

Tanker Q&As and CIs on the IACS CSR Knowledge Centre

KCID No.	Ref.	Type	Topic	Date completed	Question/CI	Answer	Attachment
57	2/3.1.8.1	Question	fatigue assessment-cargo tank structures	2006/5/5	For the fatigue assessment of cargo tank structures, a mean SG of 0.9 is to be used. This mean SG used is to reflect an 'average' SG of oil cargo carried by the ship throughout its life. A higher value will be required if it is intended to carry higher density oil cargo on a regular basis. Subject sentences to be deleted. We are afraid that the reduced figure, i.e. 0.9 for S.G, might cause argument between shipbuilders and shipowners because they cannot assure whether the assumption of mean S.G. of 0.9 is sufficient or not during the 25 years' operation. All other sentences mentioning 0.9 for S.G should be deleted from JTP rule.	<p>The fatigue calculation is to be based on the loading conditions most commonly used, e.g. homogeneous full load and normal ballast draft. These are the conditions that the ship will trade with for the majority of the ship's life and consequently the most relevant loading conditions for calculation of fatigue life as fatigue is an accumulative process. We have in addition put a threshold value of 0.9 in the Rules to avoid artificial homogeneous loading conditions with very low cargo density. From an operational point of view this means that, with respect to fatigue, the master can trade however he wants as long as the scantling draught is not exceeded. The ambiguous term of ;A higher value will be required if it is intended to carry higher density oil cargo on a regular basis; has been deleted due to the difficulty in defining this and potential misunderstanding or conflict between builder and buyer over this item as mentioned in the Rules. We do not see the need for further correction of the Rule text in this respect but will explain the concept in detail in the Background document.</p> <p>The choice of density to use in the fatigue calculations will have an effect on scantlings and end connection details of stiffeners on the cargo tank boundaries except for the deck and transverse bulkheads. The amount of increase will depend on whether the fatigue requirement is dominating or not.</p>	
58	2/ Table 2.7.3	Question	BWE conditions	2006/5/5	In general, BWE should be performed under the favorable weather condition. Accordingly it should be reconsidered2.We do not understand why JTP class does not establish the allowable sea condition for operators to safely perform BWE. Recalling the first sentence in Sec. 2/4.1.4.1 (d) of JTP rule, please reconsider and rationalize the JTP rule.	<p>1. We agree that BWE should preferably be performed under favourable weather conditions. However, due to past experience on discussions with owners and builders as to definition of favourable weather conditions and difficulty for the master to quantify the actual sea state the Rules require that the strength of the ship is verified for BWE conditions without applying a load reduction factor and corresponding operational limitation.</p> <p>2.The main difficulty in this issue is for the master to assess if the actual sea-state being experienced at sea is within the term "favourable weather conditions" or not. If a knock down factor was to be applied, e.g.0.8 factor on dynamic loads typically equating to 10-6 probability level (1year max.) the corresponding significant wave height for this condition would need to be specified and the master would have to be in the position to determine weather or not the actual sea state was more severe than this limit.</p> <p>As mentioned in our previous answer the classification societies are constantly coming into arguments with both owners and builders on the ambiguous wording of "not to be performed under heavy weather". Based on this, plus, when establishing the rules for the BWE conditions we determined that there would be limited and reasonably small increases in terms of total steel weight that the present BWE conditions are causing, we will keep the Rule text as is.</p>	

