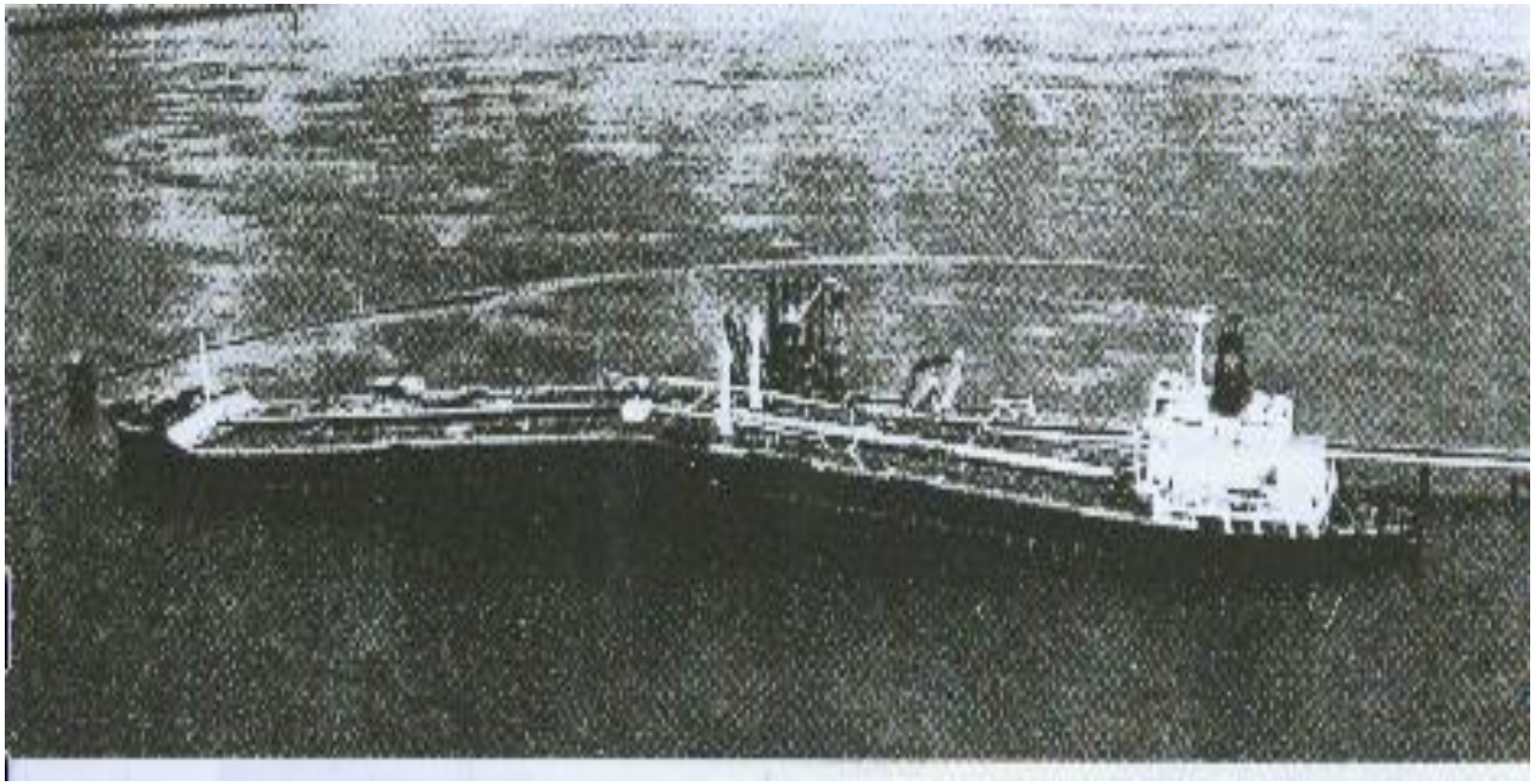
主講人 :技術處船體組　　張長根 組長

2010 CIC of Paris MoU on Port State Control

Historical Review

1980.7. A VLCC

Broke its back during discharge of oil , at Rotterdam



Historical Review

