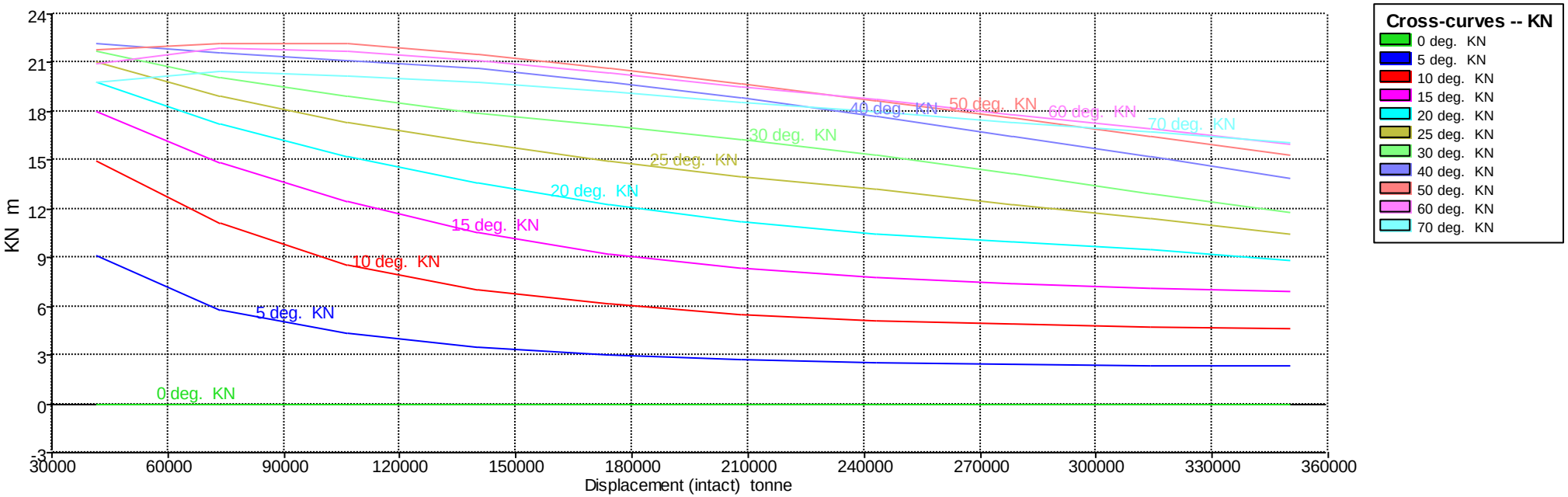
Damage Case - Intact

Fixed Trim = 2,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
41626	2,920	2,500 (fixed)	149,469	0,000	0,000	0,000	9,158	14,967	17,986	19,831	21,005	21,712	22,177	21,787	20,928	19,840
73798	4,907	2,500 (fixed)	154,326	0,000	0,000	0,000	5,789	11,163	14,825	17,217	18,902	20,122	21,593	22,189	21,890	20,424
106755	6,893	2,500 (fixed)	155,861	0,000	0,000	0,000	4,308	8,583	12,441	15,250	17,318	18,905	21,130	22,154	21,717	20,210
140265	8,880	2,500 (fixed)	156,414	0,000	0,000	0,000	3,520	7,058	10,562	13,647	16,036	17,931	20,623	21,545	21,136	19,755
174235	10,867	2,500 (fixed)	156,553	0,000	0,000	0,000	3,050	6,125	9,242	12,303	14,952	17,118	19,812	20,681	20,383	19,202
208617	12,853	2,500 (fixed)	156,486	0,000	0,000	0,000	2,753	5,532	8,360	11,241	14,021	16,285	18,809	19,710	19,561	18,600
243387	14,840	2,500 (fixed)	156,300	0,000	0,000	0,000	2,561	5,146	7,778	10,484	13,175	15,277	17,694	18,679	18,709	17,982
278674	16,827	2,500 (fixed)	155,963	0,000	0,000	0,000	2,438	4,896	7,397	9,960	12,288	14,138	16,496	17,597	17,830	17,361
314421	18,813	2,500 (fixed)	155,552	0,000	0,000	0,000	2,361	4,739	7,154	9,463	11,368	12,949	15,234	16,474	16,930	16,733
350567	20,802	2,500 (fixed)	155,118	0,000	0,000	0,000	2,317	4,648	6,940	8,849	10,429	11,781	13,928	15,317	16,009	16,093