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153	2/3.1.8.2, App C/1.3.2	Question	Cargo mean density used for simplified fatigue calculations	2006/10/9	The treatments of the cargo mean density used for the simplified Fatigue Calculation in Appendix C: Are the cargo mean density used 0.9 specified in Sec.2/3.1.8.2 or the density corresponding to the loading condition at the scantling draught in full load homogeneous loading condition under the condition of approval of the Class? If the design specification of ships gives the cargo density corresponding to the alternate loading condition, which is regarded as the option contracted by shipbuilder and ship owner, can the classification society be disregarded such option under the approval of such design?	<p>1. The cargo density of 0.9 tonnes/m<sup>3</sup> or the cargo density of homogeneous scantling draught, whichever is greater, is to be used.</p> <p>2. As specified in Section 2/3.1.10.1.(g), higher cargo density for fatigue evaluation for ships intended to carry high density cargo in part load conditions on a regular basis is an owner's extra. Such owner's extra is not covered by the Rules, and need not be considered when evaluating fatigue strength unless specified in the design documentation.</p>	
266	2/3.1.8.2	CI	fatigue assessment	2006/11/13	Because the fatigue assessment is based on full tank condition, the text of 2/3.1.8.2 is misleading as it does not state that the representative mean cargo density is derived from the cargo density corresponding to a full tank as specified in C/1.3.2.1.	Agreed the Rule text will be amended to read: 2/3.1.8.2 For the fatigue assessment of cargo tank structures, a representative mean cargo density throughout the ship's life is to be used. The representative mean density is to be taken as 0.9 tonnes/m <sup>3</sup> or the cargo density from the homogeneous full load condition at the design draught if this is higher.	
438 attc	1/1.1.1.2, 2/3.1.7.1 & 1/1.1.1.1	Question	unrestricted worldwide navigation	2009/11/2	<p>The following rules, 1/1.1.1.1. and 1/1.1.1.2 of CSR/Tanker do not clearly specify that the Rules are applicable for unrestricted worldwide navigation as clearly specified in 1-1/1.1.2 of the CSR/Bulker Carrier. The Rules basis for worldwide operation (i.e. unrestricted) can only be assumed from the rules of 2/3.1.7.1 " To cover worldwide trading operations.... the CSR/Tanker should be designed based on the North Atlantic wave environment for its entire design life".</p> <p>[QUOTE] CSR/Tanker 1/1.1.1.1 These Rules apply to double hull oil tankers of 150m, L, length and upward classed with the Society and contracted for construction(1) on or after 1 April 2006. The definition of the rule length, L, is given in Section 4/1.1.1.1. 1/1.1.1.2 Generally, for double hull tankers of less than 150m, L, in length, the Rules of the individual Classification Society are to be applied. (Continue to the next page)</p>	Please see <a href="#">attached file</a> : 5.2 - (CIP) Common Interpretations November 2009	<a href="#">Y</a>

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438 attc	1/1.1.1.2, 2/3.1.7.1 & 1/1.1.1.1	Question	unrestricted worldwide navigation	2009/11/2	<p>(Continue from previous page) 2/3.1.7 External environment 2/3.1.7.1 To cover worldwide trading operations and also to deal with the uncertainty in the future trading pattern of the ship and the corresponding wave conditions that will be encountered, a severe wave environment is used for the design assessment. The rule requirements are based on a ship trading in the North Atlantic wave environment for its entire design life.</p> <p>CSR/Bulk Carrier 1-1/1.1.2 These Rules apply to the hull structures of single side skin and double side skin bulk carriers with unrestricted worldwide navigation, having length L of 90 m or above. [UNQUOTE]</p> <p>Q1: Does this difference in application of the Rules between CSR/Tanker and CSR/Bulk Carrier intentionally provide for CSR/Tanker in order to cover a restricted service double hull oil tanker (L&gt;150m) by the CSR/Tanker? Q2: Or, is IACS considering to modify the CSR/Tanker text in order to harmonise to CSR/Bulk Carrier?</p> <p>Q3: If the answer of Q1 is affirmative, CSR notation will be provided for oil tanker regardless its intended service, unrestricted or restricted. Has this policy ever discussed within IACS and firmly decided? Q4: If the answer of Q2 is affirmative, CSRs cover only oil tankers and bulk carriers, of which general configurations are specified in each Rules, intended to operate unrestricted worldwide navigation only and these ships for restricted service operation are not within the scope of CSRs. Hence, the applicable requirements for these ships are to be referred to each society's Rules. Is this understanding correct? Please confirm.</p>	(See previous page)	<a href="#">Y</a>
487	2/3.1.2.4	Question	Limitation of "B/D" ratio	2007/8/28	Section 2/3.1.2.4 indicates limitation of "B/D" ratio together with some other factors with respect to environmental loading. If a vessel's "B/D" ratio exceeds the limit of 2.5 by approximately 10%, are the current requirements applicable without any additional correction?	The limits provided in Section 2/3.1.2.4 are assumptions made in the determination of the environmental loading. In case limitations are exceeded, then special consideration is to be given by the individual classification society as stipulated in Section 3/4. The structural safety of the design is to be at least equivalent to that intended by the Rules.	