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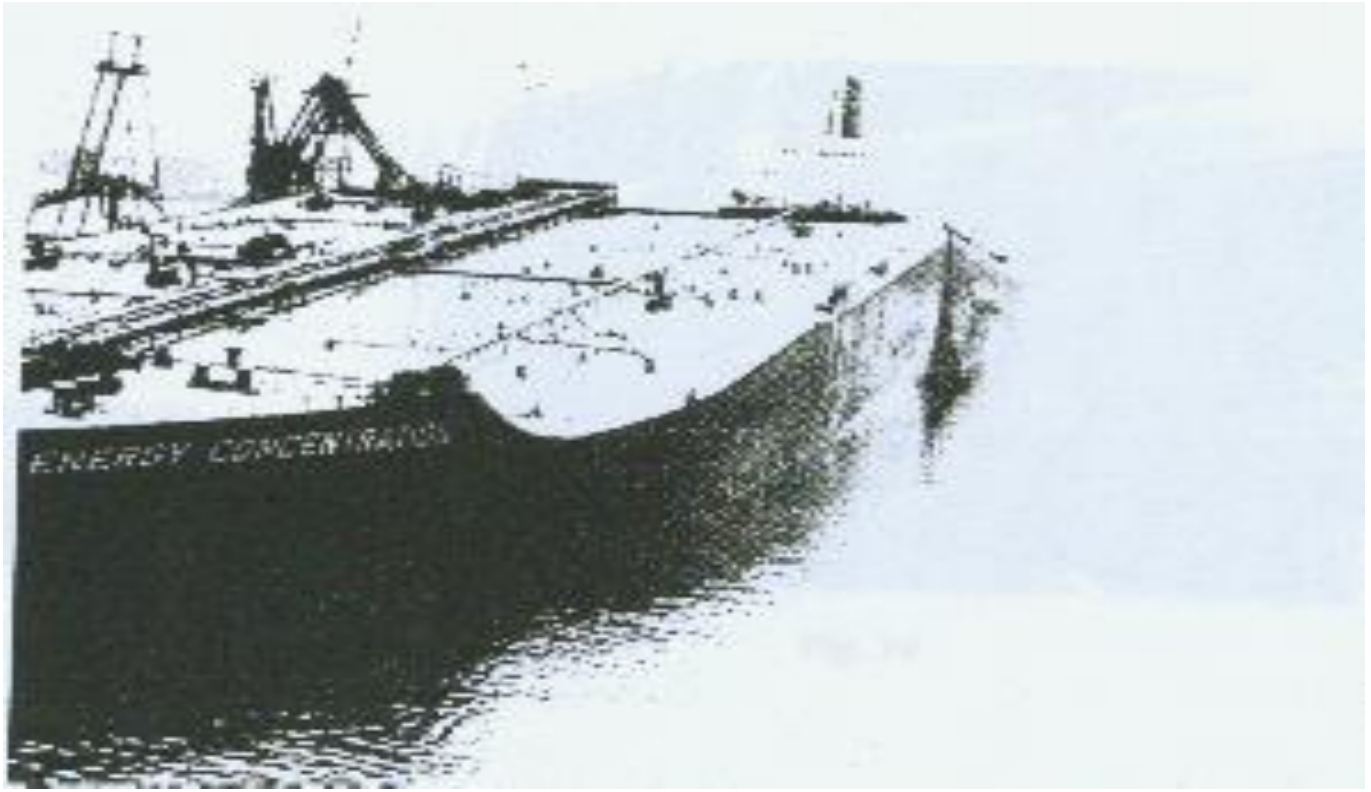
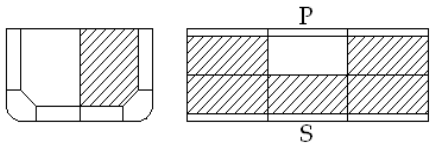
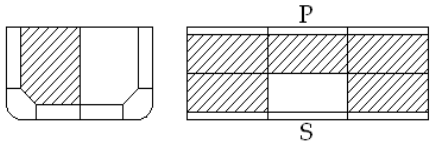
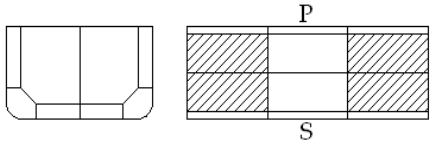
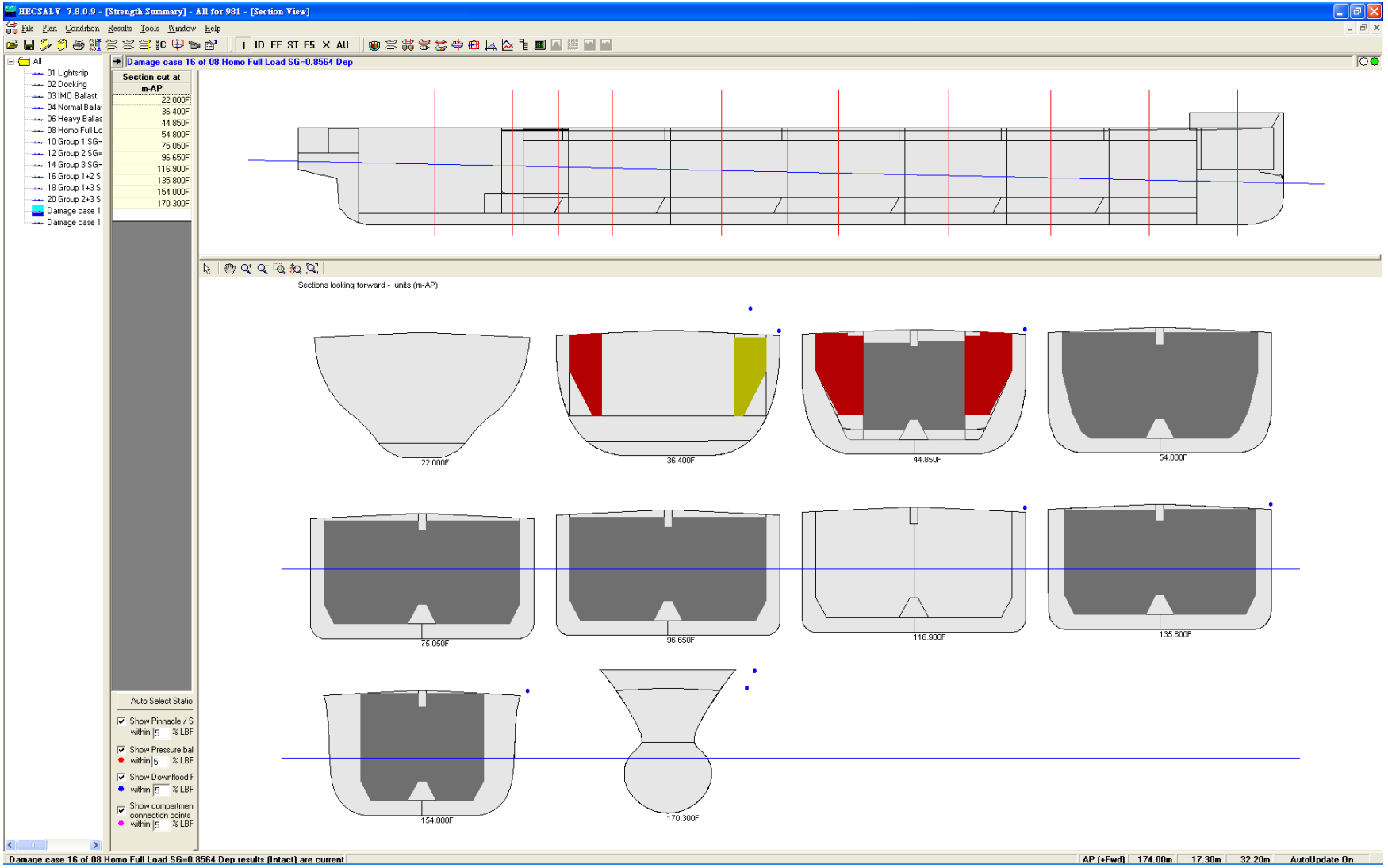