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
18
15
12
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6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

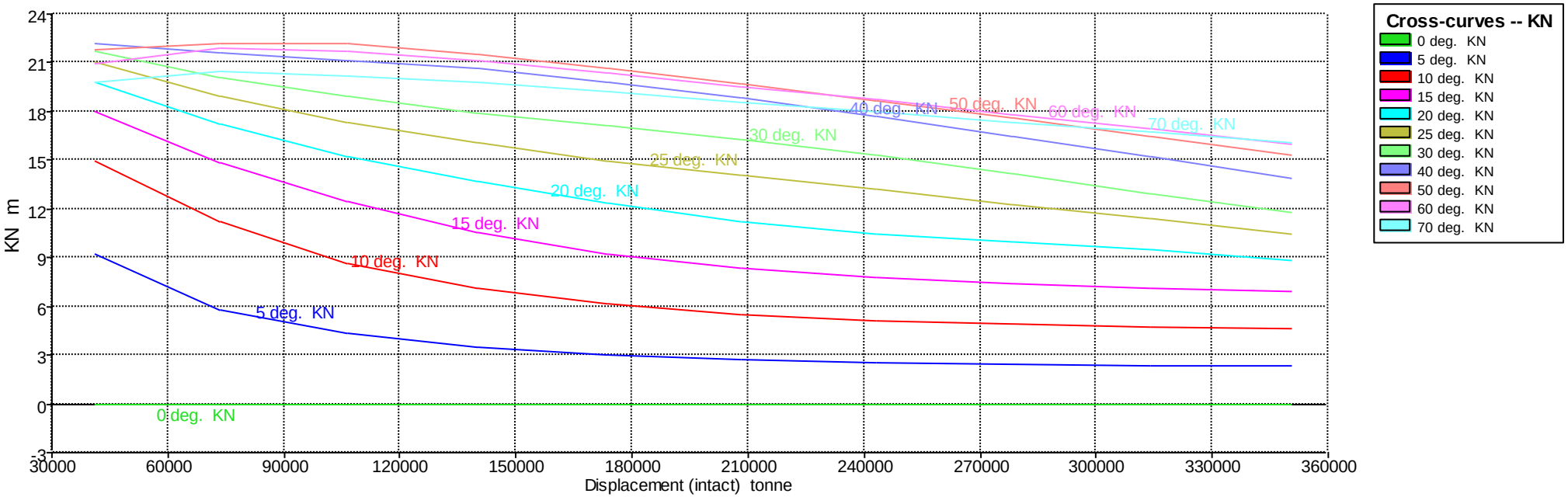
Damage Case - Intact

Fixed Trim = 3 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
41407	2,920	3,000 (fixed)	145,934	0,000	0,000	0,000	9,174	14,942	17,967	19,818	20,997	21,710	22,177	21,786	20,928	19,832
73608	4,907	3,000 (fixed)	152,209	0,000	0,000	0,000	5,810	11,176	14,823	17,213	18,898	20,118	21,591	22,188	21,887	20,425
106592	6,893	3,000 (fixed)	154,335	0,000	0,000	0,000	4,319	8,603	12,451	15,253	17,319	18,904	21,129	22,150	21,717	20,212
140129	8,880	3,000 (fixed)	155,207	0,000	0,000	0,000	3,526	7,070	10,579	13,655	16,040	17,934	20,620	21,543	21,136	19,755
174125	10,867	3,000 (fixed)	155,546	0,000	0,000	0,000	3,054	6,133	9,255	12,316	14,960	17,123	19,811	20,680	20,382	19,202
208530	12,853	3,000 (fixed)	155,617	0,000	0,000	0,000	2,756	5,538	8,370	11,254	14,033	16,287	18,809	19,710	19,562	18,600
243334	14,840	3,000 (fixed)	155,525	0,000	0,000	0,000	2,564	5,150	7,786	10,495	13,182	15,279	17,694	18,679	18,709	17,982
278668	16,827	3,000 (fixed)	155,250	0,000	0,000	0,000	2,439	4,900	7,403	9,966	12,291	14,139	16,495	17,596	17,829	17,360
314447	18,813	3,000 (fixed)	154,897	0,000	0,000	0,000	2,362	4,742	7,160	9,462	11,366	12,949	15,232	16,472	16,928	16,732
350619	20,802	3,000 (fixed)	154,511	0,000	0,000	0,000	2,318	4,651	6,936	8,844	10,425	11,777	13,926	15,315	16,008	16,092


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
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12
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6
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0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