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512	2/2.1.2.1	RCP	Modification as audit in sense of Quality Control	2007/10/15	<p>We propose the following modification as audit in sense of Quality control is not actually performed as requested in the Rules: - Replace "undertake and audit" in para 2.1.2.1 below with "ensure compliance".</p> <p>2.1.2.1 Classification Societies develop and publish the standards for the hull structure and essential engineering systems. Classification Societies undertake and audit during design, construction and applicable international regulations when authorised by a National Administration.</p>	<p>The following changes will be made:</p> <p>2.1.2 Classification Societies</p> <p>2.1.2.1 Classification Societies develop and publish the standards for the hull structure and essential engineering systems. Classification Societies undertake an audit during design, construction and operation of a ship to confirm compliance with the classification requirements and the applicable international regulations when authorised by a National Administration. will be replaced by:</p> <p>2.1.2.1 Classification Societies develop and publish the standards for the hull structure and essential engineering systems. Classification Societies ensure compliance with the classification requirements and the applicable international regulations when authorised by a National Administration during design, construction and operation of a ship.</p> <p>2.1.3 Responsibilities of Classification Societies, builders and owners</p> <p>2.1.3.1</p> <p>(b) design aspects:</p> <p>the classification society is responsible for a technical review and audit of the design plans and related documents for a ship to verify compliance with the appropriate classification rules.</p> <p>will be replaced by:</p> <p>the classification society is responsible for a technical appraisal of the design plans and related documents for a ship to verify compliance with the appropriate classification rules.</p>	
1124	2/5.4.1.2	RCP	Cross reference and editorial correction	2012/8/27	<p>In Rules of CSR for Tanker, we found the requirements in which cross references are not correct. Please confirm the following and modify them appropriately.</p> <p>[Sec.2/5.4.1.2] Cross reference for the load scenarios should be "Table 2.5.1" instead of "Table 2.5.3".</p> <p>[Sec.3/5.2.6.2] Cross reference for the load point should be "5.2.2" instead of "5.2.1"</p> <p>[Sec.5/4.2.1.1] "5.3" is not exist. It should be "5.1".</p> <p>[Sec.8/4.4.3.5 and Sec.8/4.4.3.6] Cross reference for the scantlings of pillars should be "3.9.5" instead of "4.8.4". Sentences should be the same as "Sec.8/5.4.4.4" and "Sec.8/5.4.4.5".</p> <p>[App.B/1.2.1.1] "Sec.2/6.3.4" is not exist. It should be "Sec.2/4.3.4".</p> <p>[Table B.2.5] Cross reference for block coefficient should be "Sec.4/1.1.9.1" instead of "Sec.4/1.1.1.1".</p> <p>[Fig. B.3.2] "Table B.2.22" is not exist. It should be "Table B.2.2".</p> <p>[App.B/4.2.2.2] "Sec.9/3.3.3" is not exist. It should be "Sec.9/3.3.2".</p>	<p>We can confirm your proposal. The cross references will be modified at the earliest opportunity.</p>	

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1128	2/3.1.8.4	Question	Cargo loaded below zero	2013/5/3	<p>If cargo can be loaded below zero as we understand that this is not uncommon. Also ask if IACS should include a comment in the Loading Manual 'Guidance to Master', indicating the boundaries/constraints for cargo carriage temperature if not already done.</p> <p>Some cold cargo below zero temperature case can be loaded is more serious considered cargo hold structures because this cargo hold temperature will be continuously below zero. If this ship's trading route will be north atlantic or Russia in winter season case then CSR rule is not covered and necessary some Guidance for Master in LM for safety operation or crew. In this case, we are not sure unaware of any problem as follows;-</p> <ul style="list-style-type: none"> <li>-Cargo is continuous below zero</li> <li>-North Atlantic or Russia trading in winter season</li> <li>-Exposed air condition is also low temperature during ice voyage</li> <li>-Water in ballast tank will be frozen</li> </ul>	<p>CSR-OT 2/3.1.8.4 clearly mentions that CSR is applicable for vessels with cargo/ballast water temp above 0 C degrees. Furthermore cargo holds are equipped with heating coil systems that can warm up the cargo if necessary in order to maintain the viscosity for carrying and unloading. Vessels carrying cargo with temperatures less than zero degrees C are to be considered on a case by case basis by the individual Class Society.</p> <p>IACS is aware of this topic and will further consider a unified proposal for the carriage of low temperature cargoes in the future.</p>	