Critical load cases in CSR Oil Tanker Rule

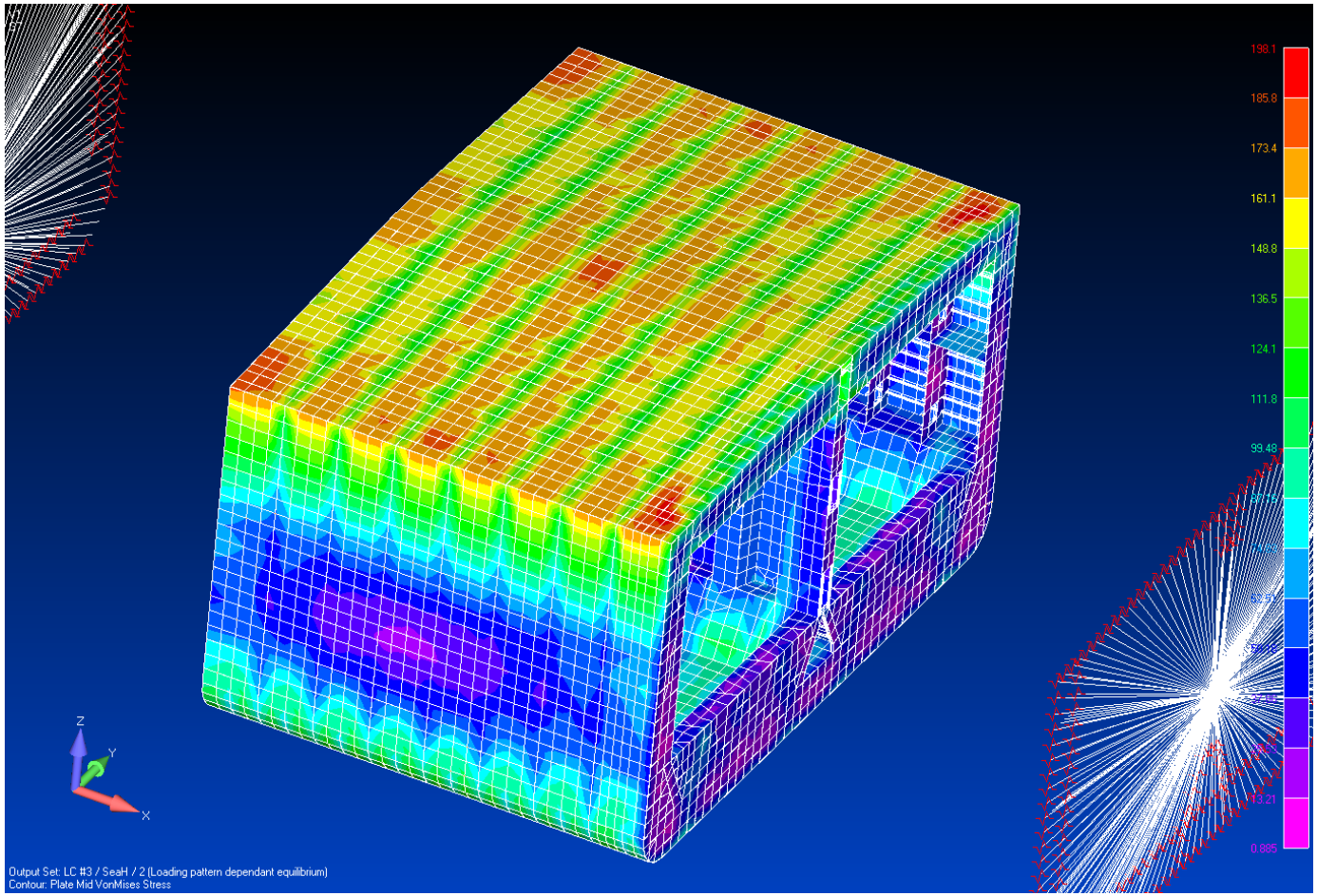
Table B.2.4
Load Cases for Tankers with One Centreline Oil-tight Longitudinal Bulkhead

Loading Pattern	Figure	Still Water Loads			Dynamic load cases		
		Draught	% of Perm. SWBM(2)	% of Perm. SWSF(2)	Strength assessment (1a)	Strength assessment against hull girder shear loads (1b)	
					Midship region	Forward region	Midship and aft regions
Design load combination S + D (Sea-going load cases)							
B1		0.9 T_{sc}	100% (sag)	See note 3	1	\	\
			100% (hog)	100% (-ve fwd) See note 4	2, 5a	\	\
B2 (6)		0.9 T_{sc}	100% (sag)	See note 3	1	\	\
			100% (hog)	100% (-ve fwd) See note 4	2, 5b	\	\
B3		0.9 T_{sc}	100% (hog)	100% (-ve fwd) See note 5	2	4	2
				100% (-ve fwd) See note 4	5a, 5b, 6a, 6b	\	\

Critical load cases in CSR Oil Tanker Rule



Critical load cases in CSR Oil Tanker Rule



2010 CIC of Paris MoU on Port State Control

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Fax +31 (0)70 456 1599
email:
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2509 LR The Hague
The Netherlands

Paris MOU
on Port State Control

Press release

27 July 2010

TANKERS INSPECTED FOR DAMAGE STABILITY BY PARIS MOU.

The Paris Memorandum on Port State Control will start a Concentrated Inspection Campaign (CIC) to verify correct damage stability on oil tankers, chemical tankers and gas carriers. This inspection campaign will last for 3 months, starting on 1 September and ending on 30 November 2010.

The reasons for this CIC include that inspections showed tankers frequently sailing when not complying with damage stability requirements or had no means of assessing damage stability or were sailing in a loading condition not covered by the approved stability book.