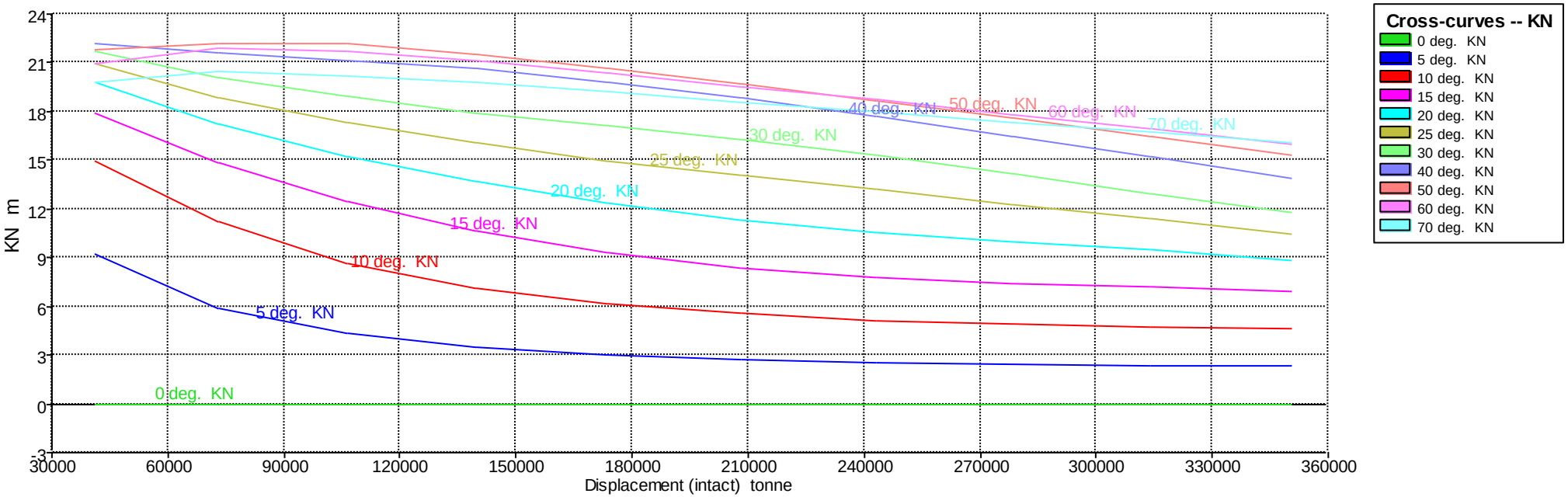
Damage Case - Intact

Fixed Trim = 3,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
41200	2,920	3,500 (fixed)	142,366	0,000	0,000	0,000	9,174	14,905	17,940	19,798	20,986	21,705	22,177	21,786	20,929	19,824
73425	4,907	3,500 (fixed)	150,076	0,000	0,000	0,000	5,831	11,183	14,817	17,206	18,892	20,112	21,588	22,187	21,883	20,425
106434	6,893	3,500 (fixed)	152,801	0,000	0,000	0,000	4,330	8,623	12,458	15,254	17,318	18,903	21,128	22,145	21,717	20,213
139998	8,880	3,500 (fixed)	153,995	0,000	0,000	0,000	3,532	7,083	10,596	13,662	16,043	17,936	20,615	21,540	21,136	19,756
174020	10,867	3,500 (fixed)	154,536	0,000	0,000	0,000	3,058	6,142	9,268	12,329	14,967	17,127	19,809	20,679	20,382	19,202
208448	12,853	3,500 (fixed)	154,746	0,000	0,000	0,000	2,759	5,544	8,379	11,268	14,045	16,287	18,808	19,709	19,562	18,599
243291	14,840	3,500 (fixed)	154,744	0,000	0,000	0,000	2,566	5,155	7,794	10,507	13,189	15,280	17,693	18,678	18,708	17,981
278668	16,827	3,500 (fixed)	154,536	0,000	0,000	0,000	2,441	4,904	7,410	9,972	12,292	14,140	16,493	17,594	17,828	17,359
314477	18,813	3,500 (fixed)	154,240	0,000	0,000	0,000	2,364	4,746	7,165	9,459	11,364	12,947	15,229	16,470	16,926	16,731
350675	20,802	3,500 (fixed)	153,902	0,000	0,000	0,000	2,320	4,654	6,932	8,839	10,420	11,773	13,923	15,312	16,005	16,091


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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18
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60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