# CI-T 7 Application of the Common Structural Rules for Double Hull Oil Tankers

(November 2009)

## Rule Section

- 1/1.1.1.1 Applicability
- 2/Figure 3.2.1 Typical arrangements of Double Hull Tankers
- 2/3.1.7.1 External environment
- 3/4.1.2 Novel designs

## Knowledge Centre Questions:

- No 142 (Type of cargo)
- No 183 (OBO Carriers)
- No 279 (Ore/Oil Carriers)
- No 432 (Design with no cross ties)
- No 438 (Restricted/Unrestricted Navigation)
- RCP No 562 (Restricted/Unrestricted Navigation)

## Description

The Common Structural Rules for Double Hull Oil Tankers (CSR/Tankers) of 150 metres or more have been published and adopted by IACS and became effective from April 1, 2006.

There are a couple issues of concern regarding the applicability of the rules that have become apparent after the adoption of the CSR/Tankers which this interpretation addresses:

- Ship types: do CSR apply to Chemical tankers, combination carriers etc.
- Conversions: vessels converted to tanker for oil
- Novel Designs: application of the CSR/Tankers to novel designs and unusual structural configurations
- Hull shapes outside of normal range L/B or B/D etc
- Service Area: application of the CSR/Tankers for ships on restricted service.

## Common Interpretation / Procedure

The purpose of this interpretation is to ensure a unified understanding for which CSR/Tankers shall apply.

This common interpretation is not intended as a detailed procedure for the review and approval of novel concepts or particular structural arrangements not described in the CSR/Tankers.

## 1. Ship Types

The CSR/Tankers are mandatory for oil tankers with length of 150m and above having integral tanks for carriage of crude oil or oil products in bulk, which is contained in the definition of oil in Annex 1 of MARPOL 73/78.

Exemptions for which CSR/Tankers are not applicable are listed below:

- Combined Ore/Oil Carriers; or
- OBO Carriers; and
- Chemical tankers not having MARPOL certificate for carriage of oil or oil products
- Pure asphalt carrier
- FPSO, FSO
- Ships only carrying oil or oil products in independent tanks.

The class notation CSR may only be assigned for those vessels covered by mandatory application and may not be assigned voluntarily based on preference of Yard or Owner.

## 2. Conversion to Tanker for Oil

Ships converted to oil tankers should be exempted from complying with CSR for tank unless the whole cargo block (i.e. all the cargo holds) is replaced, in that case, relevant parts of CSR should apply to the cargo block only, and not the rest of the ship.

The exemption will only be applicable for vessels for which the date of the original contract for construction was prior to 1. April 2006.

## 3. Novel designs and unusual structural configurations

Although the Rules have been formulated for families of double hull tankers of more or less conventional structural configuration, there is no intention of limiting the development of novel designs in the future, or designs having improved local structural arrangements. However, the proposed designs must demonstrate that their structural safety is at least equivalent to that intended by the CSR/Tankers. This may include an independent systematic review/structural risk assessment in order to document equivalence with the Rules.

The individual class society will particularly consider how to apply CSR/Tankers on structural configurations different from those shown in Figure 3.2.1 or on “novel designs” (Section 3/4.1.2).