In practice the CIC will mean that during every port State control inspection of a tanker within the Paris MoU region, the stability information book and other applicable documentation shall be verified in more detail for compliance with relevant regulations.

Port State Control Officers (PSCOs) shall use a list of 9 selected items to verify critical areas for tanker stability. The questionnaire will be published on the website of Paris MoU.

A special training programme was organized to prepare PSCOs for the campaign.

When deficiencies are found, actions by the port State may vary from recording a deficiency to detention of the ship until deficiencies have been rectified.

In case of detention, publication in the monthly list of detentions available on the Paris MoU web page will take place.

The results of the campaign will be analysed and findings will be presented to the governing bodies of the MoU for submission to the IMO.

2010 CIC of Paris MoU on Port State Control

PARIS MOU CIC ON TANKER DAMAGE STABILITY

TANKER DAMAGE STABILITY QUESTIONNAIRE

Name	
IMO Number	
Type: Gas, Chemical, Oil	

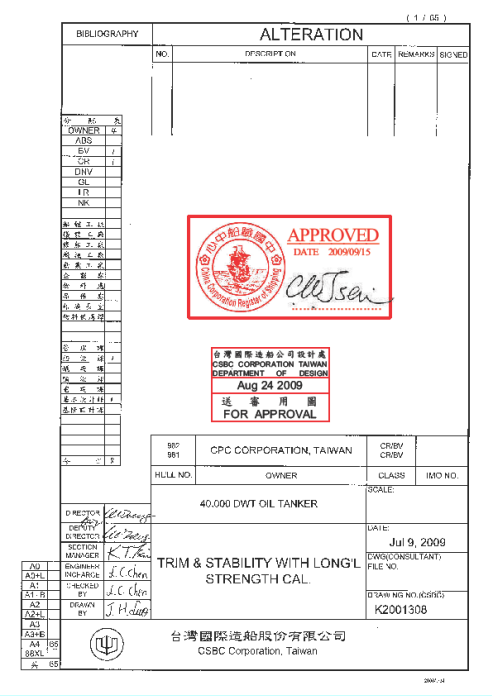
No	Question	Yes	No	N/A
1	Does the ship have an approved stability information book (SIB)?			
2	Is the SIB written in a language understood by the master?			
3	Does the approved stability information cover damage conditions?			
4	Can the master demonstrate that the ship is normally loaded in accordance with the SIB?			
5	Has the master verified an alternate loading condition by written authority from flag/class?			
6	Has the master verified an alternate loading condition by assessing loaded condition against critical damage KG data, included in the approved stability information?			
7	Is there an on-board stability computer program that includes damage stability?			
8	Has the master verified an alternate loading condition by using the on-board stability computer program for carrying out damage stability checks?			
9	Was the ship detained as a result of this CIC?			

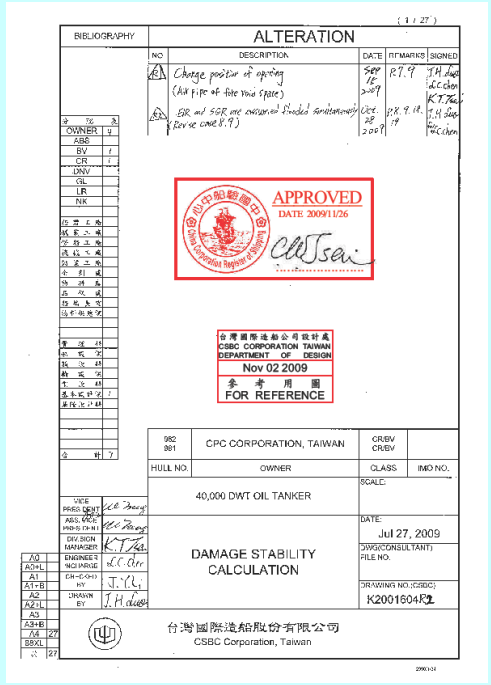
1. Does the ship have an approved stability information book (SIB) ?
2. Is the SIB written in a language understood by the master ?
3. Does the approved stability information cover damage conditions ?
4. Can the master demonstrate that the ship is normally loaded in accordance with the SIB ?
5. Has the master verified an alternate loading condition by written authority from flag/class ?
6. Has the master verified an alternate loading condition by assessing loaded condition against critical damage KG data, included in the approved stability information ?
7. Is there an on-board stability computer program that includes damage stability ?
8. Has the master verified an alternate loading condition by using the on-board stability computer program for carrying out damage stability checks ?
9. Was the ship detained as a result of this CIC ?

1.Does the ship have an approved stability information book (SIB) ?

Ans.

Stability information book is approved and stamped by RO.

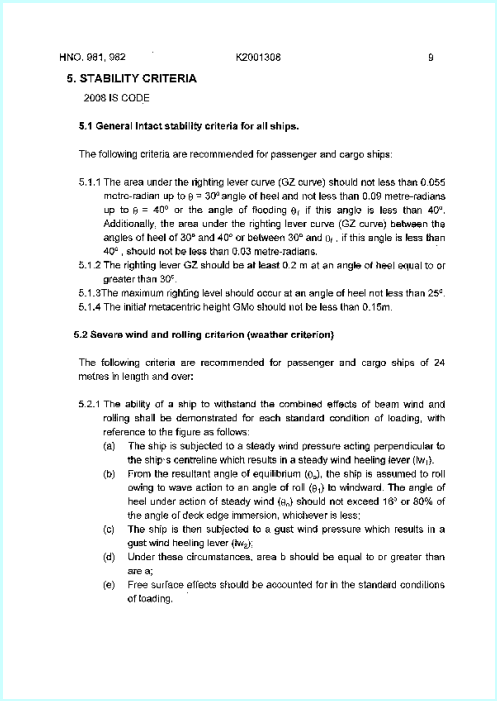




2.Is the SIB written in a language understood by the master ?

Ans.

Stability information book is written in English and/or 中文.