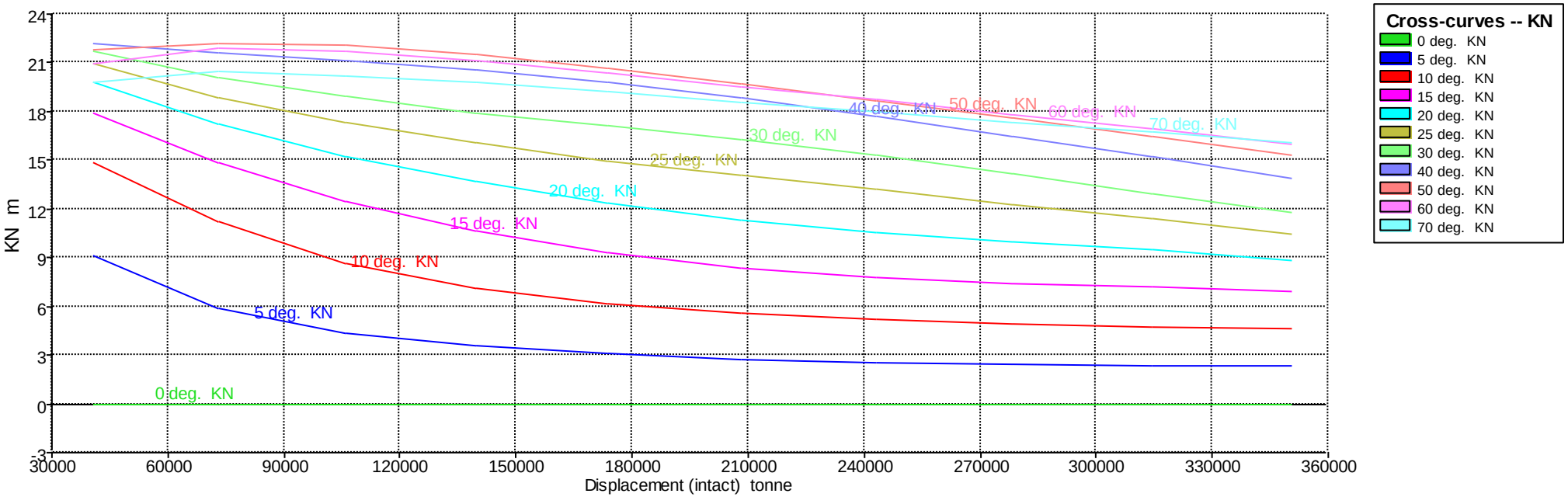
Damage Case - Intact

Fixed Trim = 4 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
41006	2,920	4,000 (fixed)	138,773	0,000	0,000	0,000	9,158	14,857	17,904	19,773	20,969	21,696	22,175	21,786	20,932	19,818
73249	4,907	4,000 (fixed)	147,930	0,000	0,000	0,000	5,850	11,185	14,806	17,196	18,883	20,104	21,584	22,186	21,878	20,424
106282	6,893	4,000 (fixed)	151,259	0,000	0,000	0,000	4,340	8,642	12,464	15,252	17,315	18,900	21,126	22,139	21,715	20,213
139871	8,880	4,000 (fixed)	152,778	0,000	0,000	0,000	3,538	7,095	10,612	13,668	16,045	17,938	20,609	21,536	21,135	19,756
173919	10,867	4,000 (fixed)	153,522	0,000	0,000	0,000	3,062	6,150	9,281	12,342	14,974	17,130	19,805	20,676	20,380	19,201
208372	12,853	4,000 (fixed)	153,871	0,000	0,000	0,000	2,762	5,550	8,389	11,282	14,056	16,287	18,805	19,708	19,561	18,598
243258	14,840	4,000 (fixed)	153,958	0,000	0,000	0,000	2,568	5,160	7,802	10,519	13,194	15,280	17,690	18,676	18,707	17,981
278673	16,827	4,000 (fixed)	153,820	0,000	0,000	0,000	2,444	4,908	7,417	9,976	12,292	14,140	16,490	17,591	17,826	17,358
314512	18,813	4,000 (fixed)	153,582	0,000	0,000	0,000	2,366	4,750	7,170	9,456	11,361	12,945	15,226	16,466	16,924	16,729
350736	20,802	4,000 (fixed)	153,293	0,000	0,000	0,000	2,322	4,658	6,926	8,832	10,414	11,768	13,919	15,309	16,003	16,089


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
24
21
18
15
12
9
6
3
0
-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN

KN Calculation - Petrolero 300000TPM

Stability 20.00.04.9, build: 9

Model file: C:\Users\Admin\Desktop\TFM\Maxurf\Petrolero 300000TPM (Medium precision, 66 sections, Trimming off, 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)