## 4. Designs with main particular outside normal ranges

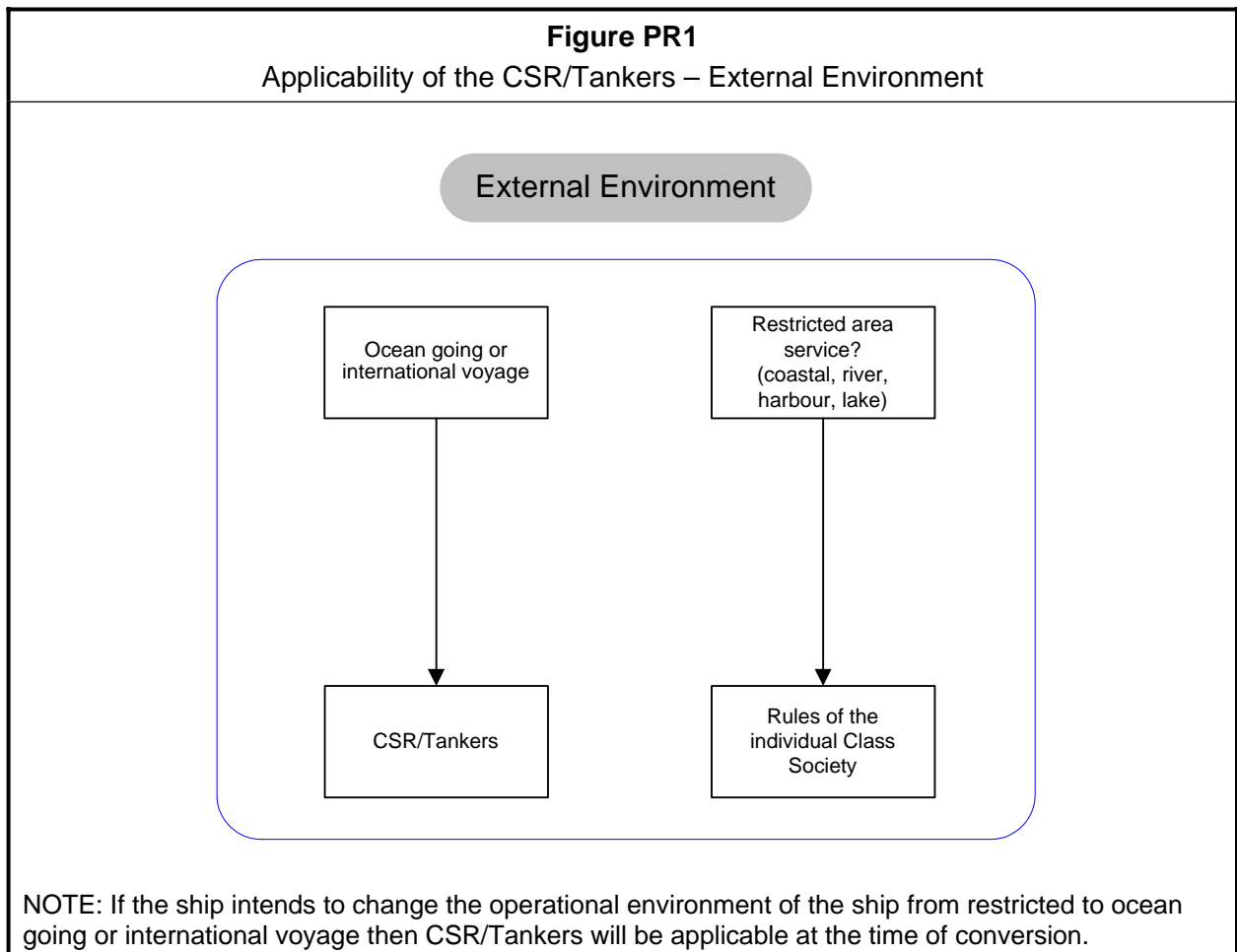
The formulae for loads are tailored for ships of normal proportions. Although most may be applied to vessels of other proportions guidance should be sought from the individual class society when the criteria below are not satisfied. The individual class society will decide how to apply the CSR/Tankers to the ship.

- $L/B > 5$
- $B/D < 2.5$
- $C_b > 0.7$
- $GM < 0.12B$  for homogeneously full load conditions  
<  $0.33B$  for ballast conditions

## 5. Service Area

Because there is uncertainty about the actual trading patterns of most ships, it is necessary to choose an arbitrary, but prudently severe, wave environment for the purposes of design assessment. The Rule requirements are therefore based on a ship trading for all of its life in the demanding North Atlantic wave environment. See Figure PR1 for application of CSR/Tankers based on external environment.

Shipowners are naturally concerned about maximising operational flexibility with the loading conditions that are approved and in the Loading Manual. The CSR for Tankers defines loading conditions that envelope the most prevalent in-service cases. This means that actual loading conditions will then fall within the range of draughts and hull girder bending moments (BM) / shear forces (SF) that have been investigated and approved by class. The standard loading conditions in CSR have been carefully selected to give extreme service limits. In some cases they are significantly more onerous than those routinely occurring. Where the shipowner intends actual loading conditions that may be outside the standard draught and BM/SF limits then these must be identified to the shipbuilder in the specification and submitted to Class to ensure the ship meets this enhanced requirement.





**Implementation date**

This CI is effective from 1 November 2009.

**Background**

This common procedure has been prepared to ensure a unified understanding on the application of CSR/Tankers.