HNO. 981, 982 K2001308 9

5. STABILITY CRITERIA

2008 IS CODE

5.1 General Intact stability criteria for all ships.

The following criteria are recommended for passenger and cargo ships:

5.1.1 The area under the righting lever curve (GZ curve) should not less than 0.055 metre-radian up to θ = 30° angle of heel and not less than 0.09 metre-radians up to θ = 40° or the angle of flooding θ_f if this angle is less than 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and θ_f, if this angle is less than 40°, should not be less than 0.03 metre-radians.

5.1.2 The righting lever GZ should be at least 0.2 m at an angle of heel equal to or greater than 30°.

5.1.3 The maximum righting level should occur at an angle of heel not less than 25°.

5.1.4 The initial metacentric height GMo should not be less than 0.15m.

5.2 Severe wind and rolling criterion (weather criterion)

The following criteria are recommended for passenger and cargo ships of 24 metres in length and over:

5.2.1 The ability of a ship to withstand the combined effects of beam wind and rolling shall be demonstrated for each standard condition of loading, with reference to the figure as follows:

(a) The ship is subjected to a steady wind pressure acting perpendicular to the ship's centreline which results in a steady wind heeling lever (lw_1).

(b) From the resultant angle of equilibrium (θ_0), the ship is assumed to roll owing to wave action to an angle of roll (θ_1) to windward. The angle of heel under action of steady wind (θ_0) should not exceed 16° or 80% of the angle of deck edge immersion, whichever is less;

(c) The ship is then subjected to a gust wind pressure which results in a gust wind heeling lever (lw_2);

(d) Under these circumstances, area b should be equal to or greater than area a;

(e) Free surface effects should be accounted for in the standard conditions of loading.

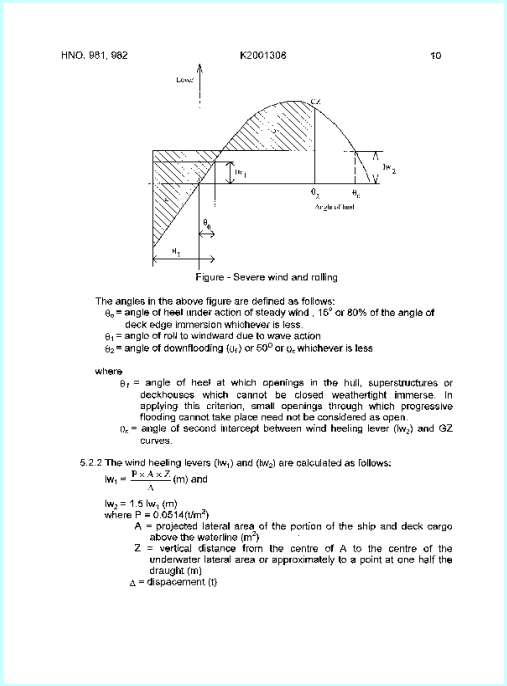


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Figure - Severe wind and rolling

The angles in the above figure are defined as follows:

θ_0 = angle of heel under action of steady wind , 16° or 80% of the angle of deck edge immersion whichever is less.

θ_1 = angle of roll to windward due to wave action

θ_2 = angle of downflooding (θ_f) or 50° or θ_c whichever is less

where

θ_f = angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.

θ_c = angle of second intercept between wind heeling lever (lw_2) and GZ curves.

5.2.2 The wind heeling levers (lw_1) and (lw_2) are calculated as follows:

$lw_1 = \frac{P \times A \times Z}{\Delta}$ (m) and

$lw_2 = 1.5\ lw_1$ (m)

where P = 0.0514(t/m²)

A = projected lateral area of the portion of the ship and deck cargo above the waterline (m^2)

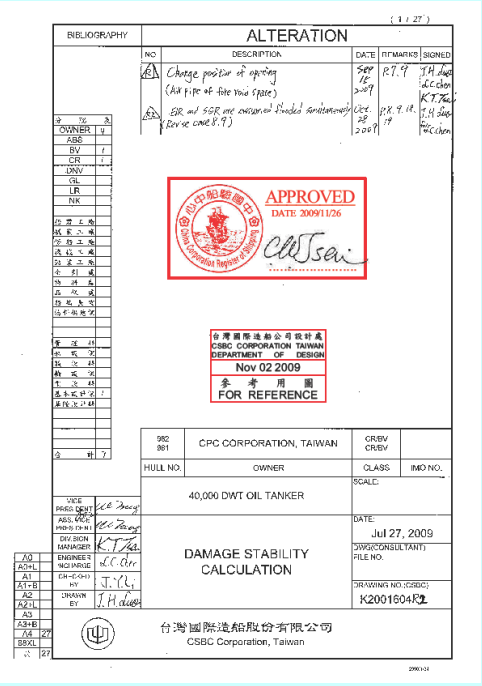
Z = vertical distance from the centre of A to the centre of the underwater lateral area or approximately to a point at one half the draught (m)

Δ = displacement (t)

3.Does the approved stability information cover damage conditions ?

Ans.

Damage stability calculation is complied with Marpol / ICLL / IBC / IGC / Solas and stamped by RO.