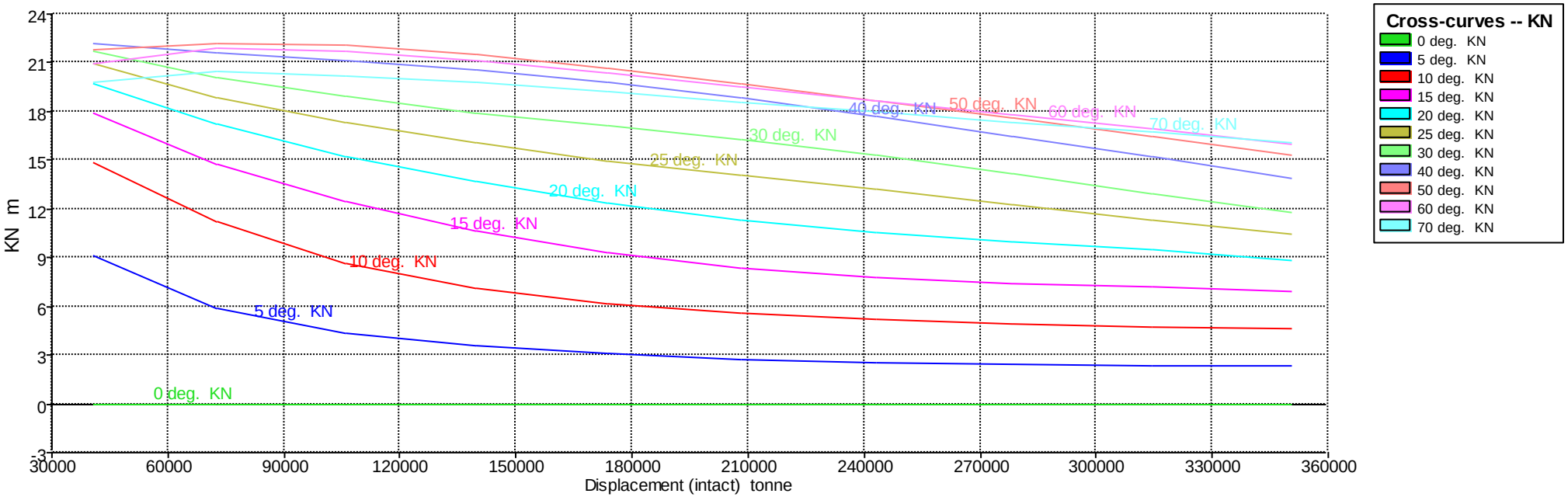
Damage Case - Intact

Fixed Trim = 4,5 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 0,0 deg.	KN 5,0 deg. Starb.	KN 10,0 deg. Starb.	KN 15,0 deg. Starb.	KN 20,0 deg. Starb.	KN 25,0 deg. Starb.	KN 30,0 deg. Starb.	KN 40,0 deg. Starb.	KN 50,0 deg. Starb.	KN 60,0 deg. Starb.	KN 70,0 deg. Starb.
40827	2,920	4,500 (fixed)	135,165	0,000	0,000	0,000	9,125	14,797	17,859	19,742	20,948	21,684	22,171	21,787	20,937	19,812
73079	4,907	4,500 (fixed)	145,771	0,000	0,000	0,000	5,869	11,182	14,792	17,182	18,871	20,093	21,579	22,184	21,872	20,422
106135	6,893	4,500 (fixed)	149,710	0,000	0,000	0,000	4,350	8,661	12,467	15,249	17,311	18,896	21,123	22,132	21,712	20,212
139750	8,880	4,500 (fixed)	151,556	0,000	0,000	0,000	3,544	7,108	10,627	13,673	16,047	17,938	20,602	21,530	21,132	19,755
173823	10,867	4,500 (fixed)	152,504	0,000	0,000	0,000	3,066	6,158	9,294	12,354	14,981	17,131	19,800	20,673	20,378	19,200