BIBLIOGRAPHY

ALTERATION

NO	DESCRIPTION	DATE	REMARKS	SIGNED
1	Change position of opening (Aft Fire of Aft Void Space)	Sept 15 2009	R.7.9	J.H.Chen W.C.Chen K.T.Tsai
2	ER and SGR are assumed flooded simultaneously (Revise under R.9)	Oct. 28 2009	R.8.9.10. 19	J.H.Chen W.C.Chen

OWNER / ABS / BV / CR / DNV / GL / LR / NK

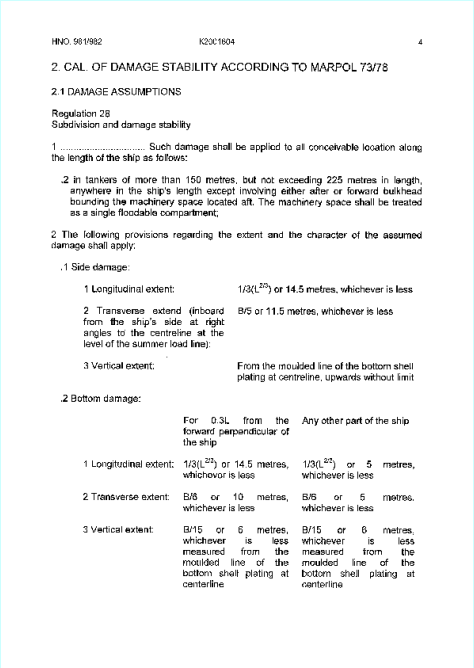
APPROVED
DATE 2009/11/26
China Corporation Register of Shipping

台灣國際造船公司設計處
CSBC CORPORATION TAIWAN
DEPARTMENT OF DESIGN
Nov 02 2009
參考用圖
FOR REFERENCE

982 981	CPC CORPORATION, TAIWAN	CR/BV CR/BV	
HULL NO.	OWNER	CLASS	IMO NO.
	40,000 DWT OIL TANKER	SCALE:	
		DATE: Jul 27, 2009	
	DAMAGE STABILITY CALCULATION	DWG(CONSULTANT) FILE NO.	
		DRAWING NO.(CSBC) K2001604	

VICE PRESIDENT W.C.Chen
ABS, VICE PRESIDENT W.C.Chen
DIVISION MANAGER K.T.Tsai
ENGINEER IN CHARGE W.C.Chen
CHECKED BY J.H.Chen
DRAWN BY J.H.Chen

台灣國際造船股份有限公司
CSBC Corporation, Taiwan



HNO. 981/982 K2001604 4

2. CAL. OF DAMAGE STABILITY ACCORDING TO MARPOL 73/78

2.1 DAMAGE ASSUMPTIONS

Regulation 28
Subdivision and damage stability

1 ..... Such damage shall be applied to all conceivable location along the length of the ship as follows:

.2 in tankers of more than 150 metres, but not exceeding 225 metres in length, anywhere in the ship's length except involving either after or forward bulkhead bounding the machinery space located aft. The machinery space shall be treated as a single floodable compartment;

2 The following provisions regarding the extent and the character of the assumed damage shall apply:

.1 Side damage:

1 Longitudinal extent: $1/3(L^{2/3})$ or 14.5 metres, whichever is less

2 Transverse extend (inboard from the ship's side at right angles to the centreline at the level of the summer load line): B/5 or 11.5 metres, whichever is less

3 Vertical extent: From the moulded line of the bottom shell plating at centreline, upwards without limit

.2 Bottom damage:

	For 0.3L from the forward perpendicular of the ship	Any other part of the ship
1 Longitudinal extent:	$1/3(L^{2/3})$ or 14.5 metres, whichever is less	$1/3(L^{2/3})$ or 5 metres, whichever is less
2 Transverse extent:	B/6 or 10 metres, whichever is less	B/6 or 5 metres, whichever is less
3 Vertical extent:	B/15 or 6 metres, whichever is less measured from the moulded line of the bottom shell plating at centerline	B/15 or 6 metres, whichever is less measured from the moulded line of the bottom shell plating at centerline

4.Can the master demonstrate that the ship is normally loaded in accordance with the SIB?

Ans.

Actual loading condition is similar to one of the typical loading conditions shown in SIB.

SUMMARY OF TRIM & STABILITY CALCULATION

		CASE12 Group 2 SG=0.856 4. DEP	CASE13 Group 2 SG=0.856 4. ARR	CASE14 Group 3 SG=0.856 4. DEP	CASE15 Group 3 SG=0.856 4. ARR	CASE16 Group 1+2 SG=0.856 4. DEP	CASE17 Group 1+2 SG=0.856 4. ARR	CASE18 Group 1+3 SG=0.856 4. DEP	CASE19 Group 1+3 SG=0.856 4. ARR	CASE20 Group 2+3 SG=0.856 4. DEP	CASE21 Group 2+3 SG=0.856 4. ARR	CASE22 Urgent Case (for owner reference). DEP
LIGHTSHIP WEIGHT	(MT)	10900.0	10900.0	10900.0	10900.0	10500.0	10900.0	10900.0	10900.0	10900.0	10900.0	10900.0
CONSTANT	(MT)	277.6	277.6	277.6	277.6	277.6	277.6	277.6	277.6	277.6	277.6	277.6
CARGO	(MT)	13510.4	13510.4	13317.0	13317.0	24958.3	24958.3	24784.9	24784.9	26827.4	26827.4	9186.3
BALLAST WATER	(MT)	4595.2	4613.4	5191.6	5208.9	367.6	2224.7	1681.7	1705.6	2423.9	2446.3	8568.7
FUEL OIL	(MT)	1279.3	133.2	1279.3	133.2	1279.3	133.2	1279.3	133.2	1279.3	133.2	1279.3
DIESEL OIL	(MT)	136.3	14.2	136.3	14.2	136.3	14.2	136.3	14.2	136.3	14.2	136.3
FRESH WATER	(MT)	318.2	32.0	319.2	32.0	319.2	32.0	319.2	32.0	319.2	32.0	319.2
DEAD WEIGHT	(MT)	20119.0	18580.7	23521.2	21983.7	27338.3	27699.8	28459.1	26927.5	31203.7	29730.7	19787.5
DISPLACEMENT	(MT)	31019.0	29480.7	34421.2	32883.7	38238.3	38539.8	39359.1	37827.5	42163.7	40630.7	30637.5
DRAFT (CORR.)	(M)	6.947	6.617	7.857	7.324	8.420	8.481	8.658	8.398	9.221	8.905	6.880
DRAFT AT F.P.	(M)	5.752	6.244	6.438	6.802	8.280	8.474	7.423	7.849	7.986	8.368	6.252
DRAFT AT A.P.	(M)	8.216	7.036	8.826	7.796	8.568	8.488	9.916	8.853	10.471	9.458	7.533
DRAFT (MEAN)	(M)	6.999	6.640	7.887	7.345	8.424	8.481	8.685	8.351	9.219	8.913	6.893
TRIM	(M)	2.464	0.792	2.458	0.906	0.288	0.014	2.493	1.004	2.505	1.090	1.281
HEEL	(DEG)	0.00	0.00	0.00	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
KM	(M)	15.513	15.699	14.867	14.970	14.141	14.086	14.223	14.249	13.936	13.971	15.471
KG	(M)	9.940	9.771	9.517	9.349	10.546	10.038	10.373	10.280	10.382	10.259	9.938
GM	(M)	5.574	5.927	5.350	5.620	3.595	4.048	3.850	3.968	3.554	3.712	5.532
GSo	(M)	0.833	0.975	0.638	0.667	0.977	0.955	0.696	0.723	0.743	0.773	0.258
KGo	(M)	10.772	10.647	10.155	10.017	11.523	11.007	11.069	10.984	11.105	11.033	10.197
GoM	(M)	4.741	5.052	4.712	4.953	2.618	3.079	3.154	3.265	2.831	2.942	5.304
LCB	(M)	89.881	92.902	89.894	92.671	93.146	93.513	89.748	92.119	89.566	91.763	92.014
LCG	(M)	89.977	92.933	89.977	92.805	93.157	93.514	89.854	92.154	89.648	91.799	92.083
LCF	(M)	90.524	91.974	89.418	90.975	89.524	89.558	87.685	89.240	86.680	88.117	91.386
TPC	(MT)	48.066	48.159	49.771	48.765	48.357	49.258	50.750	49.667	51.221	50.193	48.529
MTC	(MT-M)	551.07	521.46	574.71	540.10	557.91	554.15	608.92	569.34	625.83	587.14	533.96
PROP IMMER	(M)	128.24	108.87	139.74	121.32	134.37	133.14	155.36	138.87	165.32	148.92	116.78
MAX. S. F.	(MT)	-2560.9	-2023.5	3057.0	2772.4	-2975.0	-2693.5	-2953.8	-2926.3	-2899.1	-2722.7	-2853.6
MAX. B. M.	(MT-M)	42615	38549	90307	76906	35064	-36628	44706	34853	32236	-25775	54746