208300	12,853	4,500 (fixed)	152,994	0,000	0,000	0,000	2,765	5,556	8,400	11,296	14,066	16,285	18,802	19,706	19,559	18,597
243232	14,840	4,500 (fixed)	153,168	0,000	0,000	0,000	2,571	5,166	7,810	10,531	13,199	15,278	17,687	18,673	18,705	17,979
278683	16,827	4,500 (fixed)	153,101	0,000	0,000	0,000	2,446	4,913	7,424	9,981	12,292	14,138	16,486	17,588	17,823	17,356
314552	18,813	4,500 (fixed)	152,923	0,000	0,000	0,000	2,368	4,754	7,175	9,452	11,357	12,941	15,222	16,463	16,921	16,728
350802	20,802	4,500 (fixed)	152,683	0,000	0,000	0,000	2,323	4,661	6,920	8,824	10,407	11,762	13,915	15,305	16,000	16,088


Cross-curves -- KN
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN
KN m
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-3
30000
60000
90000
120000
150000
180000
210000
240000
270000
300000
330000
360000
Displacement (intact) tonne
0 deg. KN
5 deg. KN
10 deg. KN
15 deg. KN
20 deg. KN
25 deg. KN
30 deg. KN
40 deg. KN
50 deg. KN
60 deg. KN
70 deg. KN