* NOTE (+) SIGN IN CASE OF LCB, LCG, LCF TO BE PLACED FORWARD FROM AP
(+) SIGN IN CASE OF TRIM IS TRIM BY STERN.
(+) SIGN IN CASE OF HEEL IS STARBOARD.

IN THE CALCULATION OF KM THE TRIM IS INCLUDED.

HNO. 981, 982 K2001308

Questionnaire & your answers

5.Has the master verified an alternate loading condition by written authority from flag/class ?

Ans.

1.Actual loading condition is not similar to any one of the typical loading conditions shown in SIB.

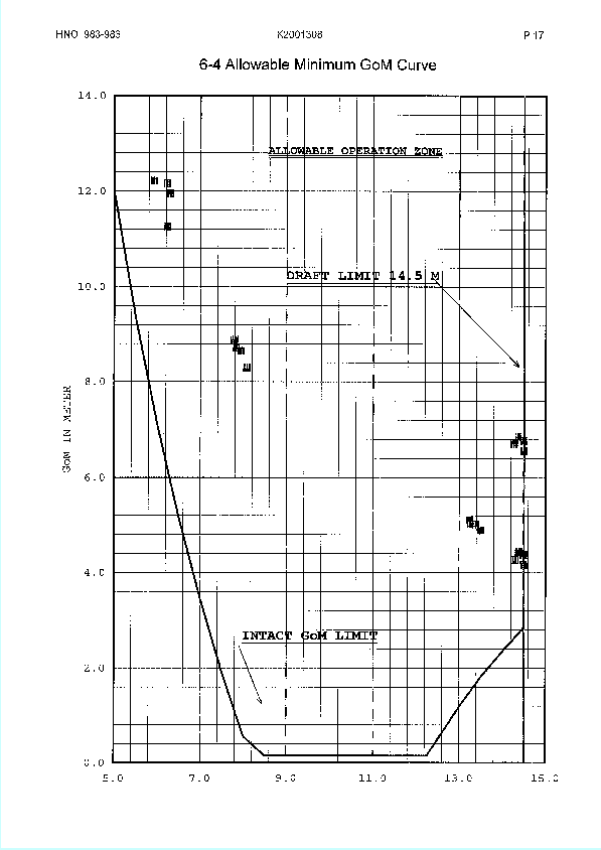
2.The owner shall prepare a document to demonstrate that this alternate loading condition is complied with the intact and damage stability requirements. The document shall be specially approved by RO before loading.

Questionnaire & your answers

6.Has the master verified an alternate loading condition by assessing loaded condition against critical damage KG data, included in the approved stability information ?

Ans.

The master shall demonstrate that the KG or GM of the alternate loading condition is within the safety zone. KG or GM of the alternate loading condition is easy attained by using of the loading computer .

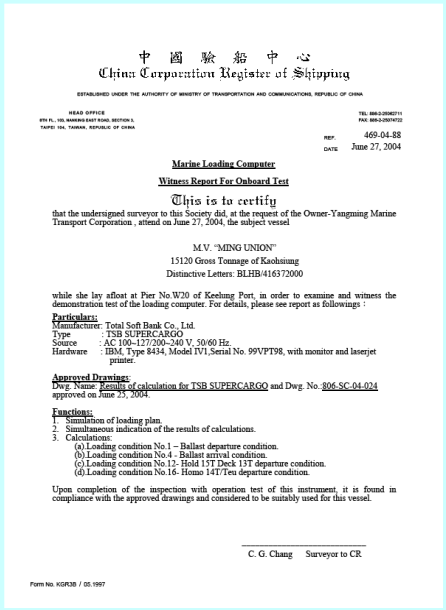


Questionnaire & your answers

7.Is there an on-board stability computer program that includes damage stability?

Ans.

The loading computer shall be approved by RO.



中 國 驗 船 中 心
China Corporation Register of Shipping

ESTABLISHED UNDER THE AUTHORITY OF MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, REPUBLIC OF CHINA

HEAD OFFICE
8TH FL., 100, MINSHENG EAST ROAD, SECTION 3,
TAIPEI 104, TAIWAN, REPUBLIC OF CHINA

TEL: 886-2-25967211
FAX: 886-2-25974722

REF. 469-04-88
DATE June 27, 2004

Marine Loading Computer

Witness Report For Onboard Test

This is to certify

that the undersigned surveyor to this Society did, at the request of the Owner-Yangming Marine Transport Corporation , attend on June 27, 2004, the subject vessel

M.V. "MING UNION"
15120 Gross Tonnage of Kaohsiung
Distinctive Letters: BLHB/416372000

while she lay afloat at Pier No.W20 of Keelung Port, in order to examine and witness the demonstration test of the loading computer. For details, please see report as followings :

Particulars:
Manufacturer: Total Soft Bank Co., Ltd.
Type : TSB SUPERCARGO
Source : AC 100~127/200~240 V, 50/60 Hz.
Hardware : IBM, Type 8434, Model IV1,Serial No. 99VPT98, with monitor and laserjet printer.

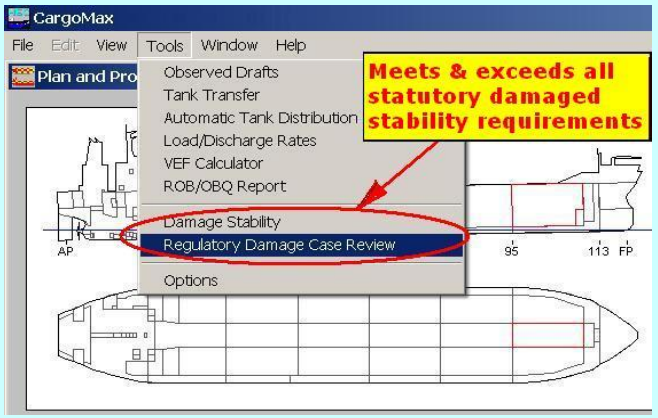
Approved Drawings:
Dwg. Name: Results of calculation for TSB SUPERCARGO and Dwg. No. 806-SC-04-024 approved on June 25, 2004.

Functions:
1. Simulation of loading plan.
2. Simultaneous indication of the results of calculations.
3. Calculations:
   (a) Loading condition No.1 – Ballast departure condition.
   (b) Loading condition No.4 - Ballast arrival condition.
   (c) Loading condition No.12- Hold 15T Deck 13T departure condition.
   (d) Loading condition No.16- Homo 14T/Teu departure condition.

Upon completion of the inspection with operation test of this instrument, it is found in compliance with the approved drawings and considered to be suitably used for this vessel.

C. G. Chang Surveyor to CR

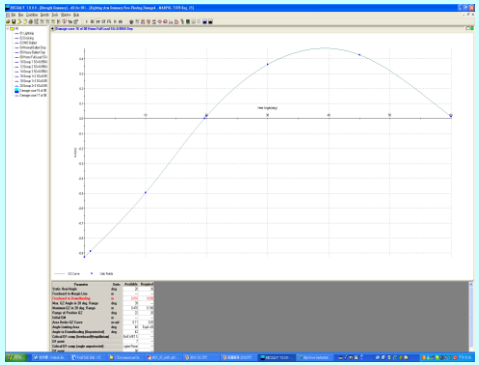
Form No. KGP38 / 05.1997

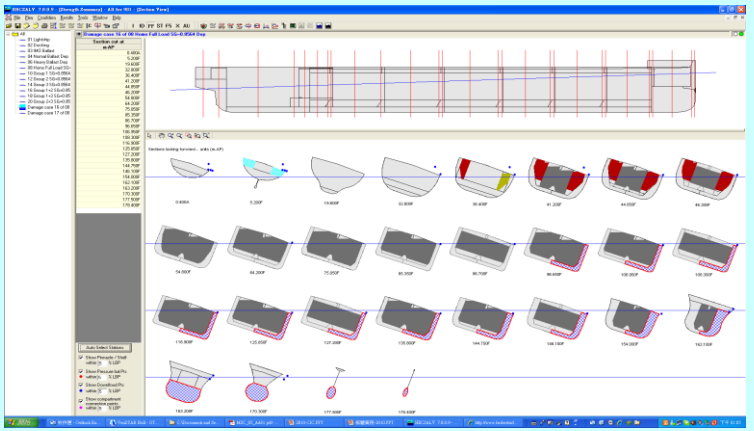


8.Has the master verified an alternate loading condition by using the on-board stability computer program for carrying out damage stability checks?

Ans.

The master shall use the loading computer to demonstrate that the damage stability of the alternate loading condition is complied with the regulation as approved document.





2010 CIC of Paris MoU on Port State Control

PARIS MOU CIC ON TANKER DAMAGE STABILITY

TANKER DAMAGE STABILITY QUESTIONNAIRE

Name	
IMO Number	
Type: Gas, Chemical, Oil	

No	Question	Yes	No	N/A
1	Does the ship have an approved stability information book (SIB)?			
2	Is the SIB written in a language understood by the master?			
3	Does the approved stability information cover damage conditions?			
4	Can the master demonstrate that the ship is normally loaded in accordance with the SIB?			
5	Has the master verified an alternate loading condition by written authority from flag/class?			
6	Has the master verified an alternate loading condition by assessing loaded condition against critical damage KG data, included in the approved stability information?			
7	Is there an on-board stability computer program that includes damage stability?			
8	Has the master verified an alternate loading condition by using the on-board stability computer program for carrying out damage stability checks?			
9	Was the ship detained as a result of this CIC?			

2011 CIC of Paris MoU on Port State Control

Next year, 2011 CIC of Paris MoU will be focus on

Structural safety and

the International Convention on Load Lines